

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

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with Microsoft® Windows® 7 Professional

## **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 [and with RSS-210 of Industry Canada]. 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

This device complies with Industry Canada licence-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 4 clause 4.1.

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

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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 la clause 4.1 du document CNR-102, version 4.

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: 3dBi 4.9 to 5.9Ghz: 3dBi	LAIRD Technologies

### **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 0°C to 35°C 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  
Nijverheidsweg 9-13  
5627 BT Eindhoven  
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.

WWAN is not available in Singapore.

	EN 300 328 V1.8.1: 2012 EN 301 893 V1.7.1: 2012 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







## Getting Started

### Overview

The Thor VM3 Vehicle Mount Computer (VMC) is a rugged, vehicle mounted computer running a Microsoft® Windows® 7 Professional (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.



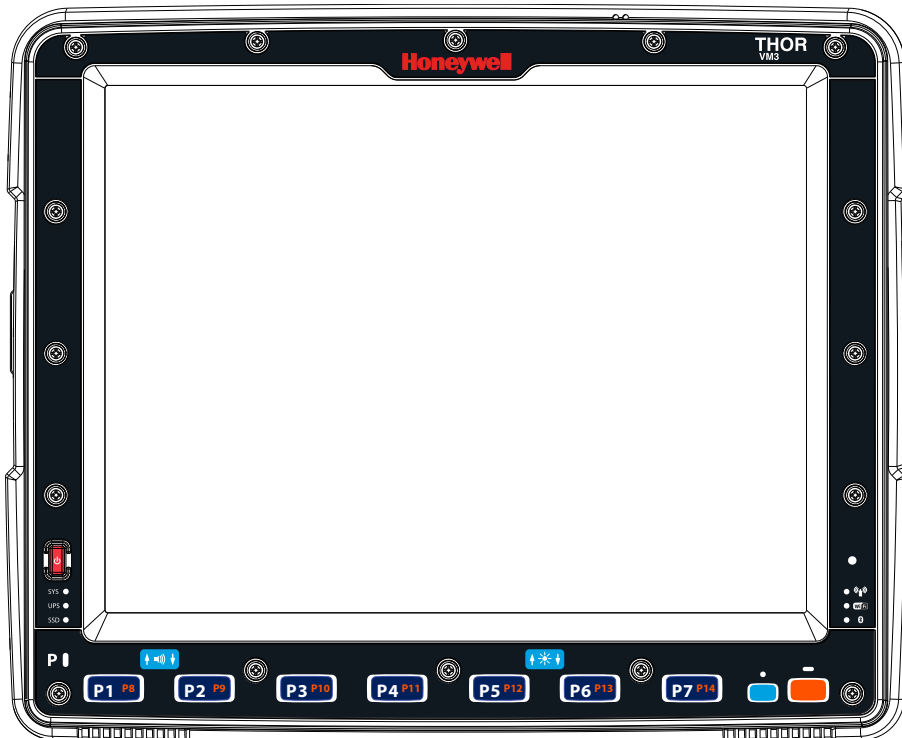
**CAUTION** - Before shipping the Thor VM3, be sure to [Disconnect UPS Battery](#) (page 4-54) .

The Thor VM3 is designed for use with a vehicle Quick Mount Smart Dock. 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 Quick Mount Smart 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® 7 Professional operating system.

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## Out of the Box

The following items may be packaged separately:

- Thor VM3
- Quick Mount Smart 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 4-18) or [Install U Bracket Mount](#) (page 4-23) to the vehicle.
2. [Place Thor VM3 in the Dock](#) (page 4-16).
3. [Connect Cables](#) (page 4-26) for any peripherals.
4. [Connect Power](#) (page 4-27).
5. Secure all cables in [Strain Relief Cable Clamps](#) (page 4-26).
6. Press the [Power Switch](#) (page 3-4) on the dock to the on position.
7. Press the [Power Button](#) (page 3-4) on the Thor VM3.

### Software

This section only applies if the Thor VM3 was ordered with an operating system. For a Thor VM3 ordered without an operating system, see Thor VM3 with no Operating System (page 5-55).

#### Languages

The language selection and installation process varies by operating system:

- The Thor VM3 with a **Windows 7 Professional** operating system provides a choice between English or Simplified Chinese upon initial configuration. Once selected, the operating system language cannot be changed without reinstallation using a recovery DVD. Recovery DVDs may also be available for additional languages. Contact [Technical Assistance](#) (page 9-1) to order a [Thor VM3 Recovery DVD](#) (page 5-14). The language installed is identified on the **Software** tab of the [About](#) (see page 5-3) control panel.

#### First Boot

The first boot (also known as the Out of Box Experience) provides initial configuration of the Thor VM3. When a Thor VM3 is ordered with a Windows 7 Professional operating system, the product key is printed on a decal on the rear of the Thor VM3. It may be necessary to remove the Thor VM3 from the dock to view the product key decal. Under normal circumstances, it is not necessary to re-enter the product key as it was entered during the manufacturing process. If the Thor VM3 was ordered without an operating system, a product key must be provided by the customer to activate Windows.

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.

## **Smart Dock**

The Thor VM3 assembly consists of two parts, the Thor VM3 computer and the Smart 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 Smart Dock.

### **Standard Smart Dock**

The Standard Smart Dock provides:

- 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.
- Strain relief cable mounts.
- 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.
- COM1 and COM2 serial connections for a tethered scanner, printer, PC connection, etc.
- USB host connection via an adapter cable. This port also supports Honeywell external keyboards.
- CANbus connection via an adapter cable.
- Headset connection via an adapter cable. When a headset is not attached, the microphone and speakers on the Thor VM3 are active.

### **Enhanced Smart Dock**

The Enhanced Smart Dock provides:

- 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.
- Strain relief cable mounts.
- 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.
- COM1 and COM2 serial connections for a tethered scanner, printer, PC connection, etc.
- USB1 connector provides host connection via an adapter cable. This port also supports Honeywell external keyboards.
- USB2 connector provides 2 USB host connections via an adapter cable.
- CANbus connection via an adapter cable.
- Headset connection via an adapter cable. When a headset is not attached, the microphone and speakers on the Thor VM3 are active.
- A USB host port is located on the top of the Enhanced Smart Dock.
- An RJ-45 Ethernet connector is located on the top of the Enhanced Smart Dock.

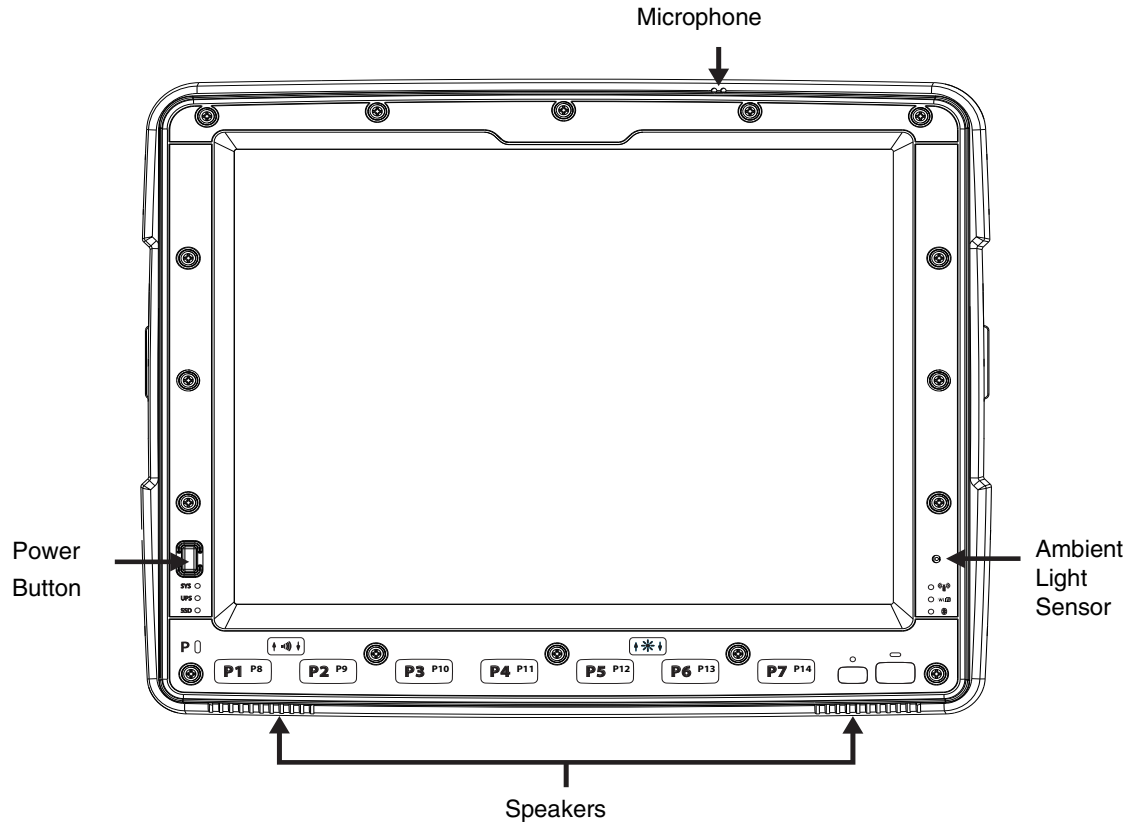
## **Additional Connectors**

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).

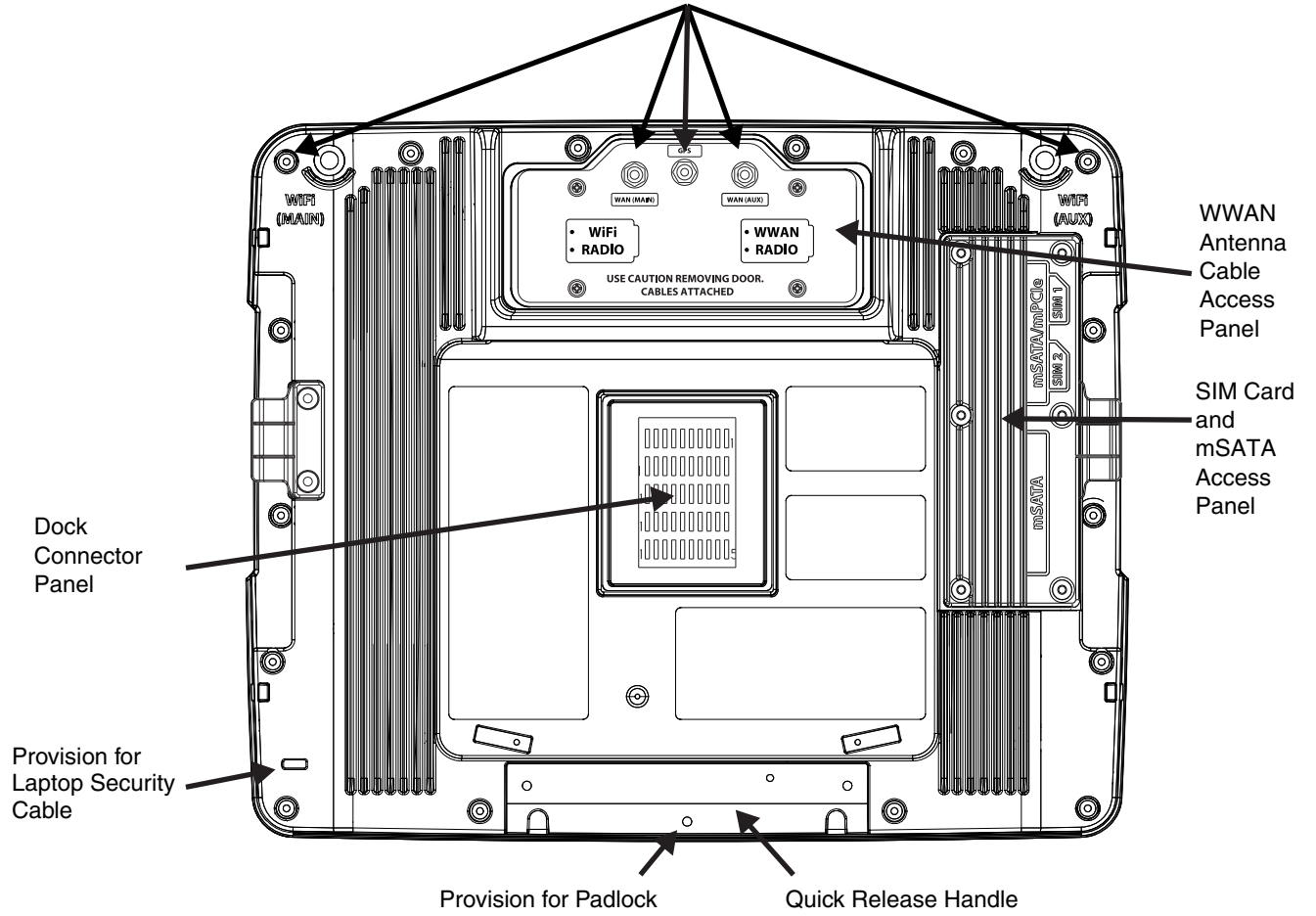
## **Components**

### **Front View - Thor VM3**



***Back View - Thor VM3***





**Access Panels - Thor VM3**

SIM and mSATA Card Access Pane with door removed

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## **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 5-6) 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.
3. Press the **P5** key to increase backlight brightness or the **P6** key to decrease backlight brightness.
4. Press the **Blue** key to exit Blue mode.

Refer to the [Screen Control](#) (page 5-9) 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 the [Screen Control](#) (page 5-9) panel 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](#) (see page 5-23) 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 5-11) control panel or via the system tray speaker icon. These items can also be used to adjust speaker volume

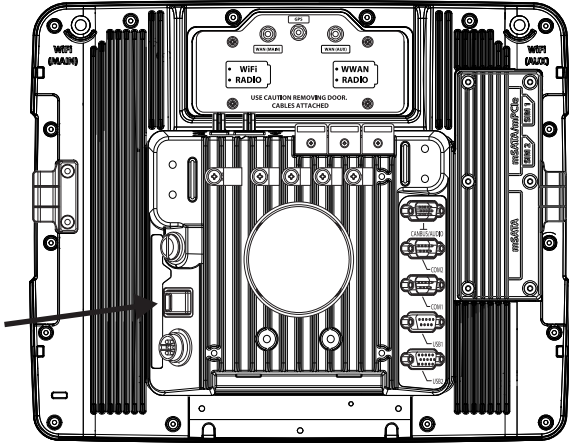
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## Power Up



If a USB drive, such as a thumb drive is attached to the Thor VM3, the device attempts to boot from the USB drive and cannot. Please remove the USB drive and power up the Thor VM3 again.

