

MobileCollectTM

Hardware Components

User's Guide

MICRORIDGE

*Measurement Collection Specialists
Connect Any Gage into Any Software*

MobileCollect Hardware Users Guide

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1 Introduction

MobileCollect is a wireless data collection system designed for use on the factory floor, in the lab, or any location where you need to connect gages or serial devices to a computer through a wireless connection. The MobileCollect product line consists of different components to meet the needs of any data collection system.

The MobileCollect wireless network that is created with the Base, Remotes, and Mobile Modules is typically referred to as a Personal Area Network (PAN). The range of the MobileCollect wireless products is approximately 133 feet (40m), line-of-site. The actual distance for any application can be influenced by the environment around the wireless system.

User's Guide Organization

This User's Guide covers hardware components and accessories available for MobileCollect.

If you are viewing the PDF version of this User's Guide, you will see page numbers to the right of links within the PDF document.

Base Receivers

The MobileCollect receivers are referred to as Bases or Base Receivers. There are 4 different Bases that can be used with PCs and mobile devices.

| | |
|-------------|--|
| USB Base | Desktop Base that connects directly to a USB port on a PC and outputs USB Serial data. |
| RS-232 Base | Desktop Base that connects directly to a DB9 RS-232 serial port or a USB port on a PC. |
| Wedge Base | Desktop Base that connects directly to a USB port on a PC. The Wedge Base has 2 USB output formats: Serial and Keyboard Wedge. |
| MicroBase | Dongle Sized Base that connects directly to a USB port on a PC or mobile device. |

Mobile Module Transmitters

| | |
|-----------------------|--|
| Mini Mobile Module | This module supports multiple brands of digital and some RS-232 gages. Supported brands include Brown & Sharpe, CDI, Fowler, Insize, LMI, Mahr Federal, Mitutoyo, Ono Sokki, Starrett, Sylvac, and more. This module uses a CR2032 coin cell lithium battery rated at 240 mAh. |
| Command Mobile Module | This module supports all of the gages supported by the Mini Mobile Module and allows you to send commands from a Base to the Mobile Module. This module uses a CR2 Photo lithium battery rated at 750 mAh. |
| RS-232 Mobile Module | This module supports serial devices that output full RS-232 voltage levels. This module uses a CR2 Photo lithium battery rated at 750 mAh. |

Remote Transmitters

| | |
|----------------|---|
| Digital Remote | The Digital Remote is a desktop transmitter used with a stationary digital gage. |
| RS-232 Remote | The RS-232 Remote is a desktop transmitter used with a stationary serial RS-232 device. |

Base to Host Computer Communications Cable

Each Base must be connected to a computer so that the data received by the Base can be sent to an appropriate application. The USB Base, USB MicroBase, and Keyboard Wedge/USB Base are connected to a USB port on your computer. The RS-232/USB Base can be connected directly to a 9-pin serial port or a USB port on your computer.

For Legacy Bases before the EVO Series (2025): For USB Serial, be sure to install the USB drivers before you connect the USB device to your computer. If you are using the Keyboard Wedge/USB Base in the wedge mode, no special drivers are required. For More information refer to the [Base Receivers](#) ¹⁴ Section.

For EVO Series Bases, no USB Driver is required in serial or wedge output mode

Computer Requirements

The computer used to capture measurement data from a MobileCollect Base can be any model and operating system. Remember that whether you are using a serial port or USB port, it all looks like a serial port to your application.

The MobileCollect Setup software requires Microsoft Windows and has been tested on Windows 7 and later operating systems. If you have any problems with the MobileCollect Setup software, please [Contact MicroRidge Systems](#) ⁹⁶.

Application Software

You will need an application program to read the data from the serial or USB port. The data formatting options available within the Base allow you to use MobileCollect with virtually any software application.

If you are trying to get the data into an application that only accepts keyboard input and you do not have a wedge capable base, you should install WedgeLink Xpress. WedgeLink Xpress is a free keyboard wedge software utility that will transfer serial data directly into the application. A very common application that requires the use of a keyboard wedge is Microsoft Excel.

MobileCollect on the Web

Additional information about MobileCollect options, applications and updates can be found on the MicroRidge web site.

| | |
|----------------------|---|
| MicroRidge Home Page | www.microridge.com |
| MobileCollect | https://www.microridge.com/mobilecollect-wireless/ |
| Firmware updates | https://www.microridge.com/mobilecollect-wireless/firmware-updates/ |

MicroRidge RM2.4 Protocol

MobileCollect products use the RM2.4 wireless protocol for wireless data transmission between transmitters and base receivers. The RM2.4 protocol is a proprietary MicroRidge protocol that enables MobileCollect's long range, data security, and RF noise resilience. Products may contain different hardware, but all RM2.4 capable devices are compatible with one another.



Products utilizing the RM2.4 protocol display this logo on the product label. Any hardware with this logo is compatible with other hardware with this logo.

1.1 Wireless Communications

To obtain the maximum range from MobileCollect, you need to pay close attention to the placement of the Bases, Remotes and Mobile Modules, and the obstacles between the units. It is important to understand what the RF transmission pattern looks like so that you can make appropriate decisions on the placement and use of MobileCollect. The illustration below shows transmitters and receivers with external antennas. The antennas in MobileCollect products are internal antennas. The same rules apply for both internal and external antennas.

Role of Transmitter & Receiver

The transmitter's role in wireless communications is to feed a signal to an antenna for transmission. A radio transmitter encodes data into RF waves with certain signal strength (power output) to project the signal to a receiver.

The receiver receives and decodes data that comes through the receiving antenna. The receiver performs the task of accepting and decoding designated RF signals while rejecting unwanted ones.

The space between the transmitter and receiver is the system's environment. Physical obstructions and noise (interference) can enter into the environment and limit the system's ability to get information from one place to another. Range reducing elements are commonly introduced into simple wireless communications systems in the form of walls, people, machinery, etc.

Visual vs. RF Line-of-Sight

Attaining RF Line-of-Sight (LOS) between the sending and receiving antennas is essential in achieving the longest possible wireless communication range. There are 2 types of LOS that are generally used to describe an environment:

1. Visual LOS is the ability to see from one site to the other (transmitter to receiver). It requires only a straight linear path between two points.
2. RF LOS requires not only visual LOS, but also a football-shaped path free of obstacles for data to optimally travel from one point to another. This football-shaped path is called the Fresnel zone.



In order to achieve the greatest range, the football-shaped path in which radio waves travel must be free of obstructions. Buildings, walls, machinery or any other obstacles in the path will decrease the communication range. If the antennas are mounted just barely off the ground, nearly half of the Fresnel Zone ends up being obstructed by the earth resulting in significant reduction in range. To avoid this

problem, the antennas should be mounted high enough off of the ground so that the earth does not interfere with the central diameter of the Fresnel Zone.

The diameter of the Fresnel Zone (midway between the transmitter and receiver) varies with the frequency of the wireless system and the distance between the transmitter and receiver. The table below shows the diameter for MobileCollect at 2.4 GHz at various distances between the transmitter and receiver.

| Distance, ft (m) | Fresnel Zone Diameter, ft (m) |
|------------------|-------------------------------|
| 10 (3) | 1.0 (0.3) |
| 50 (15) | 2.3 (0.7) |
| 100 (30) | 3.2 (1.0) |
| 150 (46) | 3.9 (1.2) |

Transmitter & Receiver Placement Guidelines

The general recommendation is to keep at least 80% of the Fresnel Zone clear of obstructions. Aim to place the receiver in an elevated location away from metal objects so that the football shaped RF transmission zone is free of obstacles.

When using the Mobile Module, best signal strength will occur if the Mobile Module is in direct line-of-sight of the receiver. Any obstruction between transmitter and the receiver, will lessen the signal strength.

1.2 Legacy Wireless Certifications

Country Certifications & Approvals - Legacy Series (2006-2025)

MobileCollect has been approved for use in North America (Canada, United States and Mexico), South America, Europe, Australia and New Zealand. MicroRidge Systems has not obtained approval for operation in other parts of the world. If your application for MobileCollect is for other regions, contact us about the status of the approvals for your area. The radio used in MobileCollect operates in the Industrial, Scientific & Medical (ISM) frequency band at 2.4 GHz.

The following approvals allow for the Legacy USB Base, Legacy USB Wedge Base, Legacy USB MicroBase, and Legacy RS-232 Base, RS-232 Remote and Mobile Modules to be closer than 8.7 inches (22 cm) to an individual.

The following statement is included in this manual for the USB MicroBase and Mobile Modules. A similar statement is already displayed on a label on the bottom of the full sized Base units.

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.

The wireless approvals for the MobileCollect components are covered under the following:

FCC ID: U6TZIGBIT-A2 Radio certification numbers for the ATZB Radio Module
IC: 7036A-ZIGBITA2

FCC ID: VW4A090664 Radio certification numbers for the ATZB Radio Module
IC: 11019A-090664

FCC ID: 2ACNQRM2 Radio certification numbers for the RM2.4 Radio Module
IC 12298A-RM2



All MobileCollect transmitters and receivers are in compliance with the European Union Directive on the restricted use of certain hazardous substances (RoHS/RoHS2 Directive).



Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 is commonly referred to as REACH. REACH stands for the Regulation for Registration, Evaluation, Authorization, and Restriction of Chemicals. The REACH Regulation entered into force on 1st June

2007 to streamline and improve the former legislative framework for chemicals of the European Union (EU) and European Economic Area (EEA) countries.

REACH compliance is only mandatory on products produced in or shipped into the European Union (EU) and member countries. However, since many other jurisdictions have similar or pending legislation and manufacturers' products may eventually find their way into the EU, REACH compliance is having a global effect.

All current MicroRidge produced products are in compliance with REACH and do not contain any of the currently listed SVHC (substance of very high concern) in concentrations of 0.1% or above.

1.3 EVO Wireless Certifications

Country Certifications & Approvals - EVO Series (Introduced 2025)

MobileCollect EVO Series has been approved for use in the United States and Canada. The MobileCollect EVO Series conforms to the standards required for use in the European Union, United Kingdom, Japan, Taiwan, South Korea, Brazil, Australia, New Zealand, and South Africa. The radio used in MobileCollect operates in the Industrial, Scientific & Medical (ISM) frequency band at 2.4 GHz.

| | |
|--------------------------|--------------|
| FCC ID: | 2ACNQB1 |
| IC: | 12298A-B1 |
| Full Size EVO Base HVIN: | BRD-BASE-EVO |
| EVO MicroBase HVIN: | BRD-MB-EVO |

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. Full size Bases (MC-BASE-USB-EVO, MC-BASE-RS232-EVO, MC-BASE-KW-EVO) equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. MicroBases (MC-MB-A-EVO, MC-MB-C-EVO) have been evaluated and found acceptable for use while the user is in contact with the outer case. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

The following statement is included in this manual for the EVO MicroBases. A similar statement is already displayed on a label on the top of the full sized Base units.

This device complies with Part 15 of the FCC Rules and Industry Canada License-exempt RSS standard(s). 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.



Cet équipement est conforme aux limites d'exposition aux rayonnements FCC et ISED établies pour un environnement non contrôlé. Les équipements de base pleine grandeur (MC-BASE-USB-EVO, MC-BASE-RS232-EVO, MC-BASE-KW-EVO) doivent être installés et utilisés avec une distance minimale de 20 cm entre le radiateur et votre corps. Les MicroBases (MC-MB-A-EVO, MC-MB-C-EVO) ont été évaluées et jugées acceptables pour une utilisation lorsque l'utilisateur est en contact avec le boîtier extérieur. Cet émetteur ne doit pas être colocalisé ou fonctionner en conjonction avec une autre antenne ou émetteur.

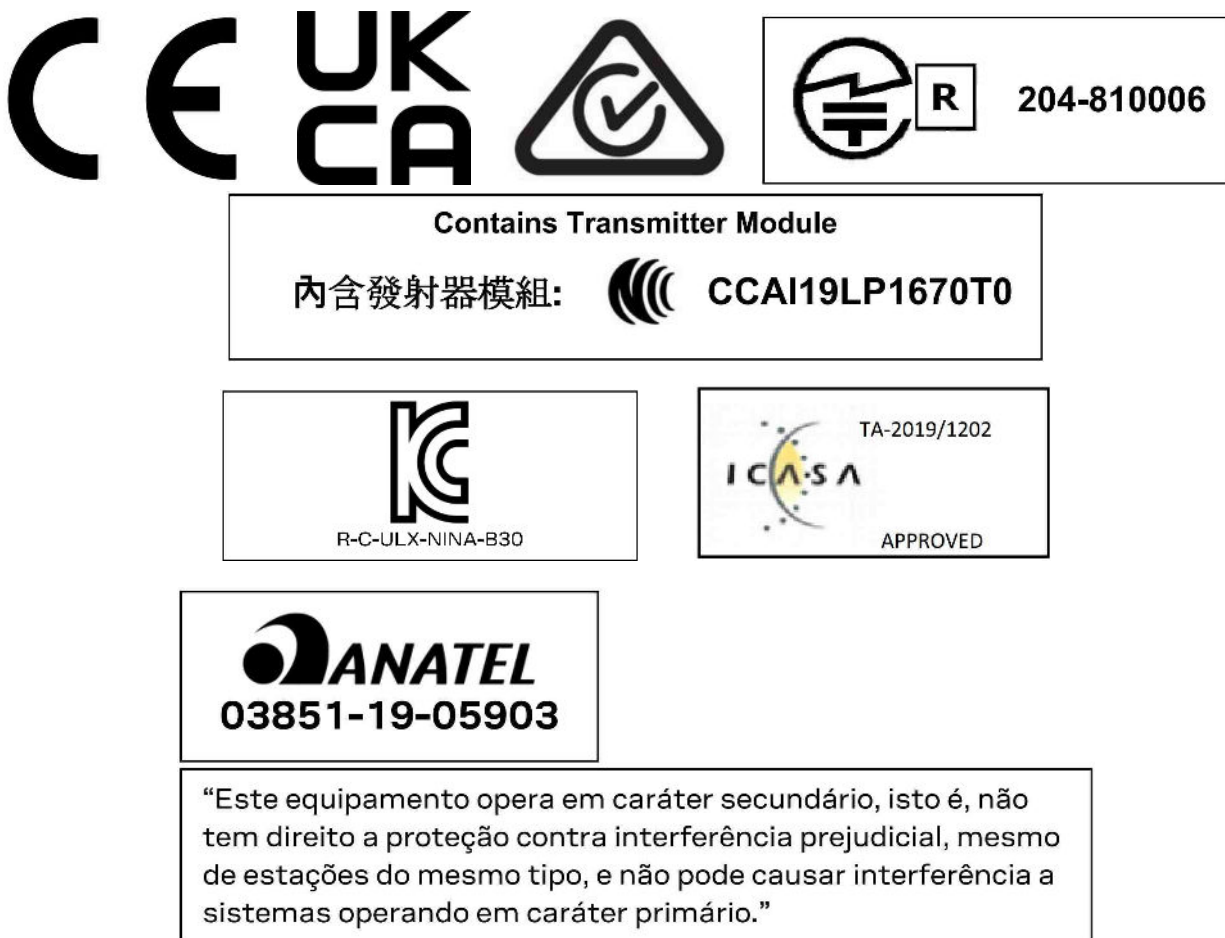
La déclaration suivante est incluse dans ce manuel pour les MicroBases EVO. Une déclaration similaire est déjà affichée sur une étiquette située sur le dessus des unités de base pleine taille.

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;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Global Module Certifications

The following Certification Marks are included in this manual for the EVO MicroBases. Similar marks are already displayed on a label on the top of the full sized Base units.



All MobileCollect transmitters and receivers are in compliance with the European Union Directive on the restricted use of certain hazardous substances (RoHS/RoHS2 Directive).



Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 is commonly referred to as REACH. REACH stands for the Regulation for Registration, Evaluation, Authorization, and Restriction of Chemicals. The REACH Regulation entered into force on 1st June 2007 to streamline and improve the former legislative framework for chemicals of the European Union (EU) and European Economic Area (EEA) countries.

REACH compliance is only mandatory on products produced in or shipped into the European Union (EU) and member countries. However, since many other jurisdictions have similar or pending legislation and manufacturers' products may eventually find their way into the EU, REACH compliance is having a global effect.

All current MicroRidge produced products are in compliance with REACH and do not contain any of the currently listed SVHC (substance of very high concern) in concentrations of 0.1% or above.



2 Setup Programs

There are 2 Setup Programs available for configuring a MobileCollect system.

| | |
|----------------|--|
| Xpress Setup | Easy to use Windows based Setup Program that covers the features required by most users. Primarily used for systems using exclusively Mini Mobile Module Transmitters. |
| Extended Setup | Windows based Setup Program that covers all the features supported by MobileCollect. Used to set up system with multiple transmitter models. |

When do I need to use a Setup Program?

