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**Warranty**

Subject to the terms of Zebra’s hardware warranty statement, the VC70 Vehicle Computer products are warranted against defects in workmanship and materials for a period of one year from the date of shipment. For the complete Zebra hardware product warranty statement, go to: http://www.zebra.com/warranty
Introduction
The VC70 is Zebra’s ultra-rugged forklift mounted computer. It is designed to maximize productivity in harsh environments. Its rugged construction and high-performance wireless networking enables real-time data access and collection in a wide range of environments — from the loading dock and freezer to the warehouse.

The VC70’s compact design improves visibility and reduces safety concerns while retaining large screen size (10.4”). Its 802.11 a/b/g/n WLAN provides real-time information that improves decision making, reduces errors, and enhances productivity. Its rugged design with integrated shock-mount and MIL-STD 810 military rating for shock and vibration ensures dependable operation in challenging environments. Its IP66 sealing, display, defroster and wide temperature range ensure operation in and out of -30°C freezer storage warehouse.

With its high-resolution and high-brightness display, the VC70 provides the user access to more information in low ambient light warehouse and outdoors. The VC70 accessories allow backward compatibility with the VC5090 for easy and gradual migration.

About This Guide
This guide contains the following:

- Features on page 4
- Unpacking on page 5
- Installation on page 5
- Electrical Power Wiring on page 33
- Powering the VC70 On/Off on page 38
- Connecting Accessories on page 42
- Maintenance on page 42
- Troubleshooting on page 46
- Regulatory Information on page 47.

Features

Antenna Port for Optional External Antenna

Ambient Light Sensor

+, P1 Key

-, P2 Key

Keyboard, P3 Key

Speaker, P4 Key

Brightness Key

Function LED

Power Button

Charging LED

COMM LED

Display

Internal Speaker

COM2 + CAN-bus

Microphone

External Speaker

USB 2

Power

COM1

USB 1

Ethernet

Bottom Connectors
Unpacking
The following items are contained in the box:
• VC70 vehicle computer
• This guide.

Optional Accessories
• Scanners (corded and wireless) and scanner cables
• External speaker
• DC and AC power supplies and cables
• External keyboards - QWERTY, AZERTY or numeric with mounting kits
• VC5090 Keyboard with adapter kit

Installation
This section describes how to install the vehicle computer in a vehicle or on a desktop and connecting the vehicle computer to a power source. There are different installation options depending on the type of vehicle. This chapter also describes how to install the various accessories for the vehicle computer. Read all of the following instructions before you begin.

WARNING! The vehicle computer and bracket must be firmly secured to a surface that can support the vehicle computer’s weight.

CAUTION A competent engineer must perform the installation in a vehicle. Improper installation can damage your vehicle and/or the VC70.

Do not install the vehicle computer in a location that will affect vehicle safety, drivability, or visibility.

NOTE All bolts and screws used for installing the VC70 are metric type with T7 to T30 TORX head.
Installing the VC70 on a Forklift

CAUTION  A competent engineer must perform the installation in a vehicle. Improper installation can injure the operator and damage your vehicle and/or the VC70.

Follow the instructions below to properly install the VC70 on a forklift.

• Determine the best location for mounting the vehicle computer taking into consideration the driver’s field of view and ease of accessing the vehicle computer.

• Install the appropriate mounting hardware. The VC70 ships with four No. 8 Allen head screws (M10x50mm) for securing the mounting bracket. If the supplied cap screws are not long enough, use M10 - X stainless steel Allen head screws where X represents the length in millimeters of the required screws.

• Connect the vehicle computer to the vehicle’s wiring system.
Mounting the Vehicle Computer

- Determine the best position for the vehicle computer and all the associated components. If a similar vehicle computer was previously installed, check to see if the position it used is suitable for the VC70.

- Test the installation for at least 30 minutes before installing on another vehicle. Record all details:
  - Check that the position of the vehicle computer does not obstruct vehicle controls.
  - Check that the vehicle computer does not obstruct the driver's view.
  - Check the position of the vehicle computer for user comfort over long periods.
  - Check positioning to avoid extreme wrist angles that may cause injury.
Avoid Extreme Wrist Angles

Optimum Wrist Positions
**U Mount Installation**

The U Mount (P/N: KT-U-MOUNT-VC70-R) for is used for replacing a mounted VC5090 with the VC70.

**CAUTION** Any modification to supplied mounting bracket could cause failure of the unit and/or mountings.

- Mounting surface must be flat and stiff and it must extend evenly for the entire length of the mounting bracket surface.
- All four mounting holes must be used.
- All nuts and bolts must be checked periodically and tightened if required.
- When installing the vehicle computer, care must be taken to ensure that the mounting bracket footprint is fully supported. Additional plates may be required to achieve this.

Do not mount the vehicle computer with the mounting bracket perpendicular to a wall.

Use the following figure U-Mount Installation to mount the VC70.

Drill Holes: 10.1 mm ± 0.1 mm (0.43 ± 0.004 in). 25.40 ± 0.10 mm 1.00 ±0.004 in.

160.00 ± 0.20 mm (6.299 ± 0.008 in).