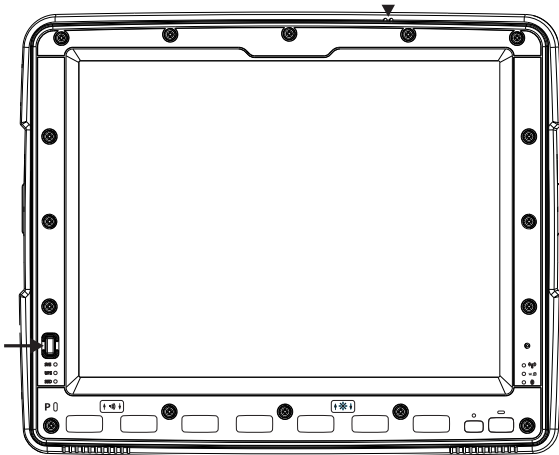
The Quick Mount Smart Dock has a power switch on the back.



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](#) (see page 3-4) for more information.

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## 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.

- 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.
- Select **Start > Shut Down > Restart** and tap OK to restart the Thor VM3

## 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 is generated by tapping the mouse icon, usually located in the upper right hand corner of the screen. After tapping, the mouse icon highlights the right button. The next touch screen tap is treated as a right click. The mouse icon returns to the left button highlighted so subsequent taps are treated as left clicks.

*Note: If the mouse icon is not displayed, this feature can be enabled by tapping the PenMount icon  in the System Tray. From the menu that pops up, tap the **Right Button** to enable the mouse icon. When this option is enabled, a checkmark is displayed in the menu.*

A stylus replacement kit is available.

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

*Note: The instructions below are for Honeywell RFTerm. If a different terminal emulation software is installed on your Thor VM3 refer to the documentation for that software.*

Before you make a host connection, you will, at a minimum, need to know:

- the alias name or IP address (Host Address) and
  - the port number (Telnet Port) of the host system to properly set up your host session.
1. Make sure the mobile client network settings are configured and functional. If you are connecting over wireless LAN (802.11x), make sure your mobile client is communicating with the Access Point.
  2. From **Start > Program**, run **RFTerm** or tap the RFTerm icon on the desktop.
  3. Select **Session > Configure** from the application menu and select the "host type" that you require. This will depend on the type of host system that you are going to connect to; i.e., 3270 mainframe, AS/400 5250 server or VT host.

- 
4. Enter the “Host Address” of the host system that you wish to connect to. This may either be a **DNS name or an IP address of the host** system.
  5. Update the **telnet port number**, if your host application is configured to listen on a specific port. If not, just use the default telnet port.
  6. Select **OK**.
  7. Select **Session > Connect** from the application menu or tap the “Connect” button on the Tool Bar. Upon a successful connection, you should see the host application screen displayed.

To change options such as Display, Colors, Cursor, Bar Code, etc., refer to these sections in the *RFTerm Reference Guide* for complete descriptions of these and other features.

## ***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 fingers and rough or sharp objects away from the bar code reader scanning aperture and the mobile device touch screen.

If the glass becomes soiled or smudged, clean only with a standard household cleaner such as Windex® 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 Wireless Client**

### **Central Processing Unit**

The CPU is a 1.6 GHz Intel Atom processor. The operating system is Microsoft Windows . The OS image is stored on an internal CompactFlash 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.
- One slot for SD memory card.
- CompactFlash (CF) memory card drive.
- Integrated keyboard.
- Ports available via adapter cables: USB host port, CANbus, Audio.

### **System Memory**

Main system memory is 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 480 pixels. This resolution complies with the WVGA 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**

#### **CompactFlash (CF) Slot**

The CF ATA slot is not hot swappable. The Thor VM3 must be powered down to insert or remove an ATA card. Since the operating system is stored on the CF ATA card, the Thor VM3 cannot operate without the ATA card.

#### **Secure Digital (SD) Slot**

The SD slot accepts an SD memory card. The SD card is hot swappable.

### **Bluetooth EZPair**

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.

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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; beeps from the mobile Bluetooth scanner as the bar code data is accepted/rejected, and other beeps from the Thor VM3 during final bar code data manipulation.

## **WWAN**

WWAN (Wireless Wide Area Networking) is available on the Thor VM3. A slot is provided for a SIM card.

## **GPS**

GPS (Global Positioning System) is available on the Thor VM3.

## **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 4-28). 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 4-37) or [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-37).

Power input is fused for protection and the fuse is externally accessible, see [Fuse](#) (page 3-4).

### **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 Quick Mount Smart Dock via an optional external power supply and adapter cable. See [External AC/DC Power Supply](#) (page 4-46).

### **Uninterruptible Power Supply**

The Thor VM3 contains an internal UPS battery. The user can [Replace UPS Battery](#) (page 1-83)

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 -20°C (-4°F) or greater. For the extended temperature version of the Thor VM3, the UPS provides a minimum of 10 minutes of operation between -20°C (-4°F) and -30°C (-22°F).

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 10% 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 internal temperature of the Thor VM3 is the trigger for UPS battery charging.

- The UPS battery is not charged when the internal Thor VM3 temperature is below 0°C (32°F). This corresponds to an ambient (room) temperature of approximately -10°C (-14°F).
- The UPS battery is not charged when the internal Thor VM3 temperature is above 45°C (113°F). This corresponds to an ambient (room) temperature of approximately 35°C (95°F).



- 
- If the UPS battery cannot be charged due to a temperature extreme, the [UPS Status LED](#) (page 3-10) is amber. 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 (or 4 hours for some earlier software revisions) timeout period expires, the [UPS Status LED](#) (page 3-10) is amber.
- The charge timeout is reset if charging resumes upon application of external power.
- The charge timeout is reset if charging resumes when the Thor VM3 enters the permissible temperature range for charging.

### ***Charging and Power Management***

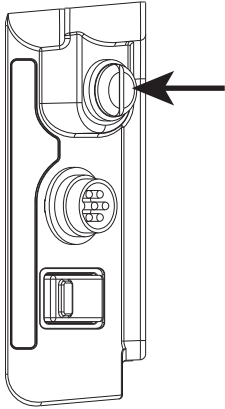
#### ***Backup Battery***

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 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 Quick Mount Smart 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**

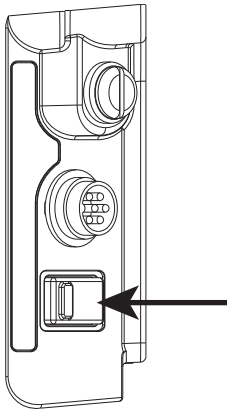
or equivalent.

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

## Power Management Modes

### 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 Quick Mount Smart 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

## External Connectors

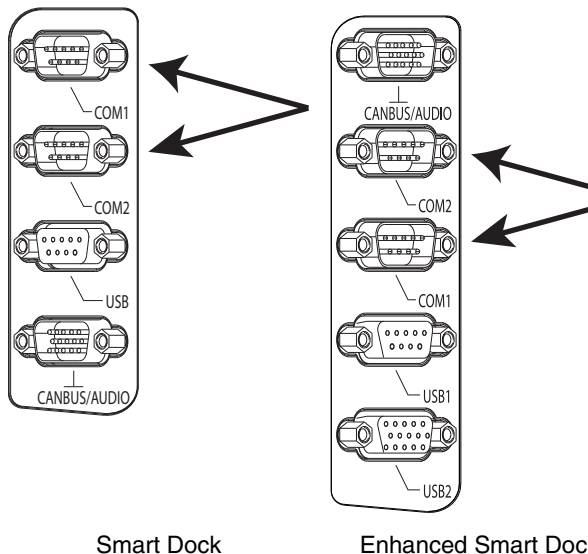
Power the Thor VM3 off before attaching a cable to any port (serial, USB, Audio/CAN, etc.).

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

The [Power Supply Connector](#) (page 3-6) 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.

## Serial Connector (COM1 and COM2)



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

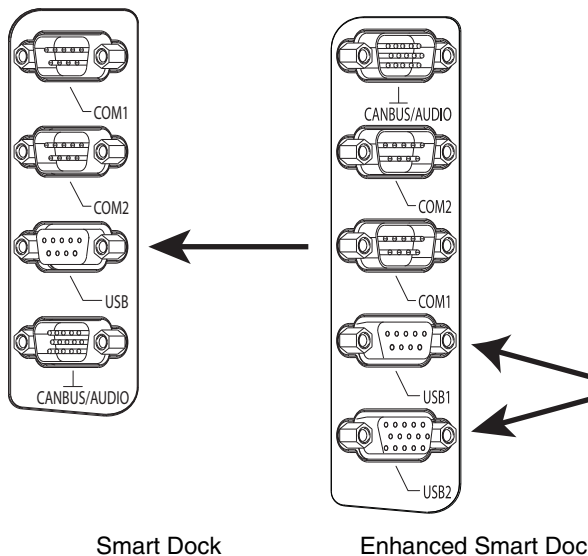
See [Connect Serial Device](#) (page 4-47) for more information.

If a COM port is not being used for a scanner, it can be used for [Screen Blanking](#) (page 4-43) 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 4-43) for information on connecting screen blanking accessories.

## USB Connector(s)

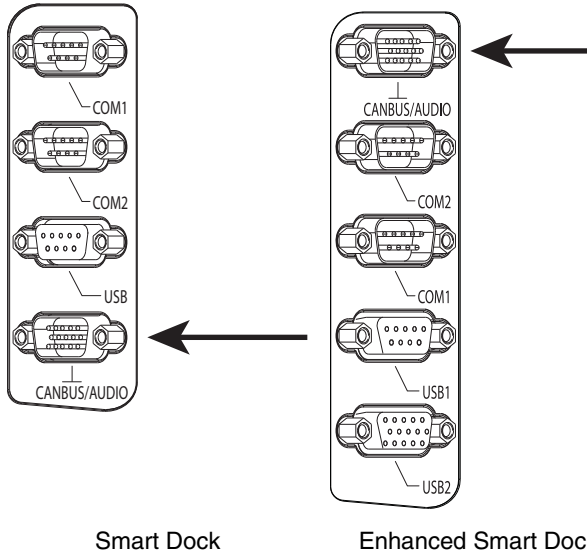


The USB or USB1 connector is a D-9 female connector located on the back of the Quick Mount Smart Dock. See [USB Connector](#) (page 8-6) for connector pinout detail.

The USB-2 connector is a D-15 female connector located on the back of the Quick Mount Smart Dock. See [USB Connector](#) (page 8-6) for connector pinout detail.

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

## CANbus / Audio Connector



The CANbus/Audio connector is a D-15 male connector located on the back of the Quick Mount Smart Dock.

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

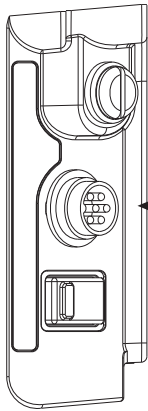
See [CANbus / Audio Connector](#) (page 8-9) for connector pin-out detail.

A headset cable attaches to the CANbus / Audio connector and provides a quick connect connection for a headset. See [Connect Headset Cable](#) (page 4-48) 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 4-49) for more information.

The CANbus interface is a virtual COM4 port. This port can be accessed using standard Windows API calls.

## Power Supply Connector

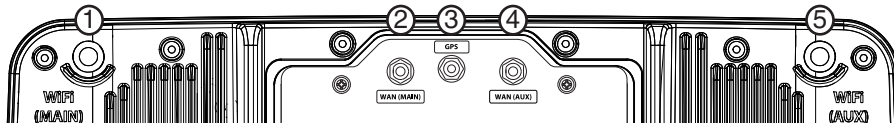


Power is supplied to the Thor VM3 through the power connector. Additionally this assembly provides a connection point for the vehicle's chassis ground to be connected internally to the conductive chassis of the computer.

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 4-27) for more information on connecting power to the Thor VM3.

## Antenna Connections

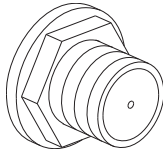


The Thor VM3 is equipped with an 802.11 radio and can be ordered with internal antennas, external antennas or external remote mount antennas. When the Thor VM3 is ordered with internal antennas, the external antenna connectors are not used. GPS and WWAN are optional on the Thor VM3 and require external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

---

### **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 4-50) for instructions. External antenna kits are available for the 802.11 Wi-Fi radio, GPS and WWAN.

---

## Keyboard Options

### Integrated Keypad



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 5-41) 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.

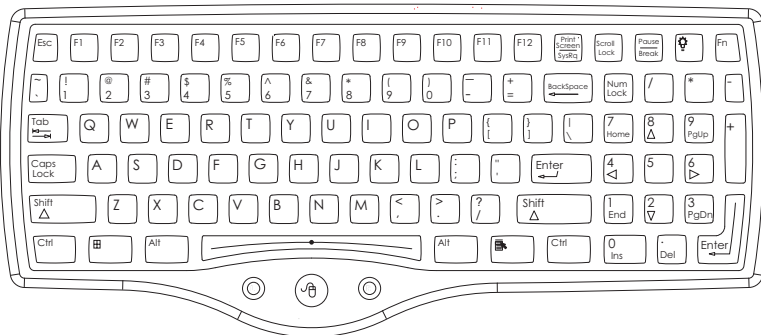
The Thor VM3 integrated keypad is backlit.

- 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 is increased (or decreased). The integrated keypad backlight and the display share the same timer, which is configured in the [Power Options](#) (page 5-6) control panel.
- The integrated keypad backlight can be disabled via the [Options](#) (page 5-23) control panel.

### Keypad LEDs

See [Keyboard LEDs](#) (page 3-12) for details.

### 95-Key USB Keyboard



The Thor VM3 uses an optional rugged QWERTY 95 key keyboard, designed for ease of use with the Windows CE operating system. The USB keyboard connects directly to the D9 USB connector on the Thor VM3 Quick Mount Smart 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.