- If you are using Mobile Modules and/or Remotes to send data to a Base and you want to use the factory defaults (single read and no special formatting), you do not have to use a Setup Program. You will need to pair the Mobile Modules with the Bases by using the [Mobile Module Pair-on-the-Fly](#)⁴⁵ method. For the Remotes, you will use the [Remote Pair-on-the-Fly](#)³³ method.
- If you are only using Bases and Mobile Modules and you need to do some special configuration, use either Setup Program. The Xpress Setup Program is easier to use than the Extended Setup Program.
- If deploying Remotes with custom parameters/configurations, use the Extended Setup Program.
- If deploying Command Mobile Modules with the Command Mode Enabled, use the Extended Setup Program.

Each Setup Program is described in its own User's Guide. The User's Guides are available as PDF documents and can be accessed the Help menu in the Setup Programs. Additionally, all user guides can be found online in our [Document Library](#).

- MobileCollect Xpress Setup User's Guide
- MobileCollect Extended Setup User's Guide

3 Base Receivers

The Base is in charge of and controls the MobileCollect network. In order for a Remote or Mobile Module to communicate to a Base, the Remote or Mobile Module must be paired with the Base. When a pairing occurs, the network identifiers (RF channel, Network S/N and PAN ID) for the Base are stored in the Remote or Mobile Module. Since each Base unit has a unique set of network identifiers, you can have multiple Bases sitting next to each other and each Base will only process the data from units that have been paired with that Base. There are two primary generations of Base Receiver this manual covers, Legacy (2006-2025) and EVO (2025+)

Legacy Base Receivers

The Legacy MobileCollect Bases are listed below.

| Product | Part Number | Description |
|----------------|--------------------|--|
| USB Base | MC-BASE-USB | Base model base receiver, single USB Serial output port |
| RS-232 Base | MC-BASE-RS232 | RS-232 model with USB Serial and DB9 RS-232 output ports |
| Wedge Base | MC-BASE-KW | Keyboard wedge model with USB Serial and USB Keyboard Wedge output ports |
| MicroBase | MC-BASE-MICRO | USB Dongle sized model with USB Serial output |

USB Serial Connection to PC - USB Driver Required

All Bases require a USB Serial connection for setup and serial data transfer via USB. Base's communicate to the PC via a Virtual ComPort that is automatically assigned by the PC when a USB Serial port is detected. A USB driver is required to be installed on your PC before connecting a Legacy Base to a PC. USB Drivers can be downloaded from the MicroRidge Website: [USB Driver](#). No USB Driver is required for the Wedge output on a Wedge Base with default settings. To modify any settings, a serial connection and therefore the USB driver is required to utilize the setup program to modify parameters.

RM 2.4 Baud Rates and Communication Parameters

The Legacy Bases can be set to any of the following baud rates. The communication parameters are preset to N-8-1 (parity, data bits and stop bits) and cannot be changed. These baud rates control the rate of data transfer between the Base and the destination PC, they do not affect speed of wireless transmission. The default baud rate is 9600. If you have several Remotes and/or Mobile Modules sending data to a Legacy Base, you should consider using a higher baud rate than 9600. With a higher baud rate, more data can be sent from Legacy Bases to the PC.

- 9600 (factory default)
- 19.2K
- 38.4K

EVO Base Receivers

In 2025, EVO series Base Receivers were released. EVO is short for Evolution and refers to the additional capabilities that the new hardware and firmware provides to the system

Improved Performance

- Improved RF performance for stability in high RF areas.
- Base to PC communication via USB instead of RS-232 protocols. No need to set baud rates for Base to PC communication. Higher data transfer speeds for large systems.
- Increased processing power and memory to better accommodate large systems.

Improved IT and SPC software compatibility

- EVO Bases do not require installation of a USB Driver. EVO utilizes the standard Windows Serial Driver making it essentially plug and play.
- Unique PID/VID USB registration numbers. PID/VID numbers allow IT admins to set device level permissions in IT security systems.
- An API is available to integrate certain setup and operation functions for the Base Receivers. These functions can be integrated into an SPC software system to bypass the need for MicroRidge Setup Software. Hardware and architecture changes in the EVO base allow for better integration than the simple serial commands available to Legacy Bases. [Contact MicroRidge Systems](#) ⁹⁶ to learn more.

Improved Form Factors

- 33% reduction in size of the MicroBase
- Introduction of USB C MicroBase
- Integrated Keyboard Wedge output on EVO MicroBases. Allowing for more mobile device compatibility with Windows, Apple, and Android based products.

The EVO series MobileCollect Bases are listed below .

| Product | Part Number | Description |
|----------------------|--------------------|--|
| EVO USB Base | MC-BASE-USB-EVO | EVO USB model with a USB Serial output port |
| EVO RS-232 Base | MC-BASE-RS232-EVO | EVO RS-232 model with USB Serial and DB9 RS-232 output ports |
| EVO Wedge Base | MC-BASE-KW-EVO | EVO Keyboard Wedge model, Single USB Port with selectable USB Serial and USB Keyboard Wedge output |
| EVO MicroBase, USB A | MC-MB-A-EVO | USB A Dongle sized EVO model with selectable USB Serial and USB Keyboard Wedge output |
| EVO MicroBase, USB C | MC-MB-C-EVO | USB C Dongle sized EVO model with selectable USB Serial and USB Keyboard Wedge output |

USB PID/VID for EVO Base Receivers

EVO Series Bases have a Unique USB Product ID (PID) under the MicroRidge Vendor ID (VID). These IDs are associated with each EVO Series Base.

- | | | |
|--|-----------|----------------|
| ▪ Vendor ID (VID) for MicroRidge | Hex: 3774 | Decimal: 14196 |
| ▪ Product ID (PID) For MobileCollect EVO Bases | Hex: 0834 | Decimal: 2100 |

Setup Programs

If you need to configure a Base, you must use one of the 2 Setup Programs.

[Xpress Setup Program](#) ¹³

Easy to use Windows based Setup Program that covers the features required by most users. Primarily used for systems using exclusively Mini Mobile Module Transmitters.

[Extended Setup Program](#) ¹³

Windows based Setup Program that covers all the features supported by MobileCollect. Used to set up system with multiple transmitter models.

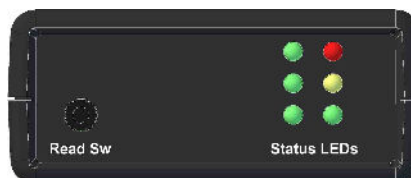
3.1 Legacy Base Models

USB Base: MC-BASE-USB

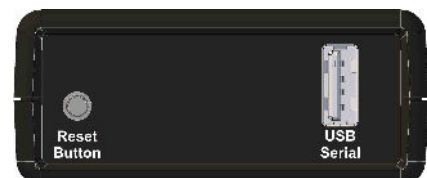
The USB Base is the simplest model receiver. It features a single USB Serial output.



MobileCollect USB Base



USB Base Front Panel
(Labels are shown for ref only)



USB Base Back Panel
(Labels are shown for ref only)

Front Panel

The MobileCollect USB Base comes with a single read switch connector in the lower left for a foot or hand switch. There is an option to increase the number of read switch connectors on the USB Base from 1 to 3. [Contact MicroRidge Systems](#)⁹⁶ about increasing the number of read switch connectors. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#)²⁸.

Back Panel

The USB Base rear panel consists of a reset button and USB connector.

Reset Button

When the reset button is pressed and released, the firmware in the USB Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the USB Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#)⁴⁵ process.

USB Serial Port

The USB Base requires a USB cable with a Type A male connector. The USB Base ships with a 6' USB cable with a Type A male connector at each end of the cable.

The maximum length of a USB cable is based on the version of the USB driver chips. The USB Base uses a USB 2.0 version chip. The USB specifications limit the length of a cable between USB 2.0 devices to 5 meters (16.4 feet).

Power Supply

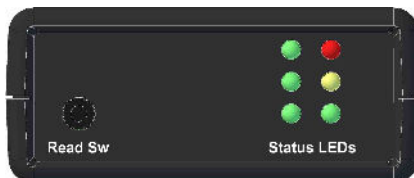
The USB Base does not require a separate power supply. Power is provided by the connection to the USB port.

RS-232 Base: MC-BASE-RS232

The RS-232 Base includes an RS-232 DB9 output that can transmit data via native RS-232. RS-232 Bases are very useful in PLC controlled systems and can also be paired with an RS-232 to Ethernet adapter for networking capabilities. A Standard DB9 Serial cable and 5V DC USB AC adapter is supplied with this base.



MobileCollect RS-232/USB Base



RS-232 Base Front Panel
(Labels are shown for ref only)



RS-232 Base Back Panel
(Labels are shown for ref only)

Front Panel

The RS-232 Base comes with a single read switch connector in the lower left for a foot or hand switch. There is an option to increase the number of read switch connectors on the RS-232 Base from 1 to 3. [Contact MicroRidge Systems](#)⁹⁶ about increasing the number of read switch connectors. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#)²⁸.

Back Panel

Reset Button

When the reset button is pressed and released, the firmware in the RS-232 Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the RS-232 Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#)⁴⁵ process.

RS-232 DB9 Port

The RS-232 output is a Female DB9 port with standard wiring. The Baud Rate of the DB9 port is programmable in the setup Software. Pin assignment for the RS-232 remote is listed in the table below

| <i>Pin</i> | <i>Assignment</i> |
|------------|-------------------|
| 1 | - |
| 2 | TxD |
| 3 | RxD |
| 4 | DSR |
| 5 | Ground |
| 6 | DTR |
| 7 | - |
| 8 | - |
| 9 | - |

USB Serial Port

The USB Port on the RS-232 Base is used to program the base via the setup software and power the unit. The RS-232 Base requires a USB cable with a Type A male connector. The RS-232 Base ships with a 6' USB cable with a Type A male connector at each end of the cable. You can connect this Base to a PC via the USB port and it will function like the USB Base. When the RS-232 Base is connected via the USB Port, the information sent out the USB Port will also be sent out the DB9 Port. The baud rate for both of the ports is always the same.

Power Supply

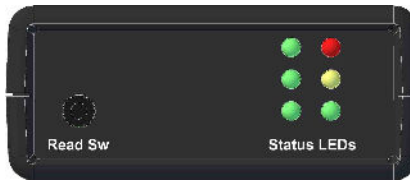
For communications to/from the RS-232 Base via the DB9 serial port, the Base needs to be powered with the USB AC adapter connected to the USB Port.

Wedge Base: MC-BASE-KW

The Wedge Base includes an additional USB port that outputs received data in keyboard wedge keystroke output. This data output emulates the data coming from a keyboard and is used to enter data into any program that can accept keyboard entry such as excel, web-based SPC programs, Power BI, etc.



MobileCollect Wedge/USB Base



Wedge Base Front Panel
(Labels are shown for ref only)



Wedge Base Back Panel
(Labels are shown for ref only)

Front Panel

The Wedge Base comes with a single read switch connector in the lower left for a foot or hand switch. There is an option to increase the number of read switch connectors on the Wedge Base from 1 to 3. [Contact MicroRidge Systems](#)⁹⁶ about increasing the number of read switch connectors. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#)²⁸.

Back Panel

Reset Button

When the reset button is pressed and released, the firmware in the Wedge Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the Wedge Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#)⁴⁵ process.

USB Wedge Port

The USB Wedge Port outputs data as a keyboard and types the data into the active program. The Wedge output utilizes the standard PC HID Driver that is used by standard keyboards on all PCs. This allows the Wedge Base to output text directly into any program that can accept keyboard data.

USB Serial Port

The USB Port on the Wedge Base is used to program the base via the setup software. The Wedge Base requires a USB cable with a Type A male connector. The Wedge Base ships with 6' USB cable with a Type A male connector at each end of the cable. This Base can be connected to a PC via the USB Serial port and it will function like the USB Base.

Power Supply

The Wedge Base does not require a separate power supply. Power is provided by the connection to the USB port.

MicroBase: MC-BASE-MICRO

The MicroBase is the dongle sized version of the USB base. It performs the same core functions of controlling the MobileCollect System and receiving transmitter data in a mobile form factor.



MobileCollect USB MicroBase

The MicroBase supports the same functionality found in the USB Base with the following exceptions:

- The MicroBase does not have a read switch connector.
- The MicroBase does not have Reset button. Pairing on the Fly is still possible by power cycling the MicroBase. Refer to the [Mobile Module Pairing](#)⁴⁵ process.
- The MicroBase has a single green, red and yellow LED rather than 2 LED stacks (3 LEDs per stack). The LEDS are visible through the translucent case.

The USB MicroBase is intended for use with tablets and other computers that require mobility. The USB MicroBase can be used with desktop PCs; however, a full size base is recommended for stationary applications.

3.2 EVO Base Models

EVO USB Base: MC-BASE-USB-EVO

The EVO USB Base is the simplest model receiver. It features a single USB Serial output and is only sold through MicroRidge Resellers.



EVO USB Base Front Panel
(Labels are shown for ref only)

EVO USB Base Back Panel
(Labels are shown for ref only)

Front Panel

The EVO USB Base comes with a single read switch connector in the lower left for a foot or hand switch. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#) ²⁸.

Back Panel

The EVO USB Base rear panel consists of a reset button and USB connector.

Reset Button

When the reset button is pressed and released, the firmware in the EVO USB Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the EVO USB Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#) ⁴⁵ process.

USB Serial Port

The EVO USB Base requires a USB cable with a Type A male connector. The USB Base ships with 6' USB cable with a Type A male connector at each end of the cable.

The maximum length of a USB cable is based on the version of the USB driver chips. The EVO USB Base uses a USB 2.0 version chip. The USB specifications limit the length of a cable between USB 2.0 devices to 5 meters (16.4 feet).

Power Supply

The EVO USB Base does not require a separate power supply. Power is provided by the connection to the USB port.

EVO RS-232 Base: MC-BASE-RS232-EVO

The EVO RS-232 Base includes an RS-232 DB9 output that can transmit data via native RS-232. RS-232 Bases are very useful in PLC controlled systems and can also be paired with an RS-232 to Ethernet adapter for networking capabilities. A Standard 6' (2m) DB9 Serial cable, USB cable, and 5V DC USB AC adapter is supplied with base.



EVO RS-232 Base Front Panel
(Labels are shown for ref only)



EVO RS-232 Base Back Panel
(Labels are shown for ref only)

Front Panel

The EVO RS-232 Base comes with a single read switch connector in the lower left for a foot or hand switch. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#)²⁸.

Back Panel

Reset Button

When the reset button is pressed and released, the firmware in the EVO RS-232 Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the EVO RS-232 Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#)⁴⁵ process.

RS-232 DB9 Port

The RS-232 output is a Female DB9 port with standard wiring. The Baud Rate of the DB9 port is programmable with the serial help command "<\$CS" via a program such as [ComTestSerial](#)⁹¹. Pin assignment for the RS-232 remote is listed in the table below

| <i>Pin</i> | <i>Assignment</i> |
|------------|-------------------|
| 1 | - |
| 2 | TxD |
| 3 | RxD |
| 4 | DSR |
| 5 | Ground |
| 6 | DTR |
| 7 | - |
| 8 | - |
| 9 | - |

USB Serial Port

The USB Port on the EVO RS-232 Base is used to program the base via the setup software and powering the unit. The EVO RS-232 Base ships with a 6' USB cable with a Type A male connector at each end of the cable. You can connect this Base to a PC via the USB port and it will function like the USB Base. When the EVO RS-232 Base is connected via the USB Port, the information sent out the USB Port will also be sent out the DB9 Port.

Power Supply

When communicating via the DB9 serial port, the Base needs to be powered with the USB AC adapter connected to the USB Port.

EVO Wedge Base: MC-BASE-KW-EVO

The EVO Wedge Base includes an additional USB port that outputs keystroke output. This data output emulates the data coming from a keyboard and is used to enter data into any program that can accept keyboard entry such as excel, web-based SPC programs, Power BI, etc.



EVO Wedge Base Front Panel
(Labels are shown for ref only)



EVO Wedge Base Back Panel
(Labels are shown for ref only)

Front Panel

The EVO Wedge Base comes with a single read switch connector in the lower left for a foot or hand switch. There is an option to increase the number of read switch connectors on the EVO Wedge Base from 1 to 3. [Contact MicroRidge Systems](#) ⁹⁶ about increasing the number of read switch connectors. The right side contains the Signal and Status LEDs. LED light code info can be found in the [Base LED Light Section](#) ²⁸.

Back Panel

Reset Button

When the reset button is pressed and released, the firmware in the EVO Wedge Base is restarted and the setup parameters are reloaded from nonvolatile memory. Once the Power LED on the front panel shows a steady green, the EVO Wedge Base is ready to use. This reset button can be used in the [Mobile Module Pairing](#)⁴⁵ process.