To install the U-mount to the VC70:

1. Position the friction pads in the friction pad mounting area.
2. Position the U-mount over the mounting holes.
3. Place lock and flat washers onto cap screws.
Screw the M12x40mm hex head screws into mounting holes and tighten. Torque the hex head screws 350 ± 10% kgf-cm (300 ± 10% lbs-in).
Mounting onto an Over-Head Cross-Beam Example

The diagram below illustrates a typical installation where the vehicle computer is mounted onto a cross-beam.
**Mounting onto an Over-Head Cage Example**

The diagrams below illustrate a typical installation where the vehicle computer is mounted on an overhead cage. A customer supplied mounting plate must be used that can withstand the weight of the vehicle computer under vibration and shock. The plate must be made of stainless steel or hardened steel with the following dimensions: 3.0 in. (76.0 mm) wide, 8.66 in. (220.0 mm) long and 0.2 in. (5.0 mm) thick. The plate must be secured with hardware or to the underside of the cage by welding.
Mounting on a Dashboard or Horizontal Surface Example

The diagram below illustrates a typical installation where the vehicle computer is mounted on a dashboard or horizontal flat surface.

NOTE If mounting to a thin surface, a reinforcing plate maybe required.
Installing the Optional QWERTY/AZERTY Keyboard

The keyboard kit contains the following items:

- Keyboard
- Right and left mounting arms
- Four Torx head screws with flat and lock washers
- Six screws with captive flat and lock washers (for keyboard fastening)
- Two locking knobs, two flat washers and two lock washers.

1. Position the keyboard on the tray and fasten six M4x10mm screws.

2. Attach the left and right mounting arms to both sides of the VC70, using the M5x14mm Torx head screws with flat and lock washers. Only tighten the cap screws three turns.
3. Insert the keyboard locking knobs through the washers and brackets and screw into the keyboard tray. Tighten fully to lock into place.

4. Torque the mounting arms Torx head screws to 40 + 10% kgf-cm (35 + 10% lbs-in).

5. To adjust keyboard tray position, loosen the right and left locking knobs two full turns and rotate the keyboard tray to the desired position. The keyboard tray snaps into possible positions as it is rotated.

6. Tighten the keyboard tray locking knobs to secure the tray in position.
7. Plug the keyboard cable into one of the USB connectors and carefully screw the locking screws using a flat head screw driver.

### Installing an Optional VC5090 Keyboard on VC70

You can install the VC5090 keyboard on the VC70 using the keyboard adapter kit (PN KT-VC50KYBD-ADPT-R).

The kit contains the following items:

- Two spacers with screws and washers
- Adapter cable

**NOTE** When using the VC5090 keyboards, the integrated keyboard heater is not supported.

1. Attach the keyboard spacers to both sides of the VC70 using 2 M5x14mm Torx head screws with captive washers for each spacer. Tork the screws to 20 + 5% kgf-cm (17 + 5% lbs-in).
2. Attach the VC5090 keyboard brackets (part of the VC5090 keyboard assembly) to both sides of the VC70, using the cap screws with captive washers. Only tighten the cap screws three turns.

3. Insert the keyboard locking knobs through the washers and brackets and screw into the keyboard. Tighten fully to lock into place.

4. Torque the bracket cap screws to 230 kgf-cm (200 lbs-in).

5. Connect the VC5090 keyboard cable to the supplied adapter cable.
6. Connect the USB connector of the adapter cable into one of the VC70 USB connectors and carefully screw the locking screws using a flat head screw driver.

**Installing a Numeric Keyboard**

The Numeric keyboard is installed using the following items:

- numeric keyboard mount with all required screws for attaching the keyboard to the mount and the mount to the vehicle computer

1. Attach the numeric keyboard to the mount, using six M4x10mm Torx head screws with captive washers.
2. Torque the numeric keyboard Torx head screws to $8 + 10\% \, \text{kgf-cm}$ ($7 + 10\% \, \text{lbs-in}$).

**NOTE** The Numeric Keyboard can be installed on both sides of the Numeric Keyboard Mount.
3. Attach the numeric keyboard mount to the VC70, using four M5x14mm Torx head screws with captive washers. Tighten the screws.

4. Torque the numeric keyboard Torx head screws to $20 + 10\% \text{ kgf-cm}$ ($17 + 10\% \text{ lbs-in}$).
5. Connect the numeric keyboard to a free USB connector. Fasten the screws using a flat head screw driver.
Installing a Keyboard Protection Grill

To protect the VC70 keyboard, it is recommended to install a protection grill. Different grills should be used with the QWERTY/AZERTY or Numeric keyboard.

Each grill kit includes the following items:

- Two Securing Strings
- Keyboard Protection Grill

To install the grill:

1. Place the cover onto the VC70 keyboard.
2. Use the two Securing Strings to attach the Protection Grill to the keyboard.

QWERTY/AZERTY Keyboard Protection Grill

Numeric Keyboard Protection Grill

Securing Strings
Installing a Scanner Mount

The Scanner mount kit contains the following items:

- Side accessory mount (PN KT-ACCMNT-VC70-R) with two screws, two captive lock washers and flat washers
- Scanner mount (PN KT-SCANMNT-VC70-R) with four screws, four captive lock washers and flat washers

1. Attach the scanner mount to the side accessory mount, using four M4x10mm screws with captive flat and lock washers. Torque the screws to 8 + 10% kgf-cm (7 + 10% lbs-in).

2. Attach the side accessory mount to the VC70, using two M5x14mm screws with captive flat and lock washers. Torque the screws to 20 + 10% kgf-cm (17 + 10% lbs-in).

Installing the Scanner Bracket
Installing the VC70 on a Cart, a Wall, or a Desktop

To mount the vehicle computer on a cart, a wall, or a desktop:

- Install the U-mount to the desktop.
- Connect the vehicle computer to the AC power supply.

