

# **Thor™ VM3 Vehicle-Mount Computer**

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with Microsoft® Windows® 10 IoT Enterprise

## **User's Guide**

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## Thor VM3 Agency Information

Thor VM3 mobile computers meet or exceed the requirements of all applicable standards organizations for safe operation. However as with any electrical equipment, the best way to ensure safe operation is to operate them according to the agency guidelines that follow. Read these guidelines before using your Thor VM3.

This documentation is relevant for the following Thor models: VM3.

### ***FCC Part 15 Statement***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTE - This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

**Caution** - Changes or modifications made to this equipment not expressly approved by Honeywell may void the FCC authorization to operate this equipment.

### ***FCC 5GHz Statement***

For the band 5600-5650 MHz, no operation is permitted.



High-power radar is allocated as the primary user of the 5.25- to 5.35-GHz and 5.65- to 5.85-GHz bands. These radar stations can cause interference with and/or damage to this device.

### ***EMC Directive Requirements***

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### ***Canada, Industry Canada (IC) Notices***

This Class B digital apparatus complies with Canadian ICES-003 and RSS-247.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

#### **Exposure of humans to RF fields (RSS-102)**

The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at <http://www.hc-sc.gc.ca/>

The radiated energy from the antennas connected to the wireless adapters conforms to the IC limit of the RF exposure requirement regarding IC RSS-102, Issue 5.

Cet appareil numérique de classe B est conforme à la norme NMB-003 et RSS-247.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### Conformité des appareils de radiocommunication aux limites d'exposition humaine aux radiofréquences (CNR-102)

L'ordinateur utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par Santé Canada pour la population. Consultez le Code de sécurité 6 sur le site Internet de Santé Canada à l'adresse suivante : <http://www.hc-sc.gc.ca/>

L'énergie émise par les antennes reliées aux cartes sans fil respecte la limite d'exposition aux radiofréquences telle que définie par Industrie Canada dans le document CNR-102, version 5.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

Description	Type	Gain	Manufacturer
External wifi antenna, dual band 2.40-2.50G/4.90-5.90G. Dual Band Swivel Mount. Dipole RP-TNC Blade	R380500314	2.4 ~ 2.5Ghz: 1.6dBi 4.9 ~ 5.9Ghz: 5dBi	LARSEN
External Two-Way Radio Antenna	WTS 2450	2.4 to 2.485Ghz: 2.1dBi 4.9 to 5.9Ghz: 2.6dBi	LAIRD Technologies
Internal PIFA antenna	FIT-VM3-ANT-21Y	2.4GHz: 4.25dBi	Venture GES Singapore Pte Ltd (Designed by: Frontier Integrated Technology)
	FIT-VM3-ANT-028	5.0GHz: 5.5dBi	

#### 5GHz Statement

UNII-1 Band (5150-5250 MHz) is in passive/listen mode only and will not actively initiate communication.

### ANATEL (Brazil)

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não causar interferência a sistema operando em caráter primário.

### 警告

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰，在这种情况下，可能需要用户对干扰采取切实可行的措施。

### Vehicle Power Supply Connection Safety Statement

*Note: For North America, a UL Listed fuse is to be used*

For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches (12.7 cm) of the battery's positive (+) terminal. Use VM3055FUSEKIT (or equivalent) to install the fuse as shown below:

- For **12VDC** input, use the 10A in VM3055FUSEKIT or a slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use the 6A in VM3055FUSEKIT or a slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use the 4A in VM3055FUSEKIT or a slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use the 3A in VM3055FUSEKIT or a slow blow fuse that has a DC voltage rating greater than 48VDC.

### Li-Ion Battery

When disposing of the Thor VM3 UPS battery, the following precautions should be observed: The battery should be disposed of properly. The battery should not be disassembled or crushed. The battery should not be heated above 212°F (100°C) or incinerated.

Safety requirements restrict the temperature at which the Li-Ion UPS battery can be charged. Charging is disabled if the ambient temperature is outside of the -30°C (-22°F) to 50°C (122°F) safe charging range. In order to maintain UPS charge the Thor VM3 should have power applied while the unit is within the safe charging range for at least an hour each day.

## RF Safety Notice



This device is intended to transmit RF energy. For protection against RF exposure to humans and in accordance with FCC rules and Industry Canada rules, this transmitter should be installed such that a minimum separation distance of at least 20 cm (7.8 in.) is maintained between the antenna and the general population. .

## Bluetooth



## Honeywell Scanning & Mobility Product Environmental Information

Refer to [www.honeywellaidc.com/environmental](http://www.honeywellaidc.com/environmental) for the RoHS / REACH / WEEE information.

## CE Mark

The CE marking on the product indicates that this device is in conformity with the following directives:

- 1999/5/EC R&TTE
- 2004/108/EC
- 2011/65/EU RoHS (Recast)

In addition, complies to 2006/95/EC Low Voltage Directive, when shipped with recommended power supply.

European contact:

Hand Held Products Europe BV  
Lagelandseweg 70,  
6545CG Nijmegen  
The Netherlands

Honeywell shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.



	EN 300 328 V1.9.1: 2015 EN 301 893 V1.8.1: 2015 EN 62311: 2008 EN 301511 V9.0.2 : 2003 EN 301908-1 V5.2.1 : 2011 EN 300440-2 V1.4.1 : 2010
1999/5/EC	EN 301489-1 V1.9.2: 2011 EN 301489-3 V1.6.1: 2013 EN 301489-7 V1.3.1 : 2005 EN 301489-17 V2.2.1: 2012 EN 301489-24 V1.5.1 : 2010 EN 55022 :2010 EN 55024 :2010
2004/108/EC	EN 60950-1:2006 + A11:2009 +A1:2010 +A12:2011

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## ***Dealer License - Republic of Singapore***

Complies with  
IDA Standards  
DA104328

Republic of Singapore - Dealer License Number DA104328 complies with IDA Standards.

WWAN is not available in Singapore.



## Getting Started

### Overview

The Thor VM3 Vehicle Mount Computer (VMC) is a rugged, vehicle mounted computer running a Microsoft® Windows® 10 Enterprise (64-bit) operating system and capable of wireless data communications from a fork-lift truck or any properly configured vehicle. Wireless communications are supported over a 802.11 WLAN network and, optionally, over a WWAN network. The Bluetooth® module supports Bluetooth printers and scanners.



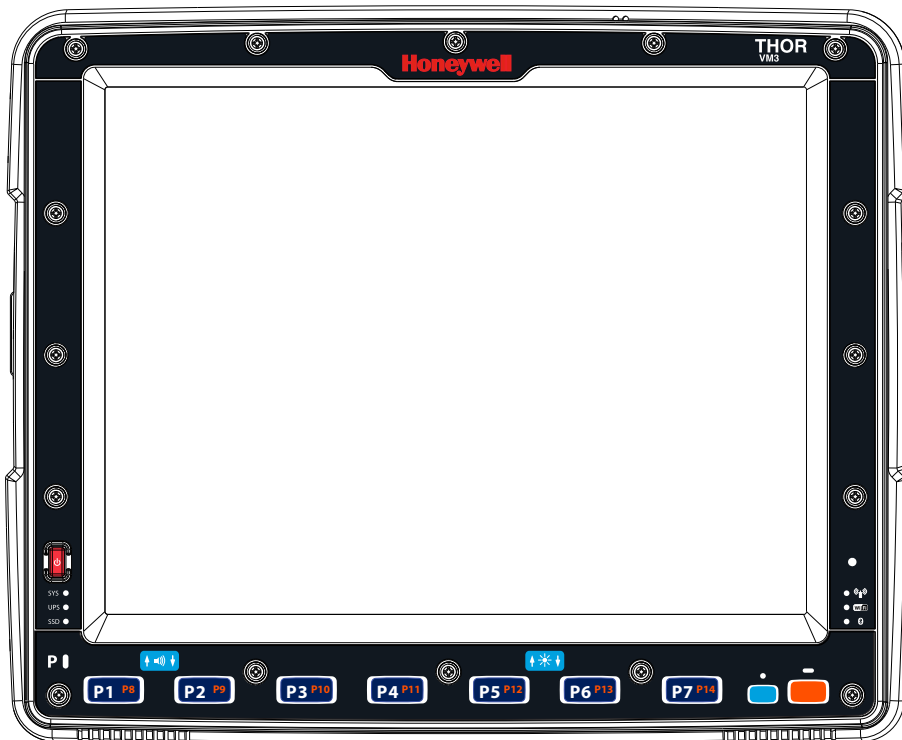
**CAUTION** - Before shipping the Thor VM3, be sure to [Disconnect UPS Battery](#) (page 4-50) .

The Thor VM3 is designed for use with a vehicle dock. Two models of docks are supported, a [Standard Dock](#) (page 2-6) and an [Enhanced Dock](#) (page 2-7). The dock installs in the vehicle and connects to vehicle power. The dock provides conditioned input power for the Thor VM3. Peripheral connections are on the dock. The Thor VM3 is designed to easily be removed from the dock with a latch on the lower rear of the Thor VM3 housing. Since the dock remains attached to the vehicle, the Thor VM3 computer can easily be moved from one vehicle equipped with a dock to another vehicle equipped with a dock.

The Thor VM3 contains a UPS battery which, when fully charged, can power the Thor VM3 for a minimum of 30 minutes. This can be when the Thor VM3 is not attached to a dock or when the Thor VM3 is attached to a dock but the vehicle power is interrupted, such as when the vehicle battery is being changed.

The Thor VM3 can be used with or without an external keyboard. There are 7 programmable keys (P1-P7) on the front bezel and, when used with the Orange modifier key, provide 7 additional programmable keys (P8-P14).

Contact [Technical Assistance](#) (page 9-1) for information on the latest upgrades for your Thor VM3.



### About this Guide

This user's guide has been developed for a Thor VM3 with a Microsoft® Windows® 10 Enterprise operating system.

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## Out of the Box

The following items may be packaged separately:

- Thor VM3
- Standard or Enhanced Dock (includes 10-60VDC power cable)
- RAM or U-Bracket vehicle mount kit

If you ordered additional accessories for the Thor VM3, verify they are also included with the order. Keep the original packaging material in the event the Thor VM3 should need to be returned for service. For details, see [Product Service and Repair](#) (page 9-1).

## Initial Setup for Thor VM3

This page lists a quick outline of the steps you might take when setting up a new Thor VM3. More instruction for each step is listed later in this guide.

Contact [Technical Assistance](#) (page 9-1) if you need additional help.

### Hardware Setup

1. [Install RAM Mount](#) (page 4-4) or [Install U Bracket Mount](#) (page 4-13) to the vehicle.
2. [Place Thor VM3 in the Dock](#) (page 4-2).
3. Secure the optional external keyboard to either an integrated or remote mounting bracket.
4. [Connect Cables](#) (page 4-16) for any peripherals.
5. [Connect Power](#) (page 4-17).
6. Secure all cables in [Strain Relief Cable Clamps](#) (page 4-16).
7. Press the [Power Switch](#) (page 3-4) on the dock to the on position.
8. Press the [Power Button](#) (page 3-4) on the Thor VM3.
9. Perform [Touch Screen Calibration](#) (page 5-44) (not required for PCAP touch screen).

### Software

#### Languages

The Thor VM3 may be shipped with an English only operating system. Additional languages can be downloaded and installed from the [Region and Language](#) (page 5-37) control panel.

#### First Boot

When a new Thor VM3 starts up a EULA (End User License Agreement) may be displayed on the touch screen. It remains on the screen until the Accept or Decline button is tapped with a stylus.

Tap the **Accept** button to accept the EULA terms and the Thor VM3 continues the startup process. The EULA is not presented to the user again.

Tap the **Decline** button to decline the EULA and the Thor VM3 reboots. It will continue to reboot until the **Accept** button is tapped with the stylus.

#### Software Setup

Hardware setup should be completed before starting software setup.

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## Dock

The Thor VM3 assembly consists of two parts, the Thor VM3 computer and the dock. The Thor VM3 contains an internal UPS battery that, once fully charged, powers the Thor VM3 for a minimum of 30 minutes when the unit is not mounted in the dock.

All docks provide:

- A mount for the Thor VM3 computer. The dock attaches to a vehicle via a RAM or U-bracket mount or to a RAM table stand for use in an office environment.
- Conditioned power for the Thor VM3. The dock accepts 10-60VDC power input directly or 50-150VDC power input with a DC/DC converter.
- Mobility of the Thor VM3, since the dock remains attached to the vehicle the Thor VM3 computer can easily be moved from one vehicle equipped with a dock to another.
- Several I/O ports as described in the table below.
- Strain relief provisions for cables.
- Headset connection via an adapter cable. When a headset is not attached, the microphone and speakers on the Thor VM3 are active.

There are three type of docks available for the Thor VM3. Features of the docks are described below:

	<b>VM1D Standard Dock</b>	<b>VM3D Enhanced Dock</b>	<b>VMXD Enhanced Dock (for Thor VM3 replacing Thor VX8 and Thor VX9</b>
SKUs	VM1001VMCRADLE (with RAM ball) VM1002VMCRADLE VM1003VMCRADLE	VM3001VMCRADLE	VMX004VMCRADLE
Power Connection	Direct, DC/DC Adapter, AC/DC Adapter	Direct, DC/DC Adapter, AC/DC Adapter	Designed to connect to existing Thor VX8 or Thor VX9 power cable only
Serial Ports	COM1 and COM2	COM1 and COM2	COM1 and COM2 (see note below)
USB Ports	USB port provides host connection via an adapter cable. This port also supports Honeywell external keyboards.	USB1 port provides host connection via an adapter cable. This port also supports Honeywell external keyboards.  USB2 port provides two USB host ports via an adapter cable.  Direct USB host connection on top of dock.	USB1 port provides host connection via an adapter cable. This port also supports Honeywell external keyboards.  USB2 port provides two USB host ports via an adapter cable.  Direct USB host connection on top of dock.
Ethernet	N/A	RJ-45 Ethernet connection on top of dock.	RJ-45 Ethernet connection on top of dock.
CANbus	CANbus connection via an adapter cable	CANbus connection via an adapter cable	CANbus connection via an adapter cable
Audio	Headset connection via an adapter cable	Headset connection via an adapter cable	Headset connection via an adapter cable
Screen Blanking	Supported via COM1 and COM2 connectors.	Supported via COM1 and COM2 connectors.	Supported via power cable connector. (see note below)
Ignition Control	Supported	Supported	Not supported

*Note: For the VMX Enhanced Dock: COM1 is used for screen blanking (via the power cable connector) and is unavailable when the screen blanking box is attached. When a screen blanking box is attached, any external serial device such as a scanner, must be connected to the COM2 port on the dock. If a screen blanking box is not connected via the power cable, the COM1 port on the dock is available for a serial device.*

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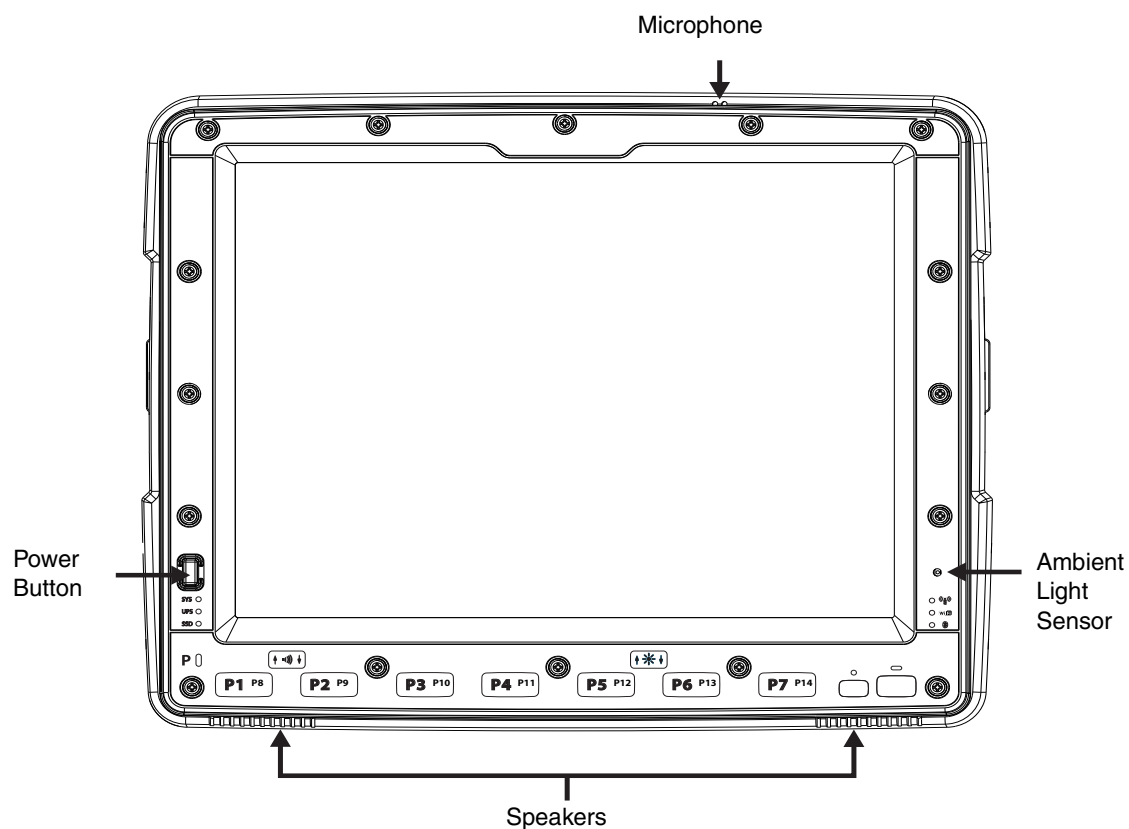
## Additional Connectors

External antenna connectors may be present on the back of the Thor VM3. The connectors may include:

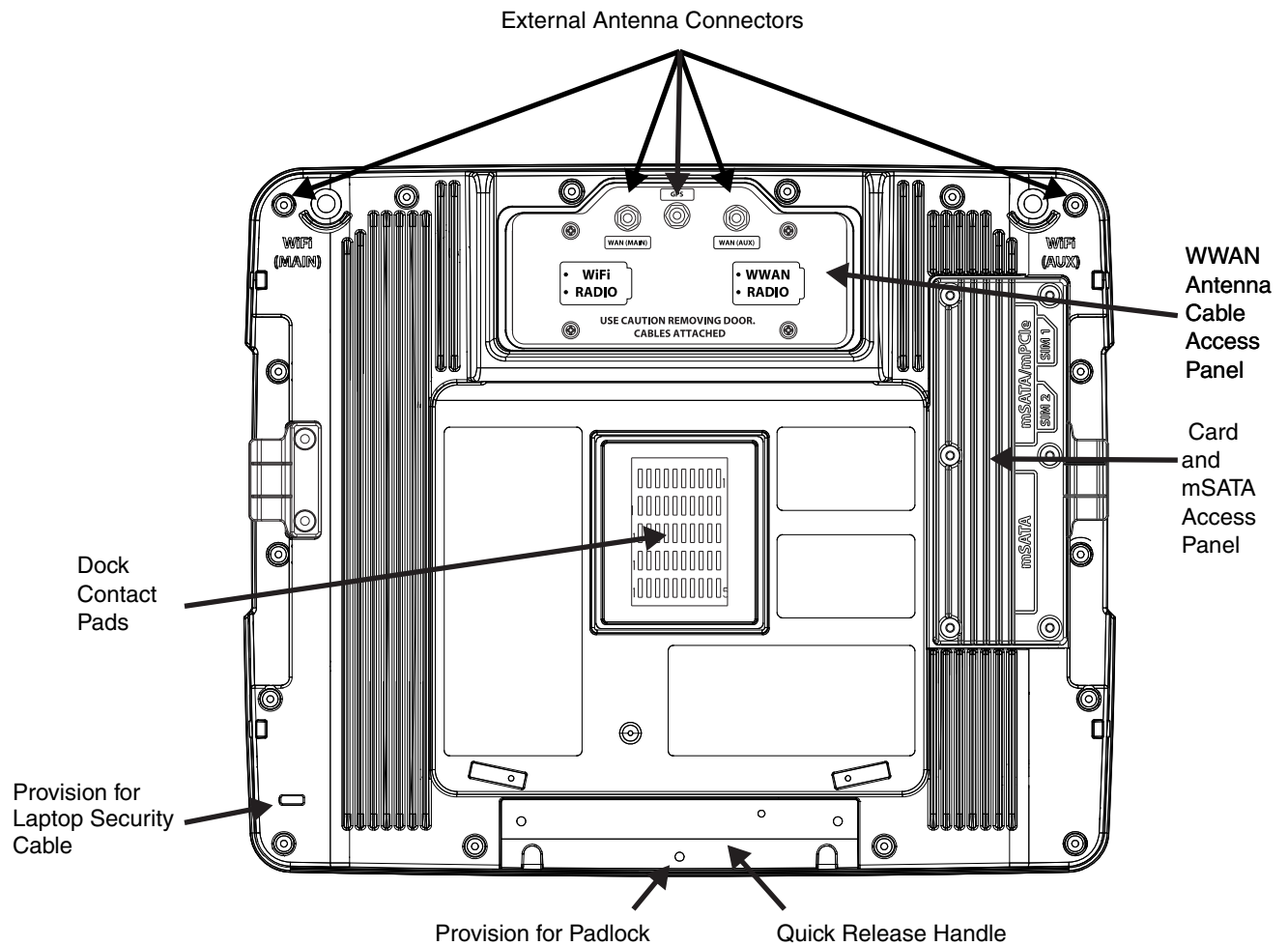
- 802.11 antenna connectors, used when the Thor VM3 is not equipped with internal antennas.
- External GPS antenna connector, when the Thor VM3 is equipped with GPS.
- External WWAN antenna connectors, when the Thor VM3 is equipped with WWAN. Optional WWAN radio (available in North America, Europe, New Zealand, and Australia only).

## Components

### Front View - Thor VM3

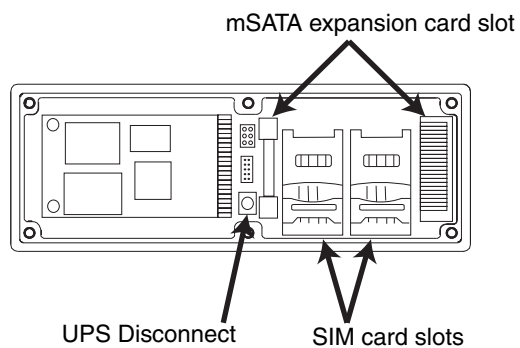


## Back View - Thor VM3



## Access Panels - Thor VM3

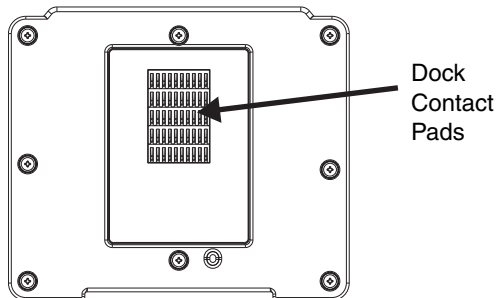
SIM and mSATA Card Access Panel with door removed



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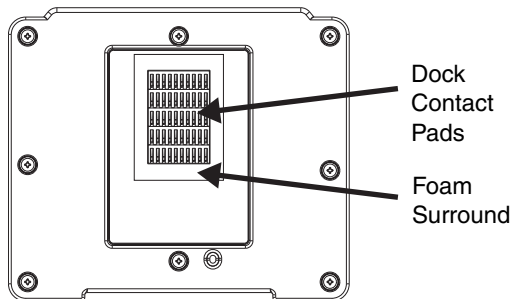
## **Front View - Dock**

### **Standard Dock**



### **Enhanced Dock**

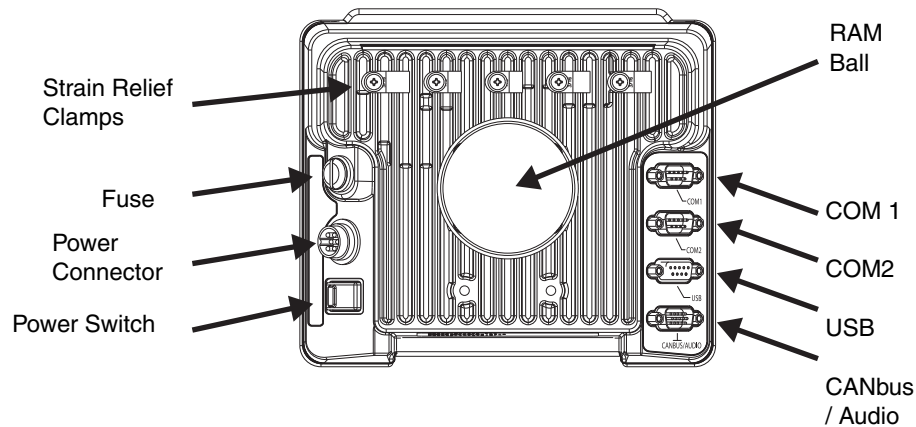
The Enhanced Dock has a foam surround around the dock contact pad.



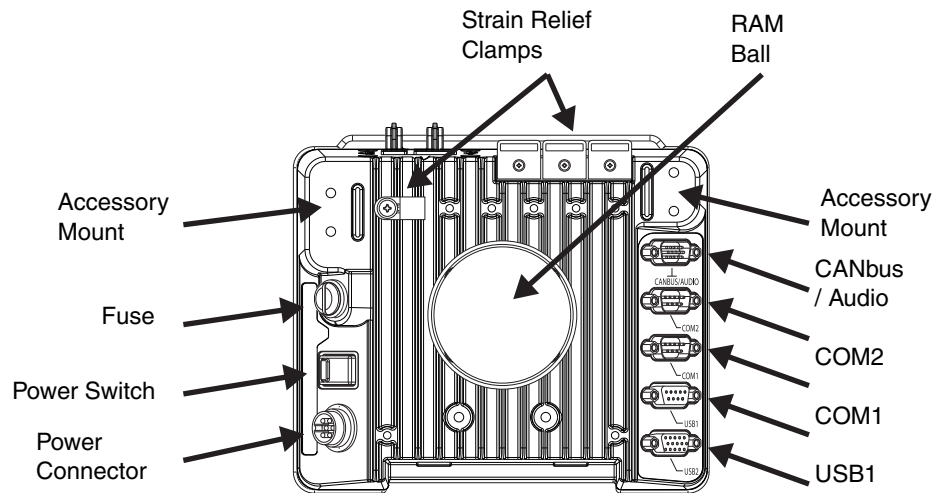
## **Back View - Dock**

The connectors on the back of the dock vary by dock model.

### **Standard Dock**



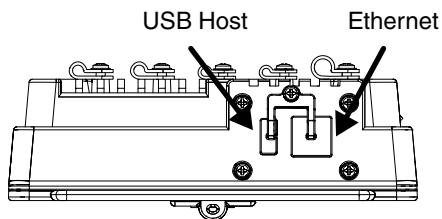
## Enhanced Dock



*Note: For the VMX Enhanced Dock: COM1 is used for screen blanking (via the power cable connector) and is unavailable when the screen blanking box is attached. When a screen blanking box is attached, any external serial device such as a scanner, must be connected to the COM2 port on the dock. If a screen blanking box is not connected via the power cable, the COM1 port on the dock is available for a serial device*

## Top View - Enhanced Dock

Only the Enhanced Dock has these connectors on the top. The connectors are located behind water tight plugs.



---

## ***Backlights and Indicators***

### ***Display Backlight***

There are several configuration options for the Thor VM3 display backlight:

#### ***Power Management***

The display backlight is controlled by power management. When the user activity timer expires, the display backlight is turned off. Timeouts can be set for the available power management schemes.

See [Power Options](#) (page 5-19) for configuration options.

#### ***Backlight Brightness***

The intensity of the display backlight can be manually configured:

1. Press the **Blue** key to enter Blue mode
2. Press the **P5** key to increase backlight brightness or the **P6** key to decrease backlight brightness.
3. Press the **Blue** key to exit Blue mode.

Refer to the [Screen Control](#) (page 5-39) panel for the current display brightness level.

#### ***Screen Blanking***

The Thor VM3 can be configured to blank (blackout) the display while the vehicle is in motion.

Refer to [ZoomZone](#) (page 5-42) for information.

### ***Keypad Backlight***

By default, the integrated keypad backlight follows the display backlight. The integrated keypad backlight can be disabled.

To change this behavior, see the [Options](#) (page 5-18) control panel.

The external USB keyboard backlight is manually controlled.

### ***Speaker Volume***

The speaker volume can be adjusted via the Thor VM3 keypad:

1. Press the **Blue** key to enter Blue mode
2. Press the **P1** key to increase speaker volume or the **P2** key to decrease speaker volume.
3. Press the **Blue** key to exit Blue mode.

The current volume level can be viewed on the [Sounds](#) (page 5-40) control panel or via the system tray speaker icon. These items can also be used to adjust speaker volume.



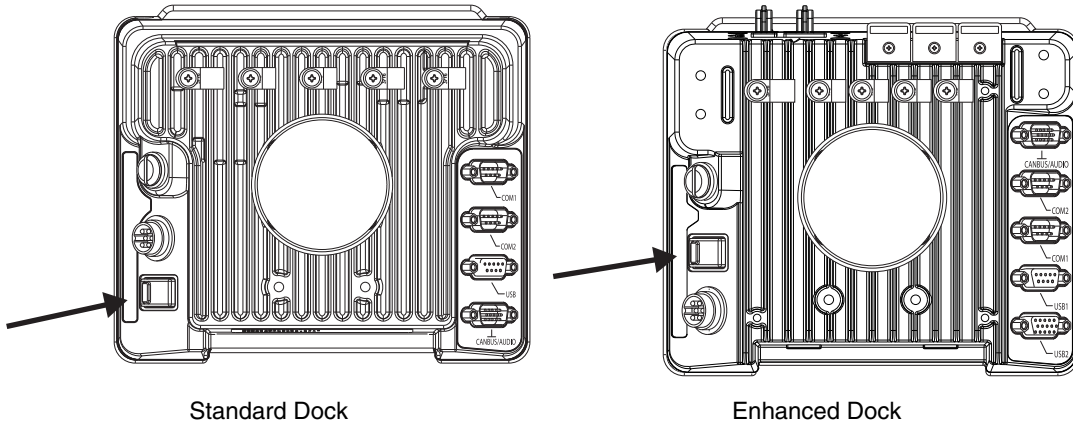
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## Power Up



*If a USB drive, such as a thumb drive is attached to the Thor VM3, the device may attempt to boot from the USB drive. Remove the USB drive and power up the Thor VM3 again.*

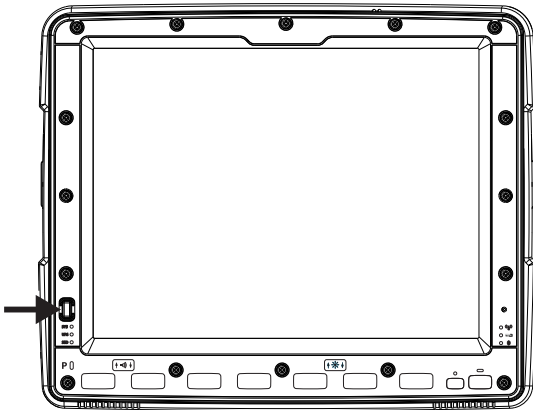
The dock has a power switch on the back.



The “On” side of this rocker switch has a raised bump to allow the state of the switch to be determined when the switch may not be easily viewed, for example, after the dock is mounted in a vehicle.

After external power has been connected and the Thor VM3 has been mounted in the dock, press the side of the power switch with the raised bump to pass power from the dock to the Thor VM3.

Next locate the power button on the front of the Thor VM3.



Press the power button to turn the Thor VM3 on. When the Windows desktop is displayed or an application begins, the power up sequence is complete.

See [Power Controls](#) (page 3-4) for more information.

---

## Rebooting the Thor VM3



*If a USB drive, such as a thumb drive is attached to the Thor VM3, the device attempts to boot from the USB drive:*

- If the USB drive contains a bootable sector, the Thor VM3 boots from the USB drive.
- If the USB drive does not contain a bootable sector, the Thor VM3 does not boot. Remove the USB drive and boot the Thor VM3 again.

### Restart

Restart performs a controlled shutdown of the Thor VM3 and then restarts the device.

- If an optional keyboard is attached, use the **Ctrl + Alt + Del** keypress sequence to start the task manager. Tap the **Shut Down** button and select **Restart** from the pull-down list. Tap the **OK** button to restart the Thor VM3.
- Tap the Windows icon (in the lower right corner of the screen) and select **Power > Restart**.
- Use the **P1 + P7 + Orange** key press sequence to reboot the Thor VM3. The keys must be pressed in sequence; they do not need to be held down simultaneously.

## Tapping the Touch Screen with a Stylus

*Note: Always use the point of the stylus for tapping or making strokes on the touch screen.*

**Never use an actual pen, pencil, or sharp/abrasive object to write on the touch screen.**

Hold the stylus as if it were a pen or pencil. Touch an element on the screen with the tip of the stylus then remove the stylus from the screen.

Firmly press the stylus into the stylus holder when the stylus is not in use.

Using a stylus is similar to moving the mouse pointer then left-clicking icons on a desktop computer screen.

Using the stylus to tap icons on the touch screen is the basic action that can:

- Open applications
- Choose menu commands
- Select options in dialog boxes or drop-down boxes
- Drag the slider in a scroll bar
- Select text by dragging the stylus across the text
- Place the cursor in a text box prior to typing in data
- Place the cursor in a text box prior to retrieving data using a scanner/imager.

A right-click can be simulated by touching the touch screen with the stylus and holding it for a short time.

A stylus replacement kit is available.

*Note: The stylus is different for a Thor VM3 with a PCAP touch screen and one with a resistive touch screen. Be sure the stylus is the correct type for the touch screen installed in the device.*

When a dialog box is too large for the display, tap and drag the dialog box up or down or from side to side to view the remainder of the dialog box.

## Setup Terminal Emulation Parameters

The Thor VM3 offers both RFTerm and Enterprise TE. For details on configuring these terminal emulators, refer to the appropriate user's guide at [www.honeywellaidc.com](http://www.honeywellaidc.com).

## Cleaning

### Cleaning the Thor VM3 and the Dock

Dampen a cloth with the cleaner and then wipe the surface. Do not spray the cleaner directly onto the Thor VM3 or the dock. Avoid harsh chemicals. The following cleaners are recommended:

- Windex® Glass Cleaner
- Formula 409® All-Purpose Cleaner or Glass and Surface Cleaner
- Fantastik® All Purpose Cleaner
- Liquid hand soap

---

## ***Cleaning the Touch Screen***

*Note: These instructions are for components made of glass. If there is a removable protective film sheet on the display, remove the film sheet before cleaning the screen.*

Keep rough or sharp objects away from the Thor VM3 touch screen and, if installed, the bar code reader scanning aperture.

If the glass becomes soiled or smudged, clean only with a standard household cleaner such as Windex<sup>®</sup> without vinegar or use isopropyl alcohol. Dampen the cloth with the cleaner and then wipe the surface.

Do not use paper towels or harsh-chemical-based cleaning fluids since they may result in damage to the glass surface. Use a clean, damp, lint-free cloth.

Do not scrub optical surfaces. If possible, clean only those areas which are soiled. Lint and particulates can be removed with clean, filtered canned air.

## ***Startup Help***

Contact [Technical Assistance](#) (page 9-1) if you need more help.

Thor VM3 seems to lockup as soon as it is rebooted.	There may be slight delays while the wireless client connects to the network, authorization for voice-enabled applications complete, and Bluetooth relationships establish or re-establish. When an application begins, the Thor VM3 is ready for use.
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## System Hardware

### 802.11a/b/g/n Wireless Client

The Thor VM3 has an 802.11a/b/g/n network card that supports diversity with two internal or external antennas. Power management for the network card is configured with the [WLAN Wireless Configuration Utility \(WCU\)](#) (page 6-1).

### Central Processing Unit

The CPU is a 1.5 GHz Dual Core Intel Atom processor.

The operating system is Microsoft Windows 10 Enterprise.

The OS image is stored on an internal mSATA memory card and is loaded into DRAM for execution.

### Input/Output Components

The Thor VM3 supports the following I/O components of the core logic:

- Two 9-pin RS-232 serial ports, COM1 and COM2, on dock.
- One slot for mSATA card for operating system storage.
- Second slot for mSATA memory card for storage expansion.
- Integrated keyboard with programmable keys.
- Ports available via adapter cables on dock: USB host port, CANbus, Audio. Direct connections on Enhanced Dock: Ethernet and USB host.

### System Memory

Main system memory is 2 or 4 GB SDRAM.

### Video Subsystem

The Thor VM3 video subsystem consists of a color TFT display. The video subsystem complies with the VESA VL bus standard. The resolution of this display is 800 x 600 or 1024 x 768 pixels. This resolution complies with the SVGA graphics industry standard.

The display supports screen blanking to eliminate driver distraction when the vehicle is in motion.

### Audio Interface

Speakers are located on the bottom front of the Thor VM3. A headset adapter cable provides a connection for headset operation. When a headset is plugged into the adapter cable, the main speakers are disabled.

A microphone is located at the upper right of the Thor VM3 display, near the Thor VM3 emblem. When a headset is plugged into the adapter cable, the internal microphone is disabled.

### Card Slots

#### mSATA Slots

There are two mSATA slots. The lower slot contains an mSATA card loaded with the operating system.

The upper slot is available for a factory installed or a user installable mSATA card for storage expansion.

### Bluetooth

The Thor VM3 contains Bluetooth version 2.0 with Enhanced Data Rate (EDR) up to 3.0 Mbit/s over the air. Bluetooth device connection (or pairing) can occur at distances up to 32.8 ft (10 meters) Line of Sight. The wireless client retains wireless connectivity while Bluetooth is active.

The user cannot select PIN authentication or encryption on connections from the Thor VM3. However, the Thor VM3 supports authentication requests from pairing devices. If a pairing device requests authentication or encryption, the Thor VM3 displays a prompt for the PIN or passcode. Maximum encryption is 128 bit. Encryption is based on the length of the user's passcode.

---

Bluetooth simultaneously supports one printer as a slave Bluetooth device and one scanner, either as a slave or as a master Bluetooth device.

- The LED on the Bluetooth scanner illuminates during a scanning operation.
- Multiple beeps may be heard during a bar code scan using a mobile Bluetooth scanner. The mobile Bluetooth scanner may beep as the bar code data is accepted/rejected and the Thor VM3 may beep during final bar code data manipulation.

WWAN (Wireless Wide Area Networking) is available on the Thor VM3. Two slots are provided for SIM cards.

*Note: The Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system currently supports only a single SIM card. See [Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system](#) (page 6-39) for more information.*

## **Power**

### **Vehicle DC Power Supply**

Vehicle power input for the Thor VM3 dock is 10V to 60V DC and is accepted without the need to perform any manual operation within the Thor VM3 dock, see [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-19). The dock provides a conditioned power output for the Thor VM3. By using a specified DC/DC power supply, input voltage of 50-150V DC can be accepted, see [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27) or [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27).

Power input is fused for protection and the fuse is externally accessible, see [Fuse](#) (page 3-3).

### **External AC Power Supply**

If DC power is not available – for example, in an office environment – an optional external Universal Input Power Supply can be used to convert AC wall power to an appropriate DC level. AC to DC power input for the Thor VM3 is delivered to the dock via an optional external power supply and adapter cable. See [External AC/DC Power Supply](#) (page 4-39).

### **Uninterruptible Power Supply**

The Thor VM3 contains an internal UPS battery.

The UPS battery is automatically charged when the Thor VM3 is placed in a powered dock, provided the safe charging temperature conditions below are met.

When external power is removed, the UPS automatically powers the Thor VM3 with no user intervention. When running on UPS power, the power management timeouts may be different than when vehicle power is applied.

The UPS allows the Thor VM3 to continue operation when not mounted in a dock or when the vehicle battery is being swapped. When fully charged the UPS battery is designed to power the Thor VM3 for a minimum of 30 minutes at temperatures of -30°C (-22°F) or greater.

If operating on UPS power and the UPS battery becomes critically low, the Thor VM3 performs a controlled shutdown.

If there is no external power available, there must be 35% or greater power in the UPS battery or the Thor VM3 does not power on.

The UPS status LED and the Battery Control Panel can be used to monitor the state of the UPS battery.

### **Safe Charging Temperature Range**

The temperature of the Thor VM3 is the trigger for UPS battery charging.

- The UPS battery is not charged when the ambient (room) temperature is below -30°C (-22°F).
- The UPS battery is not charged when the ambient (room) temperature is above 50°C (122°F).
- Move the Thor VM3 to a different location to charge the UPS battery.

When the Thor VM3 is operated in an environment where the UPS battery is not able to charge due to temperature extremes, the Thor VM3 should be removed to a location within the safe charging temperature range during off hours. A discharged UPS battery cannot protect against data loss in the event vehicle power is interrupted.

### **Charging Timeout**

- A fully discharged UPS battery normally recharges in less than 4 hours when the Thor VM3 is in a powered dock and within the safe charging temperature range.

- If the UPS battery is not charged before an 8 hour timeout period expires, the [UPS Status LED](#) (page 3-14) then flashes super-fast red.
- If the charge timeout occurs, remove the Thor VM3 from the dock and [Disconnect UPS Battery](#) (page 4-50). Reinstall the Thor VM3 in the dock and power on.

### **Charging and Power Management**

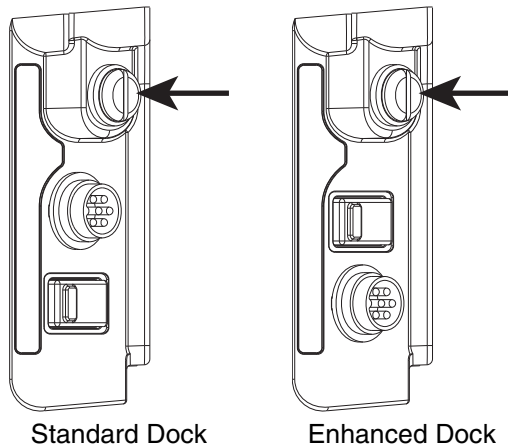
- Charging does not occur when either Ignition Mode power scheme/plan is selected and the ignition is inactive.
- Charging of the UPS battery continues when the Thor VM3 is in power management (user idle, system idle or suspend modes).
- Charging of the UPS battery continues when the Thor VM3 is in power management (display off, sleep or hibernate modes).

### **Backup Battery**

The Thor VM3 has a permanent Lithium battery installed to maintain time, date and CMOS setup information for a minimum of 90 days. The lithium battery is not user serviceable and should last four years with normal use before it requires replacement.

*Note: The backup battery should only be changed by authorized service personnel.*

### **Fuse**



The Thor VM3 uses an 8A time delay (slow blow) fuse that is externally accessible and user replaceable. The fuse is located on the back of the dock. The fuse is accessed by unscrewing the cap as indicated.

Should it need replacement, replace with same size, rating and type of fuse:

- **Littelfuse 0215008.MXP**
- **Cooper Bussmann BK1/S506-8-R**
- **Bel Fuse 5HT 8-R**

or equivalent.

Fuse has voltage on it even when power is off. Always disconnect input power before changing the fuse.

### **Power Management Modes**

The Thor VM3 has four power modes: Full On, Standby/Sleep, Hibernate and Off.

#### **Full On Mode**

When the Thor VM3 is attached to either vehicle power or an external power supply or is operating from the UPS battery and the power button is pressed, the Thor VM3 is in the On mode. In this mode, the keypad, touch screen and any attached peripherals such as a scanner function normally. The display remains on until the display, standby or hibernate timer (if enabled) expires.

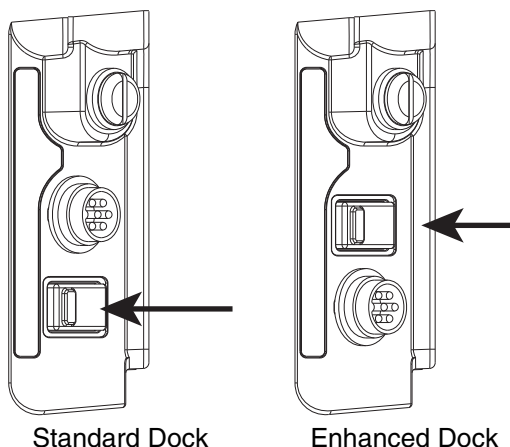
When in Full On mode, the status LED is solid green.

If the Thor VM3 is Full On, a press of the power button can be configured to put the unit in Standby. See the [Choose What the Power Button Does](#) (page 5-29).

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## Power Controls

### Power Switch



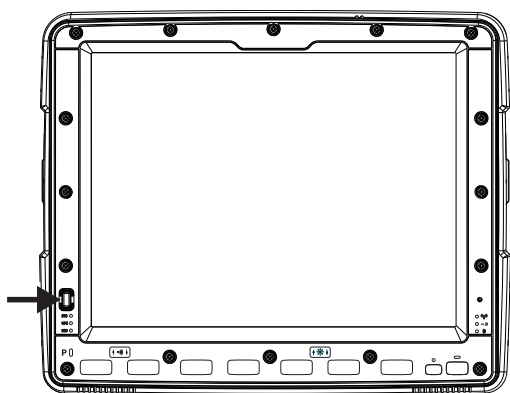
After all cables are connected, the Thor VM3 can be powered on.

There is a power switch located on the back of the dock. The power switch is a rocker switch.

The power switch has a raised bump to identify the switch position even when it is hidden from view. When the side of the switch with the raised bump is pressed, the power switch is On. If the dock is connected to external power, the dock delivers power to the Thor VM3.

Generally, once the dock is powered On, there is no need to power it off. The dock power can remain On even when the Thor VM3 is not attached.

### Power Button



The power button is located at the lower left of the Thor VM3.

If the Thor VM3 is Off, pressing the power button starts the power up sequence.

*Note: This assumes that the Thor VM3 is docked in a powered dock or that the internal UPS battery has a sufficient charge to power the Thor VM3. If no external power is available and the UPS battery does not have a charge, pressing the power button causes no action.*

If the Thor VM3 is On, pressing the power button performs the option selected in the Advanced tab of the Power control panel (options may vary by OS type):

- Ignore power button press
- Prompt the user to select action
- Shut down (default, an orderly shutdown is performed)
- Standby/Sleep
- Hibernate

## External Connectors

Power the Thor VM3 off before attaching a cable to any port (serial, USB, Audio/CAN, etc.).

The external I/O connectors for the Thor VM3 are located on the right side of the dock (when viewed from the back).

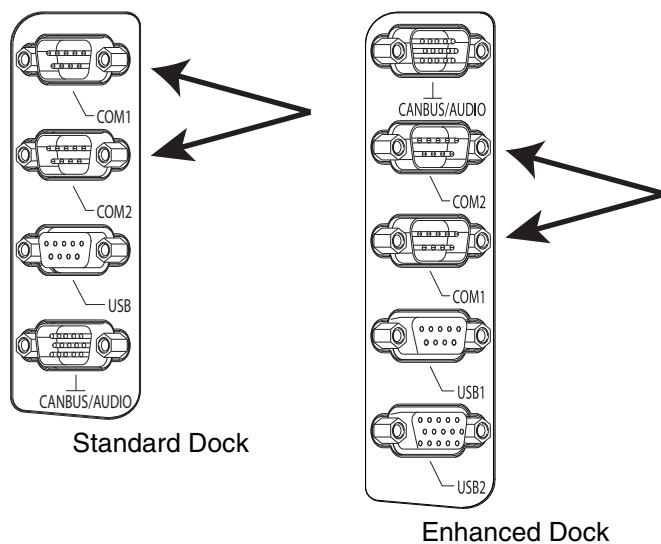
The [Power Supply Connector](#) (page 3-7) is on the left side of the dock (when viewed from the back).

Antenna connectors are located on the top rear of the Thor VM3.



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## Serial Connector (COM1 and COM2)



The COM1 and COM2 connectors are D-9 male connectors located on the back of the dock.

Power the Thor VM3 off before attaching a cable to any port (serial, USB, Audio/CAN, etc.).

The serial connectors are industry-standard RS-232, PC/AT standard 9-pin "D" male connector. See [COM1 and COM2 Connector](#) (page 8-5) for connector pinout detail.

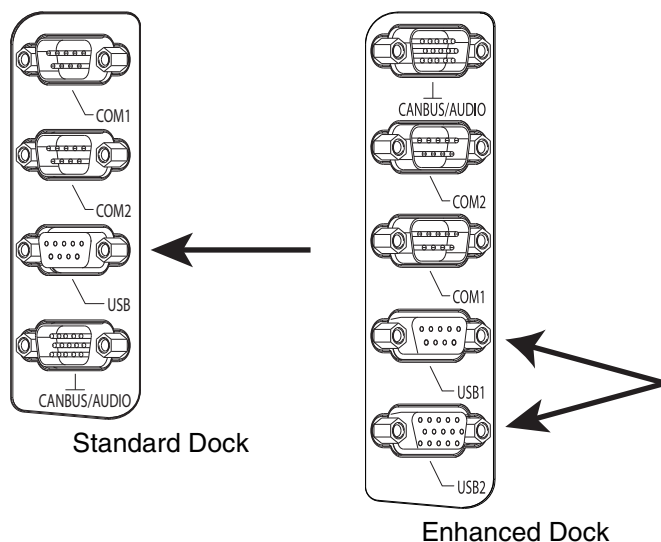
See [Connect Serial Device](#) (page 4-42) for more information.

If a COM port is not being used for a scanner, it can be used for [Screen Blanking](#) (page 4-33) when the vehicle is in motion.

## Screen Blanking

The screen blanking signal can be provided either by a Honeywell Screen Blanking Box or a user supplied switch or relay. See [Screen Blanking](#) (page 4-33) for information on connecting screen blanking accessories.

## USB Connector(s)

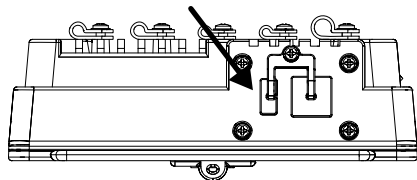


The USB or USB1 connector is a D-9 female connector located on the back of the dock. See [USB and USB1 Connector](#) (page 8-6) for connector pinout detail.

The USB-2 connector is a D-15 female connector located on the back of the dock. See [USB2 Connector](#) (page 8-7) for connector pinout detail.

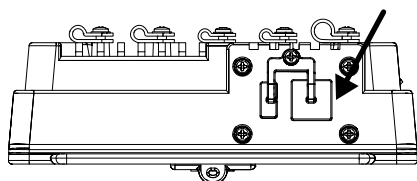
Power the Thor VM3 off before attaching a cable to any port (serial, USB, Audio/CAN, etc.).

An additional USB host port is located on the top of the Enhanced Dock. Lift the cover to access the USB port.

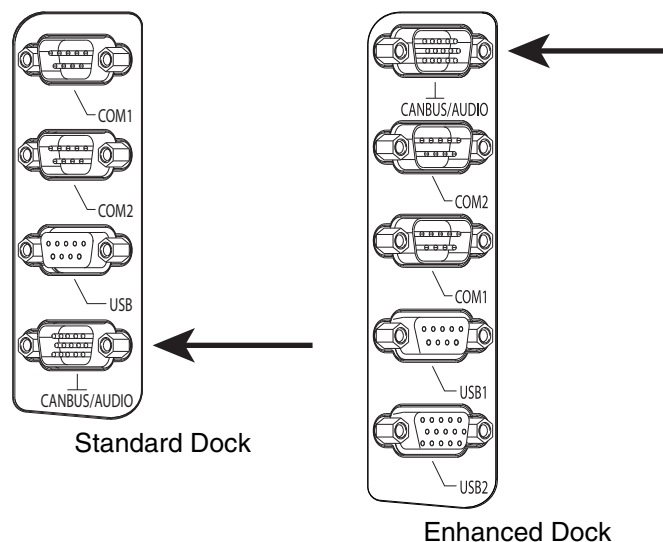


## Ethernet Connector

An Ethernet port is located on the top of the Enhanced Dock. Lift the cover to access the Ethernet port.



## CANbus / Audio Connector



The CANbus/Audio connector is a D-15 male connector located on the back of the dock.

The connector supports a headset adapter cable or a CANbus cable. The Thor VM3 does not support connecting audio and CANbus simultaneously.

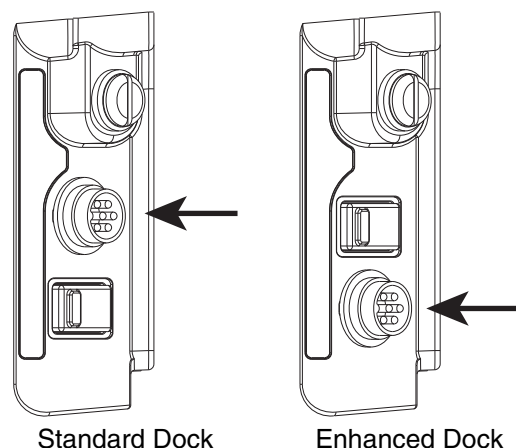
See [CANbus / Audio Connector](#) (page 8-10) for connector pinout detail.

A headset cable attaches to the CANbus / Audio connector and provides a quick connect connection for a headset. See [Connect Headset Cable](#) (page 4-43) for more information.

The CANbus Y cable has a 9 pin F SAE J1939 (Deutsch) and 9 pin M SAE J1939 (Deutsch) connector. See [Connect CANbus Cable](#) (page 4-45) for more information.

The CANbus interface is a virtual COM port. This port can be accessed using standard Windows API calls.

## Power Supply Connector

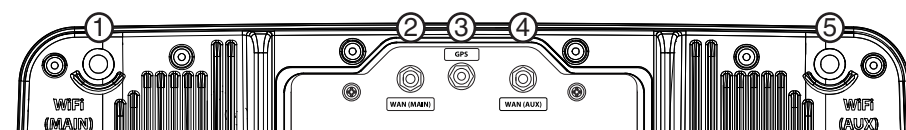


Power is supplied to the Thor VM3 through the power connector. Additionally this assembly provides a connection point for the vehicle's chassis ground to be connected internally to the conductive chassis of the computer.

The Thor VM3 internal power supply can accept DC input voltages in the range of 10 to 60 Volts DC.