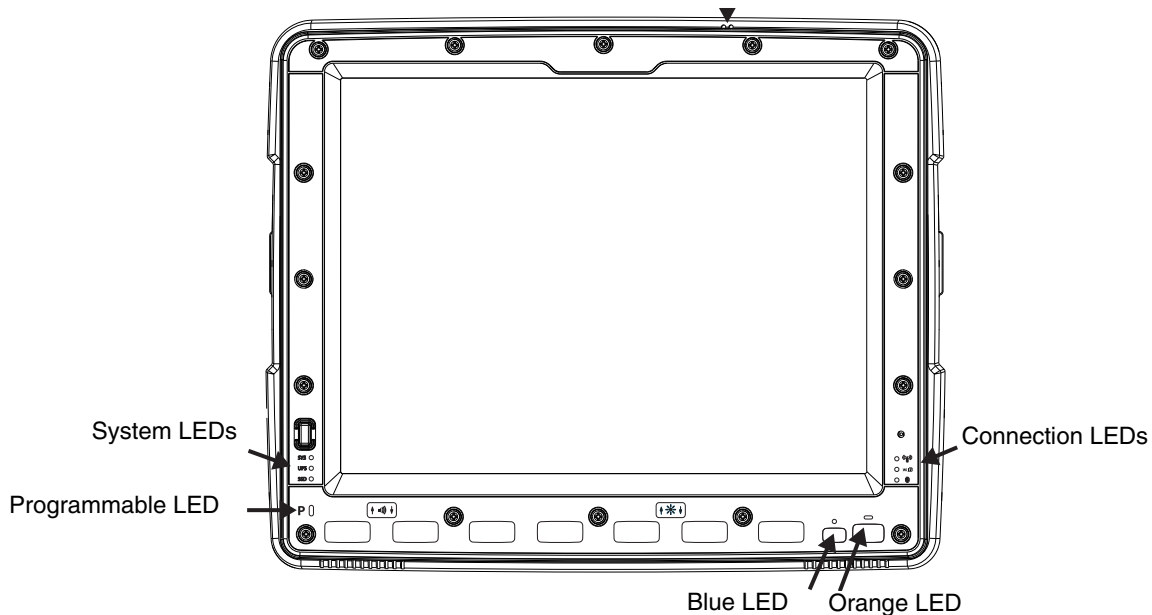
Since the keyboard is a USB device, by default the external keyboard backlight is turned off when the Thor VM3 enters Standby/Sleep. This behavior can be changed by enabling USB power in Standby/Sleep on the [Options](#) (page 5-23) control panel.

### USB Keyboard / Mouse

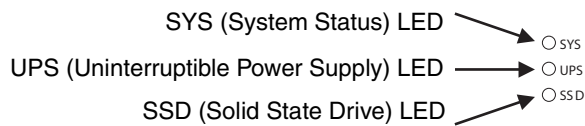
A standard USB keyboard or mouse can be attached to the Thor VM3 using the appropriate adapter cable.

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

LED Behavior	System State
Solid Green	<ul style="list-style-type: none"> <li>On</li> <li>On but Display Off</li> </ul>
Green blinking very slowly External power present (1/2 sec. on, 4 1/2 sec. off)	<ul style="list-style-type: none"> <li></li> </ul>
Off External power present	<ul style="list-style-type: none"> <li>Off</li> </ul>

LED Behavior	System State
Off External power not present	<ul style="list-style-type: none"> <li>Off</li> </ul>
Green blinking slowly External power present (1/2 sec. on, 1 1/2 sec. off)	CPU temperature less than -20°C, Heater warming CPU for 30 sec.
Green blinking slowly External power not present (1/2 sec. on, 1 1/2 sec. off)	CPU temperature less than -20°C, Need to move unit to warmer environment

### 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	<ul style="list-style-type: none"> <li>Less than fully charged, but more than 2 minutes runtime remaining</li> <li>Out of <a href="#">Safe Charging Temperature Range</a> (page 3-2) Charging only occurs between approximately -10°C and 35°C ambient temperature</li> <li>No UPS present</li> <li><a href="#">Charging Timeout</a> (page 3-3) Not fully charged after 4 or 8 hours depending on software revision.</li> </ul>
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 Suspend

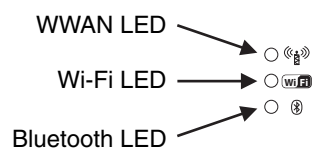
### SSD (Solid State Drive) LED

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



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## 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
Blue Blinking Slowly	Bluetooth is paired but not connected to a device
Blue Blinking Medium	Bluetooth is paired and connected to a device
Blue Blinking Fast	Bluetooth is discovering Bluetooth devices
Off	Bluetooth hardware has been turned off

The Bluetooth LED blinks once every 6 seconds when the Bluetooth client is paired but not connected. It blinks once for a very short time every 2 seconds when paired and connected. It blinks every second when in discovery. The LED is off when the Bluetooth client is 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 through P4 provide volume and 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 WSVGA graphics modes. Display size is 1024x768 pixels. The display covering is designed to resist stains. The touch screen allows signature capture and touch input. The display supports screen blanking to eliminate driver distraction when the vehicle is in motion.

### Touch Screen

The touch screen is a Resistive Panel with a scratch resistant finish that can detect touches by a stylus, and translate them into computer commands. In effect, it simulates a computer mouse. Only Delrin or plastic 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 5-9) 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 4-43) for hardware setup and [Screen Control](#) (page 5-9) for software setup to enable screen blanking. Once screen blanking is enabled, the display is blanked out any time when the cable sends the signal 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 5-9).

*Note: When automatic brightness control is enabled, the manual display brightness controls described below have no effect.*

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

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



# Vehicle Mounting and Accessory Installation

## Introduction

The Thor VM3 is designed to be mounted to a Quick Mount Smart Dock in a vehicle with either a RAM mount or U Bracket system. A power cable is provided with the Thor VM3 dock. 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 Quick Mount Smart 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 4-18) or [Install U Bracket Mount](#) (page 4-23) to the vehicle.
2. [Place Thor VM3 in the Dock](#) (page 4-16).
3. Adjust the Thor VM3 to the best viewing angle.
4. [Install Remote Antenna](#) (page 4-50) if necessary.
5. [Connect Cables](#) (page 4-26) for any peripherals.
6. Connect vehicle power:
  - [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-28)
  - [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-37)
  - [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-33).
  - [Thor VX8 / Thor VX9 Adapter Cable](#) (page 4-42)
  - [VX6 / VX7 Adapter Cable](#) (page 4-41)
7. Secure all cables in [Strain Relief Cable Clamps](#) (page 4-26).

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.

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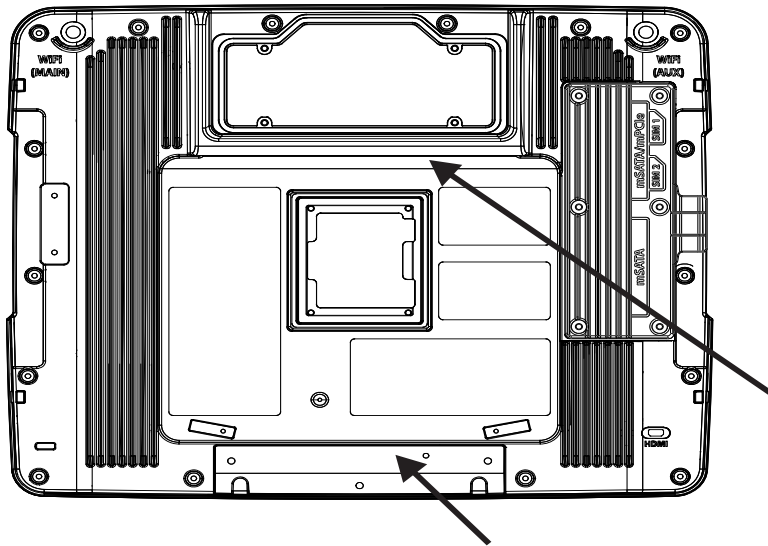
## Cleaning

Do not use paper towels or harsh-chemical-based cleaning fluids since they may result in damage to the Thor VM3 surfaces, cables, connectors and mounting hardware.

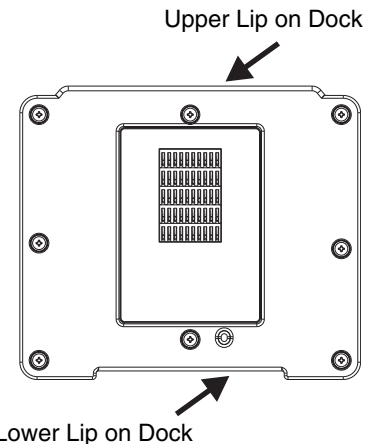
Use a clean soft cloth to wipe any dirt, moisture or grease from the Thor VM3, connectors, cables or the vehicle mounting hardware. Do not use any liquid to clean the Thor VM3, or connectors. Spray or dampen the cleaning cloth with the cleaning liquid. If possible, clean only those areas which are soiled. Lint/particulates can be removed with clean, filtered canned air.

## Place Thor VM3 in the Dock

Back of Thor VM3



Front of Smart Dock



Notch on Thor VM3

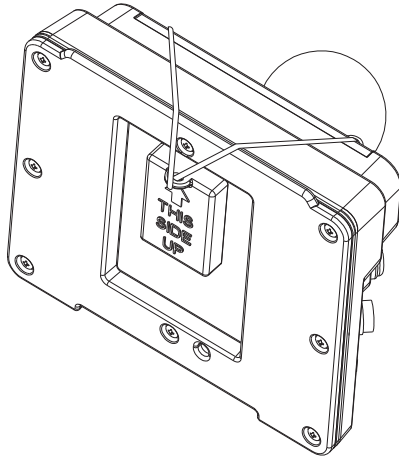
Release Lever

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.
5. If necessary, adjust the viewing angle of the Thor VM3.

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

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

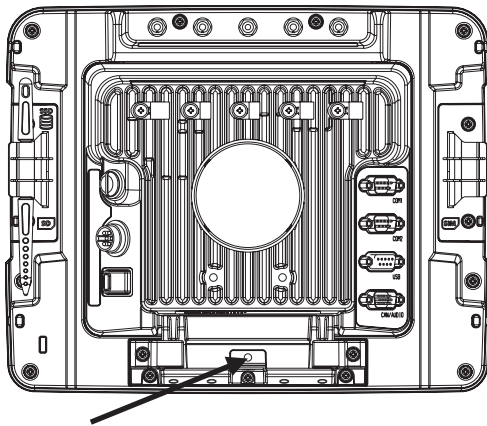
### **Dock I/O Pin Cover.**



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.

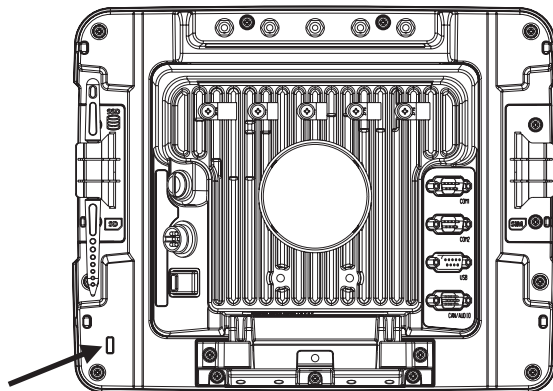
### **Padlock**



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.

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## 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.

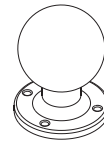
Before installation begins, verify you have the applicable vehicle mounting bracket assembly components necessary, as shown in the following figures.

### Components - RAM Mounting Kits

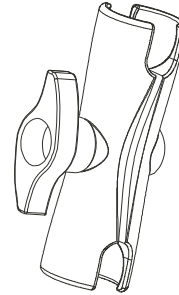
In addition to the kits below, individual RAM mounting components are also available.

Each mounting kit contains:

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

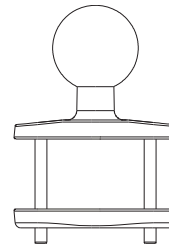
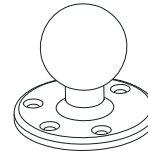


RAM Arm (Size D), length varies by kit selected

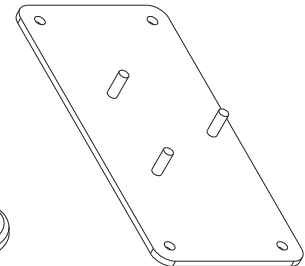
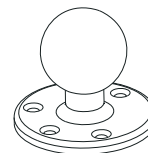


One of three mounting options:

- 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





## 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:

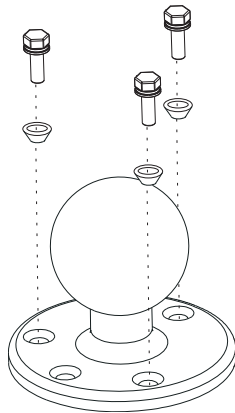
For these nuts...	Torque to
10-32 lock nuts	17 - 20 in/lb (0-95 - 1.10 N/m)

### 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 4-20). If you are using the RAM plate mount, please go to [Step 1c – Attach RAM Plate to Vehicle and Attach RAM Ball](#) (page 4-21).*

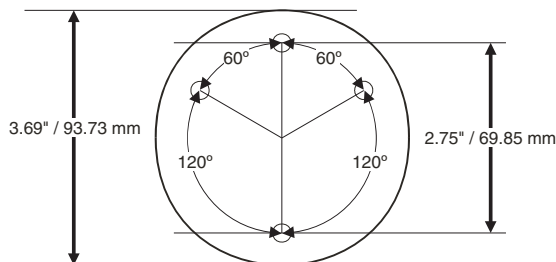
1. Determine the position for mounting the RAM ball base. Be sure to position the RAM bracket to allow access to the switches and ports on the bottom of the Thor VM3.
2. Attach the RAM ball base to the vehicle mounting surface using three or four 1/4 bolts (not included) or equivalent fasteners. If the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