Mounting the Bracket on a Desktop

**CAUTION** If mounting to a thin surface such as drywall or plywood, a reinforcing plate is required.

**NOTE** The VC70 ships with four No. 8 Allen head screws (M10x50mm) for securing the mounting bracket. If the supplied cap screws are not long enough, use M10 - X stainless steel Allen head screws where X represents the length in millimeters of the required screws.
Connecting the Vehicle Computer to AC Power

NOTE Use only a approved power supply, output rated 12 VDC and minimum 9A (part number 50-14000-241R). The power supply is certified to EN60950 with SELV outputs.

To provide power from an AC source:

1. Insert the AC line cord into the AC connector on the universal power supply.

   Connecting AC power

   ![Diagram of AC power connection]

2. Plug the other end of the AC power cable into a wall outlet.
3. Insert the DC power cable into the DC connector on the universal power supply.
4. Plug the other end of the cable into the vehicle computer’s Power port.
Installing DC Power Supply (PSU) on VC70.

NOTE Follow this procedure when using the U-mount. The PSU fastening screws are supplied with the U-mount kit.

1. Attach the PSU to the back of the vehicle computer.
2. Screw the four M5x14mm screws into the PSU mounting holes and tighten. Torque the screws 20 ± 10% kgf-cm (17 ± 10% lbs-in).

NOTE You need to also use an extender cable PN 25-159549-01 to connect the PSU to the vehicle computer.
PSU Installation Template For Remote Installation

Measurements are given in millimeters.

RAM Mount Installation

CAUTION If mounting to a thin surface such as drywall or plywood, a reinforcing plate is required.

The RAM Double Socket Arm Mount allows the VC70 to be easily adjusted to most comfortable location. A single Adjustment Knob enables simultaneous adjustment of both upper and lower ball joints. The mount affixes to the forklift cage or other strong surface by the supplied
hardware kit and bolts provided by the customer (Search for VC70 on http://www.rammount.com).
Installing an External Antenna

**NOTE** Zebra recommends using the Laird Technologies™ antenna, model number: WTS2450-RPSMA and Antenna Adaptor part number: RPSMA-RTRPSMA.

To install an external antenna:

1. Lift the Antenna Connector cap on top of the vehicle computer.
2. Screw the Antenna Adaptor onto the Antenna Connector. Torque to 5 ± 0.5 kgf/cm (4.3 ± 0.4 in-lbs).
3. Screw the Antenna onto the Antenna Adaptor.
4. Fasten the Ring at the base of the Antenna to cover as much threads as possible.
Installing the External Roof-mounted Antenna

**WARNING!** The antenna must be installed in a location that will ensure a distance of at least 8" (20cm) between the antenna and any bystander.

**NOTE** Do not use VC5090 antennas.

For general antenna installation instructions refer to the Installation Guide supplied with the antenna.

**IMPORTANT** If not installed on a metal roof, the antenna must be installed in the middle of a flat metal surface (minimum size 2.56” (65 mm)x2.56” (65 mm)).

1. Tap > Settings > Control Panel > System Manager icon. The System Management window displays.
2. Tap the **External Devices** tab.
3. Tap the **External Antenna** radio button.
4. Tap **OK**.

**Connecting an External Speaker to VC70**

It may be necessary to install an external speaker in noisy environments. Use a Zebra HSN4040 15 Watt water-resistant loudspeaker and connect it to the VC70 External Speaker connector using the adapter cable (PN 25-159552-01).

![System Manager v1.13](image)

**NOTE** When connecting the adapter cable, the audio is automatically routed to the external speaker. If the external speaker is not connected, you will not be able to hear any audio.

**Installing an External Microphone Mount**

The External Microphone mount consists of the following two kits:

- microphone holder with two screws and captive washers
- side mount with two screws and captive washers

1. Attach the microphone holder to the side mount, using two M4x12mm screws with captive washers. Torque the screws to 8 + 10% kgf-cm (7 + 10% lbs-in).
2. Attach the side mount to the VC70, using two M5x14mm screws with captive washers. Tork the screws to 20 + 10% kgf-cm (17 + 10% lbs-in).
Installing a Micro SD Card

A micro SD (Secure Digital) card provides secondary non-volatile storage. The card holder is located on the right side of the VC70 under the Service door.

To install the micro SD card:

1. Remove the two T8 TORX screws securing the Service door.
2. Push the memory card, with the contacts up, into the card slot until it locks.
3. Replace the Service door and secure using two T8 TORX screws.

⚠️ CAUTION Ensure to torque the screws to seal the device properly. Otherwise, sealing can be compromised.

Torque the Torx head screws to 4.0 + 10% kgf-cm (3.5 ± 10% lbs-in).
Electrical Power Wiring

- Establish a neat route for the cable, staying clear of moving parts or hot surfaces.
- Fix the cable to existing cable runs inside the vehicle using cable ties, but make sure they are away from any moving or hot surfaces.
- When the cabling must go through a panel, use a suitable gland.
- When fixing the conduit or cable on the outside of a vehicle, use P-Clips. Either drill and tap the hole or use a nut and bolt to secure the clip.
- Ensure the cable does not have tight bends. The minimum recommended radius is 63.5 mm (2.5 in.).
- Ensure cables do not swing or chafe on the structure. This often requires using cable ties approximately every foot, and ensuring the cables do not flex often, especially where they connect to the VC70. However, if you must re-position the VC70 occasionally, ensure there is enough slack in the cable to accommodate movement without putting tension on the cable.
- DO NOT wind a cable in and out of the mesh on a cage.
- On electric vehicles, take the power from as close to the battery as possible, but not directly from the battery terminals, and not before any main fuse.
- On gasoline, diesel or propane vehicles, take the power from as close to the battery terminals as possible, and avoid using existing wiring.
- Ensure that all fuses are as close as possible to the power source.