USB Port and Output Selector Switch

The EVO Wedge base has only 1 USB port, whereas the legacy Wedge base had dedicated Serial and Wedge ports. The position of the selector switch determines the output of the EVO Wedge Base. When the selector switch is in the "Serial" setting, the EVO Wedge Base will function like an EVO USB Base and output data via USB Serial. When the selector switch is in the "Wedge" setting, the EVO Wedge Base will output data as a keyboard and type the data into the active program. The Wedge output utilizes the standard PC HID Driver that is used by standard keyboards on all PCs. This allows the Wedge Base to output text directly into any program that can accept keyboard input. MobileCollect Setup programs will identify the EVO Wedge Base regardless of the position of the selector switch.

Power Supply

The Wedge Base does not require a separate power supply. Power is provided by the connection to the USB port

EVO MicroBases: MC-MB-A-EVO, MC-MB-C-EVO

The EVO MicroBase is a dongle size version of the EVO Wedge Base Receiver. It performs the same core functions of controlling the MobileCollect System and receiving transmitter data in a mobile form factor. It excels when used with mobile phones, tablets, and other small devices running Windows, iOS, and Android operating systems. Set up is done via MobileCollect Setup programs on a PC, but data can be output via the Wedge output to all platforms.



EVO MicroBase, USB A
MC-MB-A-EVO



EVO MicroBase, USB C
MC-MB-C-EVO

EVO MicroBases offer the following Base Receiver functions, while offering a mobile device compatible format:

- USB Serial and Wedge output modes
- Ability to receive data from multiple Transmitters
- EVO MicroBases can send the same [Base Commands](#)⁸¹ as a Full size Base.

The EVO MicroBases support the same functionality found in the Wedge Base with the following exceptions:

- The EVO MicroBase RF Range is reduced from the nominal 150 feet to ~120 feet.
- The EVO MicroBases do not have a read switch connector to connect a wired Foot Switch or Hand Switch. The EVO MicroBases are compatible with EVO wireless switches.
- The EVO MicroBases do not have a Reset button. Pairing on the Fly is still possible by power cycling the MicroBase. Refer to the [Mobile Module Pairing](#)⁴⁵ process.
- The EVO MicroBases contain a single green, red and yellow LED rather than 2 LED stacks (3 LEDs per stack). The LEDs are visible through the translucent case.
- The EVO MicroBase does not have a Serial/Wedge Selector switch. Changing output formats is done via the MobileCollect Setup Programs.




The EVO MicroBases are intended for use with tablets, mobile devices, and other computers that require mobility. The EVO MicroBases can be used with desktop PCs; however, it is recommended that you use a USB Base or RS-232/USB Base in non-mobile applications for the increased RF performance.

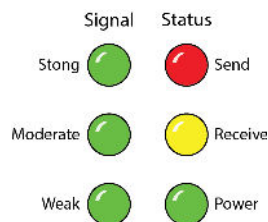
3.3 Base LED Lights

Full Size Bases

There are 2 stacks of LEDs on the front of the Legacy and EVO USB, RS-232, and Wedge Full Size Bases. The left stack Signal LEDs are all green and are used to indicate the strength of the signal received from a Mobile Module or Remote transmitters. The right stack Status LEDs indicate general information, data reception and power on

status.

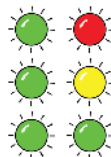
-  Primarily used to indicate that a command is being sent to a Command Mobile Module or a Remote Unit. This LED may also indicate an error condition with the Base
-  RF data packet received.
-  A solid green indicates the Base start up has been completed and the Base is ready to receive data. If the LED is flashing about once per second, the Base is in Setup mode.



LED Code Diagrams



LED - Steady On



LED - 1x Blink



LED - Steady Flashing

Quantity of flashes listed if more than 1

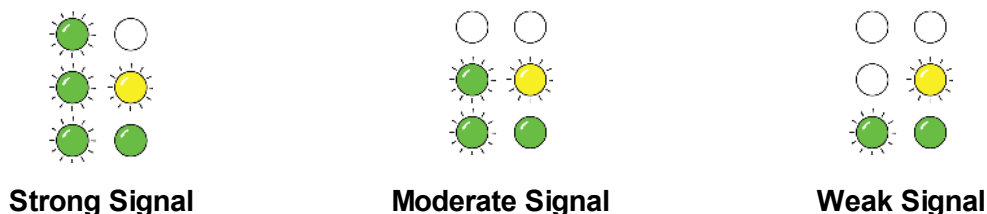
Start up Sequence

Upon powering up a full size Base or pressing the reset button, the Base will enter a start up sequence and cycle through different LED light combinations. During the ~10 sec pairing window, a Mobile Module or Remote Transmitter can be paired. Refer to [Mobile Module Pairing](#)⁴⁵ and [Remote Pairing](#)³³ sections.



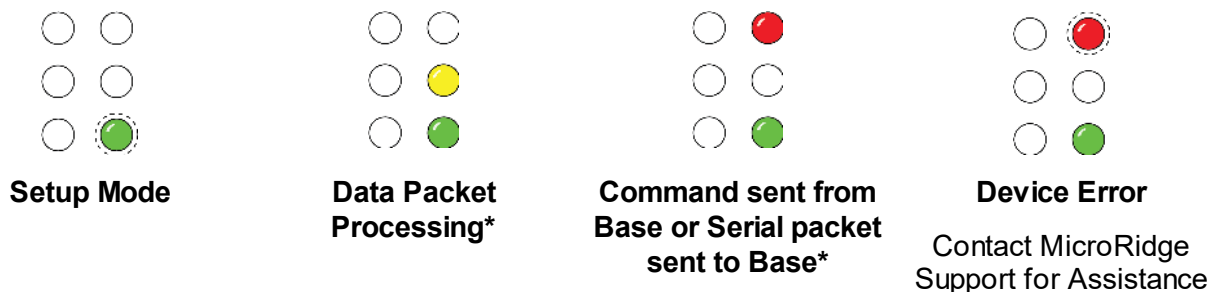
Signal Strength

The signal strength LEDs will light up depending on the strength of the transmission signal. Upon receiving a reading the appropriate Signal Strength LEDs and the Packet LED will flash. It is desirable to have your system positioned so that you have at least 2 green LEDs come on when data is received. If you only have a single LED come on, you should try to reposition your system to improve the strength of the received signals.



Status Lights

A combination of LED lights communicate processes and potential issues with the Bases.



* Prolonged Data Packet and Send LEDs could indicate an error. Prolonged Packet LED could indicate data is stuck in the buffer, prolonged Send LED could indicate an error with a command sent to the Base from the PC/Program.

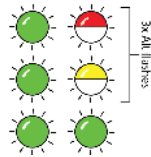
USB Serial Port Data Transfer Error

All EVO Bases can send data to a PC via serial communication through a USB port. The USB protocol allows for the Base to confirm the USB Serial ComPort is open and ready to receive data. This is done by utilizing the DTR control signal. If DTR is not raised at the USB serial port by a PC application, then the Base cannot send data to the USB port and will send an error sequence indicating that the data is not reaching the destination. If this error is shown, check the

PC Application to ensure it is connected to the ComPort assigned to the EVO Base and enabling the DTR signal. Alternatively, the USB Serial Send All Mode can be used to bypass the DTR check.

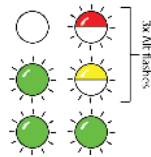
The USB Serial Output Mode setting (<#USBn) in the [Base Commands](#) ⁸¹ sections could resolve this issue if the SPC application accessing the ComPort is not providing a DTR signal.

NOTE: This error message only applies to serial data transferred via USB. Since the USB port on the RS-232 EVO Base is for powering the base, the unit would always show an error when transmitting via DB9. Therefore, this error code is not available on the RS-232 EVO Base.



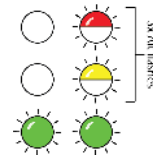
Strong Signal

USB Transfer Error



Moderate Signal




USB Transfer Error






Weak Signal

USB Transfer Error

MicroBase

There are 3 LEDs located on the USB MicroBase. These LEDs are located inside the enclosure at the lower left-hand corner of the enclosure on Legacy models and at the upper left on the EVO models. When the LEDs are on, they are visible through the translucent enclosure. The LED colors from left to right are   .

-  A solid green indicates the Base start up has been completed and the Base is ready to receive data. If the LED is flashing about once per second, the Base is in Setup mode.
-  Primarily used to indicate that a command is being sent to a Command Mobile Module or a Remote Unit. This LED may also indicate an error condition with the Base
-  This LED turns on briefly when a valid data packet is received from a Mobile Module or a Remote.

Status



Power

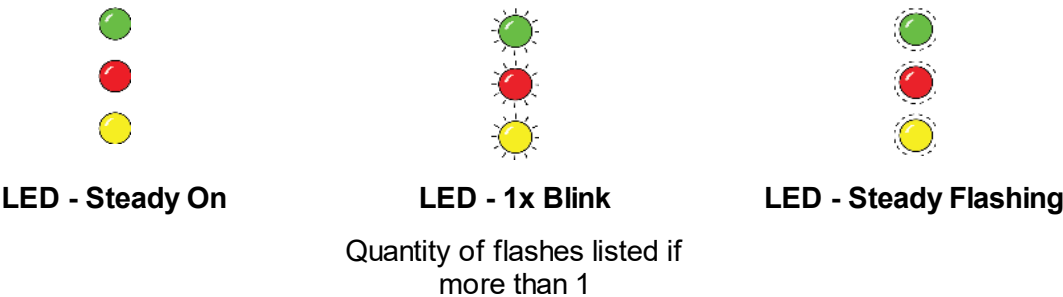


Send



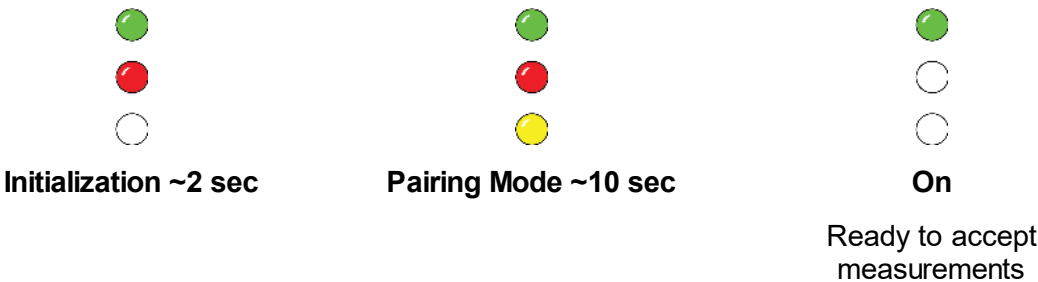
Receive

LED Code Diagrams



Start up Sequence

Upon plugging in a MicroBase, the MicroBase will enter a start up sequence and cycle through different LED light combinations. During the ~10 sec pairing window, Mobile Modules and Remote Transmitters can be paired. Refer to [Mobile Module Pairing](#)⁴⁵ and [Remote Pairing](#)³³ sections.



Status Lights

A combination of LED lights communicate processes and potential issues with the MicroBases.



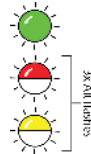
* Prolonged Data Packet and Send LEDs could indicate an error. Prolonged Packet LED could indicate data is stuck in the buffer, prolonged Send LED could indicate an error with a command sent to the Base form the PC/Program.

USB Serial Port Data Transfer Error

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data. This is done by utilizing the DTR control signal. If DTR is not raised at the USB serial port by a PC application, then the Base cannot send data to the USB port and will send an error sequence indicating that the data is not reaching the destination. If this error is shown, check the PC Application to ensure it is connected to the ComPort assigned to the EVO Base and enabling the DTR signal. Alternatively, the USB Serial Send All Mode can be used to bypass the DTR check.

The USB Serial Output Mode setting (<#USBn) in the [Base Commands](#)⁸¹ sections could resolve this issue if the SPC application accessing the ComPort is not providing a DTR signal.



Reading Received

USB Transfer Error

4 Remote Transmitters

Remote transmitters capture measurements from digital gages and RS-232 devices and send this measurement data to a Base (receiver). You typically use a Remote when you don't need the mobility provided by a Mobile Module. Unlike the Mobile Module, which is powered by a battery, Remotes are powered by an external USB AC adapter.

A Remote can be configured with the [Extended Setup Program](#)¹³. If you are using the factory default setup for the Remote, you do not need to configure the Remote or Base with the setup program.

These are 2 types of Remotes available:

Digital Remotes The Digital Remote supports digital gages from manufacturers such as Mitutoyo, Mahr Federal, Ono Sokki, Fowler, INSIZE, Starrett, Sylvac, etc. The Digital Remote automatically recognizes the type of gage connected to the front panel input port. The input port for a Digital Remote is a 2x5 connector as shown below.



RS-232 Remotes The RS-232 Remote supports gages that have an RS-232 output. The RS-232 Remote can automatically determine the baud rate and communication parameters for the connected RS-232 device (requires a send or print button on the serial device). The input port for a RS-232 Remote is a DB9 male connector as shown below. This DB9 is configured the same as a standard PC DB9 serial port.



4.1 Operation

There are several operational procedures and features that are common to both the Digital and RS-232 Remotes. The operational features that are unique to each Remote are described in the [Digital Remote](#)³⁸ and [RS-232 Remote](#)³⁹ sections.

4.1.1 Remote Pairing

A Remote must be paired with a Base before the Base will accept measurements from the Remote. The pairing information (RF channel number, Base network serial number and Base PAN ID) are stored in the Remote. When the Remote sends measurement data to a Base, the address information for the target Base is included in the wireless packet. The wireless packet sent by a Remote may be received by several Bases; however, only the Base that matches the pairing information will process the measurement packet.

There are 2 methods that can be used to pair a Remote with a Base.

- Pairing-on-the-fly.
- Use the [Extended Setup Program](#)¹³.

In order for the pairing process to be successful, the Base and Remote must both be communicating on the same RF channel.

Pairing-on-the-Fly

A Remote can be paired with a Base on-the-fly by using the back panel buttons on the Remote and the Base. If the Remote is set to factory defaults, the Extended Setup Program will not be needed. Pairing-on-the-fly requires both the Remote Transmitter and Base Receiver to be in Pairing Modes.

Follow the steps below to pair a Remote with a Base.

Putting the Remote into Pairing Mode

- Be sure the Remote is being powered. The Remote can be connected to a USB port on a PC or powered via the USB AC adapter.
- Press and hold the Associate & Test button
- Press and release the Reset button
- When the right-hand LED stack starts flashing, release the Associate & Test button

Pairing-on-the-Fly for MobileCollect Remotes - Full Size Bases (Legacy and EVO)

This method can be used with the Legacy or EVO USB Base, RS-232 Base and Wedge Base. This method cannot be used with any of MicroBases since the MicroBase does not have a Reset button.

1. Be sure no other Transmitters are sending measurements to the Base.
2. Put the Remote into the Setup Mode.
3. Press and release the Reset button on the back of the Base.
4. When the left status LEDs (green/green/green) go out and the right LEDs (red/yellow/green) are all on, press and release the Associate & Test button on the Remote
5. If the pairing was successful, the left-hand LED stack on the Remote will blink multiple times and all of the Base LEDs, except for the green Pwr LED will be off.
6. If the Base does not receive a pairing request, it will automatically exit the pairing mode after 10 seconds.

Pairing-on-the-Fly for MobileCollect Remotes - MicroBases (Legacy and EVO)

This method can be used with a Legacy or EVO MicroBase. This method can be used with all the MicroBase models.

1. Be sure no other Transmitters are sending measurements to the MicroBase.
2. Put the Mobile Module into the Setup Mode.
3. Unplug and replug the Microbase to enter the start up sequence.
4. When all LEDs (red/yellow/green) are all on, press and release the Associate & Test button on the Remote

5. If the pairing was successful, the left-hand LED stack on the Remote will blink multiple times and on the MicroBase the Red and Yellow LEDs will turn off in sequence. After pairing, only the Green LED will be lit on the MicroBase.
6. If the Base does not receive a pairing request, it will automatically exit the pairing mode after 10 seconds.





4.1.2 Remote LED Lights

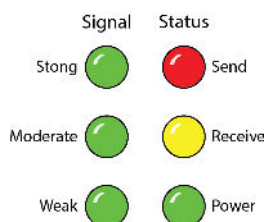
Status LEDs

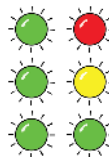
There are 2 stacks of LEDs on the front of a Remote. The left stack LEDs are all green and are used to indicate the strength of the signal received from a Base. The right stack indicates general information, data reception and power on status.