See [Power Supply Connector](#) (page 8-5) for connector pinout detail. See [Connect Power](#) (page 4-17) for more information on connecting power to the Thor VM3.

## Antenna Connections

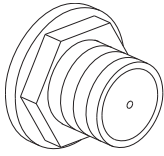


The Thor VM3 is equipped with an 802.11 radio and can be ordered with internal antennas, external antennas or external remote mount antennas. When the Thor VM3 is ordered with internal antennas, the external antenna connectors are not used. GPS and WWAN are optional on the Thor VM3 and require external remote mount antennas.

1. WI-FI (MAIN) 802.11 Main External Antenna Connector
2. WAN (MAIN) (Blue label) Main WWAN Antenna Connector
3. GPS (Green label) GPS Antenna Connector
4. WAN (AUX) (Blue label) Auxiliary WWAN Antenna Connector
5. WI-FI (AUX) 802.11 Auxiliary External Antenna Connector

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### ***External Antenna Connector***



When the Thor VM3 is ordered with the internal antenna option, the 802.11 antenna connectors on the back are not connected to the 802.11 radio. Instead the internal antenna connector is connected to the 802.11 radio.

Remove the rubber cap, if present, from the antenna connector before connecting an external antenna.

### ***Internal 802.11 Antenna***

If the internal 802.11 antenna option is ordered, antennas are mounted inside the Thor VM3. The internal antennas are not user accessible.

### ***Vehicle Remote Antenna***

The external antennas can be remotely mounted on the vehicle. See [Install Remote Antenna](#) (page 4-46) for instructions. External antenna kits are available for the 802.11 Wi-Fi radio, GPS and WWAN.

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## Keyboard Options



The integrated keypad contains seven programmable keys, a blue modifier key and an orange modifier key.

The P1 through P7 keys are user programmable.

- When used with no modifier key, P1 through P7 can be configured for a user programmable function.
- When used with the Orange modifier key, P1 through P7 provide secondary programmable keys, P8 through P14, and can be configured for a user programmable function.
- The programmable keys can be remapped to provide a single keypress, a string of keypresses or to execute an application or command. Key remapping is configured via the [Programmable Key](#) (page 5-31) option in the Control Panel.
- Programmable keys persist across a warmboot or power cycle.
- When used with the Blue modifier key, P1 and P2 keys are used to adjust speaker volume and P5 and P6 keys are used to adjust display brightness.

The Thor VM3 integrated keypad is backlit.

- By default, the integrated keypad backlight follows the display backlight. When the display backlight is on, the integrated keypad backlight is on.
- If the display backlight brightness is increased (or decreased) the integrated keypad backlight brightness does not change.
- The integrated keypad backlight and the display share the same timer, which is configured in the [Power Options](#) (page 5-19) control panel.
- The integrated keypad backlight can be disabled via the [Options](#) (page 5-18) control panel.

### Keypad LEDs

See [Keyboard LEDs](#) (page 3-16) for details.

## USB Keyboards

Two Honeywell ruggedized USB keyboards are available, 95-key alphanumeric and 21-key numeric.

### 95-Key USB Keyboard

The 95-key USB keyboard may have any of the following markings on the decal on the back of the keyboard:

- 164288-0001
- 95 KEY USB
- 9000160KEYBRD

If the keyboard looks similar but has a different part number refer to [95-key PS/2 Keyboard](#) (page 3-11).

If the keyboard is labeled as 164288-0001 Revision B (or greater ) the keyboard has sticky keys for Alt, Ctrl and Shift. These keys will remain active for the next keypress. Earlier versions of this keyboard (Revision A) do not have sticky keys implemented.



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The Thor VM3 uses an optional rugged QWERTY 95 key keyboard, designed for ease of use with the Windows operating system. The USB keyboard connects directly to the D9 USB connector (Standard Dock) or USB1 connector (Enhanced Dock).

- The 95 key keyboard supports all 104 keyboard functions (101 standard keyboard plus Windows keys) and includes an integrated pointing device and left and right mouse buttons. However, because the keyboard only has 95 keys, all functions are not visible (or printed on the keyboard). Therefore the keyboard supports what is called hidden keys - keys that are accessible but not visible on the keyboard.
- The 95 key keyboard keys are backlit. The keyboard backlight is manually controlled.

### ***Keyboard Backlight***

The keyboard backlight key in the top right hand corner has a light bulb icon.

The keyboard keys are backlit. The keyboard backlight is manually controlled using the backlight key in the upper right hand corner of the keyboard. Pressing the backlight key cycles the keyboard backlight through the levels of backlight intensity: Off, Low intensity, Medium intensity, Maximum intensity, Off, etc. When the Thor VM3 is powered on, the keyboard backlight defaults to Off.

Since the keyboard is a USB device, by default the external keyboard backlight is turned off when the Thor VM3 enters Standby/Sleep. This behavior can be changed by enabling USB power in Standby/Sleep on the [Options](#) (page 5-18) control panel.

### ***21-key Numeric Keypad***

A numeric keypad is available for the Thor VM3 in applications where a full keyboard may not be needed. The USB keyboard connects directly to the D9 USB connector (Standard Dock) or USB1 connector (Enhanced Dock).



### ***Keyboard Backlight***

The keyboard backlight key has a light bulb icon.

The keyboard keys are backlit. The keyboard backlight is manually controlled using the backlight key in the upper right hand corner of the keyboard. Pressing the backlight key cycles the keyboard backlight through the levels of backlight intensity: Off, Low intensity, Medium intensity, Maximum intensity, Off, etc. When the Thor VM3 is powered on, the keyboard backlight defaults to Off.

Since the keyboard is a USB device, by default the external keyboard backlight is turned off when the Thor VM3 enters Standby/Sleep. This behavior can be changed by enabling USB power in Standby/Sleep on the [Options](#) (page 5-18) control panel.

The PF key can be programmed using the [External Keypad](#) (page 5-15) control panel.

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## PS/2 Keyboards

Legacy PS/2 keyboards can be used with the Thor VM3 via a USB to PS/2 adapter cable. PS/2 keyboards are available in 60-key and 95-key versions and were used with the VX6, VX7, Thor VX8 or Thor VX9.

*Note: The PS/2 adapter cable does not work with the Thor VM3 and the VM1D Standard Dock. The PS/2 adapter cable works with either the VM3D or VMXD Enhanced Docks.*

### 95-key PS/2 Keyboard

The 95-key PS/2 keyboard may have any of the following markings on the decal on the back of the keyboard:

- 160491-0001
- 95 KEY PS-2
- 9000154KEYBRD (also available as VX89154KEYBRD)

If the keyboard looks similar but has a different part number refer to [95-Key USB Keyboard](#) (page 3-9).

An adapter cable is required to attach this keyboard to the Thor VM3. See [Connect PS/2 Keyboard](#) (page 4-40) for details.

*Note: If the keyboard was previously used with Thor VX8 or Thor VX9, the adapter cable for the Thor VX8/VX9 is not used. The new PS/2 to USB adapter cable must be used.*



This keyboard is visually similar to the USB external keyboard.

### Key Maps

The 95-key keyboard supports all 104 keyboard functions (101 keyboard standard plus Windows keys) and includes an integrated pointing device and left and right mouse buttons. However, because the keyboard only has 95 keys, all functions are not visible (or printed on the keyboard). Therefore the Thor VM3 keyboard supports what is called hidden keys -- keys that are accessible but not visible on the keyboard. Refer to [External 95-Key Keyboard](#) (page 7-3) for keymaps.

### NumLock

For the 95-key PS/2 keyboard, the NumLock key and the numeric keys are backlit green when NumLock is off. When NumLock is on, the backlight for the NumLock key and the numeric keys is amber.

### CapsLock and Scroll Lock

For the 95-key PS/2 keyboard, the CapsLock key is backlit green when CapsLock is off. When CapsLock is on, the backlight for the CapsLock key is amber.

The Scroll Lock key is backlit green when Scroll Lock is off. When Scroll Lock is on, the backlight for the Scroll Lock key is amber.

The default values for CapsLock and Scroll Lock are Off.

### Keyboard Backlight

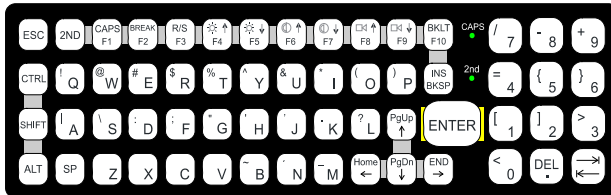
The keyboard keys are backlit. The keyboard backlight is manually controlled using the backlight key in the upper right hand corner of the keyboard. Pressing the backlight key cycles the keyboard backlight through the levels of backlight intensity: Off, Low intensity, Medium intensity, Maximum intensity, Off, etc.

---

## 60-key PS/2 Keyboard

The 60-key PS/2 keyboard is part number **160068-0001** (see decal on back of keyboard).

An adapter cable is required to attach this keyboard to the Thor VM3. See [Connect PS/2 Keyboard](#) (page 4-40) for details.



The 60-key keyboard has 101 keyboard functions, including a numeric keyboard pad.

### Key Maps

The 60-key keyboard supports all 101 keyboard functions. However, because the keyboard only has 60 keys, all functions are not visible (or printed on the keyboard). Therefore the Thor VM3 keyboard supports what is called hidden keys - keys that are accessible but not visible on the keyboard.

On standard keyboards many keys are found in the Alphanumeric section as well as on the Numeric keypad (i.e. the 1 key is found on the numeric keypad and above the alpha characters on standard keyboards). However these keys send distinctly different scan codes when the keys are pressed. The default codes for the Thor VM3 number keys correspond to the numeric keypad on standard keyboards. In order to duplicate the codes sent when the alphanumeric key is pressed, the hidden keystroke must be used.

Refer to [External 60-Key Keyboard](#) (page 7-4) for keymaps.

### NumLock

The 60-key keyboard does not have a NumLock indicator or key. NumLock can be toggled On or Off using the **2<sup>nd</sup> SHIFT F10** keypress sequence.

### Keyboard Backlight

The keyboard keys are backlit with LEDs. The backlight is manually controlled using the **2<sup>nd</sup> + CTRL + F10** key-press sequence. The keyboard backlight is off when the Thor VM3 is powered up. The backlight must be manually turned on with the **2<sup>nd</sup> + CTRL + F10** key sequence.

### Control Keys

The VMT keyboard has several control keys. Because of the construction of the Thor VM3 and the Microsoft Windows operating system, many of the Control Keys are not used on the Thor VM3.

- The 2<sup>nd</sup> functions of the **F4** and **F5** keys are not used as the display brightness is adjusted via the buttons on the Thor VM3.
- The 2<sup>nd</sup> functions of the **F6** and **F7** keys are not used as the Thor VM3 has TFT LCD screen with no provision for contrast adjustments.
- The 2<sup>nd</sup> functions of the **F8** and **F9** keys are not used as the sound volume on the Thor VM3 is controlled with the Sound icon in the Microsoft Windows System Tray.
- The **F10** key is used to toggle the backlight as part of the keypress sequence **2<sup>nd</sup> + CTRL + F10**. This key sequence immediately toggles the status of the keyboard backlight. Pressing **2<sup>nd</sup> + F10** has no effect on the keyboard backlight.

### Keyboard LEDs

#### CAPS LED

This LED indicates the state of the keyboard CapsLock mode. If CapsLock is enabled this LED is illuminated green. When CapsLock is off, the LED is dark.

Press 2<sup>nd</sup> then F1 to toggle CapsLock On and Off.

The default value of CapsLock is Off.



## Secondary Keys LED

The VMT keyboard is equipped with several secondary keys. These keys are identified by the superscripted text found on the keyboard keys. The secondary keys are accessible by using two (2) keystrokes: the 2<sup>nd</sup> key followed by the superscripted key.

Once the 2<sup>nd</sup> state is enabled (by pressing the 2<sup>nd</sup> key) the Secondary Mode LED is illuminated and the 2<sup>nd</sup> state is enabled until another key is pressed. The 2<sup>nd</sup> key is toggled on with a 2<sup>nd</sup> keypress and then immediately off with another 2<sup>nd</sup> keypress.

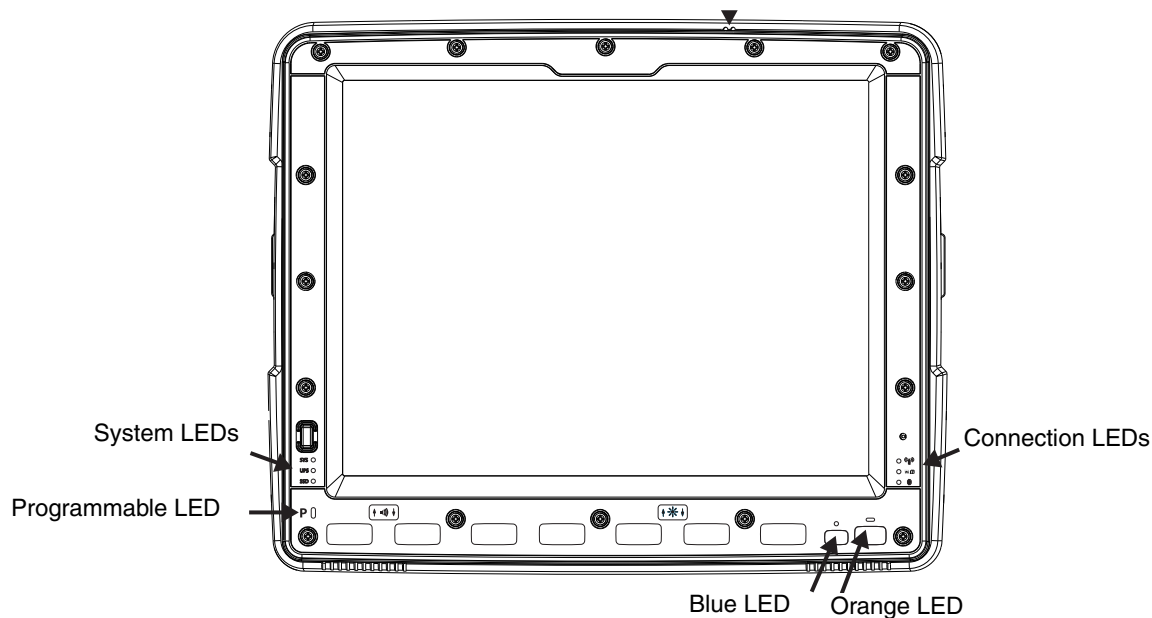
- Press 2<sup>nd</sup> and F1 to turn CapsLock on and off.
- Press 2<sup>nd</sup> and ↑ (up arrow) to initiate the PgUp command.
- Press 2<sup>nd</sup> and Q to type the “!” key.
- Press 2<sup>nd</sup> and BkSp to enter the Insert (Ins) mode.

## USB Keyboard / Mouse

A standard USB keyboard or mouse can be attached to the Thor VM3 using the appropriate adapter cable.

The Y cable attaches to the Thor VM3 and provides a USB connector. Please refer to documentation provided with the USB keyboard or mouse for more information on their operation.

## LED Functions



## System LEDs

- SYS (System Status) LED → ○ SYS
- UPS (Uninterruptible Power Supply) LED → ○ UPS
- SSD (Solid State Drive) LED → ○ SSD

### SYS (System Status) LED

LED Behavior	System State
Solid Green	<ul style="list-style-type: none"><li>• On</li><li>• On but Backlight Off</li><li>• On but Display Off</li></ul>

---

LED Behavior	System State
Off External power present	<ul style="list-style-type: none"> <li>Off</li> </ul>
Off External power not present	<ul style="list-style-type: none"> <li>Hibernate</li> <li>Standby/Sleep</li> <li>Off</li> </ul>

### ***UPS Status LED***

The color of the UPS LED identifies the charge level, while the behavior of the LED identifies the charging state.

#### ***Charge Level***

LED Color	Status
Green	Fully charged (>90%)
Amber	Less than fully charged, but more than 2 minutes runtime remaining
Red	Low battery, less than 2 minutes runtime until shutdown

#### ***Charging State***

LED Behavior	Status
Slow Blink (1 sec. on, 3 sec. off)	Charging
Fast Blink (1/2 sec. on, 1/2 sec. off)	UPS supplying power and discharging
On	Neither charging or discharging
Off	Unit is off or is in Hibernate

#### ***UPS Unavailable***

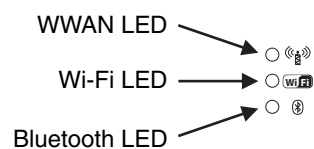
LED Behavior	Status
Super-Fast Blink (1/8 sec. on, 1/8 sec. off)	<ul style="list-style-type: none"> <li>Out of charging temperature range</li> <li>Charge timeout</li> <li>UPS is not installed</li> </ul>

### ***SSD (Solid State Drive) LED***

LED Behavior	Status
Flashing Green	SSD read or write activity
Off	No SSD read or write activity

---

## Connection LEDs



### WWAN LED

LED Behavior	Status
Solid Green	Indicates a WWAN connection to a network
Off	Indicates no WWAN connection

### Wi-Fi LED

LED Behavior	Status
Solid Green	Indicates a connection with an IP address to an Access Point
Off	Indicates no connection to an Access Point

### Bluetooth LED

LED Behavior	Status
On	Bluetooth hardware is on
Off	Bluetooth hardware has been turned off

---

## Keyboard LEDs

The keyboard LEDs are located near the specified key.

### Blue LED

Solid Blue	<ul style="list-style-type: none"><li>Indicates the <b>Blue</b> modifier key is active</li><li>Pressing the <b>Blue</b> key a second time exits this modifier mode and turns off the LED</li><li>Pressing the <b>Orange</b> key exits the Blue mode and turns off the Blue LED</li><li>If no key other key is pressed within five seconds, the <b>Blue</b> key times out and turns off the LED</li><li>When Blue mode is active, keys P1 and P2 provide volume adjustment and keys P5 and P6 provide brightness adjustment functions</li></ul>
Off	Blue mode is not invoked

### Orange LED

LED Behavior	Status
Solid Orange	<ul style="list-style-type: none"><li>Indicates the <b>Orange</b> modifier key is active. Orange mode is invoked for the next keypress only</li><li>Pressing the <b>Orange</b> key a second time exits this modifier mode and turns off the LED</li><li>Pressing the <b>Blue</b> key exits the Orange mode and turns off the Orange LED</li></ul>
Off	Orange mode is not invoked.

### Programmable LED

The Programmable LED is available for user applications. The LED defaults to Off unless activated by user application.

## Display

The display is a thin-film transistor display capable of supporting SXGA graphics modes. Display size is 1024x768 pixels. The display covering is designed to resist stains. The display supports screen blanking to eliminate driver distraction when the vehicle is in motion.

### Touch Screen

The Thor VM3 has two touch screen options:

- The standard touch screen is a Resistive Panel with a scratch resistant finish that uses a standard plastic stylus.
- The optional touch screen is a multitouch panel with Projected Capacitance (PCAP) touch for either a finger or conductive stylus with a hardened glass overlay.

The touch screen detects touches by a stylus, and translates them into computer commands. In effect, it simulates a computer mouse. Only the proper styluses should be used. A right mouse click is simulated by touching and holding the screen for the appropriate time interval.

When a dialog box is too large for the display, tap and drag the dialog box up or down or from side to side to view the remainder of the dialog box.

Always use the point of the stylus for tapping or making strokes on the display. Never use an actual pen, pencil, sharp or abrasive object to write on the touch screen.

An extra or replacement stylus may be ordered.

A replaceable touch screen protective film is available when the Thor VM3 is used in an abrasive environment. Contact [Technical Assistance](#) (page 9-1) for availability.

*Note: If the touch screen is disabled or loses calibration on a Thor VM3, you must use a USB mouse or keyboard attached to the Thor VM3 to access the control panel to re-enable or recalibrate the touch screen unless a programmable key has been assigned to that function.*

---

## **Touch Screen Defroster**

Extended temperature versions of the Thor VM3 contain a touch screen defroster. The touch screen defroster can be disabled when not needed via the [Screen Control](#) (page 5-39) panel. The defroster trip point is configurable. The defroster is always disabled when the device is operating from UPS battery power.

## **Screen Blanking**

Screen blanking (blackout) can be enabled when the vehicle is in motion. See [Screen Blanking](#) (page 4-33) for hardware setup and [ZoomZone](#) (page 5-42) for software setup to enable screen blanking. Once screen blanking is enabled, the display is blanked out (or a preselected zoom area is displayed) any time when the cable sends the signal that the vehicle is in motion. If the cable is removed, screen blanking is disabled and the display remains on.

## **Display Backlight Control**

The display brightness on a Thor VM3 equipped with an outdoor display can be configured to automatically adjust depending on the ambient light level via [Screen Control](#) (page 5-39).

*Note: When automatic brightness control is enabled, the user can still manually adjust brightness. However, automatic brightness control continues to adjust display brightness if the ambient lighting level changes.*

The display brightness can be adjusted manually, via the keypad:

1. Press the **Blue** key to enter Blue mode.
2. Press **P5** to increase brightness or **P6** to decrease brightness.
3. Press the **Blue** key to exit Blue mode.

---

## Vehicle Mounting and Accessory Installation

### Introduction

The Thor VM3 is designed to be mounted to a dock in a vehicle with either a RAM mount or U Bracket system. A power cable is provided with the Thor VM3 dock. An optional 21 key numeric or 95 key laptop-style USB keyboard and keyboard mounts are available. An integrated scanner mount is also offered. Optional communication cables are available.

Vehicle mounting brackets are specifically designed for vehicle mount applications. The vehicle mounted assembly restrains the Thor VM3 and isolates it from shock and vibration. A RAM metal table stand is available to secure the Thor VM3 and dock when in an office environment, for example.

The vehicle mount holds the dock and the Thor VM3 attaches to the dock. The dock remains attached to the vehicle, however, the Thor VM3 has a quick release located on the lower rear side that allows the Thor VM3 to easily be removed from the dock. The Thor VM3 can be operated for a minimum of 30 minutes from an internal UPS battery when not attached to a dock. The Thor VM3 can be transferred from one dock equipped vehicle to another for easy portability. The dock provides accessory attachment and conditioned power for the Thor VM3.

Overhead, dash and roof support pillar mounting is via a RAM Mount or U-bracket accessory which includes all the hardware required for vehicle mounting.

Never put the Thor VM3 into the vehicle mounted assembly until the assembly is securely fastened to the vehicle.

### Prepare for Vehicle Mounting

The Thor VM3 should be secured to an area in the vehicle where it:

- Does not obstruct the driver's vision or safe vehicle operation.
- Will be protected from rain or inclement weather.
- Will be protected from extremely high concentrations of dust or wind-blown debris.
- Can be easily accessed by a user seated in the driver's seat while the vehicle is not in operation.

### Quick Start

The following list outlines, in a general way, the process to follow when mounting the Thor VM3 in a vehicle. Refer to the following sections in this document for more details.

1. [Install RAM Mount](#) (page 4-4) or [Install U Bracket Mount](#) (page 4-13) to the vehicle.
2. [Place Thor VM3 in the Dock](#) (page 4-2).
3. Secure accessories such as an optional external keyboard or a scanner holder to either an integrated or remote mounting bracket.
4. Adjust the Thor VM3 to the best viewing angle.
5. [Install Remote Antenna](#) (page 4-46) or [Install External Antenna](#) (page 4-45) if necessary.
6. [Connect Cables](#) (page 4-16) for any peripherals.
7. Connect vehicle power:
  - [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-19)
  - [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27)
  - [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-24).
  - [Thor VX8 / Thor VX9 Adapter Cable](#) (page 4-31)
  - [VX6 / VX7 Adapter Cable](#) (page 4-30)
8. Secure all cables in [Strain Relief Cable Clamps](#) (page 4-16).

The Thor VM3 is ready for use.

---

## Maintenance - Vehicle Mounted Devices

Check the vehicle mounting hardware frequently and re-tighten if necessary.

If the vehicle mounting hardware and connections become broken, loose or cracked, the assembly must be taken out of service and replaced. Contact [Technical Assistance](#) (page 9-1) for help.

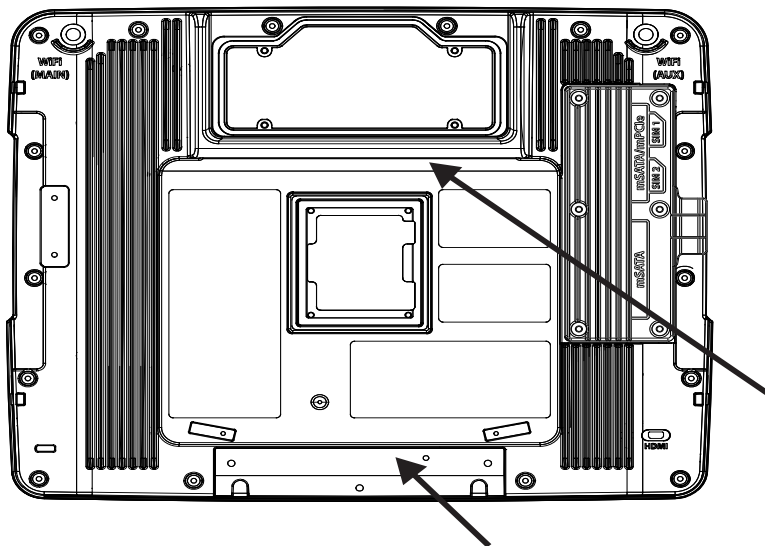
### Cleaning

If it becomes necessary to clean the Thor VM3, dock, peripherals or mounting hardware see:

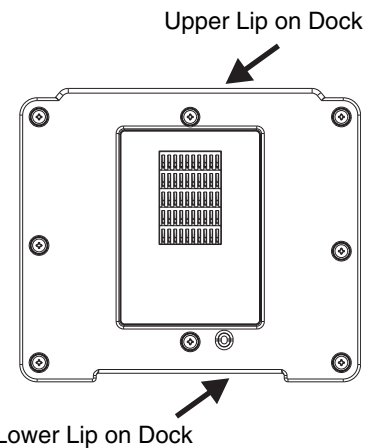
- [Cleaning the Thor VM3 and the Dock](#) (page 2-10)
- [Cleaning the Touch Screen](#) (page 2-11)

### Place Thor VM3 in the Dock

Back of Thor VM3



Front of Dock



Release Lever

1. Locate the notch on the upper rear of the Thor VM3.
2. Slide this notch over the top lip of the dock. Slide the Thor VM3 from side to side on the dock to make sure it fully engages on the lip of the dock. If the Thor VM3 cannot be slid side to side, the lip is engaged.
3. Pull the quick release lever on the Thor VM3 down and push the Thor VM3 against the dock.
4. Release the quick release lever. The quick release lever catches the lower lip on the dock and secures the Thor VM3 to the dock. Be sure the red quick release lever is pushed all the way in to secure the Thor VM3 to the dock.
5. If necessary, adjust the viewing angle of the Thor VM3.

When the Thor VM3 is placed in the dock, the following may happen:

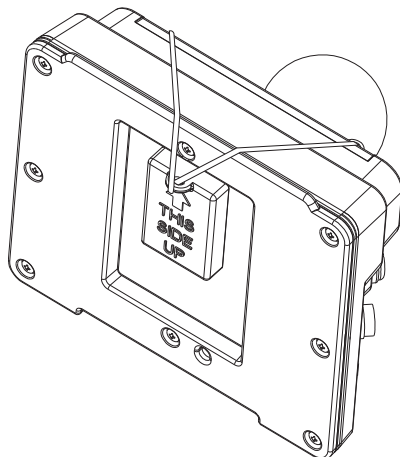
- If the Thor VM3 is off and power is connected to the dock, the Thor VM3 may boot when placed in the dock. The behavior depends on the Power Scheme selected. See [Ignition Control/Ignition On](#) (page 5-22) and [Auto-On](#) (page 5-26).
- If the Thor VM3 is on and power is connected to the dock, the Thor VM3 power management timers may change when the Thor VM3 is placed in the dock. See [Power Scheme](#) (page 5-89).

When the Thor VM3 is removed from the dock, the following may happen:

- If the Thor VM3 is on and power is connected to the dock, the Thor VM3 power management timers may change when the Thor VM3 is placed in the dock. See [Power Scheme](#) (page 5-89).



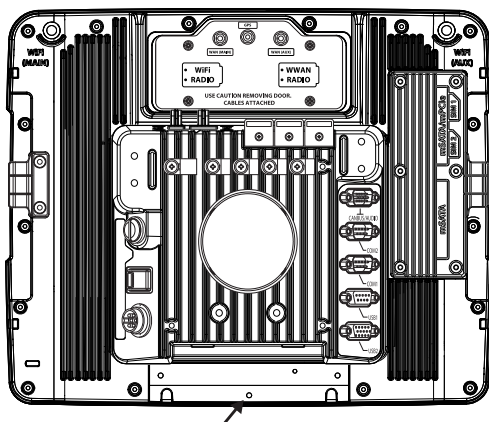
## Dock I/O Pin Cover.



The dock contains a tethered I/O Pin Cover to protect the I/O pins on the dock when a Thor VM3 is not mounted in the dock.

- When the Thor VM3 is not installed in the dock, use the I/O Pin Cover to protect the pins on the dock as shown.
- When a Thor VM3 is installed in the dock, the I/O Pin Cover can be placed out of the way behind the dock.

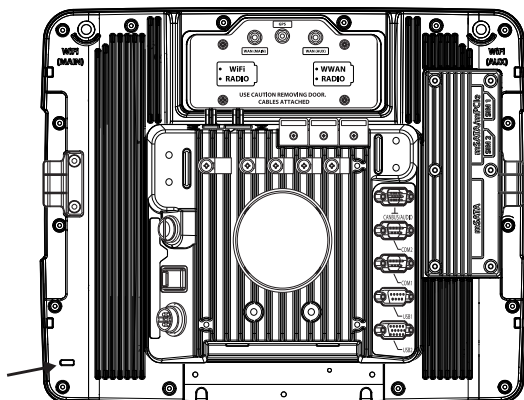
## Padlock



It may be desirable to secure the Thor VM3 in the dock so it cannot be removed from the dock. The quick release handle on the Thor VM3 is notched to allow a user supplied standard padlock to be placed through a hole in the bracket on the back of the Thor VM3 in the location shown below. Once the padlock is installed, the release handle cannot be moved so the Thor VM3 cannot be removed from the dock. The padlock shackle must be smaller than 3/16" (4.76mm).

A cable tie wrap can be used instead of a padlock if desired.

## Laptop Security Cable



The Thor VM3 can be secured with a standard laptop security cable using the slot on the back of the Thor VM3.

---

## Install RAM Mount



**CAUTION** - This device is intended to transmit RF energy. For protection against RF exposure to humans and in accordance with FCC rules and Industry Canada rules, this transmitter should be installed such that a minimum separation distance of at least 20 cm (7.8 in.) is maintained between the antenna and the general population. This device is not to be co-located with other transmitters.

Before installation begins, verify you have the applicable vehicle mounting bracket assembly components necessary, as shown in the following figures.

### Components - RAM Mounting Kits

Mounting kits that do not include an external keyboard are shown below.

Mounting kits that include a provision for an external keyboard include the parts on this page plus the parts on the next page.

In addition to the kits below, individual RAM mounting components are also available.

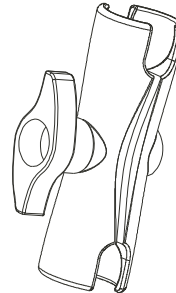
#### Mounting Kits without Keyboards

Each mounting kit contains:

RAM Ball (Size D) for back of Thor VM3 dock with hardware (screws and washers) to attach RAM ball to dock

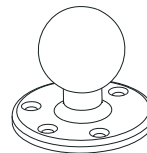


RAM Arm (Size D), length varies by kit selected

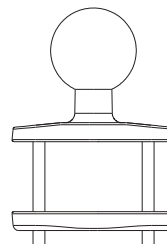


One of three mounting options:

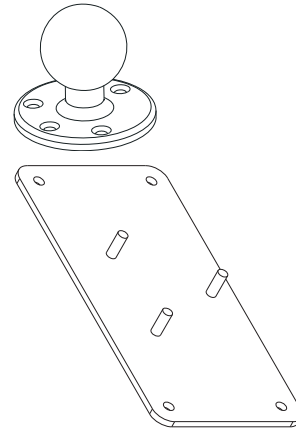
- RAM Ball mount (Size D, may include 3 cone washers), or



- RAM Clamp mount (Size D), or



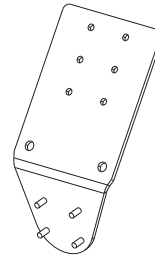
- RAM Plate mount with RAM Ball (Size D) with Hardware (cone washers and nuts) to attach Ball to Plate



### ***Mounting Kits with Integrated Keyboard Mounting***

Additionally, the kits for the Thor VM3 with an integrated 95 key keyboard mount include:

Thor VM3 Keyboard Mounting Bracket



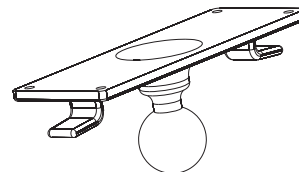
RAM Ball (Size C) with hardware (nuts) to attach RAM ball to Keyboard Mounting Bracket



RAM Arm (Size C)



Keyboard Mounting Plate with RAM Ball (Size C) and hardware (screws and washers) to attach Keyboard to Mounting Plate



### ***Accessory Mounting Kits***

An accessory mounting kit is also available. This kit mounts the 21 key numeric keyboard or the Thor scanner holder to the Enhanced Dock.

*Note: This accessory mount kit is only for use with the Enhanced Dock.*

Accessory RAM Ball

This accessory RAM ball mounts to the back of the Enhanced Dock.

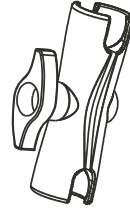


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RAM Ball (Size C) to attach RAM ball to 21key numeric keyboard or scanner holder.



RAM Arm (Size C)



## Procedure - RAM Mount Assembly

Equipment Needed: Sockets, screwdriver and a Torque wrench capable of measuring to 50 inch pounds (5.64±.56 N/m).

*Note: Torquing tool is not supplied by Honeywell. Tools needed to attach the RAM Clamp Mount to the vehicle are not supplied by Honeywell.*

### Torque Measurement

You will need a torquing tool capable of torquing to 20 inch pounds (1.10 N/m). Torque all screws and bolts according to the following table:

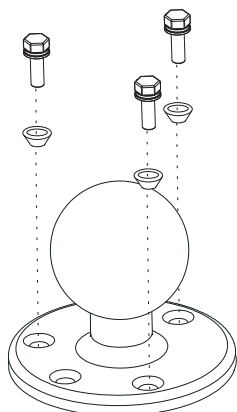
For these nuts...	Torque to
10-32 lock nuts	17 - 20 in/lb (0-95 - 1.10 N/m)

### Step 1a – Attach RAM Ball to Vehicle

*Note: If you are using the RAM clamp mount, please go to [Step 1b – Mount RAM Clamp to Vehicle](#) (page 4-8). If you are using the RAM plate mount, please go to [Step 1c – Attach RAM Plate to Vehicle and Attach RAM Ball](#) (page 4-9).*

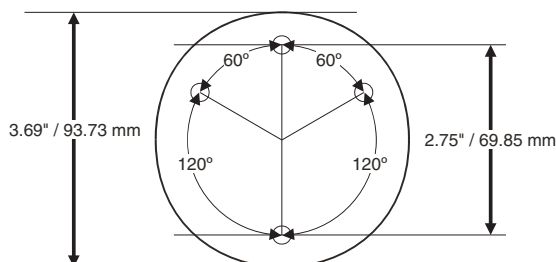
1. Determine the position for mounting the RAM ball base. Be sure to position the RAM bracket to allow access to the switches and ports on the bottom of the Thor VM3.
2. Attach the RAM ball base to the vehicle mounting surface using three or four 1/4 bolts (not included) or equivalent fasteners. If the mounting kit includes cone washers, use those as illustrated below.

**IMPORTANT:** Mount to the most rigid surface available.



### Mounting Dimensions

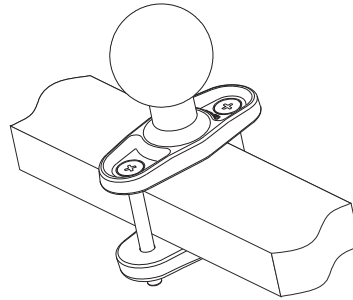
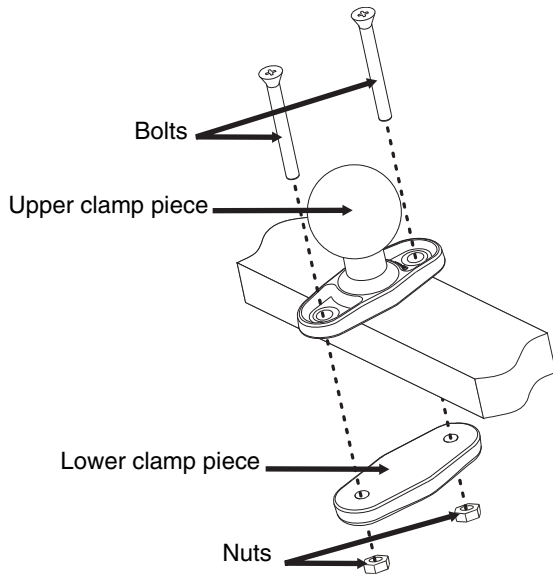
*Note: Drill and tap holes for three 1/4 bolts. Drawing not to scale.*



## Step 1b – Mount RAM Clamp to Vehicle

*Note: If you are using the RAM ball mount, please go to [Step 1a – Attach RAM Ball to Vehicle](#) (page 4-7). If you are using the RAM plate mount, please go to [Step 1c – Attach RAM Plate to Vehicle and Attach RAM Ball](#) (page 4-9).*

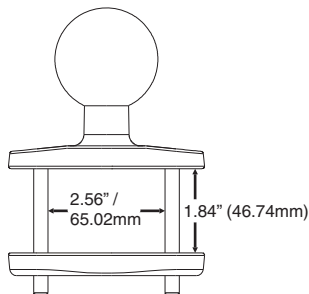
1. Determine the position for mounting the RAM clamp mount. The clamp mount can be used on a beam (such as on a fork lift truck) up to 2.5" (63.5 mm) wide and approximately 2" (50.8 mm) thick. The clamp may be attached to a thicker beam by substituting longer bolts (not included). Be sure to position the RAM clamp mount to allow access to the switches and ports on the bottom of the Thor VM3.



2. Position the upper clamp piece with ball on the beam. Place the bolts through the holes in the upper clamp piece.
3. Position the lower clamp piece below the beam. Align the bolts with the holes in the lower clamp piece.
4. Place the nylon locking nuts on the bolts and tighten the bolts.

### Mounting Dimensions

*Note: Drawing not to scale.*



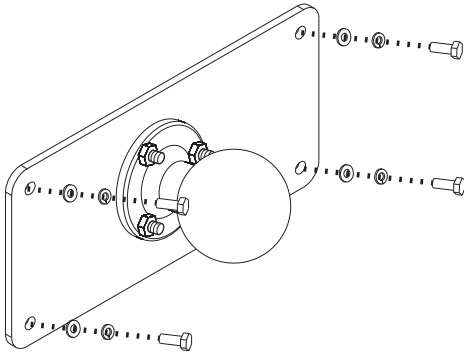
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### Step 1c – Attach RAM Plate to Vehicle and Attach RAM Ball

*Note: If you are using the RAM ball mount, please go to [Step 1a – Attach RAM Ball to Vehicle](#) (page 4-7) If you are using the RAM clamp mount, please go to [Step 1b – Mount RAM Clamp to Vehicle](#) (page 4-8).*

1. Determine the position for mounting the RAM ball plate. Be sure to position the RAM plate to allow access to the switches and ports on the bottom of the Thor VM3.
2. Attach the RAM ball plate to the vehicle mounting surface using four 1/4 bolts (not included) or equivalent fasteners.
3. If not already attached, attach the RAM ball to the RAM ball plate using three M6 nuts and washers.

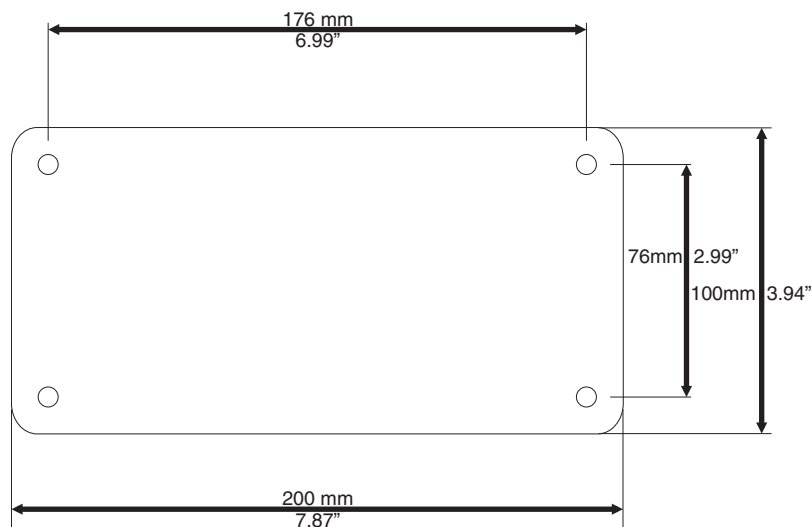
**IMPORTANT:** Mount to the most rigid surface available.



### Mounting Dimensions

There are 4 mounting holes in the plate. Use four 1/4 bolts to secure the plate to the vehicle.

*Note: Drawing not to scale.*



---

### **Step 2 – Attach RAM Mount Ball to the Thor VM3 Dock**

1. Turn the Thor VM3 off before attaching the RAM mount ball.
2. Place the Thor VM3 face down on a stable surface.
3. If using the external keyboard mount, position the Keyboard Bracket and the Size D RAM ball on the rear of the Thor VM3 dock, aligning the holes on the back of the Thor VM3 dock with the holes on the bracket and the RAM ball base.
4. If not using the external keyboard mount, position the RAM ball on the rear of the Thor VM3 dock, aligning the holes on the back of the Thor VM3 dock with the holes on the RAM ball base. Attach with four M5 screws, flat washers and lock washers.
5. If using the external keyboard mount, attach the Size C RAM ball to the Thor VM3 Keyboard bracket with four M5 nuts, flat washers and lock washers.

### **Step 3 – Attach Thor VM3 Assembly to RAM Mount**

1. Slip the Size D RAM arm over the ball on the vehicle RAM mount (RAM Ball mount shown).
2. Insert the ball on the dock into the RAM arm and tighten the knob on the RAM arm using the supplied RAM wrench.

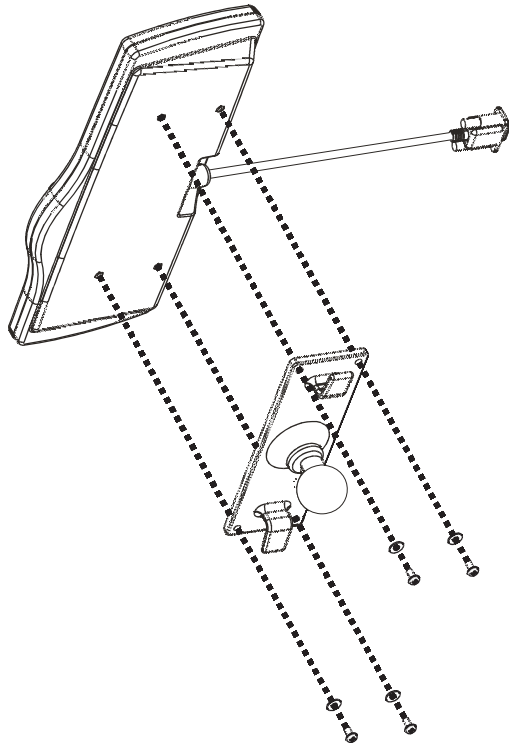
### **Step 4 – Place the Thor VM3 into the Dock**

If the Thor VM3 is not already mounted to the dock, [Place Thor VM3 in the Dock](#) (page 4-2)

### **Step 5 – Attach Alphanumeric Keyboard to Mounting Plate (Optional)**

*Note: This step is only for a Thor VM3 with the optional external keyboard.*

If using the optional integrated keyboard mount, attach the keyboard to keyboard mounting plate, using four #8 screws, flat washers and lock washers.



*Note: Excess keyboard cable length can be looped around the hooks on the bottom of the keyboard mounting plate.*



---

### **Step 6 – Attach Keyboard Assembly to Thor VM3 Assembly (Optional)**

*Note: This step is only for a Thor VM3 with the optional external keyboard.*

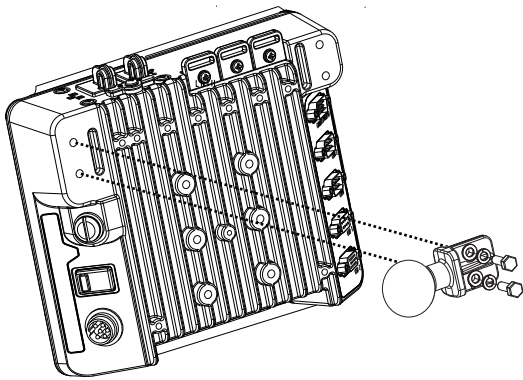
1. Slip the Size C RAM arm over the ball on the Thor VM3 Keyboard Bracket.
2. Slip the ball on the Keyboard Mounting Plate into the other end of the Size C RAM arm.
3. Tighten the knob on the RAM arm using the supplied RAM wrench.

*Note: Some components omitted for detail clarity.*

### **Step 7 - Attach Numeric Keypad (Optional)**

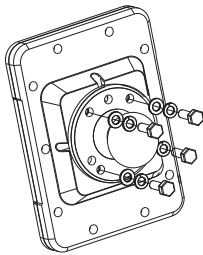
This step is only for use with the Enhanced Dock.

1. Attach the accessory RAM ball to the Enhanced Dock. There are two mounting provisions, one on either side of the Enhanced Dock and either can be used to mount the numeric keypad.

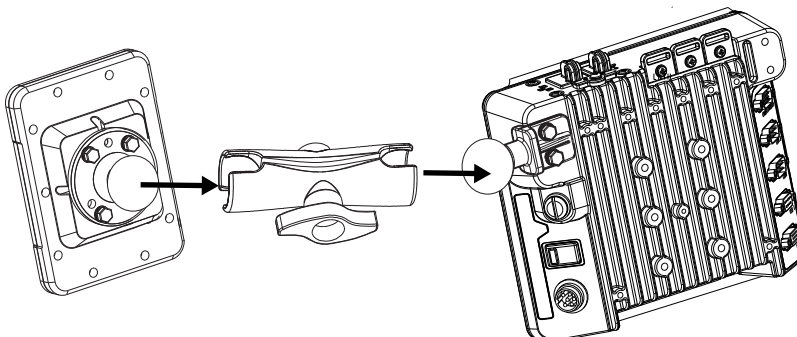


*Note: Some components eliminated for detail clarity.*

2. Attach the RAM ball to the back of the keypad.



3. Slip the RAM arm over the accessory RAM ball.
4. Slip the RAM ball on the keyboard into the RAM arm.



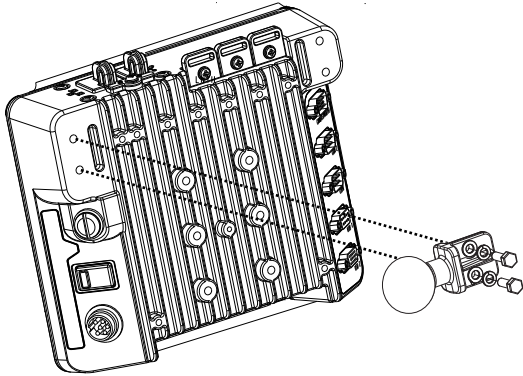
5. Tighten the knob on the RAM arm while adjusting to the desired angle.

---

### **Step 8 - Attach Scanner Holder (Optional)**

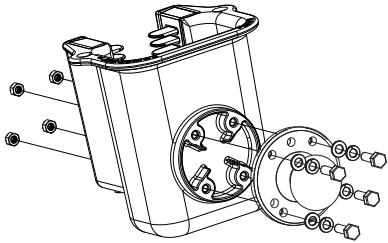
This step is only for use with the Enhanced Dock.

1. Attach the accessory RAM ball to the Enhanced Dock. There are two mounting provisions, one on either side of the Enhanced dock and either can be used to mount the scanner holder.

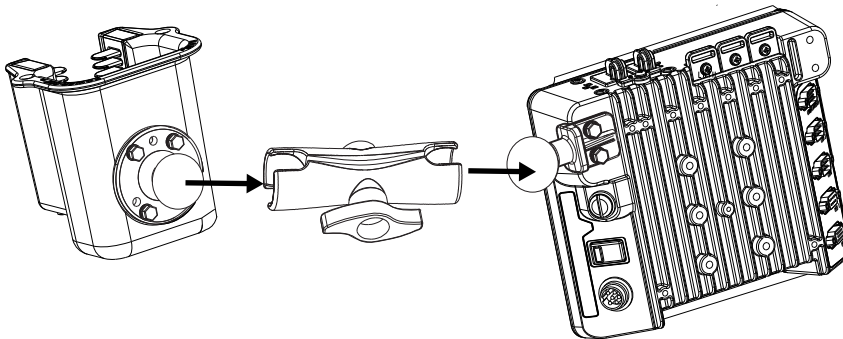


*Note: Some components eliminated for detail clarity.*

2. Attach the RAM ball to the back of the scanner holder.



3. Slip the RAM arm over the accessory RAM ball.
4. Slip the RAM ball on the scanner holder into the RAM arm.



5. Tighten the knob on the RAM arm while adjusting to the desired angle.

---

## Install U Bracket Mount

*Note: This mounting system does not have provisions for an integrated external keyboard mount or scanner holder. These accessories can be mounted remotely if desired. Contact [Technical Assistance](#) (page 9-1) for details.*

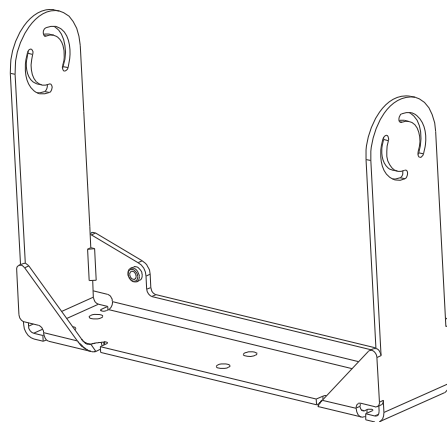
Before installation begins, verify you have the applicable vehicle mounting bracket assembly components necessary, as shown in the following figures.

### Components - U Bracket Mounting Assembly

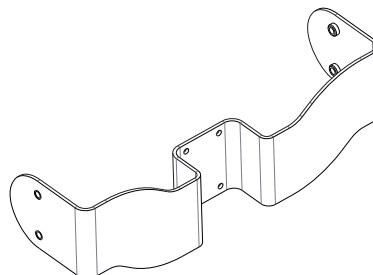
The U bracket kit is available in two configurations:

- With a U Bracket included for new vehicle installations
- Without a U Bracket for installing the Thor VM3 in place of a previous Honeywell vehicle mounted computer, such as a VX6 or VX7.

U Bracket (only necessary for new installations)



Adapter Bracket (includes screws, flat washers and lock washers to attach Adapter Bracket to Thor VM3 and to U Bracket). The U bracket may already be installed on the vehicle where a VX1, VX2, VX4, VX5, VX6 or VX7 was previously installed.



### Procedure - U Bracket Assembly

Equipment Needed: Sockets and a Torque wrench capable of measuring to 50 inch pounds (5.64±.56 N/m).

*Note: Torquing tool is not supplied by Honeywell.*

#### Torque Measurement

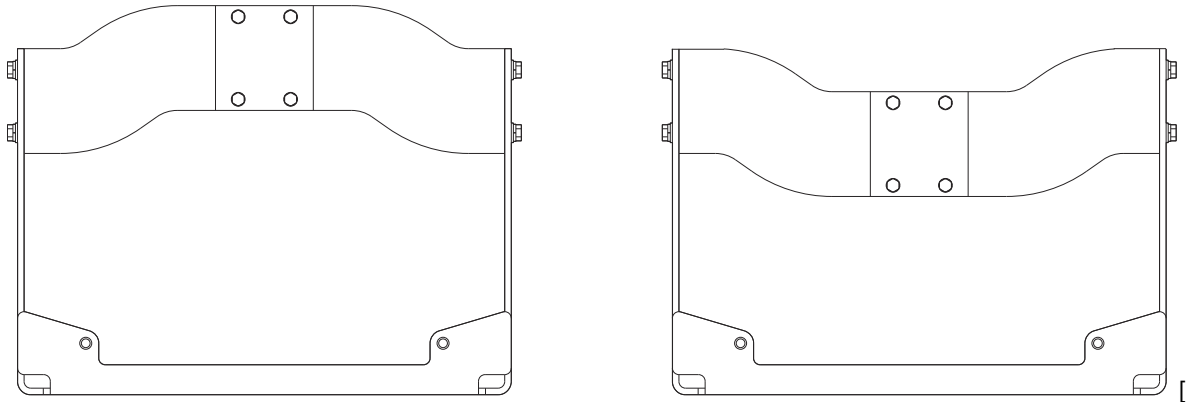
You will need a torquing tool capable of torquing to 35-50 inch pounds (1.10 N/m). Torque all screws and bolts according to the following table:

For these bolts...	Torque to
1/4-20x5/8 Bolts	50 in/lb (5.6 N/m)
M5x16mm Bolts	35 in/lb (4.0 N/m)
1/4 Bolts (user supplied)	50.0±5 in/lb (5.64±.56 N/m)

---

## Mounting Positions

The adapter bracket can be mounted in a high or low position, depending on viewing position, as shown below.



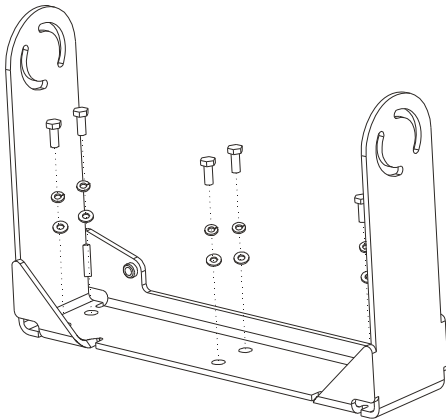
Additionally, the slotted U bracket allows the Thor VM3 to be mounted vertically or tilted forward or backward for best viewing angle.

