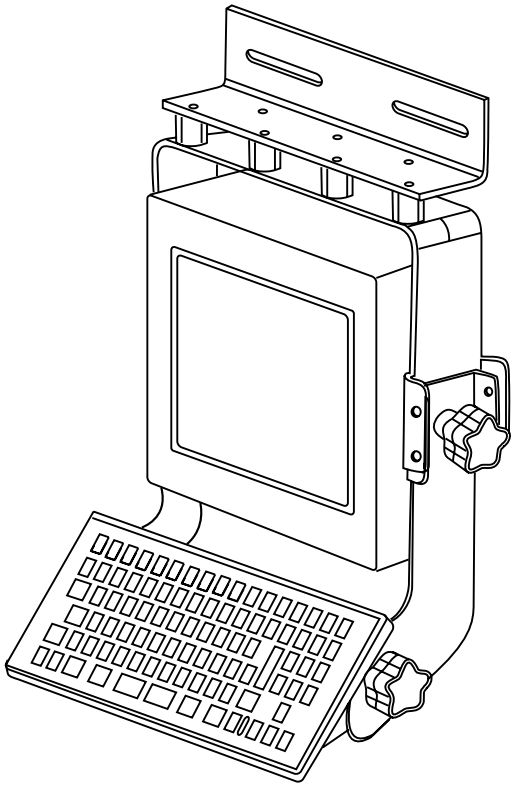
VRC 4000 Series



Installation Guide

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Installation Guide

Introduction

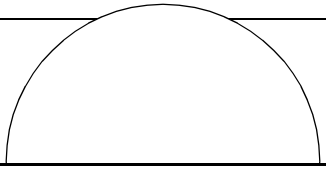
Symbol Technologies' Vehicular Radio Computers (VRC) 4000 series are PC-compatible computers ruggedized to withstand the physical shock and vibration extremes of harsh industrial environments. All VRC systems provide a touchscreen, full VGA display (either electroluminescent or color LCD), multiple network options, and full I/O capability. Each VRC system is fully PC-compatible with the MS-DOS Versions 3.3 through 6.22, Windows 3.1, Windows 95, and Windows NT operating systems. There are two versions of the VRC: the VRC 4000 and the VRC 4040. Each of these versions are available with options such as additional memory, operating systems, and network configurations.

VRC 4000

The VRC 4000 is designed for fixed-mount applications. It is powered by a standard 110 VAC outlet via a plug-in power supply. It is hard-wired into the local area network (LAN). Standard Ethernet or Token Ring hard-wired LAN connections are supported.

VRC 4040

The VRC 4040 is designed for vehicular-mounted applications such as those on forklifts, hysters, and motorized pallets. It is powered from the vehicle's electrical system (battery) through a choice of two power converters. It uses Symbol's Spectrum24® 2.4 GHz spread-spectrum radio link to communicate with radio frequency (RF) network access points hard-wired into the LAN. Antenna options include patch and 'rubber duck' types.

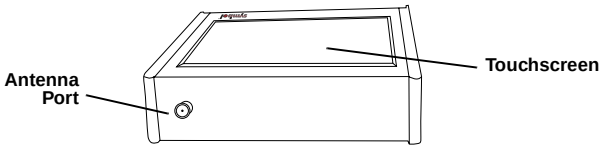


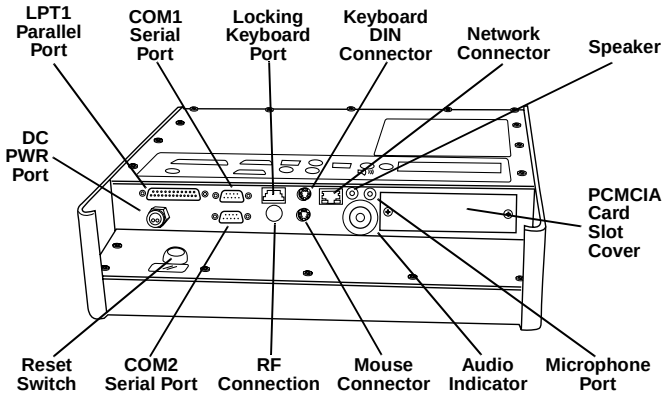
About This Guide

This guide provides basic setup, installation, and maintenance instructions. Topics discussed include:

- Parts of the VRC 4000
- Setting up the VRC 4000
- Mounting the bracket assemblies
- Mounting the VRC
- Attaching the keyboard assembly
- Providing power to the VRC 4000
- Providing power to the VRC 4040
- Maintaining the VRC 4000.