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



### Mounting Dimensions

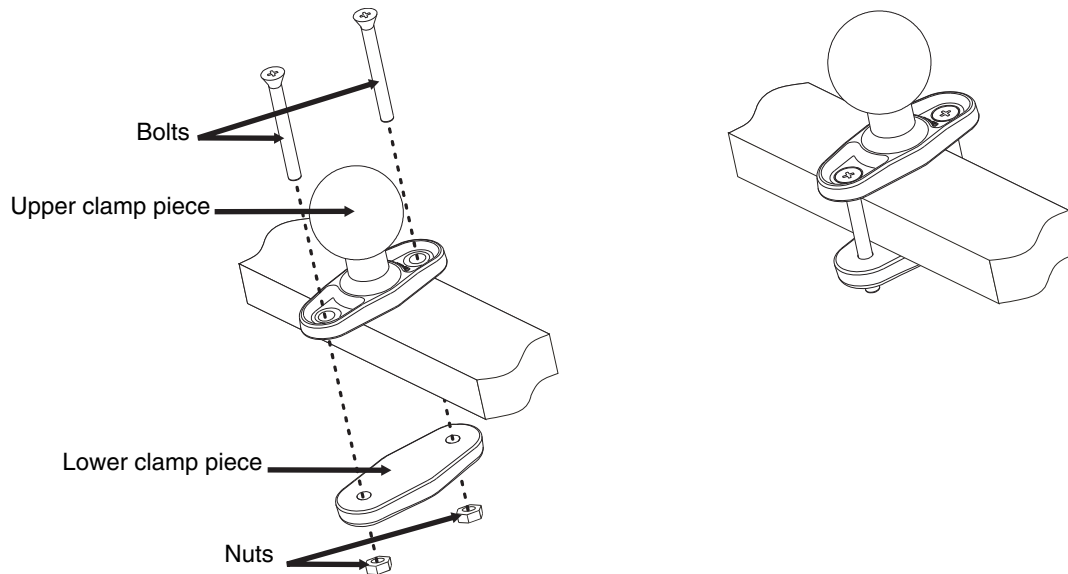
*Note: Drill and tap holes for three 1/4 bolts. Drawing not to scale.*



## 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 4-19). If you are using the RAM plate mount, please go to [Step 1c – Attach RAM Plate to Vehicle and Attach RAM Ball](#) (page 4-21).*

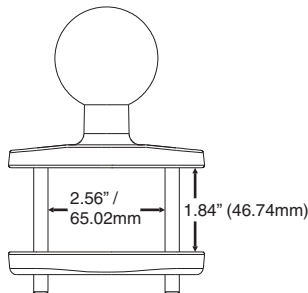
1. Determine the position for mounting the RAM clamp mount. The clamp mount can be used on a beam (such as on a fork lift truck) up to 2.5" (63.5 mm) wide and approximately 2" (50.8 mm) thick. The clamp may be attached to a thicker beam by substituting longer bolts (not included). Be sure to position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



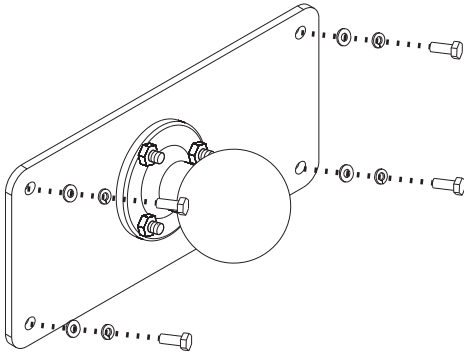
---

### 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 4-19) If you are using the RAM clamp mount, please go to [Step 1b – Mount RAM Clamp to Vehicle](#) (page 4-20).

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.

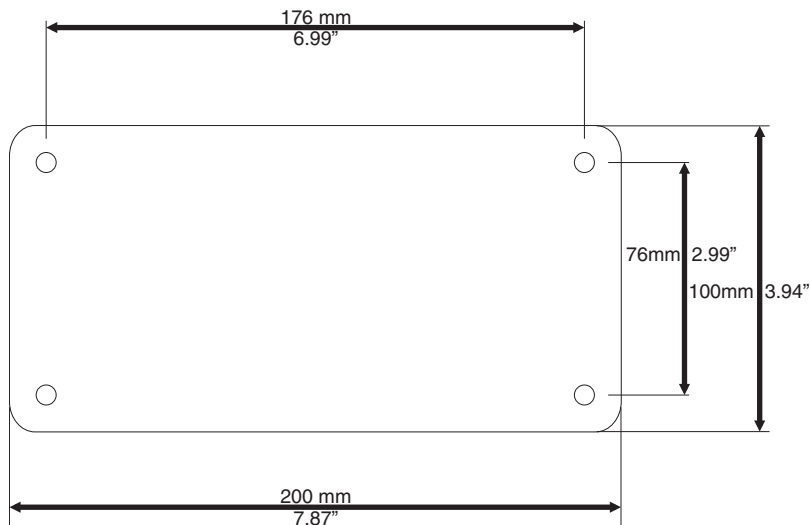
IMPORTANT: Mount to the most rigid surface available.



#### 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 Quick Mount Smart Dock***

1. Turn the Thor VM3 off before attaching the RAM mount ball.
2. Place the Thor VM3 face down on a stable surface.

### ***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 4-16)

---

## Install U Bracket Mount

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



**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.

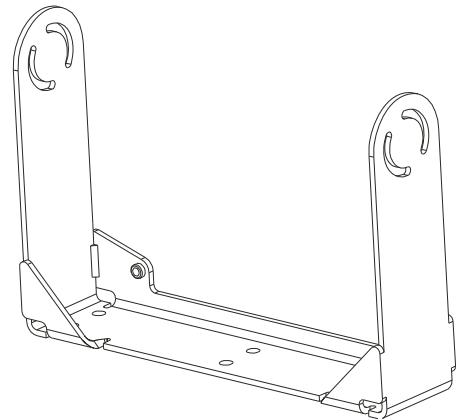
in the following figures.

### Components - U Bracket Mounting Assembly

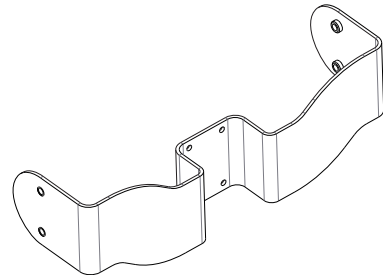
The U bracket kit is available in two configurations:

- 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 included in kits for new installations)



Adapter Bracket (includes screws, flat washers and lock washers to attach Adapter Bracket to Thor VM3 and to attach Adapter Bracket to existing U Bracket (for example, to a 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

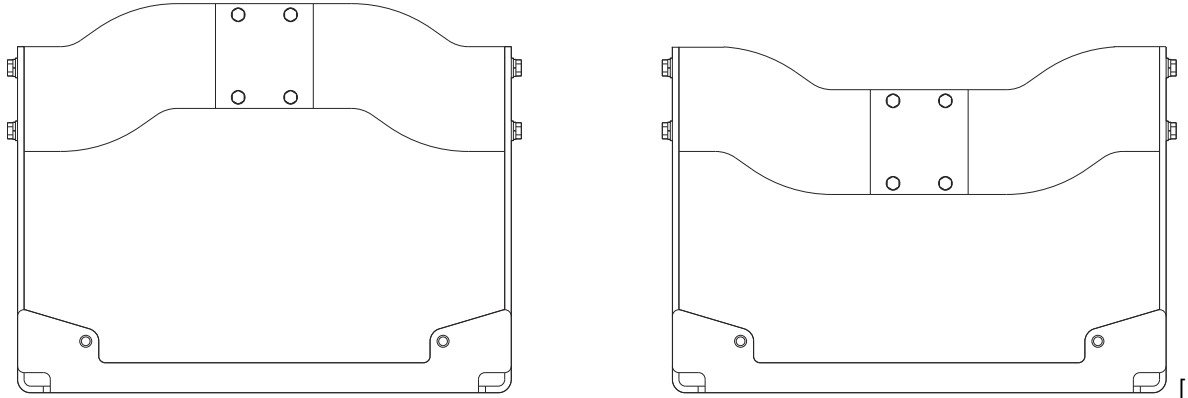
You will need a torquing tool capable of torquing to 35-50 inch pounds (1.10 N/m). Torque all screws and bolts according to the following table:

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.



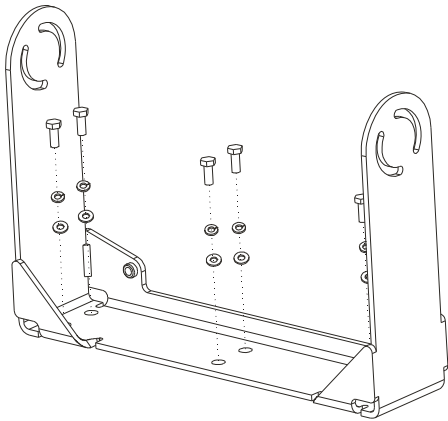
Additionally, the slotted U bracket allows the Thor VM3 to be mounted vertically or tilted forward or backward for best viewing angle.

### 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.*

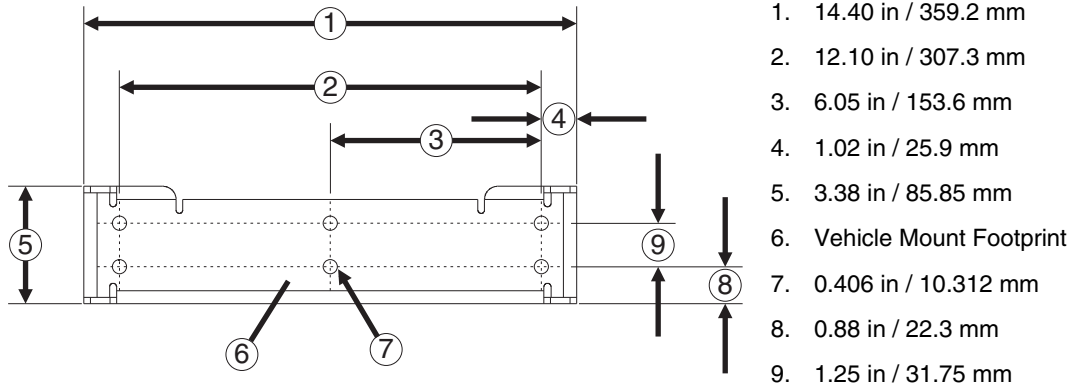
**IMPORTANT:** Mount to the most rigid surface available.



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.

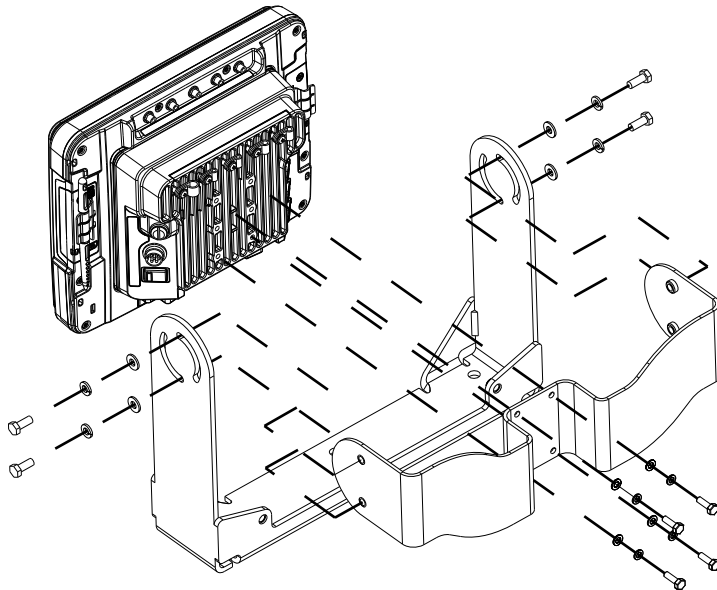


### Step 2 - Remove RAM Ball

If the Thor VM3 Quick Mount Smart 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 4-16).
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

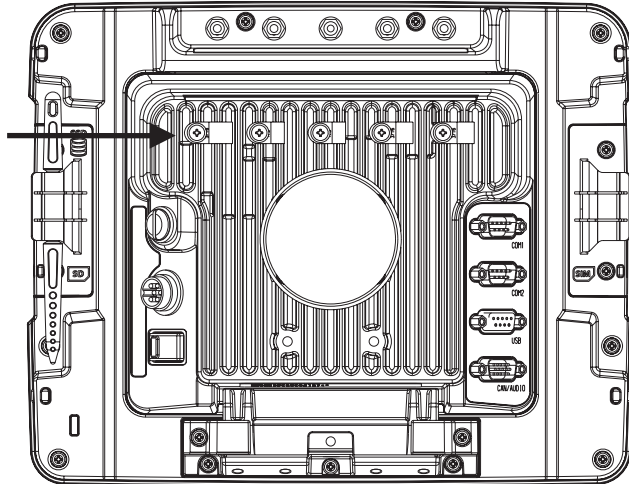
There are many cables available for the Thor VM3 including power cables, and data/ communication cablesThor VM3.

### Strain Relief Cable Clamps

Equipment Required: Phillips screwdriver (not supplied by Honeywell)

There are five strain relief cable clamps secured to the Thor VM3 Quick Mount Smart Dock.

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



1. Determine the proper strain relief cable clamp. There are three sizes of cable clamps on the Thor VM3 which should be matched to the cable to be secured. For example, the largest clamp (on the left when viewing the back of the Thor VM3) is designed to secure the power cable.
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 Quick Mount. 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 Thor VM3 dock.



## Connect Power

Power options include:

- [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (see page 4-28) - Direct connection to vehicle power.
- [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (see page 4-33) - Requires the use of a DC/DC power supply.
- [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (see page 4-37) - Requires the use of a DC/DC power supply.
- [VX6 / VX7 Adapter Cable](#) (see page 4-41) - For applications where the Thor VM3 replaces a previously installed VX6 or VX7.
- [Thor VX8 / Thor VX9 Adapter Cable](#) (see page 4-42) - For applications where the Thor VM3 replaces a previously installed Thor VX8 or Thor VX9.
- [Screen Blanking](#) (see page 4-43) - Optional connection to blank the Thor VM3 display while the vehicle is in motion.
- [External AC/DC Power Supply](#) (see page 4-46) - For use when DC power is not available to power the Thor VM3, such as in an office environment.

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

## Power Cable Cautions



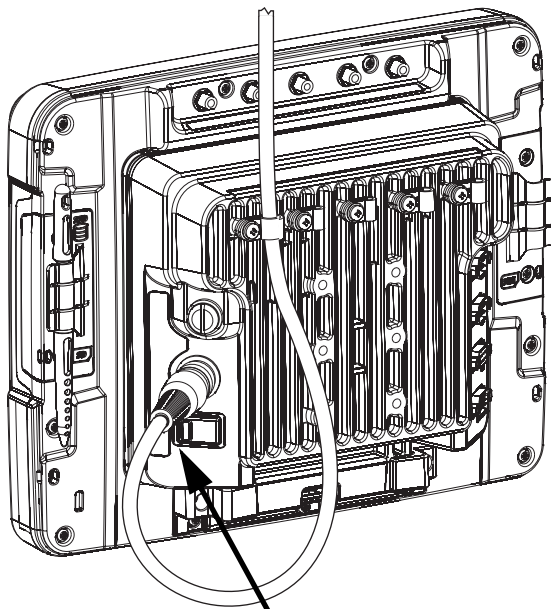
**CAUTION** - When routing the power cable:

- 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 4-26) 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.