Forklifts and Trucks with 12V, 24V, 36V and 48V Batteries

- All power wiring must use the supplied 25-159551-01 power cable.
- Fuse: One 3AB, 15A, 250V, FST BLO fuse - 9-60V DC.
• Keep the path between the battery and the vehicle computer as short as possible and away from any part of the ignition high tension system.

**Wiring Diagram**

![Wiring Diagram]

**Important**: If your vehicle is not equipped with an ignition or key switch, connect the yellow wire directly to the positive terminal of the vehicle’s battery. Failure to comply, will disable the VC70 operation.

You can use your old VC5090 power cable. When employing this option, use VC5090 Bridge Cable, PN 25-159553-01. You must also replace the fuses on the red and black wires of the old cable with the new fuses supplied with the bridge cable kit.

1. Disconnect the vehicle battery.
2. Connect the red wire directly to the vehicle's battery positive terminal. Connect the black wire directly to the vehicle's battery negative terminal.

**NOTE** The vehicle computer contains an Ignition Sense feature that detects when the ignition switch or key switch is turned off and shuts the vehicle computer down after a pre-programmed time-out. This feature allows the operator to use the vehicle computer for a predetermined time period after the ignition switch or key switch is turned off, then shuts the vehicle computer down automatically to prevent over-discharge of the forklift battery. The time-out period is adjustable by the user (see Ignition Sensing on page 36 for setting the time-out value). The normal current draw of a suspended vehicle computer is approximately 500mA. When the vehicle computer shuts down using the Ignition Sense feature, current draw is reduced to approximately 5 mA. This feature provides the automatic shutoff functionality of an external relay, without requiring an actual relay and has the added benefit of allowing the user to work for a preset time period before shutting down.

**NOTE** See the vehicle Owner's Manual for specific wiring information.

3. Connect the yellow wire to the vehicle's ignition or key switch if such is used. If you do not plan on using the Ignition Sense feature, connect the yellow wire directly to the vehicle's battery positive terminal.

4. Ensure the wiring connections created are sufficiently insulated from each other.

5. Re-connect the vehicle battery.

6. Connect the power cable connector into the vehicle computer's Power port. Align the keyway on the power connector with the notch on the vehicle computer’s power port.

7. If the power supply is mounted remotely from the VC70, use 25-159549-01 extender cable to connect between the power supply and the VC70.
8. Secure the power cables on both sides of the power supply with cable ties as close as possible to the connectors.

The VC70 display can be blanked when the vehicle is moving to eliminate driver distraction for safety considerations.

To recover from display lock:

1. Press and hold on touch screen (more than 1 second).
2. Remove your finger from the screen to resume operation.

**Ignition Sensing**

The vehicle computer contains an Ignition Sense feature that detects when the ignition switch or key switch is turned off and shuts the vehicle computer down after a pre-programmed time-out. This feature allows the operator to use the vehicle computer for a predetermined time period after the ignition switch or key switch is turned off, then shuts the vehicle computer down automatically to prevent over-discharge of the forklift battery. The time-out period is adjustable by the user. The normal current draw of a suspended vehicle computer is approximately 500mA. When the vehicle computer shuts down using the Ignition Sense feature, current draw is reduced to approximately 5 mA. This feature provides the automatic shutoff functionality of an external relay, without requiring an actual relay and has the added benefit of allowing the user to work for a preset time period before shutting down.

The power cable must be connected to the ignition switch or key switch. See *Forklifts and Trucks with 12V, 24V, 36V and 48V Batteries on page 33* for information on connecting the power cable to enable the Ignition Sense feature.

![NOTE] These settings are not persistent across a cold boot.

1. Tap 🎈 > Settings > Control Panel > System Manager icon. The System Manager window displays.
2. Select the Miscellaneous tab.
3. In the **Forklift Ignition Time-out** drop-down list, select the amount of time before the vehicle computer shuts down after the ignition switch or key switch is turned off.

4. Tap **OK**.
Powering the VC70 On/Off

NOTE Only use the Main Power switch when removing power completely from the VC70. The power switch cover door can be safely removed without affecting the unit seal in case the user prefer to switch the unit off completely.

To power on, place the Main Power switch on the top of the VC70 to the on ( | ) position.

To power off, place the Main Power switch on the top of the VC70 to the off ( O ) position.
Use the Power button on the Quick Access Panel to place the VC70 into Suspend mode or wake the VC70 from Suspend mode.

This is usually enough to conserve battery power while the VC70 is idle during off time in normal operation.

**Charging the Internal Backup Battery**

After installing the VC70, leave it powered on for 6 hours to fully charge the internal backup battery. Note that the VC70 can charge the backup battery while in Suspend mode, but not if power is turned Off with the power switch.

The internal battery provides up to 30 minutes of VC70 operation with reduced functionality (no heaters, USB, Serial, Ethernet, external speaker interfaces and dimmed display backlight, and lower internal speaker volume) to enable forklift battery replacement when drained. Backup battery will also maintain the RAM memory for 72 hours when...
fully charged. The data in the Flash memory or Flash file system is not affected by the state of charge.

Calibrating the Touch Screen

The VC70 prompts you to calibrate the touch screen when you first power on the VC70 or after a cold-boot.