Parts of the VRC





Set-Up

To set up your equipment, first unpack your terminal and accessories, and ensure that the parts shipped match the parts ordered. Keep the shipping container and packing material in case you need to return your computer for repair at a later date.

The VRC is factory-equipped with a network interface and the appropriate network software for communicating with the network. The network ports on the VRC use different connectors for each type of network. For Token Ring connections, a DB9 connector is used. For Ethernet connections, an RJ-45 connector is used. For wireless network communications, an FCC mandated, non-standard RF antenna connector is provided.

Note: The VRC 4040 uses Spectrum24 2.4 GHz spread-spectrum radio link to communicate with (RF) network access points hard-wired into the LAN. These access points must be set up before the terminal can communicate with the host. Refer to the Access Point User Documentation for detailed instructions on setting up the access points.

Mounting the Bracket Assemblies

The VRC 4000 can be mounted almost anywhere that is convenient to the operator. The mounting location must be near a standard 110 VAC electrical outlet, and there must be sufficient space below the unit for cable access to the rear panel, which faces downward when the unit is wall-mounted. Secure the mounting bracket to a wall prior to attaching the VRC 4000 to the bracket.

The VRC 4040 mounts to a forklift or other vehicle with a custom bracket assembly. Operating power is obtained from a DC power converter that attaches to the vehicle's electrical system

via an access cord. Installation of the VRC 4040 requires mounting the bracket assembly, installing the DC power converter, and attaching the access cord to the vehicle's electrical system.

Caution

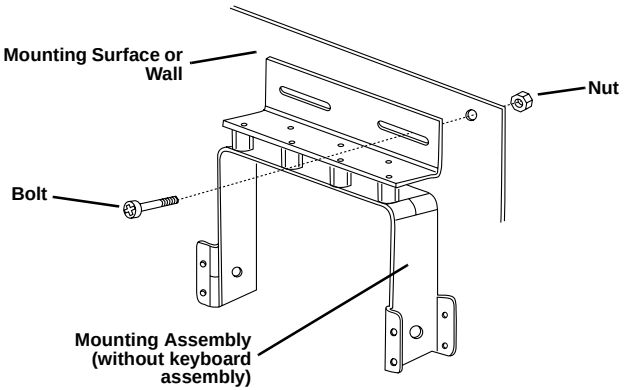
For proper operation on electric fork lifts, the VRC must be isolated from the chassis. Damage to terminal could result.

The three types of mounting bracket assemblies are:

- universal mounting assembly
- hyster mounting assembly
- crown mounting assembly.

Crown Mounting Assembly

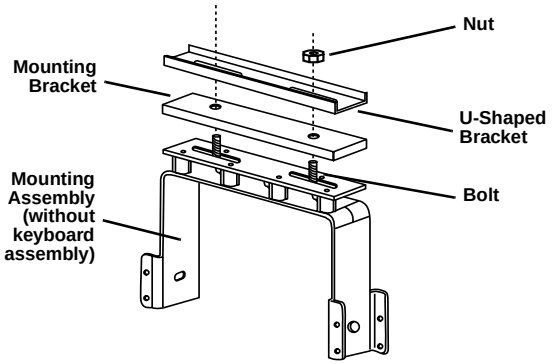
The crown mounting assembly has an L-shaped bracket at the top that permits mounting of the assembly onto a flat vertical wall or bracket. To mount the assembly:



1. Place the mounting assembly up against the wall or bracket. Make sure assembly is level.
2. Mark location for mounting holes.
3. Drill mounting holes using 13/32" drill bit.
4. Secure mounting bracket to wall using two bolts (3/8" x 16 x 3/4") and two nuts.
5. Install VRC using procedure in *VRC Mounting* on page 8.