Data Reception & Power On Status LEDs

The Red/Yellow/Green LEDs indicate general information, data reception and power on status. The function of the red, yellow and green LEDs are as follows:

-  This LED will blink if the Remote does not receive a packet received acknowledgment from the Base.
-  Digital Remote: When data is received from the connected digital gage, this LED will quickly flash.
-  RS-232 Remote: Data from the serial port is currently in the RxD buffer. When an end-of-packet condition is detected, the data is sent to the Base unit and the yellow LED is turned off. If this LED does not go off, you have probably incorrectly set the end-of-packet condition in the RS-232 Remote for the data being received from your serial device.
-  At start up, several LEDs are turned on. Once the other LEDs are turned off and this LED is solid green, the Remote start-up process has been completed and the Remote is ready to send and receive data.

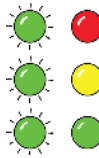
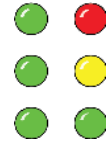


**LED - Steady On****LED - 1x Blink****LED - Steady Flashing**

Quantity of flashes listed if
more than 1

Start up Sequence

Upon powering up a Remote Transmitter or pressing the reset button, the Remote will enter a start up sequence and cycle through different LED light combinations.

**Boot up and initialization****AutoBaud⁴¹ (RS-232)**

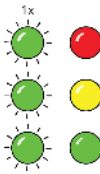
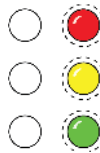
~5sec

**On**

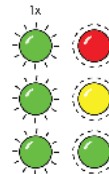
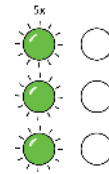
Ready to send measurements

Pair-on-the-Fly

Upon powering up a full size Base or pressing the reset button, the Base will enter a start up sequence and cycle through different LED light combinations. During the ~10 sec pairing window, Mobile Modules and Remote Transmitters can be paired. Refer to [Mobile Module Pairing](#)⁴⁵ and [Remote Pairing](#)³³ sections.

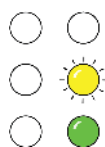
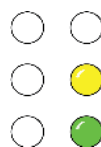
**Entering Pairing Mode****Pairing Mode**

~30 Sec

**Pairing Requested****Pairing Successful**

Gage Data

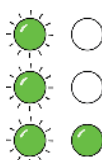
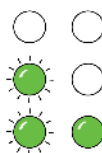
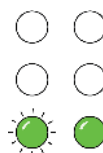
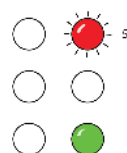
The Remote will communicate when the port is receiving data from either the Digital or RS-232 Port.

**Gage Data - Complete****Gage Data - Incomplete***

*Data from the serial port is currently in the RxD buffer. When an end-of-packet condition is detected, the data is sent to the Base unit and the yellow LED is turned off. If this LED does not go off, you have probably incorrectly set the end-of-packet condition in the RS-232 Remote for the data being received from your serial device.

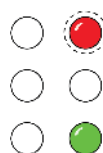
Signal Strength

The signal strength LEDs will light up depending on the strength of the transmission signal. Upon receiving a reading confirmation from the Base, the appropriate Signal Strength LEDs and the Packet LED will flash. It is desirable to have your system positioned so that you have at least 2 green LEDs come on when data is received. If you only have a single LED come on, you should try to reposition your system to improve the strength of the received signals.

**Strong Signal****Moderate Signal****Weak Signal****No Confirmation from Base**

Status Lights

A flashing Send LED light communicates an error state with the Remote.

**Device Error**

Contact MicroRidge Support
for Assistance

4.2 Digital Remote



MobileCollect Digital Remote



Digital Remote Front Panel
(Labels are shown for reference only)



Digital Remote Back Panel
(Labels are shown for reference only)

Front Panel

Digital Gage Input

The 2x5 gage connector on the front panel is a standard connector used for digital gages. It is compatible with the Mitutoyo Digimatic 10 pin connection. Gage cables available from Mitutoyo and Mahr Federal (cable with Mitutoyo compatible output) can be plugged directly into the Digital Remote. Gage cables from other manufacturers may have to be purchased from MicroRidge. The digital gage cables used for the Digital Remotes are the same cables that are used for the MicroRidge GageWay Pro interfaces.

Back Panel

Reset Button (Gage Detection)

Resets the Remote. Does not delete configuration files. Before obtaining a reading from the connected gage, the Remote must detect the type of connected gage. After connecting a gage to the Remote, press and release the Reset button. If a gage is detected the lower right green LED will blink several times. If a gage is not detected, the upper right red will blink several times. Be sure the gage is turned on before pressing the Reset button.

USB Connector (Setup/Power)

The USB connector is used when setting up the Remote with the [Extended Setup Program](#) and for power when the Remote is in a measurement collection mode.

To configure the Remote, connect the Remote to a USB port on a PC with the USB cable supplied with the Remote. The USB port on the PC will supply power to operate the Remote while it is being used with the Extended Setup Program. Prior to connecting the Remote to a USB port, install the USB drivers from the MicroRidge Website: [USB Driver](#).

When the Remote is collecting measurement information and not connected to a PC USB port, power the Remote with the USB AC adapter supplied with the Remote.

Read Switch

By default, the read switch connector is configured to take a single reading from the connected gage. Use the Extended Setup Program to configure the read switch for continuous read and TIR.

Associate & Test Button

The Associate & Test button can perform several different functions based upon how long the button is pressed and whether the Reset button is pressed. The functions available for the button are:

- Pair the Remote with a Base. This function uses this button and the Reset button. Refer to the [Pairing](#) ³³ section for more detail.
- Take a test reading. Press and release (within 2 seconds) the Associate & Test button to take a test reading and send to the paired Base. This function is designed for testing only. The duty cycle of the Associate & Test button is not designed for thousands of readings.
- Send the string "Test Packet from Digital Gage Remote" to the paired Base. The Associate & Test button must be held for 10 seconds before this string will be sent.

4.3 RS-232 Remote



MobileCollect RS-232 Remote



RS-232 Remote Front Panel
(Labels are shown for reference only)



RS-232 Remote Back Panel
(Labels are shown for reference only)

Front Panel

RS-232 Input

The DB9 male connector on the front panel is configured like a standard PC DB9 serial port. Gage cables that can be used to connect your serial device to a PC serial port should work with the RS-232 Remote input port. In order for the Remote to receive data from the connected serial device, the Remote baud rate and communication parameters must be set to match those of the serial device. You can manually set the baud rate and communication parameters with the Extended Setup program. If your serial device has a send or print button, you can have the RS-232 Remote automatically detect the required serial port settings with the AutoBaud feature. The AutoBaud feature is described below.

| <i>Pin</i> | <i>Assignment</i> |
|------------|-------------------|
| 1 | - |
| 2 | RxD |
| 3 | TxD |
| 4 | DTR |
| 5 | Ground |
| 6 | DSR |
| 7 | RTS |
| 8 | - |
| 9 | - |

Back Panel

Reset Button (Automatic Baud Rate Detection)

Resets the Remote. Does not delete configuration files. Also used for the [AutoBaud](#)⁴¹ feature

USB Connector (Setup/Power)

The USB connector is used when setting up the Remote with the [Extended Setup Program](#)¹³ and for power when the Remote is in a measurement collection mode.

If you need to configure the Remote, you will connect the Remote to a USB port on your PC with the USB cable supplied with the Remote. The USB port on your PC will supply power to operate the Remote while it is being used with the Extended Setup Program. Prior to connecting the Remote to a USB port, you must install the USB drivers from the MicroRidge Website: [USB Driver](#).

When the Remote is collecting measurement information and not connected to a PC USB port, you must power the Remote with the USB AC adapter supplied with the Remote.

Read Switch

In order to use a read switch with the RS-232 Remote, you must use the [Extended Setup Program](#)¹³ to configure the read switch operation. Typically, a serial command must be programmed to the read switch that would prompt the gage to send data. The serial command varies by each gage and the gage's user manual should have a list of serial commands.

Associate & Test Button

The Associate & Test button can perform several different functions based upon how long the button is pressed and whether the Reset button is pressed. The functions available for the button are:

- Pair the Remote with a Base. This function uses this button and the Reset button. Refer to the [Pairing](#) ³³ section for more detail.
- Take a test reading. Press and release (within 2 seconds) the Associate & Test button to take a test reading and send to the paired Base. In order to take a test reading, you must have used the Extended Setup Program to enable the read switch and to define the read switch operation. This function is designed for testing only. The duty cycle of the Pairing & Test button is not designed for thousands of readings.
- Send the string "Test Packet from RS-232 Remote" to the paired Base. The Associate & Test button must be held for 10 seconds before this string will be sent.

4.3.1 AutoBaud

Automatic Baud Rate Detection (AutoBaud) is a feature of the RS-232 Remote that analyzes a sample data packet from a connected serial device to detect the baud rate and communication parameters. The RS-232 Remote then sets the serial devices baud rate and comm parameters on the Remote for future use. The serial device must be able to send a data packet from a button from the device for AutoBaud to function.

Automatic Baud Rate Detection (AutoBaud) Process:

1. Press and release the Reset Button on the back of the Remote.
2. The Remote will reset and go through an initialization phase. The right LED stack will be illuminated (red, yellow, green), the left LED stack will flash all 3 green LEDs once.
3. The Remote will then enter AutoBaud mode for ~5 seconds. This is indicated by illuminating all 6 LEDs.
4. During AutoBaud mode, send a reading to the RS-232 remote by pressing the print or send button on the serial device.
5. The RS-232 Remote will automatically detect the baud rate and comm parameters if a full data packet with multiple characters is received during the AutoBaud Mode. If successful, the Lower Right (Pwr) LED will blink 5 times.
6. The RS-232 Remote will automatically set the baud rate and comm parameters detected for the Remote. These settings will remain until they are changed by another AutoBaud calculation, the Extended Setup Program, or a cold start (<Z computer command).

If the Remote does not receive RS-232 data, the Remote will exit the AutoBaud mode after 5 seconds and restore the previously stored parameters.

5 Mobile Module Transmitters

The Mobile Modules are portable battery operated transmitters that are typically used with hand gages such as calipers, micrometers, digital indicators, etc. Support is provided for digital and RS-232 gages and devices. The MobileCollect Mobile Modules support more gages than wireless systems from other manufacturers. Gage manufacturers supported included Brown & Sharpe, CDI, Fowler, Insize, LMI, Mahr Federal, Mitutoyo, Ono Sokki, Starrett, Sylvac, and more!

The MobileCollect Mobile Modules include the following models.

[Mini Mobile Module](#) ⁵¹

This Mobile Module is less than half the size (measured on a volume basis) of a Command or RS-232 Mobile Module. The Mini Mobile Module supports digital gages and some RS-232 devices (devices that output at TTL voltage levels).

[Command Mobile Module](#) ⁵⁶

This Mobile Module supports the same gages as the Mini Mobile Module. The Command Mobile Module has the ability to receive wireless read and sleep commands from a MobileCollect Base.

[RS-232 Mobile Module](#) ⁷⁵

This Mobile Module is used for gages and devices that provide full RS-232 level signals. Digital gages are not supported by this Mobile Module.

The following sections cover the features and operations that are common to all of the Mobile Modules. Refer to the sections covering the Mobile Modules for a description of the unique features and operation of each of the Mobile Modules.

The enclosures used for the Command and RS-232 Mobile Modules are the same. The enclosure used for the Mini Mobile Module is smaller than the Command Mobile Module enclosure.

5.1 Operation

Features common to all of the Mobile Modules are discussed in this section. Refer to the [Mini Mobile Module](#) ⁵¹, [Command Mobile Module](#) ⁵⁶ and [RS-232 Mobile Module](#) ⁷⁵ sections for the unique features of the Mobile Module.

5.1.1 Buttons & LEDs

The Mobile Modules contains 2 push buttons and 2 LEDs. Each of the LEDs can display a red or green color. The picture below shows the location of the buttons and LEDs for a Mini Mobile Module. The layout of the LEDs and buttons are the same for the Command and RS-232 Mobile Modules.



Mobile Module Buttons and LEDs

When the LEDs are off, the lenses over the LEDs will appear clear. When an LED is turned on, it will be a bright red or green as shown in the picture.

The 2 push buttons are located along the top edge of the Mobile Module just to the right of the gage cable. There may also be a third button on your gage cable. Depending on the brand of gage, you may or may not be able to use the button on the gage cable to take a reading. Refer to [Getting a Reading from Your Gage](#)⁴⁹ for more information.

Setup Button

The Setup button is used for setup functions, resetting the Mobile Module and entering the firmware update mode. These functions also require the use of the Read button

Read Button

The Read button is mainly used to wake up the Mobile Module and get a reading from the device connected to the Mobile Module. The Read button is also used in conjunction with the Setup button for the functions described above under Setup Button.

Gage Read LED

The Gage Read LED is a bi-color LED that can display red or green. This LED is primarily used to indicate a reading was obtained from the connected device. When a reading is obtained, the LED will display red for about 150 msec and then turn off. Refer to the [LED Codes](#)⁵⁰ section for more information about the LED blink codes.

Host Accept LED

The Host Accept LED is a bi-color LED that can display red or green. This LED is primarily used to indicate the reading was received by the Base. When the Mobile Module receives the acknowledgment from the Base, the LED will display green for about 150 msec and then turn off. Refer to the [LED Codes](#)⁵⁰ section for more information about the LED blink codes.

5.1.2 Batteries & Battery Life

All of the Mobile Modules use disposal lithium batteries. The Mini Mobile Modules uses a CR2032 coin cell and the other Mobile Modules (Command and RS-232) use a CR2 Photo lithium battery. These batteries are commonly available and you do not have to order replacement batteries from MicroRidge.

The battery life for the Mini Mobile Module was determined through actual battery life testing. There are many factors that can affect the Command and RS-232 Mobile Module battery life. The battery life for the RS-232 Mobile Module is greatly reduced for those gages that require the Mobile Module to keep the serial port powered up even when you are not getting a reading from the gage.

| Mobile Module | Battery P/N | Battery Capacity | Battery Life | Comments |
|---------------|-------------|------------------|-------------------------|--|
| Mini | CR2032 | 240 mAh | 500,000 readings | Frequent use of Setup Mode and doing firmware updates will reduce battery life. |
| Command | CR2 | 800 mAh | Depends on Module usage | Use of command function will reduce battery life. |
| RS-232 | CR2 | 800 mAh | Depends on Module usage | Some RS-232 devices require Module to remain on. Battery life can be very different for various gages. |

Battery Voltage Levels

The radios used in MobileCollect require a battery voltage between 1.8 and 3.6. The voltage of a brand new battery will be about 3.2 volts. When the battery voltage approaches 2.0 volts, you should

replace the battery. The Mobile Module will blink the red gage read LED (●) 6 times after it gets a reading to indicate that the battery should be replaced.

5.1.3 Mobile Module Pairing

A Mobile Module must be paired with a Base before the Base will accept measurements from the Mobile Module. The pairing information (RF channel number, Base network serial number and Base PAN ID) are stored in the Mobile Module. When the Mobile Module sends a measurement to a Base, the address information for the target Base is included in the wireless packet. The wireless packet sent by a Mobile Module may be received by several Bases; however, only the Base that matches the pairing information will process the measurement packet.

There are 3 methods that can be used to pair a Mobile Module with a Base.

- Pairing-on-the-fly.
- Use the [Xpress Setup Program](#)¹³ for the Mini and RS-232 Mobile Modules.
- Use the [Extended Setup Program](#)¹³ for the Mini, Command, and RS-232 Mobile Modules.

Mobile Module Setup Mode

All of the Mobile Module pairing methods require the Mobile Module to be placed into the Setup Mode. To put the Mobile Module into the Setup Mode follow the steps below:

- Press and hold the Setup button. The Setup button is the button closest to the gage cable and is gray on newer Mobile Modules
- While holding the Setup button, press the Read button.
- Once both LEDs start to flash, release the Setup button.
- When the Setup Mode is active, both LEDs will flash rapidly. The left LED is red and the right LED is green.

Pairing-on-the-Fly for MobileCollect Mobile Module - Full Size Bases (Legacy and EVO)

This is a very quick and easy method used to pair a Mobile Module with a Base. With this method, no setup software is required. This method can be used with Legacy or EVO USB Bases, RS-232 Bases, and Wedge Bases. This method cannot be used with any of the MicroBases since the MicroBase does not have a Reset button.

1. Be sure no other Transmitters are sending measurements to the Base.
2. Put the Mobile Module into the Setup Mode.
3. Press and release the Reset button on the back of the Base.
4. When the left status LEDs (green/green/green) go out and the right LEDs (red/yellow/green) are all on, press and release the Setup button on the Mobile Module.
5. If the pairing was successful, the LEDs (red/green) on the Mobile Module will blink 5 times and all of the Base LEDs, except for the green Pwr LED will be off.
6. If the Base does not receive a pairing request, it will automatically exit the pairing mode after 10 seconds.