### Step 1 - Install U Bracket to Vehicle

1. Position the bracket to allow access to the switches and ports on the bottom of the Thor VM3.
2. Attach the bottom mounting bracket to the vehicle mounting surface using a minimum of four 1/4 bolts (or equivalent) fasteners.

*Note: 1/4 bolts and washers not included. It is recommended to use lock washers and flat washers on the fasteners.*

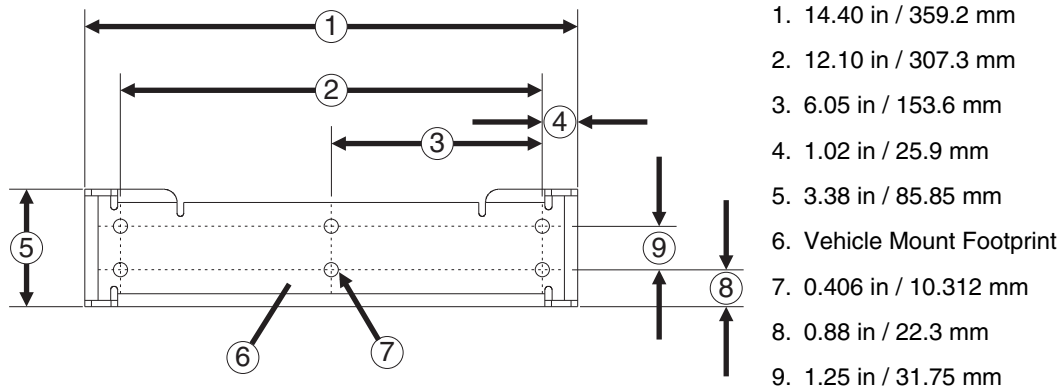
**IMPORTANT:** Mount to the most rigid surface available.



After the bottom bracket has been attached to a rigid surface, you are ready to assemble the Thor VM3 bracket configuration.

## Mounting Dimensions

Note: Drawing not to scale.

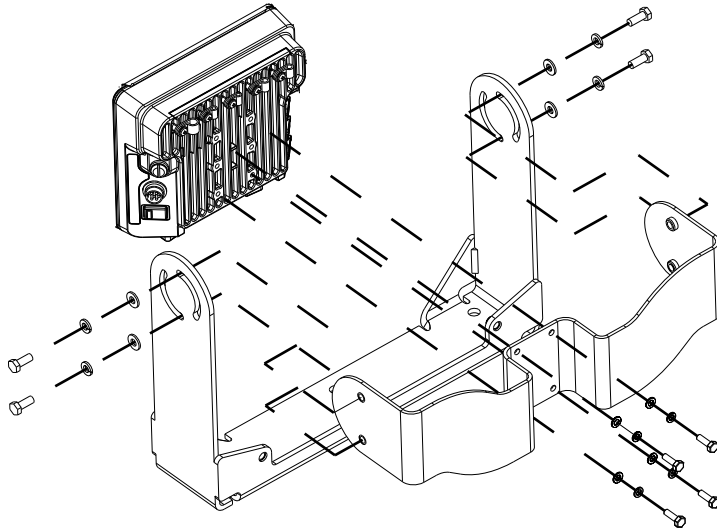


### Step 2 - Remove RAM Ball

If the Thor VM3 dock has a RAM ball attached, the RAM ball must be removed from the dock to use the U Bracket mount.

Remove the RAM ball. The hardware used to attach the RAM ball to the dock is not reused for the U bracket mount.

### Step 3 - Attach Adapter Bracket



Note: For the steps below, always place the lock washer on the bolt before the flat washer.

1. Attach the Adapter Bracket to the Thor VM3 dock using four each M5x16mm bolt, M5 lock washer and M5 flat washer. Torque to 35 in/lbs (4.0 N/m).
2. Attach the Thor VM3/Adapter Bracket assembly to the U Bracket using 4 each 1/4-20x5/8 bolt, 1/4 lock washer and 1/4 flat washer.
3. If the Thor VM3 is not already mounted to the dock, [Place Thor VM3 in the Dock](#) (page 4-2).
4. Adjust the Thor VM3 to the desired viewing angle.
5. Torque the 14-20 bolts to 50 in/lbs (5.6 N/m).

---

## Connect Cables

There are many cables available for the Thor VM3 including power cables, and data/ communication cables.

### Strain Relief Cable Clamps

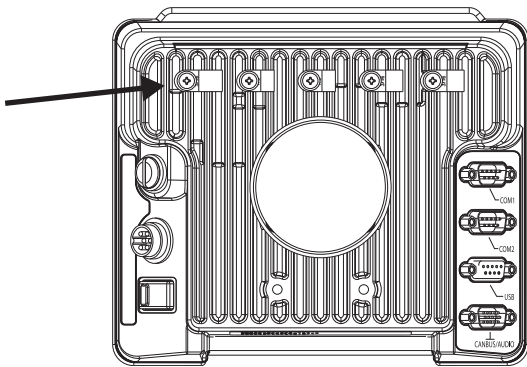
Equipment Required: Phillips screwdriver (not supplied by Honeywell)

There are five strain relief cable clamps secured to the Standard Dock.

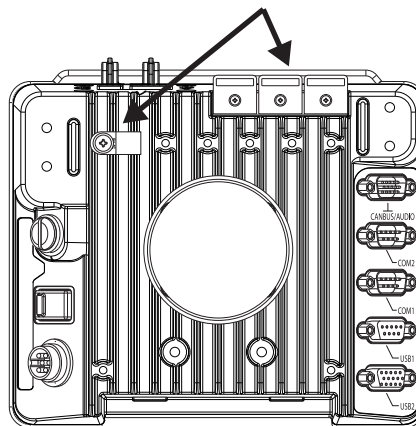
There is one strain relief cable clamp and three strain relief brackets for securing cables to the Enhanced Dock.

Use the strain relief clamps to secure audio, power, and I/O cables attached to the Thor VM3 dock.

Use the left-most strain relief clamp for the power cable.



Standard Dock



Enhanced Dock

To use the strain relief clamp(s):

1. Determine the proper strain relief cable clamp. There are three sizes of cable clamps on the Standard Dock which should be matched to the cable to be secured. For example, the largest clamp (on the left when viewing the back of the dock) is designed to secure the power cable. For the Enhanced Dock there is a single cable clamp. Use this clamp for the power cable. Use the brackets for all other cables.
2. Remove the strain relief clamp from the Thor VM3 by turning the screw counterclockwise. Put the screw aside in a safe location.
3. Slide the strain relief clamp over the cable.
4. Using a Phillips screwdriver and the screw that was removed, refasten the clamp holding the cable to the Dock. Do not stretch the cable. Leave enough slack in the cable to allow it to be connected and disconnected easily when needed.
5. Continue in this manner until all cables are secured to the dock.

To use the strain relief brackets (Enhanced Dock only):

1. Secure the cable to the bracket with plastic tie straps (cable ties).
2. If necessary, the cable ties can be trimmed to length after installation. Cut the excess tie length off flush and not at an angle to prevent sharp edges that may cause cuts.

---

## Connect Power

See [Power Supply Connector](#) (page 8-5) for connector pinout

For the VM1D Standard Dock and VM3D Enhanced Dock, power options include:

- [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-19) - Direct connection to vehicle power.
- [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-24) - Requires the use of a DC/DC power supply.
- [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27) - Requires the use of a DC/DC power supply.
- [VX6 / VX7 Adapter Cable](#) (page 4-30) - For applications where the Thor VM3 replaces a previously installed VX6 or VX7.
- [Thor VX8 / Thor VX9 Adapter Cable](#) (page 4-31) - For applications where the Thor VM3 (with a VM1D Standard Dock or VM3D Enhanced dock) replaces a previously installed Thor VX8 or Thor VX9.
- [Screen Blanking](#) (page 4-33) - Optional connection to blank the Thor VM3 display while the vehicle is in motion.
- [External AC/DC Power Supply](#) (page 4-39) - For use when DC power is not available to power the Thor VM3, such as in an office environment.

For the VMX3D Enhanced Dock, power options include:

- [VMXD Enhanced Dock with Thor VX8/Thor VX9 Power Cable](#) (page 4-36) - For applications where a Thor VM3 (with a VMXD Enhanced Dock) replaces a previously installed Thor VX8 or Thor VX9.
- [External AC/DC Power Supply](#) (page 4-39) - For use when DC power is not available to power the Thor VM3, such as in an office environment.

## Power Cable Cautions



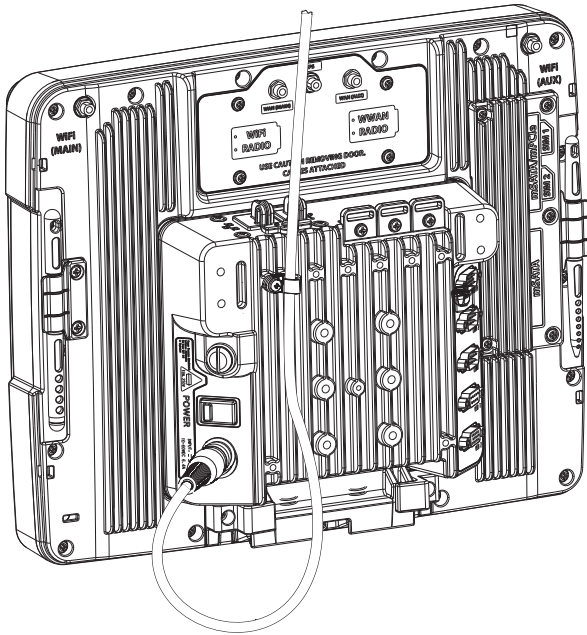
**CAUTION** - *When routing the power cable:*

- Route power cable away from the outside of the fork truck.
- Choose a mounting location so that the power cable does not extend outside the vehicle and that provides sufficient clearance so that the power cable (especially the dock connector end) is not pressed against part of the vehicle.
- Use the proper [Strain Relief Cable Clamps](#) (page 4-16) to secure cable.
- The power cable is less flexible in low temperature environments. Avoid sharp bends.

*Regularly inspect power cable for damage, especially in low temperature environments. Contact [Technical Assistance](#) (page 9-1) for replacement cable options.*

---

## ***Power Cable Routing***





## 12-48 VDC Vehicles (10-60 VDC Direct Connection)



**CAUTION** - For installation by trained service personnel only.



Use caution when routing the power cable. See [Power Cable Cautions](#) (page 4-17).



### Fuse Requirements

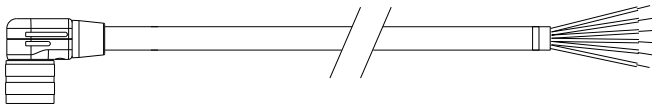
**WARNING** - For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

- For **12VDC** input, use the 10A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use the 6A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use the 4A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 48VDC.

Note: For North America, a UL Listed fuse is to be used.

### Power Cable Identification

The DC power cable is included with the dock:



Wire Color	Connection
Red	DC + (10-60 VDC)
Red/White	DC + (10-60 VDC)
Black	DC -
Black/White	DC -
Green	Ground
Blue	Ignition Input (optional)



Twist the red and red/white wires together and twist the black and black/white wires together before connecting to vehicle power.

Note: Correct electrical polarity is required for safe and proper installation. See the figures below for additional wire color-coding specifics.

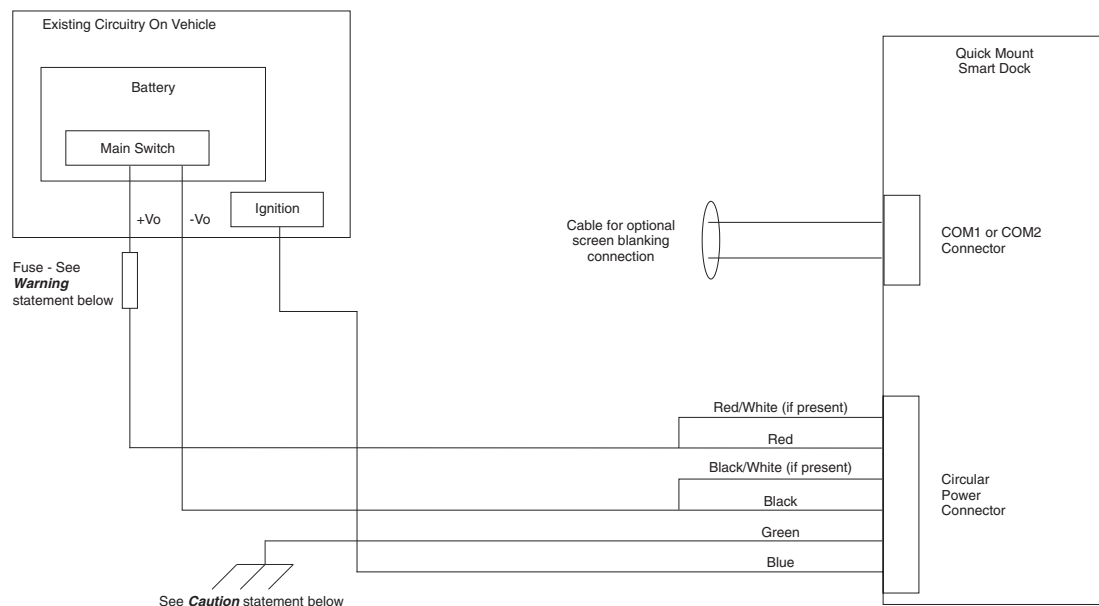
The Thor VM3 DC input wires (Red, Red/White DC+ and Black, Black/White DC-) and the Blue ignition input wire are galvanically isolated. The Green ground input is used for electrostatic discharge (ESD) protection.

### Vehicle 10-60VDC Direct Power Connection

1. The Thor VM3 must not be mounted in the dock. The power switch on the dock must be turned *Off*. The power cable must be UNPLUGGED from the dock.
2. While observing the [Fuse Requirements](#) (page 4-19), connect the power cable as close as possible to the actual battery terminals of the vehicle (if using unswitched power).
3. Use proper electrical and mechanical fastening means for terminating the cable. Properly sized "crimp" type electrical terminals are an accepted method of termination. Please select electrical connectors sized for use with 20AWG (0.81mm<sup>2</sup>) conductors.
4. Refer to the wiring diagrams following this section for wire colors and connections:
  - [Ignition Control Wiring Diagram](#) (page 4-21)
  - [Auto-On Control Wiring Diagram](#) (page 4-22)
  - [Manual Control Wiring Diagram](#) (page 4-23)

- 
5. Route the power cable the shortest way possible removing any left-over cable. The cable is rated for a maximum temperature of 105°C (221°F). Therefore, when routing this cable it should be protected from physical damage and from surfaces that might exceed this temperature. Cable should be protected from physical damage from moving parts. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
  6. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate outer cable jacket.
  7. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
  8. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
  9. [Place Thor VM3 in the Dock](#) (page 4-2)
  10. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch.
  11. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
  12. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

## Ignition Control Wiring Diagram



### CAUTION

#### For battery powered vehicles:

- Twist the red and red/white wires together and connect to battery positive.
- Black and black/white wires must be connected to battery negative. Twist these wires together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

#### For internal combustion engine powered vehicles:

- Twist the red and red/white wires together and connect to battery positive.
- Twist the black wire and a black/white together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



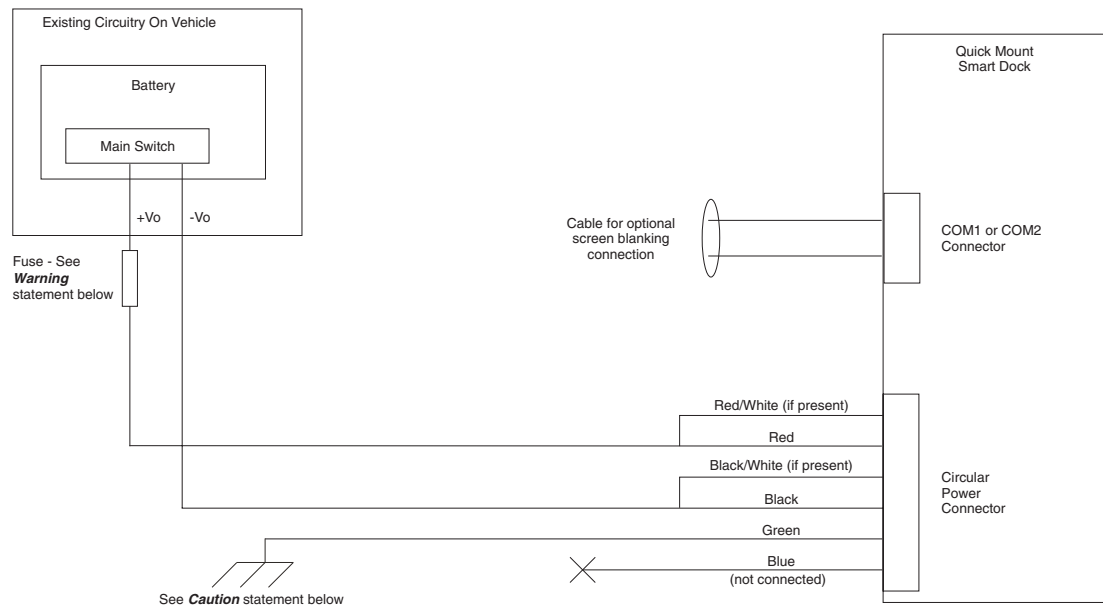
### WARNING

For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

- For **12VDC** input, use the 10A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use the 6A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use the 4A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 48VDC.

Note: For North America, a UL Listed fuse is to be used.

## Auto-On Control Wiring Diagram



### **CAUTION**

#### **For battery powered vehicles:**

- Twist the red and red/white wires together and connect to battery positive.
- Black and black/white wires must be connected to battery negative. Twist these wires together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

#### **For internal combustion engine powered vehicles:**

- Twist the red and red/white wires together and connect to battery positive.
- Twist the black wire and a black/white together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



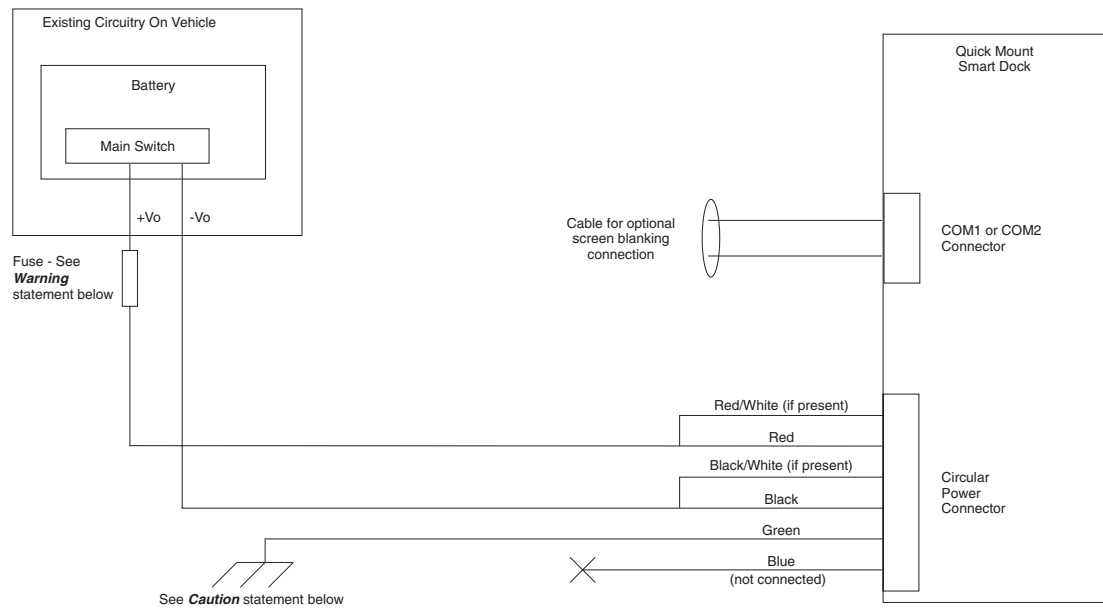
### **WARNING**

*For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:*

- For **12VDC** input, use the 10A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use the 6A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use the 4A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 48VDC.

*Note: For North America, a UL Listed fuse is to be used.*

## Manual Control Wiring Diagram



### **CAUTION**

#### **For battery powered vehicles:**

- Twist the red and red/white wires together and connect to battery positive.
- Black and black/white wires must be connected to battery negative. Twist these wires together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

#### **For internal combustion engine powered vehicles:**

- Twist the red and red/white wires together and connect to battery positive.
- Twist the black wire and a black/white together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



### **WARNING**

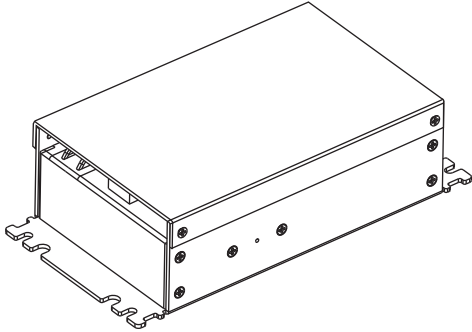
*For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:*

- For **12VDC** input, use the 10A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use the 6A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use the 4A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than 48VDC.

*Note: For North America, a UL Listed fuse is to be used.*

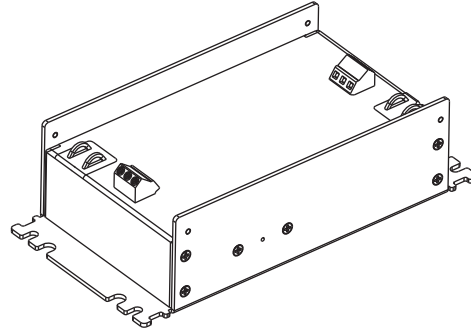
## 60-144 VDC Vehicles (50-150 VDC Power Supply, Screws on Side of Lid)

This option requires DC/DC external power supply Honeywell Part no. 9000313PWRSPLY.



Shown With Lid Attached

- Lid is secured with screws on the side of lid.



Shown With Lid Removed

- Input and output connector blocks under lid.
- One positive (Vin+), negative (Vin-) and ground ( ) connection in input block.
- One positive (Vo+) and negative (Vo-) connection in output block.

If the DC/DC power supply does not have screws in the side of the lid, see [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27).



**CAUTION** - For installation by trained service personnel only.



**CAUTION** - Usage in areas where moisture can affect the power supply connections should be avoided. The power supply should be mounted in a dry location within the vehicle or placed in a suitable protective enclosure.



Use caution when routing the power cable. See [Power Cable Cautions](#) (page 4-17).



### Fuse Requirements

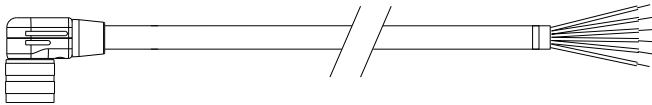
**WARNING** - For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

- For **all voltages**, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than the vehicle input voltage.

Note: For North America, a UL Listed fuse is to be used.

### Power Cable Identification

The DC power cable is included with the dock:



Twist the red and red/white wires together and twist the black and black/white wires together before connecting to vehicle power.

Wire Color	Connection
Red	DC + (10-60 VDC)
Red/White	DC + (10-60 VDC)
Black/White	DC -
Black	DC -
Green	Ground
Blue	Ignition Input (not used)

Note: Correct electrical polarity is required for safe and proper installation. See [Wiring Diagram](#) (page 4-26) for additional wire color-coding specifics.

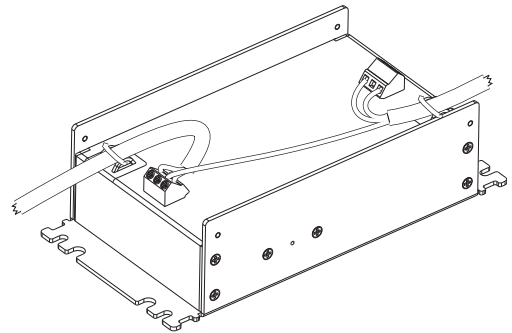
The Thor VM3 DC input wires (Red, Red/White DC+ and Black, Black/White DC-) and the Blue ignition input wire are galvanically isolated. The Green ground input is used for electrostatic discharge (ESD) protection.

### **Vehicle 50-150VDC Power Connection**

1. Please review the [Wiring Diagram](#) (page 4-26), before beginning power cable install.
2. The Thor VM3 must not be mounted in the dock. The power switch on the dock must be turned *Off*. The power cable must be UNPLUGGED from the dock.
3. Route the cable from the Thor VM3 to the DC/DC power supply. Route the power cable the shortest way possible. The cable is rated for a maximum temperature of 105°C (221°F). When routing this cable, it should be protected from physical damage and from surfaces that might exceed this temperature. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
4. Cut the cable to length and strip the wire ends.
5. Remove the lid from the DC/DC power supply.
6. Connect the stripped end of the positive wires (red and red/white twisted together) to the output block. See [Power Cable Identification](#) (page 4-24).
7. Connect the stripped end of the negative wires (black and black/white twisted together) to the output. See [Power Cable Identification](#) (page 4-24).

*Note: The input block has VIN+, VIN- and GND terminals. The output block has VO+ and VO- terminals.*

8. Connect the ground (green) wire from the Thor VM3 to the GND terminal on the input side of the DC/DC power supply.
9. Route the wiring from the DC/DC power supply to the vehicle's electrical system. **Do not connect to vehicle power at this time.**
10. Strip the wire ends and connect to the input side of the DC/DC power supply.
11. Use looms and wire ties to secure all wiring as shown.
12. Reattach the cover with the screws.



13. Connect the DC/DC power supply to the vehicle's electrical system as directed below:



**For battery powered vehicles:**

*VIN+ is connected to battery positive.  
VIN- must be connected to battery negative.  
GND must be connected to the vehicle chassis ground.*

**For internal combustion engine powered vehicles:**

*VIN+ is connected to battery positive.  
VIN- is connected to battery negative.  
GND is connected to the vehicle chassis ground, which can also be battery negative.*

14. While observing the [Fuse Requirements](#) (page 4-24) connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in the vehicle fuse panel, after providing proper fusing.

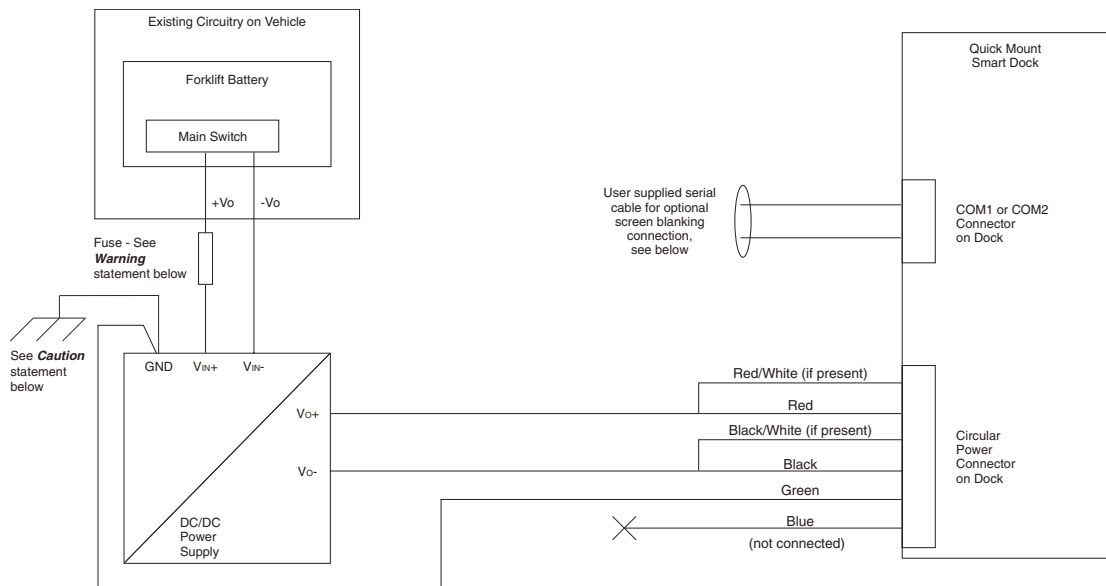
**ATTENTION: For uninterrupted power, electrical supply connections should not be made at any point after the ignition switch of the vehicle.**

15. Use proper electrical and mechanical fastening means for terminating the cable. Properly sized "crimp" type electrical terminals are an accepted method of termination. Select electrical connectors sized for use with 18AWG (1mm<sup>2</sup>) conductors.
16. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate the outer cable jacket.
17. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely. Flip the power switch on the back of the dock to On.

18. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
19. [Place Thor VM3 in the Dock](#) (page 4-2)
20. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch.
21. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
22. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

*Note: Ignition control is not available for trucks over 60VDC.*

## Wiring Diagram



### CAUTION

#### **For battery powered vehicles:**

*GND must be connected to the vehicle chassis ground.*

#### **For internal combustion engine powered vehicles:**

*GND is connected to the vehicle chassis ground, which can also be battery negative.*



### Fuse Requirements

**WARNING** - For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

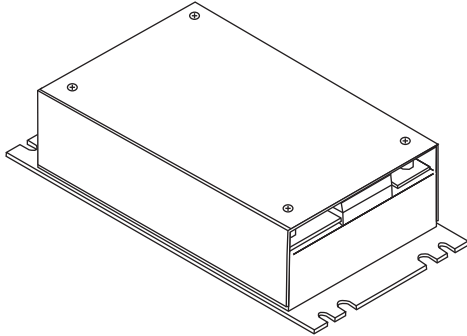
- For **all voltages**, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than the vehicle input voltage.

*Note: For North America, a UL Listed fuse is to be used.*



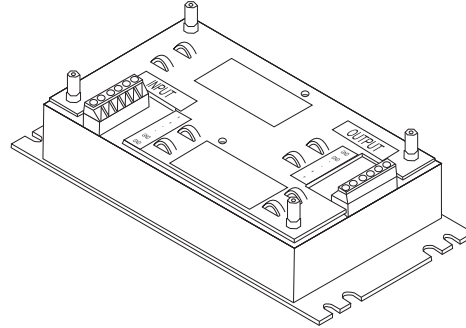
## 60-144 VDC Vehicles (50-150 VDC Power Supply, Screws on Top of Lid)

This option requires DC/DC power supply Honeywell Part no. VX89303PWRSPPLY, shown below.



Shown With Lid Attached

- Lid is secured with screws on the top of lid.



Shown With Lid Removed

- Input and output connector blocks under lid.
- Two positive (+), negative (-) and ground (⊕) connections per terminal block

If the DC/DC power supply does not have screws in the top of the lid, see [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-24).



**CAUTION** - For installation by trained service personnel only.



**CAUTION** - The VX89303PWRSPPLY power supply is sealed per IPXX. Usage in areas where moisture can affect the power supply connections should be avoided. The power supply should be mounted in a dry location within the vehicle or placed in a suitable protective enclosure.



Use caution when routing the power cable. See [Power Cable Cautions](#) (page 4-17).



### Fuse Requirements

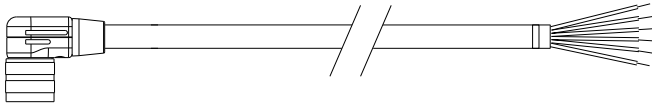
**WARNING** - For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

- For **all voltages**, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than the vehicle input voltage.

Note: For North America, a UL Listed fuse is to be used.

## Power Cable Identification

The DC power cable is included with the dock:



Twist the red and red/white wires together and twist the black and black/white wires together before connecting to vehicle power.

Wire Color	Connection
Red	DC + (10-60 VDC)
Red/White	DC + (10-60 VDC)
Black	DC -
Black/White	DC -
Green	Ground
Blue	Ignition Input (not used)

Note: Correct electrical polarity is required for safe and proper installation. See [Wiring Diagram](#) (page 4-29) for additional wire color-coding specifics.

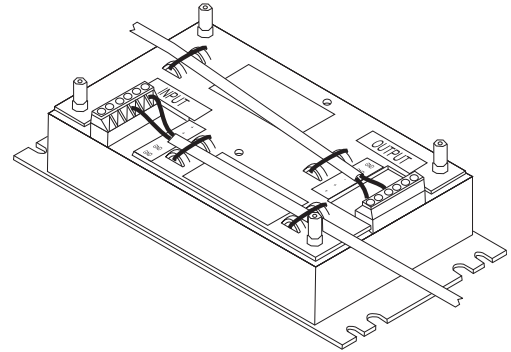
The Thor VM3 DC input wires (Red, Red/White DC+ and Black, Black/White DC-) and the Blue ignition input wire are galvanically isolated. The Green ground input is used for electrostatic discharge (ESD) protection.

## Vehicle 50-150VDC Power Connection

1. Please review the [Wiring Diagram](#) (page 4-26), before beginning power cable install.
2. The Thor VM3 must not be mounted in the dock. The power switch on the dock must be turned *Off*. The power cable must be UNPLUGGED from the dock.
3. Route the cable from the Thor VM3 to the DC/DC power supply. Route the power cable the shortest way possible. The cable is rated for a maximum temperature of 105°C (221°F). When routing this cable, it should be protected from physical damage and from surfaces that might exceed this temperature. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
4. Cut the cable to length and strip the wire ends.
5. Remove the lid from the DC/DC power supply.
6. Connect the stripped end of the positive wires (red and red/white twisted together) to the output block. See [Power Cable Identification](#) (page 4-27).
7. Connect the stripped end of the negative wires (black and black/white twisted together) to the output. See [Power Cable Identification](#) (page 4-27).

*Note: The input and output blocks each have two + (plus), two – (minus) and two ⊕ (ground) connectors. Either connector in the block can be used to connect the matching polarity wire.*

8. Route the wiring from the DC/DC power supply to the vehicle's electrical system. **Do not connect to vehicle power at this time.**
9. Strip the wire ends and connect to the input side of the DC/DC power supply.
10. Use looms and wire ties to secure all wiring as shown.
11. Reattach the cover with the screws.
12. Connect the DC/DC power supply to the vehicle's electrical system as directed below



### **For battery powered vehicles:**

- + is connected to battery positive.
- must be connected to battery negative.
- ⊕ must be connected to the vehicle chassis ground.

### **For internal combustion engine powered vehicles:**

- + is connected to battery positive.
- is connected to battery negative.
- ⊕ is connected to the vehicle chassis ground, which can also be battery negative.

13. While observing the [Fuse Requirements](#) (page 4-27), connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in the vehicle fuse panel, after providing proper fusing.

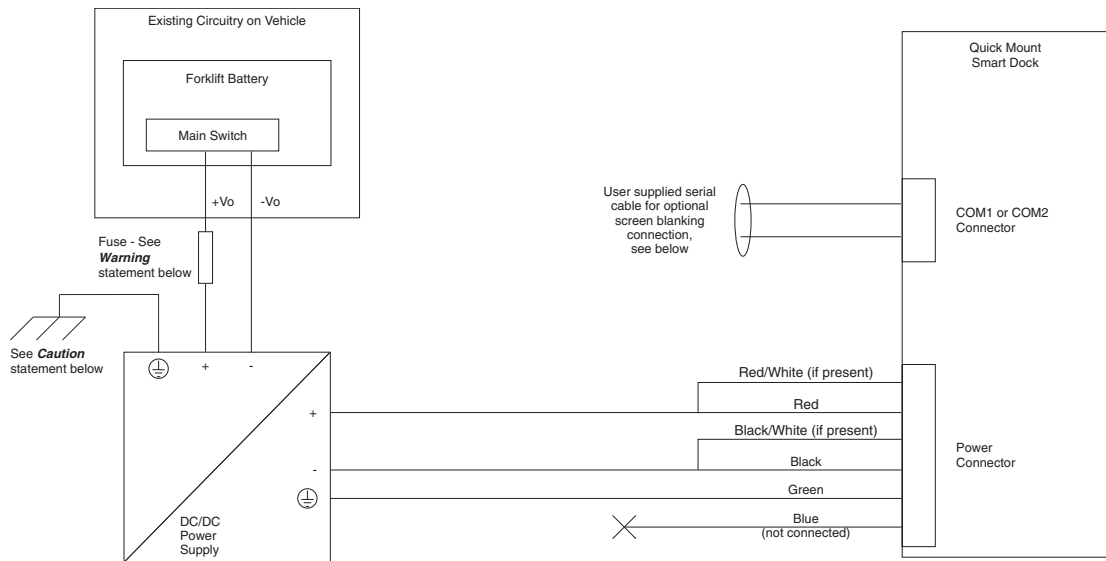
**ATTENTION: For uninterrupted power, electrical supply connections should not be made at any point after the ignition switch of the vehicle.**

14. Use proper electrical and mechanical fastening means for terminating the cable. Properly sized “crimp” type electrical terminals are an accepted method of termination. Select electrical connectors sized for use with 18AWG (1mm<sup>2</sup>) conductors.
15. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate the outer cable jacket.
16. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely. Flip the power switch on the back of the dock to On.

17. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
18. [Place Thor VM3 in the Dock](#) (page 4-2)
19. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch.
20. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
21. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

*Note: Ignition control is not available for trucks over 60VDC.*

### Wiring Diagram



#### CAUTION

**For battery powered vehicles:**

⊕ must be connected to the vehicle chassis ground.

**For internal combustion engine powered vehicles:**

⊕ is connected to the vehicle chassis ground, which can also be battery negative.



#### Fuse Requirements

**WARNING** - For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. Use VM3055FUSE (or equivalent) to install the fuse as shown below:

- For **all voltages**, use the 3A fuse from the kit or a slow blow fuse that has a DC voltage rating greater than the vehicle input voltage.

*Note: For North America, a UL Listed fuse is to be used.*

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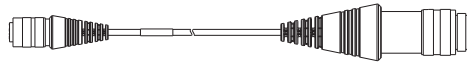
## VX6 / VX7 Adapter Cable

An adapter cable is available to attach the Thor VM3 to a vehicle previously equipped with a VX6/VX7 DC power cable. The adapter cable has a 5-pin connector to match with the VX6/VX7 power supply cable on one end and a 6-pin connector to match to the Thor VM3 on the other end. This section assumes the VX6/VX7 power cable is properly connected to vehicle power. Refer to the VX6 or VX7 Vehicle Mounting Reference Guide for details.



**CAUTION** - Because the VX6/VX7 supports 10-60 VDC power input, **verify input voltages** before using this adapter cable with an existing VX6 or VX7 power connection installation.

To Power Connector on Dock



To VX6/VX7 Power Supply Cable

When this adapter cable is used, there is no provision for an ignition switch input. Therefore the vehicle ignition monitoring function is not available when using this cable.

### Connect to VX6 / VX7 Power Cable

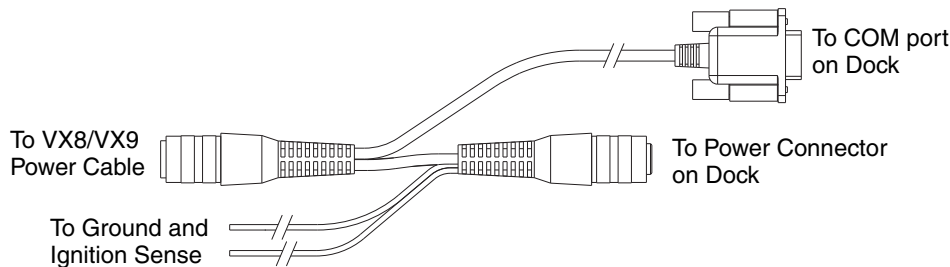
1. Connect the adapter cable to the Thor VM3 power cable by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
2. The cable is rated for a maximum temperature of 105°C (221°F). Therefore, routing this cable it should be protected from physical damage and from surfaces that might exceed this temperature. Cable should be protected from physical damage from moving parts. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
3. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate outer cable jacket.
4. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
5. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
6. [Place Thor VM3 in the Dock](#) (page 4-2)
7. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch.
8. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
9. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

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## Thor VX8 / Thor VX9 Adapter Cable

*Note: This cable is for use with VM1D Standard Dock and VM3D Enhanced Dock. This cable is not needed for VMXD Enhanced Dock.*

An adapter cable is available to attach the Thor VM3 to a vehicle previously equipped with a VX8/VX9 DC power cable. The adapter cable has a 6-pin connector to match the VX8/VX9 power supply cable on one end and a 6-pin connector to match the Thor VM3 on the other end. The cable also has bare wires for ground and ignition sense connection plus a D9 cable to connect to a COM port on the Thor VM3 dock to provide a screen blanking signal. This section assumes the VX8/VX9 power cable is properly connected to vehicle power. Refer to the VX8 or VX9 Vehicle Mounting Reference Guide for details.



### Connect to Thor VX8 / VX9 Power Cable

1. Connect the adapter cable to the Thor VX8/VX9 power cable by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
2. Connect the green wire to vehicle ground:



**For battery powered vehicles:**

*The green wire must be connected to the vehicle chassis ground.*

**For internal combustion engine powered vehicles:**

*The green wire is connected to the vehicle chassis ground, which can also be battery negative.*

3. If ignition control will be used, connect the blue wire to an ignition switched circuit (less than 1mA over input voltage range). If ignition control is not used, the blue wire can be left disconnected,
4. If the VX8/VX9 cable is connected to a screen blanking box or switch, connect the D9 connector to a COM port on the dock.
5. The cable is rated for a maximum temperature of 105°C (221°F). Therefore, when routing this cable it should be protected from physical damage and from surfaces that might exceed this temperature. Cable should be protected from physical damage from moving parts. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
6. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate outer cable jacket.
7. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
8. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
9. [Place Thor VM3 in the Dock](#) (page 4-2)
10. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch if not previously installed.
11. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
12. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

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### **CV61 Adapter Cable**

An adapter cable is available to attach the Thor VM3 to a vehicle previously equipped with a CV61 DC power cable. The adapter cable has a 5-pin connector to match with the VV61 power supply cable on one end and a 6-pin connector to match to the Thor VM3 on the other end. This section assumes the CV61 power cable is properly connected to vehicle power. Refer to the CV61 documentation for details.

To Power Connector on Dock



To CV41 Power Supply Cable

When this adapter cable is used, there is no provision for an ignition switch input. Therefore the vehicle ignition monitoring function is not available when using this cable.

#### **Connect to CV61 Power Cable**

1. Connect the adapter cable to the CV61 power cable by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
2. The cable is rated for a maximum temperature of 105°C (221°F). Therefore, routing this cable it should be protected from physical damage and from surfaces that might exceed this temperature. Cable should be protected from physical damage from moving parts. Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate. Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
3. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate outer cable jacket.
4. Connect the watertight connector end of the power cable to the Thor VM3 dock power connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
5. Secure the power cable to the Thor VM3 using the [Strain Relief Cable Clamps](#) (page 4-16).
6. [Place Thor VM3 in the Dock](#) (page 4-2)
7. If using the [Screen Blanking](#) (page 4-33) feature, install the screen blanking box or switch.
8. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
9. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

## Screen Blanking

Prerequisite: The steps outlined in either [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-19), [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-24) or [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-27) have been completed.

Screen blanking is accomplished by either a Screen Blanking Box or a user supplied switch.



**CAUTION** - For installation by trained service personnel only.



**CAUTION** - For proper and safe installation, the input power lead to the Screen Blanking Box requires a 3 Amp maximum time delay (slow blow) high interrupting rating fuse. Note: For North America, a UL Listed fuse is to be used.

## Screen Blanking Cable

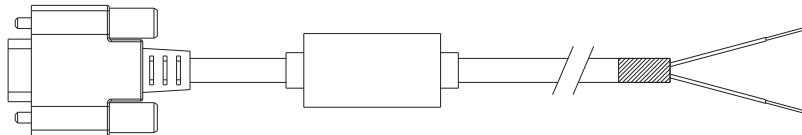
Refer to [ZoomZone](#) (page 5-42) to configure the Thor VM3 for screen blanking.

When routing any additional cables for screen blanking:

- Route the cable the shortest way possible removing any left-over cable
- Fuses and cabling are user supplied. Therefore, route these cables so they are protected from physical damage and from surfaces that might exceed the cable's rated temperature threshold.
- Cable should be protected from physical damage from moving parts
- Do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate
- Always route the cable so that it does not interfere with safe operation and maintenance of the vehicle.
- Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to over tighten and pinch conductors or penetrate outer cable jacket.

## Honeywell Screen Blanking Box Cable

An optional Honeywell Screen Blanking Box Cable is available.



DB9 Female	Function with Screen Blanking Box	Wire color
1 -6, 9	Not Used	
7 (RTS)	Connected to Screen Blanking Box, unswitched side	Black (see note)
8 (CTS)	Connected to Screen Blanking Box, switched side	Gray (see note)

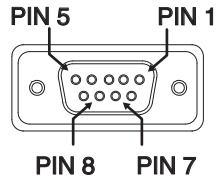
*Note: Wire colors only apply to optional Honeywell Screen Blanking Box Cable, VM1080CABLE. Wire colors may vary in a user-supplied cable.*

The optional Honeywell Screen Blanking Box Cable, VM1080CABLE, is installed as follows:

1. Connect the gray wire of the cable to the switched side of the Screen Blanking Box.
2. Connect the black wire of the cable to the unswitched side of the Screen Blanking Box.
3. Connect the D9 serial connector to either COM1 or COM2 serial port on the Thor VM3 dock.

### User-Supplied Cable

A user-supplied cable can be used as well. Pins 7 and 8 must be connected as detailed below. No other pins are to be connected.

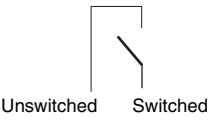


DB9 Female	Function with Screen Blanking Box	Function with Switch
1 -6, 9	Not Used	Not Used
7 (RTS)	Connected to Screen Blanking Box, unswitched side	Connected to Switch
8 (CTS)	Connected to Screen Blanking Box, switched side	Connected to Switch

The user-supplied cable is installed as follows:

1. Connect the wire from Pin 8 of the cable to the switched side of the Screen Blanking Box or to a user-supplied switch.
2. Connect the wire from Pin 7 of the cable to the unswitched side of the Screen Blanking Box or to a user-supplied switch.
3. Connect the D9 serial connector to either COM1 or COM2 serial port on the Thor VM3 dock.

### Screen Blanking Box

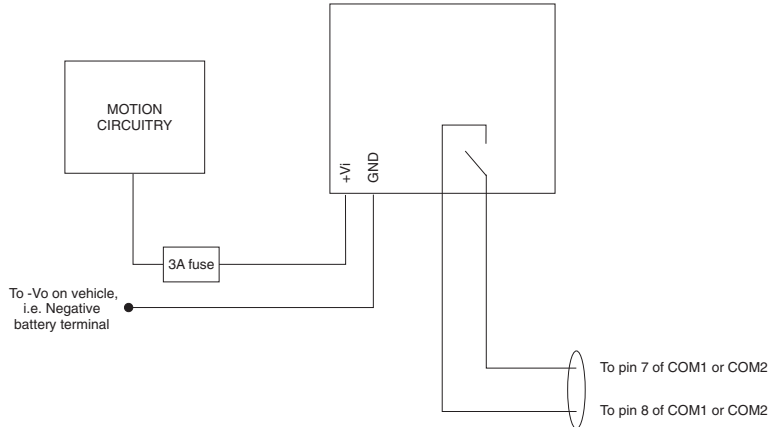
Screen Blanking Box Terminal	Connection
12-xxV	Input from vehicle motion sensing circuitry. Please refer to label on Screen Blanking Box for allowable voltage input range.
GND	DC -
	These two terminals are for connecting a serial cable: <ul style="list-style-type: none"><li>• If using an optional Honeywell screen blanking cable, VM1080CABLE, connect the <i>gray</i> wire to the <i>switched</i> side of the connection and connect the <i>black</i> wire to the <i>unswitched</i> side.</li><li>• If using a user-supplied cable, the cable must be constructed so that Pin 7 (RTS) connects to <i>switched</i> side of the connection and Pin 8 (CTS) connects to the <i>unswitched</i> side.</li></ul>

It is assumed that the motion sensing circuitry in the illustrations below is powered by internal vehicle circuitry.

Please refer to the appropriate illustration below for Screen Blanking Box wiring diagrams.

 **CAUTION** - Do not exceed the maximum input voltage, either 60 or 72VDC, specified on the Screen Blanking Box label when using this configuration.

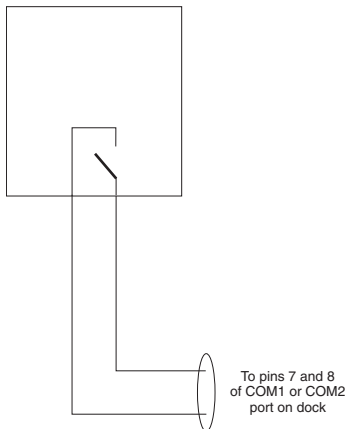




**Note:** The black and gray wire colors in the illustration only apply to the optional Honeywell Screen Blanking Box Cable, VM1080CABLE. The wire colors may be different in a user-supplied cable.

### Screen Blanking with Switch


In applications where it is impractical to use the screen blanking box due to vehicle voltage or lack of a motion sensing signal, screen blanking can be controlled via a user supplied switch or relay that provides an electrical conductive connection on vehicle motion.



Pins 7 and 8 must be connected as shown in the illustration above. No other pins are to be connected.

---


### ***VMXD Enhanced Dock with Thor VX8/Thor VX9 Power Cable***

 This dock is recommended for use when replacing an existing Thor VX8 or Thor VX9 where screen blanking is used. This dock eliminates the need for wiring changes by enabling the existing VX8/VX9 power cable and screen blanking box to be used when the VX8/VX9 is replaced by a Thor VM3 computer. **These instructions are for this dock model only!**


The Ignition Control feature is not available when this dock is used.

 **The external DC/DC converter previously used with the Thor VX8 or Thor VX9 must be left in place to provide ground isolation.**

Connecting the dock power input directly to vehicle power could result in a safety hazard or equipment damage.

 **The cable shielding must be connected to chassis ground.**


Consult the instructions later in this section for the respective power supply type.

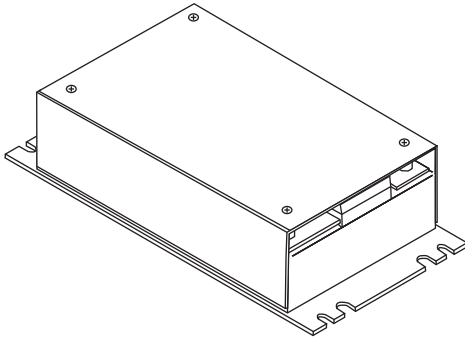
 COM1 is used for screen blanking (via the power cable connector) and is unavailable when the screen blanking box is attached. When a screen blanking box is attached, any external serial device such as a scanner, must be connected to the COM2 port on the dock. If a screen blanking box is not connected via the power cable, the COM1 port on the dock is available for a serial device connection.

Determine the type of power supply used with the previous Thor VX8 or Thor VX9 installation:

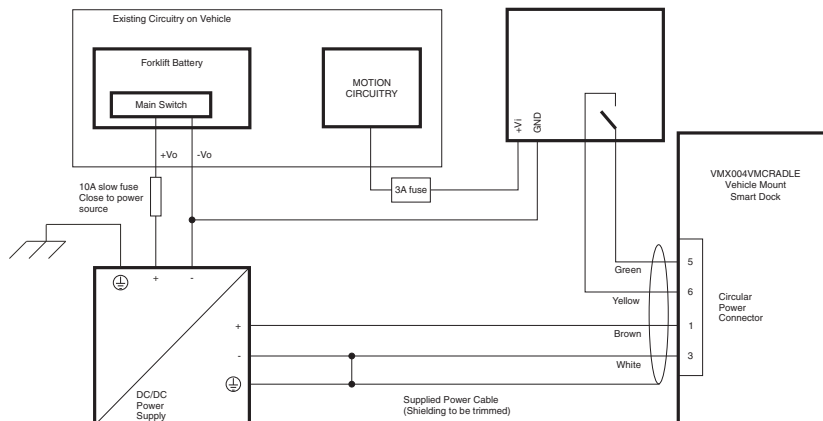
- [DC/DC Power Supply with Screws on Top of Lid](#) (page 4-37)
- [DC/DC Power Supply with Screws on Side of Lid](#) (page 4-38)

## DC/DC Power Supply with Screws on Top of Lid

 Inspect the cable shield to verify it is connected to chassis ground. If there is no connection from the cable shield to chassis ground, one must be added at this time. Use a jumper wire to connect the cable shield to chassis ground as shown below for the appropriate type of power supply installed on the vehicle. A jumper wire, as shown in the illustrations below, may be present to attach the chassis ground to the white wire of the power cable. This wire is not necessary but can be left in place if present. For proper screen blanking, verify the yellow and green wires are attached to the screen blanking box as shown in the illustrations below.




For this model, follow the diagram below to attach the power cable shield to chassis ground:



### **For battery powered vehicles:**

+ is connected to battery positive.

- must be connected to battery negative.

 must be connected to the vehicle chassis ground.

### **For internal combustion engine powered vehicles:**

+ is connected to battery positive.

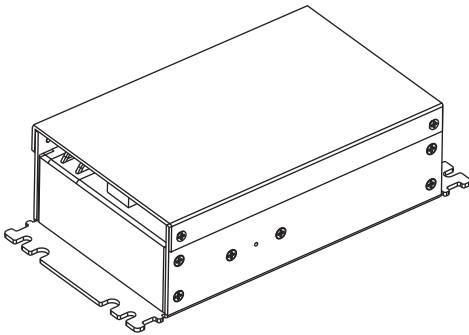
- is connected to battery negative.

 is connected to the vehicle chassis ground, which can also be battery negative.