Universal Mounting Assembly

The universal mounting assembly has an U-shaped bracket at the top that permits mounting of the assembly onto a horizontal bracket. To mount the assembly:

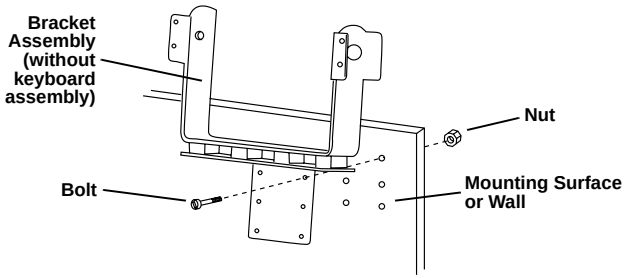


1. Place the U-shaped bracket up against surface to use as a template for drilling mounting holes.
2. Mark location for mounting holes.
3. Drill two mounting holes using 13/32" drill bit.
4. Place bolts (3/8" x 20 x 3") through the slots in the assembly and through horizontal mounting bracket.

5. Place the U-shaped bracket over bolts and secure the U-shaped bracket to the assembly using two nuts.
6. Install VRC using procedures in *VRC Mounting* on page 8.

Hyster Mounting Assembly

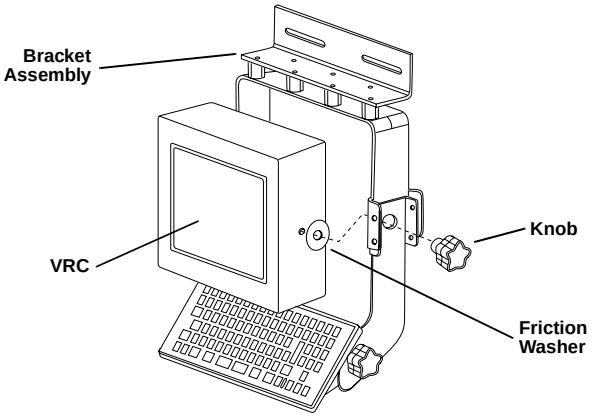
The hyster mounting assembly has an L-shaped bracket at the bottom that permits mounting the bracket onto a flat vertical wall or bracket. To mount the assembly:



1. Place the assembly up against wall or bracket. Make sure assembly is level.
2. Mark location for mounting holes.
3. Drill six mounting holes using 9/32" drill bit.
4. Secure assembly to wall or bracket using six bolts (1/4" x 20 x 3/4") and six nuts.
5. Install VRC using procedures in *VRC Mounting* on page 8.

VRC Mounting

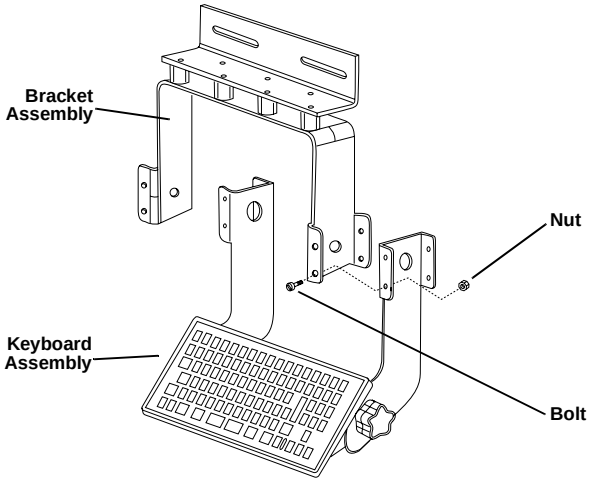
After the mounting bracket is installed, mount the VRC onto the assembly. To mount the VRC:



1. Align mounting holes on the sides of the VRC with the holes on the arms of the mounting assembly.
2. Slide two rubber friction washers between the mounting assembly arms and the VRC. These washers must be aligned with the mounting holes in the VRC and the mounting assembly.
3. Insert the two knob screws through the holes in the mounting assembly arms and into the mounting holes on the VRC.
4. Position VRC at a desired viewing angle and turn knobs clockwise to tighten.
5. Connect all required cables to the VRC.