**NOTE** The VC70 touch screen monitor is pre calibrated to the highest accuracy at the factory. However, if additional calibration is required, perform the following steps.

**CAUTION** Do not use sharp objects when touching the screen. Use your finger tip or a stylus when touching the screen.

1. Carefully touch and hold the center of each target. Repeat as the target moves around the screen.
2. Tap the screen to accept the settings when the calibration is complete.

Controlling Screen Brightness

There are five levels of screen brightness. To adjust the brightness of the screen, press the Brightness button on the Quick Access Panel. The amber Function LED lights indicating that the VC70 is in the backlight control mode. Press the P1 (+) button to increase the brightness or the P2 (-) button to decrease the brightness. Press the Brightness (☀️) button to exit this mode (or after five seconds of inactivity the VC70 automatically returns to normal operation).
Resetting the Vehicle Computer

If the vehicle computer stops responding to inputs, perform a warm boot or cold boot.

**Performing a Warm Boot**

A warm boot restarts the vehicle computer and saves all stored records and entries.

*NOTE* Verify that all open files are closed. Files that remain open during a warm boot may not be retained.

To perform a warm boot, press the Power button (オン) on the Quick Access Panel continuously for 5 seconds.
Performing a Cold Boot

A cold boot restarts the vehicle computer, but erases all stored records and entries in RAM. Data saved in flash memory or a memory card is not lost. In addition it returns formats, preferences and other settings to the factory default settings. There are two ways to perform a cold boot:

- Simultaneously press and hold the Power, P1 and P3 buttons.
- Turn off the Main Power switch on the right side of the vehicle computer, press the Power, P1 and P3 buttons simultaneously then turn the Main Power switch to the on position.

Programmable Keys

The programmable keys on the Quick Access Panel (P1, P2, P3, P4) can be set to perform certain functions, such as switching between applications or emulator sessions.

To set a programmable key:

1. From the Start menu, select Settings > Control Panel.
2. Select the Programmable Keys icon.
3. In the Key: drop-down list, select the key to program.
4. In the Action drop-down list, select the function to assign to the key to perform.
5. Tap OK.

Connecting Accessories

Connect an optional scanner, ActiveSync serial or USB cable, audio or USB device using the appropriate connector on the bottom of the VC70. Cables are available from Zebra.

You may also use the USB port for ActiveSync connection, if the serial ports are used for another purpose. This cable is also available from Zebra. Refer to the VC70 Product Reference Guide, P/N 72-164686-xx for information about additional accessories.

Maintenance

The vehicle computer is factory-sealed. There are 3 user accessible areas:
• Service door - provides access to the micro USB On-The-Go for ActiveSync without the need to disconnect any accessory, access to the Micro SD card slot and access to the desiccant.

• Access to the On/Off switch (the door can be removed without affecting the sealing).

• Access to the backup battery.

For general cleaning:

• Clean the casing, keyboard, and display window by wiping with a soft cloth. Use a damp cloth if necessary.

• Never use solvents or abrasive cleaners. You may damage the display or keyboard.

Replacing the Desiccant Bag

1. The VC70 ships with a desiccant bag installed. The installer may wish to replace the desiccant in the VC70 with a new bag prior to installing the VC70 on the vehicle, as transit and storage may have saturated the desiccant.

2. Open the two screws securing the service door and remove the door.

   ![CAUTION](Do not use any sharp tool to pull the desiccant bag out of the VC70. Failure to comply may cause tear of the bag and damage to the VC70.)

3. Pull out the old desiccant bag using the attached tab.

4. Open the new desiccant package and remove the desiccant bag.

5. Fold the four corners of the bag under to form a pillow.

6. Place the desiccant bag in the desiccant well.

7. Carefully place the service door onto the right side of the housing.
4. Torque the torx head screws to $4.0 \pm 10\%$ kgf-cm ($3.5 \pm 10\%$ lbs-in).

### Replacing the Backup Battery

To replace the backup battery:

- **CAUTION** Use ESD precautions when installing the backup battery.

1. Place the Main Power switch on the right side of the vehicle computer to the off position and perform cold boot to electrically disconnect the battery from the unit.
2. Open the four screws securing the Backup Battery door on the back of the vehicle computer and remove the door.
3. Open the four screws securing the Backup Battery and disconnect the Backup Battery connector.
4. Carefully pull the Backup Battery out of the computer.
5. Place the new backup battery into the well.
6. Connect the Backup Battery connector to the connector inside the Backup Battery well.
7. Secure the battery into location using four screws.

**CAUTION** Be sure to torque the screws to seal the device properly. Otherwise, sealing can be compromised.
8. Place the Backup Battery door over the battery and secure using the four captive screws.