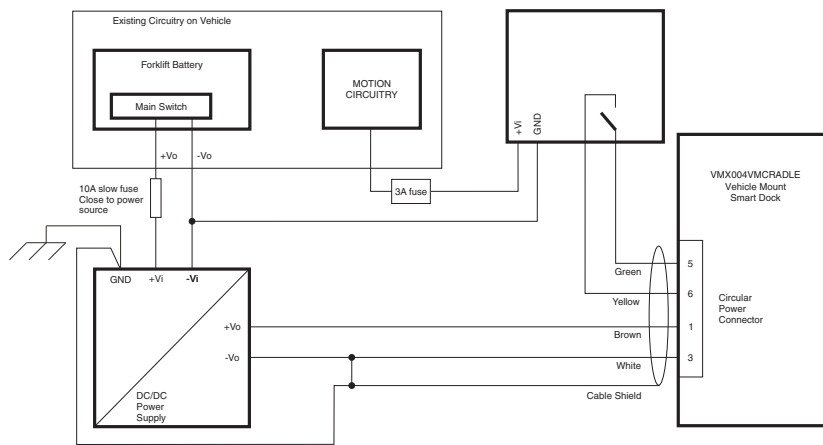
### DC/DC Power Supply with Screws on Side of Lid



Inspect the cable shield to verify it is connected to chassis ground. If there is no connection from the cable shield to chassis ground, one must be added at this time. Use a jumper wire to connect the cable shield to chassis ground as shown below for the appropriate type of power supply installed on the vehicle. A jumper wire, as shown in the illustrations below, may be present to attach the chassis ground to the white wire of the power cable. This wire is not necessary but can be left in place if present. For proper screen blanking, verify the yellow and green wires are attached to the screen blanking box as shown in the illustrations below.



For this model, follow the diagram below to attach the power cable shield to chassis ground:



#### **For battery powered vehicles:**

VIN+ is connected to battery positive.

VIN- must be connected to battery negative.

GND must be connected to the vehicle chassis ground.

#### **For internal combustion engine powered vehicles:**

VIN+ is connected to battery positive.

VIN- is connected to battery negative.

GND is connected to the vehicle chassis ground, which can also be battery negative

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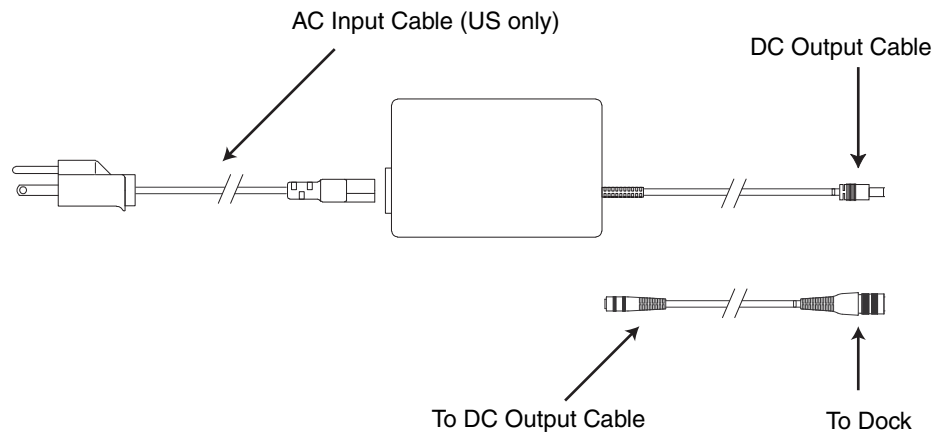
## External AC/DC Power Supply

The optional external AC/DC power supply is for use in environments, such as an office, where DC power is not available.

*Note: The Honeywell-approved AC/DC Power Supply and Adapter Cable are only intended for use in a 25°C (77°F) maximum ambient temperature environment.*

In North America, this unit is intended for use with a UL Listed ITE power supply with output rated 10 – 60 VDC, minimum 15W. Outside North America, this unit is intended for use with an IEC certified ITE power supply with output rated 10 – 60 VDC, minimum 15W.

The external power supply may be connected to either a 120V, 60Hz supply or, outside North America, to a 230V, 50Hz supply, using the appropriate detachable cordset. In all cases, connect to a properly grounded source of supply provided with maximum 15 Amp overcurrent protection (10 Amp for 230V circuits).



### Connect External Power Supply

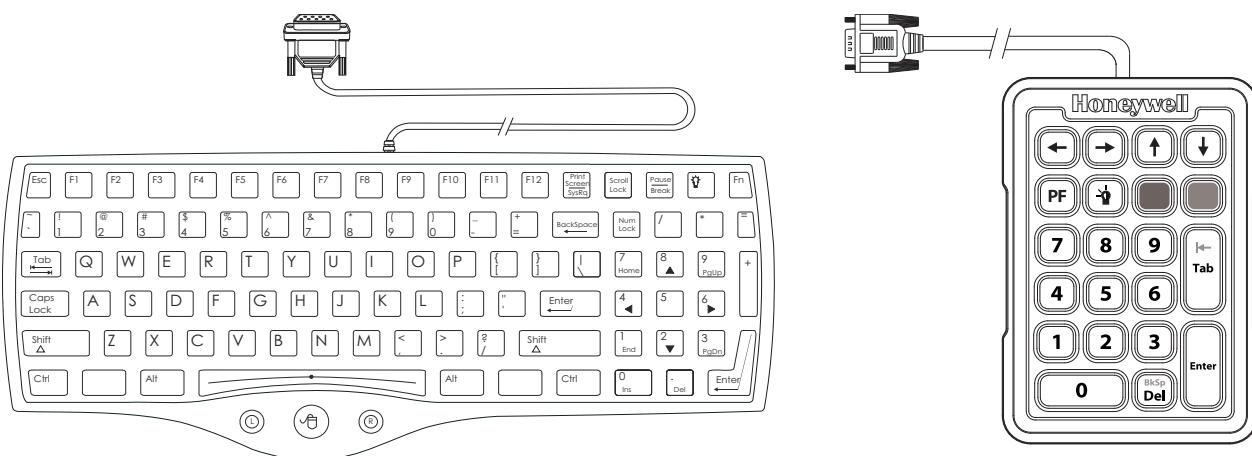
1. Connect the provided detachable cordset (US only, all others must order cable separately) to the external power supply (IEC 320 connector).
2. Plug cordset into appropriate, grounded, electrical supply receptacle (AC mains).
3. Connect the DC Output Cable end to the corresponding connector on the Adapter Cable.
4. Connect the watertight connector end of the Adapter Cable to the Thor VM3 dock Power Connector by aligning the connector pins to the power connector; push down on the watertight connector and twist it to fasten securely.
5. Press the [Power Switch](#) (page 3-4) on the back of the Thor VM3 dock.
6. Press the [Power Button](#) (page 3-4) on the front of the Thor VM3 to turn on the Thor VM3.

## Connect USB Keyboard

There are two external USB keyboard options

- 95-key keyboard (part number **164288-0001**)
- 21-key numeric keyboard.

These USB keyboards have a D9 connector which attaches to the USB port on the Standard Dock or the USB1 connector on the Enhanced Dock.



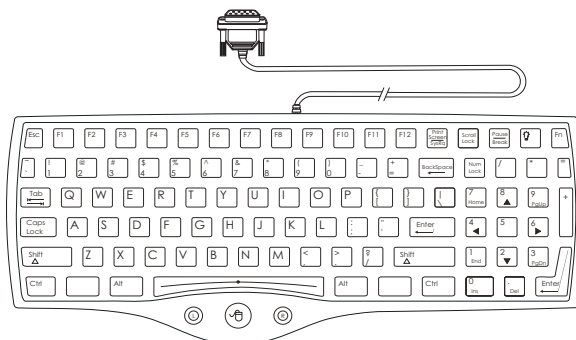
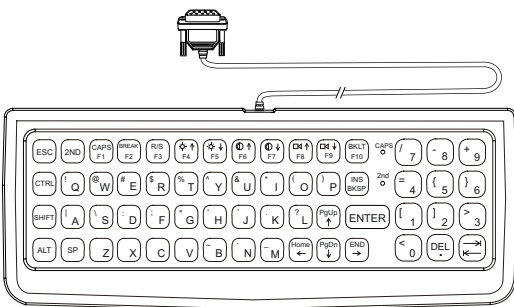
### 95-Key USB Keyboard

Part number **164288-0001**

### 21-Key Numeric USB Keyboard

1. Seat the keyboard cable connector over the USB or USB1 connector on the dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.
3. Secure the cable to the Thor VM3 with [Strain Relief Cable Clamps](#) (page 4-16).

## Connect PS/2 Keyboard



### 60-Key PS/2 Keyboard

Part number **160068-0001**

Requires PS/2 to USB adapter cable

Not supported on the Thor VM3 with VM1D Standard Dock

*Note: The keyboard backlight must be turned on manually. It does not come on automatically at boot up.*

### 95-Key PS/2 Keyboard

Part number **160491-0001**

Requires PS/2 to USB adapter cable

Not supported on the Thor VM3 with VM1D Standard Dock

*Note: The mouse function is not supported with this keyboard.*

*Note: While the 95-key USB keyboard and the 95-key PS/2 keyboard look similar the installation procedure is different.*

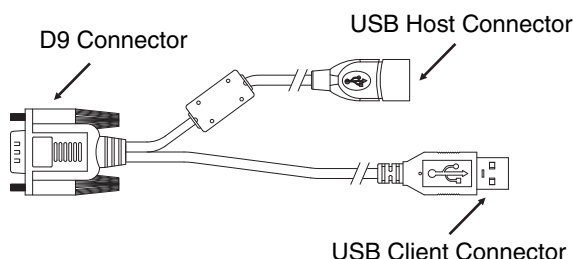
A legacy PS/2 keyboard (used with VX6, VX7, Thor VX8 or Thor VX9), available in either 60-key or 95-key versions can be used with the Thor VM3 via a PS/2 to USB adapter cable. This function is only supported with the VM3D or VMXD Enhanced Docks. It is not supported with the VM1D Standard Dock.



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## Connect USB Host

### Host / Client Y Cable

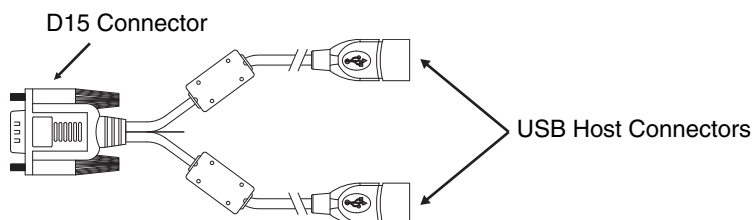


See [USB and USB1 Connector](#) (page 8-6) for connector pinouts.

*Note:* The USB client connection is not available on the Thor VM3.

1. Seat the D9 connector firmly over the USB (Standard Dock) or USB1 (Enhanced Dock) connector on the dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.
3. The USB-host connector provides a connector for a USB device such as a USB thumb drive.
4. Secure the cables to the Thor VM3 with [Strain Relief Cable Clamps](#) (page 4-16).

### Dual Host Y Cable



See [USB2 Connector](#) (page 8-7) for connector pinouts.

1. Seat the D15 connector firmly over the USB2 (Enhanced Dock only) connector on the dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.
3. The USB-host connectors provide a connector for a USB device such as a USB thumb drive.
4. Secure the cables to the Thor VM3 with [Strain Relief Cable Clamps](#) (page 4-16).

### USB Scanner

A USB scanner may be attached to the USB host port.

If using [Enterprise Settings](#) (page 5-11) to configure the USB scanner, it may be necessary to unplug the scanner and plug it back into the USB port in order for the auto-detect function to display the scanner settings.

## Connect USB Client

*Note:* The USB client connection is not used on the Thor VM3.

## Connect Serial Device

*Note:* Pin 9 of the desired COM port must be configured to provide +5V or RI as needed for the connected device. See the [Options](#) (page 5-18) control panel for details.

*Note:* By default, COM1 and COM2 ports are used by Enterprise Data Collection. To use a COM port for screen blanking, access [Enterprise Settings](#) (page 5-11) and set **Data Collection > Tethered Scanners > Tethered Scanner (COMx) - Enable Scanner Port** to off (where COMx is either COM1 or COM2).

See [COM1 and COM2 Connector](#) (page 8-5) for connector pinouts.



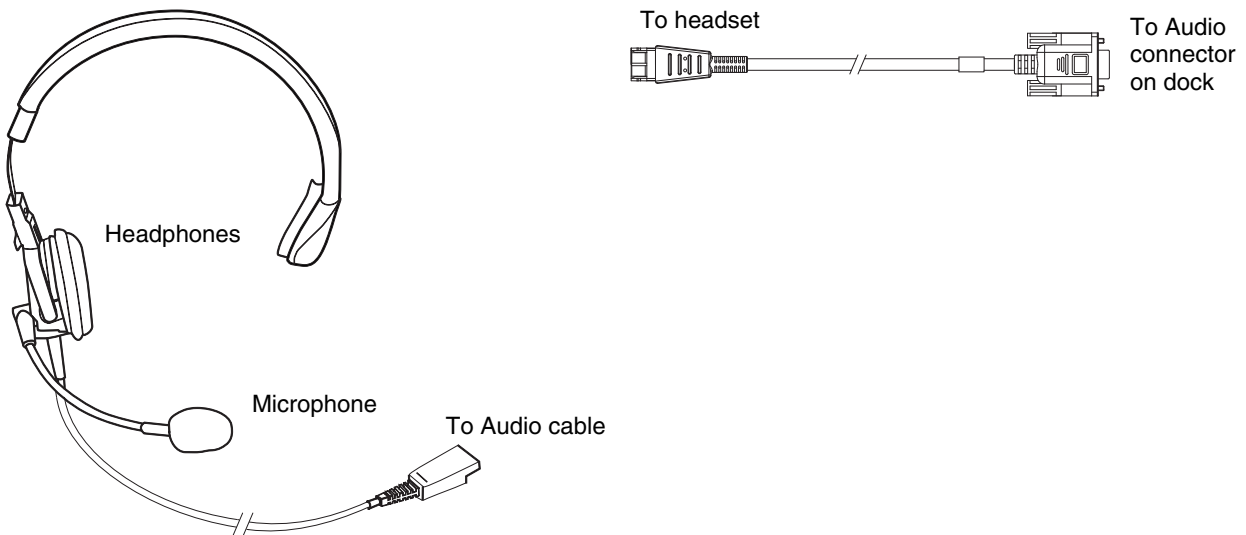
1. Seat the cable end connector firmly over the serial COM port on the dock.
2. Turn the thumbscrews in a clockwise direction. Do not over tighten.
3. Secure the cables to the Thor VM3 with [Strain Relief Cable Clamps](#) (page 4-16).
4. Connect the other cable end to the desired serial device.

### ***Connect a Tethered Scanner***

1. The scanner cable is attached to either the COM1 or COM2 port on the dock.
2. Connect the serial cable for the scanner as directed above.
3. When the Thor VM3 is powered on, it provides power to the serial scanner.
4. Configure the Data Collection (DC) Wedge to manipulate scanned data as desired.

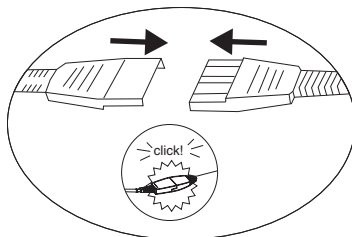
### ***Connect Headset Cable***

The CANbus/Audio connector supports a headset adapter cable or a CANbus cable. The Thor VM3 does not support connecting audio and CANbus simultaneously.



See [CANbus / Audio Connector](#) (page 8-10) for connector pinouts.

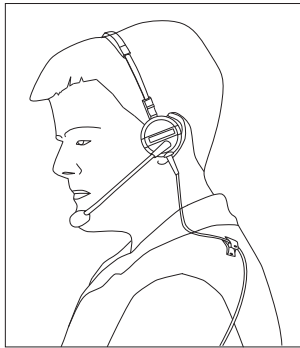
1. Seat the D15 cable end connector firmly over the CANbus/Audio Connector on the dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.



3. Slide the cable ends together until they click shut. Do not twist or bend the connectors. The Thor VM3 internal microphone and speakers are automatically disabled when the headset is connected.

---

### ***Adjust Headset / Microphone and Secure Cable***



The headset consists of an earpiece, a microphone, a clothing clip and a cable.

1. Do not twist the microphone boom when adjusting the microphone. The microphone should be adjusted to be about two finger widths from your mouth.
2. Make sure the microphone is pointed at your mouth. Note the small “Talk” label near the mouthpiece. Make sure the Talk label is in front of your mouth. The microphone cable can be routed over or under clothing.
3. Follow the safety guidelines below when wearing the headset.

#### ***Under Clothing***

- Leave the cable exposed only at the top of the collar.
- Be sure to leave a small loop of cable to allow movement of your head.

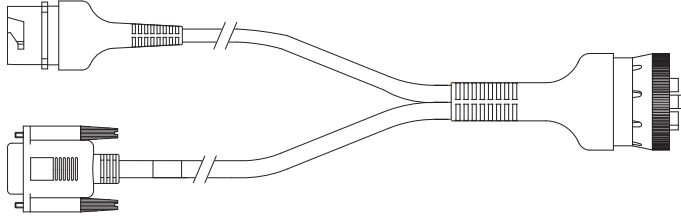
#### ***Over Clothing***

- Use clothing clips to hold the cable close to your body.
- Tuck the cable under the belt, but leave a small loop where it goes under the belt.
- Do not wear the cable on the front of your body. It may get in your way or get caught on protruding objects.

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## **Connect CANbus Cable**

The CANbus/Audio connector supports a headset adapter cable or a CANbus Y cable. The Thor VM3 does not support connecting audio and CANbus simultaneously.



See [CANbus / Audio Connector](#) (page 8-10) for connector pinouts.

1. Seat the D15 cable end connector firmly over the CANbus/Audio Connector on the dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.
3. The CANbus Y cable has a 9 pin F SAE J1939 (Deutsch) and 9 pin M SAE J1939 (Deutsch) connector. Connect the appropriate cable connector as needed.

## **Install External Antenna**

The external antenna cannot be used by devices with an internal antenna.

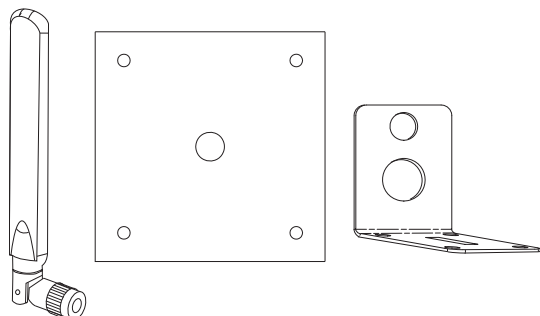
1. Remove the rubber cap, if present, from the antenna connector before connecting an external antenna.
2. Place the antenna over the antenna connector. If only one antenna is used, be sure to connect it to the Wi-Fi Main connector.
3. Push down and twist the antenna base clockwise until secure.
4. Repeat for second antenna, if used.

---

## ***Install Remote Antenna***

Remote antennas are available for the 802.11 WLAN radio, the WWAN radio and the GPS.

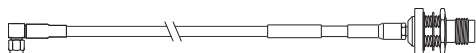
### ***802.11 Remote Mount Antenna***



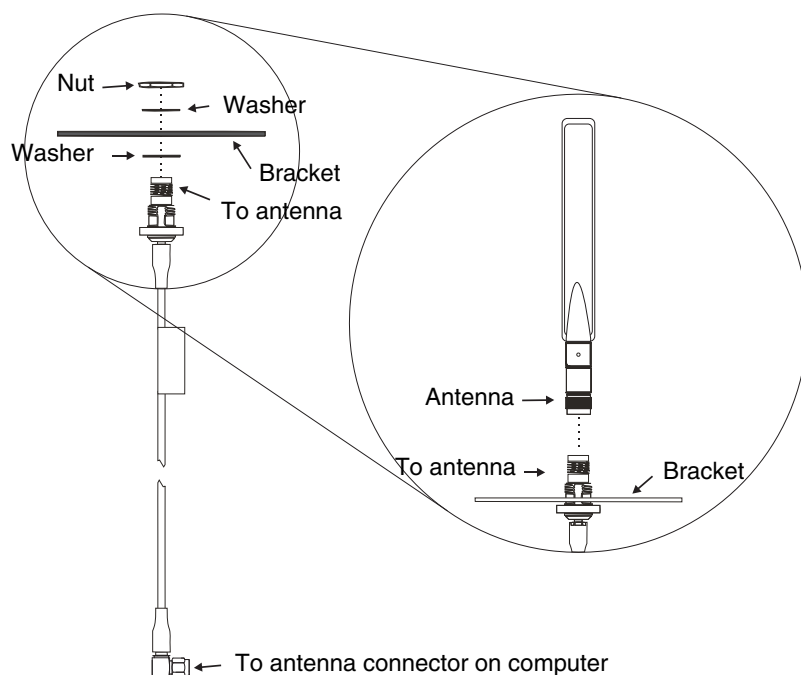
The Remote Antenna Installation Kit consists of two brackets (base plate and right angle), cable, and antenna. Tools are not included.

The desired remote antenna bracket is mounted on the top of a forklift, truck or other vehicle and cabled to the Thor VM3 inside the vehicle.

The Vehicle Remote Mount Antenna cannot be used by devices with an internal antenna.

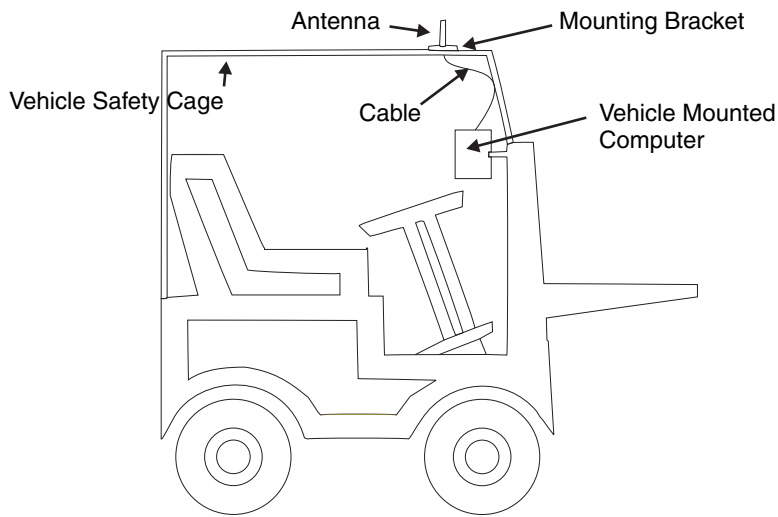


### ***Components and Mounting Diagram***



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### **Typical Installation**



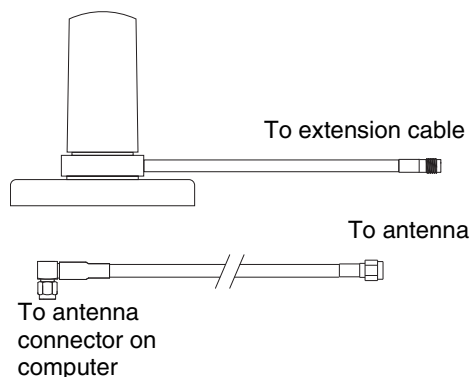
### **Mounting Instructions**

1. Attach and secure the desired mounting bracket to the highest point on the safety cage, following these precautions:
  - The plate must be mounted so the antenna is not damaged while the vehicle or any of its parts are moving.
  - The antenna mounting portion of the bracket must be parallel to the floor.
  - If using two antennas, they must be mounted at least 12 inches (304.8mm) apart.
2. Attach the female connector of the coaxial cable to the antenna connector on the vehicle mounted Thor VM3.
3. Secure the whip antenna to the mounting bracket.
4. Connect the antenna cable to the whip antenna.
5. Use cable ties to secure the coaxial cable to the vehicle as necessary. Make sure the cable is routed so it is not damaged by any moving parts of the vehicle.
6. Connect the cable to the antenna connector (Wi-Fi Main or Wi-Fi Aux) on the Thor VM3. If only one antenna is used, be sure to connect it to the Wi-Fi Main connector.
7. Repeat the steps above for the second 802.11 antenna.

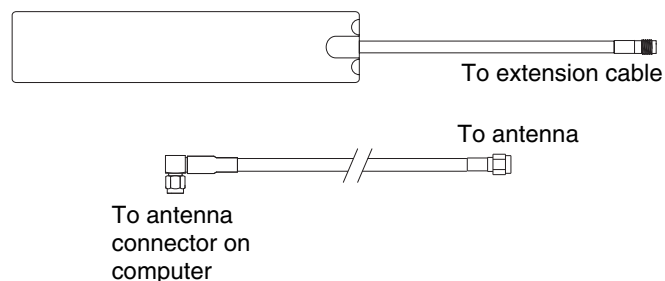
## WAN Remote Mount Antenna

The WAN remote mount antenna can be either a magnetic mount or an adhesive mount antenna.

### Magnetic Mount WAN Antenna



### Adhesive Mount WAN Antenna

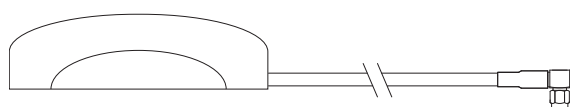


The Remote Antenna Installation Kit consists of the WAN antenna and an extension cable. The remote antenna is mounted on the top of a forklift, truck or other vehicle and cabled to the Thor VM3 inside the vehicle.

1. Locate a mounting position on highest point on the vehicle, following these precautions:
  - The antenna must be mounted so the antenna is not damaged while the vehicle or any of its parts are moving.
2. Clean the area where the antenna is to be mounted.
3. If using an adhesive mount antenna, remove the protective backing paper from the adhesive on the antenna.
4. Position the antenna on the vehicle.
5. Attach the one end of the coaxial cable to the antenna and the other end to the Mobile Net WWAN connector on the vehicle mounted Thor VM3.
6. Use cable ties to secure the coaxial cable to the vehicle as necessary. Make sure the cable is routed so it is not damaged by any moving parts of the vehicle.

## GPS Remote Mount Antenna

The external GPS antenna is an adhesive mount antenna.



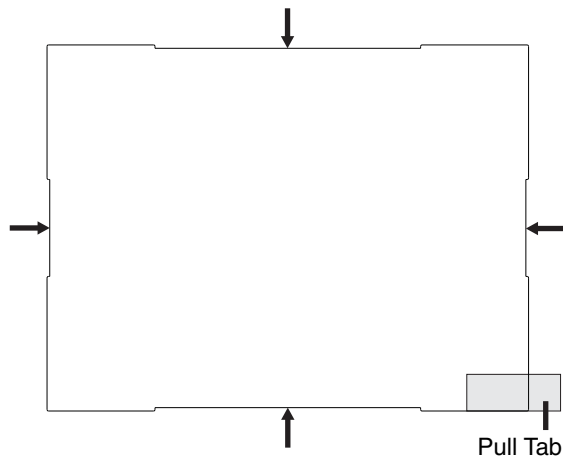
The Remote Antenna Installation Kit consists of the antenna and an integrated cable. The remote antenna is mounted on the top of a forklift, truck or other vehicle and cabled to the Thor VM3 inside the vehicle.

1. Locate a mounting position on highest point on the vehicle, following these precautions:
  - The antenna must be mounted so the antenna is not damaged while the vehicle or any of its parts are moving.
2. Clean the area where the antenna is to be mounted.
3. Remove the protective backing paper from the adhesive on the antenna and position the antenna on the vehicle.
4. Attach the connector on the coaxial cable to the GPS antenna connector on the vehicle mounted Thor VM3.
5. Use cable ties to secure the coaxial cable to the vehicle as necessary. Make sure the cable is routed so it is not damaged by any moving parts of the vehicle.

---

## Apply Touch Screen Protective Film

The optional Thor VM3 touch screen protective film is shipped in packs of 10. The protective film is flexible and treated with an anti-glare coating on the outer surface.



The protective film is slightly larger than the Thor VM3 touch screen, however the notches on the edge of the protective film (indicated by the arrows) correspond to the display size of the Thor VM3. The protective film is not adhesive. The corner edges are designed to fit between the Thor VM3 display and the display housing to hold the protective film in place.

A protective backing is applied to the rear surface of the protective film. A pull tab is attached to the protective backing for easy removal of the protective backing from the film.

### Installation

1. Make sure the touch screen is clean and dry before installation. See [Cleaning](#) (page 4-2) for instructions on suitable cleaning agents.
2. Pull the release tab to separate the protective backing from the rear of the protective film. Avoid touching the rear side of the protective film while removing the liner.
3. Place the rear side of the protective film against the Thor VM3 display, roughly centering the protective film over the display.
4. Slide the protective film until one corner can be slid back between the touch screen and the display housing as the protective film is re-centered on the display. It may be necessary to press the edges of the protective film against the display to ensure the entire edge slides under the display housing. It is easiest to start with one of the bottom corners.
5. Slide the protective film away from the other bottom corner. The film may bulge slightly away from the Thor VM3 as it is being slid. Only slide the protective film enough so that the protective film can slide under the display housing on that corner when the protective film is returned to center.
6. Repeat with each of the top corners, sliding the protective film away from the corner just enough that the protective film can slide under the display housing when the protective film is returned to center.
7. It may be necessary to flex the protective film during the install, however use care not to flex the protective film so much that the protective film kinks.
8. Once all corners are secure under the display housing, adjust the protective film, if necessary, so it is centered on the touch screen.

### Removal

1. To remove the protective film, slide the protective film in one direction until the edge clears.
2. Lift up on the edge of the protective film so it does not slide between the touch screen and display housing when the protective film is slid back to the center.
3. Repeat until all edges are free and remove the protective film.

## Disconnect UPS Battery



**CAUTION** - The UPS battery must be disconnected before you ship the Thor VM3 or [Replace Front Panel](#) (page 4-54).

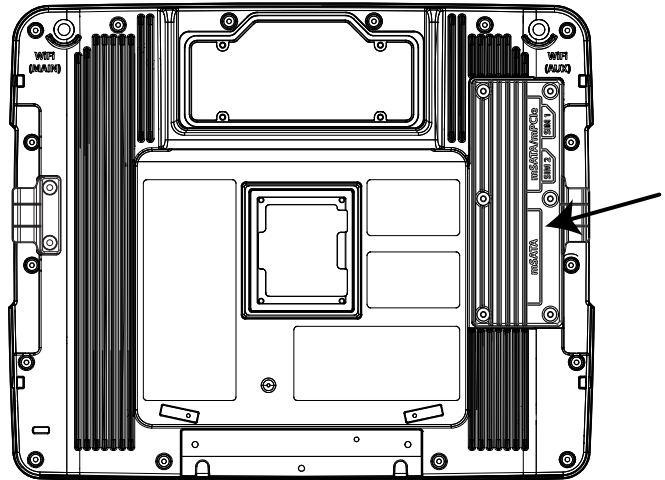
### Equipment Required

The following equipment is user-supplied:

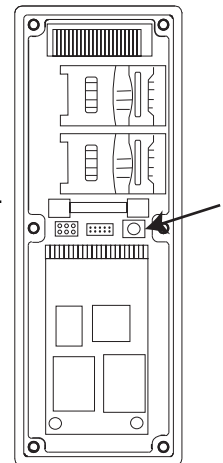
- Torquing tool capable of measuring inch pounds
- #2 Phillips screwdriver bit

### Disconnect Procedure

1. For convenience, the Thor VM3 can be removed from the dock, though it is not necessary.
2. If the Thor VM3 remains in the dock, disconnect the power cable from the dock.
3. Shutdown the Thor VM3.
4. Place the Thor VM3 face down on a stable surface.
5. Use a #2 Phillips bit to loosen the captive M3 screws on the access panel with the mSATA and SIM labels. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.



6. Locate the small push button located just below the SIM card installation slot.
7. Press the push button to disconnect the UPS. The UPS battery maintains its charge but is disconnected from the power circuitry of the Thor VM3.
8. Reattach the access panel, torquing the M3 screws to  $7.0 \pm 0.5$  inch pounds using a #2 Phillips bit.
9. When the Thor VM3 is attached to external power, the UPS battery is automatically reconnected.
10. Restart the Thor VM3.





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## Install mSATA Drive

*Note:* [Install SIM Card\(s\)](#) (page 4-52) before installing the mSATA drive.

An mSATA card slot is provided for storage expansion.



- Only mSATA drives with pin 43 not connected are supported.
- Connecting an mSATA drive with connector pin 43 grounded can result in system instability such as a failure to boot or non-functional accessories such as keyboard or mouse.

### Equipment Required

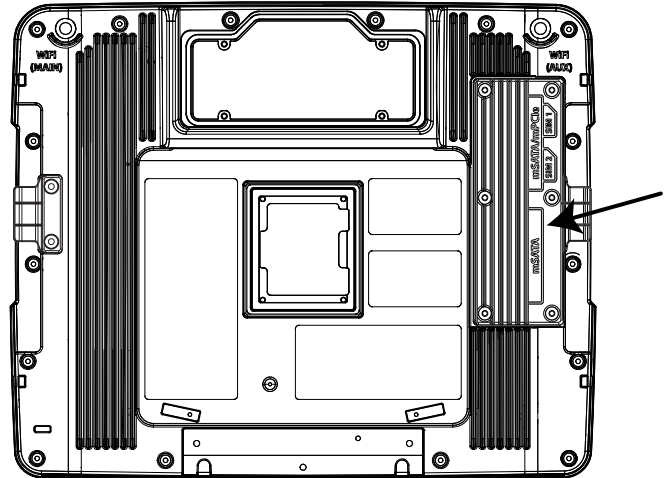
The following equipment is user-supplied:

- Torquing tool capable of measuring inch pounds
- mSATA card

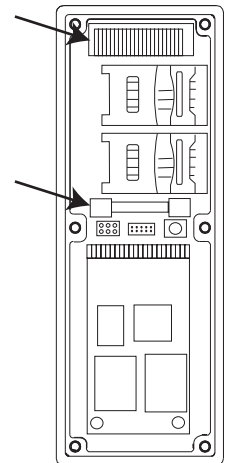
### Installation Procedure

*Note:* [Install any SIM cards](#) before installing the mSATA drive.

1. Shutdown the Thor VM3.
2. Remove the Thor VM3 from the dock.
3. [Disconnect UPS Battery](#) (page 4-50).
4. Place the Thor VM3 face down on a stable surface.
5. Use a #2 Phillips bit to loosen the captive M3 screws on the access panel with the mSATA and SIM labels. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.



6. Locate the mSATA card installation slot.
7. Tilt the card at a 45° angle and insert the connector end of cards into the slot.
8. Once the connector end is inserted, lower the card until the other end is captured and secured by the anchor pins.
9. Reattach the access panel, torquing the screws to 7.0 ± 0.5 inch pounds.
10. Reinstall the Thor VM3 in the dock.
11. Restart the Thor VM3.
12. When using Windows explorer to view **My Computer**, the mSATA expansion card is identified as **Hard Disk Drive**, usually Drive D:.



---

## Install SIM Card(s)

The Thor VM3 supports two SIM cards for WWAN switching. The Thor VM3 can switch between carriers, but the WWAN connection is lost during this switch as the first carrier must be disconnected before the second carrier can be connected. See [VM3 WWAN Connection Manager](#) (page 6-39) for software configuration.

*Note: The Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system currently supports only a single SIM card. See [Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system](#) (page 6-39) for more information.*

*Note: The SIM card is not hot-swappable. After installing or removing a SIM card, the Thor VM3 must be rebooted for the change to take effect.*

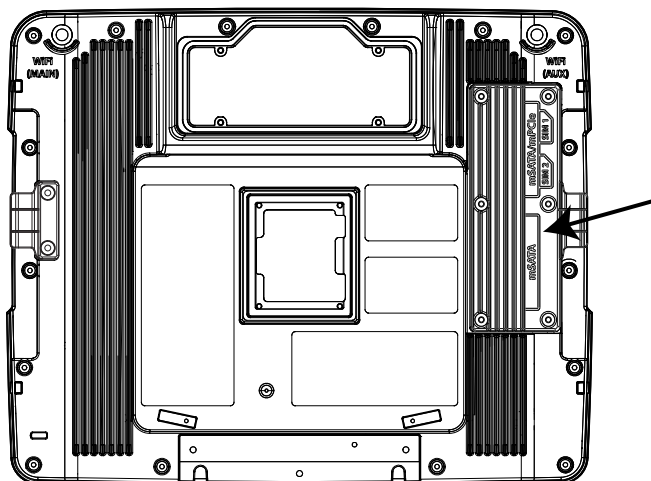
### Equipment Required

The following equipment is user-supplied:

- SIM card(s) for desired carrier(s)
- Torquing tool capable of measuring inch pounds
- #2 Phillips screwdriver bit

### Installation Procedure

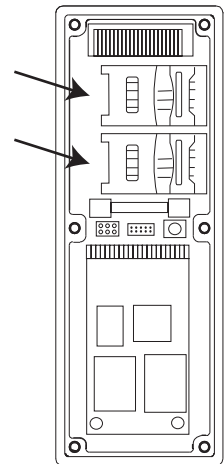
1. Shutdown the Thor VM3.
2. Remove the Thor VM3 from the dock.
3. [Disconnect UPS Battery](#) (page 4-50).
4. Place the Thor VM3 face down on a stable surface.
5. Use a #2 Phillips bit to loosen the captive M3 screws on the access panel with the mSATA and SIM labels. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.



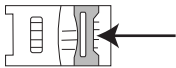
6. Locate the SIM card holders. The [VM3 WWAN Connection Manager](#) (page 6-39) identifies the top slot (the slot closest to the top of the Thor VM3 as slot 1 (SIM 1) and the lower slot as slot 2 (SIM 2).

*Note: If an mSATA drive has been installed, it is necessary to remove the drive before installing the SIM card(s).*

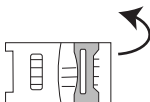
*Note: The Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system currently supports only a single SIM card. See [Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system](#) (page 6-39) for more information.*



7. Slide the silver retainer clip toward the center of the Thor VM3.



8. After the clip is slid in, lift the outer edge of the SIM holder so it is at a 45° to 90° angle (compared to the circuit board on which it is mounted).

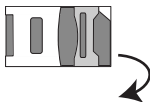


9. Insert the SIM card into the SIM holder.

*Note: The SIM card does not have a “spring lock” type holder. Slide the SIM card into the holder but do not push it expecting it to lock into place. The SIM card will be held in place when the card holder is closed.*



10. Lower the SIM holder to back to its flat position.



11. Slide the silver retainer clip back toward the outside edge of the Thor VM3. This locks the SIM card in place.



12. Reattach the access panel, torquing the screws to 7.0 ± 0.5 inch pounds.
13. Reinstall the Thor VM3 in the dock.
14. Restart the Thor VM3.

---

## Replace Front Panel

### Front Panel Options

The front panel of the Thor VM3 is field replaceable. The front panel assembly contains the keypad, touch screen and optional defroster. Should any of these components fail, the front panel assembly can easily be replaced to reduce down-time. The replacement front panel is available in several configurations:

- Standard temperature with resistive touch screen
- Cold storage with resistive touch screen
- Standard temperature with PCAP touch screen
- Outdoor with resistive touch screen
- Outdoor with PCAP touch screen

*Note: The resistive and PCAP touch screens each use a unique stylus. If switching between touch screen types, be sure to swap the stylus as well.*

### Equipment Required

The following equipment is user-supplied:

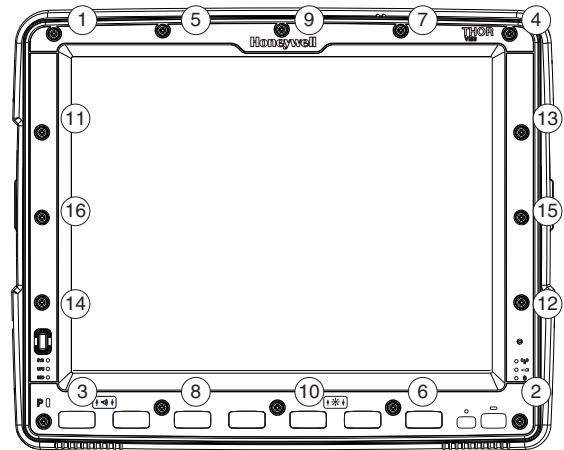
- Torquing tool capable of measuring inch pounds
- #2 Phillips screwdriver bit

### Replacement Procedure

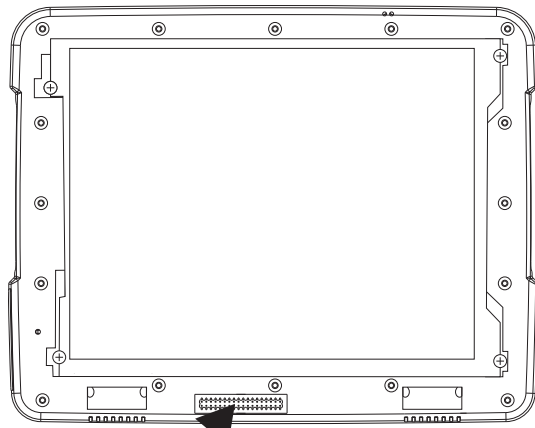


**CAUTION** - Before replacing the Thor VM3 front panel, [Disconnect UPS Battery](#) (page 4-50).

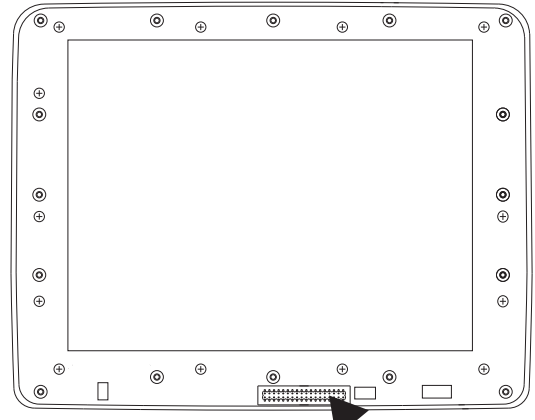
1. Place the Thor VM3 on a clean, well-lit surface before performing the front panel replacement.
2. Remove the Thor VM3 from the dock.
3. [Disconnect UPS Battery](#) (page 4-50).
4. Loosen the sixteen (16) captive M3 screws holding the front panel. Use a #2 Phillips bit.



- 
5. Carefully lift the front panel away from the device.



Wiring Connector  
on Thor VM3



Wiring Connector  
on Front Panel

6. Position the replacement front panel so wiring connector on the back of the front panel lines up with the connector on the Thor VM3.
7. Gently press the front panel into place.
8. Tighten the sixteen (16) captive M3 screws. In the order shown in the top figure above, use a #2 Phillips bit and torque the screws to  $7 \pm 0.5$  inch pounds.
9. Reinstall the Thor VM3 in the dock.
10. When the Thor VM3 is placed in the powered dock, the UPS battery automatically reconnects.
11. Restart the Thor VM3.
12. If adding or removing a defroster, update the Thor VM3 configuration by selecting **Screen Control**. It may be necessary to change the control panel to **Large Icon** or **Small Icon** view before selecting **Screen Control**. Tap the **Detect Defroster** button and follow any on-screen prompts.
13. Close any open control panel windows.
14. If the replacement touch screen contains a resistive touch screen, perform a [Touch Screen Calibration](#) (page 5-44).
15. The Thor VM3 is ready for use.

---

## Microsoft Windows Setup and Configuration

After the system files are processed, Microsoft Windows begins to load. Windows maintains a System Registry and INI files. Standard Windows configuration options apply to the Thor VM3. Configuration options are located in the System Tray or the Control Panel:

- The System Tray contains icons for adjusting the time, date or volume level.
- The Control Panel contains icons for many other configuration options, such as Power Management, Regional and Language Options, etc.
- The Control Panel icons are also used to add, delete or modify software installed on the Thor VM3.

### Drive C Folder Structure

Microsoft Windows is installed in the \Windows folder. In addition, Microsoft Windows creates other folders and several subfolders. For more information on the folder structure, please refer to commercially available Microsoft Windows OS reference guides.

### Software Loaded on Drive C

The software loaded on the Thor VM3 computer includes:

- BIOS
- Microsoft operating system (Windows 10 Enterprise)
- device drivers
- radio software, see [WLAN Wireless Configuration Utility \(WCU\)](#) (page 6-1) and [VM3 WWAN Connection Manager](#) (page 6-39)
- touch screen software

The software installed on the Thor VM3 is summarized below.

*Note: Due to the complex folder structure and System Registry under Microsoft Windows, software should not be removed manually. Instead use the Windows Control Panel.*

### Microsoft Windows

Microsoft Windows is installed in the \Windows subfolder, which is the Windows default. In addition, Windows places files in other folders and subfolders during installation. For more information, please refer to commercially available Microsoft Windows OS user guides.

### Device Drivers

Device drivers are installed for all installed hardware options, such as the display, touch screen, radios, etc. For more information on Microsoft Windows device drivers, please refer to commercially available Windows OS reference guides.

### Radio Software

The Thor VM3 is delivered with the radio software installed. Because the Thor VM3 uses a Microsoft Windows operating system, the radio installation includes Windows device drivers.

### Touch Screen Software

Software is installed for calibrating the standard resistive touch screen. See [Touch Screen Calibration](#) (page 5-44) for more information.

Touch screen calibration is not necessary with the optional Projective Capacitance (PCAP) touch screen.

---

## **RFTerm**

 (Start) > All Apps > RFTerm

Optional terminal emulation software. The application can also be accessed by double-clicking the RFTerm desktop icon.



*It is necessary to run RFTerm as an administrator when modifying settings because RFTerm must be able to access and make changes to the Windows registry.*

*Rather than selecting to run as administrator each time, right-click on the RFTerm icon and select **Properties**. Tap the **Compatibility** tab and check **Run this program as an administrator**. This modification affects the current user only unless **Change settings for all users is tapped** before changing the privilege level.*

## **Enterprise Client Pack**

There are several components of the Enterprise Client Pack installed on the Thor VM3. For more information on these programs visit the Thor VM3 product page at [www.honeywellaidc.com](http://www.honeywellaidc.com).

### **Enterprise TE**

 (Start) > All Apps > Honeywell > Enterprise TE

Optional terminal emulation software. The application can also be accessed by double-clicking the Enterprise TE desktop icon.

### **Enterprise Browser**


 (Start) > All Apps > Honeywell > Enterprise Browser

Optional lock-down web client software. The application can also be accessed by double-clicking the Enterprise Browser desktop icon.

Enterprise Browser is designed for users running web-based applications to limit access to other applications, web sites, or other parts of the operating system

Enterprise Browser can be used alone or with Launcher.

### **Launcher**

 (Start) > All Apps > Honeywell > Launcher

Optional lock-down menu software. The application can also be accessed by double-clicking the Launcher desktop icon.

End users must log in and can only access authorized programs.

Launcher can be used alone or with Enterprise Browser.

## **CloneNGo**

To launch CloneNGo, right-click on the CloneNGo icon on the desktop and select **Run as Administrator**.

For information on using CloneNGo on the Thor VM3, refer to the CloneNGo User Guide available at [www.honeywellaidc.com](http://www.honeywellaidc.com).

## **WLAN Wireless Configuration Utility (WCU)**

Manage the wireless 802.11 client installed in the Thor VM3.

## **VM3 WWAN Connection Manager**

Manage the WWAN network device installed in the Thor VM3.



---

## Control Panel

Most control panel applets on the Thor VM3 are standard Microsoft Windows items. The control panels and other functions listed below may differ from a standard Microsoft Windows equipped PC or laptop.

### About

■ (Start) > All Apps > Windows System > Control Panel > About (Large or Small Icon View)

#### Software

##### Firmware Versions

The Software tab lists the firmware versions installed. The VMT software version and battery, BIOS, Embedded Controller (EC) and Screen MCU firmware versions are shown on this tab.

##### Language

The Software tab displays the localized language version of the OS image. The language is identified as English or + an additional language.

The Thor VM3 may be pre-loaded with an English only OS. Additional languages may be downloaded from the Microsoft Windows update site.

#### Versions

The Versions tab displays the versions of many of the software programs installed. Not all installed software is included in this list and the list varies depending on the applications loaded on the Thor VM3. The Image line displays the revision of the system software installed. Refer to the last three digits to determine the revision level.

##### Versions Tab and the Registry

The Versions tab displays program version details from the registry. Customized information can be displayed by modifying the Registry using the Registry Editor. Use caution when editing the Registry and make a backup copy of the registry before changes are made.

The registry settings for the Version tab are under HKEY\_LOCAL\_MACHINE \ Software \ HSM \ Version in the registry. To add a user application to the Version panel, create a new string value under the HKLM\Software\HSM\Version key. The string name should be the Application name to appear in the Version window. The data for the value should be the version number to appear in the Version window. Version strings can be equal to or less than 254 characters. Because the strings are displayed in a text box, any number can be accommodated, up to the 64K byte text box limitation.

#### Network IP



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## MAC Address

The Network IP tab displays the MAC address of the network card(s) such as the WLAN radio and the Bluetooth module.

## Bluetooth Printing

 (Start) > All Apps > Windows System > Control Panel > Bluetooth Printing (Large or Small Icon View)

To configure your computer for Bluetooth wireless printing, you need to:

- Create an application that opens the wireless printing COM port on your computer. For help, see the Bluetooth Resource Kit, which is part of the Intermecc Developer Library (IDL), available from the Intermecc website at [www.intermec.com/idl](http://www.intermec.com/idl).
- Select the current wireless printer on your computer. For help, see the **Printer Options** section of [Enterprise Settings](#) (page 5-11).

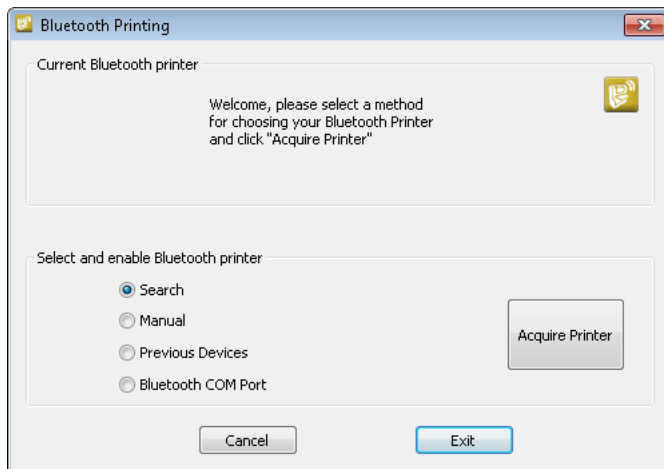
*Note: You can also print wirelessly using Microsoft APIs with Bluetooth extensions for Winsock and Bluetooth. For help, see the Bluetooth Resource Kit documentation.*

The Bluetooth Printing wizard supports the following Honeywell printers:

- PR2
- PR3
- PB31
- PB21
- PB42
- PB50

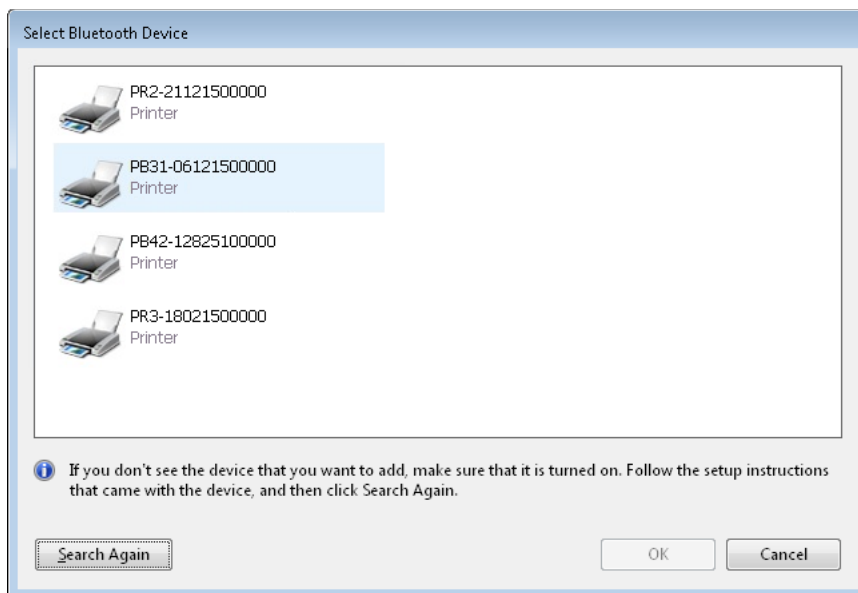
To connect a printer using the search option:

1. Turn on the printer.
2. Select **Bluetooth Printing** from the control panel.



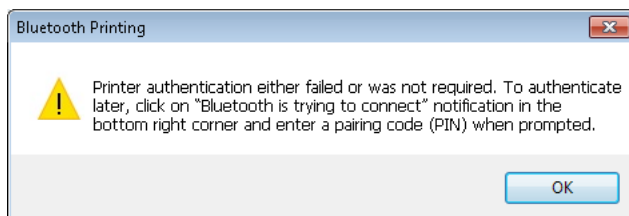
3. Select **Search** and tap **Acquire Printer**.

- 
4. A list of available Bluetooth printers is displayed.



*Note: Due to operating system limitations, other Bluetooth devices may not be filtered out from the printer listing.*

5. If this is the first time a printer is connected, it may take 40-45 seconds for the driver to install.
6. If no error message is displayed, the printer is ready. If an error message such as the one below is displayed, the timeout may have happened before the driver installation has completed.

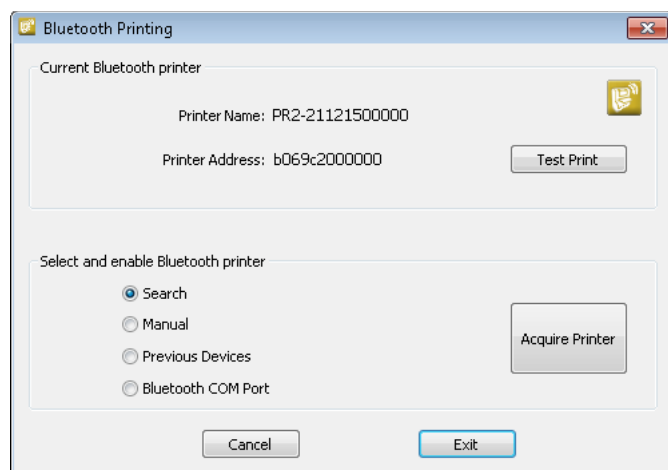


To continue after this error:

- Dismiss the error.
- Return to the Bluetooth Printing control panel and repeat the process starting with step 3.