Keyboard Assembly

The VRC mounting assembly may be configured with or without the keyboard assembly. If the keyboard assembly is not originally configured, it can be added to the mounting assembly at a later time. To mount the keyboard assembly onto the mounting bracket assembly:



1. Remove power from the VRC.
2. Disconnect all cables connected to the VRC.
3. Remove two knob screws securing the VRC and rubber friction washers to the mounting bracket assembly.
4. Align mounting wings of keyboard assembly with mounting wings of mounting bracket.

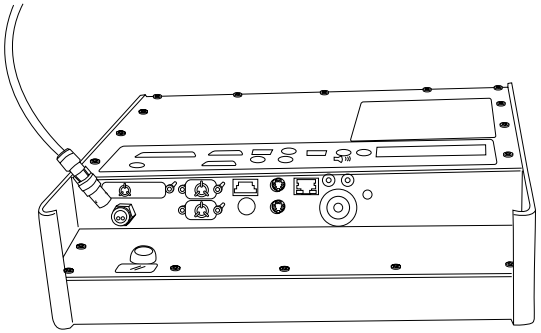
5. Insert eight bolts, supplied with the keyboard assembly, through mounting holes in mounting bracket and keyboard assembly bracket.
6. Secure bolts using eight nuts.
7. Install VRC using procedures in *VRC Mounting* on page 8.
8. Connect keyboard cable to connector on rear panel of VRC.

   Note: The Symbol-supplied ruggedized keyboard has a special locking connector which is designed to ensure good contact in the high-vibration vehicle mount application.

9. If a scanner is attached to the VRC, a special "Y" cable (P / N STI180-0275) is required to connect the keyboard and scanner to the keyboard connector on the rear panel:
   a. Connect the keyboard connector to the mating connector on the special cable.
   b. Connect the scanner connector to the mating connector on the special cable.
   c. Connect the special cable to the keyboard connector on the rear panel of the VRC.
10. Connect all cables removed in step 2.
11. Apply power to the VRC.

Providing Power to the VRC 4000

Power is provided to the VRC 4000 terminal via a locking DC-power adapter, as illustrated below:



All cable connections should be made to the VRC 4000 before the system is powered up. Since there is no ON / OFF switch, the VRC 4000 powers up as soon as the power supply connections are completed and the power supply is plugged in to the 110 VAC electrical outlet.

Providing Power to the VRC 4040

Power is provided to the VRC 4040 via a DC power converter (12 V or 24-48V) that is connected to the vehicle's battery. The DC power converter mounts to a steel surface on the vehicle via magnetic feet. Locate the converter so as not to interfere with either moving parts on the vehicle or the operator's vision. Be certain that the power cable from the DC power converter can reach the mating connector on the VRC 4040.

The access cable should be connected to the vehicle's electrical system, at the point that provides power at all times and that is

filtered and fused. Never connect the access cable directly to the battery terminals. Possible connection points are at the horn, lights (feed), or ignition switch (feed).

24-48 V Power Converter

The electrical harness access cable for the 24-48 V Power converter has two leads at one end which are permanently wired into the vehicle's electrical system. The other end of the cable has a circular 2-pin connector with rubber boot that mates with a similar connector on the DC power converter's power input cable.

Caution

On some older electric fork lifts, it might be necessary to install a 4 amp, 25 mhy filter choke (STANCOR p/n C-2686 or equivalent) in series with the positive lead to prevent motor transients from interfering with the terminal.

The black harness wire is connected to a positive voltage source. The white harness wire is connected to the negative voltage source. The booted connector end of the cable should be accessible for convenient attachment to the DC power converter.