   **CAUTION**  Be sure to torque the screws to seal the device properly. Otherwise, sealing can be compromised.

9. Torque the screws to $9 \pm 0.5$ kgf-cm ($7.8 \pm 0.4$ lbs-in).

10. Place the Main Power switch to the on position.

    It takes four hours to fully charge the Backup Battery.
# Troubleshooting

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<th>Solution</th>
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<td>The power cable ignition sense wire (yellow) is not connected properly.</td>
<td>Verify that the power cable is connected properly.</td>
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<tr>
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<td>Main Power switch on the right side of the vehicle computer is in the off position.</td>
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</tr>
<tr>
<td></td>
<td>Power cable not connected or unplugged.</td>
<td>Connect power cable to power cable port on bottom of the vehicle computer. Press the Power button to wake up the VC70.</td>
</tr>
<tr>
<td></td>
<td>If VC70 is powered by a vehicle battery, the vehicle battery is depleted.</td>
<td>Replace or charge the vehicle battery.</td>
</tr>
<tr>
<td>Cannot see characters on display.</td>
<td>VC70 not powered on.</td>
<td>Check that the Main Power switch on the top of the VC70 is in the on position. Press the Power button.</td>
</tr>
<tr>
<td></td>
<td>Screen is too bright or too dark.</td>
<td>Adjust the brightness; see <em>Controlling Screen Brightness on page 40.</em></td>
</tr>
<tr>
<td></td>
<td>VC70 is in Suspend mode (green Power LED is off)</td>
<td>Press the Power button to wake up the VC70.</td>
</tr>
<tr>
<td>Application does not respond.</td>
<td>VC70 is not communicating with the AP (Communication LED is off).</td>
<td>Bring the VC70 closer to the AP. If problem continues, contact your System Administrator.</td>
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<tr>
<td>Optional scanner does not operate.</td>
<td>Scanner is not properly connected to the VC70.</td>
<td>Connect the scanner to the COM1 port and power up the vehicle computer. If the problem continues, refer to the scanner Product Reference Guide or see your System Administrator.</td>
</tr>
<tr>
<td></td>
<td>DataWedge application is not enabled or set to the correct COM Port.</td>
<td>Ensure that the DataWedge application is enabled and set to the correct port. See <em>VC70 Product Reference Guide P/N 72-164686-01</em> for more information.</td>
</tr>
<tr>
<td></td>
<td>External power is not connected.</td>
<td>Verify external power connection.</td>
</tr>
</tbody>
</table>
Regulatory Information

All Zebra devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required.

This guide applies to Model Number VC70N0

Local language translations are available at the following website: http://www.zebra.com/support.

Any changes or modifications to Zebra equipment, not expressly approved by Zebra, could void the user's authority to operate the equipment.

Antennas: Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could cause damage and may violate regulations.

This device has been designed to operate with the optional remote antenna 8508851K46, and having a maximum gain of 1.18 dBi. Antennas not included in this list are strictly prohibited for use with this device.

**CAUTION**  Only use Zebra approved and UL Listed accessories, battery packs and battery chargers.

Do NOT attempt to charge damp/wet mobile computers or batteries. All components must be dry before connecting to an external power source.

Radio Modules

The device contains approved radio module. This module is identified below.

Zebra WLAN radio 802.11 a/b/g/n and BT Technology, Type(s): 21-148603.

Bluetooth® Wireless Technology

This is an approved Bluetooth® product. For more information or to view End Product Listing, please visit https://www.bluetooth.org/tpg/listings.cfm

Wireless Device Country Approvals

Regulatory markings, subject to certification, are applied to the device signifying the radio(s) is/are approved for use in the following countries: United States, Canada, Japan, China, Australia, and Europe.¹
Please refer to the Declaration of Conformity (DoC) for details of other country markings. This is available at http://www.zebra.com/doc.

Note 1: For 2.4GHz or 5GHz Products: Europe includes, Austria, Belgium, Bulgaria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

⚠️ **CAUTION** Operation of the device without regulatory approval is illegal.

**Country Roaming**

This device incorporates the International Roaming feature (IEEE802.11d) which will ensure the product operates on the correct channels for the particular country of use.

**Ad-Hoc Operation (2.4 GHz band)**

Ad-Hoc operation is limited to Channels 1-11 (2412-2462 MHz).

**Frequency of Operation - IC**

**5 GHz Only**

The use in the UNII (Unlicensed National Information Infrastructure) band 1 (5150-5250 MHz) is restricted to Indoor Use Only; any other use will make the operation of this device illegal.

Industry Canada Statement:

⚠️ **CAUTION** The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-Channel mobile satellite systems. High power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

**Avertissement**: Le dispositive fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.
Les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bands 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

2.4 GHz Only

The available channels for 802.11 b/g/n operation in the US are Channels 1 to 11. The range of channels is limited by firmware.
Health and Safety Recommendations

Ergonomic Recommendations

**CAUTION** In order to avoid or minimize the potential risk of ergonomic injury follow the recommendations below. Consult with your local Health & Safety Manager to ensure that you are adhering to your company's safety programs to prevent employee injury.

- Reduce or eliminate repetitive motion
- Maintain a natural position
- Reduce or eliminate excessive force
- Keep objects that are used frequently within easy reach
- Perform tasks at correct heights
- Reduce or eliminate vibration
- Reduce or eliminate direct pressure
- Provide adjustable workstations
- Provide adequate clearance
- Provide a suitable working environment
- Improve work procedures.

Vehicle Installation

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles (including safety systems). Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

Position your device within easy reach. Be able to access your device without removing your eyes from the road.

**NOTE** Connection to an alert device that will cause a vehicle horn to sound or lights to flash, on receipt of a call on public roads, is not permitted.
**IMPORTANT** Before installing or using, check state and local laws regarding windshield mounting and use of equipment.

**Warnings for Use of Wireless Devices**

Please observe all warning notices with regard to the usage of wireless devices.

**Potentially Hazardous Atmospheres**

You are reminded of the need to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles (such as grain, dust, or metal powders) and any other area where you would normally be advised to turn off your vehicle engine.