Pairing-on-the-Fly for MobileCollect Mobile Module - MicroBases (Legacy and EVO)

This is a very quick and easy method used to pair a Mobile Module with a MicroBase. With this method, no setup software is required. This method can be used with all the Legacy and EVO MicroBase models.

1. Be sure no other Transmitters are sending measurements to the MicroBase.
2. Put the Mobile Module into the Setup Mode.
3. Unplug and replug the MicroBase to enter the start up sequence.
4. When all LEDs (red/yellow/green) are all on, press and release the Setup button on the Mobile Module.
5. If the pairing was successful, the LEDs (red/green) on the Mobile Module will blink 5 times and on the MicroBase the Red and Yellow LEDs will turn off in sequence. After pairing, only the Green LED will be lit on the MicroBase.
6. If the Base does not receive a pairing request, it will automatically exit the pairing mode after 10 seconds.

Pairing by Using the MobileCollect Xpress Setup Program




Using the [Xpress Setup Program](#)¹³ allows you to pair a Mobile Module with a Base and perform other Mobile Module configuration steps. This Setup Program covers the features required by most users.

Pairing by Using the MobileCollect Extended Setup Program

Using the [Extended Setup Program](#)¹³ allows you to pair a Mobile Module with a Base and perform other Mobile Module configuration steps. This Setup Program provides access to all of the MobileCollect setup features.

5.1.4 Resetting to Defaults







You can use the Setup and Read buttons to reset the parameters in a Mobile Module back to the factory defaults. To reset the parameters, follow the steps below. This procedure requires that you keep the Setup button pressed during the entire process.





- Press & hold the Setup button. The Setup button is the button closest to the gage cable.
- While you continue to press the Setup button, press and release the Read button.
- Continue to keep the Setup button pressed and the Host Accept LED should be .
- After about 10 seconds, the Gage Read  and Host Accept  LEDs will alternately flash. Once this flash begins, you can release the Setup button.
- When all of the LEDs remain off, the parameters in the Mobile Module have been reset to the factory defaults. Transmitters must be re-configured and re-paired.

5.1.5 Firmware Update Mode

If you are going to update the firmware in a Mobile Module, you must put the Mobile Module into the Firmware Update Mode. Once the Mobile Module is in the Firmware Update Mode, you have about 20 seconds to start the firmware update process. Refer to the [Firmware Updates](#)⁹² section for more information.

To enter the Firmware Update Mode, follow the steps below.

- Press & hold the Setup button. The Setup button is the button closest to the gage cable.
- While you continue to press the Setup button, press and hold the Read button. The LEDs will flash 4 times then stay on solid.
- Continue to keep the Setup and Read buttons pressed. The Gage Read LED should be  and the Host Accept LED should be .
- After about 10 seconds, both LEDs will turn off and you should then release both of the buttons.
- After the buttons are released, both LEDs will alternate between   and  . You now have about 20 seconds to start the firmware update process.
- If you do not start the update process within the allotted time, the Mobile Module will reset all of its parameters and return to normal operation.

If the firmware update process fails once it has started, the Mobile Module will turn off and the Firmware Update Mode will stay enabled. You must successfully complete the firmware update process before you will be able to use the Mobile Module. To retry the firmware update process, press any button on the Mobile Module and both LEDs will alternate between   and  . You now have about 20 seconds to start the firmware update process.


5.1.6 Restricted Mode

The Read button on the Mobile Module can be used to acquire a reading from the connected gage. If the user is wearing gloves when the Read button is pressed, it is possible that the user may actually press the Setup button and then press the Read button. When the user presses the Setup/Read button combination, the Mobile Module will enter the Setup Mode. To eliminate the problem of entering the Setup Mode while wearing gloves, the Setup button mode of operation can be changed from Standard to Restricted.

When the Setup button is in the Restricted mode of operation, the Setup button must be pressed for over 10 seconds before the Setup Mode can be entered. If the Read button is pressed, within 10 seconds of pressing the Setup button, the Setup button press is ignored and the Mobile Module will request a reading from the gage.

Switching between the Standard and Restricted modes for the Setup Button (Firmware Version 5.15 and later)

To switch the Setup button between the Standard and Restricted modes of operation, follow the steps below:

Press and hold the Setup button. The Host Accept LED will display green (O)

- After 10 seconds, the Host Accept LED will turn off (OO). Continue to press the Setup button.

- If the Setup button is in the Restricted mode, the following will occur
 - After 1 second, both the Gage Read & Host Accept LEDs will display green (●●). Continue to press the Setup button.
 - After 3 seconds, both LEDs will turn off (OO). Continue to press the Setup button.
- After 1 second, both the Gage Read & Host Accept LEDs will display red (●●). Continue to press the Setup button.
- The red LEDs will be on for up to 3 seconds. While the red LEDs are on, press and release the Read button. The red LEDs will turn off and the Setup button will be in the Restricted mode of operation.

Remembering How to Switch the Setup Button Between Restricted & Standard Modes

The steps above show the LED states and the timing used by the Mobile Module to switch between the Standard and Restricted modes. This actually looks more complex than it really is. The easiest way to remember how to switch the Setup button modes of operation is as follows:

- Press and hold the Setup button.
- After about 13 or 15 seconds, both LEDs will display red (●●). To switch the Setup button mode of operation, press & release the Read button while both red LEDs are on.

Entering Setup Mode when Setup Button is in the Restricted Mode

If the Setup button is in the Restricted mode of operation, follow the steps below to enter the Setup Mode

- Press and hold the Setup button.
- After about 11 seconds, both LEDs will display green (●●). Press & release the Read button to enter the Setup Mode.

5.1.7 Getting a Gage Reading

To get a gage reading from a gage or serial device connected to a Mobile Module you must press a Read button. A Read button is located on the Mobile Module, and additional Read buttons may be located on the gage cable and on the serial device. Additional setup is often required for an RS-232 Mobile Module to receive information from the connected serial device.

The Mobile Module may not support the use of all of the available Read buttons. The table below provides a summary of the available Read buttons that can be used with the Mini, Digital and Command Mobile Modules. For the handheld gages like calipers, micrometers and digital indicators, you can always use the Read button on the Mobile Module.

| Gage Manufacturer & Type | Read Button on Gage Cable | Active Read Buttons | | | Comments |
|--------------------------|---------------------------|---------------------|------------|----------------|--|
| | | Mobile Module | Gage Cable | Button on Gage | |
| Brown & Sharp Opto | No | X | | | |
| Fowler Opto | No | X | | | |
| LMI | No | X | | | |
| Mitutoyo | Yes | X | X | | Use what is the most convenient. |
| Mahr Federal | No | X | | | Cannot use read button on gage or cable. |
| Starrett TTL | Yes | X | X | | Mobile Module button may be easier to use. Cannot use gage cable button with Mini Mobile Module. |
| Starrett Opto | No | X | | | |
| Sylvac Opto | No | X | | | |

5.1.8 LED Codes

There are several LED blink sequences associated with the Mobile Module. These blink sequences provide information to the user about measurement transfer, wireless transmission failure, low battery, etc. Normally the user only needs to be concerned with the single red blink when a gage is read and the single green blink when the Base sends an acknowledgement to the Mobile Module.

The railroad blinks shown in the following table refer to a rapid back and forth blinking of a red and green LED. The pattern is similar to a railroad crossing with 2 flashing red lights.

| Item | Gage Read LED | | Host Accept LED | | LED Action |
|---|---------------|-------|-----------------|-------|--|
| | Red | Green | Red | Green | |
| Obtained reading from gage | X | | | | LED on for about 150 msec |
| Could not get gage reading | X | | | | 2 blinks |
| Received acknowledgment from the Base that the reading was accepted. This LED blink can only occur after reading was obtained from the gage. | | | | X | LED on for about 150 msec |
| Did not receive acknowledgment from the Base that the reading was accepted. This LED blink can only occur after reading was obtained from the gage. | | | | X | 5 blinks |
| The Mobile Module is not paired with a Base. This LED blink can only occur after reading was obtained from gage. | | | X | | 5 blinks |
| Enter Setup mode | X | | | X | 5 blinks |
| Exit Setup mode | X | | | X | 3 blinks |
| Low battery warning | X | | | | 6 blinks after gage reading LED goes off |
| Press read button with no gage cable connected. This is a warm start | X | X | X | X | Both green LEDs blink once |
| | X | | | X | Both red LEDs blink once |
| Cold start (all EEPROM values set to defaults) | X | X | X | X | 4 read/green railroad blinks |
| | X | | | X | 31 red/green railroad blinks |
| | X | | | X | Both green LEDs blink once |
| Boot loader mode. Mobile Module waiting for new firmware upload. | X | X | X | X | Both red LEDs blink once |
| | X | | | | 4 read/green railroad blinks |
| Radio initialization failed. Can only occur after a restart. | X | | X | | Both green LEDs blink once then both red LEDs blink once. Process repeated for up to 25 seconds. |
| | X | | X | | 20 red/red railroad blinks |

5.2 Mini Mobile Module

The Mini Mobile Module is used to capture measurements from virtually any handheld digital gage and many handheld serial gages. The Mini Mobile Module supports gages from Brown & Sharpe, CDI, Fowler, Mahr Federal, Mitutoyo, Ono Sokki, Starrett, Sylvac, etc. Other manufacturers also make gages that have compatible outputs and these gages can also be used with the Mini Mobile Module.



Mini Mobile Module with Mitutoyo Caliper Cable

Digital Gages

Digital gages are gages that have outputs that are not RS-232 compatible. The output from these gages consists of 1 or more data lines and a clock line. Unlike RS-232 devices that output data at a uniform rate, the output data rate from a digital gage can be quite variable. The most common gage manufacturers that have gages with digital outputs include, CDI, Mitutoyo, Insize, etc.

Serial Gages

The Mini Mobile Module also supports 2 types of RS-232 gages.

- Gages that use an Opto RS-232 cable can typically be used with the Mini Mobile Module. Gages that use the Opto RS-232 cable are available from companies such as Brown & Sharpe, Fowler, Starrett, Sylvac, etc.
- Gages that supply an RS-232 output signal that ranges from 0 to 3.3 volts can typically be used with the Mini Mobile Module. Gages with this type of output are supplied by manufacturers such as Mahr Federal, Starrett, etc.

Gages that have standard RS-232 output signals (typically +/- 5 volts or more) cannot be used with the Mini Mobile Module. These gages with standard RS-232 output levels must be used with the [RS-232 Mobile Module](#)⁷⁵.

Differences Between the Mini and Command Mobile Module

The Mini Mobile Module and the Command Mobile Module are very similar. The primary differences between these 2 Mobile Modules are listed below.

- The Mini Mobile Module is less than half the size (measured on a volume basis) of a Command Mobile Module.
- The Command Mobile Module automatically detects the type of gage cable connected. The user must specify (with one of the Setup Programs) the type of gage cable connected to a Mini Mobile Module. Experience has shown that the type of gage cable connected to a Mobile Module is rarely changed.
- Most of the gages supported by the Command Mobile Module are also supported by the Mini Mobile Module. A few of the less frequently used gages are not supported by the Mini Mobile Module.
- The gage cables used by the Command Mobile Module cannot be used with the Mini Mobile Module.
- Commands can be sent from a Base to get a reading from a Command Mobile Module. To get a reading from a Mini Mobile Module, you must press the read button on the Mobile Module or the gage cable (Mitutoyo only).

Gage Cables

There is a very broad range of gage cables that are used to connect the Mini Mobile Module to your gage. Cables are available in lengths from a few inches up to 6 feet. The MobileCollect Selection Tool shows the gage cables required for most of the supported gages. This Selection Tool can be downloaded at: <https://www.microridge.com/mobilecollect-wireless/setup-programs-utilities/mobilecollect-selection-tool/>

When you connect a gage cable to the internal Mini Mobile Module gage cable connector, the Mini Mobile Module does not automatically detect the type of cable. If the new cable you are connecting to a Mini Mobile Module is for a different type of gage output, you will have to use one of the [Setup Programs](#)¹³ to identify the type of cable you are using.

Mobile Module Setup

Typically, the only setup required for a Mini Mobile Module is to pair the module with the target Base. To pair a Mobile Module with a Base, follow the procedures in the [Mobile Module Pairing](#)⁴⁵ section.

Other setup items that you may need to configure for a Mini Mobile Module are continuous read, TIR and module label. To configure these items in the Mobile Module, you must use the [Xpress Setup Program](#)¹³ or the [Extended Setup Program](#)¹³.

5.2.1 Installation on a Caliper

When the Mini Mobile Module is used with a caliper, it is typically mounted on the back side of the caliper as shown in the illustration below.



Mini Mobile Module Mounted on a Caliper



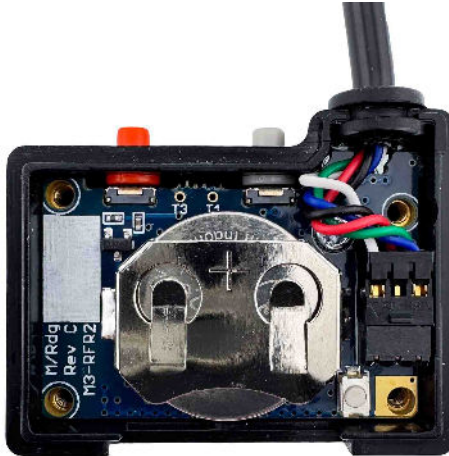
Recommended Adhesive Placement on Module

The Mobile Module should be mounted so that the 2 LEDs are visible along the top edge of the caliper. These LEDs are used to notify the user that the gage was read and the data was received by the Base. When mounted in this fashion on a caliper, you can still gain access to the batteries and replace the gage cable without having to remove the Mobile Module from the caliper.

The Mobile Module should be attached to the caliper with the included Dual Lock adhesive strips as shown above.

5.2.2 Gage Cable Replacement

The gage cable should be installed as shown in the photo below. The wires coming from the black grommet should clear the threaded insert and not interfere with the battery holder.



Mini Mobile Module Gage Cable

To replace a gage cable, follow the steps below:

- Remove the Mobile Module cover with a #2 Phillips screwdriver.
- Note how the current gage cable is installed.
- Ground yourself to eliminate any static charge.
- Remove the current gage cable by pulling up on the wires going into the connector.
- **Inspect the new gage cable to locate the very small tab located at the edge of the connector that connects to the pins in the Mobile Module. This tab must be up when you install the cable. The cable cannot be installed with this tab facing downward.**
- Install your new gage cable.
- Replace the Mobile Module cover. Do not over-tighten the screws.

If you have installed a cable for a gage that has a different type of output than the previous cable, you will have to use a [Setup Program](#)¹³ to identify the gage type for the Mini Mobile Module. A few examples are shown below.

- Previously you had a cable that connected to a Mitutoyo caliper. The new cable you installed is for a Mahr-Federal uMaxum II. You will have to use a Setup Program to identify the gage type.
- Previously you had a cable that connected to a Mitutoyo caliper. The new cable you installed is for a Mitutoyo digital indicator. Since the Mitutoyo Caliper and Mitutoyo digital indicator have the same output format, no additional setup is required.

5.2.3 Battery Replacement

The battery and gage cable can be accessed by removing the Mobile Module top cover held in place by 4 screws.

Caution: The components within the Mobile Module are subject to damage as a result of static electricity. Be sure to ground yourself before touching any component within the Mobile Module.

Battery

The battery used by the Mini Mobile Module is a CR2032, 3 volt lithium coin cell battery. The Mobile Module case shown in the picture below has the battery removed and is shown with the positive (+) terminal facing upward. To install the battery, slide the battery into the battery holder from the bottom edge of the case.

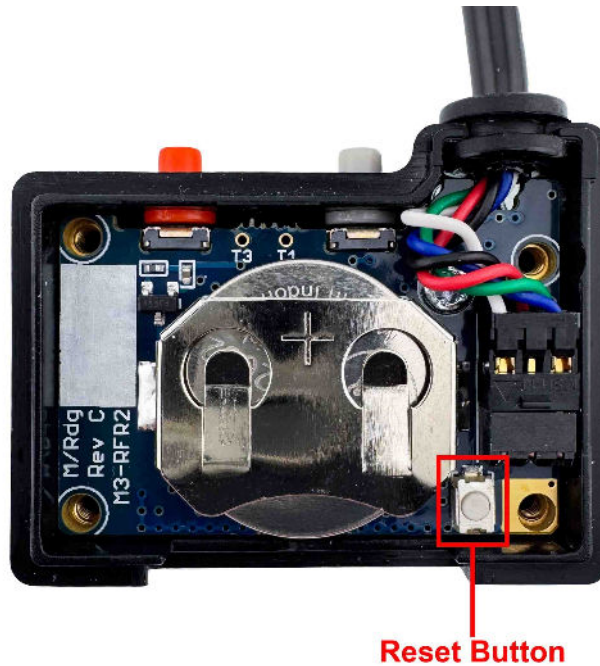
When installing a battery, be sure the positive (+) side of the battery is facing upward.