Make sure that the DC power converter ON/OFF switch is in the OFF position. Once the access cable is wired to the electrical system, mate the connectors on the access cable and the DC power converter power input cable. All cable connections must be completed before applying power to the VRC 4040.

12 V Power Converter

The electrical harness access cable for the 12 V power converter has three leads at one end which are permanently wired into the vehicle's electrical system. The leads are white and black, plus a third lead that is either shield braid or green. The other end of the cable has a circular 3-pin connector with rubber boot that

mates with a similar connector on the DC power converter's power input cable.

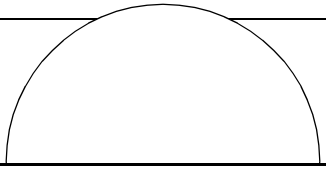
The black harness wire is connected to a positive voltage source. The white harness wire is connected to a negative voltage source. The green or braided lead is connected to chassis ground. The booted connector end of the cable should be accessible for convenient attachment to the DC power converter.

Make sure the DC power converter ON / OFF switch is in the OFF position. Once the access cable is wired to the electrical system, mate the connectors on the access cable and the DC power converter power input cable. All cable connections must be completed before applying power to the VRC 4040.

Maintenance

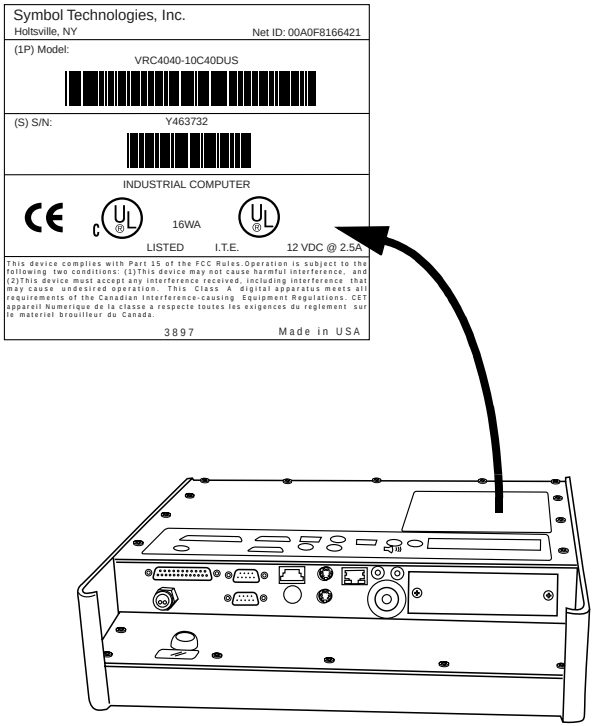
The VRC is designed to operate normally in industrial environments which may contain high levels of airborne contaminants including dirt and smoke. Periodic cleaning of the VRC is recommended to remove build-up of foreign substances on the case and touchscreen.

Before cleaning, remove power from the VRC. Wipe accumulated dirt and dust from the case with a slightly dampened cloth, paying particular attention to the angled edge of the bezel. Clean the touchscreen with a commercial brand of computer screen cleaner and a soft, damp cloth or compressed air.



Regulatory Information

Labeling



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Radio Frequency Interference Requirements

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

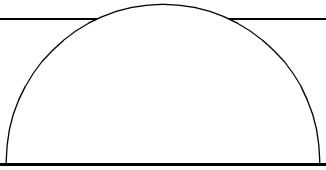
However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

Radio Frequency Interference Requirements - Canada

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Reglement sur le Materiél Brouilleur du Canada.