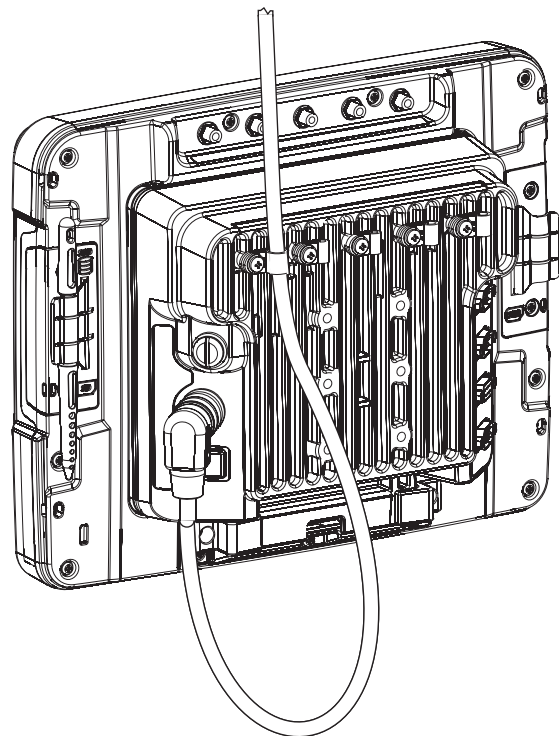
## Power Cable Routing

Power cable with straight connector



Avoid sharp bends in this area of the power cable

Power cable with right-angle connector



## 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 4-27).



### 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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.

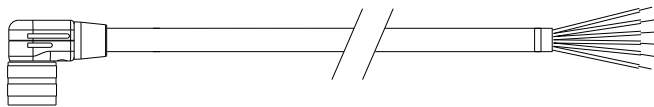
- For **12VDC** input, use a 10A slow blow fuse that has a DC voltage rating greater than 12VDC.
- For **24VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 24VDC.
- For **36VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 36VDC.
- For **48VDC** input, use a 3A 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 (included with the dock) is one of the two styles below:

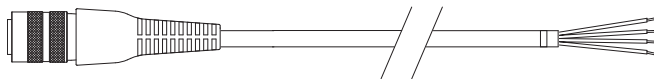
Power cable with **right angle connector** and **6 wires**:



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 (optional)

Power cable with **straight connector** and **4 wires**:



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

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

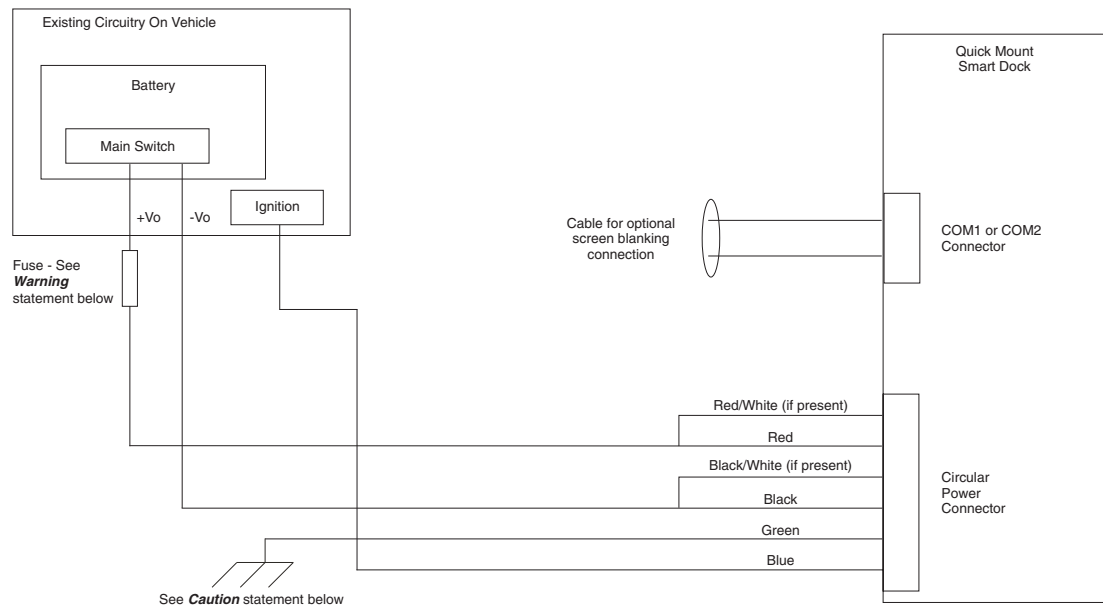
The Thor VM3 DC input wires (Red, Red/White DC+ and Black, Black/White DC-) and the Blue ignition input wire are galvanically isolated. The Green ground input is used for electrostatic discharge (ESD) protection.

### Vehicle 10-60VDC Direct Power Connection

1. The Thor VM3 must not be mounted in the Quick Mount Smart 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](#) (see page 4-28), 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 4-30)

- 
- [Auto-On Control Wiring Diagram](#) (page 4-31)
  - [Manual Control Wiring Diagram](#) (page 4-32)
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 Quick Mount Smart 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 4-26).
  9. [Place Thor VM3 in the Dock](#) (page 4-16)
  10. If using the [Screen Blanking](#) (page 4-43) 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:**

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire must be connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

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

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire must be connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



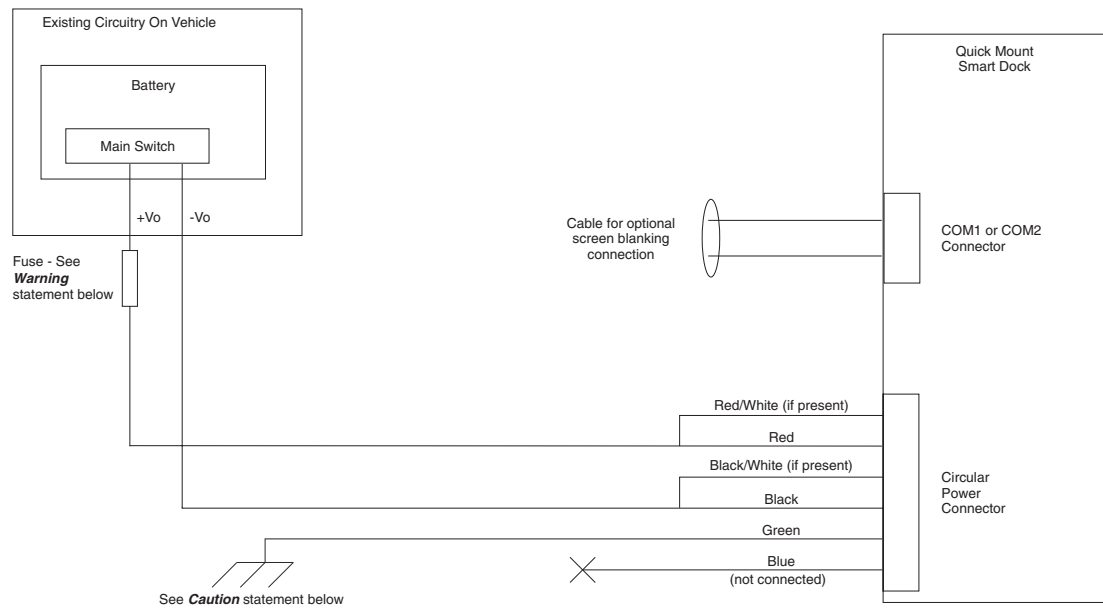
### **WARNING**

*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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

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

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire must be connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

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

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire is connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



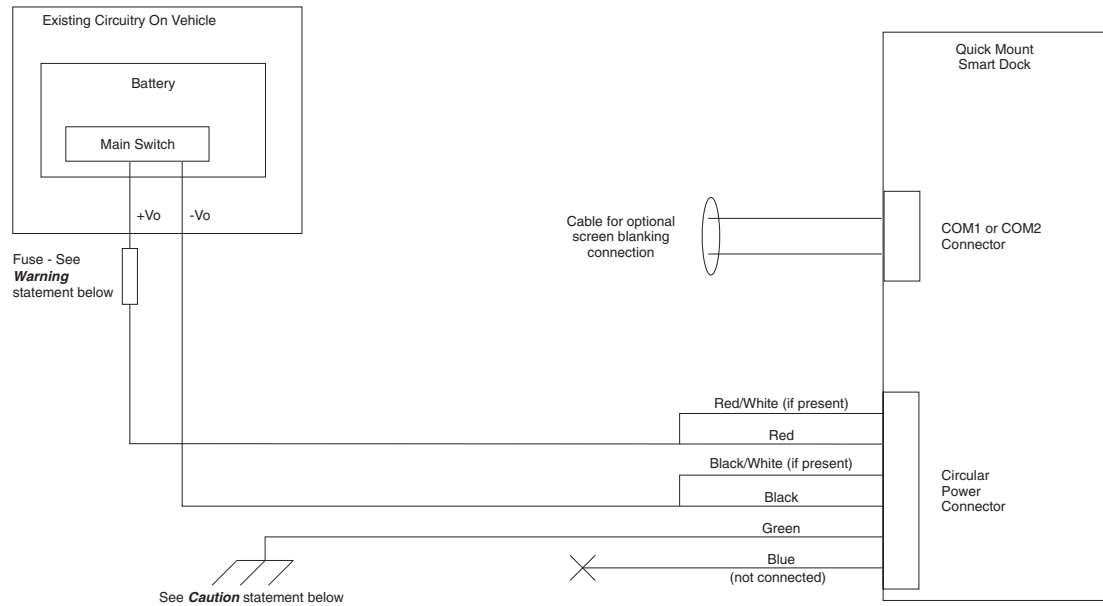
### **WARNING**

*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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

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

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire must be connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire must be connected to the vehicle chassis ground.

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

- Red wire is connected to battery positive. If there is a red wire and a red/white wire, twist them together and connect to battery positive.
- Black wire is connected to battery negative. If there is a black wire and a black/white wire, twist them together and connect to battery negative.
- Green wire is connected to the vehicle chassis ground, which can also be battery negative.



### **WARNING**

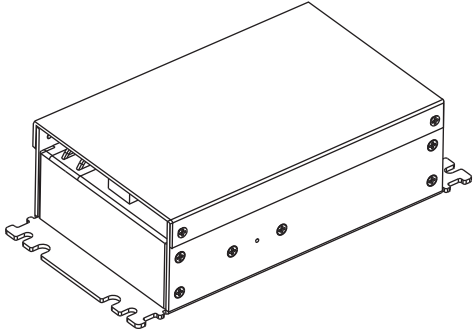
*For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery's positive (+) terminal. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

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

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

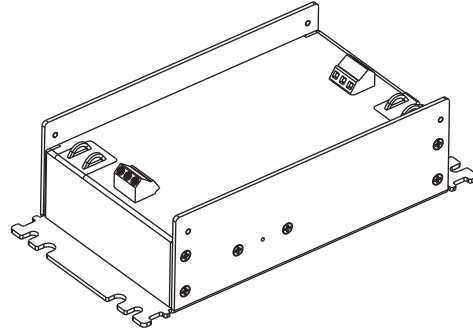
## 60-144 VDC Vehicles (50-150 VDC Power Supply, Screws on Side of Lid)

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 4-37).



**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 4-27).



### **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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.

- For **60VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 60VDC.
- For **72VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 72VDC.
- For **96VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 96VDC.
- For **108VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 108VDC.
- For **120VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 120VDC.
- For **132VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 132VDC.
- For **144VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 144VDC.


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

## Power Cable Identification

The DC power cable (included with the dock) is one of the two styles below:

Power cable with **right angle connector** and 6 wires:



 *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 (2 wires)	DC + (10-60 VDC)
Black (2 wires)	DC -
Green	Ground
Blue	Ignition Input (not used)

Power cable with **straight connector** and 4 wires:



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

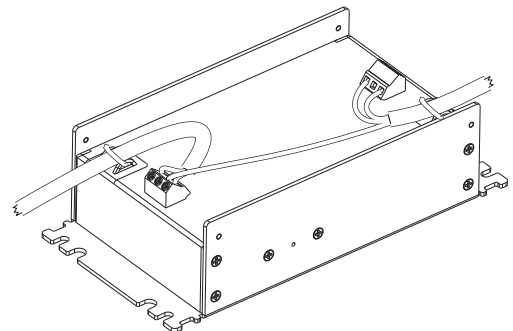
*Note: Correct electrical polarity is required for safe and proper installation. See [Wiring Diagram](#) (page 4-36) for additional wire color-coding specifics.*

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 4-36), before beginning power cable install.
2. The Thor VM3 must not be mounted in the Quick Mount Smart 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 or a single red wire) to the output block. See [Power Cable Identification](#) (page 4-34).
7. Connect the stripped end of the negative wires (black and black/white twisted together or a single black wire) to the output. See [Power Cable Identification](#) (page 4-34).