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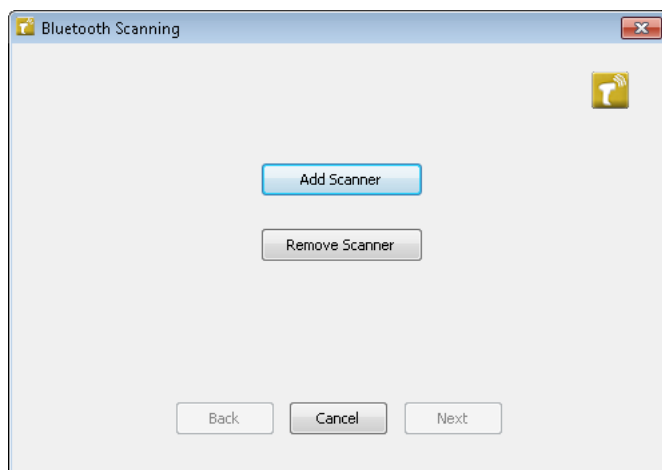
7. The Bluetooth printer is shown. Print a test page if desired.



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## Bluetooth Scanning

■ (Start) > All Apps > Windows System > Control Panel > Bluetooth Scanning (Large or Small Icon View)



There are several options to add a scanner:

- [Quick Connect](#) (page 5-7) - Displays a bar code to be scanned by the desired Bluetooth scanner. The bar code displayed on screen only works for certain Bluetooth scanners. See [Quick Connect](#) (page 5-7) for details and supported scanners.
- [Search](#) (page 5-8) - Initiates a search (discovery) of Bluetooth scanners within range. See [Search](#) (page 5-8) for details.
- [Manual](#) (page 5-9) - Prompts for entry of the **Bluetooth scanner's MAC address**. See [Manual](#) (page 5-9) for details.
- Previous Devices - Displays a list of devices previously discovered Bluetooth scanners.

Some scanners are not supported via Bluetooth Scanning. To connect one of these scanners, see [Adding Other Scanners](#) (page 5-9).

If a scanner does not connect, see [Troubleshooting](#) (page 5-9) for help.

### Quick Connect

There are two different bar codes printed on decals on the side of the Thor VM3.

*Note: The bar codes below are samples. Do not scan these to connect a Bluetooth scanner. Scan the bar code on your device.*

LnkB00078006111AAA



LnkB Bar Code Sample

Bluetooth Quick Connect 007806111AAA



Quick Connect Bar Code Sample

### Using Quick Connect with Preprinted Labels

Scan the applicable bar code as indicated below:

Use the **LnkB bar code** on either side of the Thor VM3 to connect the following scanners:

- Honeywell/LXE 8650 family of Bluetooth ring scanners
- Honeywell Granit 1911i Bluetooth scanner
- Honeywell Granit 1981i Bluetooth scanner
- LXE 88x0 family of Bluetooth scanners

Use the bar code **Quick Connect bar code** on either side of the Thor VM3 to connect the following scanners:

- Intermec SF51 Bluetooth scanner
- Intermec SF61 Bluetooth scanner
- Intermec SR61 Bluetooth scanner

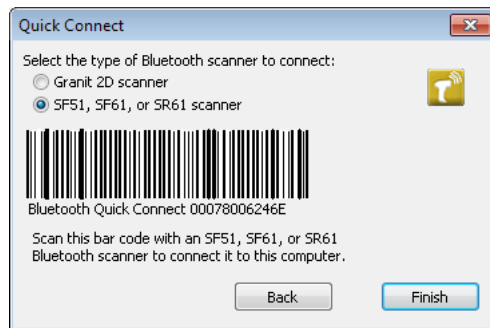
---

## Using Quick Connect with On Screen Bar Code

1. Select **Bluetooth Scanning** from the Control Panel (either large or small icon view option must be selected).
2. Tap **Add Device**.
3. Select **Quick Connect (incoming)**.
4. Tap **Next**.
5. Select the type of scanner to add:

*Note: If this choice is not presented, the on-screen bar code displayed is only valid for SF51, SF61 or SR61 bar code scanners.*

Select **Granit 2D scanner** to:  
Display this bar code

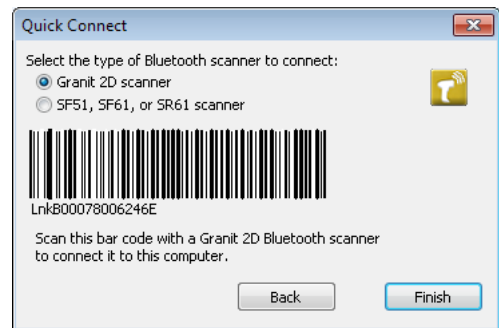


Scan the displayed bar code to connect one of these scanners:

- Honeywell/LXE 8650 family of Bluetooth ring scanners
- Honeywell Granit 1911i Bluetooth scanner
- Honeywell Granit 1981i Bluetooth scanner
- LXE 88x0 family of Bluetooth scanners

*Note: Not all bar code scanners can read the bar code from the screen. If this process fails, use the printed label on the device. See [Using Quick Connect with On Screen Bar Code](#) (page 5-8)*

Select **SF51, SF61 or SR61 scanner** to:  
Display this bar code



Scan the displayed bar code to connect one of these scanners:

- Intermec SF51 Bluetooth scanner
- Intermec SF61 Bluetooth scanner
- Intermec SR61 Bluetooth scanner

## Search

To search for a Bluetooth scanner:

1. Select **Bluetooth Scanning** from the Control Panel (either large or small icon view option must be selected).
2. Tap **Add Device**.
3. Select **Search**.
4. Tap **Next**.
5. Select the scanner from the devices shown.
6. Tap **Next**.

---

## **Manual**

1. Select **Bluetooth Scanning** from the Control Panel (either large or small icon view option must be selected).
2. Tap **Add Device**.
3. Select **Manual**.
4. Tap **Next**.
5. Enter the MAC address of the Bluetooth scanner.
6. Tap **Next**.

## **Troubleshooting**

- The Honeywell Xenon 1902 Bluetooth scanner does not work with Quick Connect. It must be connected using the Search or Manual options.
- Make sure the scanner is in the correct mode. Bar codes to set the mode can be found in the manual provided with the Bluetooth scanner.
  - » The scanner must be a master device to use the Quick Connect option.
  - » The scanner must be a slave device to use the Search or Manual option.
- The Motorola/Symbol LS3578 family of scanners may not support the Quick Connect feature (depending on firmware installed). If Quick Connect does not work, use the other options to connect these scanners.
- If the Honeywell Granit 1911i and Granit 1981i scanners cannot be found with the Search option, scan the **PDAs/Mobility Systems Devices** bar code from the scanner manual and search again.
- If the Honeywell Granit 1911i and Granit 1981i scanners cannot connect using the manual option, scan the **PDAs/Mobility Systems Devices** bar code from the scanner manual then repeat the manual add process again.
- If the Honeywell Granit 1911i and Granit 1981i scanners are not removed after using the Remove option, the auto-reconnect option is enabled on the Granit scanner (this is the default option). To remove the scanner:
  - » Scan the **disable auto-reconnect** bar code from the Granit scanner manual then tap **Remove**, or
  - » Scan BT\_RMV to unlink and disconnect the scanner then tap **Remove**.
- If a Honeywell/LXE ring scanner is not connecting, scan the **Restore Factory Defaults** bar code in the scanner manual and try connecting again.

## **Adding Other Scanners**

Some scanners may not be supported/discoverable by Bluetooth Scanning. In this case, use the Microsoft Bluetooth panels to add the scanner.

*Note: The Microsoft Bluetooth panels should only be used when the scanner cannot be connected with one of the methods listed above.*

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## ***Display***

 (Start) > All Apps > Windows System > Control Panel > Display (Large or Small Icon View)

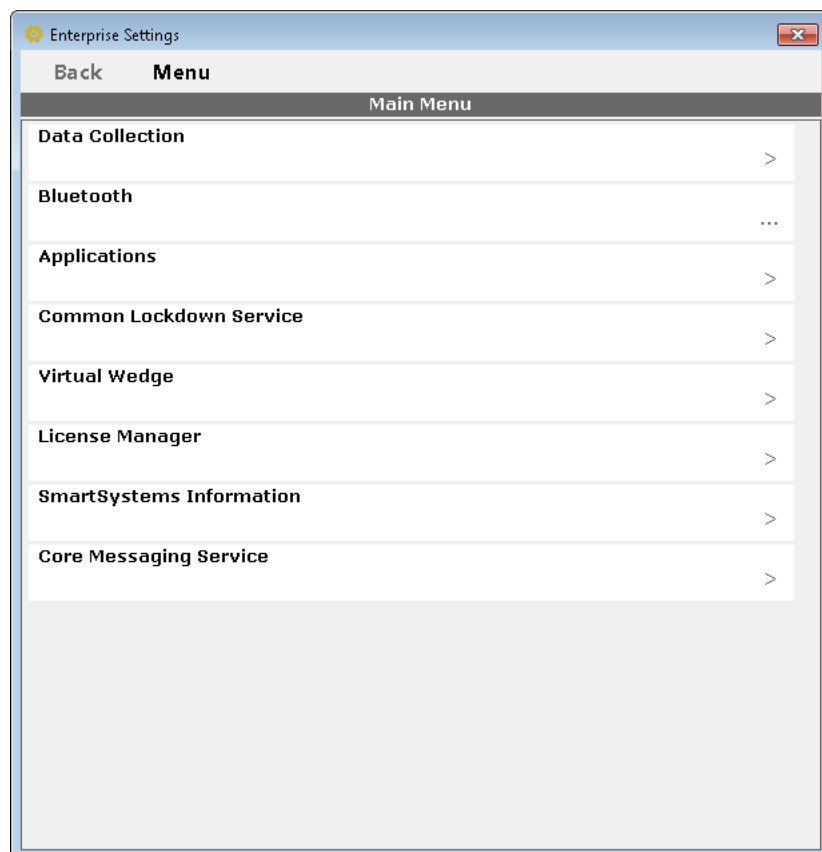
The Thor VM3 supports a maximum 1024 x 768 pixel display resolution.

Screen Blanking via [ZoomZone](#) (page 5-42), [Defroster Control](#) (page 5-40) and [Automatic Brightness Control](#) (page 5-39) are configured on separate control panels.



## Enterprise Settings

■ (Start) > All Apps > Windows System > Control Panel > Enterprise Settings (Large or Small Icon View)



Use Enterprise Settings to configure parameters for Enterprise applications on the computer. You can configure parameters for important functions like data collection and communications.

External bar code scanners are supported by connecting the scanner to a COM port, USB port, or by Bluetooth. The scanners parameters, including bar code symbologies, can be configured using **Enterprise Settings > Data Collection**.

### About the Structure of Enterprise Settings

Use the tables below to help find the parameters in Enterprise Settings that you want to configure. Each table contains the parameters for one of the Enterprise Settings Main Menu options.

If you see > next to a menu option, there are more screens available in the next level. If you see ... next to a menu option, there is only one more screen available.

Most parameters are saved as soon as you tap OK. Some settings require you to reboot the computer for the changes to take effect.

Data Collection	Parameters
<b><i>Tethered Scanners</i></b>	
Tethered/USB-Configure on Connect	Auto-configure on connect: <ul style="list-style-type: none"><li>• Overwrite with computer settings (default)</li><li>• Keep scanner settings</li></ul>
Enable USB Scanner Auto Detect	Off (default)

Tethered Scanner (COM1)	<ul style="list-style-type: none"> <li>• Enable scanner port (On by default, see note below)</li> <li>• Symbologies</li> <li>• Symbology Options</li> <li>• Scanner Settings</li> <li>• Scanner port Settings</li> <li>• Decode Security</li> </ul>
Tethered Scanner (COM2)	<ul style="list-style-type: none"> <li>• Enable scanner port (On by default, see note below)</li> <li>• Symbologies</li> <li>• Symbology Options</li> <li>• Scanner Settings</li> <li>• Scanner port Settings</li> <li>• Decode Security</li> </ul>
<p><i>Note: By default, COM1 and COM2 are enabled as scanner ports. To use the COM port for another use (such as screen blanking), set the Enable Scanner Port to Off for the desired port.</i></p> <p><i>Note: Symbology configuration is supported on Intermec scanners. For all other scanners use the bar codes provided in the scanner manuals to program the symbologies.</i></p> <p><i>Note: Do not select ASCII as the scanner model for an Intermec scanner or the ability to configure the symbology settings with Enterprise Settings is lost.</i></p>	
<b>Bluetooth Scanners</b>	
BT-Configure on Connect	Auto-configure on connect: <ul style="list-style-type: none"> <li>• Overwrite with computer settings</li> <li>• Keep scanner settings</li> </ul>
<b>Bluetooth</b>	<b>Parameters</b>
Power	<ul style="list-style-type: none"> <li>• Off</li> <li>• On (default)</li> </ul>
Discoverable	<ul style="list-style-type: none"> <li>• Disable (default)</li> <li>• Enable</li> </ul>
Connectable	<ul style="list-style-type: none"> <li>• Disable</li> <li>• Enable (default)</li> </ul>
Class of Device	Hardware information (no user entry)
IBT	Hardware information (no user entry)
Radio	Hardware information (no user entry)
Device Address	Hardware information (no user entry)
<b>Applications</b>	<b>Parameters</b>
Launcher	<ul style="list-style-type: none"> <li>• Program Version</li> <li>• Application Launch Buttons               <ul style="list-style-type: none"> <li>» Caption text Color</li> <li>» Application Button 1 - 21</li> </ul> </li> <li>• Background Image</li> <li>• Single Application Auto Start</li> <li>• Restricted File Browser</li> <li>• Default Password</li> <li>• Advanced Options</li> </ul>
Enterprise Browser	Program Version Browser Engine General Menu Options Security Privacy Appearance Menu and Toolbar Actions

Auto Start	Auto Start Options <ul style="list-style-type: none"> <li>• None (default)</li> <li>• Launcher</li> <li>• Enterprise Browser</li> <li>• Enterprise Terminal Emulation</li> </ul>
Enterprise Terminal Emulation	Enterprise Terminal Emulation Configuration Options
<b>Printers</b>	<b>Parameters</b>
Printer Options	If connected through Bluetooth Printing, configuration options such as Auto detect printer, memory, display, etc. are available.
<b>Common Lockdown Service</b>	<b>Parameters</b>
CLDS Server	<ul style="list-style-type: none"> <li>• Server <ul style="list-style-type: none"> <li>» Port</li> <li>» Maximum Client Connections</li> <li>» Enable Server</li> </ul> </li> <li>• Lockable Keys <ul style="list-style-type: none"> <li>» Lock Windows key</li> <li>» Lock Task Manager key</li> <li>» Lock Task Switcher key</li> <li>» Lock Windows Security Dialog key</li> <li>» Lock Closing Applications key</li> <li>» Lock Minimize key</li> <li>» Lock New Session key</li> </ul> </li> </ul> <p><i>Note: The Windows key may not display the Windows Start menu. This is a limitation of the Windows 10 operating system.</i></p>
<b>License Manager</b>	<b>Parameters</b>
License Vault	None (displays applications that are licensed)
<b>SmartSystem information</b>	<b>Parameters</b>
Identity	Identity information (hardware version, firmware version, OS version, etc.) (read-only)
Administrator	Administrator settings (name, phone, and email)
Location	Location settings (country, state, city, campus, and detail)
Information	Device Notes (read-only)
<b>Core Messaging Service</b>	<b>Parameters</b>
Server IP	Server IP (read-only)
Broadcast Name	Broadcast Name
Port	Port (read-only)
Keep Alive Ping Interval	Keep alive ping interval
<b>Virtual Wedge</b>	<b>Parameters</b>
Enable Virtual Wedge	Enable virtual wedge
Virtual Wedge Method	<ul style="list-style-type: none"> <li>• Adapt to Application (default)</li> <li>• Character mode</li> <li>• Block mode</li> </ul>
Barcode Scanner Wedge	<ul style="list-style-type: none"> <li>• Barcode Scanner Grid</li> <li>• Label Encoding (Code Page)</li> </ul>

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## ***Bar Code Scanners and Enterprise Settings***

The following types of bar code scanners are supported on the Thor VM3:

- A tethered scanner connected to COM1 or COM2
- A tethered scanner connected to a USB host port
- A wireless scanner connected via Bluetooth

The scanner symbologies can be updated through Enterprise data collection software.

### ***Serial Scanners***

To configure a particular scanner to work with Enterprise data collection software, select  (Start) > All Apps > Windows System > Control Panel > Enterprise Settings > Data Collection > Tethered Scanner > Tethered Scanner (COM1) or (COM2) > Scanner Settings.

Select the appropriate scanner model (SR Intermec Scanner, ASCII, SR60). By default, both COM1 and COM2 are opened so the appropriate scanners (see below) can work without changing factory defaults:

#### ***Tethered Scanner (COM1)***

By default the Scanner Model is set to **SR Intermec Scanner**, which covers models such as SR61T, SR30, and SR31. This COM port's settings are designed to work with legacy Intermec scanners.

#### ***Tethered Scanner (COM2)***

By default the Scanner Model is set to **ASCII** to connect with a scanner with baud rate of 9600, 8 data bits, no parity, 1 stopbit, and no flow control. This COM port's settings are designed to work with most other legacy Honeywell and LXE scanners.

### ***USB Scanners***

By default, when a HID enabled USB scanner is connected to the Thor VM3, the scanned data is transmitted to the active windows as keystroke messages. Any data handling to be applied to the scanned data, for example to strip leading or trailing characters, must be programmed into the scan engine. This is done by scanning configuration bar codes from the scanner manufacturer or handled by the application accepting the data.

For the Thor VM3 the USB Intermec SR61T and SR31 may be setup to be configurable through Enterprise Settings. This can be done by setting Enable USB Scanner Auto-detect to On under the Data collection menu. If the USB scanner is already attached, you must detach and then re attach it after USB Scanner Auto-detect is enabled in order for it to be recognized by Enterprise Settings. Refresh the Enterprise Settings screen to see the connected USB scanner.

### ***Bluetooth Scanners***

See [Bluetooth Scanning](#) (page 5-7) for information on connecting Bluetooth scanners.

Always use Enterprise Settings to configure Bluetooth parameters. Do not use the Bluetooth configuration options available from the Bluetooth icon in the system tray.

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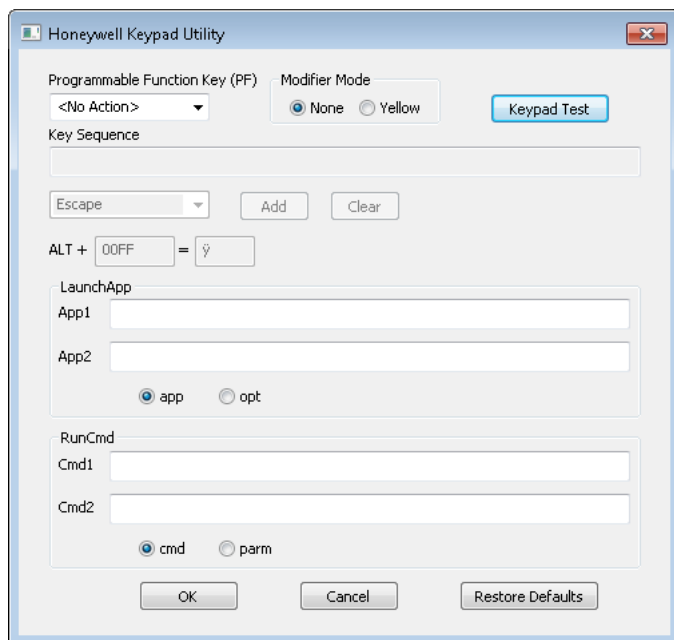
## External Keypad

 (Start) > All Apps > Windows System > Control Panel > External Keypad (Large or Small Icon View)

This function remaps the programmable keys (PF and Yellow + PF) in the external (21-key numeric) USB keyboard. To remap the P1-P7 keys integrated into the front panel of the Thor VM3, see [Programmable Key](#) (page 5-31).

The External Keypad panel can be used to perform the following functions:

- [Remap a Key to a Single Key](#) (page 5-15)
- [Remap a Key to a Unicode Value](#) (page 5-15)
- [Remap a Key to a Key Sequence](#) (page 5-16)
- [Remap a Key to a Sequence of Unicode Values](#) (page 5-16)
- [Remap a Key to Launch an Application](#) (page 5-16)
- [Remap a Key to Run a Command](#) (page 5-17)



### ***Remap a Key to a Single Key***

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select the value for the remapped key from the pull-down list.
4. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Unicode Value***

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select **Unicode** from the pull-down list.
4. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the text box to the right of **ALT +** and the Unicode character is displayed in the box to the right of **=**.
5. Click **OK** to save the result and close the control panel.

---

### ***Remap a Key to a Key Sequence***

Up to 16 keys may be specified for the key sequence. The sequence can consist of keys and Unicode values.

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select **Key Sequence** from the pull-down list.
4. Select the first key for the multiple key sequence from the pull-down list.
5. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box.
6. Repeat this steps 4 and 5 until all desired keys have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
7. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Sequence of Unicode Values***

Up to 16 Unicode values may be specified for the key sequence. The sequence can consist of keys and Unicode values.

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select **Key Sequence** from the pull-down list.
4. Select **Unicode** from the Key Sequence pull-down list.
5. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the text box to the right of **ALT +** and the Unicode character is displayed in the box to the right of **=**.
6. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box.
7. Repeat this steps 4 through 6 until all desired characters have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
8. Click **OK** to save the result and close the control panel.

### ***Remap a Key to Launch an Application***

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select **Launch App1-2** from the remapped key from the Remapped Key pull-down list.
4. Make sure the **APP** radio button is selected.
5. In the text box (LaunchApp1-2) corresponding to the number selected for Launch App1-2, enter the application to launch.
6. If any parameters are needed for the application, click on the **OPT** radio button. This clears the text box (though the application name is saved). Enter the desired parameters in the appropriate text box.
7. Click **OK** to save the result and close the control panel.
8. If the KeyMap tab is accessed again, the application plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

---

### **Remap a Key to Run a Command**

1. Select the modifier key from the Modifier Mode options.
2. The key to be remapped is the programmable function (PF) key on the numeric keyboard.
3. Select **RunCmd 1-2** from the remapped key from the Remapped Key pull-down list.
4. Make sure the **CMD** radio button is selected.
5. In the text box (RunCmd1-2) corresponding to the number selected for RunCmd1-2, enter the desired command.
6. If any parameters are needed for the command, click on the **PARM** radio button. This clears the text box (though the command is saved). Enter the desired parameters in the appropriate text box.
7. Click **OK** to save the result and close the control panel.
8. If the KeyMap tab is accessed again, the command plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

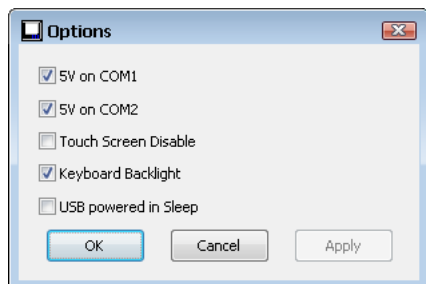


*Some executables may require elevated privileges to run. For example, an executable such as regedit.exe may not run for a standard user but does run for an admin user.*

---

## Options

 (Start) > All Apps > Windows System > Control Panel > Options (Large or Small Icon View)



### **5V on COM1**

By default, Pin 9 of COM1 provides +5V, such as for an external scanner tethered to the COM1 port. Uncheck this box to configure Pin 9 of COM1 to provide RI.

### **5V on COM2**

By default, Pin 9 of COM2 provides +5V, such as for an external scanner tethered to the COM2 port. Uncheck this box to configure Pin 9 of COM2 to provide RI.

### **Touch Screen Disable**

By default, this option is unchecked and the touch screen is enabled. If this option is checked, it may be necessary to attach an external keyboard or USB mouse to access this screen to re-enable the touch screen unless a [Programmable Key](#) (page 5-31) has been assigned to enable the touch screen.

*Note: Tapping **Apply** disables the touch screen but does not dismiss this panel. The panel must be dismissed via an external keyboard or mouse. This panel is dismissed when the **OK** button is tapped after selecting Touch Screen Disable.*

### **Keyboard Backlight**

By default, the integrated keyboard backlight follows the display backlight. Uncheck this box to turn the keyboard backlight off regardless of the display backlight status.

### **USB Powered in Sleep**

By default, power is removed from attached USB devices when the Thor VM3 is in Standby or Sleep mode. Check this box to maintain power to attached USB devices in Standby or Sleep



## Power Options

### Select a Power Plan

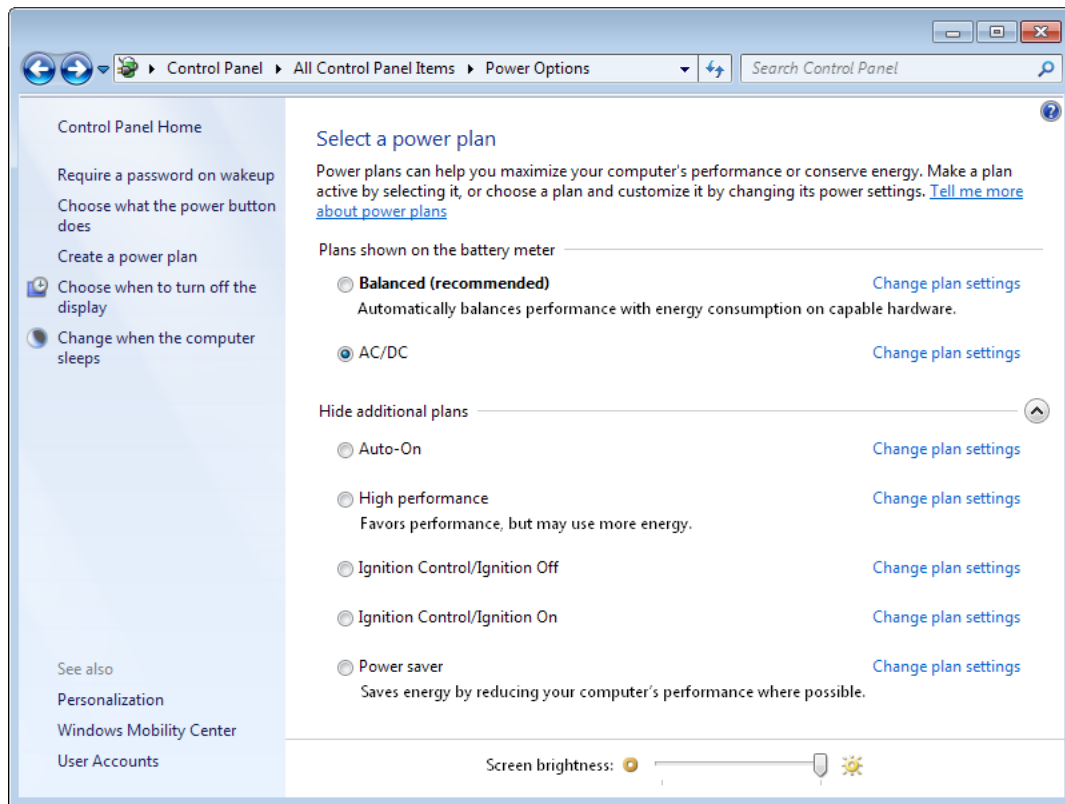
The Thor VM3 has four customized power management plans defined. The active Power Scheme depends on:

- The user selected Power Plan
- And, for Ignition Control, the status of the ignition input signal.

Each power management plan includes two sets of time out values:

- **Plugged in** for when external power is present (such as vehicle power or from an AC power adapter)
- **Running on batteries** for when external power is not present and the Thor VM3 is operating on UPS power.

### Select a Power Plan



The Thor VM3 has four power management as described in the following sections.

---

## **AC/DC**

Select the AC/DC power plan when manual control of the Thor VM3 power on process is desired.

This is the default power scheme/plan. In AC/DC mode the Thor VM3 is turned on by a press of the Power button. Ignition input is ignored when AC/DC Mode is enabled.

The following default timeouts are used in the AC/DC power plan.

<b>Setting</b>	<b>Plugged In (AC or DC Power)</b>	<b>On Battery (UPS Power)</b>
Dim the display	Never	Never
Turn of the display	30 minutes	1 minute
Put the computer to sleep	Never (see note)	Never (see note)
Hibernate after	300 minutes	20 minutes

---

## ***AC/DC Behavior***

When the AC/DC power plan is selected and external power is present the Thor VM3 behaves as described below. If external power is not present, refer to the [UPS](#) (page 5-28) section for Thor VM3 behavior.

### ***Thor VM3 is Off***

#### ***Conditions***

The Thor VM3 is **Off** and external power is available, such as:

- Thor VM3 is installed on a powered Smart Dock with the dock power switch On
- Thor VM3 is already mounted to a dock and external power is applied to the dock

#### ***Result***

The Thor VM3 boots when the Power button is pressed. Once booted the Thor VM3 follows the **AC/DC** power plan with timers reset after bootup.

### ***Thor VM3 is On***

#### ***Conditions***

The Thor VM3 is **On** (but powered by the UPS battery) and gets external power, such as:

- Thor VM3 is installed on a powered dock with the dock power switch On
- Thor VM3 is already mounted to a dock with the dock power switch On and truck power is applied to the dock
- Thor VM3 is already mounted to a dock and the dock power switch is turned On

#### ***Result***

The Thor VM3 continues to run and follows the **AC/DC** power plan with timers reset at power connection.

---

### ***Ignition Control/Ignition On***

Select either the Ignition Control/Ignition On or the Ignition Control/Ignition Off power plan when ignition control of the Thor VM3 power on process is desired.

The Thor VM3 automatically switches between the Ignition Control/Ignition On or the Ignition Control/Ignition Off power schemes/plans depending on the state of the vehicle ignition input.

The following default timeouts are used in the Ignition Control/Ignition On power scheme./plan

<b>Setting</b>	<b>Plugged In (AC or DC Power)</b>	<b>On Battery (UPS Power)</b>
Dim the display	Never	Never
Turn of the display	30 minutes	1 minute
Put the computer to sleep	Never (see note)	Never (see note)
Hibernate after	300 minutes	20 minutes

The ignition input wire must be connected. If the user selects this power plan but the ignition is Off, the Ignition Control/Ignition Off plan is used instead.

---

### ***Ignition Control/Ignition On Behavior***

When either Ignition Control power plan is selected and external power is present the Thor VM3 behaves as described below. If external power is not present, refer to the [UPS](#) (page 5-28) section for Thor VM3 behavior.

#### ***Thor VM3 is Off and Vehicle Ignition is Switched to On***

##### ***Conditions***

The Thor VM3 is **Off** and vehicle ignition changes from Off to On.

##### ***Result***

The Thor VM3 boots. Once booted the Thor VM3 follows the **Ignition Control/Ignition On** power plan with timers reset after the boot completes.

#### ***Thor VM3 is On and Vehicle Ignition is Switched to On***

##### ***Conditions***

The Thor VM3 is **On** and vehicle ignition changes from Off (or not present) to On.

##### ***Result***

The Thor VM3 continues to run and follows the **Ignition Control/Ignition On** power plan with timers reset at the time Ignition switched to Active.

An example of this case would be a Thor VM3 that is running on UPS and is then mounted on a dock that has truck power and the ignition switch is already On.

---

### ***Ignition Control/Ignition Off***

Select either the Ignition Control/Ignition On or the Ignition Control/Ignition Off power plan when ignition control of the Thor VM3 power on process is desired.

The Thor VM3 automatically switches between the Ignition Control/Ignition On or the Ignition Control/Ignition Off power schemes/plans depending on the state of the vehicle ignition input. Default timeouts are shorter in this scheme to conserve the vehicle battery charge.

The following default timeouts are used in the Ignition Control/Ignition Off power plan.

<b>Setting</b>	<b>Plugged In (AC or DC Power)</b>	<b>On Battery (UPS Power)</b>
Dim the display	Never	Never
Turn of the display	1 minute	1 minute
Put the computer to sleep	Never (see note)	Never (see note)
Hibernate after	60 minutes	20 minutes

The ignition input wire must be connected. If the user selects this power plan but the ignition is On, the Ignition Control/Ignition On plan is used instead.

---

### ***Ignition Control/Ignition Off Behavior***

When either Ignition Control power plan is selected and external power is present the Thor VM3 behaves as described below. If external power is not present, refer to the [UPS](#) (page 5-28) section for Thor VM3 behavior.

#### ***Thor VM3 is Off and Vehicle Ignition is Off***

##### ***Conditions***

The Thor VM3 is **Off** and vehicle ignition is Off.

##### ***Result***

The Thor VM3 remains Off regardless of external power. UPS charging is disabled.

##### ***Conditions***

The Thor VM3 has external power but vehicle ignition is Off. The Power button is pressed.

##### ***Result***

The Thor VM3 boots. Once booted the Thor VM3 follows the **Ignition Control/Ignition Off** power plan with timers reset after the boot completes.

#### ***Thor VM3 is On and Vehicle Ignition is Switched to Off***

##### ***Conditions***

The Thor VM3 is **On** and vehicle ignition changes from On to Off.

##### ***Result***

The Thor VM3 follows the **Ignition Control/Ignition Off** power plan with timers reset at the time Ignition switched to Inactive. UPS charging is disabled.

An example of this case would be a Thor VM3 that is running on UPS and is then mounted on a dock that has truck power and the ignition switch is already Off.

---

### ***Auto-On***

Select the Auto-On power plan when it is desired that the Thor VM3 power on when external power is connected.

In Auto-On mode, the Thor VM3 is turned On by the presence of external power with no user interaction required. Ignition input is ignored when Auto-On Mode is enabled.

The following default timeouts are used in the Auto-On power plan.

<b>Setting</b>	<b>Plugged In (AC or DC Power)</b>	<b>On Battery (UPS Power)</b>
Dim the display	Never	Never
Turn of the display	30 minutes	1 minute
Put the computer to sleep	Never (see note)	Never (see note)
Hibernate after	300 minutes	20 minutes



---

## ***Auto-On Behavior***

When the Auto-On power plan is selected and external power is present the Thor VM3 behaves as described below. If external power is not present, refer to the [UPS](#) (page 5-28) section for Thor VM3 behavior.

### ***Thor VM3 is Off***

#### ***Conditions***

The Thor VM3 is **Off** and gets external power, such as

- Thor VM3 is installed on a powered Smart Dock with the dock power switch On
- Thor VM3 is already mounted to a dock and external power is applied to the dock
- Thor VM3 is already mounted to a dock and the dock power switch is turned On

#### ***Result***

The Thor VM3 boots. Once booted the Thor VM3 follows the **Auto-On** power plan with timers reset after the boot completes.

### ***Thor VM3 is On***

#### ***Conditions***

The Thor VM3 is **On** and gets external power, such as

- Thor VM3 is installed on a powered Smart Dock with the dock power switch On
- Thor VM3 is already mounted to a dock and external power is applied to the dock
- Thor VM3 is already mounted to a dock and the dock power switch is turned On

#### ***Result***

The Thor VM3 continues to run and follows **Auto-On** power plan with timers reset at the time power was connected.

---

## **UPS**

When the Thor VM3 is operating on the UPS the timeouts from the battery section for the selected power plan are used. By default, the timeouts for UPS are the same for each power plan.

### **UPS Behavior**

The Thor VM3 behavior when operating from UPS power is described below.

#### **Thor VM3 is Off**

##### **Conditions**

The Thor VM3 is Off and the power button is pressed the Thor VM3 and the following condition is met:

- UPS power is over 35% capacity

##### **Result**

The Thor VM3 boots and follows the selected power scheme's Running on Batteries (or power plan's On battery) timeouts with power management timers reset at boot up.

##### **Conditions**

The Thor VM3 is Off and the power button is pressed the Thor VM3 and the following condition is met:

- UPS power is under 35% capacity

##### **Results**

The Thor VM3 remains Off.

#### **Thor VM3 is On**

##### **Conditions**

The Thor VM3 is On and external power is removed, such as:

- Thor VM3 is removed from a powered dock (Dock power switch On)
- Thor VM3 is mounted to a dock and truck power is removed from the dock
- Thor VM3 is mounted to a dock and the dock power switch is turned Off

##### **Result**

The Thor VM3 boots and follows the selected power scheme's Running on Batteries (or power plan's On battery) timeouts with power management timers reset at the time of power removal. UPS charging is disabled.

### **Power Notification Icon**

The Power icon in the notification area provides an indication of the level of UPS battery charge. The icon also indicates if external power is connected. Some samples are shown below



External power is connected and the UPS battery is approximately 50% charged.

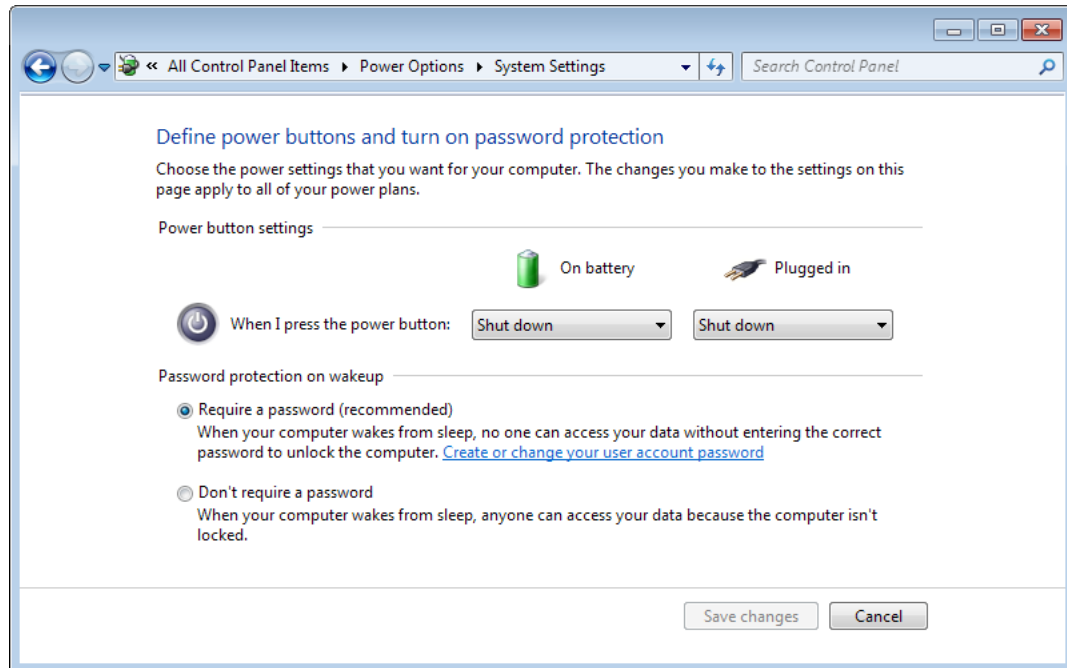


External power not connected and the UPS battery is approximately 100% charged.

---

## Choose What the Power Button Does

■ (Start) > All Apps > Windows System > Control Panel > Power Options (Large or Small Icon View)



Tap **Choose what the power button does**. For both battery and external power, the power button press may be configured as follows:

- Do nothing
- Sleep
- Hibernate
- Shut down.

---

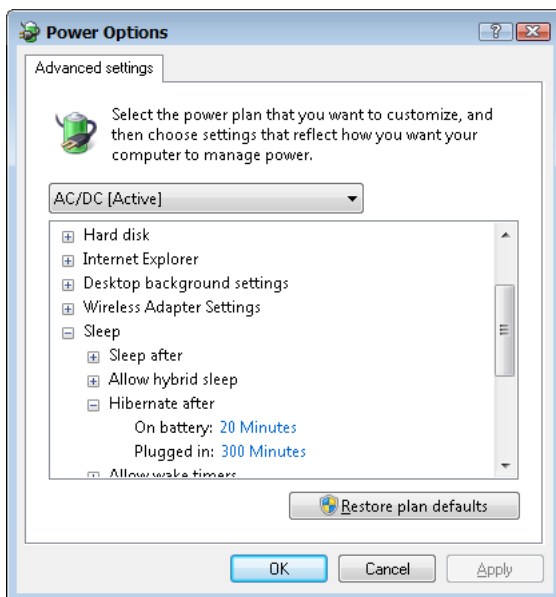
## Configure Hibernation

**(Start) > All Apps > Windows System > Control Panel > Power Options** (Large or Small Icon View)

By default, hibernate is enabled on the Thor VM3.

To change the hibernate settings:

1. Open the Power Options control panel.
2. For the desired power plan, tap **Change plan settings**. It may be necessary to tap **Show additional plans** if the desired plan is not the currently active power plan.
3. Tap **Change advanced power settings**.
4. From the popup window, tap the **+** in front of **Sleep**.
5. Tap the **+** in front of **Hibernate after**.



6. Enter the new timeout period in minutes. The hibernate timeout can be specified for on battery and plugged in. Enter **0** to disable hibernation for the specified plan and power source (battery or external).
7. Tap **OK** and close all open power control panels.

---

## Programmable Key

 (Start) > All Apps > Windows System > Control Panel > Programmable Key (Large or Small Icon View)

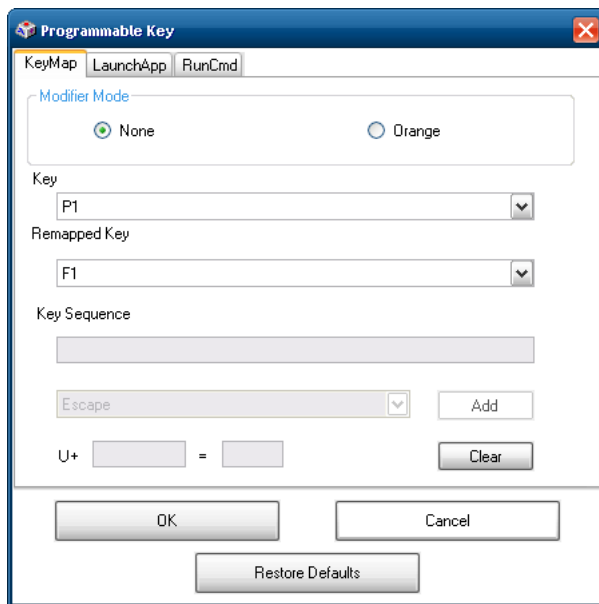
This function remaps P1-P57 keys integrated into the front panel of the Thor VM3. To remap the programmable keys (PF and Yellow + PF) in the optional external (21-key numeric) USB keyboard see [External Keypad](#) (page 5-15).

Programmable Key	Default Value
P1	F1
P2	F2
P3	F3
P4	F4
P5	F5
P6	Toggle SIP
P7	Enter
P8 (Orange + P1)	<no key>
P9 (Orange + P2)	<no key>
P10 (Orange + P3)	<no key>
P11 (Orange + P4)	<no key>
P12 (Orange + P5)	<no key>
P13 (Orange + P6)	<no key>
P14 (Orange + P7)	<no key>

The Programmable Key panels can be used to perform the following functions:

- [Remap a Key to a Single Key](#) (page 5-32)
- [Remap a Key to a Unicode Value](#) (page 5-32)
- [Remap a Key to a Key Sequence](#) (page 5-32)
- [Remap a Key to a Sequence of Unicode Values](#) (page 5-33)
- [Remap a Key to a Special Function](#) (page 5-33)
- [Remap a Key to Launch an Application](#) (page 5-33)
- [Remap a Key to Run a Command](#) (page 5-17)

## Keymap



A key or combination of keys can be remapped to provide a single keypress or a string of keypresses.

Assign settings by clicking radio buttons and selecting keys from the drop down boxes.

Tap the **OK** button to save changes and exit the Programmable Keys control panel.

Tap the **Cancel** button to discard any changes and exit the Programmable Keys control panel.

Tap the **Restore Defaults** to return all Programmable Keys to their default values and exit the Programmable Keys control panel.

### ***Remap a Key to a Single Key***

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select the value for the remapped key from the Remapped Key pull-down list.
4. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Unicode Value***

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select **Unicode** from the Remapped Key pull-down list.
4. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the text box to the right of **ALT +** and the Unicode character is displayed in the box to the right of **=**.
5. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Key Sequence***

Up to 16 keys may be specified for the key sequence. The sequence can consist of keys and Unicode values.

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select **Key Sequence** from the Remapped Key pull-down list.

- 
4. Select the first key for the multiple key sequence from the pull-down list.
  5. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box.
  6. Repeat this steps 4 and 5 until all desired keys have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
  7. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Sequence of Unicode Values***

Up to 16 Unicode values may be specified for the key sequence. The sequence can consist of keys and Unicode values.

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select **Key Sequence** from the Remapped Key pull-down list.
4. Select **Unicode** from the Key Sequence pull-down list.
5. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the text box to the right of **ALT +** and the Unicode character is displayed in the box to the right of **=**.
6. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box.
7. Repeat this steps 4 through 6 until all desired characters have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
8. Click **OK** to save the result and close the control panel.

### ***Remap a Key to a Special Function***

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select the special function from the remapped key from the Remapped Key pull-down list. Special functions that can be assigned are:
  - Toggle SIP (soft keyboard) state between displayed and hidden
  - Toggle touch screen state between enabled and disabled
  - Toggle integrated keyboard backlight state between on and off
  - Launch the touch screen calibration utility
4. Click **OK** to save the result and close the control panel.

### ***Remap a Key to Launch an Application***

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select **Launch App1-4** from the remapped key from the Remapped Key pull-down list.
4. Click on the [LaunchApp](#) (page 5-35) tab.
5. Make sure the **APP** radio button is selected.
6. In the text box (LaunchApp1-4) corresponding to the number selected for Launch App1-4, enter the application to launch.
7. If any parameters are needed for the application, click on the **OPT** radio button. This clears the text box (though the application name is saved). Enter the desired parameters in the appropriate text box.
8. Click **OK** to save the result and close the control panel.
9. If the KeyMap tab is accessed again, the application plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

---

### ***Remap a Key to Run a Command***

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pull-down list.
3. Select **RunCmd 1-4** from the remapped key from the Remapped Key pull-down list.
4. Click on the [RunCmd](#) (page 5-36) tab.
5. Make sure the **CMD** radio button is selected.
6. In the text box (RunCmd1-4) corresponding to the number selected for RunCmd1-4, enter the desired command.
7. If any parameters are needed for the command, click on the **PARM** radio button. This clears the text box (though the command is saved). Enter the desired parameters in the appropriate text box.
8. Click **OK** to save the result and close the control panel.
9. If the KeyMap tab is accessed again, the command plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

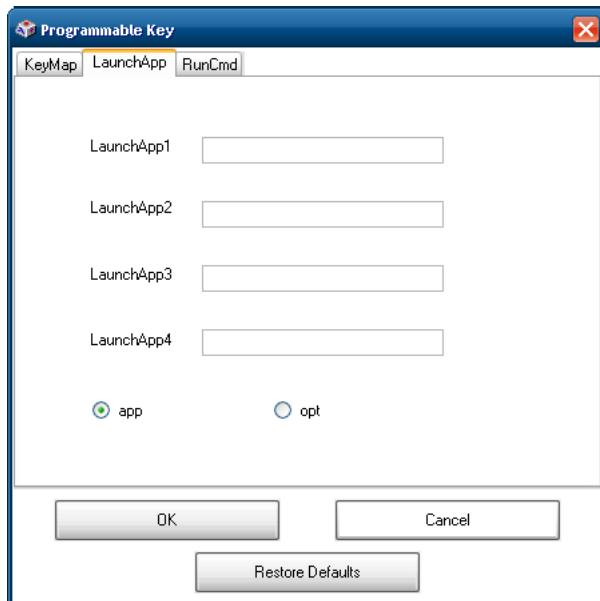


---

## LaunchApp

The default for all text boxes is Null or “”. The text boxes accept string values only.

The executables and parameters are not checked for accuracy by the keyboard driver. If the launch fails, the Thor VM3 displays a popup error message. If the launch is successful, no notification is displayed.



The Launch App command is defined for use by system administrators. These instructions are parsed and executed directly by the keyboard driver.

1. Place the cursor in the text box next to the App you wish to run, e.g., App1, App2.
2. Enable the **app** radio button if the application is an EXE file.
3. Enter the path and name of the executable file including the file extension, e.g.: C:\Windows\System32\notepad.exe.
4. Enable the **opt** radio button to add options or parameters for the executable file in the same text box. Switching from **app** to **opt** clears the text box (but the information previously entered is stored), allowing parameter entry.
5. Tap the **OK** button to save changes and exit the Programmable Keys control panel.

Tap the **Cancel** button to discard any changes and exit the Programmable Keys control panel.

Tap the **Restore Defaults** to return all Programmable Keys to their default values and exit the Programmable Keys control panel.

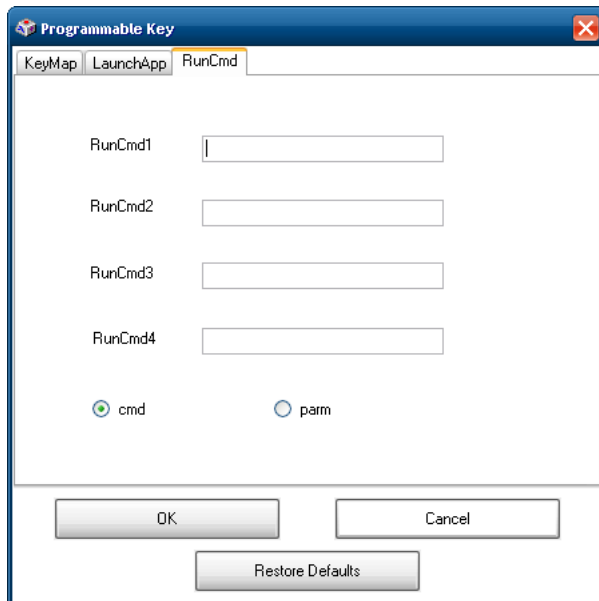
The result of the application (**app**) and options (**opt**) entries are displayed on the KeyMap tab in the Key Sequence box when the key mapped to the LaunchApp is selected.

---

## RunCmd

The default for all text boxes is Empty, Null or “”. The text boxes accept string values only.

The executables and parameters are not checked for accuracy by the keyboard driver. If the launch fails, the Thor VM3 displays a popup error message. If the launch is successful, no notification is displayed.



The Run Cmd command is defined for use by system administrators. These instructions call the ShellExecuteEx API, which opens documents directly.

1. Place the cursor in the text box next to the Cmd you wish to run, e.g., Cmd1, Cmd2.
2. Enable the file radio button and enter the name of the file.
3. Enable the PARM radio button to add parameters for file/exe execution in the same text box.
4. Tap the **OK** button to save changes and exit the Programmable Keys control panel.

Tap the **Cancel** button to discard any changes and exit the Programmable Keys control panel.

Tap the Restore Defaults to return all Programmable Keys to their default values and exit the Programmable Keys control panel.

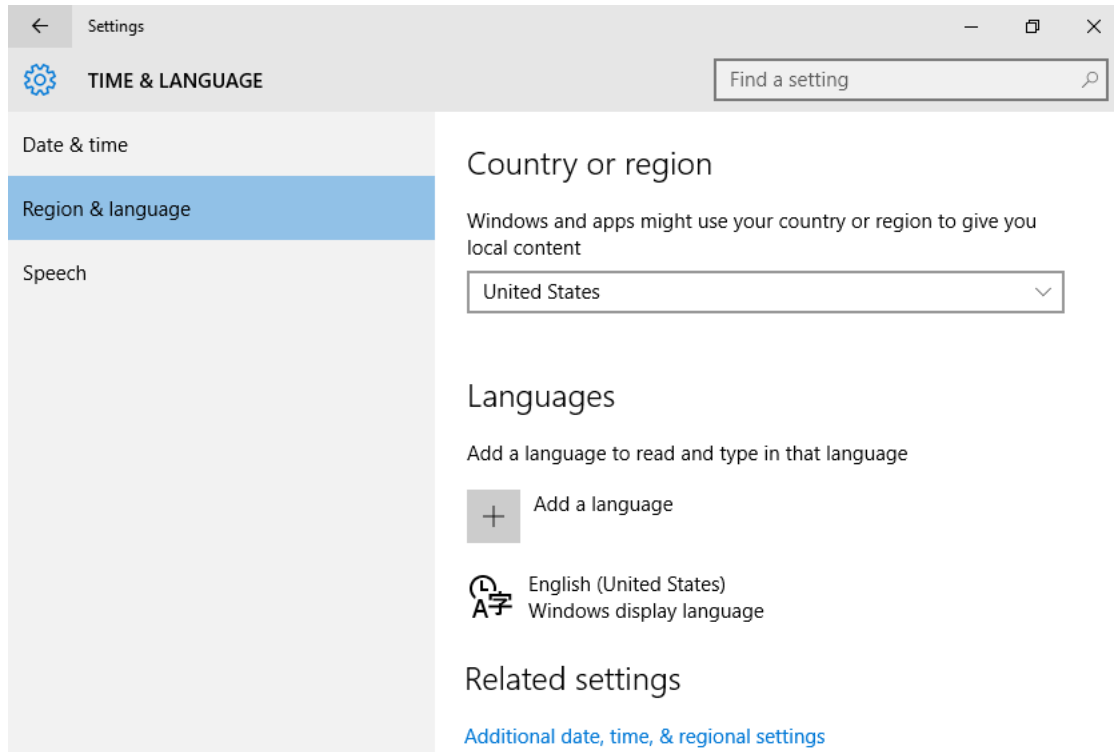


*Some executables may require elevated privileges to run. For example, an executable such as regedit.exe may not run for a standard user but does run for an admin user.*

---

## Region and Language

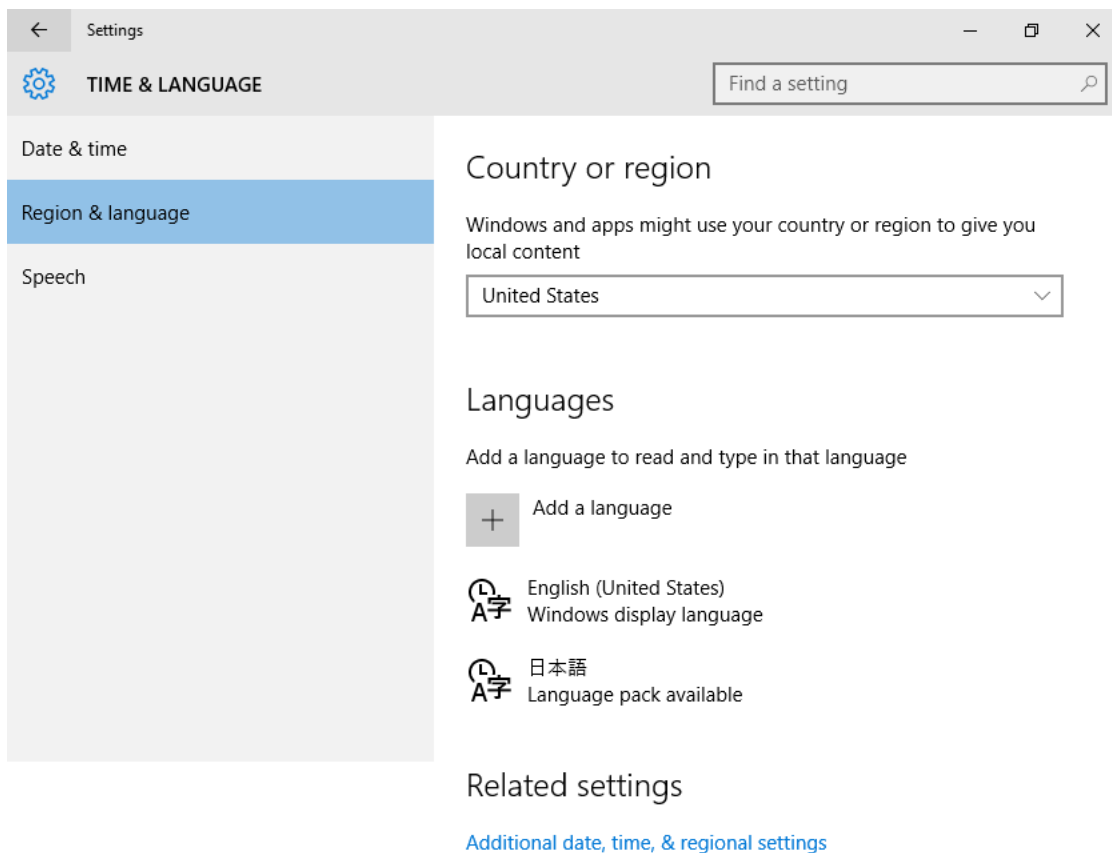
(Start) > Settings > Time & Language > Region & Language



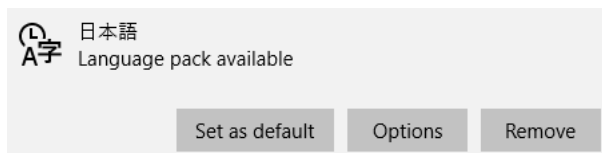
To add a language, there must be Internet access available to access the Windows update site.