Mini Mobile Module- No Battery

5.2.4 Reset Button

The Mini Mobile Module contains a Reset button as shown below.



Mini Mobile Module and Internal Reset Button

Pressing the Reset button causes the Mobile Module to reboot and restart the firmware. This restart process does not reset the parameters to the factory defaults. If you are working with MicroRidge Technical Support, you may be instructed to use this Reset button as part of a troubleshooting procedure.

5.3 Command Mobile Module

The Command Mobile Module allows you to send commands from a Base to the Command Mobile Module. These commands include the ability to tell the Mobile Module to initiate a gage reading, tell the Mobile Module to go to sleep, etc. By default, the command functionality is disabled in the Command Mobile Module. Even when the command functionality is enabled, the Command Mobile Module has all of the features and functions of the Mini Mobile Module. A Command Mobile Module can only be controlled by any Legacy or EVO Base.



This command functionality can be configured with the [Extended Setup Program](#)¹³. If a Command Mobile Module is configured with the Xpress Setup Program, the command functionality will be disabled. Refer to the MobileCollect Extended Setup User's Guide for more information.

Methods for Sending Commands

The Base can be told to send a command to the Command Mobile Module through a command from the host computer or by pressing a read switch connected to the Base. When you use commands from a host computer to control a Command Mobile Module, you have access to a very broad range of features and functionality. When you use a read switch or switches to control a Command Mobile Module, you are restricted to a more limited set of features. However, in most applications, you will find that the read switch approach gives you access to the features you really need to use. For the more complex applications, you may find that you need the flexibility that sending commands from the host computer provides. The function of the read switches are defined through the MobileCollect [Extended Setup Program](#)¹³. Refer to the MobileCollect Extended Setup User's Guide for more information.

Base Read Switches

The Legacy and EVO MobileCollect full size bases come with a single read switch connector for a foot or hand switch. The Legacy/EVO MicroBase does not contain any foot or hand switch connectors. There is an option to increase the number of read switch connectors on front panel of the full size bases from 1 to 4. [Contact MicroRidge Systems](#)⁹⁶ about increasing the number of read switch connectors.

5.3.1 Module Setup & Operation

When a Command Mobile Module is shipped from MicroRidge, the command functionality is disabled. To configure a Command Mobile Module use the [Extended Setup Program](#)¹³.

Pairing with Base

In order for the Command Mobile Module to send measurement data to a Base, it must be paired with the Base. If you are using a read switch connected to a Base to control the Command Mobile Module, you must pair the Command Mobile Module as outlined in the [Mobile Module Pairing](#)⁴⁵ section. If you are sending commands from a host computer, it is possible to pair the Command Mobile Module using the appropriate command. Refer to the [Commands for Command Mobile Module](#)⁶¹ section for a listing of the available commands.

Module ID & Base Setup Tab

If the Command Mode is enabled and you are sending commands to the Command Mobile Module, you must enter the Command Mobile Module ID on a channel using the [Extended Setup Program](#)¹³. This Module ID is entered in the Module ID column on the Base Setup tab.

Modes of Operation

There are 5 different modes of operation that are used by the Command Mobile Module. Some of these modes can be controlled with the Setup button on the Command Mobile Module. The modes can also be controlled by the Extended Setup Program or commands sent to the Base from the host computer. Each of the modes of operation are described below.

| | |
|----------|---|
| Disabled | The command mode is disabled and cannot be used. By default, the command mode is disabled. This mode can only be toggled between enabled and disabled in the Extended Setup Program. If a Command Mobile Module is configured with the Xpress Setup Program ¹³ , the command mode will be disabled. |
| Off | The command mode is enabled, but the Mobile Module is currently turned off. The only way to start the command mode is to press & release the Setup button. When the Setup button is pressed & released, the Command Mobile Module will enter the Active Mode. The Command Mobile Module must not be in the Setup mode when you try to enter the Active mode. |
| Active | This is the mode that is used to get measurements from the attached gage and send them to the Base. When the Command Mobile Module is in this mode, the Command Mobile Module will wake up every 0.5 seconds and listen for 0.050 seconds for a command from the Base. Each time the Command Mobile Module wakes up to listen, the green Host Accept LED will quickly flash. If the Command Mobile Module receives a command from its paired Base, the green Gage Read LED will turn on. If the Setup button is pressed & released, the Command Mobile Module will remain in the Active Mode and restart its timeout timer. |

| | |
|------------------|--|
| Standby | <p>The Standby mode is designed to be a power saving mode. No gage reading can be obtained when the Command Mobile Module is in this mode. This mode can only be entered with a command from the paired Base. This command can come from the host computer⁷² or it can be initiated by pressing a read switch connected to the Base⁷². When the CMM is in the Standby mode, the CMM will wake up every 10 seconds and listen for 0.050 seconds for a command from the Base. To help the user know that the CMM is in the Standby mode, the CMM will blink LEDs every 2 seconds. If both green LEDs (Gage Read & Host Accept) blink, the CMM is just notifying the user that the CMM is enabled. When the CMM actually listens for a command from the Base, only the green Host Accept LED will blink. If you press the Setup button when the CMM is in the Standby mode, the CMM will switch to the Active mode and restart its timeout timers.</p> |
| Extended Standby | <p>The Extended Standby mode is designed to be a power saving mode. No gage reading can be obtained when the CMM is in this mode. This mode can only be entered with a command from the paired Base.⁶¹ This command must come from the host computer. When the Command Mobile Module is in the Extended Standby mode, the Command Mobile Module will wake up every 60 seconds and listen for 0.050 seconds for a command from the Base. To help the user know that the Command Mobile Module is in the Extended Standby mode, the Command Mobile Module will blink LEDs every 4 seconds. If both green LEDs (Gage Read & Host Accept) blink, the Command Mobile Module is just notifying the user that the Command Mobile Module is enabled. When the Command Mobile Module actually listens for a command from the Base, only the green Host Accept LED will blink. If you press the Setup button when the Command Mobile Module is in the Extended Standby mode, the Command Mobile Module will switch to the Active mode and restart its timeout timers.</p> |

Mobile Module Push Buttons

The 2 push buttons (Setup & Read) on the Command Mobile Module support all of the functions of the Mini Mobile Module. In addition to these functions, the Setup button is also used to control the Command Mobile Module command mode.

- To exit the current command mode and enter the Off mode, press and hold the Setup button for 5 seconds. When you press the Setup button, the green Host Accept LED will turn on. When the green Host Accept LED turns off, the Command Mobile Module has entered the Off command mode.
- To enter or restart the Active mode, press and release the Setup button. When you press and release the Setup button, the timeout times are also reset.

When using the Setup button to control Command Mobile Module functions, the Command Mobile Module must not be in the Setup Mode.

Timeout Timers

The Active, Standby and Extended Standby modes have a timeout timer that controls when the Command Mobile Module will exit its current mode and go to the Off mode.

| Mode | Wakeup Interval | Default Timeout | Description |
|------------------|-----------------|-----------------|---|
| Active | 0.5 seconds | 10 minutes | The mode used for measurement taking. This mode wakes up every 0.5 seconds. |
| Standby | 10 Seconds | 5 minutes | Power saving mode that listens for a Base command every 10 seconds. |
| Extended Standby | 60 seconds | 3 Minutes | Power saving mode that listens for a Base command every 60 seconds. |
| Keep Awake | -- | 2 seconds | Maximum amount of time a Command Mobile Module will stay awake after it receives a command from the Base. This waiting period should be sufficient to receive and process all the commands from a Base. |

When a Command Mobile Module receives a command from a Base, the Command Mobile Module will reset its timeout timers. For example, let's assume the Command Mobile Module is in the Active mode and the Active timeout is set to 15 minutes. If you always send a command to the Command Mobile Module every 12 minutes, the Command Mobile Module will never turn off. If you stop sending commands to the Command Mobile Module, the Command Mobile Module will enter the Off mode after 15 minutes.

To maximize the battery life of the Command Mobile Module, you should keep the timeout values as low as possible. If a Command Mobile Module does go into the Off mode, you must press the Setup button on the Command Mobile Module to wake it up and put it into the Active mode.

The wakeup times are set in the CMM Controls section on the Home tab of the Extended Setup Program.

Sending Commands from a Base to a Command Mobile Module

It is important to understand how long a Base is actually sending commands to a Command Mobile Module. If the Base has been instructed to communicate with a Command Mobile Module that is in the Active mode, the Base will send out a series of Attention commands for a period of about 0.6 seconds. Since the Command Mobile Module only wakes up and listens every 0.5 seconds, the commands from the Base must be broadcast for a period slightly longer than 0.5 seconds. The commands actually sent from the Base take about 0.001 seconds (1 msec) to send and this transmission is repeated about every 0.010 seconds (10 msec) for the 0.6 seconds.

If the Base is trying to send commands to a Command Mobile Module that is in the Extended Standby mode, the Attention commands must be sent for a period of just over 60 seconds.

RF Channel

It is recommended that you use a unique RF channel for each Base and the Command Mobile Modules that are being controlled by the Base. If you are only using a single Base in your facility, using the default channel 21 would be OK. If you have 2 Bases controlling Command Mobile Modules and these Bases are located within a few hundred feet of each other, you should use a different RF channel for each Base and its Command Mobile Modules. By using separate RF channels, you eliminate the conflicts that can occur when a Base is sending attention commands to a Command Mobile Module. Remember, that when a Base is trying to communicate with Command Mobile Modules that are in the Extended Standby mode, the Base will be sending attention commands for just over 60 seconds.

5.3.2 Base Setup & Operation

The Base is used to set the Command Mobile Module timeout times and control a Command Mobile Module. By default, the Base is enabled to control a Command Mobile Module. To control a Command Mobile Module, you must send specific commands to the Base from the host computer or [configure read switches](#)⁷² for sending commands. The following sections describe the Command Mobile Module commands and their usage.

When using a Mini Mobile Module, you can make use of the Global channel for pairing and do not need to define the Mobile Module ID on a specific channel in the Base Setup Tab of the [Extended Setup Program](#)¹³. For the Command Mobile Module, you must define the Module ID for each Command Mobile Module on a different channel in the Base Setup & Pairing Tab of the Extended Setup Program.

5.3.2.1 Commands for Command Mobile Module

The commands that can be sent to a Base from the host computer to control the operation of a Command Mobile Module are listed below. In most cases the Command Mobile Module must be paired with the Base before the Command Mobile Module will process the command from the Base.

Sending commands to a Command Mobile Module is a 2 step process. You must first define the information that is to be sent and then you must tell the Base to send the information to the Command Mobile Modules.

Read Commands

The read commands are used to define what channels you want to get readings from.

| | |
|--------------|---|
| Description: | Get a number of readings (nn) from channel xx |
| Command: | <@Rnnxx |
| Parameters: | nn = Number of readings, 00 to 99 00 = Remove previous read request 01 = Single reading 14 = 14 readings as fast as possible xx = * for all channels or 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.) |
| Other Info: | Read request is sent to Command Mobile Modules when Base receives <@PR command. Command Mobile Modules must be in Active mode. |
| Example: | To get a single reading from each Command Mobile Module paired with a Base, send the following commands from the host computer to the Base: <@R01* <@PR |

| | |
|--------------|--|
| Description: | Number of times to repeat read command |
| Command: | <@Nnnn |
| Parameters: | nnn = Number of time to repeat the read command, 001 to 100 |
| Other Info: | You must also define what channels to read with the <@Rnnxx command. Request is sent to Command Mobile Modules when Base receives <@PR command. Command Mobile Modules must be in Active mode. |

| | |
|--------------|--|
| Description: | Send read request to Command Mobile Modules |
| Command: | <@PR |
| Parameters: | None |
| Other Info: | Command Mobile Modules must be in Active mode. Command Mobile Module Active timeout timer is reset when Command Mobile Module receives this command. |

Output Format

Set the output format to be used for all channels.

| | |
|--------------|---|
| Description: | Set output format for all channels |
| Command: | <@Fxx |
| Parameters: | <p>xx = Output format</p> <p>00 = Disabled, used what is defined in Setup program</p> <p>01 = Measurement (10 char), Channel number (2 char), Module ID (6 char), Units (4 char), Battery voltage (4 char), Signal strength (3 char), Attempts (1 char)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> <p>02 = Measurement (10 char), Module ID (6 char)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> <p>03 = Measurement (10 char), Channel number (2 char)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> <p>04 = Channel number (2 char), Measurement (10 char)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> |

Base Setup Tab

These commands can be used to configure parameters in the Base Setup Tab.

Description: Add a Mobile Module ID to a channel

Command: <@Mxxiiiiii

Parameters: xx = 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.)
iiiiii = 6 character Mobile Module ID. Valid characters are 0 to 9 and A to F

Description: Remove the Mobile Module ID from a channel

Command: <@Exx

Parameters: xx = * for all channels or 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.)

Description: Set a channel as active or inactive

Command: <@Aaxx

Parameters: a = Active/Inactive state (0 = Inactive, 1 = Active)
xx = * for all channels or 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.)

Other Info: The channel must have a Mobile Module ID defined for the active/inactive state to be changed.

Status Information

Get status information from the Base.

| | |
|--------------|--|
| Description: | Send the battery status to the host computer in a table format |
| Command: | <@BT |
| Parameters: | None |
| Other Info: | <p>Output format:</p> <p>Channel (2 char), Module ID (6 char), Channel enabled flag (1 char), Last battery voltage (4 char)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> <p>If a Command Mobile Module is in the Active mode, the current battery voltage is obtained from the Command Mobile Module. If the Command Mobile Module is not in the Active mode or the Base has received a measurement on channels 1 to 20 from a Command Mobile Module, the voltage reported is the last voltage value received. No voltage is reported for the Global channel (channel 00).</p> |

| | |
|--------------|---|
| Description: | Get the Mobile Module ID and active status defined for each channel |
| Command: | <@lxx Note: The l in the command is a capital i. |
| Parameters: | xx = * for all channels or 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.) |
| Other Info: | <p>Output format:</p> <p>Channel number (2 char), Module ID (6 char), Active status (1 char, 0 = Inactive, 1 = Active)</p> <p>Each field is separated by a comma and a carriage return is sent at the end of the string</p> |

Description: Send the Command Mobile Module control queue to the host computer

Command: <@Qxx

Parameters: xx = * for all channels or 2 digit channel number (Chan 1 = 01, Chan 2 = 02, etc.)

Other Info: Output format:
Channel (2 char), Module ID (6 char), Channel enabled flag (1 char),
Read order (2 char), Number of readings (2 char), Last battery
voltage (4 char), Last reported mode (1 char), Pairing state (1 char)
Each field is separated by a comma and a carriage return is sent at
the end of the string

Description: Send the Command Mobile Module control queue to the host computer
in a table format for easy reading

Command: <@QT

Parameters: None

Other Info: The data provided is the same as provided by the <@Qxx command

Operational Modes

Change the operational mode of the Command Mobile Module and the Base.

| | |
|--------------|--|
| Description: | Set the Base operational mode. The mode will automatically be reset to Active after an <@PM is received by the Base. The Base operational mode will automatically be reset to Active after all other <@Pxx commands are processed by the Base. |
| Command: | <@CBn |
| Parameters: | n = New operational mode: A = Active mode S = Standby mode E = Extended standby mode |
| Other Info: | If you want to send a command to a Command Mobile Module that is in the Standby or Extended Standby, you must put the Base into the appropriate mode before the command is sent to the Command Mobile Module. |

| | |
|--------------|--|
| Description: | Set the Command Mobile Module operational mode. |
| Command: | <@CMniiiiii |
| Parameters: | <p>n = New operational mode:</p> <p>A = Active mode</p> <p>S = Standby mode</p> <p>E = Extended standby mode</p> <p>O = Turn the CMM off (this is a capital letter O)</p> <p>iiiiii = * for all CMMs or 6 character CMM ID. Valid characters are 0 to 9 and A to F</p> |
| Other Info: | <p>Read request is sent to Command Mobile Module when Base receives <@PM command. If you are setting the mode in individual Command Mobile Modules, you must send the <@PM command after each <@CMniiiiii command.</p> <p>Example:</p> <p>This will work: <@CMS* <@PM</p> <p>This will work: <@CMS6F647F <@PM <@CMSD5AEAE <@PM</p> <p>This will not work: <@CMS6F647F <@CMSD5AEAE <@PM (only D5AEAE get changed)</p> |

| | |
|--------------|---|
| Description: | Enable or disable the Base command mode. |
| Command: | <@Dn |
| Parameters: | n = Enable/Disable state (0 = Disabled, 1 = Enabled) |
| Other Info: | If the Base command mode is disabled, no <@Px command will be processed |

| | |
|--------------|---|
| Description: | Send the change mode request to Command Mobile Module(s) |
| Command: | <@PM |
| Parameters: | None |
| Other Info: | Be sure the Base has been set to the mode that matches the Command Mobile Module you are trying to send the command to. |

Change or Restart the Timeout Times

Change the Command Mobile Module timeout times or restart the timers.