*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.*

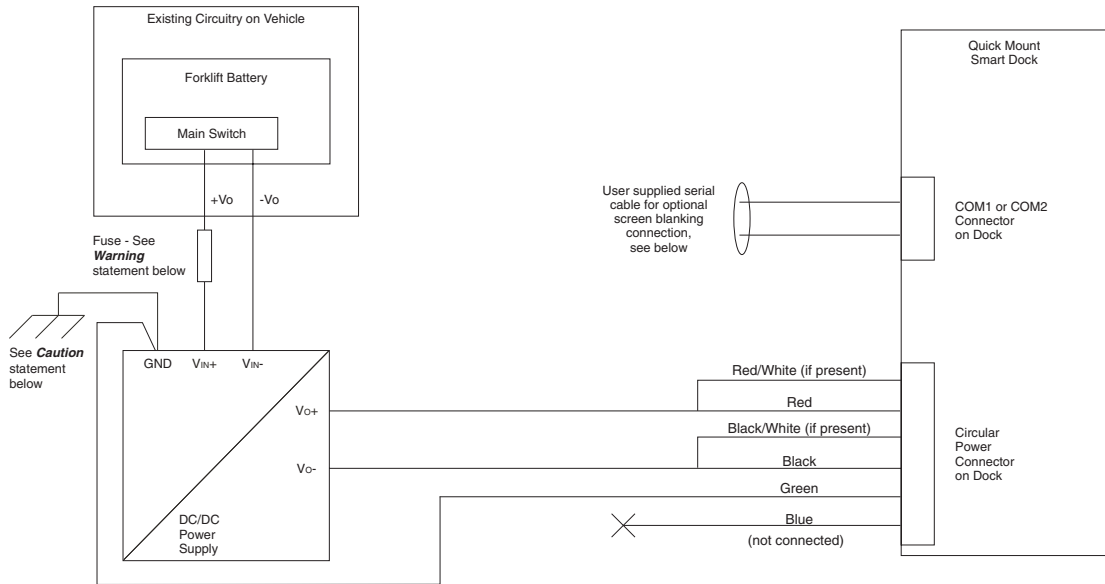
14. While observing the [Fuse Requirements](#) (see page 4-33) connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in the vehicle fuse panel, after providing proper fusing.

**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 Quick Mount Smart 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 4-26).
19. [Place Thor VM3 in the Dock](#) (page 4-16)
20. If using the [Screen Blanking](#) (page 4-43) 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.*



### WARNING

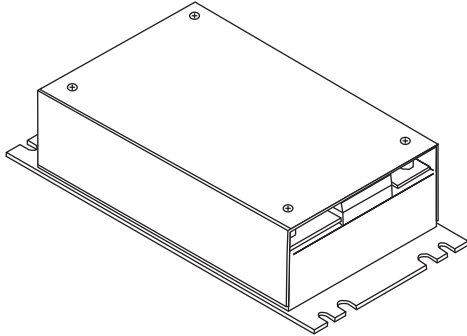
*For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. If the supply connection is made directly to the battery, the fuse should be installed in the positive (+) terminal within 5 inches of the battery's positive (+) terminal. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.*

- For **60VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 60VDC.
- For **72VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 72VDC.
- For **96VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 96VDC.
- For **108VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 108VDC.
- For **120VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 120VDC.
- For **132VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 132VDC.
- For **144VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 144VDC.

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

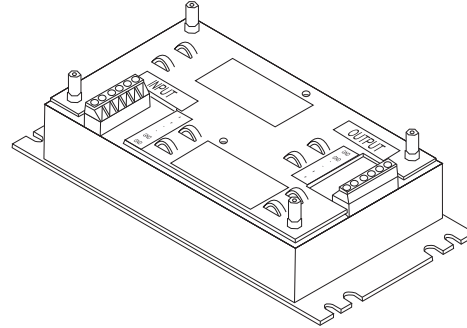
## 60-144 VDC Vehicles (50-150 VDC Power Supply, Screws on Top of Lid)

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 ( $\oplus$ ) 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 4-33).



**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 4-27).



### **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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.

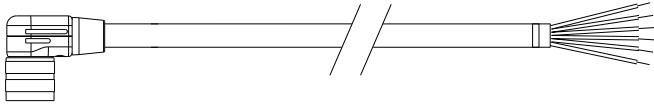
- For **60VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 60VDC.
- For **72VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 72VDC.
- For **96VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 96VDC.
- For **108VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 108VDC.
- For **120VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 120VDC.
- For **132VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 132VDC.
- For **144VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 144VDC.


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

## Power Cable Identification

The DC power cable (included with the dock) is one of the two styles below:

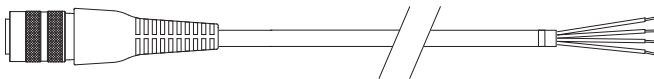
Power cable with **right angle connector** and **6 wires**:



 *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 (2 wires)	DC + (10-60 VDC)
Black (2 wires)	DC -
Green	Ground
Blue	Ignition Input (not used)

Power cable with **straight connector** and **4 wires**:



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

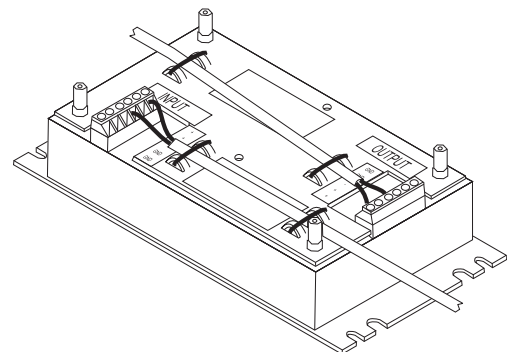
*Note: Correct electrical polarity is required for safe and proper installation. See [Wiring Diagram](#) (page 4-40) for additional wire color-coding specifics.*

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 4-36), before beginning power cable install.
2. The Thor VM3 must not be mounted in the Quick Mount Smart 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 or a single red wire) to the output block. See [Power Cable Identification](#) (page 4-38).
7. Connect the stripped end of the negative wires (black and black/white twisted together or a single black wire) to the output. See [Power Cable Identification](#) (page 4-38).

*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.

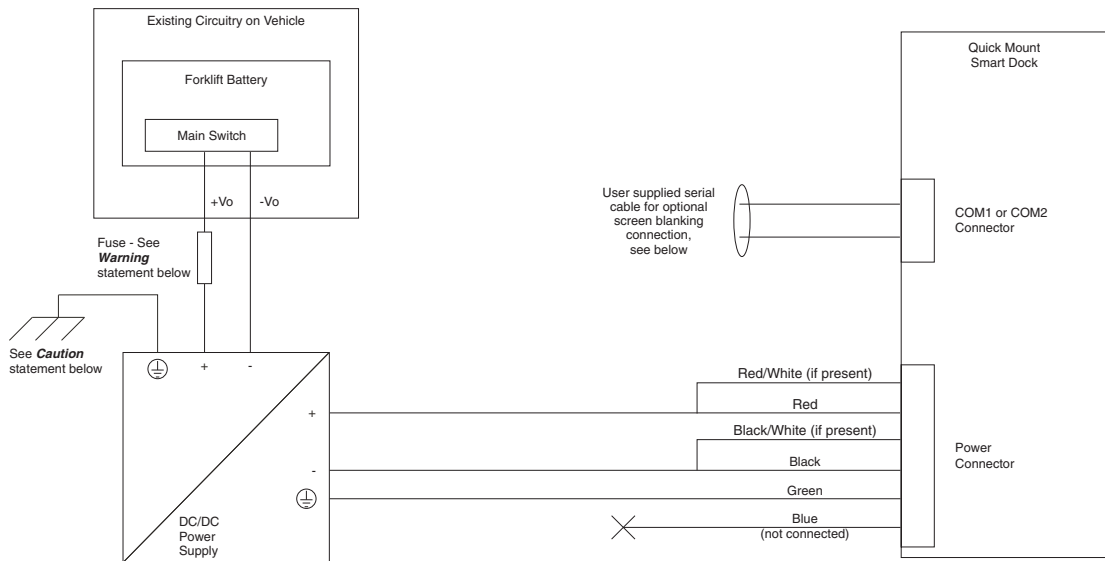
13. While observing the [Fuse Requirements](#) (see page 4-37), connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in the vehicle fuse panel, after providing proper fusing.

**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 Quick Mount Smart 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 4-26).
18. [Place Thor VM3 in the Dock](#) (page 4-16)
19. If using the [Screen Blanking](#) (page 4-43) 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.



### 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. The fused circuit requires a maximum time delay (slow blow) fuse with a current rating as noted below.

- For **60VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 60VDC.
- For **72VDC** input, use a 6A slow blow fuse that has a DC voltage rating greater than 72VDC.
- For **96VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 96VDC.
- For **108VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 108VDC.
- For **120VDC** input, use a 4A slow blow fuse that has a DC voltage rating greater than 120VDC.
- For **132VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 132VDC.
- For **144VDC** input, use a 3A slow blow fuse that has a DC voltage rating greater than 144VDC.

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 Thor 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.

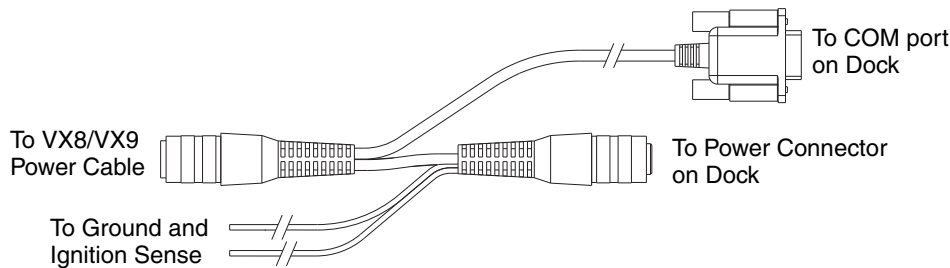
### Connect to VX6 / VX7 Power Cable

1. Connect the 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 Quick Mount Smart 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 4-26).
6. [Place Thor VM3 in the Dock](#) (page 4-16)
7. If using the [Screen Blanking](#) (page 4-43) 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

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 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 Quick Mount Smart 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 4-26).
9. [Place Thor VM3 in the Dock](#) (page 4-16)
10. If using the [Screen Blanking](#) (page 4-43) 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.



## Screen Blanking

Prerequisite: The steps outlined in either [12-48 VDC Vehicles \(10-60 VDC Direct Connection\)](#) (page 4-28), [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Side of Lid\)](#) (page 4-33) or [60-144 VDC Vehicles \(50-150 VDC Power Supply, Screws on Top of Lid\)](#) (page 4-37) 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

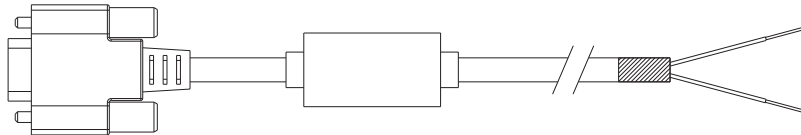
Refer to Screen Control (in the Windows Control Panel) to configure the Thor VM3 for screen blanking.

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)

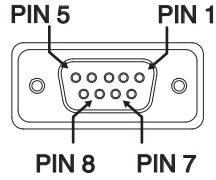
*Note: Wire colors only apply to optional Honeywell Screen Blanking Box Cable, VM1080CABLE. Wire colors may vary in a user-supplied cable.*

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 Quick Mount Smart 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 Quick Mount Smart Dock.

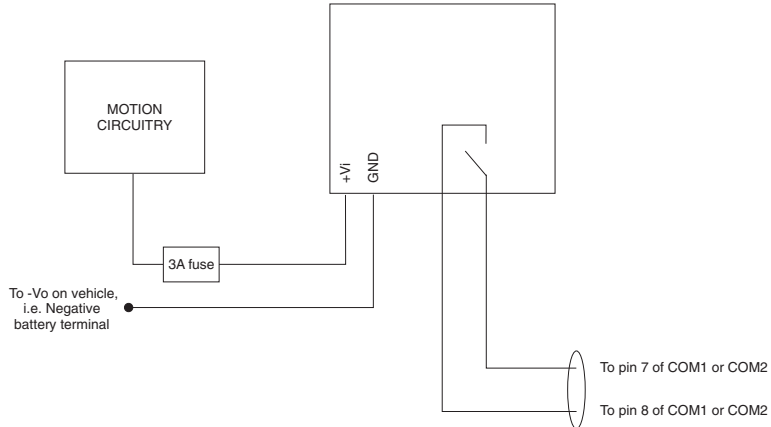
### Screen Blanking Box

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.

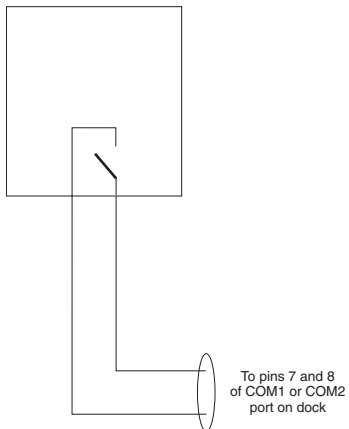
**CAUTION** - Do not exceed the maximum input voltage, either 60 or 72VDC, specified on the Screen Blanking Box label when using this configuration.



*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.

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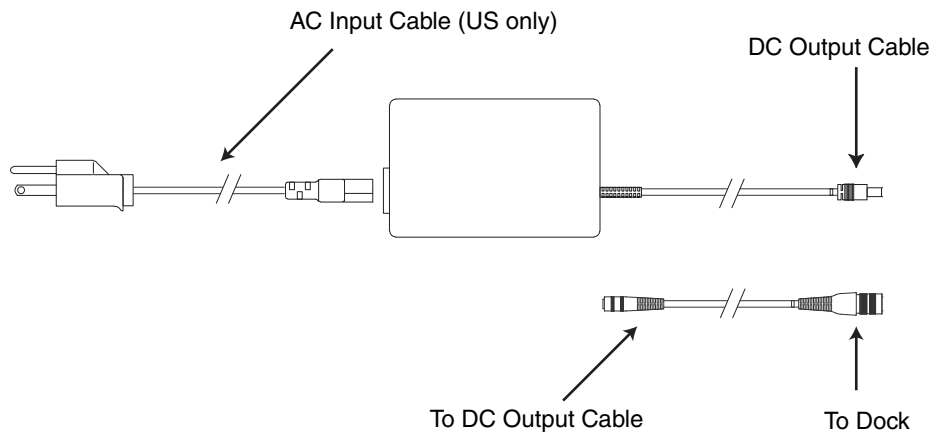
## External AC/DC Power Supply

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.

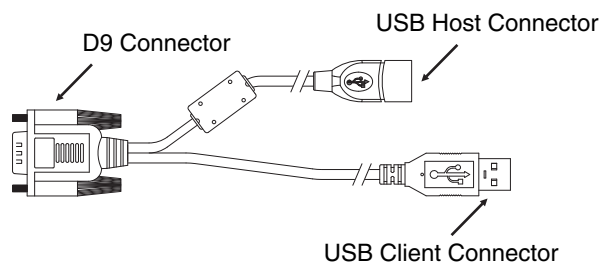
The external power supply may be connected to either a 120V, 60Hz supply or, outside North America, to a 230V, 50Hz supply, using the appropriate detachable cordset. In all cases, connect to a properly grounded source of supply provided with maximum 15 Amp overcurrent protection (10 Amp for 230V circuits).