1. Tap **Add a language**.
2. A list of available languages is displayed. Tap the desired language.

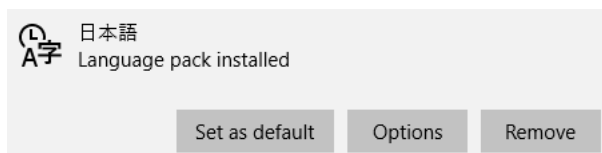
3. The selected language is now shown below **Add a language**. In this case it is Japanese (日本語). Note that “Searching Windows Update” and then “Language pack available” is shown below the new language.



4. Tap the new language.



5. Tap **Options**.
6. Tap the **Download** button under **Download language pack**.
7. When the download and installation are completed, **Language pack installed** is displayed.
8. Tap the ← (back arrow symbol) at the top left of the screen.
9. Tap the new language again.



10. Tap **Set as default**.
11. Restart the Thor VM3.

---

## Screen Control

☰ (Start) > All Apps > Windows System > Control Panel > Screen (Large or Small Icon View)

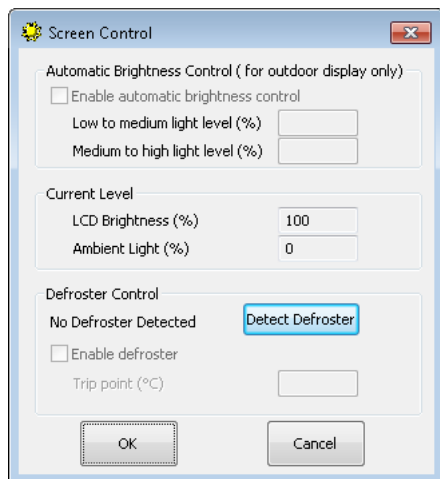
Set screen properties for the Thor VM3.

Factory Default Settings

Automatic Brightness Control (for outdoor display only)	
Enable automatic brightness control	Disabled
Low to medium light level (%)	25
Medium to high light level (%)	75
Current Level	
LCD Brightness (%)	100 (see note)
Defroster Control	
Enable defroster	Enabled
Trip point (°C)	40°C

*Note: If automatic brightness control is enabled for an outdoor display, the value for LCD brightness depends on the Ambient Light %.*

*Note: There is no default value for Ambient Light % as it varies depending on the level of light where the Thor VM3 is located.*



### Automatic Brightness Control

When the Thor VM3 is equipped with an **outdoor display**, automatic brightness control can be enabled. When enabled, display brightness is based on ambient light detected by the ambient light sensor, located near the top right of the display. The default is disabled. To enable, check the **Enable automatic brightness control** checkbox and specify the thresholds for display backlight transition.

When enabled, the thresholds can be entered for display brightness transitions.

- When a low level of ambient light is detected, the display backlight is set to low level.
- When the ambient light exceeds the threshold specified in **Low to medium light level (%)**, the display backlight is automatically increased to a medium level.
- When the ambient light exceeds the threshold specified in **Medium to high light level (%)**, the display backlight is automatically increased to a high level.
- Likewise if the Thor VM3 is returned to a lower ambient light area, the display backlight automatically transitions to the appropriate lower display backlight level.

---

## Current Level

Current levels of **LCD brightness** and **ambient light** are displayed as a percentage. Ambient light level is detected by the light sensor, located near the top right of the display.

## Defroster Control

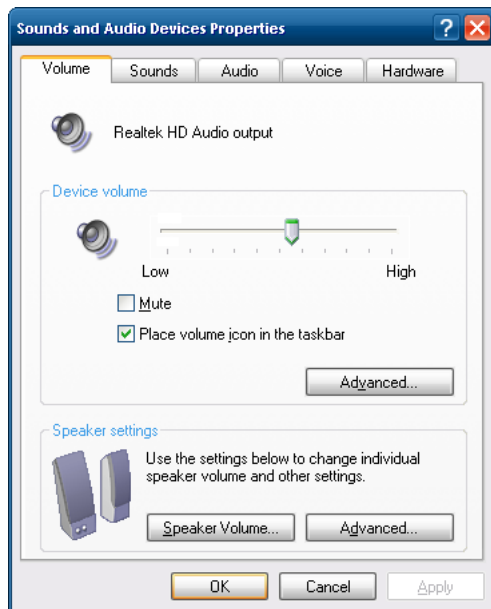
Enable the touch screen defroster, if installed, and set the trip point. Settings are ignored if the defroster is not installed.

If a defroster is installed, the defroster can be switched between the **Enabled** and **Disabled** states using the check box. The default is **Disabled** (unchecked).

Specify the Defroster trip point. The default trip point is 40°C/104°F.

## Sounds

 (Start) > All Apps > Windows System > Control Panel > Sounds (Large or Small Icon View)



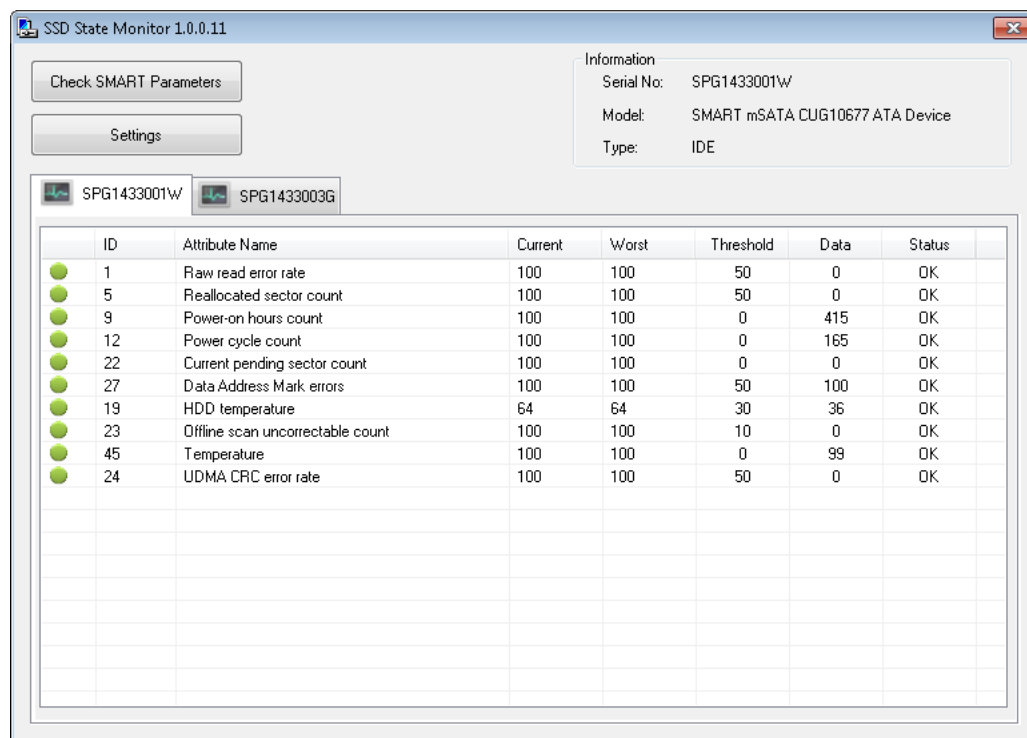
Use the slider bar to adjust the volume level as desired.

Alternatively:

- Tap the Volume icon, if present, in the taskbar and move the slider until the volume level is as desired.
- Use the integrated keypad - press the **Blue** key then **P1** to adjust volume up or **Blue** then **P2** to adjust volume down.
- By default the side tone is muted. If needed, the user should enable the side tone. If this causes interfering noise, the side tone should be disabled. The VM3 audio is designed to be used with or without the side tone. This is acceptable permissible performance for the Thor VM3.

## SSD State Monitor

■ (Start) > All Apps > Windows System > Control Panel > SSD Monitor (Large or Small Icon View)



Use this option to view statistics for the SSD drive(s) installed.

For each attribute, the current, worst, threshold and data values are displayed. The status is also displayed.

If there is more than one SSD installed, there is a tab for each drive.

Tap the Settings button to set the frequency the automatically update data for the SSD drive(s). The default is 1 hour.

## Tablet PC Settings (Touch Screen Calibration)

■ (Start) > All Apps > Windows System > Control Panel > Tablet PC Settings (Large or Small Icon View)

The Thor VM3 uses the HIDEGalaxTouch touch screen driver. The **Calibrate...** button on this control panel is not used. Instead use the HIDEGalaxTouch utility, see [Touch Screen Calibration](#) (page 5-44) for information on calibrating the touch screen. The PCAP touch screen is calibrated at the factory and does not use the calibration utility.

## User Accounts

*Note: The following applies to a Thor VM3 that is not part of a domain. When the Thor VM3 is part of a domain, the user is prompted for credentials at Windows startup or log on.*

The Thor VM3 is pre-configured with an administrator account named Administrator. By default, the Thor VM3 automatically logs onto the Administrator account at Windows startup.

If the user assigns a password to the Administrator account:

- The password is stored and used when the Thor VM3 logs onto the Administrator account at Windows startup. The user is not prompted to enter a password.
- If the user logs off, the password must be manually entered to log back onto the Thor VM3.
- At the logon prompt, the user could specify a different user account (and password, if necessary) to log on, assuming the account has been added to the Thor VM3.
- When the Thor VM3 is restarted, the Administrator account automatically becomes the active user account, regardless of the active account before the restart.

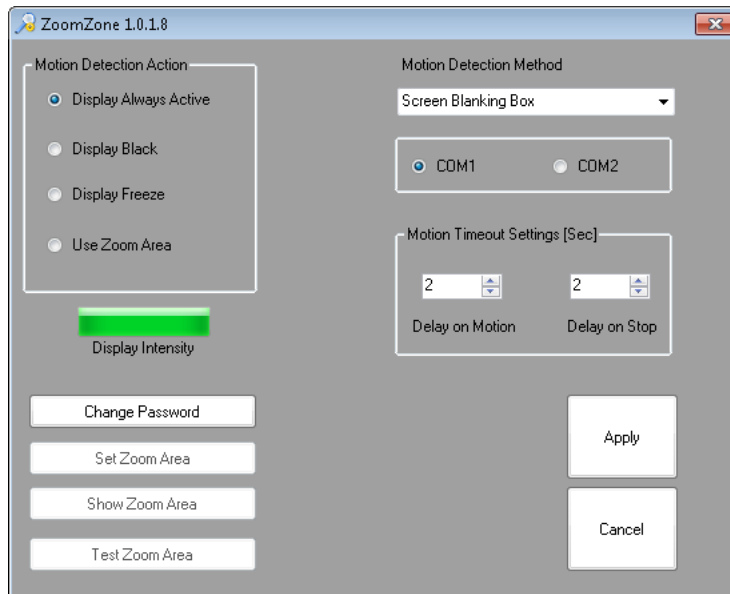
If using certificates for authentication, the user must assign a password to the active (Administrator) account.

## VM3 Connection Manager

The [VM3 WWAN Connection Manager](#) (page 6-39) is used to configure and prioritize available wireless connections.

## ZoomZone

**(Start) > All Apps > Windows System > Control Panel > ZoomZone** (Large or Small Icon View), or ZoomZone can be used to configure screen blanking behavior.



### Motion Detection Action

Determine what to do when motion is detected:

- Display Always Active - The display does not change when motion is detected.
- Display Black - The display is blacked out when motion is detected.
- Display freeze - The display is frozen at the time motion is detected.
- Use Zoom Area - A preconfigured zoom area is displayed when motion is detected.

### Motion Detection Method

Select the motion detection method.

The Thor VM3 supports the screen blanking box to determine motion. Select the port (COM1 or COM2) to which the blanking box is attached.

*Note: By default, COM1 and COM2 ports are used by Enterprise Data Collection. To use a COM port for screen blanking, access [Enterprise Settings](#) (page 5-11) and set **Data Collection > Tethered Scanners > Tethered Scanner (COMx) - Enable Scanner Port** to off (where COMx is either COM1 or COM2).*

### Motion Timeout Settings

Screen blanking can be configured to provide delays.

- Delay on Motion - Configure the delay between motion detection and screen blanking. The default is 2 seconds.
- Delay on Stop - Configure the delay between motion stopping and the screen resuming normal behavior. The default is 2 seconds.

### Change password

By default, no password is assigned to ZoomZone. If a password is set, the password must be entered to access the ZoomZone user interface to view or change configuration parameters.



---

To set a password:

1. Tap the **Change Password** button.
2. Enter the current password. If no password is assigned, leave this entry blank.
3. Enter and confirm the new password. To remove a previously set password, leave the new password blank.
4. Tap **OK** to confirm changes or **Cancel** to discard changes.

### **Set Zoom Area**

The ZoomArea can be selected from the current active desktop display. To set the zoom area:

1. Display the desired content on the Thor VM3 desktop.
2. Open the ZoomZone interface.
3. Tap the **Set Zoom Area** button.
4. Select the desired zoom area by tapping on the upper left corner of the desired area and dragging to the lower right corner of the desired area. The selected area is highlighted by a red outline.

*Note: Be sure to select the desired area from the upper left corner to the lower right. Selecting the area from a different corner may result in nothing (a black box) being displayed.*

5. If the selected area is not satisfactory, repeat the step above to reselect an area.
6. At the top of the display, tap **File** and select one of the available options:
  - **Save** - Saves the selected zoom area and returns to the ZoomZone user interface.
  - **Test** - Previews the zoom area as it would be displayed during screen blanking.
    - » Tap Accept Zoom to keep the zoom area and finish, or
    - » Tap Reject Zoom to discard the zoom area and be returned to select a different zoom area.
  - **Exit** - Discards changes and returns to the ZoomZone user interface.

### **Show Zoom Area**

Tap the Show Zoom Area button to show the currently selected zoom area. The selected area is highlighted in red.

To see how the zoom area would be displayed during screen blanking.

When finished, at the top of the display tap **File > Exit** to exit.

### **Test Zoom Area**

Tap the **Test Zoom Area** button.

The zoom image is displayed.

When finished, at the top of the display tap **File > Exit** to exit.

---

## ***Bar Code Readers***

The Thor VM3 can use the following external bar code readers:

- Tethered hand-held scanners are tethered to a serial port or a USB host port (via a dongle cable) on the Thor VM3 Smart Dock and are configured by scanning the engine-specific bar codes in the scanner manufacturer's programming guide. The manufacturer's guides are usually shipped with the bar code reader.
- Wireless hand-held Bluetooth scanners are configured by scanning the engine-specific bar codes in the scanner manufacturer's programming guide. The manufacturer's guides are usually shipped with the bar code reader.
- The body worn Bluetooth Ring Scanner module may be using a Symbol 4400 Ring Imager or a Symbol 955 Ring Scanner. The BTRS module is configured by scanning the bar codes in the Bluetooth Ring Scanner Guide.

### ***Scanner (Virtual) Wedge***

Virtual wedge parameters are set via [Enterprise Settings](#) (page 5-11).

## ***Touch Screen Calibration***

To calibrate the touch screen:

1. Browse to the **C:\Honeywell\Touch\_5W** folder.
2. Tap **HIDeGalaxTouch.exe**.
3. Select **4 Points Calibration**.
4. Follow the on screen instructions to touch the screen, hold the touch and then lift the stylus to complete the calibration process.

---

## BIOS

The Microsoft Windows operating system is installed before shipping. The default BIOS parameters are configured at that time. In most cases, it is unnecessary to modify the BIOS parameters.

Generally, it is only necessary to enter the BIOS setup to change the boot order of the drives.

This section is not intended to detail all features of the BIOS, instead it is intended to cover the most commonly used setup options.



**CAUTION** - *Be very careful when using this utility to modify BIOS Setup parameters. The Thor VM3 may generate unexpected results when incorrect or conflicting parameter values are entered. Selecting incorrect or invalid options may require the Thor VM3 to be returned for repairs. The parameters should only be modified by Information Services personnel or the system administrator.*

### Accessing the BIOS Setup

To access and modify the BIOS on the Thor VM3, an external keyboard must be attached.

When the **Press F2 for System Utilities** prompt is displayed at power up, press the P2 key on the Thor VM3 or the F2 key on an external keyboard to enter BIOS setup.

Use the arrow keys to move around the screen.

### Boot Order

To view or edit the boot order, select the **Boot** tab.

The boot drive can also be selected at bootup. Press P5 from the Thor VM3 keypad or press F5 from an external keyboard. Use the arrows on the external keypad to make a selection. This does not change the default boot order and the next bootup will return to the default drive without user intervention.

### Exiting BIOS Setup

To exit the BIOS setup, select the **Exit** tab and select from these options:

- Exit Saving Changes
- Exit Discarding Changes
- Load Setup Defaults for Windows 8.1/Windows 10 (Do not use options for other operating systems as this can cause unexpected results)
- Discard Changes
- Save Changes

---

## Using PXE Boot to Load an Operating System

The Thor VM3 supports PXE boot. The following are required for PXE boot:

- A server containing the installation files.
- A wired connection from the server to the Thor VM3.
- An external keyboard connected to the Thor VM3.

The Thor VM3 supports UFE mode PXE boot.

### **To Use UFE Mode PXE Boot:**

1. Start the Thor VM3.
2. When the **Press F2 for System Utilities** prompt is displayed at power up, press the P2 key on the Thor VM3 or the **F2** key on an external keyboard to enter BIOS setup.
3. Select the **Main** tab on the BIOS screen.
4. Set **Network Stack** to **Enabled**.
5. Select the **Boot** tab in the BIOS.
6. Set **PCI LAN** first in the boot priority list.

*Note: Rather than change the boot order in the BIOS, press **F5** as the Thor VM3 boots and use the menu presented to select **PCI LAN** as the boot device. After this boot up, the Thor VM3 returns to the default boot device shown in the BIOS.*

7. Select the **Exit** tab in the BIOS.
8. Choose **Exit Saving Changes** and press enter.
9. The Thor VM3 reboots and the OS load process begins.
10. Follow any on-screen prompts to select and load the desired OS.
11. The Thor VM3 first tried an IPv4 connection to the server. If that fails, the Thor VM3 tries an IPv6 connection to the server.
12. If the server is not found, the Thor VM3 proceeds to the next device in the boot priority list.

---

## ***Thor VM3 Recovery DVD***

A recovery DVD is available to restore the operating system on your Thor VM3 to the same state it had when it was shipped from the factory. The recovery DVD may not reload all factory installed software, but the [Thor VM3 Drivers DVD](#) (page 5-47) can be used to install software applications. Recovery DVDs are available for English and Simplified Chinese.

Contact [Technical Assistance](#) (page 9-1) for information on the recovery DVD and for assistance installing other factory loaded software.

To use the recovery DVD:

1. Attach a USB DVD drive and an external keyboard to the Thor VM3.
2. Insert the recovery DVD into the DVD drive.
3. Reboot the Thor VM3.
4. Repeatedly press the P5 key on the Thor VM3 front panel or the F5 key on the external keyboard.
5. When the Boot Menu is displayed, use the arrow keys on the external keyboard to select the USB DVD drive.
6. Follow the on-screen instructions to complete the recovery process.
7. When the process is complete, disconnect the USB DVD drive and start the Thor VM3.

## ***Thor VM3 Drivers DVD***

The drivers DVD contains drivers and software for the Thor VM3. The contents of the recovery DVD are divided by operating system type:

- Use the contents of the **Win7x86** folder for drivers for a 32-bit Windows 7 operating system.
- Use the contents of the **Win7x64** folder for drivers for a 64-bit Windows 7 operating system.
- Use the contents of the **WIN10** folder for drivers for a 64-bit Windows 10 operating system.

Inside the appropriate folder is a Microsoft Word document, **UserGuide.docx**, detailing the installation process. Install the drivers in the order listed in this document, rebooting when specified.

---

## ***Configuration Cloning Utility (CCU)***

This utility provides an automated process to read the configuration settings from one Thor VM3 and then apply those settings to one or more other Thor VM3s with the same operating system. The Configuration Cloning Utility (CCU) is installed as part of the factory software load. Configuration settings for the following items may be included:

- RFTerm
- Honeywell Control Panels:
  - » USB powered in Sleep
  - » Enable/disable touch screen
  - » COM port pin 9 +5V or RI
  - » Ambient light sensor thresholds
  - » Defroster threshold

The CCU allows a configuration file (ccf file) to be created by:

- Reading the current program settings from the source Thor VM3
- Reading the default program settings from a ddf file.

If desired, settings can be modified (advanced user only) before saving the ccf file. If any changes have been made, the CCU can also apply them to the source Thor VM3.


The configuration file can then be copied and deployed to the destination Thor VM3(s). Options include:

- Import changes only - Only those configuration settings which have been modified from their default value are applied to the destination Thor VM3. All other settings on the destination Thor VM3 are left unchanged.
- Import changes and defaults - All configuration settings are applied to the destination Thor VM3. If a setting was modified on the source Thor VM3 the modified value is applied to the destination Thor VM3. Otherwise the default value is applied for that setting on the destination Thor VM3.

The Configuration Cloning Utility can be run as a GUI or command line interface.

---

## Launching Configuration Cloning Utility GUI

1. Locate the CCU icon either on the desktop or by selecting  (Start) > All Apps > > Honeywell > Configuration Cloning.
2. Right-click on the icon.
3. Select **Run as administrator** to launch the CCU.

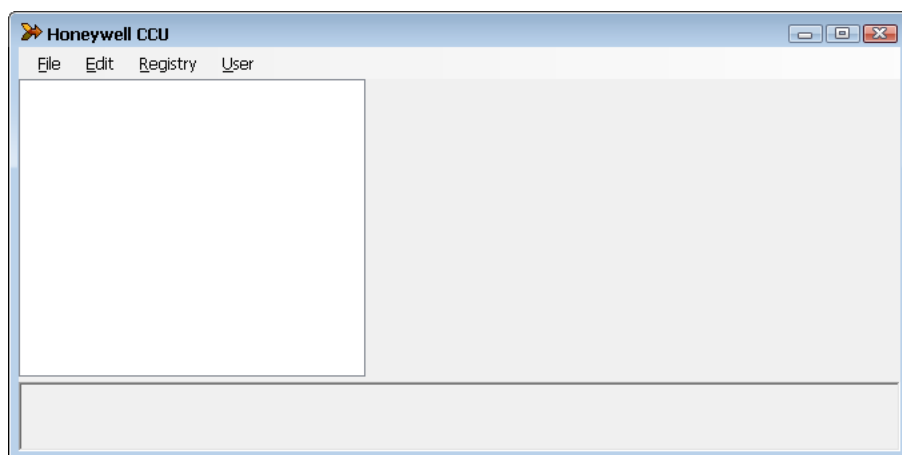


*It is necessary to run the CCU as an administrator because the CCU must be able to access and make changes to the Windows registry.*

*Rather than selecting to run as administrator each time, right-click on the CCU icon and select **Properties**. Tap the **Compatibility** tab and check **Run this program as an administrator**. This modification affects the current user only unless **Change settings for all users is tapped** before changing the privilege level.*

If a User Account Control message is displayed, you must allow the CCU to make changes to the computer.

## Using Configuration Cloning Utility GUI



### Menu Options

#### File

The File menu contains information for working with the configuration files.

#### About

Displays version and copyright information for the Configuration Cloning Utility.

#### Open

Opens a configuration file. The CCU looks for configuration files in the C:\Windows\DDF folder. CCU can open the following files types:

- ddf files - These files contain the factory default values for the software. These files are placed on the Thor VM3 when the applicable software was installed or upgraded. Use this option if you wish to start a configuration settings file based on the factory defaults.
- ccf files - These files contain the modified values for the software settings. These files are created with the CCU. ccf files are encrypted for security. Once a ccf file is created on one Thor VM3 it can be copied to other Thor VM3s to duplicate the configuration. An existing ccf file can be opened, modified, applied to the Thor VM3, saved, saved with a different name, etc.

#### Close

Closes the open data file.

#### Save

Saves the open data file as a ccf file.

- If a ccf file was opened, it is saved with the same name and in the same location.
- If a ddf file was opened, a prompt is displayed for the name to assign to the new ccf file. By default a new file is saved at C:\Windows\DDF though a different location can be specified.

### **Save As**

Saves the open data file as a ccf. If a ccf file was opened, this option allows a new name or location for the data file to be specified during the save process.

### **Exit**

Exits the CCU. A prompt may be displayed if there are unsaved ccf changes.

### **Edit**

Provides access to the standard Windows Cut, Copy and Paste functions. These functions can be used to manipulate the settings within the configuration file.

### **Registry**

Reads values from and writes values to the system registry.

#### **Import Settings**

Imports the current settings from the Windows registry for the selected application(s). When selected, the available programs from which settings can be read are displayed in a tree format.

#### **Apply Settings**

Applies the current settings to the Windows registry for the selected applications. During the process, a **Default all Non-Configured Parameters** prompt is displayed:

- Tap **Yes** to set all parameters not configured in the ccf file to defaults on the destination device.
- Tap **No** to apply the values from the ccf file and leave all other parameters as-is on the destination device.
- Tap **Cancel** to exit with no changes to the destination device.

Upon completion, exit the CCU and reboot the Thor VM3 so changes can take effect.

### **User**

Selects the desired user access level:

- Basic - Basic users can open files and import setting from the system registry. Basic users cannot modify settings from an opened file or setting imported from the registry. Basic users can apply setting to the system registry.
- Advanced - Advanced users can open files and import settings registry. Advanced users can modify the values from either an opened file or imported from the system registry. Advanced users can apply settings to the system registry.

### **Shortcuts**

The table below lists the valid shortcut key combinations within the CCU.

Shortcut key	Action
CTRL + A	Opens About screen
CTRL + O	Opens folder with CCF files (C:\Windows\DDF)
CTRL + C	Closes the open file (only valid when a ccf or ddf file
CTRL + S	Application is saved
CTRL + E	Application is closed
CTRL + X	Cuts the data
CTRL + C	Copies the selected data to the clipboard
CTRL + V	Pastes the data from the clipboard at the current location
CTRL + I	Displays import setting list
CTRL + L	Modified settings are applied
CTRL + B	Basic settings are displayed

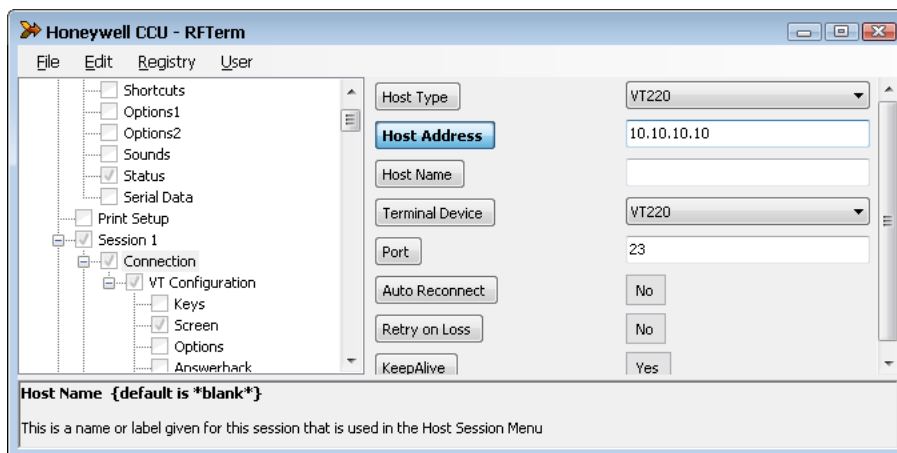


Shortcut key	Action
CTRL + D	Advanced settings are displayed

## Modifying Settings

Advanced user only. Basic user cannot view the expanded tree or modify settings.

When settings have been loaded (either from **Registry > Import Settings** or **File > Open**) the following screen is displayed.



The left side of the upper pane displays the current program settings that have been imported or are part of the open ccf file. Click the + icon to expand the tree or the - icon to condense the tree. When the tree is expanded sufficiently to view the settings, the settings are displayed in the right portion of the upper pane. When a parameter is selected, the name of the parameter is highlighted in blue. The parameter name remains highlighted in blue (regardless of if the value was changed or not) until the parameter name button is tapped a second time. Enter a new value for the parameter as desired. Depending on the parameter selected, the following entry types are available:

- Text box - This is an open entry field and a new value can be typed into the text box. Depending on the parameter, there may be validity checking to ensure the entry in the text box is within the valid range.
- Pull-down list - A down arrow indicates the setting must be selected from a pull-down list of available values. Expand the list and select the desired setting from the list of options.
- Button - Items with two choices (such as Off or On) are displayed as a button. Tapping the button switches the value for the parameter.

When all desired parameter settings have been made, tap **File > Save** to save as a ccf file which can be used to deploy these settings on another Thor VM3.

If the parameter setting changes should also be applied to this Thor VM3, select **Registry > Import Settings**. After importing the settings, a reboot is necessary for the changes to take effect on the Thor VM3.

## Using the CCU

Refer to the following examples for instructions on using the CCU.

### Example 1: Import the current settings and save to a file

To import the current settings from the Thor VM3 running the CCU:

1. If you want to view the settings, tap **User** and select **Advanced**.
2. Tap **Registry > Import settings**.
3. Select the desired program(s) from which to import the settings.
4. Select **File > Save** then specify a file name and tap **Save** to save the settings to a ccf file.
5. The ccf file can be used to configure another Thor VM3. See Example 4.

---

### ***Example 2: Modify settings on the current device and save to a file***

To modify the settings on the Thor VM3 running the CCU:

1. Tap **User** and select **Advanced**.
2. Tap **Registry > Import settings**.
3. Select the desired program(s) from which to import the settings.
4. Make any desired changes to the settings.
5. Tap **Registry > Apply settings**
6. Select **File > Save** then specify a file name and tap **Save** to save the settings to a ccf file.
7. Reboot the Thor VM3 for the new settings to take effect.
8. The ccf file can be used to configure another Thor VM3. See Example 4.

### ***Example 3: Reset a device to system defaults***

To import and apply the default values to the Thor VM3 running the CCU:

1. If you want to view the default settings before applying, **User** and select **Advanced**.
2. Tap **File > Open** and change the file type to **ddf files (\*.ddf)**.
3. Select the desired ddf file(s) for the software program(s) to return to default values.
4. Tap **File > Save** and specify a file name for the ccf file.
5. Tap **Registry > Apply settings**
6. Reboot the Thor VM3 for the new settings to take effect.
7. The ccf file can be used to configure another Thor VM3. See Example 4.

### ***Example 4: Clone settings to another device***

1. Create a ccf file using any of the above examples.
2. Copy the ccf file to C:\Windows\DDF on the destination Thor VM3.


*Note: Rather than using the CCU GUI, the command line can be used to apply the settings to the destination device.*

3. Open the CCU on the destination device.
4. Tap **File > Open** and select the ccf file that was copied to the device.
5. Tap **Registry > Import**.
6. When prompted to **Default all Non-Configured Parameters:**
  - Tap **Yes** to set all parameters not configured in the ccf file to defaults on the destination device.
  - Tap **No** to apply the values from the ccf file and leave all other parameters as-is on the destination device.
  - Tap **Cancel** to exit with no changes to the destination device.
7. Reboot the Thor VM3 for the new settings to take effect.

---

## Configuration Cloning Utility Command Line Interface

*Note: The CCU GUI must be closed before launching the command line interface.*

To launch the Client Configuration Utility from the command line, select  (Start) > All Apps > Windows System. Right-click on the **Command Prompt** listing and select **Run as administrator**.



*It is necessary to open the command window as an administrator because the CCU must be able to access and make changes to the Windows registry.*

The command utility can be run from the installed location (C:\Program Files\Honeywell\Configuration Cloning Utility) or in portable mode (such as from a USB drive). When running in portable mode copy the following files to the USB drive:

- Configuration Cloning Utility.exe (from installation directory)
- PrivateKeyLoaded.dll (from installation directory)
- ccf file(s) (from C:\Windows\DDF or other user-specified folder)

A batch file (.bat) can be created to run the CCU commands.

Refer to the examples below to use the command line.

### **Example 1: Launch GUI**

CCU.exe

If ran with no parameters, the GUI CCU interface is opened.

### **Example 2: Import settings**

CCU.exe -import -[programs] -C:\myfile.ccf

Use this command line example to import the current settings from the Thor VM3 running the CCU.

Where:

**import** directs the CCU to read the settings from the system registry.

**[programs]** is replaced by one or more of the following programs from which to import settings, separated by an asterisk (\*):

- **RFTerm** - RFTerm terminal emulation settings
- **VM3\_Win7** - certain Honeywell specific control panels settings
- **\*,\*** can be used to import settings from all available programs.

**C:\myfile.ccf** is the path and filename assigned to the file to settings read from the device. The file must have a .ccf extension. If a file name is specified without a path, the ccf file is saved to C:\Windows\DDF.

CCU.exe -import -\*.\* -C:\myfile.ccf

The example above imports settings from all available programs into a file named myfile.ccf.

CCU.exe -import -RFTerm -C:\myfile.ccf

The example above imports RFTerm settings into a file named myfile.ccf.

CCU.exe -import -RFTerm-Win7 -C:\myfile.ccf

The example above imports RFTerm and Honeywell control panel settings into a file named myfile.ccf.

---

### **Example 3: Apply settings**

```
CCU.exe -apply -reset -e:\myfile.ccf
```

Use this command line example to read the settings from the specified ccf file and apply them to the Thor VM3 running the CCC.

Where:

**apply** directs the CCU to read the settings from the ccf file and apply them to the system registry.

**reset** is optional. When -reset is specified, all settings are reset to their default values before the customized settings in the ccf file are applied. Any prior changes made to these settings on the Thor VM3 are lost. If -reset is not specified, only the changed values in the ccf file are applied. Any other settings previously made on the Thor VM3 are retained.

**E:\myfile.ccf** is the path and filename of the ccf file containing the changes to be applied. If the path is not specified, the ccf file must be located at C:\Windows\DDF.

*Note: After using the -apply parameter, the Thor VM3 must be rebooted for the changes to take effect.*

```
CCU.exe -apply -e:\myfile.ccf
```

The example above applies the settings from the ccf file to the device leaving all other settings untouched.

```
CCU.exe -apply -reset -e:\myfile.ccf
```

## Wireless Network Connections

### Managing Wireless Connections


The Thor VM3 has an 802.11 a/b/g/n WLAN radio and an optional WWAN radio.

- The WLAN radio is configured using the [WLAN Wireless Configuration Utility \(WCU\)](#) (page 6-1).
- The WWAN radio is configured using the [VM3 WWAN Connection Manager](#) (page 6-39).
- The VM3 Connection Manager also provides configuration options for hyper-roaming between WLAN and WWAN connections.

### WLAN Wireless Configuration Utility (WCU)

The 802.11 wireless client device is a Qualcomm Atheros AR950 802.11 a/b/g/n WLAN adapter. This wireless radio is configured by the Wireless Configuration Utility (WCU).

#### Dynamic vs. Fixed IP Address

When changing between dynamic and fixed IP address (Select  (Start) > All Apps > Windows System > Control Panel > Network and Sharing Center > Change Adapter Settings, right-click on desired adapter and select Properties > Internet Protocol Version 4 (TCP/IPv4) > Properties) be sure to reboot the Thor VM3 after changing the IP address type.

#### Important Notes




*It is important that all dates are correct on the Thor VM3 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.*



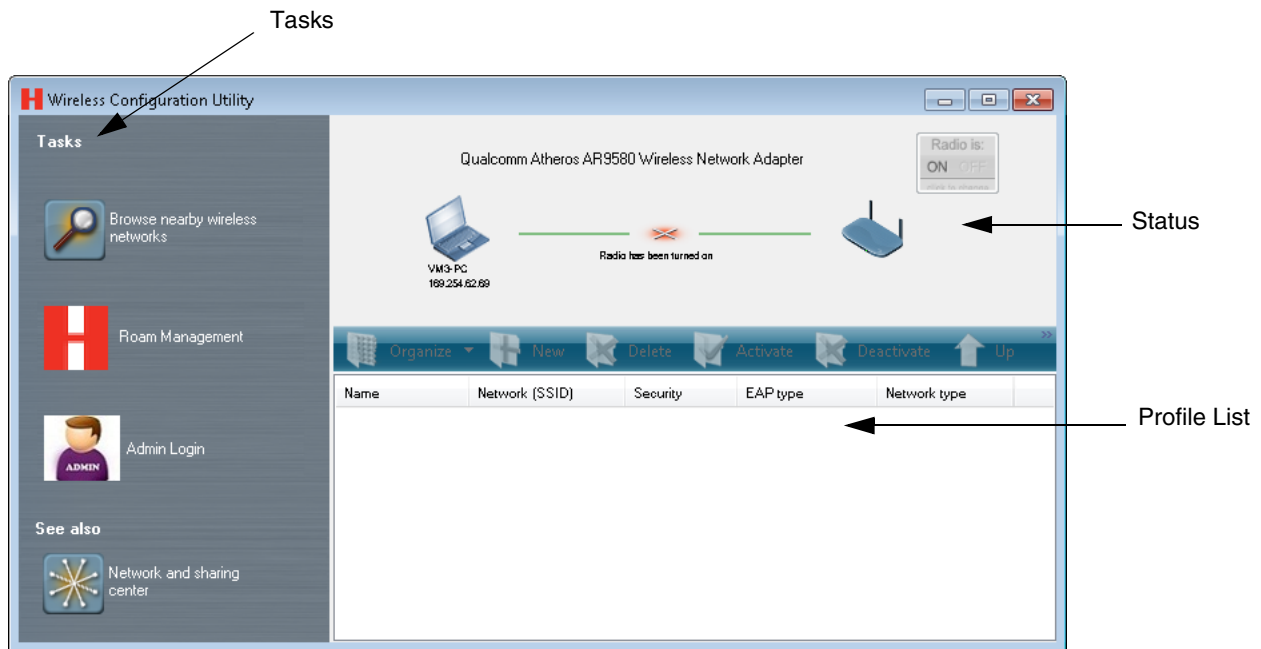
*When using the 802.11 radio, the U-NII 1 band is the preferred band for indoor operation. For regulatory domains in which the U-NII 3 band is allowed, the following channels are supported: 149, 153, 157 and 161. The AP must be configured accordingly.*

#### Using the Wireless Configuration Utility

*Note: When finished making changes the device should be restarted afterwards.*

 (Start) > All Apps > Honeywell > Honeywell (version ID) > WCU or

WCU Icon on Desktop



When using any profile that requires the user to enter credentials (user name, password), the user should enter those credentials when the window pops up. If the credentials are not entered then, the credentials window may be hidden by other windows.

This screen contains several items:

### Tasks

Tasks are listed on the left side of the screen:

- [Browse Nearby Wireless Networks](#) (page 6-5)
- [Roam Management](#) (page 6-28)
- [Admin Login](#) (page 6-4)

### Status

The status of the radio card is shown in the upper right hand of the screen:



Radio is on.

Tapping the button turns the radio off.

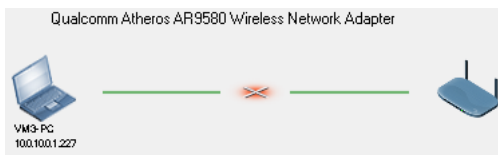


Radio is off.

Tapping the button turns the radio on.

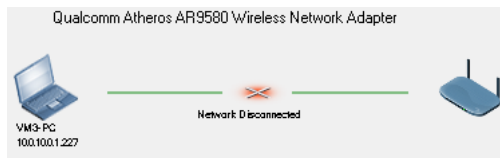
**Note:** The radio status can only be changed when the admin is logged on. Tapping the icon has no effect when not logged in.

The status of the network connection is above the profile list.



The radio has been turned off.

- Tap the radio off icon to turn the radio on.
- When the status of the radio is changing a message may be displayed such as "Radio has been turned on".



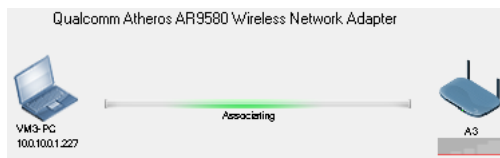
The radio is on but is not connected:

- If there are one or more auto profiles, none of them are able to connect.
- If there are one or more manual profiles, none of them have been activated.



The radio is on and is starting a connection:

- The SSID of the network is displayed below the access point icon.



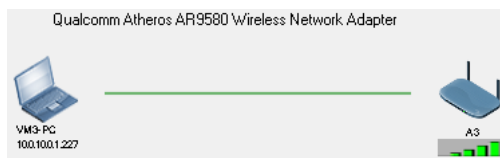
The radio has initiated a connection and is attempting to associate with the access point:

- The SSID of the network is displayed below the access point icon.



The radio has associated with an access point and is attempting to authenticate:

- The SSID of the network is displayed below the access point icon.
- This step not necessary if the network is open (no security).



The radio has successfully connected to the network:

- If security is enabled, the authentication process has been completed.
- The SSID of the network is displayed below the access point icon.
- The signal strength is also displayed below the access point icon.

## Profile List

All profiles that have been created are listed in this section. Profiles can be configured for auto connect or manual connect and are subdivided by connection type in this list.

From the profile list, an admin can:

- **Organize** - Open or rename a profile
- **New** - Create a new profile
- **Delete** - Delete an existing profile
- **Activate** - Make an inactive profile the active profile. The inactive profile may be either a manual or an auto profile not currently in use.
- **Deactivate** - When the current active profile is selected, this option deactivates that profile. If there is an inactive auto profile, that profile may become active.
- **Up** - If there are multiple profiles, the Up feature moves the selected profile up the list. This feature is available for both the Auto and Manual profiles.
- **Down** - If there are multiple profiles, the Down feature moves the selected profile down the list. This feature is available for both the Auto and Manual profiles.

Similar features are also available by right-clicking on a profile name:

- **New** - Create a new profile.
- **Open** - Open the selected profile to view or edit properties.
- **Activate** - Make an inactive profile the active profile. The inactive profile may be either a manual or an auto profile not currently in use.
- **Deactivate** - When the current active profile is selected, this option deactivates that profile. If there is an inactive auto profile, that profile may become active.
- **Disconnect** - If the selected profile is connected, this option disconnects the profile.
- **Rename** - Use to assign a new name to the selected profile.

- 
- **Up** - If there are multiple profiles, the Up feature moves the selected profile up the list. This feature is available for both the Auto and Manual profiles.
  - **Down** - If there are multiple profiles, the Down feature moves the selected profile down the list. This feature is available for both the Auto and Manual profiles.

### **Admin Login**

All users can select from existing profiles and use the browse feature to view nearby networks.

It is necessary to log in to create or edit profiles, turn the radio off or on and to adjust the roaming parameters.



Admin is not  
logged in



Admin is  
logged in

The appearance of the icon indicates if the admin is logged in or not.

To log in:

1. Tap the **Admin Login** icon.
2. Enter the password. The default password is **Honeywell**.

A screenshot of a 'WCU Login Form' dialog box. It has a title bar 'WCU Login Form'. Inside, there are two labels: 'Username :' and 'Password :'. The 'Username :' label is followed by a text box containing 'WCU\_Administrator'. The 'Password :' label is followed by an empty text box. At the bottom, there are three buttons: 'Login', 'Cancel', and 'Reset Password'.

3. Tap the **Login** button to log in or **Cancel** to exit without logging in.

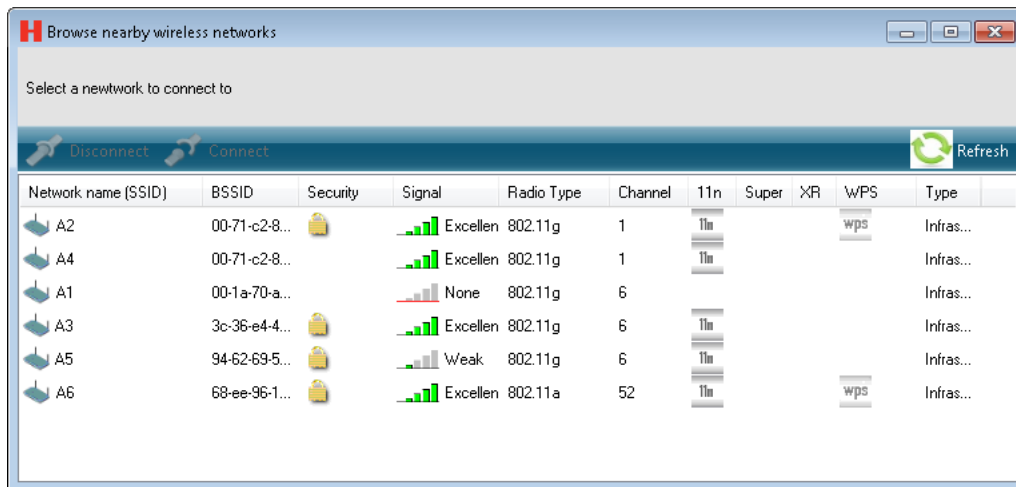
To change the default password:

1. Tap the **Admin Login** icon.
2. Tap the **Reset Password** button.
3. Enter the current password.
4. Enter and confirm the new password.
5. Tap **Reset** to save the new password or **Cancel** to exit without changing the password.



## Browse Nearby Wireless Networks

Tap the Browse nearby wireless networks to open the open this window.



Tap the Refresh button to update the network list.

For each network discovered the following attributes are listed:

- Network Name (SSID) - Name of the network (Service Set ID).
- BSSID - Basic Service Set ID, a unique ID to an access point in the network.
- Security - Indicates if the access point is using security. A lock icon is displayed if the network is using security.
- Signal - A graphic representation of the signal strength plus (0 to 4 bars) plus a text description of signal strength.
- Radio Type - The type of radio in the access point, i.e. 802.11a, 802.11g, etc.
- Channel - The channel the access point is using.
- 11n - If an icon is displayed, the access point supports 802.11n.
- Super - If an icon is displayed, the access point supports Atheros' Super AG features.
- XR - If an icon is displayed, the access point supports Atheros' extended range (ER) technology.
- WPS - If an icon is displayed, the access point supports WPS (Wi-Fi Protected Setup).
- Type - Identifies the network type, infrastructure or Ad Hoc.

*Note: Tapping on any of the column headings will sort the network list by the contents of that column.*

If logged on as admin, tap on any network in the list to create a profile for that network.

## Creating a Profile

To create from the Profile list:

1. Log in as admin.
2. Tap the **New** button.
3. Select the desired profile type - auto connect, manual connect or Ad Hoc.
4. Enter a profile name and network name.
5. Tap **Next**.
6. Tap **Connect To...** to connect to the network or tap **Change connection settings** for additional configuration options including **Security** (page 6-7).

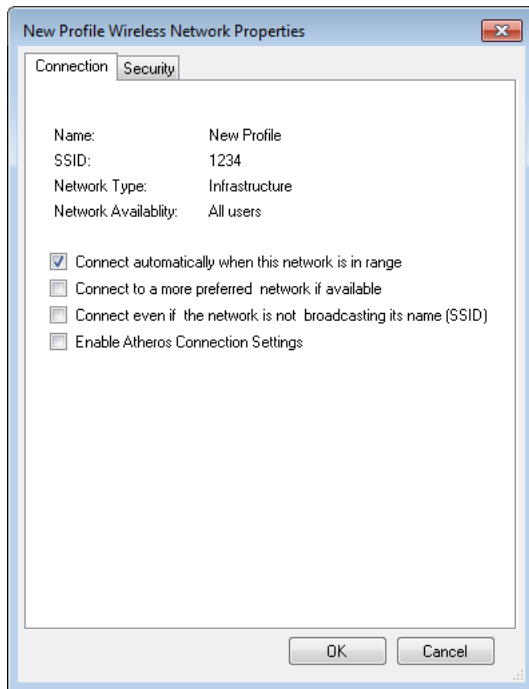
To create a profile from the nearby networks:

1. Log in as admin.
2. Tap the **Browse nearby wireless networks** button.
3. Tap the desired network then tap the **Connect** icon or double tap the desired network.

- 
4. Change the profile name if desired.
  5. Tap **Advanced security settings** for additional configuration options including [Security](#) (page 6-7).
  6. Tap **OK** to exit and save the profile or type **Cancel** to exit without creating a profile.

## **Advanced Profile Configuration**

### **Connection**



This tab shows the basic information used to create the profile.

Options include:

- Connect automatically when this network is in range - If the profile was created as an auto connect profile, this box is checked. If created as a manual profile, this box is unchecked.
- Connect to a more preferred network if available
- Connect even if the network is not broadcasting its name (SSID) - If a network is not broadcasting its SSID, check this box.
- Enable Atheros connection settings.

*Note: Atheros connection settings must be enabled to use CCX. It is disabled by default.*

---

## **Security**

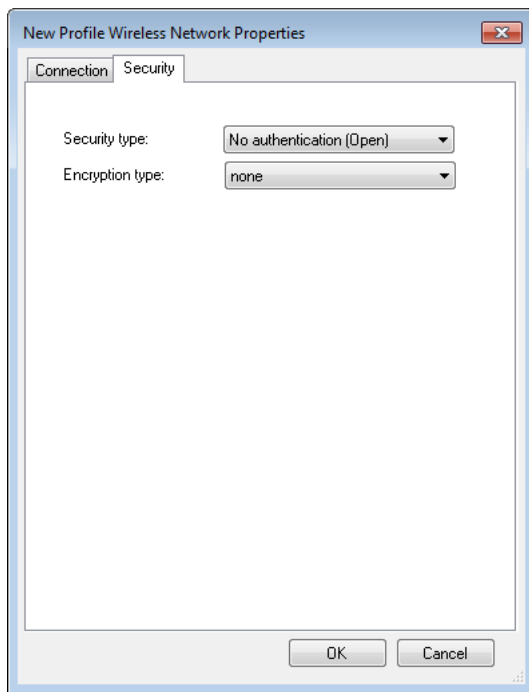
The options available on the security tab will depend on the security type and encryption type selected.

Continue to the applicable section to configure the WCU for network security:

- [Open \(No Security\)](#) (page 6-8)
- [WEP](#) (page 6-9)
- [WPA2-Personal](#) (page 6-10)
- [PEAP-TLS](#) (page 6-11)
- [LEAP](#) (page 6-14)
- [EAP-FAST PEAP](#) (page 6-16)
- [EAP-FAST TLS](#) (page 6-19)
- [EAP-TLS](#) (page 6-22)
- [EAP-TTLS](#) (page 6-24)
- [PEAP-MSCHAPv2](#) (page 6-26)

---

### ***Open (No Security)***



To configure for open (no security):

1. Set **Security type** to **No authentication (Open)**.
2. Set **Encryption type** to none.
3. Tap **OK**.
4. From the profile listing, make sure the desired profile is active.
5. Verify the connection using [Status](#) (page 6-2).

---

## WEP

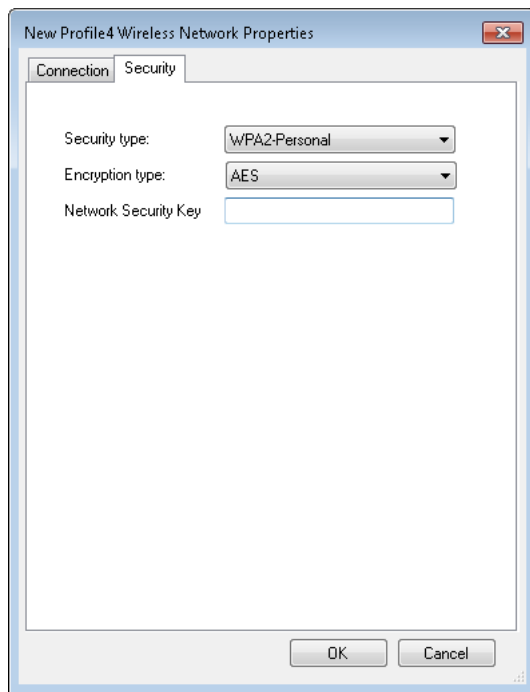


To configure for WEP:

1. Set **Security type** to **No authentication (Open)**.
2. Set **Encryption type** to **WEP**.
3. Enter the **Network Security Key**.
4. Select the **Key Index**.
5. Tap **OK**.
6. From the profile listing, make sure the desired profile is active.
7. Verify the connection using [Status](#) (page 6-2).