Description: Change the timeout times for the Command Mobile Module Active, Standby or Extended Standby modes. When a Command Mobile Module does not receive any commands for the timeout time, the Command Mobile Module will go to the Off mode.

Command: <@Tmnnnn

Parameters: m = Operational mode:

A = Active mode

S = Standby mode

E = Extended standby mode

nnnn = Times in minutes

Active mode valid range = 0001 to 0500 minutes (8.33 hours)

Standby mode valid range = 0001 to 2000 minutes (1.39 days)

Extended Standby mode valid range = 0001 to 6000 minutes (4.17 days)

Other Info: If you want to reset the times for a Command Mobile Module that is in the Standby or Extended Standby mode, you must put the Base into the appropriate mode before the command is sent to the Command Mobile Module. The timeout times are included with all of the commands sent to Command Mobile Modules. You can send a <@PT to the Command Mobile Modules to update the times and restart the timers.

Example: The following commands will set the Active time to 20 minutes and the Standby time to 60 minutes. For this example, it is assumed that the Command Mobile Modules are currently in the Standby mode. After the <@PT command has been processed by the Base, the Base will return to the Active mode.

<@CBS <@TA0020 <@TS0060 <@PT

| | |
|--------------|---|
| Description: | Change the number of seconds the Command Mobile Module should stay awake after the Command Mobile Module receives an Attention command. |
| Command: | <@Knnn |
| Parameters: | nnn = Times in seconds. Valid range is 002 to 010. Factory default = 002. |
| Other Info: | <p>This is the amount of time a Command Mobile Module will stay awake after it receives a command from the Base the Command Mobile Module is paired with.</p> <p>This Keep Awake time is included with all of the commands sent to Command Mobile Modules.</p> <p>It is unlikely that you should ever need to change this time value.</p> |

| | |
|--------------|---|
| Description: | Send the reset timeout timers to all paired Command Mobile Modules |
| Command: | <@PT |
| Parameters: | None |
| Other Info: | Be sure the Base has been set to the mode that matches the Command Mobile Module you are trying to send the command to. |

Module Pairing

If you are not sending commands to the Command Mobile Module, you must pair the Command Mobile Module with the target Base by using the procedures outlined in the [Mobile Module Pairing](#)⁴⁵ section. If you will be sending commands to the Command Mobile Module, you must also enter the Command Mobile Module Module ID in the appropriate channel in the Base Setup Tab in the [Extended Setup Program](#)¹³. It is recommended that you use the Mobile Module Setup function in the Setup Program to pair a Command Mobile Module with the Base. When a Command Mobile Module is paired with a Base using the Setup Program, a file is created on your PC that allows you to select the Command Mobile Module Module ID from a list when entering the Module IDs in the Base Setup & Pairing Tab.

It is also possible to pair or unpair a Command Mobile Module with a Base through the use of a computer command.

| | |
|--------------|---|
| Description: | Pair/Unpair a Command Mobile Module with the current Base. |
| Command: | <@Laiiii |
| Parameters: | a = Pairing instruction (0 = Unpair from Base, 1 = Pair with Base) iiii = 6 character CMM ID. Valid characters are 0 to 9 and A to F |
| Other Info: | There is only a single buffer location in the Base for the Command Mobile Module ID (iiii in the <@Laiiii command). After sending each <@Laiiii command to the Base, you must then send a <@PS command. |

| | |
|--------------|--|
| Description: | Send the pairing command to the Command Mobile Module specified in the <@Laiiii command. |
| Command: | <@PS |
| Parameters: | None |
| Other Info: | Be sure the Base has been set to the mode that matches the Command Mobile Module you are trying to send the command to. |
| Example: | To pair the Remote with the Module ID of EC49A9 sent the following commands to the Base from the Host computer: <@L1EC49A9 <@PS |

5.3.2.2 Using Commands

You can use the commands in the previous section to control a Command Mobile Module. If you are using an off-the-shelf data acquisition program, you may be limited to (due to the typical limitations we see in these software packages) the number and types of commands that can be used. If you are developing your own application, you will be able to use any of the commands.

The easiest way to become familiar with these commands is to send the commands from [ComTestSerial](#)⁹¹ to the Base. Most of the commands for the Command Mobile Module must be sent with very little time gap between the characters. Normally you cannot type fast enough to send a completed command. When using ComTestSerial to send a command, you should enter the command in the Local commands window and then press the Send button to send the command to the Base.

You can also use read switches to tell the Base to send a command to the Command Mobile Modules. Refer to the [Using Read Switches](#)⁷² for more information.

5.3.2.3 Using Read Switches

Read switches connected to a full size Base can be used to control the operation of the Command Mobile Module. The Bases each contain a single read switch connector. There is an option to install 2 additional read switch connectors on each of these bases. [Contact MicroRidge](#)⁹⁶ if you need to increase the number of read switch connectors on a Base.

Read Switch Functions for Command Mobile Modules

The read switch functions that are available for controlling a Command Mobile Module are listed below. The function for each of the Base read switches is defined in the Read Switch Control dialog in the [Extended Setup Program](#)¹³.

| | |
|--------------------|---|
| Read channel C | Read the Command Mobile Module paired with channel C. C can be any channel from 1 to 4. |
| Read all gages | Get readings from all of the Active Command Mobile Modules paired with the Base. When you configure the read switch, you can specify from 1 to 99 readings. |
| Set all to Active | Switch all of the Command Mobile Modules that are in the Standby mode to the Active mode. The Command Mobile Module must be in the Active mode before the Command Mobile Module will respond to a read request from the Base. |
| Set all to Standby | Switch all of the Command Mobile Modules that are in the Active mode to the Standby mode. |
| Turn off all | Turn off all of the Command Mobile Modules that are in the Active or Standby mode. To turn on a Command Mobile Module, you must press and release the Setup button on the Command Mobile Module. |

Most applications that use the Command Mobile Modules will be able to use read switches to control their operation.

5.3.3 Installation on an Indicator

When the Command Mobile Module is used with an indicator, it is typically mounted on the back side of the indicator as shown in the illustration below. If a back lug is present, the mounting the Command Mobile Module on the Side of the indicator is a great secondary location.



Mobile Module Mounted on an Indicator



Recommended Adhesive Placement on Module

The Mobile Module should be mounted so that the 2 LEDs are visible along an edge of the gage. These LEDs are used to notify the user that the gage was read and the data was received by the Base. When mounted in this fashion on a gage, you can still gain access to the batteries and replace the gage cable without having to remove the Mobile Module from the gage.

The Mobile Module should be attached to the gage with the included Dual Lock adhesive strip as shown above.

5.3.4 Battery Replacement

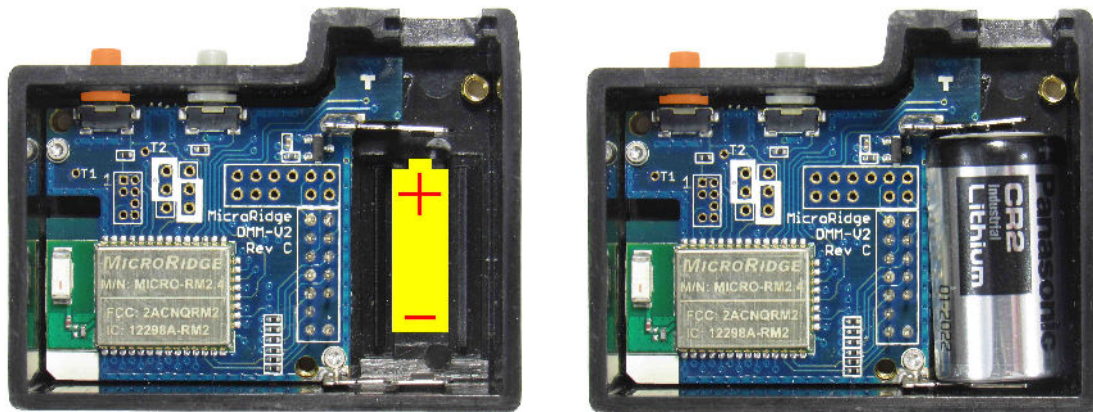
The battery and gage cable can be accessed by removing the Mobile Module top cover held in place by 3 screws. These screws are captive panel screws and should only be loosened enough to remove the cover from the bottom assembly of the enclosure.

Caution: The components within the Mobile Module are subject to damage as a result of static electricity. Be sure to ground yourself before touching any component within the Mobile Module.

Battery

The battery used by the Command Mobile Module is a CR2, 3 volt photo lithium battery. This battery is readily available anywhere photo batteries are sold. The Mobile Module case shown on the left in the picture below has the battery orientation highlighted in the picture. The negative terminal is on the flat side of the battery and is the same as found on standard AA, C and D cell batteries. The positive terminal must be installed toward the top of the case.

When installing a new battery, insert the negative (-) end of the battery first and then push down on the positive (+). This procedure will help prevent damage to the negative battery contact.



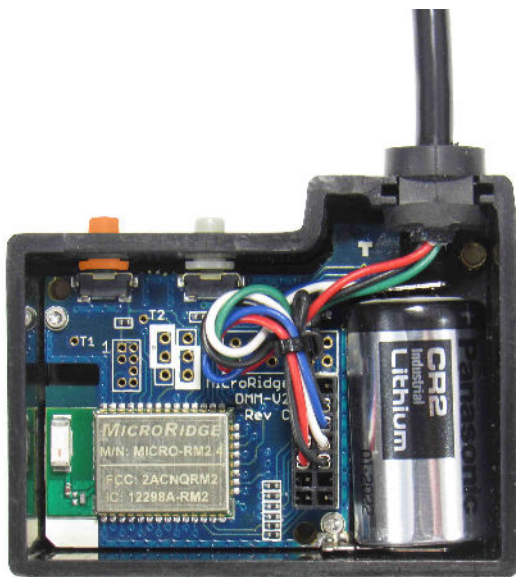
No Battery Installed

Battery Installed

Interior of Command Mobile Module with RM2.4 Radio Module

5.3.5 Gage Cable Replacement

The gage cable should be installed as shown in the photo below. The wires coming from the black grommet should press against the positive battery contact and then curve toward the top of the case.



Gage Cable Connected to Command Mobile Module with RM2.4 Radio



Gage Cable Connected to Command Mobile Module with ATZB Radio

To replace a gage cable, follow the steps below:

- Remove the Mobile Module cover.
- Note how the current gage cable is installed.
- Ground yourself to eliminate any static charge.
- Remove the battery from the Mobile Module.
- Remove the current gage cable by pulling up on the wires going into the connector.
- Press and release the Setup or Read button to remove stored voltage in the Mobile Module.
- Install your new gage cable.
- Replace the battery. Be sure to put the negative end of the battery into the case before pushing the positive end into position.
- Replace the Mobile Module cover.
- Press and release the Setup button. You should see the green LEDs blink once, then the red LEDs blink once and then the red & green LEDs do 4 railroad blinks (see description in [LED Codes](#) ⁵⁰) as the Mobile Module does a Warm Start.

When the Mobile Module does a Warm Start, it will identify the gage cable connected to the Mobile Module. During a Warm Start, none of the user defined setup parameters are modified.

5.4 RS-232 Mobile Module

The RS-232 Mobile Module is used to capture measurements from gages and serial devices that output full RS-232 level signals. RS-232 output levels typically range from 5 to 8 volts down to -5 to -8

volts. Special components are required to handle these voltage levels and are included as part of the RS-232 Mobile Module design.



The gages that use the proximity interface from Sylvac must be used with the RS-232 Mobile Module. This interface is used on handheld gages such as calipers. Gages that use this interface are available from Fowler, Starrett, etc.

The RS-232 Mobile Module only supports RS-232 devices. You cannot use gages supported by the Command and Mini Mobile Modules (Mitutoyo, CDI, Ono Sokki, etc.) with the RS-232 Mobile Module. RS-232 gages that use the Opto connector (Fowler, Starrett, Sylvac, etc.) have low voltage outputs and are used with the Command and Mini Mobile Module rather than the RS-232 Mobile Module. A few RS-232 gages from Mahr Federal are also used with the Command and Mini Mobile Module rather than the RS-232 Mobile Module.

The RS-232 Mobile Module uses the same enclosure that is used for the Command Mobile Module. The battery life for an RS-232 Mobile Module will be different than the battery life experienced with a Command Mobile Module. The power demands for a device outputting full RS-232 voltage levels is much higher than the power required by a Mitutoyo compatible gage.

Refer to the [Mobile Module Operation](#)⁴² for information about the operation common to all of the Mobile Modules.

Mobile Module Setup

You must set up an RS-232 Mobile Module with one of the [Setup Programs](#)¹³. The baud rates and communication parameters used by RS-232 devices vary widely and may not be preset for an RS-232 Mobile Module.

If you are using a gage with the Sylvac proximity interface, no baud rate or communication parameters set up is required. The gage cable used with these devices tell the RS-232 Mobile Module to configure the serial port at 4800-E-7-2.

5.4.1 Installation

The RS-232 Mobile Module can be used with a variety of RS-232 gages and devices. Placement is at the discretion of the operator and can be placed where convenient.

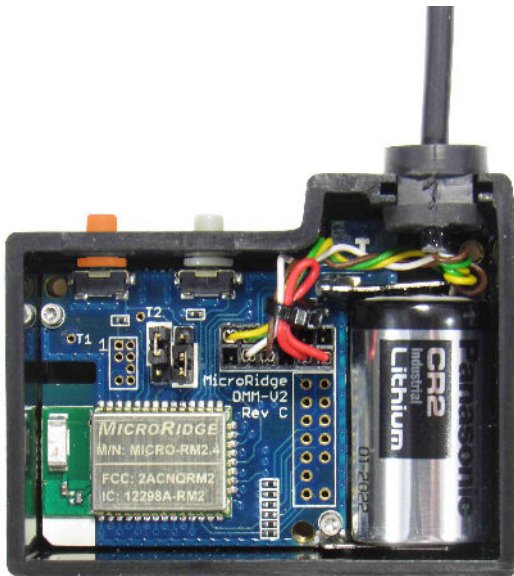


V2 RS-232 Module Mounted on a Caliper with DB9 Connector

The V2 RS-232 Mobile Module ships with a strip of Dual Lock adhesive strips. Use the adhesive strips to mount the V2 RS-232 Mobile Module in a location where the operator can press the setup/read buttons and view the Status LEDs.

5.4.2 Gage Cable Replacement

The gage cable should be installed as shown in the photo below. The wires coming from the black grommet should press against the positive battery contact and then curve toward the buttons.



***Gage Cable Connected to RS-232
Mobile Module with RM2.4 Radio***



***Gage Cable Connected to RS-232
Mobile Module with ATZB Radio***

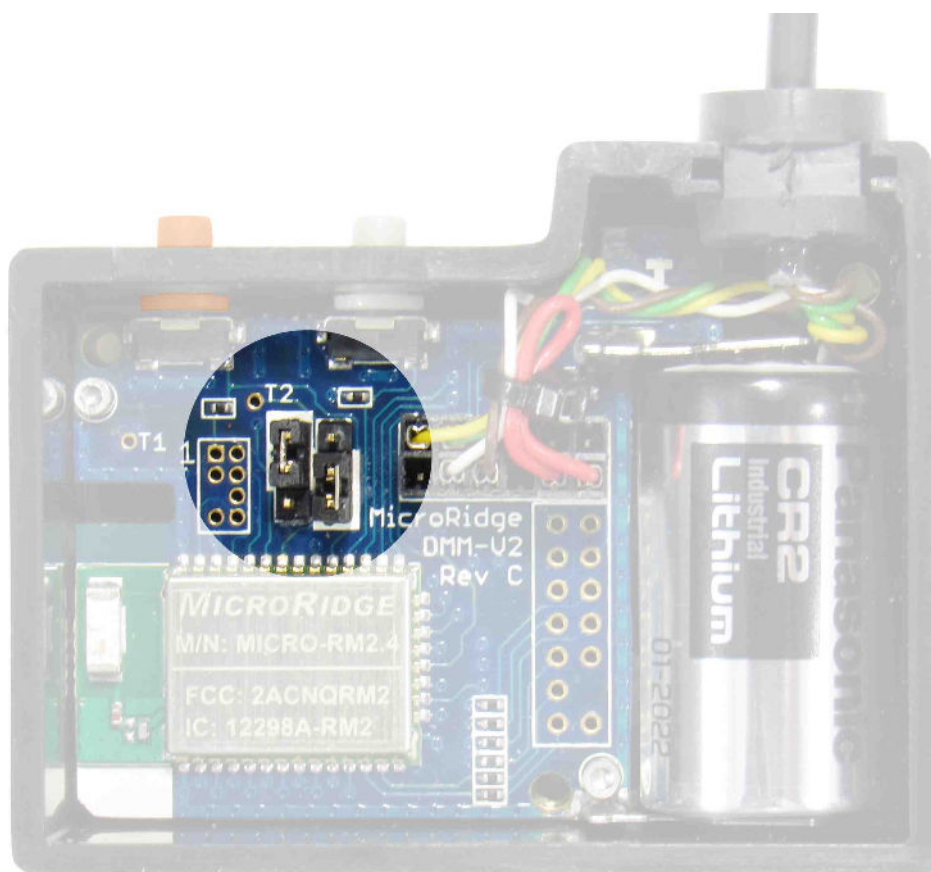
To replace a gage cable, follow the steps below:

- Remove the Mobile Module cover.
- Note how the current gage cable is installed.
- Ground yourself to eliminate any static charge.
- Remove the battery from the Mobile Module. Be careful not to disconnect the adapter board the gage cable is connected to.
- Carefully remove the current gage cable. Be careful not to disconnect the adapter board from the main board.
- Press and release the Setup or Read button to remove stored voltage in the Mobile Module.
- Install your new gage cable.
- Replace the battery. Be sure to put the negative end of the battery into the case before pushing the positive end into position.
- Replace the Mobile Module cover.
- Press and release the Setup button. You should see the green LEDs blink once, then the red LEDs blink once and then the red & green LEDs do 4 railroad blinks (see description in [LED Codes](#)⁵⁰) as the Mobile Module does a Warm Start.