### 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 Quick Mount Smart 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.

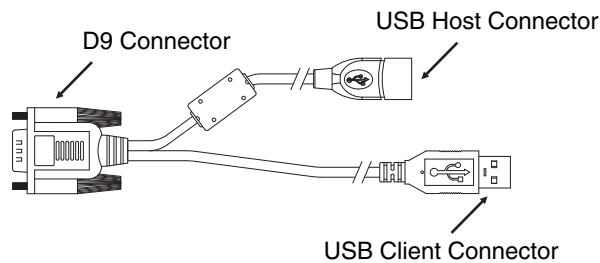
## Connect USB Host



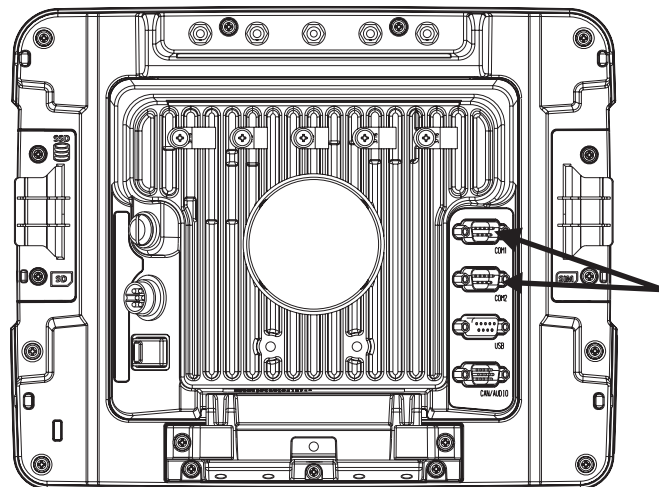
See [USB Connector](#) (page 8-6) for connector pinouts.

1. Seat the D9 connector firmly over the USB (or USB1) Connector on the Quick Mount Smart 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 4-26).

## Connect USB Client



## Connect Serial Device



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 Quick Mount Smart 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 4-26).
4. Connect the other cable end to the desired serial device.

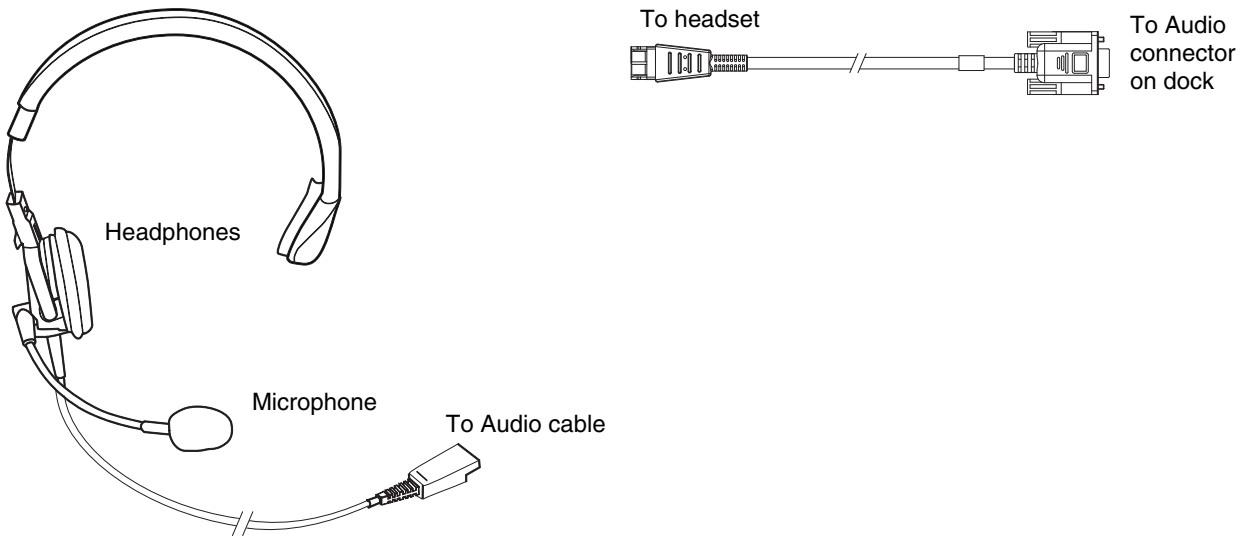
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### **Connect a Tethered Scanner**

1. The scanner cable is attached to either the COM1 or COM2 port on the Quick Mount Smart 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.

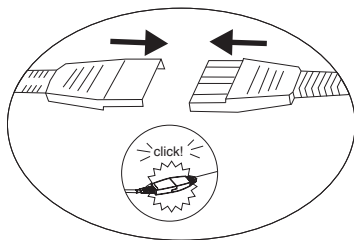
### **Connect Headset Cable**

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 8-9) for connector pinouts.

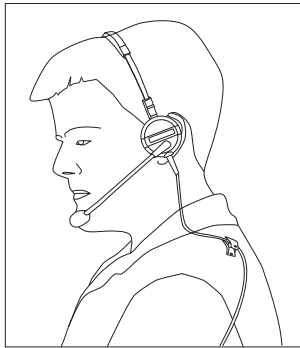
1. Seat the D15 cable end connector firmly over the CANbus/Audio Connector on the Quick Mount Smart Dock.
2. Tighten the thumbscrews in a clockwise direction. Do not over tighten.



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**

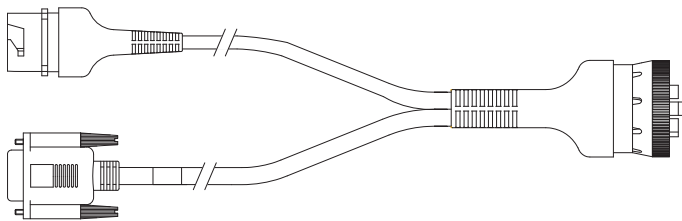
- Leave the cable exposed only at the top of the collar.
- Be sure to leave a small loop of cable to allow movement of your head.

### **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.

## **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.



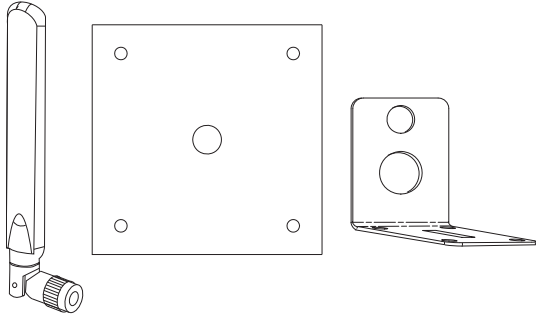
See [CANbus / Audio Connector](#) (page 8-9) for connector pinouts.

1. Seat the D15 cable end connector firmly over the CANbus/Audio Connector on the Quick Mount Smart 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 Remote Antenna

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

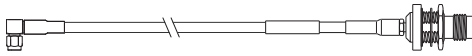
### 802.11 Remote Mount Antenna



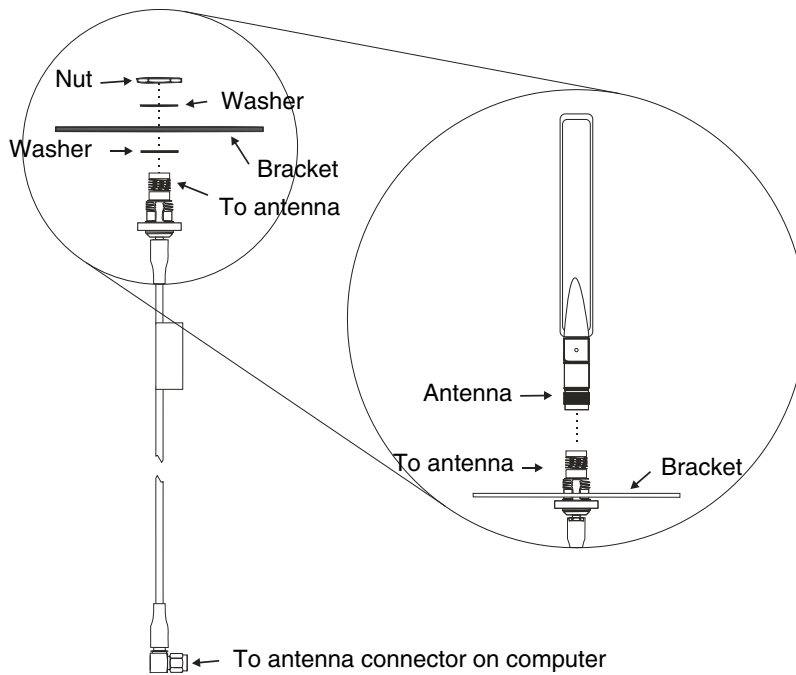
The Remote Antenna Installation Kit consists of two brackets (base plate and right angle), cable, and antenna. Tools are not included.

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.



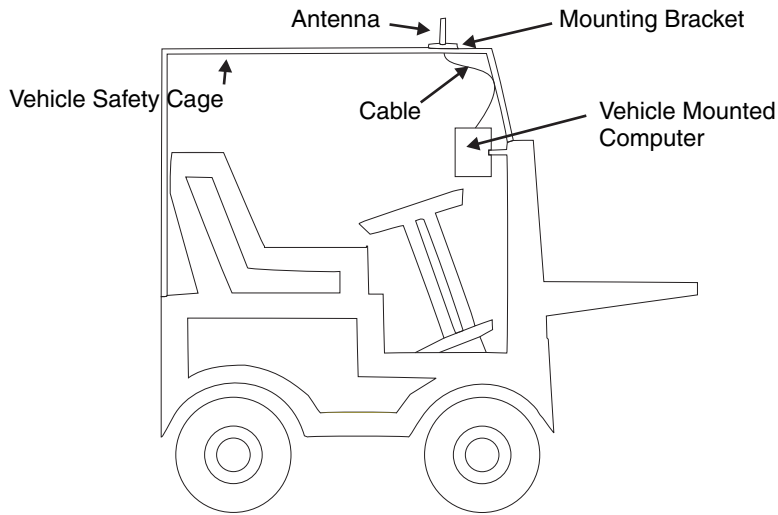
### Components and Mounting Diagram





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## Typical Installation



## Mounting Instructions

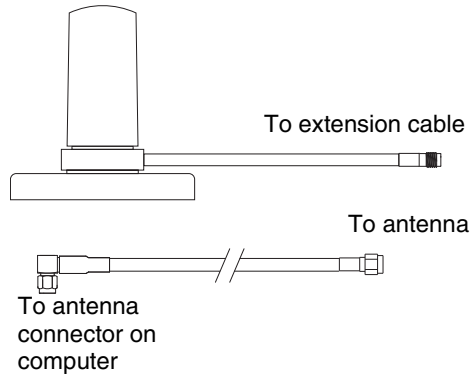
1. Attach and secure the desired mounting bracket to the highest point on the safety cage, following these precautions:
  - The plate must be mounted so the antenna is not damaged while the vehicle or any of its parts are moving.
  - The antenna mounting portion of the bracket must be parallel to the 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.

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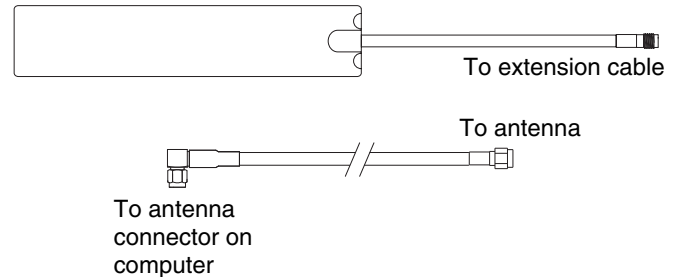
## **WAN Remote Mount Antenna**

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

### **Magnetic Mount WAN Antenna**



### **Adhesive Mount WAN Antenna**

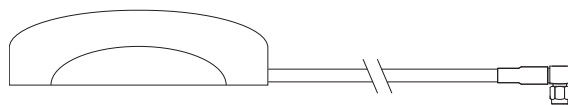


The Remote Antenna Installation Kit consists of the WAN antenna and an extension cable. The remote antenna is mounted on the top of a forklift, truck or other vehicle and cabled to the Thor VM3 inside the vehicle.

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.

### ***Installation***

1. Make sure the touch screen is clean and dry before installation. See [Cleaning](#) (page 4-16) 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 Reference Guide 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 4-58).

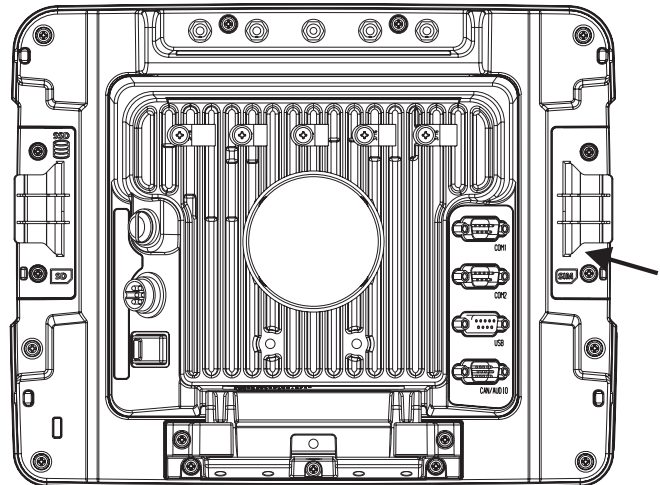
### Equipment Required

The following equipment is user-supplied:

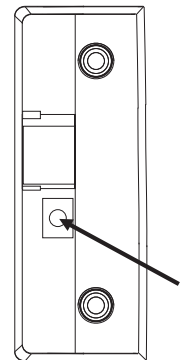
- Torquing tool capable of measuring inch pounds
- #2 Phillips screwdriver bit

### Disconnect Procedure

1. For convenience, the Thor VM3 can be removed from the Quick Mount Smart Dock, though it is not necessary.
2. If the Thor VM3 remains in the dock, disconnect the power cable from the dock.
3. Place the Thor VM3 face down on a stable surface.
4. Using a #2 Phillips bit loosen the M3 screws and then remove the tethered access panel with the SIM label. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.



5. Locate the small push button located just below the SIM card installation slot.
6. 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.
7. Reattach the access panel, torquing the M3 screws to 4-5 inch pounds using a #2 Phillips bit.
8. When the Thor VM3 is attached to external power, the UPS battery is automatically reconnected.
9. Restart the Thor VM3.