**Hearing Aids**

When some wireless devices are used near some hearing devices (hearing aids and cochlear implants), users may detect a buzzing, humming, or whining noise. Some hearing devices are more immune than others to this interference noise, and wireless devices also vary in the amount of interference they generate. In the event of interference you may want to consult your hearing aid supplier to discuss solutions.

**Hearing Aid Compatibility**

This device is not HAC compliant during Voice Over IP (VOIP) calls.

**Pacemakers**

Pacemaker manufacturers recommended that a minimum of 15cm (6 inches) be maintained between a handheld wireless device and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with independent research and recommendations by Wireless Technology Research.

Persons with Pacemakers:

- Should ALWAYS keep the device more than 15cm (6 inches) from their pacemaker when turned ON.
- Should not carry the device in a breast pocket.
- Should use the ear furthest from the pacemaker to minimise the potential for interference.
• If you have any reason to suspect that interference is taking place, turn OFF your device.

**Other Medical Devices**

Please consult your physician or the manufacturer of the medical device, to determine if the operation of your wireless product may interfere with the medical device.

⚠️ **RF Exposure Guidelines**

**Safety Information**

**Reducing RF Exposure - Use Properly**

Only operate the device in accordance with the instructions supplied.

**International**

The device complies with internationally recognized standards covering human exposure to electromagnetic fields from radio devices. For information on “International” human exposure to electromagnetic fields refer to the Zebra Declaration of Conformity (DoC) at http://www.zebra.com/doc

**Europe**

To satisfy EU RF exposure requirements, a mobile transmitting device must operate with a minimum separation distance of 20 cm or more from a person’s body.

**Remote and Standalone Antenna Configurations**

To comply with EU RF exposure requirements, antennas that are mounted externally at remote locations or operating near users at stand-alone desktop or similar configurations must operate with a minimum separation distance of 20 cm from all persons.

**US and Canada**

**Co-located Statement**

To comply with FCC RF exposure compliance requirement, the antenna used for this transmitter must not be co-located or operating in conjunction with any other transmitter/antenna except those already approved in this filling.

**Industry Canada Statement**

**IMPORTANT NOTE:** Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

**NOTE IMPORTANTÉ:**
Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

**Remote and Standalone Antenna Configurations**

To comply with FCC RF exposure requirements, antennas that are mounted externally at remote locations or operating near users at stand-alone desktop of similar configurations must operate with a minimum separation distance of 20 cm from all persons.

To satisfy FCC RF exposure requirements, a mobile transmitting device must operate with a minimum separation distance of 20 cm or more from a person’s body.
**Power Supply**

Use ONLY a LISTED, Type no. PWRS-14000 (12Vdc, 9A), PWRS-9-60VDC (12Vdc, 9A) power supply, marked Class 2 or LPS (IEC60950-1, SELV). Use of alternative Power Supply will invalidate any approvals given to this unit and may be dangerous.

**Batteries**

Please follow the local regulations when disposing of re-chargeable batteries.

**Taiwan - Recycling**

EPA (Environmental Protection Administration) requires dry battery producing or importing firms in accordance with Article 15 of the Waste Disposal Act are required to indicate the recycling marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.

**Battery Information**

Use only Zebra approved batteries. Accessories which have battery charging capability are approved for use with the following battery models:

- Zebra 82-161178-01 (3.7 Vdc, 1880mAh)

Zebra rechargeable battery packs are designed and constructed to the highest standards within the industry.

However, there are limitations to how long a battery can operate or be stored before needing replacement. Many factors affect the actual life cycle of a battery pack, such as heat, cold, harsh environmental conditions and severe drops.

When batteries are stored over six (6) months, some irreversible deterioration in overall battery quality may occur. Store batteries at half of full charge in a dry, cool place, removed from the equipment to prevent loss of capacity, rusting of metallic parts and electrolyte leakage. When storing batteries for one year or longer, the charge level should be verified at least once a year and charged to half of full charge.

Replace the battery when a significant loss of run time is detected.

Standard warranty period for all Zebra batteries is 30 days, regardless if the battery was purchased separately or included as part of the mobile computer or bar code scanner. For more information on Zebra batteries, please visit: http://www.zebra.com/batterybasics
Battery Safety Guidelines

- The area in which the units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non-commercial environment.
- Follow battery usage, storage, and charging guidelines found in the user’s guide.
- Improper battery use may result in a fire, explosion, or other hazard.
- To charge the mobile device battery, the battery and charger temperatures must be between +32 °F and +104 °F (0 °C and +40 °C).
- Do not use incompatible batteries and chargers. Use of an incompatible battery or charger may present a risk of fire, explosion, leakage, or other hazard. If you have any questions about the compatibility of a battery or a charger, contact Zebra support.
- Do not disassemble or open, crush, bend or deform, puncture, or shred.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to promptly dispose of used rechargeable batteries.
- Do not dispose of batteries in fire.
- Seek medical advice immediately if a battery has been swallowed.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
• If you suspect damage to your equipment or battery, contact Zebra support to arrange for inspection.

Radio Frequency Interference Requirements - FCC

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 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.