---

## **WPA2-Personal**

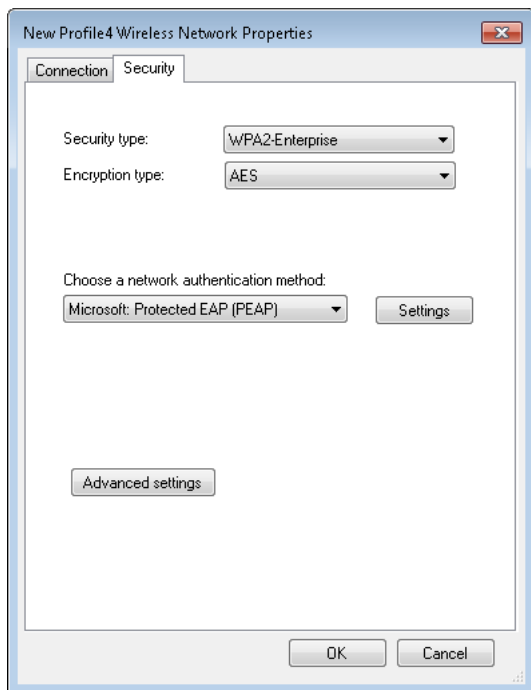


To configure for WPA2-Personal:

1. Set **Security type** to **WPA2-Personal**.
2. Set **Encryption type** to **AES**.
3. Enter the **Network Security Key**.
4. Tap **OK**.
5. From the profile listing, make sure the desired profile is active.
6. Verify the connection using [Status](#) (page 6-2).

---

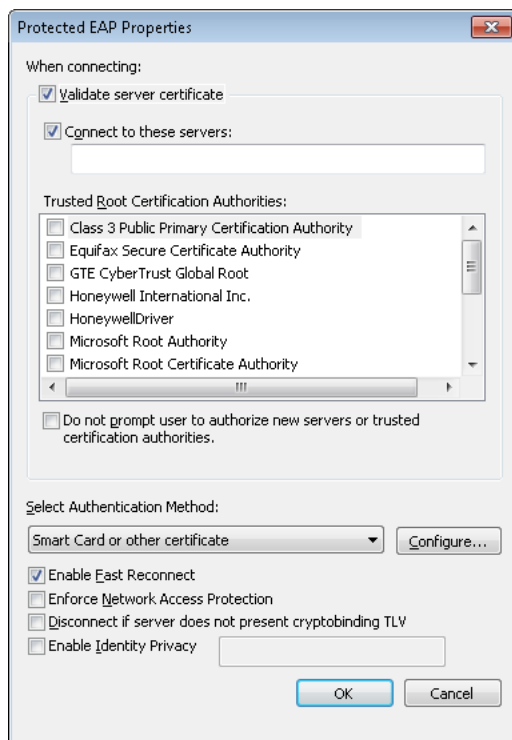
## PEAP-TLS



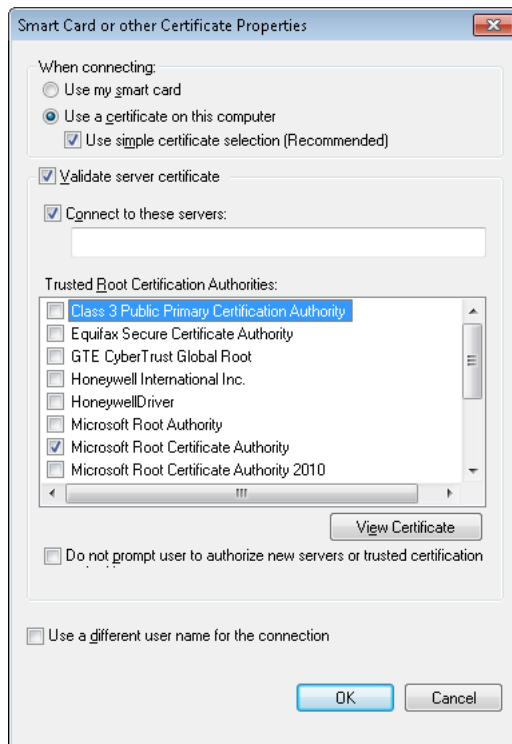
To configure for Microsoft PEAP-TLS:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **Microsoft Protected EAP (PEAP)**.

4. Tap the **Settings** button.



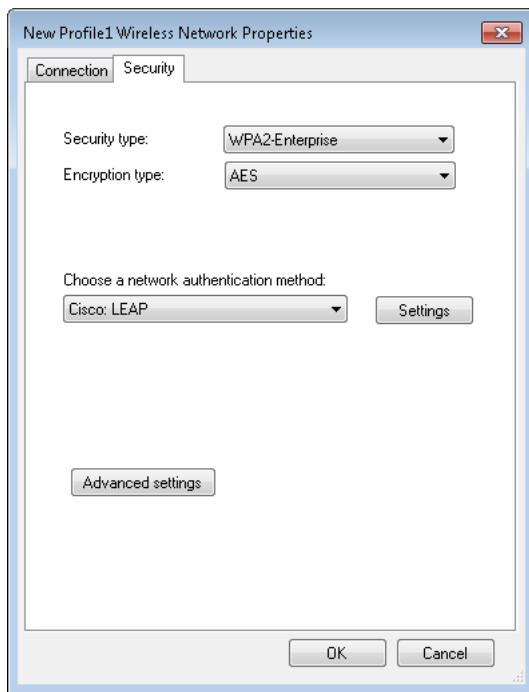
5. Set the authentication method to **Smart Card or other certificate**.
6. Tap the **Configure** button.





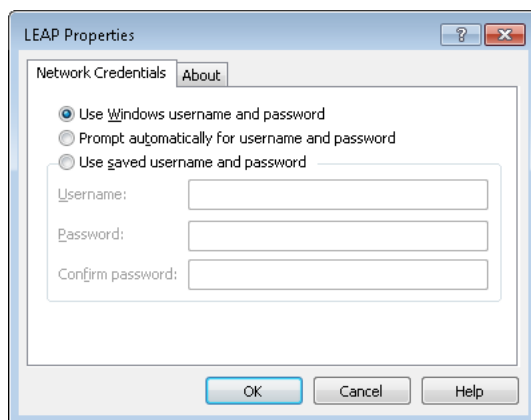
- 
7. Select **Use a certificate on this computer**.
  8. Select the trusted root certificate from the listed certificates.
  9. Tap **OK** to close any open windows.
  10. From the profile listing, make sure the desired profile is active.
  11. Verify the connection using [Status](#) (page 6-2).

## LEAP



To configure for Cisco LEAP:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Tap the **Settings** button.



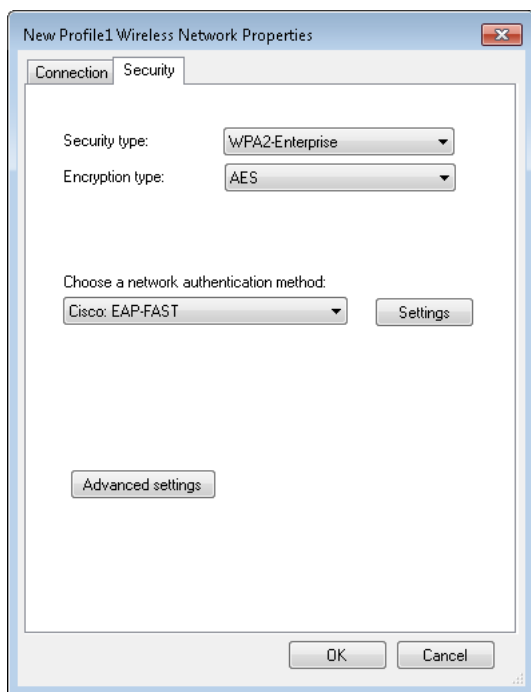
4. Select the desired credentials method of providing credentials. **Prompt automatically for username and password** is recommended.
5. If saved username and password is selected, enter the credentials now.
6. Tap **OK** to close all open windows.
7. From the profile listing, make sure the desired profile is active.

- 
8. If prompt for username and password option was selected, enter the credentials when prompted.

*Note: If the credentials are not entered when the window first pops up, the credentials window can become hidden behind other windows.*

9. Verify the connection using [Status](#) (page 6-2).

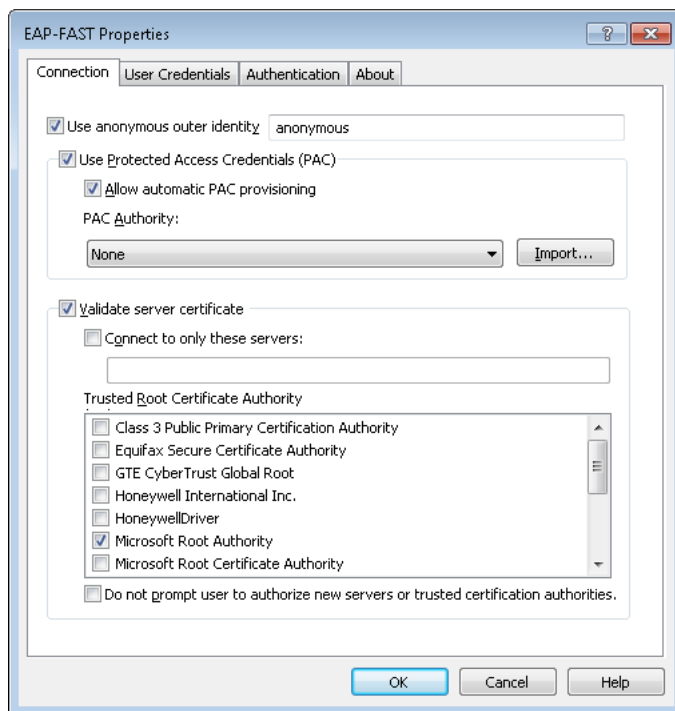
## ***EAP-FAST PEAP***



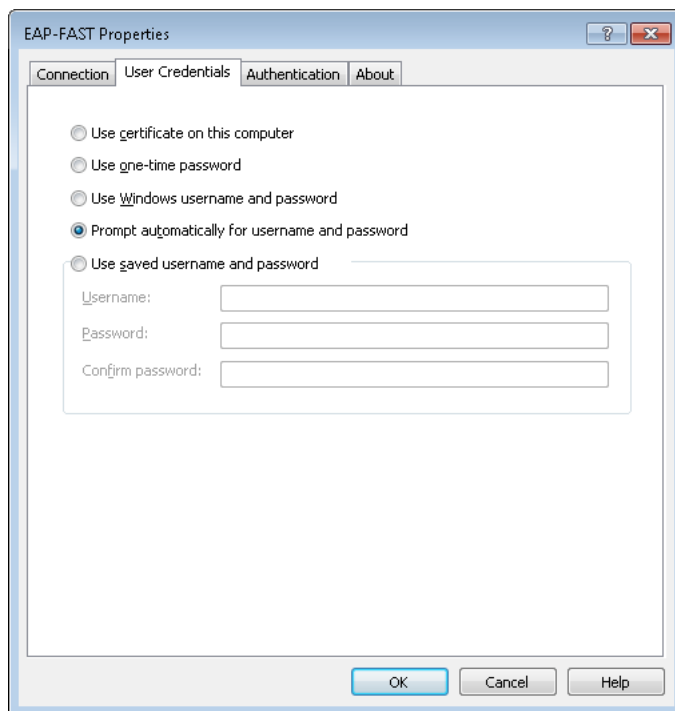
To configure for Cisco EAP-FAST PEAP:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **Cisco:EAP-FAST**.

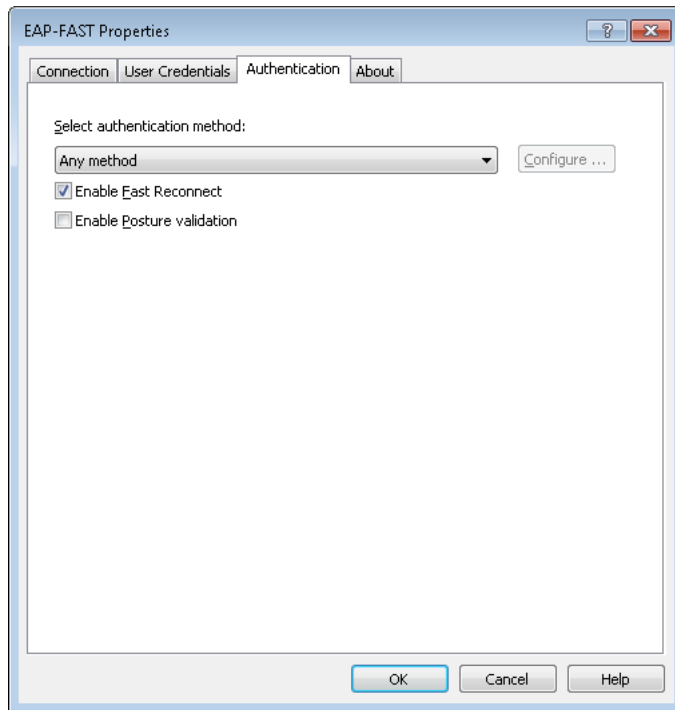
4. Tap the **Settings** button.



5. Select the **User Credentials** tab.



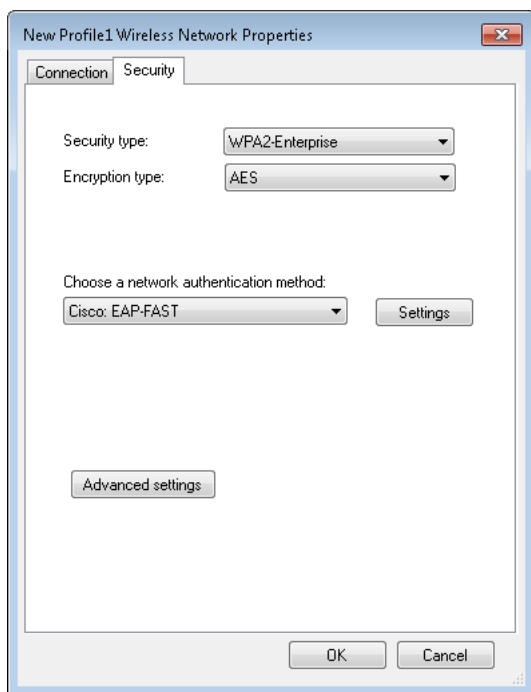
- 
6. Select the desired credentials method of providing username and password. **Prompt automatically for username and password** is recommended.
  7. If saved username and password is selected, enter the credentials now.
  8. From the profile listing, make sure the desired profile is active.
  9. Tap the **Authentication** tab.



10. Select the desired authentication method. Any of the available options may be used.
11. The **About** tab provides Cisco copyright information.
12. Tap **OK** to close all open windows.
13. From the profile listing, make sure the desired profile is active.
14. If prompt for username and password option was selected, enter the credentials when prompted.  
*Note: If the credentials are not entered when the window first pops up, the credentials window can become hidden behind other windows.*
15. Verify the connection using [Status](#) (page 6-2).

---

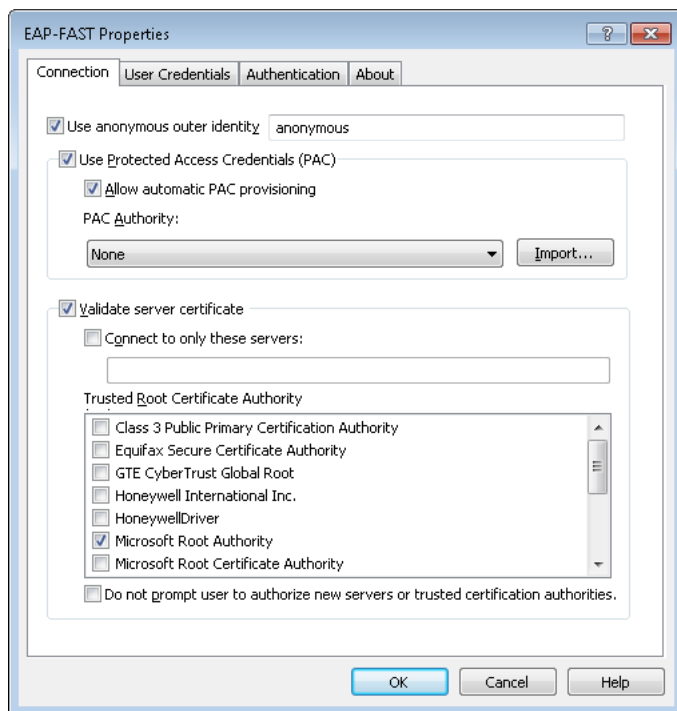
## ***EAP-FAST TLS***



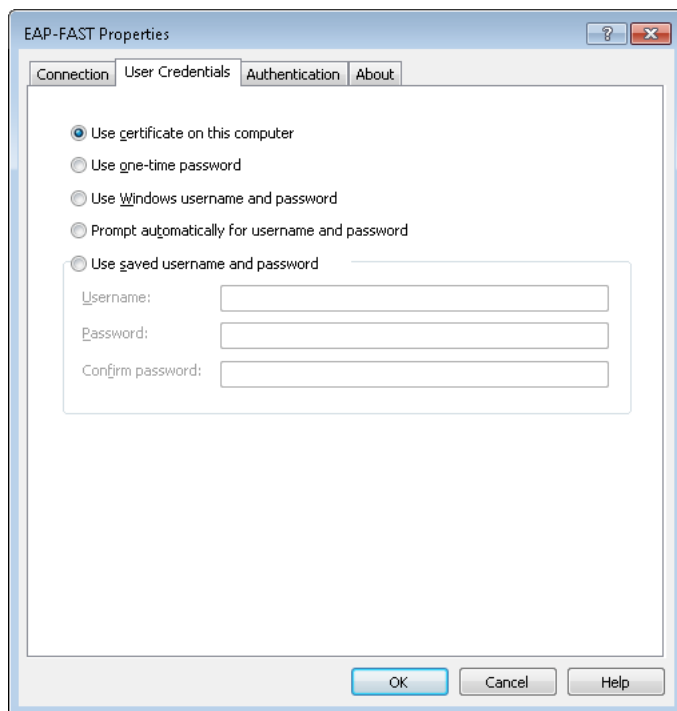
To configure for Cisco EAP-FAST TLS:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **Cisco:EAP-FAST**.

4. Tap the **Settings** button.



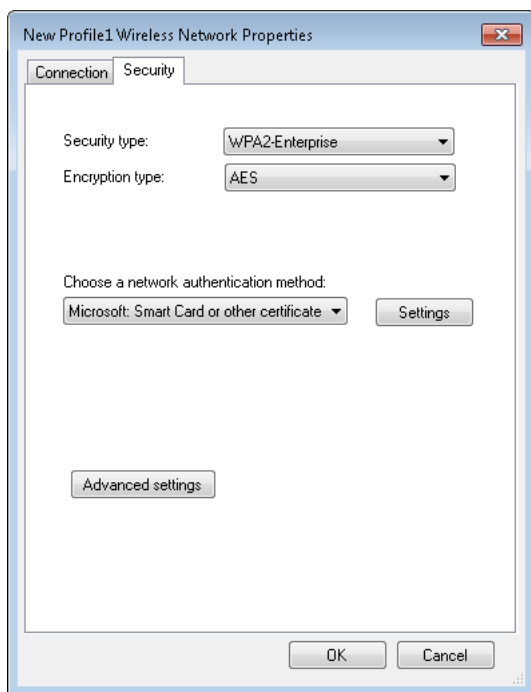
5. Select the **User Credentials** tab.





- 
6. Select **Use certificate on this computer**.
  7. No entries are needed on the **Authentication** tab.
  8. The **About** tab provides Cisco copyright information.
  9. Tap **OK** to close all open windows.
  10. From the profile listing, make sure the desired profile is active.
  11. Verify the connection using [Status](#) (page 6-2).

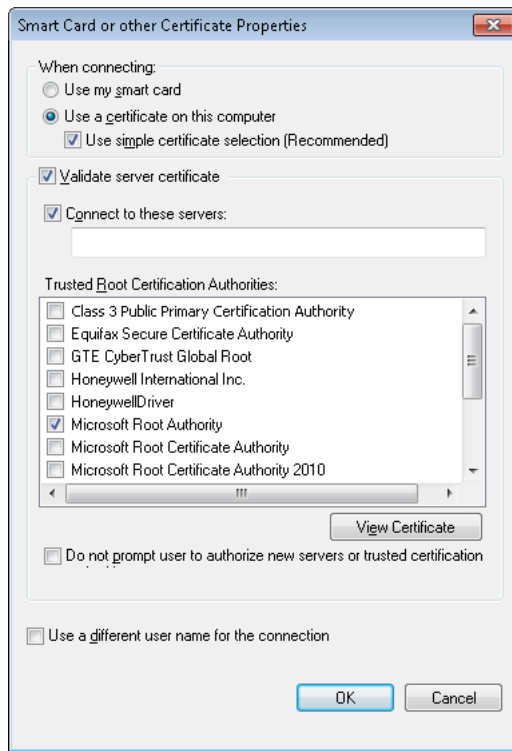
## EAP-TLS



To configure for EAP-TLS:

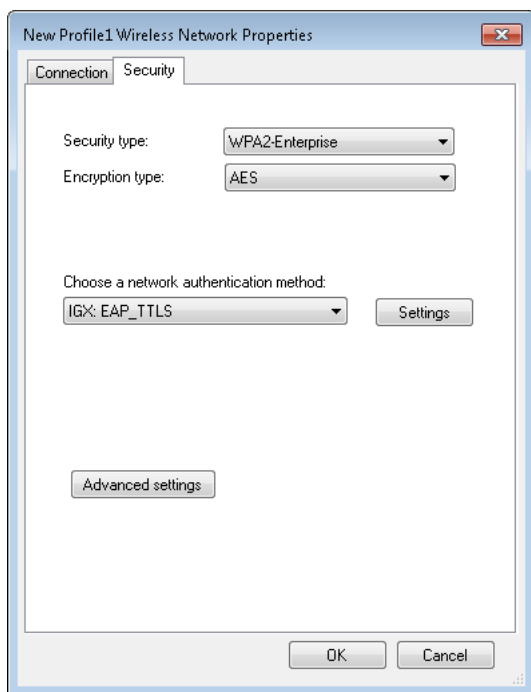
1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **Microsoft Smart Card or other certificate**.

- 
4. Tap the **Settings** button.



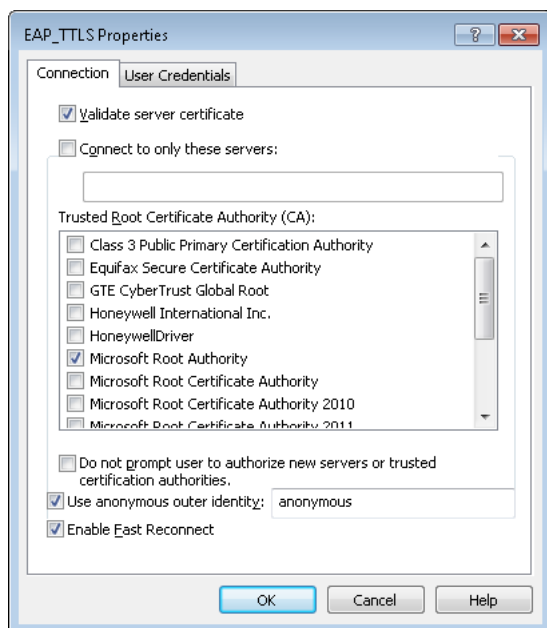
5. Select **Use a certificate on this computer**.
6. Select the trusted root certificate from the listed certificates.
7. Tap **OK** to close any open windows.
8. From the profile listing, make sure the desired profile is active.
9. Verify the connection using [Status](#) (page 6-2).

## EAP-TTLS



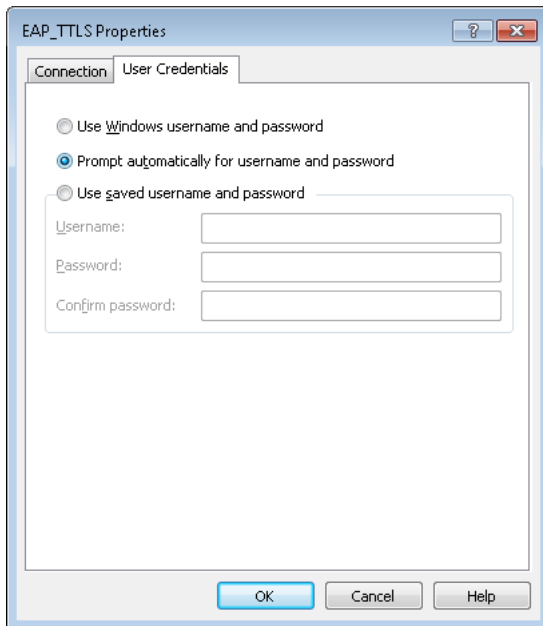
To configure for EAP-TTLS:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **IGX: EAP\_TTLS**.
4. Tap the **Settings** button.



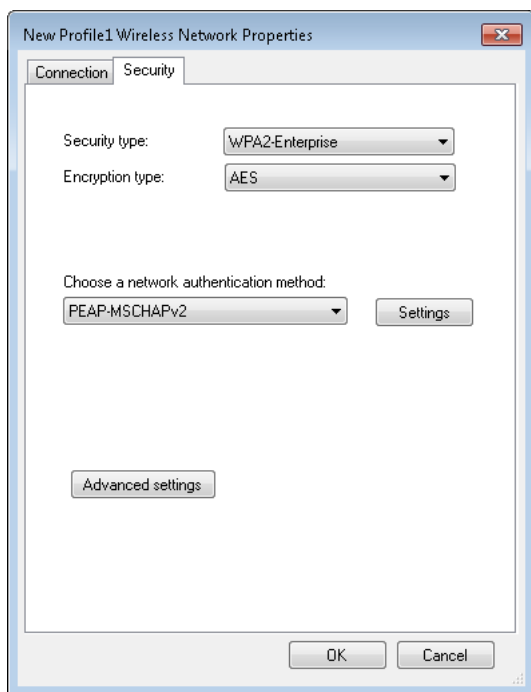
5. Select the **Connection** tab.

- 
6. Select **Validate server certificate**.
  7. Select the trusted root certificate from the listed certificates.
  8. Select the **User Credentials** tab.



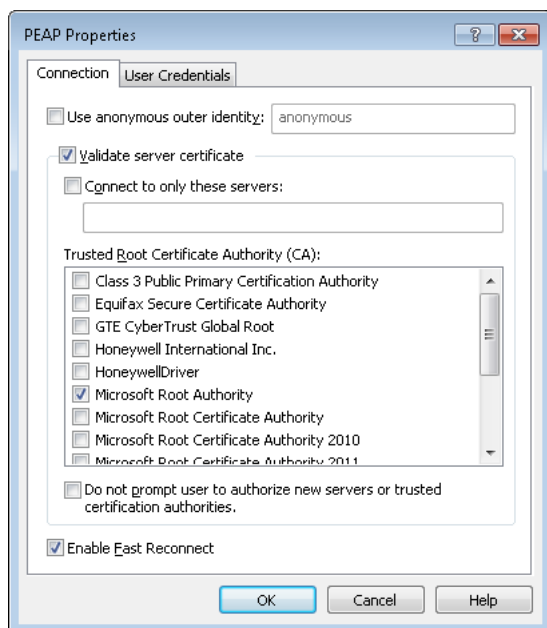
9. Select the desired credentials method of providing username and password. **Prompt automatically for username and password** is recommended.
10. If saved username and password is selected, enter the credentials now.
11. Tap **OK** to close any open windows.
12. From the profile listing, make sure the desired profile is active.
13. If prompt for username and password option was selected, enter the credentials when prompted.  
*Note: If the credentials are not entered when the window first pops up, the credentials window can become hidden behind other windows.*
14. Verify the connection using [Status](#) (page 6-2).

## PEAP-MSCHAPv2

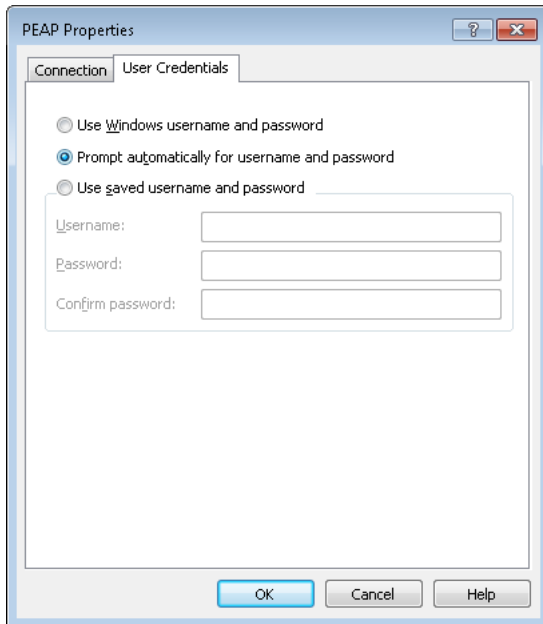


To configure for PEAP-MSCHAPv2:

1. Set **Security type** to **WPA2-Enterprise** or **CCKM**.
2. Set **Encryption type** to **AES**.
3. Set network authentication method to **PEAP-MSCHAPv2**.
4. Tap the **Settings** button.



5. Select the **Connection** tab.
6. Select **Validate server certificate**.
7. Select the trusted root certificate from the listed certificates.
8. Select the **User Credentials** tab.

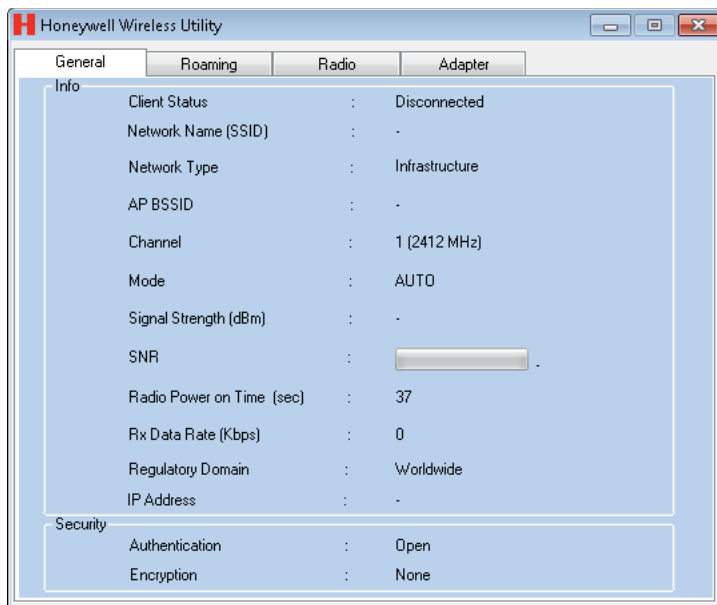


9. Select the desired credentials method of providing username and password. **Prompt automatically for username and password** is recommended.
10. If saved username and password is selected, enter the credentials now.
11. Tap **OK** to close any open windows.
12. From the profile listing, make sure the desired profile is active.
13. If prompt for username and password option was selected, enter the credentials when prompted.  
*Note: If the credentials are not entered when the window first pops up, the credentials window can become hidden behind other windows.*
14. Verify the connection using [Status](#) (page 6-2).

## Roam Management

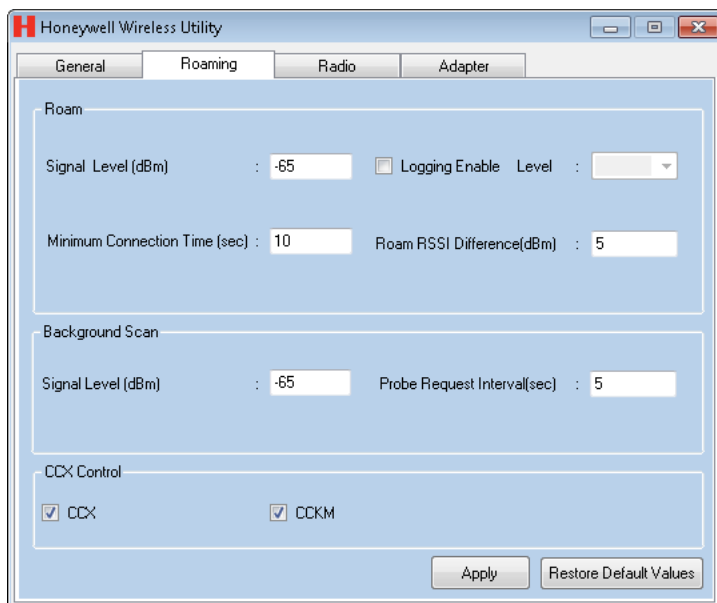
### General

The general tab provides information on the current connection. There are no user entries on this screen.



### Roaming

The Roaming tab is used to configure roaming behavior.



Roam	
Signal Level (dBm)	When the signal strength is below this level, the radio will attempt to roam. Default -65 dBm, range is -80 to -55.



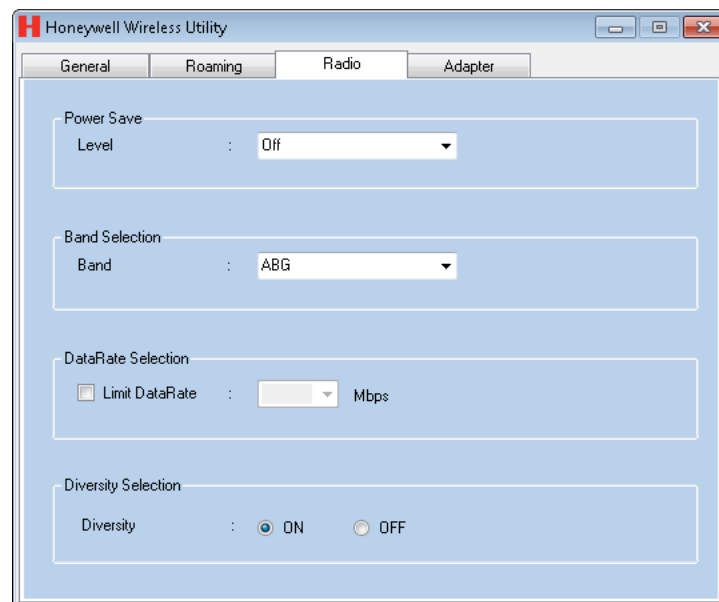
Logging Enable	When checked, logging is enabled. Logging can be set to Critical (fewer messages) or All (more messages). Logging is disabled by default. <i>Note: Logging is set to disabled after any reboot to prevent log files for taking up disk space when not needed.</i>
Minimum Connection Time (sec)	The minimum connection time the radio stays connected to the current access point before roaming begins. Default 10 seconds, range is 5 to 25.
Roam RISSI Difference (dBm)	The minimum signal strength difference between APs before the radio roams. Default 5 dBm, range is 5 to 25.
<b>Background Scan</b>	
Signal Level (dBm)	The minimum signal strength an access point signal must have to be considered for roaming. Default -65 dBm, range is -80 to -55.
Probe Request Interval (sec)	The interval between roam probes. Default 5 seconds, range is 5 to 60.
<b>CCX Control</b>	
<i>Note: For CCX to be enabled, two settings must be enabled:</i> <ul style="list-style-type: none"> <li>• CCX must be enabled (checked) on this screen.</li> <li>• <b>Enable Atheros Connection Settings</b> must be enabled (checked) on the <a href="#">Connection</a> (page 6-6) tab.</li> </ul> If both settings are not enabled, the WLAN radio does not identify itself as CCX V4 compatible when associating to an access point.	
CCX	Use CCX (Cisco Client Extensions) for faster roaming. Default is enabled.
CCKM	Use CCKM (Cisco Centralized Key Management) for faster roaming. Default is enabled.

To save changes, tap **Apply** the button. Confirmation dialogs may be displayed.

To exit without saving changes, tap the **X** in the upper right of the window.

Tap restore default values, tap the **Restore Default Values** then tap **Apply**.

## Radio



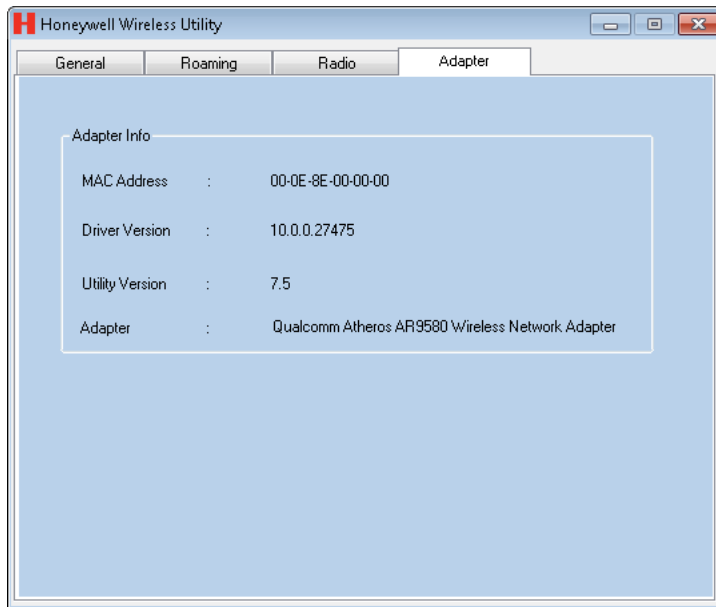
Power Save	Set the power save level. Options are Off (default) and Auto-PSM.
Band Selection	Select the bands to use. Options are: A, BG, G, ABG (default).
DataRate Selection	To limit data rates, check the Limit DataRate checkbox. If checked, select the desired rate (MCS0 to MCS15). MCS0 (Modulation and Coding Scheme) 0 is slowest, MCS15 is fastest but subject to more errors. Default is disabled.

---

Diversity Selection	By default, diversity is on.
---------------------	------------------------------

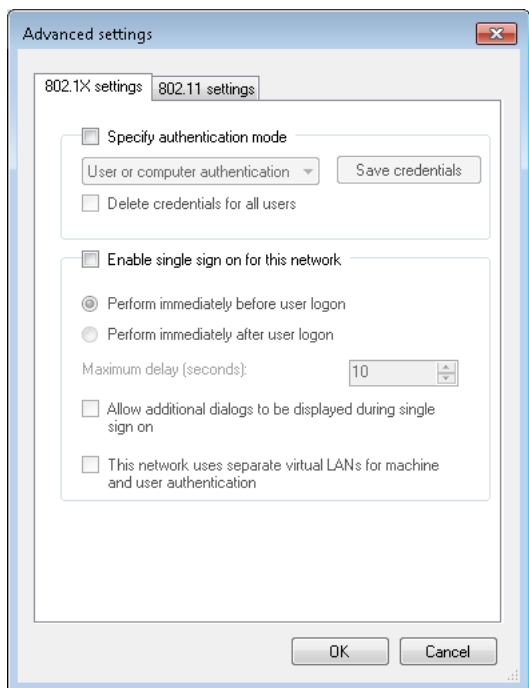
## **Adapter**

The adapter tab provides information on the radio card. There are no user entries on this screen.



## **Advanced Settings**

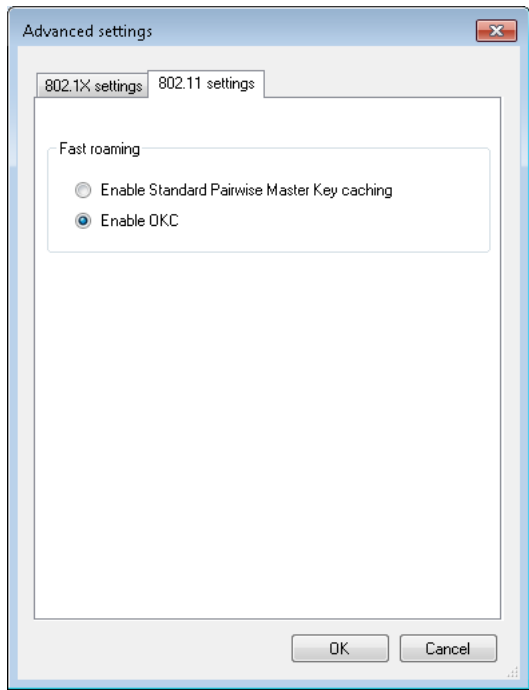
### **802.1X Settings**



Enable single sign-on from this screen. When enabled, the user credentials are provided to the WCU either immediately before or immediately after the user logs into the computer. The delay can be configured from 1 to 120 seconds (10 seconds is the default).

---

## 802.11 Settings



Determines the method used for fast roaming:

- **Enable Standard Pairwise Master key caching** - When standard Pairwise Master Key (PMK) is enabled, authentication can be skipped if the client has already authenticated to the access point previously. A connection to a new access point uses the 802.11x authentication process while a reconnect to the access point can skip the authentication.
- **Enable OKC- Opportunistic Key Caching (OKC)** allows a client to skip 802.11x authentication when roaming to an access point under a controller based infrastructure. After the client authenticates with one access point, it can roam to others under the same controller by handshaking rather than authentication.

---

## Certificates

*Note: Please refer to the Security Primer to prepare the Authentication Server and Access Point for communication.*

*Note: It is important that all dates are correct on the Thor VM3 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.*



*If using the Windows Certificate Store, the Windows Account must have a password. The password cannot be left blank. The WCU uses the Windows user account credentials to access the Certificate Store. The Windows user account credentials need not be the same as those entered in the WCU.*

### Quick Start

Root Certificates are necessary for EAP-TLS, PEAP/GTC and PEAP/MSCHAP.

1. [Generate a Root CA Certificate](#) (page 6-32) either from the Thor VM3 or using a PC.
2. If a PC was used to request the certificate, copy the certificate to the Thor VM3.
3. [Install a Root CA Certificate](#) (page 6-34).

User Certificates are necessary for EAP-TLS.

1. [Generate a User Certificate](#) (page 6-35) either from the Thor VM3 or using a PC.
2. If a PC was used to request the certificate, copy the certificate to the Thor VM3.
3. [Install a User Certificate](#) (page 6-37).

### Generate a Root CA Certificate

*Note: It is important that all dates are correct on the Thor VM3 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.*

The easiest way to get the root CA certificate is to use a browser on a PC or the Thor VM3 to navigate to the Certificate Authority. To request the root CA certificate, open a browser to

http://<CA IP address>/certsrv.

*Note: It may be necessary to use a PC to request a certificate for these devices.*

Sign into the CA with any valid username and password.



## Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

For more information about Certificate Services, see [Certificate Services Documentation](#).

### Select a task:

[Request a certificate](#)

[View the status of a pending certificate request](#)

[Download a CA certificate, certificate chain, or CRL](#)

Click the **Download a CA certificate, certificate chain or CRL** link.

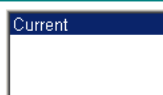
Make sure the correct root CA certificate is selected in the list box.

## Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority, [install this CA certificate chain](#).

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

### CA certificate:

A list box with a blue header bar containing the text 'Current'. The list box is empty except for the header bar.

### Encoding method:

- ☒ DER  
☐ Base 64

[Download CA certificate](#)

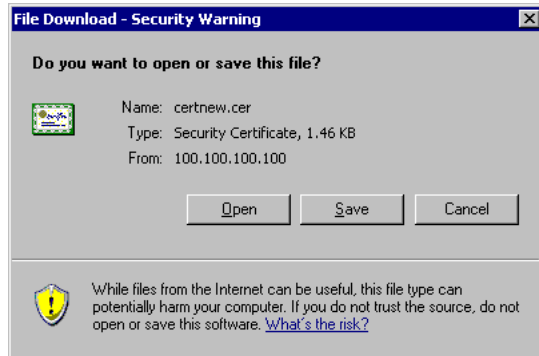
[Download CA certificate chain](#)

[Download latest base CRL](#)

[Download latest delta CRL](#)

Click the **DER** button.

To download the CA certificate, click on the **Download CA certificate** link.



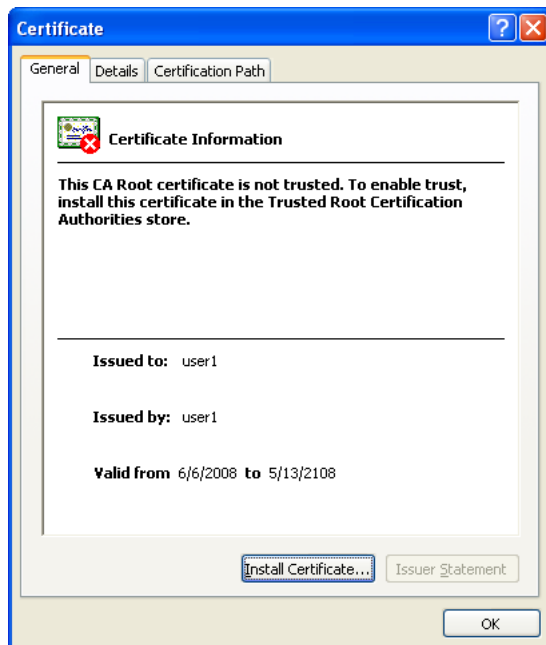
Click the **Save** button and save the certificate. Make sure to keep track of the name and location of the certificate. Next install the certificate on the Thor VM3.

### ***Install a Root CA Certificate***

Copy the certificate file to the Thor VM3. The certificate file has a .CER extension. Locate the file and double-tap on it. If presented with a security warning, confirm that you want to open the file.

If the Certificate Wizard does not start automatically when you double-tap the certificate .CER file:

1. Select **Start** and type **certmgr.msc** in the search box and press **Enter**.
2. In the left pane, right-click **Trusted Root Certificate Authorities** and select **All Tasks > Import**.
3. The Certificate Import Wizard starts.
4. Tap **Next** and use the **Browse..** button to locate the Root certificate copied to the Thor VM3 then tap **Open**.
5. The certificate filename and path are displayed. Tap **Next**.



Tap the **Install Certificate** button.

The certificate import wizard starts. Tap **Next**.

1. Select **Place all certificates in the following store**.
2. Tap **Browse** and select **Trusted Root Certification Authorities**.
3. Tap **OK** then tap **Next** and **Finish**.
4. If presented with a security warning, confirm that you want to install this certificate.
5. An import successful message is displayed.

## ***Generate a User Certificate***

The easiest way to get the user certificate is to use the browser on the Thor VM3 or a PC to navigate to the Certificate Authority. To request the user certificate, open a browser to

http://<CA IP address>/certsrv.

*Note: It may be necessary to use a PC to request a certificate for these devices.*

Sign into the CA with the username and password of the person who will be logging into the mobile device.



This process saves a user certificate file.

**Microsoft** Certificate Services [Home](#)

---

### Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

For more information about Certificate Services, see [Certificate Services Documentation](#).

**Select a task:**

- [Request a certificate](#)
- [View the status of a pending certificate request](#)
- [Download a CA certificate, certificate chain, or CRL](#)

Click the **Request a certificate** link.

## Request a Certificate

Select the certificate type:

[User Certificate](#)

Or, submit an [advanced certificate request](#).

Click on the **User Certificate** link.

### User Certificate - Identifying Information

No further identifying information is required. To complete your certificate, press submit:

[More Options >>](#)

Submit >

Click on the **Submit** button. If there is a message box asking if you want to confirm the request, click **Yes**.

The User Certificate is issued.

### Certificate Issued

The certificate you requested was issued to you.



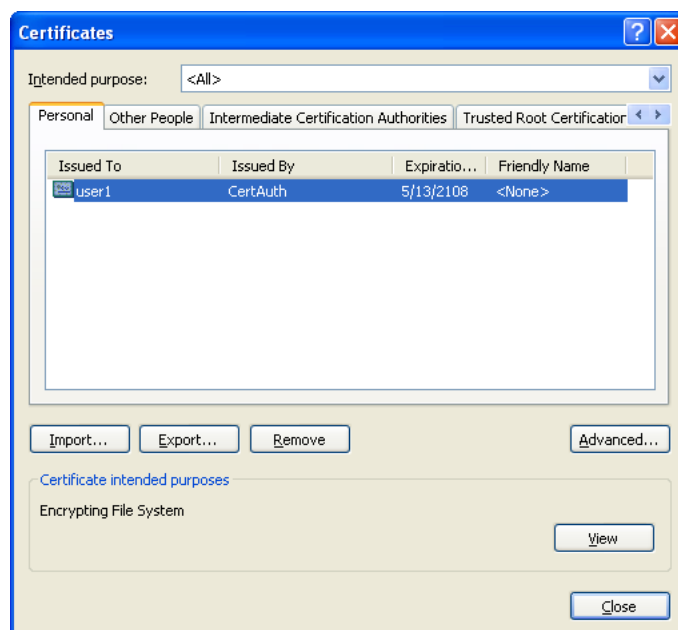
[Install this certificate](#)

Install the user certificate on the requesting computer by clicking the **Install this certificate** link.

If the requesting computer is the Thor VM3, then the process is finished. Otherwise, export the certificate as described below.

## Exporting a User Certificate

Select **Tools > Internet Options > Content** and click the **Certificates** button.



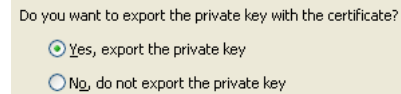


---

Make sure the **Personal** tab is selected. Highlight the certificate and click the **Export** button.

The Certificate Export Wizard is started

Select **Yes, export the private key** and click **Next**.

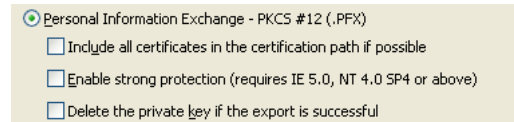


Do you want to export the private key with the certificate?

☒ Yes, export the private key

☐ No, do not export the private key

Uncheck **Enable strong protection** and click **Next**. The certificate type must be PKCS #12 (.PFX).



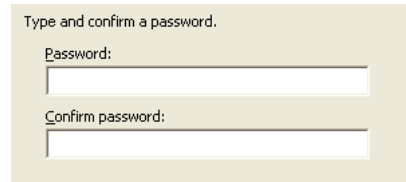
Personal Information Exchange - PKCS #12 (.PFX)

☒ Include all certificates in the certification path if possible

☐ Enable strong protection (requires IE 5.0, NT 4.0 SP4 or above)

☐ Delete the private key if the export is successful

When the private key is exported, you must enter the password, confirm the password and click **Next**. Be sure to remember the password as it is needed when installing the certificate.

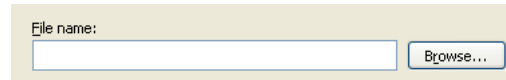


Type and confirm a password.

Password:

Confirm password:

Supply the file name for the certificate. Use the **Browse** button to select the folder where you wish to store the certificate. The certificate is saved with a .PFX extension.



File name:

Browse...

Click **Finish** and **OK** to close the Successful Export message.

Locate the User Certificate in the specified location. Copy to the Thor VM3. Install the User certificate.

### ***Install a User Certificate***

After generating and exporting the user certificate, install the user certificate.

1. Copy the certificate from the PC to the Thor VM3.
2. Locate the certificate file (it has a .PFX extension) and double-click on it. If clicking on the certificate file does not launch the certificate import wizard, follow the [Manually Initiate Certificate Installation](#) (page 6-38) before continuing the instructions below.
3. The certificate import wizard starts. Tap **Next**.
4. Confirm the certificate file name and location.
5. Tap **Next**.
6. You are prompted for the password that was assigned when the certificate was exported.



7. It is not necessary to select either of the checkboxes displayed above.
8. Enter the password and tap **Next**.
9. On the next screen, allow Windows to automatically select the certificate store, then click **Next** and **Finish**. An import successful message is displayed.

### ***Manually Initiate Certificate Installation***




If the Certificate Wizard does not start automatically when you double-tap the certificate .PFX file:

1. Select **Start** and type **certmgr.msc** in the search box and press **Enter**.
2. In the left pane, right-click **Personal** and select **All Tasks > Import**.
3. The Certificate Import Wizard starts.
4. Tap **Next** and use the **Browse..** button to locate the User certificate copied to the Thor VM3. If necessary, change the file type drop down list at the bottom of the explorer window from \*.cer to \*.pfx. After selecting the .PFX file, tap **Open**.
5. The certificate filename and path are displayed. Tap **Next**.
6. Return to the installation instructions above.

---

## VM3 WWAN Connection Manager

Access the VM3 Connection Manager from the Honeywell Connection Manager icon on the desktop or the icon in the system tray. Double tap the Connection Manager icon in the system tray (or right-click and select **Configuration Panel**). The system tray Connection Manager icon looks like this:

-  VM3 Connection Manager icon when there is no active WLAN or WWAN connection. The icon may be flashing in the system tray when there is no connection..
-  WVM3 Connection Manager icon when there is an active WLAN connection.
-  VM3 connection manager icon when a WWAN connection is active. The icon indicates which SIM card is used (1 or 2) and the strength of the connection (1 to 4 bars).

Use the VM3 Connection Manager to:

- Configure WWAN connections
- Configure hyper-roaming between WWAN carriers or between WWAN and WLAN.



### Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system

The Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system currently supports only a single SIM card.

- Only one SIM card should be installed in the Thor VM3. Either SIM slot can be used for the SIM card but the other slot must be left vacant.
- The Thor VM3 with this operating system cannot roam between WWAN carriers but can roam from WLAN to WWAN (and vice versa).
- It is expected that dual SIM card support and switching between WWAN carrier functionality will be delivered via a software update at a later date. Contact [Customer Support](#) (page 9-1) for update availability.



### Hyper-Roaming Notes:

- The Connection Manager roams from WLAN to WWAN when the WLAN signal is weak enough to allow the roaming. Due to the fact that WWAN signals are present in most areas, it is unlikely the Connection Manager will roam back to a WLAN connection automatically. User intervention may be required to switch back to WLAN.
- Roaming to or between WWAN carriers is different than roaming between WLAN access points. In order for WWAN to roam, the Connection Manager must first disconnect from the old WWAN carrier then establish a connection to the new WWAN carrier.
- When hyper-roaming (either between WWAN carriers or between WLAN/WWAN) the network connection is temporarily lost during the switching process. When switching to or between WWAN carriers, the connection manager must load carrier firmware and this can take several minutes.