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## Install SD Card

An SD card slot is provided for storage expansion.

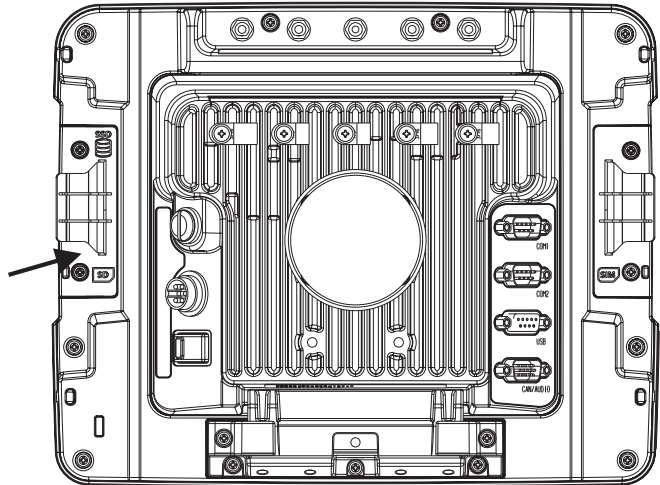
### Equipment Required

The following equipment is user-supplied:

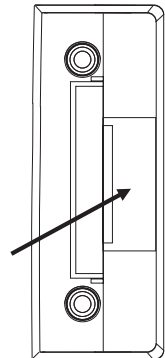
- Torquing tool capable of measuring inch pounds
- SD card - The following commercially available SD cards are recommended:
- #2 Phillips screwdriver bit

### Installation Procedure

1. For convenience, the Thor VM3 can be removed from the Quick Mount Smart Dock, though it is not necessary.
2. If the Thor VM3 remains in the dock, disconnect the power cable from the dock.
3. Place the Thor VM3 face down on a stable surface.
4. Using a #2 Phillips bit loosen the M3 screws and then remove the tethered access panel with the SIM label. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.



5. Locate the SD card installation slot.
6. Slide the SD card into the slot. The label side (front) of the SD card faces toward the back of the Thor VM3.
7. Reattach the access panel, torquing the screws to 4-5 inch pounds.
8. If removed, reinstall the Thor VM3 in the dock.



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## ***Install SLC Drive***

An mSATA card slot is provided for storage expansion. Only mSATA drives are supported.



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

. Connecting an mPCIe drive (connector pin 43 is grounded) can cause the Thor VM3

### ***Equipment Required***

The following equipment is user-supplied:

- Torquing tool capable of measuring inch pounds
- mSATA card - The following commercially available mSATA cards are recommended:
- SMART Modular SG9MST3D4GBS01

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## ***Install SIM Card***

A SIM card may be required for WWAN.

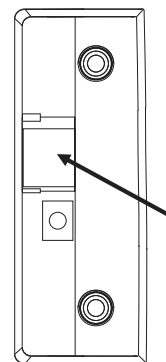
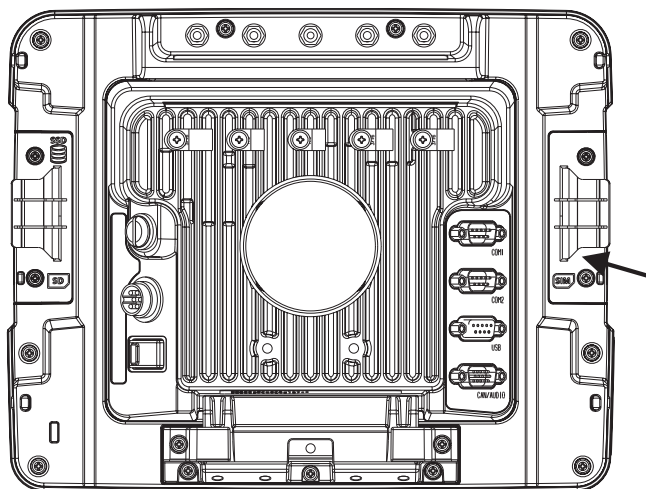
### ***Equipment Required***

The following equipment is user-supplied:

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

### ***Installation Procedure***

1. For convenience, the Thor VM3 can be removed from the Quick Mount Smart Dock, though it is not necessary.
2. If the Thor VM3 remains in the dock, disconnect the power cable from the dock.
3. Place the Thor VM3 face down on a stable surface.
4. Using a #2 Phillips bit loosen the M3 screws and then remove the tethered access panel with the SIM label. This panel is on the right hand side when the Thor VM3 is face down with the top away from the user.
5. Locate the SIM card installation slot.
6. Slide the SIM card into the slot.
7. Reattach the access panel, torquing the screws to 4-5 inch pounds.
8. If removed, reinstall the Thor VM3 in the dock.



---

## **Replace Front Panel**

### **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 4-54).

9. Carefully lift the front panel away from the device.
10. Gently press the front panel into place.
11. Tighten the captive M3 screws. In the order shown in the top figure above, use a #2 Phillips bit and torque the screws to 6-7 inch pounds.
12. Reinstall the Thor VM3 in the Quick Mount Smart Dock.
13. When the Thor VM3 is placed in the powered dock, the UPS battery automatically reconnects.
14. Restart the Thor VM3.
15. Remove the old battery and set it aside.
16. Inspect the battery well to verify the two foam pads are still in place.
17. Align the wiring connector on the new UPS battery with the connector on the Thor VM3. Gently press the connector into place until the retaining tab snaps into place.
18. Place the UPS battery into the well. Note the orientation of the battery in the illustration below. The flat surface of the battery points toward the bottom of the Thor VM3. Make sure all wires are inside the battery well so they are not pinched when the front panel is reinstalled.



## 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 consists of:

- BIOS
- Microsoft operating system (Windows Embedded Standard 2009)
- device drivers
- radio software see Wireless Configuration Utility
- 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

PenMount Universal software is installed for calibrating the touch screen. See [Touch Screen Calibration](#) (page 5-13) for more information.

### RFTerm

Start > All Programs > Honeywell RFTerm

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



*For Microsoft Windows 7 and Windows Embedded 7:*

*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.*

### **Summit Client Utility**

**Start > Control Panel > Wi-Fi, or SCU icon on desktop**

Manage wireless clients installed in the Thor VM3. If the Summit Client Utility is not present, the Laird Configuration Manager may be installed.

### **Laird Configuration Manager**

**LCM icon on desktop**

Manage wireless clients installed in the Thor VM3. If the Laird Configuration Manager is not present, the Summit Client Utility may be installed.

---

## 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

#### Software

##### Firmware Versions

The Software tab lists the firmware versions installed. The BIOS, 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. Contact [Technical Assistance](#) (page 9-1) for information on ordering a recovery DVD with an additional language.

#### 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.

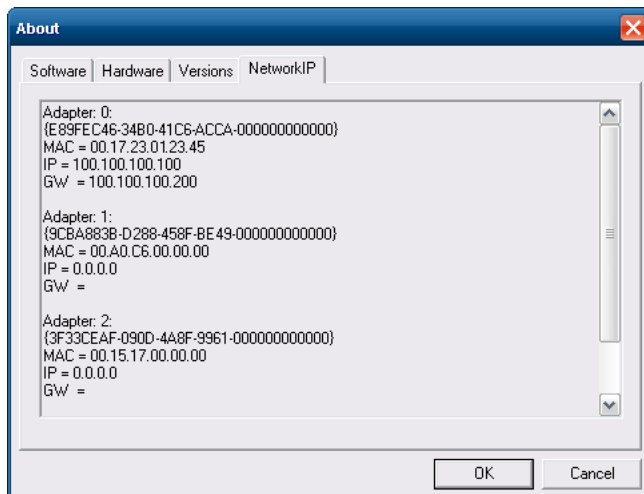
Customized information can be displayed by modifying the Registry using the Registry Editor. Use caution when editing the Registry and make a backup copy of the registry before changes are made.

The registry settings for the Version tab are under HKEY\_LOCAL\_MACHINE \ Software \ LXE \ Version in the registry.

To add a user application to the Version panel, create a new string value under the HKLM\Software\LXE\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 Summit WLAN radio and the Bluetooth module.

- 1.

---

## ***Display***

**Start > Control Panel > Display** (Classic View)

**Start > Control Panel > Appearance and Themes** (Category View)

The Thor VM3 supports a pixel display resolution.

[Screen Rotation](#) (page 5-11) [Screen Blanking](#) (page 5-10) are configured on separate control panels.

---

## ***Power Options***

### ***Select a Power Scheme***

#### ***Power Schemes***

**Start > Control Panel > Power Options > Power Schemes tab** (Classic View)

**Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes tab** (Category View)

---

## View UPS Battery Status

### Power Meter

Start > Control Panel > Power Options > Power Schemes tab (Classic View)

Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes tab (Category View)

On the Power Meter tab, battery #1 refers to the UPS battery.

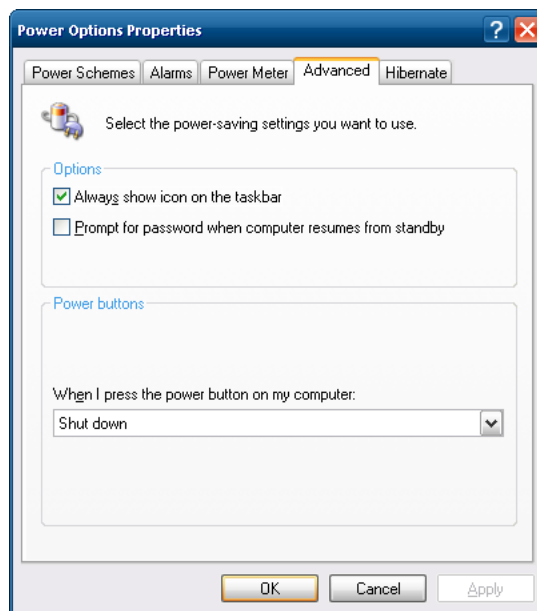
Shows power status: external power or UPS battery and the total battery power remaining before a recharge is necessary.

### Configure Power Button Behavior

Start > Control Panel > Power Options > Power Schemes tab (Classic View)

Start > Control Panel > Performance and Maintenance > Power Options > Advanced tab (Category View)

### Advanced



The **Advanced** panel allows setting the power button behavior when the unit is on and the power button is pressed. Options are:

- Do nothing
- Ask me what to do
- Stand by
- Shut down.

The default is to shut down. The Thor VM3 performs an orderly shut down when the power key is pressed when this option is enabled.

---

## ***Hibernate***

### ***Enable Hibernation***

**Start > Control Panel > Power Options > Hibernate** tab (Classic View)

**Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab (Category View)

By default, hibernate is on the Thor VM3. The default can be changed on this page.

The disk space necessary for hibernation plus the free disk space on the hard drive are listed.



---

## Screen Control

Start > Control Panel > Screen (Classic View)

Set screen properties for the Thor VM3.

Factory Default Settings

Screen Blanking (Blackout)	
Enable screen blanking	Enabled
Screen on delay (ms)	1000
COM Port	COM1
Current Level	
LCD Brightness (%)	100 (see note)

*Note: There is no default value for Ambient Light % as it varies depending on the level of light where the Thor VM3 is located.*

---

## Screen Blanking

Screen blanking allows the Thor VM3 display to automatically be turned off whenever the vehicle is in motion.

Use the **Screen on delay** to specify the period of time in ms (milliseconds) between when the vehicle stops and the Thor VM3 screen turns on. For example, use the delay if the switch end of the cable is attached to the vehicle's accelerator pedal. Release of the accelerator may mean the truck is coasting to a stop rather than stationary. Configure the delay to allow time for the vehicle to coast to a stop. The default value is 1000 ms.

Specify the **COM Port** to which the screen blanking cable is attached. If a COM port is in use by another application, that COM port is grayed out and cannot be selected for screen blanking.



*Do not enable **Screen Blanking** until the cable is properly connected to the specified COM port.*

To disable screen blanking, uncheck the **Enable screen blanking** checkbox.

See [Screen Blanking](#) (page 4-53) for hardware requirements.

Refer to the wiring instructions, including appropriate cautions and warnings, in the [Connect Power](#) (page 4-35) section.

---

## Screen Rotation

**Start > Control Panel > Screen Rotation** (Classic view)

The Screen Rotation panel provides options for rotating the display:

**0 Degree** - Returns screen to the default orientation.

**90 Degree** - Rotates the screen counter clockwise 90 degrees as compared to the default orientation.

**180 Degree** - Rotates the screen 180 degrees as compared to the default orientation.

**270 Degree** - Rotates the screen counter clockwise 270 degrees as compared to the default orientation.

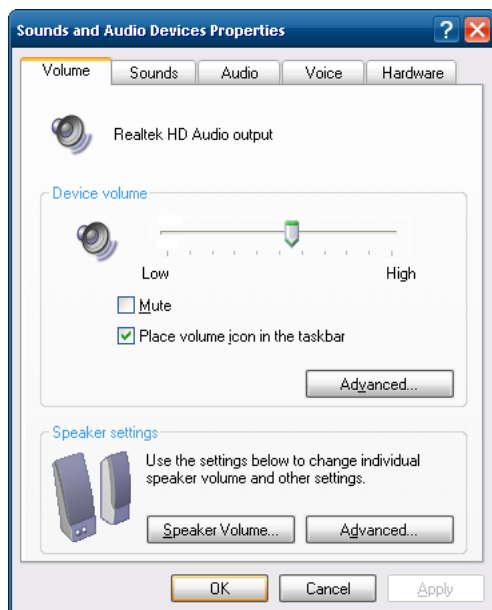
Select the desired rotation and tap **OK**. The screen may briefly go blank during the rotation process.

Tap **Close** to dismiss the panel and keep the current screen rotation.

## Sounds

**Start > Control Panel > Sounds and Audio Devices** (Classic View)

**Start > Control Panel > Sounds, Speech and Audio Devices** (Category 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.

## 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 the [Windows Certificate Store](#) (page 6-17) the user must assign a password to the active (Administrator) account.

## **Sounds**

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.

## **Wi-Fi**

**Start > Control Panel > Wi-Fi** (Classic view)

Provides a shortcut to access the 802.11a/b/g/n radio configuration utility.

Tap the Wi-Fi icon to access the [Summit Client Utility](#) (page 6-1).