Radio Transmitters (Part 15)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radio Frequency Interference Requirements - Canada

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Radio Transmitters

The use of 5 GHz RLAN's (in Canada), have the following restrictions:

• Restricted Band 5.60 - 5.65 GHz

This device complies with RSS 210 of Industry & Science 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.
Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Label Marking: The Term “IC:” before the radio certification only signifies that Industry Canada technical specifications were met.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that permitted for successful communication.
Marking and European Economic Area (EEA)

The use of 2.4 GHz RLAN's (through the EEA), have the following restrictions:

- Maximum radiated transmit power of 100 mW EIRP in the frequency range 2.400 - 2.4835 GHz

Bluetooth® Wireless Technology for use through the EEA has the following restrictions:

- Maximum radiated transmit power of 100 mW EIRP in the frequency range 2.400 - 2.4835 GHz

Statement of Compliance

Zebra, hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directives 1999/5/EC and 2011/65/EU. A declaration of Conformity may be obtained from http://www.zebra.com/doc/

Japan (VCCI) - Voluntary Control Council for Interference

Class B ITE

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.

Other Countries

Australia-Use of 5 GHz RLAN's in Australia is restricted in the following band 5.50 - 5.65GHz.

Brazil-Nota: A marca de certificação se aplica ao Transceptor, modelo VC70N0. Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.
Para maiores informações sobre ANATEL consulte o site: www.anatel.gov.br

Chile- Este equipo cumple con la Resolución No 403 de 2008, de la Subsecretaria de telecomunicaciones, relativa a radiaciones electromagnéticas.

China-

Mexico- Restrict Frequency Range to: 2.450 - 2.4835 GHz.

South Korea- For a radio equipment using 2400~2483.5MHz or 5725~5825MHz, the following two expression should be displayed;

Taiwan-

Turkey- Bu cihaz Türkçe karakterlerin tamamını ihtiva eden ETSI TS 123.038 V8.0.0 (veya sonraki sürümün kodu) ve ETSI TS 123.040 V8.1.0 (veya sonraki sürümün kodu) teknik özelliklerine uygundur.

Ukraine- This equipment corresponds to requirements of the Technical Regulation No. 1057, 2008 on restrictions as to the use of some dangerous substances in electric and electronic devices.

Thailand- เครื่องโทรศัพท์มือถือและอุปกรณ์นี้ มีความสอดคล้องตามข้อกำหนดของ ทช.
Waste Electrical and Electronic Equipment (WEEE)

**English**: For EU Customers: All products at the end of their life must be returned to Zebra for recycling. For information on how to return product, please go to: http://www.zebra.com/weee.

**Français**: Clients de l'Union Européenne: Tous les produits en fin de cycle de vie doivent être retournés à Zebra pour recyclage. Pour de plus amples informations sur le retour de produits, consultez : http://www.zebra.com/weee.

**Español**: Para clientes en la Unión Europea: todos los productos deberán entregarse a Zebra al final de su ciclo de vida para que sean reciclados. Si desea más información sobre cómo devolver un producto, visite: http://www.zebra.com/weee.


**Italiano**: per i clienti dell'UE: tutti i prodotti che sono giunti al termine del rispettivo ciclo di vita devono essere restituiti a Zebra al fine di consentirne il riciclaggio. Per informazioni sulle modalità di restituzione, visitare il seguente sito Web: http://www.zebra.com/weee.


**Magyar**: Az EU-ban vásárlóknak: Minden tönkrement terméket a Zebra vállalathoz kell eljuttatni újrahasznosítás céljából. A termék visszajuttatásának
módjával kapcsolatos tudnivalókért látogasson el a http://www.zebra.com/weee weboldalra.

**Slovenski:** Za kupce v EU: vsi izdelki se morajo po poteku življenjske dobe vrniti podjetju Zebra za reciklažo. Za informacije o vračilu izdelka obiščite: http://www.zebra.com/weee.


**Suomi:** Asiakkaat Europan unionin alueella: Kaikki tuotteet on palautettava kierrätettäväksi Zebra-yhtiöön, kun tuotetta ei enää käytetä. Lisätietoja tuotteen palauttamisesta on osoitteessa http://www.zebra.com/weee.

**Dansk:** Til kunder i EU: Alle produkter skal returneres til Zebra til recirkulering, når de er udtjent. Læs oplysningerne om returnering af produkter på: http://www.zebra.com/weee.

**Ελληνικά:** Για πελάτες στην Ε.Ε.: Όλα τα προϊόντα, στο τέλος της διάρκειας ζωής τους, πρέπει να επιστρέφονται στην Zebra για ανακύκλωση. Για περισσότερες πληροφορίες σχετικά με την επιστροφή ενός προϊόντος, επισκεφθείτε τη διεύθυνση http://www.zebra.com/weee στο Διαδίκτυο.


**Slovenščina:** Za kupce v EU: vsi izdelki se morajo po poteku življenjske dobe vrniti podjetju Zebra za reciklažo. Za informacije o vračilu izdelka obiščite: http://www.zebra.com/weee.

**Turkish WEEE Statement of Compliance**

EEE Yönetmeliğine Uygundur.
Software Support

Zebra wants to ensure that customers have the latest release of entitled software at the time of product purchase.

To confirm that your Zebra device shipped with the latest release of entitled software, visit: www.zebra.com/support. Check for the latest software from Software Downloads > Product Line/Product > Go.

If your device does not have the latest entitled software release as of your product purchase date, please e-mail a request to Zebra at: entitlementservices@zebra.com.

You must include the following essential device information with your request:

- Model number
- Serial number
- Proof of purchase
- Title of the software download you are requesting.

If it is determined by Zebra that your device is entitled to the latest software release, you will receive an e-mail containing a link directing you to a Zebra Web site to download the appropriate software.
Service Information

If you have a problem using the equipment, contact your facility’s Technical or Systems Support. If there is a problem with the equipment, they will contact the Zebra Support at: http://www.zebra.com/support.

For the latest version of this guide go to: http://www.zebra.com/support.