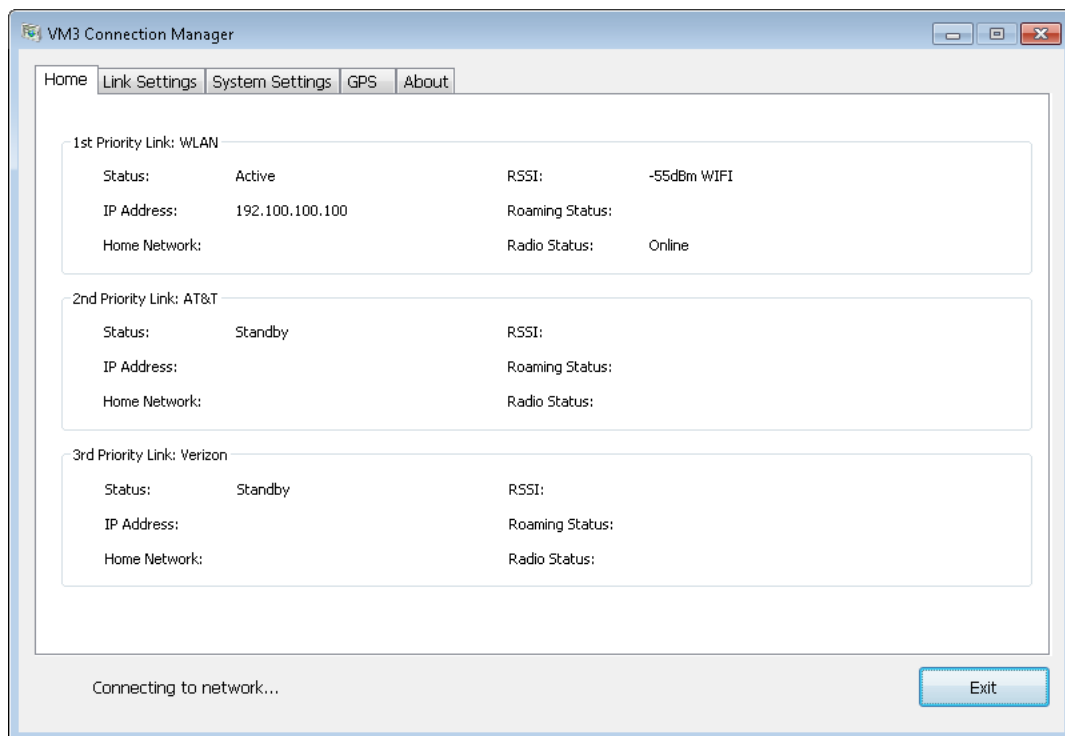
### Connection troubleshooting:

If there is a connection issue, the first step in troubleshooting is to verify the APN on the [Connection Type](#) (page 6-42) tab.

---

## Home

The Home tab lists the available connections and information on these connections. The order of the connections listed are specified on the Link Settings tab.



Each configured connection (or link) is identified by name, either WLAN (for a WLAN connection) or the name of the carrier (for a WWAN connection). If a connection is not configured, there is no name after the link and the status field is empty.

The active connection displays the IP address and signal strength (RSSI). Inactive connections show the status as Standby.

If a WWAN connection is active, the roaming status (Home or Roam) is displayed.

See [Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system](#) (page 6-39) for information about SIM card support.

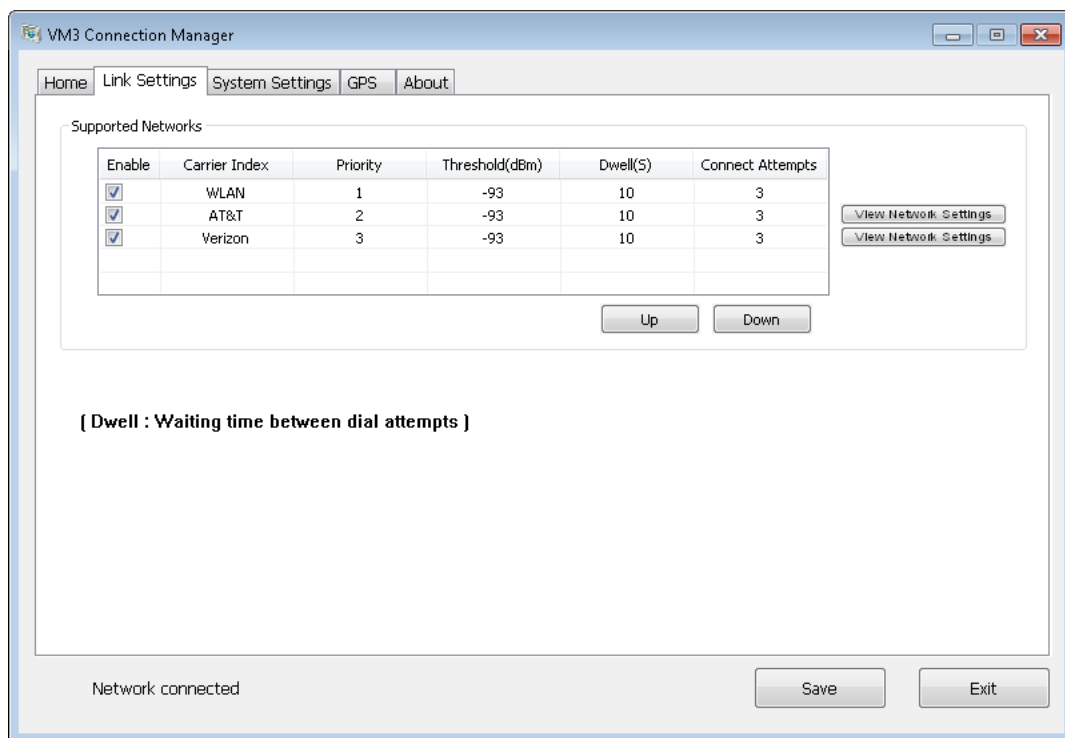
## Link Settings

The available network connections are shown on this tab:

The WLAN network can be enabled or disabled from this tab, however configuration settings for the 802.11 a/b/g/n radio are set with the [WLAN Wireless Configuration Utility \(WCU\)](#) (page 6-1).

The WWAN networks, if any, are shown on this page. A WWAN network is only displayed if a SIM card has been installed for that network. The Thor VM3 supports two SIM cards. See [Install SIM Card\(s\)](#) (page 4-52) for SIM card installation instructions. A WWAN network can be enabled or disabled from this screen, however the connection is configured by tapping the applicable **Network Settings** button.

See [Important Note for Thor VM3 with a Microsoft Windows 10 IoT Enterprise operating system](#) (page 6-39) for information about SIM card support.



To change the order (**Priority**) of the networks:

1. Select the desired network. When selected, the network has a green check mark to the left.
2. Tap the **Up** or **Down** button to move the network in the desired direction.
3. Tap the **Save** button after the order is set.

To change the other options (Enable, Threshold, Dwell, Connect Attempts):

1. To enable or disable a carrier, tap the checkbox to the left of the carrier name. When checked, the carrier is enabled.
2. For other parameters, double tap the cell containing the value that is to be changed. The value in the cell can now be edited.
3. Enter the desired value.
4. Tap anywhere else on the screen to exit the editing mode.
5. The values that can be changed are:
  - **Threshold** - The signal strength (in dBm) before roaming can occur to this connection. The default is -93 dBm.
  - **Dwell** - The length of time (in seconds) to wait before attempting the connection. The default is 10 seconds.

- **Connect Attempts** - The number of times this connection is tried. If there is no successful connection after this many tries, the next connection is tried.

To configure a WWAN network, tap the **View Network Settings** button. To configure the WLAN connection use the [WLAN Wireless Configuration Utility \(WCU\)](#) (page 6-1).

### **Connection Type**

Use this tab to configure the connection parameters. The tab is identified by the type of connection, i.e.: UMTS, LTE, UDMA, etc. The label on this tab corresponds to the **Technology** field on the [About](#) (page 6-48) tab.

Note that the SIM card being configured (Sim1 or Sim2) is identified at the top of this tab.

Sim1

LTE PIN/PUK

Setting

APN: Broadband

User Name:

IP Address: 100 . 100 . 100 . 100

Primary DNS: 111 . 100 . 100 . 100

Secondary DNS: 116 . 100 . 100 . 100

Authentication: ☐ PAP ☐ CHAP

Save Exit

⚠ If the WWAN radio fails to connect, please check that the correct APN is entered. This entry can be verified by contacting the WWAN carrier.

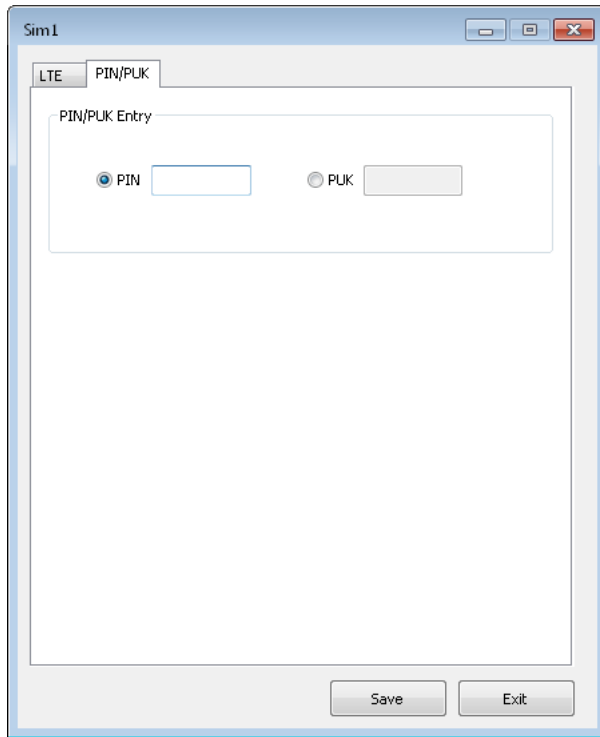
An APN mismatch may generate an error message, however this is not always the case. The first step in diagnosing a connection error should be to verify the APN.

After all entries are completed, tap the **Save** button.

---

## ***PIN/PUK***

Next select the **PIN/PUK** tab. Note that the SIM card being configured (Sim1 or Sim2) is identified at the top of this tab.

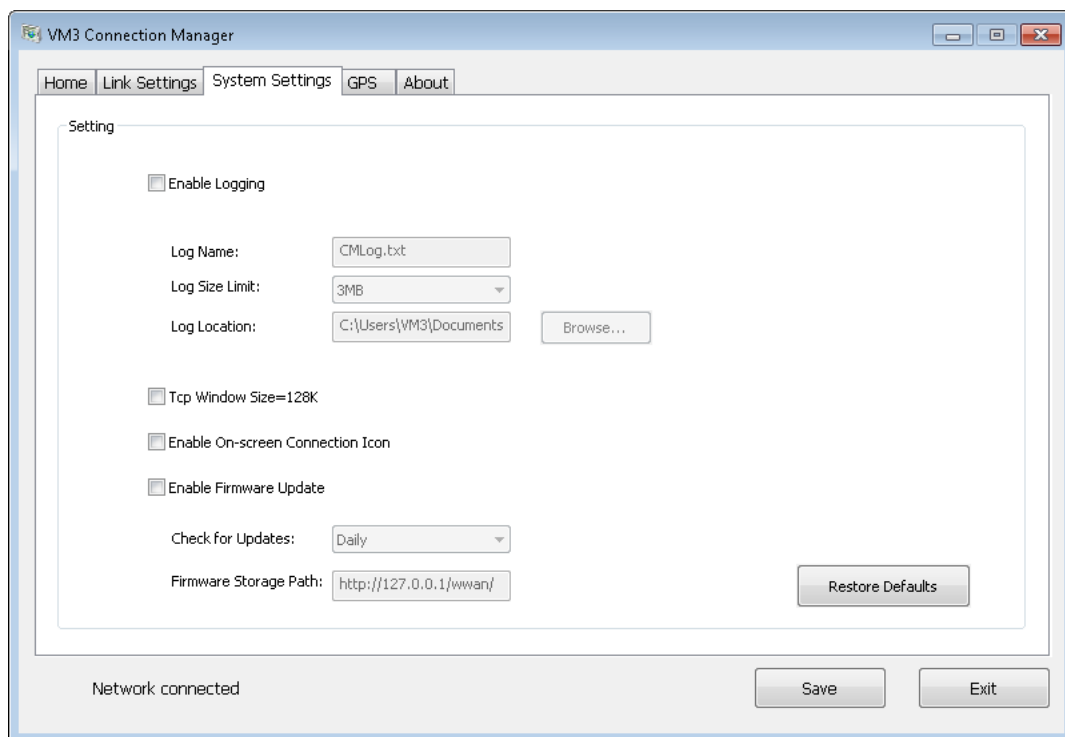


The screenshot shows a window titled "Sim1" with two tabs: "LTE" and "PIN/PUK". The "PIN/PUK" tab is selected. Inside the tab, there is a section labeled "PIN/PUK Entry" containing two radio buttons: "PIN" (which is selected) and "PUK". Each radio button is followed by a text input field. At the bottom of the window, there are two buttons: "Save" and "Exit".

Enter the PIN or PUK and tap **Save** then tap **Exit** to return to the Connection Manager.

## System Settings

Use this screen to configure WWAN settings.



### **Enable Logging**

Check to enable logging. Specify the maximum file size and the location for the log file.

By default logging is disabled.

### **TcpWindow Size=128k**

Check to set the TCP window size to 128k.

By default this options is disabled.

### **Enable On-screen Connection Icon**

Check to enable an on-screen connection icon. The icon is displayed in the lower right corner of the screen, above the date/time.



Connected



Not connected

This icon is in addition to the connection icon in the system tray.

By default the on-screen icon is disabled.

### **Enable Firmware Update**

The WWAN card supports firmware update over the air (Firmware Over The Air, or FOTA). By default, FOTA is disabled. See [Using FOTA](#) (page 6-45)

### **Restore Defaults**

Use this option to return all Connection Manager settings to the default value.



---

## Using FOTA

Honeywell recommends distributing firmware via a WLAN connection rather than the WWAN connection. This requires an HTTP server which can be hosted on the Internet or the same Intranet (i.e.: the same network domain) as the Thor VM3. Honeywell tested FOTA using:

- Uniform Server: <https://sourceforge.net/projects/miniserver/>
- IIS: Microsoft Internet Information Services, Windows 2012 server

To use FOTA, the following steps must be completed before initial use:

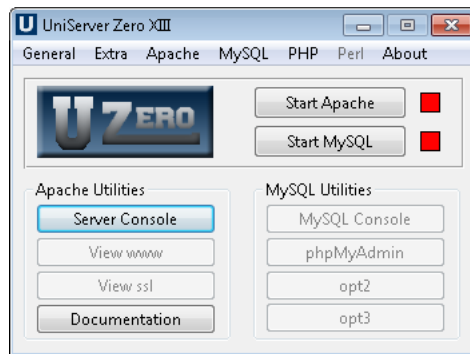
- [Configure HTTP Server](#) (page 6-45)
- [Load Firmware Updates](#) (page 6-46)
- [Configure the Thor VM3](#) (page 6-47)

For subsequent updates, it is only necessary to [Load Firmware Updates](#) (page 6-46).

### Configure HTTP Server

The instructions below are for Uniform Server (UniServer). Setup information for IIS server is widely available on line. Follow the same folder setup as in step 4 below for IIS.

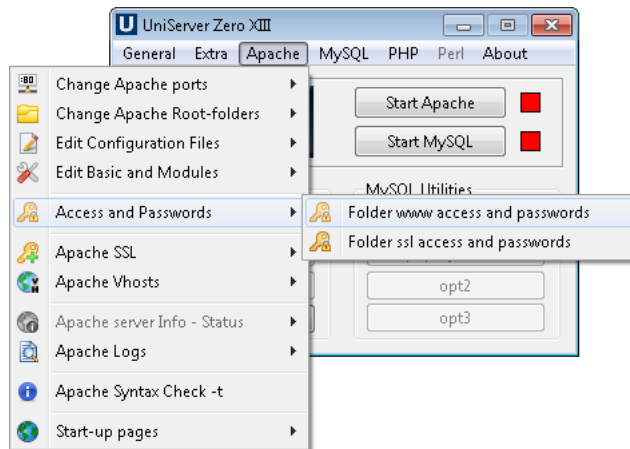
1. After installing, browse to the installation folder and run the server by double-clicking **UniController.exe**.
2. Click the **Start Apache** button. The indicator changes from red to green when the server is running. The button label also changes to **Stop Apache**.



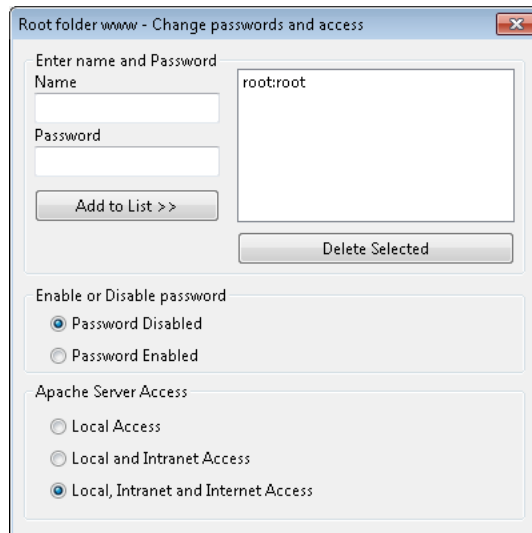
3. Display the test page by clicking the **View www** button or typing `http://localhost` into a web browser.
4. Create the folder structure on the web server:  
**<Server URL>/<wwan>/<Carrier Number>/<Version>**.  
Assuming `initroot` is root folder for the HTTP server, create a `wwan` folder underneath `initroot`. Then create folders under `wwan` numbered 0-15 to represent each carrier number. The structure is shown below. As firmware updates are received, create version folders under the appropriate carrier number. Notice the version folders under the `<3>` folder in this example.

```
<initroot>
  <wwan>
    <0>
    <1>
    <2>
    <3>
      1.0.0
      1.0.1
      1.0.2
    <4>
    <5>
    ...
    <14>
    <15>
```

- Click on the Apache tab and select **Access and Passwords > Folder www access and passwords**.



- Select **Password Disabled** and **Local, Intranet and Internet Access**.



- Verify server setup:
  - Ping the sever from the Thor VM3 to verify connectivity between the devices.
  - Open the web browser on the Thor VM3 and verify the URL of the server can be accessed.

### **Load Firmware Updates**

The firmware update is provided by Honeywell customer support. The update consists of a version string and a zip file. The version string is three numbers separated by periods, i.e.: 1.0.0 or 3.1.12.

Top load the firmware files:

- Create a subfolder under the applicable carrier number that matches the version string. For example, if update 1.0.3 is received for carrier number 6, the folder would be:  
**<Server URL>/<wwan>/<6>/<1.0.3>**
- Unzip the firmware file. The firmware update consists of three files:
  - carrier\_pri.nvu
  - imageInfo.xml
  - spkg\_sblz.cwe
- Copy the three files into the update folder created above.

## Configure the Thor VM3

Repeat these steps for each Thor VM3 that will be using FOTA. Once configured, the Thor VM3 continues to check for firmware updates at the specified interval.

On the **System Settings** tab of the Connection Manager:

1. Check the **Enable Firmware Update** checkbox.
2. Select the desired frequency (daily or weekly) to **Check for Updates**.
3. Specify the **Firmware Storage Path**. This path includes the address of the web server but does not include the carrier number or version folders created. The carrier folder and update folder are automatically detected by the update utility. For example, if the web server is hosted at **http://127.0.0.1**, the path is entered as **http://127.0.0.1/wwan/**  
**Important** - the trailing / must be included after wwan.

## GPS

This screen displays GPS data. A WWAN connection is not required for the GPS data, however an antenna must be attached to the GPS port.

VM3 Connection Manager

Home | Link Settings | System Settings | **GPS** | About

GPS Status: **GOOD**  
Operation: Standalone  
Timeout(sec): 64  
Interval(ms): 1000  
Accuracy(m): 50  
Status: Enabled  
Tracking: Active  
Lat: 33.964158  
Lon: -84.219085  
Elv: 324.500000  
Speed: 0.000000  
Signal Quality: GPS sps mode  
Automatic Fix: 2D Fix  
NMEA Count: 1012  
GPS Time: 21:13:45

Sat	ID	In Use	Elv	Azm	SNR
1	4	no	0	0	55
2	13	no	0	0	59
3	15	no	0	0	54
4	18	no	0	0	44
5	20	no	0	0	51
6	29	no	0	0	48
7	40	no	0	0	35
8	46	no	0	0	45
9	51	no	0	0	46

Stop Clear GPS Data

Network connected Exit

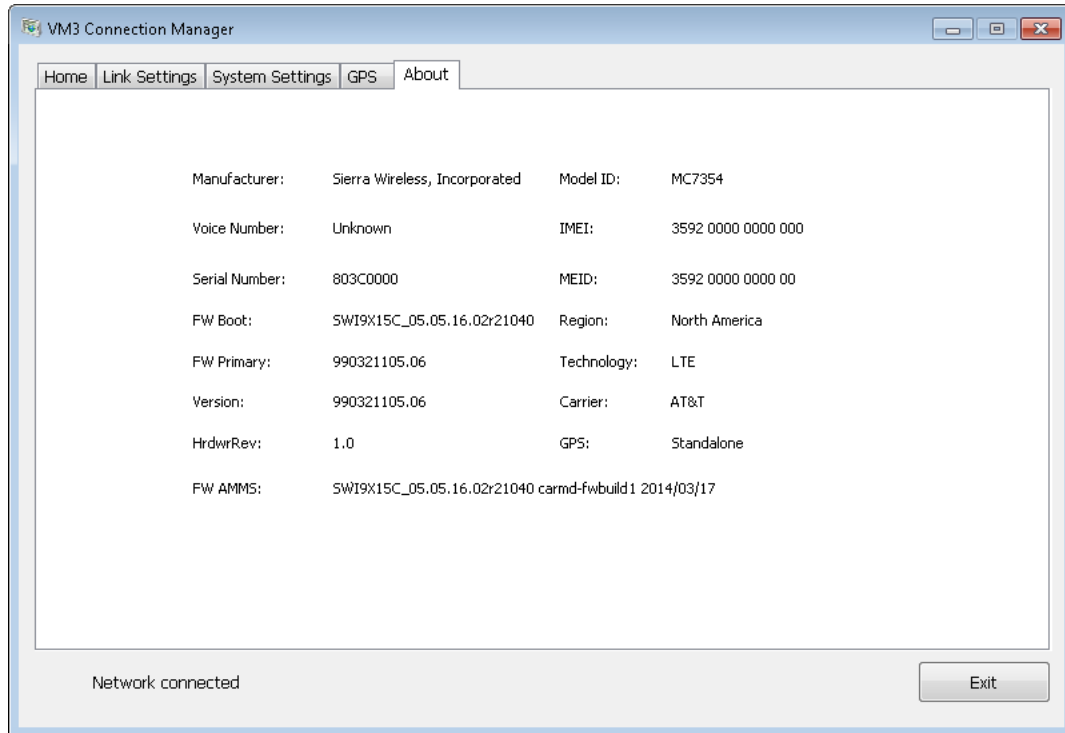
Tap the **Start** button to begin receiving GPS data. Once started, the button label changes to **Stop** and GPS data on screen is populated.

Tap the **Clear GPS Data** button to erase the GPS data.

---

## About

The about screen has no user-configurable parameters. It identifies the firmware and hardware versions, the carrier selected, MEID, etc. for the WWAN radio.



## Key Maps

### Integrated Keypad



There are seven integrated programmable keys located on the Thor VM3 below the display. Each programmable key can be modified by the Orange key for a total of 14 programmable keys.

See [Programmable Key](#) (page 5-31) to remap these keys.

The default values for these keys are:

To get this Programmable Key	Press These Keys in this Order		Default Key Value
P1 (Programmable key 1)	P1		F1
P2 (Programmable key 2)	P2		F2
P3 (Programmable key 3)	P3		F3
P4 (Programmable key 4)	P4		F4
P5 (Programmable key 5)	P5		F5
P6 (Programmable key 6)	P6		Open/Close Soft Keyboard
P7 (Programmable key 7)	P7		Enter
P8 (Programmable key 8)	Orange	P1	<none>
P9 (Programmable key 9)	Orange	P2	<none>
P10 (Programmable key 10)	Orange	P3	<none>
P10 (Programmable key 11)	Orange	P4	<none>
P10 (Programmable key 12)	Orange	P5	<none>
P10 (Programmable key 13)	Orange	P6	<none>
P10 (Programmable key 14)	Orange	P7	<none>

The following key press sequences are not programmable:

To get this function	Press These Keys in this Order	
Increase speaker volume	Blue	P1
Decrease speaker volume	Blue	P2
Increase display brightness	Blue	P5
Decrease display brightness	Blue	P6

The Blue plus P3, P4 or P7 key press sequences cause no action.

## External 21-Key Keyboard



The table below shows the results of the keypress combinations. Each key has an unshifted mode, a Yellow shifted mode and a Green shifted mode.

- To enter Yellow shifted mode, press the Yellow key. The keypad remains in Yellow shifted mode until any other key is pressed or the Yellow key is pressed again.
- To enter Green shifted mode, press the Green key. The keypad remains in Green shifted mode until any other key is pressed or the Green key is pressed again.
- Pressing the Yellow key then the Green key cancels Yellow mode and the keypad is in Green shifted mode.
- Pressing the Green key then the Yellow key cancels Green mode and the keypad is in Yellow shifted mode.
- Arrow keys are unaffected by Yellow or Green shifted mode.
- Keypress combinations marked as N/A do nothing (the keystroke is consumed by the keyboard and not sent to the Thor VM3).
- Keys marked as programmable can be assigned a value using the [Programmable Key](#) (page 5-31) control panel.
- Pressing the backlight key (alone or after the Green or Yellow keys) cycles the keypad backlight through Low, Medium, High, Off then repeats.

Key	Non-Shifted	Yellow-Shifted	Green-Shifted
1	1	F1	F11
2	2	F2	F12
3	3	F3	F13
4	4	F4	F14
5	5	F5	F15
6	6	F6	F16
7	7	F7	F17
8	8	F8	F18
9	9	F9	F19
0	0	F10	F20
PF	Programmable	Programmable	N/A
Del	Delete	Backspace	N/A
Tab	Tab	Backtab	N/A
Left	Left	Left	Left
Right	Right	Right	Right
Up	Up	Up	Up
Down	Down	Down	Down

---

## External 95-Key Keyboard



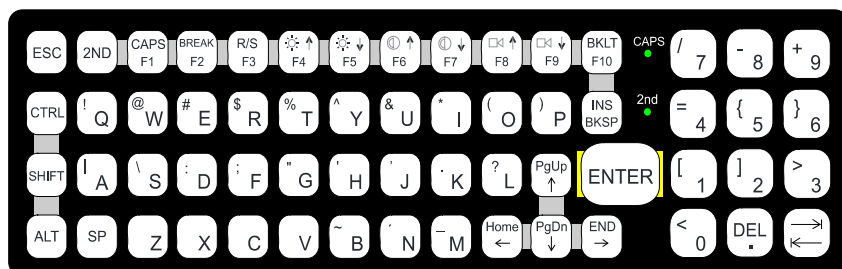
These key functions apply to both the [95-Key USB Keyboard](#) (page 3-9) and the [95-key PS/2 Keyboard](#) (page 3-11).

The key map table that follows lists the commands used for the Thor VM3. Note that since the Thor VM3 uses a Microsoft Windows operating system, no DOS Terminal Emulation keypress sequences are provided.

There are 10 hidden keys on the 95 key keyboard. Each of the hidden keys is accessed by pressing the <Fn> key (located in the top right hand corner) plus a key on the numeric keypad on the right. Additional function keys are supported as well.

To get this Key / Function	Press These Keys in this Order	
Insert	FN	0 (numeric keypad)
Home	FN	7 (numeric keypad)
Page Up	FN	9 (numeric keypad)
Delete	FN	. (numeric keypad)
End	FN	1 (numeric keypad)
Page Down	FN	3 (numeric keypad)
Up Arrow	FN	8 (numeric keypad)
Left Arrow	FN	4 (numeric keypad)
Down Arrow	FN	2 (numeric keypad)
Right Arrow	FN	6 (numeric keypad)

## External 60-Key Keyboard



The key map table that follows lists the commands used when using the Thor VM3 with the [60-key PS/2 Keyboard](#) (page 3-12).

The 60-key keyboard does not have a NumLock indicator or key. NumLock can be toggled On or Off using the **2<sup>nd</sup> SHIFT F10** keypress sequence. The default for NumLock is On. Changes made to the NumLock status persist across a Windows restart.

When running RFTerm, please refer to the RFTerm Reference Guide for equivalent keys and keypress sequences.

### 60 Key KeyMap 101-Key Equivalencies

- The following keymap is used on a Thor VM3 that is NOT running RFTerm.
- When using a sequence of keys that includes the 2nd key, press the 2nd key first then the rest of the key sequence.
- When the Thor VM3 boots, the default condition of Caps (or CapsLock) is Off. The Caps (or CapsLock) condition can be toggled with a **2<sup>nd</sup> + F1** key sequence. The CAPS LED is illuminated when CapsLock is On. The keymaps below assume Caps is Off.
- The Thor VM3 keyboard has several control keys. The following control keys are not used:
  - » The 2nd function of the **F3** key is not used as Windows Power Management controls all power management modes on the Thor VM3.
  - » The 2nd functions of the **F4** and **F5** keys are not used as the display brightness is adjusted via the buttons on the front of the Thor VM3.
  - » The 2nd functions of the **F6** and **F7** keys are not used as the Thor VM3 has TFT LCD screen with no provision for contrast adjustments.
  - » The 2nd functions of the **F8** and **F9** keys are not used as the sound volume on the Thor VM3 is controlled with a Microsoft Windows Control Panel.
  - » The 2nd function of the **F10** key is not used as the display backlight timer also controls the keyboard backlight.

To get this Key / Function	Press These Keys in this Order
Power On/Off	Power
2nd	2nd
Shift	Shift
Alt	Alt
Ctrl	Ctrl
Esc	Esc
Space	Sp
Enter	Enter
Enter (numeric)	2nd      Enter
CapsLock (Toggle)	2nd      F1
Back Space	BkSp
Tab	Tab
Back Tab	2nd      Tab
Ctrl-Break	Ctrl      2nd      F2
Pause	2nd      F2
Up Arrow	Up Arrow



Down Arrow	Down Arrow
Right Arrow	Right Arrow
Left Arrow	Left Arrow
Insert	2nd Bksp
Delete (numeric)	2nd DOT
Home	2nd Left Arrow
End	2nd Right Arrow
Page Up	2nd Up Arrow
Page Down	2nd Down Arrow
ScrollLock	2nd Shift F10
F1	F1
F2	F2
F3	F3
F4	F4
F5	F5
F6	F6
F7	F7
F8	F8
F9	F9
F10	F10
F11	2nd Shift F1
F12	2nd Shift F2
a	A
b	B
c	C
d	D
e	E
f	F
g	G
h	H
i	I
j	J
k	K
l	L
m	M
n	N
o	O
p	P
q	Q
r	R
s	S
t	T

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u	U
v	V
w	W
x	X
y	Y
z	Z
A	Shift A
B	Shift B
C	Shift C
D	Shift D
E	Shift E
F	Shift F
G	Shift G
H	Shift H
I	Shift I
J	Shift J
K	Shift K
L	Shift L
M	Shift M
N	Shift N
O	Shift O
P	Shift P
Q	Shift Q
R	Shift R
S	Shift S
T	Shift T
U	Shift U
V	Shift V
W	Shift W
X	Shift X
Y	Shift Y
Z	Shift Z
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0

DOT	DOT		
<	2nd	0	
[	2nd	1	
]	2nd	2	
>	2nd	3	
=	2nd	4	
{	2nd	5	
}	2nd	6	
/ (numeric)	2nd	Ctrl	7
/ (alpha)	2nd	7	
- (numeric)	2nd	Ctrl	8
- (alpha)	2nd	8	
+ (numeric)	2nd	Ctrl	9
+ (alpha)	2nd	9	
* (numeric)	2nd	I (letter i)	
* (alpha)	2nd	Ctrl	I (letter i)
: (colon)	2nd	D	
; (semicolon)	2nd	F	
?	2nd	L	
`	2nd	N	
_ (underscore)	2nd	M	
, (comma)	2nd	J	
' (apostrophe)	2nd	H	
~ (tilde)	2nd	B	
\	2nd	S	
	2nd	A	
"	2nd	G	
!	2nd	Q	
@	2nd	W	
#	2nd	E	
\$	2nd	R	
%	2nd	T	
^	2nd	Y	
&	2nd	U	
(	2nd	O	
)	2nd	P	

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## Specifications and Reference Material

### Technical Specifications

#### Thor VM3

Memory	2 or 4 GB DDR3 RAM
Mass Storage	64 GB mSATA
Operating System	Microsoft Windows 10 IoT Enterprise (64-bit) No operating system
Radio Modules	802.11 a/b/g/n radio / Bluetooth
Scanner Options	No integrated scanner, Optional serial, USB or Bluetooth scanners
Keyboard	Integrated 7-key keypad Optional 95-key USB keyboard Optional numeric-only keyboard Optional adapter cable for Honeywell PS/2 keyboards
External Connectors	Optional external 802.11 / GPS / WWAN antenna connectors Additional connectors on dock, see below
Beeper	Minimum loudness greater than 95dBm at 10 cm in front of unit
Power Supply	10 to 60 VDC isolated
Uninterruptible Power Supply	Internal UPS battery, 30-minute life at -30°C (-22°F)
Backup Battery (RCT)	Internal lithium battery maintains Real Time Clock

#### VM1D Standard Dock

Power Connector	6-pin connector: Direct 10-60V DC input power Optional external converters for AC (90-240 VAC) and extended range DC (60-150 VDC)
COM1 Connector	9-pin male, RS-232 serial port, COM1 with switchable power on pin 9
COM2 Connector	9-pin male, RS-232 serial port, COM2 with switchable power on pin 9
CANBUS/AUDIO Connector	15-pin male, CANbus/Audio connector supports either audio/microphone via adapter cable or J1939 Female and J1939 Male connectors via CANbus cable
USB Connector	9-pin female, USB connector supports USB host port via adapter cable
Power Switch	Sealed power switch
External Power Supply	AC Adapter, 120-240VAC to 12VDC
Input Power	DC Input Voltage: 10- 60 VDC, Input Current: 4.6 Amps (typical), Input Fuse: 8A Time Delay. Replace with same size, rating and type of fuse: <ul style="list-style-type: none"> <li>• Littelfuse 0215008.MXP</li> <li>• Cooper Bussmann BK1/S506-8-R</li> <li>• Bel Fuse 5HT 8-R</li> </ul> or equivalent.

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### **VM3D Enhanced Dock**

Power Connector	6-pin connector: Direct 10-60V DC input power Optional external converters for AC (90-240 VAC) and extended range DC (60-150 VDC)
COM1 Connector	9-pin male, RS-232 serial port, COM1 with switchable power on pin 9
COM2 Connector	9-pin male, RS-232 serial port, COM2 with switchable power on pin 9
CANBUS/AUDIO Connector	15-pin male, CANbus/Audio connector supports either audio/microphone via adapter cable or J1939 Female and J1939 Male connectors via CANbus cable
USB1 Connector	9-pin female, USB connector supports USB host port via adapter cable
USB 2 Connector	15-pin female, USB connector supports 2 USB host ports via adapter cable
USB Host Connector	One USB Host connector behind waterproof cap
Ethernet Connector	One RJ45 Ethernet connector behind waterproof cap
Power Switch	Sealed power switch
External Power Supply	AC Adapter, 120-240VAC to 12VDC
Input Power	DC Input Voltage: 10- 60 VDC, Input Current: 4.6 Amps (typical), Input Fuse: 8A Time Delay. Replace with same size, rating and type of fuse: <ul style="list-style-type: none"><li>• Littelfuse 0215008.MXP</li><li>• Cooper Bussmann BK1/S506-8-R</li><li>• Bel Fuse 5HT 8-R</li></ul> or equivalent.

### **VM3D Enhanced Dock**

Power Connector	6-pin connector: 13.2VDC input power Connector is also used for screen blanking via COM1 CTS and RTS signals
COM1 Connector	9-pin male, RS-232 serial port, COM1 with switchable power on pin 9 Do not use COM1 when screen blanking box is attached to avoid port conflicts.
COM2 Connector	9-pin male, RS-232 serial port, COM2 with switchable power on pin 9
CANBUS/AUDIO Connector	15-pin male, CANbus/Audio connector supports either audio/microphone via adapter cable or J1939 Female and J1939 Male connectors via CANbus cable
USB1 Connector	9-pin female, USB connector supports USB host port via adapter cable
USB 2 Connector	15-pin female, USB connector supports 2 USB host ports via adapter cable
USB Host Connector	One USB Host connector behind waterproof cap
Ethernet Connector	One RJ45 Ethernet connector behind waterproof cap
Power Switch	Sealed power switch
External Power Supply	AC Adapter, 120-240VAC to 12VDC
Input Power	DC Input Voltage: 13.2VDC, Input Current: 4.6 Amps (typical), Input Fuse: 8A Time Delay. Replace with same size, rating and type of fuse: <ul style="list-style-type: none"><li>• Littelfuse 0215008.MXP</li><li>• Cooper Bussmann BK1/S506-8-R</li><li>• Bel Fuse 5HT 8-R</li></ul> or equivalent.

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## Dimensions

### Thor VM3

#### Standard Dock

*Note: The RAM ball is not included in the following measurements.*

Length	7.1" (18.0 cm)
Width	6.1" (15.5 cm)
Height	2.5" (6.4 cm), measurement includes strain relief cable clamps
Weight	3.2 lb. (1.5 kg)

#### Enhanced Dock

*Note: The RAM ball is not included in the following measurements.*

Length	7.1" (18.0 cm)
Width	6.1" (15.5 cm)
Height	2.1" (5.4 cm), measurement includes strain relief cable clamps
Weight	2.4 lb. (1.1 kg)

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## **Environmental Specifications**

### **Thor VM3 and Dock**

Operating Temperature	-22° to 122° F (-30°C to 50°C) [non-condensing]
Storage Temperature	-22°F to 140°F (-30°C to 60°C) [non-condensing]
Water and Dust	IEC 60529 compliant to IP66
ESD	15 kV air, 8kV direct contact
Vibration	MIL-STD-810F, composite wheeled vehicles.
Crash	SAE-J 1455

## **Network Card Specifications**

### **WLAN - Qualcomm Atheros 802.11a/b/g/n**

Bus Interface	SDIO (Secure Digital I/O)
Wireless Frequencies (varies by regulatory domain)	2.4 to 2.4895 GHz IEEE 802.11b / 802.11g DSSS OFDM 5.15 to 5.82 GHz IEEE 802.11a DSSS OFDM
RF Data Rates	802.11a (OFDM) 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b (DSSS) 1, 2, 5.5, 11 Mbps 802.11g (OFDM) 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (OFDM 20 MHz chs) 13, 26, 39, 52, 78, 104, 117, 130 Mbps 802.11n (OFDM 40 MHz chs) 27, 54, 81, 108, 162, 216, 243, 270 Mbps
RF Power Level	50 mW max.
Channels	FCC: 1-11, 36, 40, 44, 48, 149, 153, 157, 161 ETSI: 1-13, 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140
Connectivity	TCP/IP, Ethernet, ODI
Diversity	Yes

### **WPAN - Bluetooth**

Bus Interface	USB
Enhanced Data Rate	Up to 3.0 Mbit/s over the air
Connection	No less than 32.80 feet (10 meters) line of sight
Bluetooth Version	2.0 + EDR
Operating Frequency	2.402 - 2.480 GHz
QDID	B013455

### **WWAN**

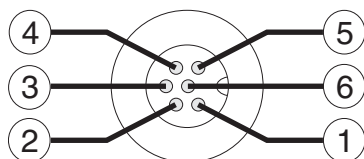
Device	Software definable (data only), includes GPS
Technology	4G radio: LTE/UMTS/HSPA+/GSM/GPRS/EDGE/ EV-DO



## Port and Connector Pinouts

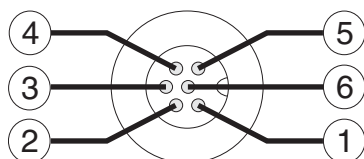
### Power Supply Connector

#### VM1D Standard Dock and VM3D Enhanced Dock



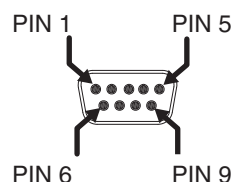
Pin	Signal	Description
1	V In+	10-60V DC input +
2	V In+	10-60V DC input +
3	V In-	input -
4	V In-	input -
5	GND	Chassis ground
6	Ignition	+0V to 60V to start terminal

#### VMXD Enhanced Dock



Pin	Signal	Description
1	V In+	13.2V DC Input + provided by DC/DC power supply
2	V In+	13.2V DC Input + provided by DC/DC power supply
3	V In-	Input -
4	V In-	Input -
5	COM1 RTS	Screen Blanking Box + The green wire in the power cable must be connected to the switched side of the screen blanking box. See the applicable wiring diagram below.
6	COM1 CTS	Screen Blanking Box - The white wire in the power cable must be connected to the unswitched side of the screen blanking box. See applicable wiring diagram below.
Cable shell provides chassis ground connection.		

### COM1 and COM2 Connector

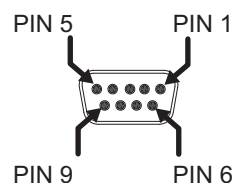


Pin	Signal	Description
1	DCD	Data Carrier Detect – Input
2	RXD	Receive Data – Input
3	TXD	Transmit Data – Output
4	DTR	Data Terminal Ready – Output
5	GND	Signal/Power Ground
6	DSR	Data Set Ready – Input
7	RTS	Request to Send – Output
8	CTS	Clear to Send – Input
9	+5VDC	Bar Code Scanner Power - 500mA max
Shell	CGND	Chassis Ground

**VMXD Enhanced Dock only:** Because the power supply connector port for the VMXD Enhanced Dock contains COM1 RTS and CTS signals, the COM1 port on the dock should not be used when the power cable is used for screen blanking to avoid port conflicts.

## USB and USB1 Connector

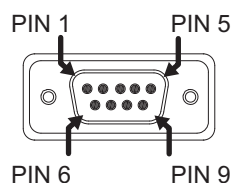
The Standard Dock has a USB connector. The Enhanced Dock has a USB1 connector.



Pin	Signal	Description
1	GND	Common ground
2	USBC_D+	USB client data signal (not used)
3	USBC_D-	USB client data signal (not used)
4	USB_H1_PWR	USB host 1; 5V output power
5	GND	Common ground
6	GND	Common ground
7	USB_H1_D+	USB host 1 data signal
8	USB_H1_D-	USB host 1 data signal
9	USBC_VBUS	USB client 5V detect from attached host

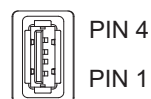
## USB Host/Client Y Cable

### D9 Male Connector



Pin	Signal	Description
1	GND	Common ground
2	USBC_D+	USB client data signal (not used)
3	USBC_D-	USB client data signal (not used)
4	USB_H1_PWR	USB host 5V output power
5	GND	Common ground
6	GND	Common ground
7	USB_H1_D+	USB host 1 data signal
8	USB_H1_D-	USB host 1 data signal
9	USBC_VBUS	USB client 5V detect from attached host

### USB Host Connector



Pin	Signal	Description
1	5V_USB	USB Power, Current Limited
2	USB_H1_D-	USB D-
3	USB_H1_D+	USB D+
4	GND	USB Power Return
Shell	CGND	Chassis Ground

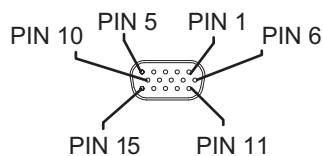
### USB Client Connector

The USB client connection is not supported on the Thor VM3.

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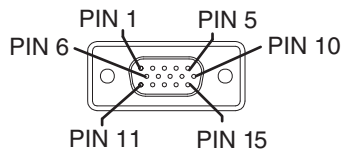
## USB2 Connector

The USB2 connector is only present on the Enhanced Dock.



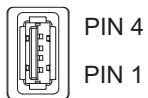
Pin	Signal	Description
1	Not Used	
2	Not Used	
3	Not Used	
4	Not Used	
5	Not Used	
6	USB_H2_PWR	USB host 2 5V output power
7	USB_H2_D+	USB host 2 data signal
8	USB_H2_D-	USB host 2 data signal
9	GND	Common ground
10	GND	Common ground
11	USB_H3_PWR	USB host 3 5V output power
12	USB_H3_D+	USB host 3 data signal
13	USB_H3_D-	USB host 3 data signal
14	GND	Common ground
15	GND	Common ground

## USB Dual Host Y Cable D15 Male Connector



Pin	Signal	Description
1	Not Used	
2	Not Used	
3	Not Used	
4	Not Used	
5	Not Used	
6	USB_H2_PWR	USB host 2 5V output power
7	USB_H2_D+	USB host 2 data signal
8	USB_H2_D-	USB host 2 data signal
9	GND	Common ground
	GND	Common ground
	USB_H3_PWR	USB host 3 5V output power
	USB_H3_D+	USB host 3 data signal
	USB_H3_D-	USB host 3 data signal
	GND	Common ground
	GND	Common ground

## USB Host Connectors



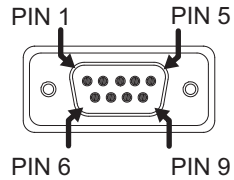
Pin	Signal	Description
1	5V_USB	USB Power, Current Limited
2	USB_H2_D-	USB D-
3	USB_H2_D+	USB D+
4	GND	USB Power Return
Shell	CGND	Chassis Ground

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### **PS/2 to USB Keyboard Adapter Cable**

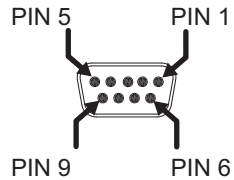
*Note: This cable is not supported when the Thor VM3 is used with the VM1D Standard Dock.*

#### **D9 Male Connector - USB**



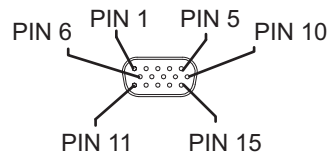
Pin	Signal	Description
1	Not Used	
2	Not Used	
3	Not Used	
4	USB_H1_PWR	USB host 5V output power
5	Not Used	
6	GND	Ground
7	USB_H1_D+	USB host 1 data signal
8	USB_H1_D-	USB host 1 data signal
9	USBC_VBUS	

#### **D9 Female Connector - PS/2**



Pin	Signal	Description
1	KBDAT	Keyboard data
2	Not Used	
3	Not Used	
4	Not Used	
5	GND	Ground
6	Not Used	
7	KBCLK	Keyboard clock
8	GND	Ground
9	VCC	Keyboard power

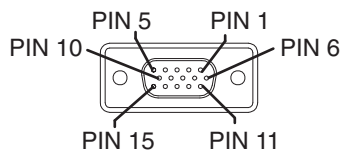
## CANbus / Audio Connector



Pin	Signal Name	Description
1	-	CAN reserved
2	CAN_L	CAN_L bus line dominant low
3	CAN_GND	CAN Ground
4	-	CAN reserved
5	GND	Optional ground
6	Audio return	Headset return
7	Audio output	Headset output
8	Mic input	Microphone input
9	Mic return	Microphone return
10	Audio Return	
11	GND	Optional ground
12	CAN_SHLD	
13	CAN_H	CAN_H bus line dominant high
14	-	CAN reserved
15	CAN_V+	Option CAN external Power Supply

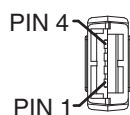
## Headset Adapter Cable

### D15 Female Connector



Pin	Signal	Description
1	Not used	
2	Not used	
3	Not used	
4	Not used	
5	Not used	
6	Audio return	Headset return
7	Audio output	Headset output
8	Mic input	Microphone input
9	Mic return	Microphone return
10	Not used	
11	Not used	
12	Not used	
13	Not used	
14	Not used	
15	Not used	

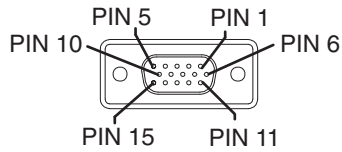
## Quick Connect Headset Connector



Pin	Signal	Description
1	Mic input	Microphone input
2	Mic return	Microphone return
3	Audio output	Headset output
4	Audio return	Headset return

## CANbus Y Cable

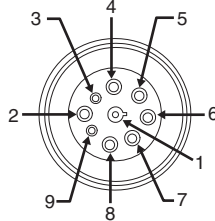
### D15 Female Connector



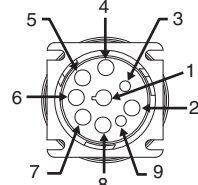
Pin	Signal	Description
1	Not Used	
2	CAN_L	CAN_L bus line dominant low
3	CAN_GND	CAN ground
4	Not Used	CAN reserved
5	GND	Ground
6	Not used	
7	Not used	
8	Not used	
9	Not used	
10	Not used	
11	GND	Optional ground
12	CAN_SHLD	
13	CAN_H	CAN_H bus line dominant high
14	Not Used	CAN reserved
15	CAN_V+	CAN external power supply

### 9-Pin J1939 (Deutsch) Connectors

Receptacle-  
J1939 Female



Socket  
J1939 Mail



Pin	Signal	Description
1	CAN_GND	CAN Ground
2	CAN_V+	Option CAN external Power Supply
3	CAN_H	CAN_H bus line dominant high
4	CAN_L	CAN_L bus line dominant low
5	CAN_SHLD	
6	Not used	
7	Not used	
8	Not used	
9	Not used	

## Hat Encoding

Desired ASCII	Hex Value	Hat Encoded
NUL	0X00	^@
SOH	0X01	^A
STX	0X02	^B
ETX	0X03	^C
EOT	0X04	^D
ENQ	0X05	^E
ACK	0X06	^F
BEL	0X07	^G
BS	0X08	^H
HT	0X09	^I
LF	0X0A	^J
VT	0X0B	^K
FF	0X0C	^L
CR	0X0D	^M
SO	0X0E	^N
SI	0X0F	^O
DLE	0X10	^P
DC1 (XON)	0X11	^Q
DC2	0X12	^R
DC3 (XOFF)	0X13	^S
DC4	0X14	^T
NAK	0X15	^U
SYN	0X16	^V
ETB	0X17	^W
CAN	0X18	^X
EM	0X19	^Y
SUB	0X1A	^Z
ESC	0X1B	^[
FS	0X1C	^\\
GS	0X1D	^]
RS	0X1E	^^
US	0X1F	^ (Underscore)
	0X7F	^?
	80	~^@
	81	~^A
	82	~^B
	83	~^C
IND	84	~^D
NEL	85	~^E
SSA	86	~^F
@	AE	~. (Period)
—	AF	~/
°	B0	~0 (Zero)
±	B1	~1

Desired ASCII	Hex Value	Hat Encoded
ESA	87	~^G
HTS	88	~^H
HTJ	89	~^I
VTs	8A	~^J
PLD	8B	~^K
PLU	8C	~^L
RI	8D	~^M
SS2	8E	~^N
SS3	8F	~^O
DCS	90	~^P
PU1	91	~^Q
PU2	92	~^R
STS	93	~^S
CCH	94	~^T
MW	95	~^U
SPA	96	~^V
EPA	97	~^W
	98	~^X
	99	~^Y
	9A	~^Z
CSI	9B	~^[
ST	9C	~^\\
OSC	9D	~^]
PM	9E	~^^
APC	9F	~^ (Underscore)
(no-break space)	A0	~ (Tilde and Space)
¡	A1	~!
¢	A2	~"
£	A3	~#
¤	A4	~\$
¥	A5	~%
¦	A6	~&
§	A7	~'
¨	A8	~(
©	A9	~)
ª	AA	~*
«	AB	~+
¬	AC	~,
(soft hyphen)	AD	~~ (Dash)
×	D7	~W
Ø	D8	~X
Ù	D9	~Y
Ú	DA	~Z



Desired ASCII	Hex Value	Hat Encoded
2	B2	~2
3	B3	~3
4	B4	~4
μ	B5	~5
¶	B6	~6
·	B7	~7
8	B8	~8
9	B9	~9
°	BA	~.
»	BB	~;
¼	BC	~<
½	BD	~=
¾	BE	~>
¿	BF	~?
À	C0	~@
Á	C1	~A
Â	C2	~B
Ã	C3	~C
Ä	C4	~D
Å	C5	~E
Æ	C6	~F
Ç	C7	~G
È	C8	~H
É	C9	~I
Ê	CA	~J
Ë	CB	~K
Ì	CC	~L
Í	CD	~M
Î	CE	~N
Ï	CF	~O
Ð	D0	~P
Ñ	D1	~Q
Ò	D2	~R
Ó	D3	~S
Ô	D4	~T
Õ	D5	~U
Ö	D6	~V

Desired ASCII	Hex Value	Hat Encoded
Û	DB	~[
Ü	DC	~\
Ý	DD	~]
Þ	DE	~^
ß	DF	~_ (Underscore)
à	E0	~`
á	E1	~a
â	E2	~b
ã	E3	~c
ä	E4	~d
å	E5	~e
æ	E6	~f
ç	E7	~g
è	E8	~h
é	E9	~i
ê	EA	~j
ë	EB	~k
ì	EC	~l
í	ED	~m
î	EE	~n
ï	EF	~o
ð	F0	~p
ñ	F1	~q
ò	F2	~r
ó	F3	~s
ô	F4	~t
õ	F5	~u
ö	F6	~v
÷	F7	~w
ø	F8	~x
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reference implementation of RFC 1321

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```
// blowfish.cpp  C++ class implementation of the BLOWFISH encryption algorithm
// _THE BLOWFISH ENCRYPTION ALGORITHM_
// by Bruce Schneier
// Revised code--3/20/94
// Converted to C++ class 5/96, Jim Conger
```

Blowfish is a symmetric block cipher that can be used as a drop-in replacement for DES or IDEA. It takes a variable-length key, from 32 bits to 448 bits, making it ideal for both domestic and exportable use. Blowfish was designed in 1993 by Bruce Schneier as a fast, free alternative to existing encryption algorithms. Since then it has been analyzed considerably, and it is slowly gaining acceptance as a strong encryption algorithm. Blowfish is unpatented and license-free, and is available free for all uses.

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