CE Marking and European Union Compliance

Products intended for sale within the European Union are marked with the CE Mark which indicates compliance to applicable Directives and European Normes (EN), as follows. Amendments to these Directives or ENs are included:

Applicable Directives

- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC

Applicable Standards

- EN 55 022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information technology Equipment
- EN 50 082-1 - Electromagnetic Compatibility - Generic Immunity Standard, Part 1: Residential, commercial, Light Industry
- IEC 801.2 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 2: Electrostatic Discharge Requirements
- IEC 801.3 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 3: Radiated Electromagnetic Field Requirements
- IEC 801.4 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment Part 4: Electrical Fast Transients Requirements
- EN 60 950 + Amd 1 + Amd 2 - Safety of Information Technology Equipment Including Electrical Business Equipment
- EN 60 825-1 (EN 60 825) - Safety of Devices Containing Lasers

RF Devices

Symbol's RF products are designed to be compliant with the rules and regulations in the locations into which they are sold and will be labeled as required. The majority of Symbol's RF devices are type approved and do not require the user to obtain license or authorization before using the equipment. Any changes or modifications to Symbol Technologies equipment not expressly approved by Symbol Technologies could void the user's authority to operate the equipment.

Installation Guide

Related Publications

- *Spectrum24 Ethernet Access Point User Guide,* p / n 70-12057-XX
- *Spectrum24 Ethernet Access Point User Guide Addendum,* p / n 70-12057-XX
- *VRC 4000 Product Reference Guide,* p / n 70-19725-XX

Warranty Information

For Warranty & Service Information, Call:

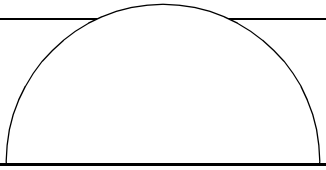
1-800-653-5350

Outside North America, contact your local Symbol representative

Symbol products are warranted against defects in workmanship and materials for a period of one year (unless specified otherwise) from the date of shipment, provided that the product remains unmodified and is operated under normal and proper conditions.

This warranty is limited to repair or replacement at Symbol's option, with reasonable promptness after being returned to Symbol by a carrier selected and paid for by the customer. These provisions do not prolong the original warranty term for any product which has been repaired or replaced by Symbol.

This warranty applies to the original owner and does not extend to any product which has been subject to misuse, neglect, accidental damage, unauthorized repair or tampering. Preventive maintenance activities are not covered by warranty.



This product is covered by one or more of the following U.S. and foreign Patents:

U.S. Patent No. 4,360,798; 4,369,361; 4,387,297; 4,460,120; 4,496,831; 4,593,186; 4,603,262; 4,607,156; 4,652,750; 4,673,805; 4,736,095; 4,758,717; 4,816,660; 4,845,350; 4,896,026; 4,897,532; 4,923,281; 4,933,538; 4,992,717; 5,015,833; 5,017,765; 5,021,641; 5,029,183; 5,047,617; 5,103,461; 5,113,445; 5,130,520; 5,140,144; 5,142,550; 5,149,950; 5,157,687; 5,168,148; 5,168,149; 5,180,904; 5,229,591; 5,230,088; 5,235,167; 5,243,655; 5,247,162; 5,250,791; 5,250,792; 5,262,627; 5,262,628; 5,280,163; 5,280,164; 5,280,498; 5,304,786; 5,304,788; 5,321,246; 5,377,361; 5,367,151; 5,373,148; 5,378,882; 5,396,053; 5,396,055; 5,399,846; 5,408,081; 5,410,139; 5,410,140; 5,412,198; 5,418,812; 5,420,411; 5,436,440; 5,444,231; 5,449,891; 5,449,893; 5,468,949; 5,479,000; 5,479,002; 5,479,441; 5,504,322; 5,528,621; 5,532,469; 5,543,610; 5,545,889; 5,552,592; 5,578,810; 5,589,680; 5,608,202; 5,612,531; 5,619,028; D305,885; D341,584; D344,501; D359,483; D362,453; D363,700; D363,918; D370,478.

Invention No. 55,358; 62,539; 69,060; 69,187 (Taiwan); No. 1,601,796; 1,907,875; 1,955,269 (Japan).

European Patent 367,299; 414,281; 367,300; 367,298; UK 2,072,832; France 81 / 03938; Italy 1,138,713.

70-32536-01
Revision A — September 1997