When the Mobile Module does a Warm Start, it will identify the gage cable connected to the Mobile Module. You may have to setup the Mobile Module using one of the [Setup Programs](#)¹³.

5.4.3 Null Modem Jumpers

There are 2 null modem jumpers on the RS-232 V2 Mobile Module that allow you to reverse the transmit (TxD) and receive (RxD) data lines.



Null Modem Jumpers Shown in the Default Positions

The jumpers in the picture are shown in the default positions. To reverse the transmit (TxD) and receive (RxD) data lines, move the left jumper to the lower position and the right jumper to the upper position. Do not put the jumpers side by side.

5.4.4 Battery Replacement

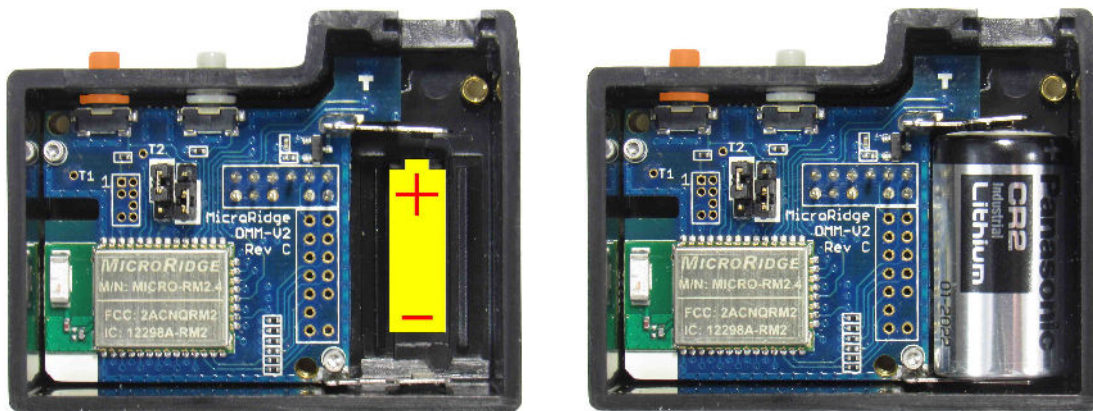
The battery and gage cable can be accessed by removing the Mobile Module top cover held in place by 3 screws. These screws are captive panel screws and should only be loosened enough to remove the cover from the bottom assembly of the enclosure. A small screwdriver is included with the Base for loosening the Mobile Module screws. The screws are secured in the bottom assembly of the enclosure by brass inserts. These brass inserts provide a secure method of holding the cover in place and eliminates the possibility of stripping threads in the plastic case.

Caution: The components within the Mobile Module are subject to damage as a result of static electricity. Be sure to ground yourself before touching any component within the Mobile Module.

Battery

The battery used by the Mobile Module is a CR2, 3 volt photo lithium battery. This battery is readily available anywhere photo batteries are sold. The Mobile Module case shown on the left in the picture below has the battery orientation highlighted in the picture. The negative terminal is on the flat side of the battery and is the same as found on standard AA, C and D cell batteries. The positive terminal must be installed toward the top of the case.

When installing a new battery, insert the negative (-) end of the battery first and then push down on the positive (+). This procedure will help prevent damage to the negative battery contact.



No Battery Installed

Battery Installed

Interior of RS-232 Mobile Module with RM2.4 Radio Module

6 Computer Commands

Each MobileCollect Base and Remote supports a specific set of commands that can be used to get information from the unit. These commands can be sent from [ComTestSerial](#)⁹¹ for testing and setup purposes. Since ComTestSerial requires that its baud and communication parameter settings match those of the Base or Remote, it is recommended that you follow the steps below to start ComTestSerial.

- Start the MobileCollect Xpress or Extended Setup Program. If you will be communicating with a Remote, you must use the Extended Setup Program.
- If ComTestSerial is currently open, close it.
- Connect the Base to a serial port on your PC and press the appropriate Find button.
- Start ComTestSerial from the Setup Program Utility menu. ComTestSerial will start with the same serial port, baud rate and communication parameters for the currently located Base or Remote.

Most commands can be started with an Esc character or < character. The characters following the Esc or < character must be UPPER CASE. A carriage return (Enter key) does not have to be sent after the end of the command. There are a few exceptions to these rules and these exceptions will be noted as necessary.

Supported MobileCollect Products

The versions of each of the MobileCollect products supported by the commands described in this section are as follows:

- Bases Version 5.30 or above
- Remotes Version 5.12 or above
- Mobile Modules Version 4.09 or above

The commands for older versions of the MobileCollect products may be slightly different. If you need a manual for older MobileCollect versions, [contact MicroRidge Systems](#)⁹⁶.

6.1 Base Commands

The commands available for use with a Base are listed below. In addition to the commands listed below, there are additional commands that are intended to be used with the Command Mobile Module. Refer to the [Command Mobile Module](#)⁹⁰ section for additional details.

Display the Active Channels, Remote Types and Remote IDs

Command: <C

Sample output: Active channels, Remote types and Remote ID's:
Global Mobile Module
1 Mobile Module 6F647F
2 Mobile Module UM0467

Show Base Help Information

Command: <H

Sample output: Base commands and guidance will be displayed for the specified base installed.

Blink each LED Bank

Command: <L

Sample output: LEDs will blink

Send Command to Remote

| | |
|------------------|--|
| Description: | <p>Send a command to a Digital or RS-2322 Remote.</p> <p>The Digital Remote supports commands for a single read (R), begin continuous read (B), start TIR reading (T) and stop continuous or TIR reading (S).</p> <p>When this command is sent to the RS-232 Remote, the command portion (dd) is sent to the connected serial device.</p> |
| Command: | <p><Pvvvvvvnndd</p> <p>vvvvvv = 6 character Remote ID. Characters should be upper case. You can use the Extended Setup Program to determine the 6 character Remote ID for your Remote</p> <p>nn = Number of characters in the command. Must be 2 characters in length. i.e.: 01, 05, 13, etc.</p> <p>dd = Command. The length of the command must be nn characters.</p> |
| Sample commands: | <p>Digital Remote:</p> <p><PDE303101R (Get a reading from the connected gage)</p> <p>RS-232 Remote:</p> <p><P61494203<R* (Send the 3 character command <R* to the connected serial device)</p> |

Set the Run Mode

| | |
|----------------|---|
| Command: | <p><Rx where x is defined as</p> <p>N = Normal mode</p> <p>S = Setup mode</p> |
| Sample output: | <p>Normal mode = Green power LED is always on</p> <p>Setup mode = Green power LED flashes (on for 1 second, off for 1 second)</p> |

Firmware Version

| | |
|----------------|------------------|
| Command: | <V |
| Sample output: | MC-USBB-00, 4.03 |

Warm Start

| | |
|----------------|---|
| Description: | Sending this command is the same as pressing the reset button or disconnecting and reconnecting the AC adapter or USB cable. |
| Command: | <W |
| Sample output: | All LEDs will turn on. In just under 1 second, the signal strength LEDs (left stack of green LEDs) will turn off. The right stack of LEDs (red/yellow/green) will remain on for about 10 seconds. While the right stack of LEDs are on, you can pair a Mobile Module with the Base. |

Cold Start

| | |
|----------------|--|
| Description: | Sending this command will reset all of the Base configuration parameters to the factory defaults. |
| Command: | <Z |
| Sample output: | All LEDs will turn on. While the parameters in EEPROM are being reset, the left stack of LEDs will be on and the right stack will blink 32 times. After the parameters have been reset to the factory defaults, the left stack of LEDs will turn off and the right stack will turn on. While the right stack of LEDs are on, you can pair a Mobile Module with the Base. |

Enable/Disable Leading Zero

| | |
|----------------|---|
| Description: | Enable/Disable the addition of a 0 (zero) to the left of the decimal point for numbers of the form .123 and -.123 |
| Command: | <#LZn n = D Disable adding a zero to left of decimal point. n = E Enable adding a zero to left of decimal point. This is the default operation. |
| Sample output: | Examples for <#LZD command: 0.123 --> .123 -0.123 --> -.123 4.123 --> 4.123 |

USB Serial Output Mode (EVO Only)

| | |
|----------------|---|
| Description: | Enable/Disable the USB serial port verification via DTR (ComPort assigned and active) for EVO Base Receivers |
| Command: | <#USBn n = N Normal Mode. Check to verify USB serial port is active before sending data. Default. n = A Send All Mode. Always send data regardless of USB Serial Port status. |
| Sample output: | N/A |

Keyboard Wedge Output Speed

| | |
|----------------|---|
| Description: | Change the Output/Typing speed of Keyboard Wedge output for Wedge Bases |
| Command: | <\$CK (opens help info) <\$TF Set the keyboard wedge transfer rate to fast. (Approx 60 char/sec) <\$TM Set the keyboard wedge transfer rate to medium. (Approx 40 char/sec) <\$TS Set the keyboard wedge transfer rate to slow. (Approx 20 char/sec) |
| Sample output: | N/A |

Commands for Mitutoyo U-Wave Info

| | |
|----------------|--|
| Description: | U-Wave information mode. Information includes items such as RF Channel, Base Group ID, U-Wave Group ID, U-Wave channel, U-Wave measurement, U-Wave units, etc. This information mode will capture data on the same RF channel the Base is set to. The U-Wave Transmitter does not have to be associated with the Base. |
| Command: | <MUWIMn n = 0 Disable information mode n = 1 Enable information mode |
| Sample output: | N/A |

Copyright & Configuration Information

Command: <*

Sample output: MobileCollect Wedge/USB Base with RM2.4-306 Radio @ 2.4
GHz - Serial
Copyright (C) 2021-2025 MicroRidge Systems, Inc.
All rights reserved.

Model number..... MC-BK306-A
Firmware version..... 6.24
Firmware date..... 5- 2-25 9:43:09
Manufacturing Date..... 2-19-25
Serial number..... MC-BK306A-250219-113827
Description..... MobileCollect Wedge/USB Base
Setup source..... Extended Setup

Keyboard wedge..... Disabled

CMM Control..... Enabled
Current mode..... Active
Keep awake..... 2 seconds
Active time..... 10 minutes
Standby time..... 5 minutes
Extended time..... 3 minutes

Base ID..... 983827
Network S/N..... 98250219-11382720
PAN ID..... 7e93

RF Channel..... 21

Mitutoyo U-Wave
Base ID..... 288892824
Group ID..... 52 (default value)

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6.2 Remote Commands

The commands available for use with a Remote are listed below. These commands can only be used when the Remote is connected to a PC with the USB cable. Normally you would use [ComTestSerial](#)⁹¹ to send the command to the Remote. The baud rate and communication parameters for the Remote USB connection are fixed at 9600-N-8-1.

Send Firmware Model and Version Information

| | | | |
|----------------|------------------|----------------------------------|--|
| Command: | <V or {Esc}V | | |
| Sample output: | MC-RDIG-01, 5.12 | (Response from a Digital Remote) | |
| | MC-R232-01, 5.12 | (Response from a RS-232 Remote) | |

Warm Start

| | | | |
|----------------|--|--|--|
| Description: | Sending this command is the same as pressing the reset button or disconnecting and connecting the power. | | |
| Command: | <W or {Esc}W | | |
| Sample output: | The right-hand LED stack will turn on when the Remote is restarting. | | |

Cold Start

| | | | |
|----------------|---|--|--|
| Description: | Sending this command will reset all of the Remote configuration parameters to the factory defaults. | | |
| Command: | <Z or {Esc}Z | | |
| Sample output: | The right-hand LED stack will turn on when the Remote is initializing its parameters. | | |

Copyright & Configuration Information

Description: This output from this command provides version, configuration and current setting information.

Command: <* or {Esc}*

Sample output for RS-232 Remote:

```

MobileCollect RS-232 Remote with RM2.4 Radio @ 2.4 GHz
Copyright (C) 2010-2021 MicroRidge Systems, Inc.
All rights reserved.
  Model Number..... MC-R232-01
  Firmware version..... 5.19
  Firmware date..... 6- 8-21    9:40:19
  Manufacture date..... 4-12-23
  Serial number..... MC-RM2-B821022506103910
  Operational mode..... Remote mode

  Auto baud detect..... Enabled
  RS-232 setup..... 9600-N-8-1
  End-of-packet..... CR

  Description..... MobileCollect RS-232 Remote
  Remote ID..... B81039
  Remote label..... B81039
  Network S/N..... b8210225-06103910

  Base Description..... MobileCollect Wedge/USB Base
  Base ID..... 7F5002
  Base Network S/N..... 7f181010-07500210

  PAN ID..... 179e
  RF Channel..... 21

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  www.microridge.com    541-593-1656

```

6.3 Mobile Module Commands

You can get the copyright and configuration information from a Mobile Module by placing the Mobile Module in the Setup Mode and sending the information to a Base. In order for the Base to display the information, the Base must also be in the Setup Mode.

The procedure for getting the Mobile Module copyright and configuration information are as follows.

- Start the MobileCollect Xpress or Extended Setup Program.
- If ComTestSerial is currently open, close it.
- Connect the Base to a serial port on your PC and press the appropriate Find button.
- Start ComTestSerial from the Setup Program Utility menu. ComTestSerial will start with the same serial port, baud rate and communication parameters for the currently located Base or Remote.
- Press the Setup Mode button in ComTestSerial.
- Put the Mobile Module into the Setup Mode.
 - Press & hold the Setup button. The Setup button is the button closest to the gage cable.
 - While you continue to press the Setup button, press and release the Read button.
 - Once both LEDs start to flash, release the Setup button.
 - When the Setup Mode is active, both LEDs will flash rapidly. The left LED is red and the right LED is green.
- Press and release the Setup button. The copyright and configuration information will be sent to the Base and displayed in ComTestSerial.
- To save battery power, you should press the Read button to turn off the Mobile Module as soon as ComTestSerial has received the information. A Mobile Collect Mobile Module will automatically turn off after a period of no activity,

A sample of the output from a Command Mobile Module copyright and configuration information command is shown below. The output from a Digital, Mini, or RS-232 Mobile Module does not contain the information about the command mode.

MobileCollect Command Mobile Module with RM2.4 Radio @ 2.4 GHz

Copyright (C) 2009-2021 MicroRidge Systems, Inc.

All rights reserved.

```

Model number..... MC-CMM-R2
Firmware version..... 5.35
Firmware date..... 6-23-23 12:13:02
Wireless library ver.. LRM24-02-01MHZ-R.014
Wireless library date. 8-25-17 12:51:08
Manufacture date..... 5- 1-24
Serial number..... MC-C2R-3923052410084710
Clock source..... 16 MHz RC Oscillator
Battery voltage..... 3.08/3.08 volts (radio on/off)
Description..... Command Mobile Module

```

```

Read mode..... Single

```

```

Command mode..... Off
Keep awake..... 2 seconds
Active time..... 10 minutes
Standby time..... 5 minutes
Extended time..... 3 minutes

```

```

Gage type..... Mitutoyo output
Gage cable ID..... 1-0

```

```

Module ID..... 390847
Module label..... CMD A
Network S/N..... 39230524-10084710

```

```

Base ID..... 0E3922
Base Network S/N..... 0e250430-11392220
PAN ID..... 83c3

```

```

RF Channel..... 21

```

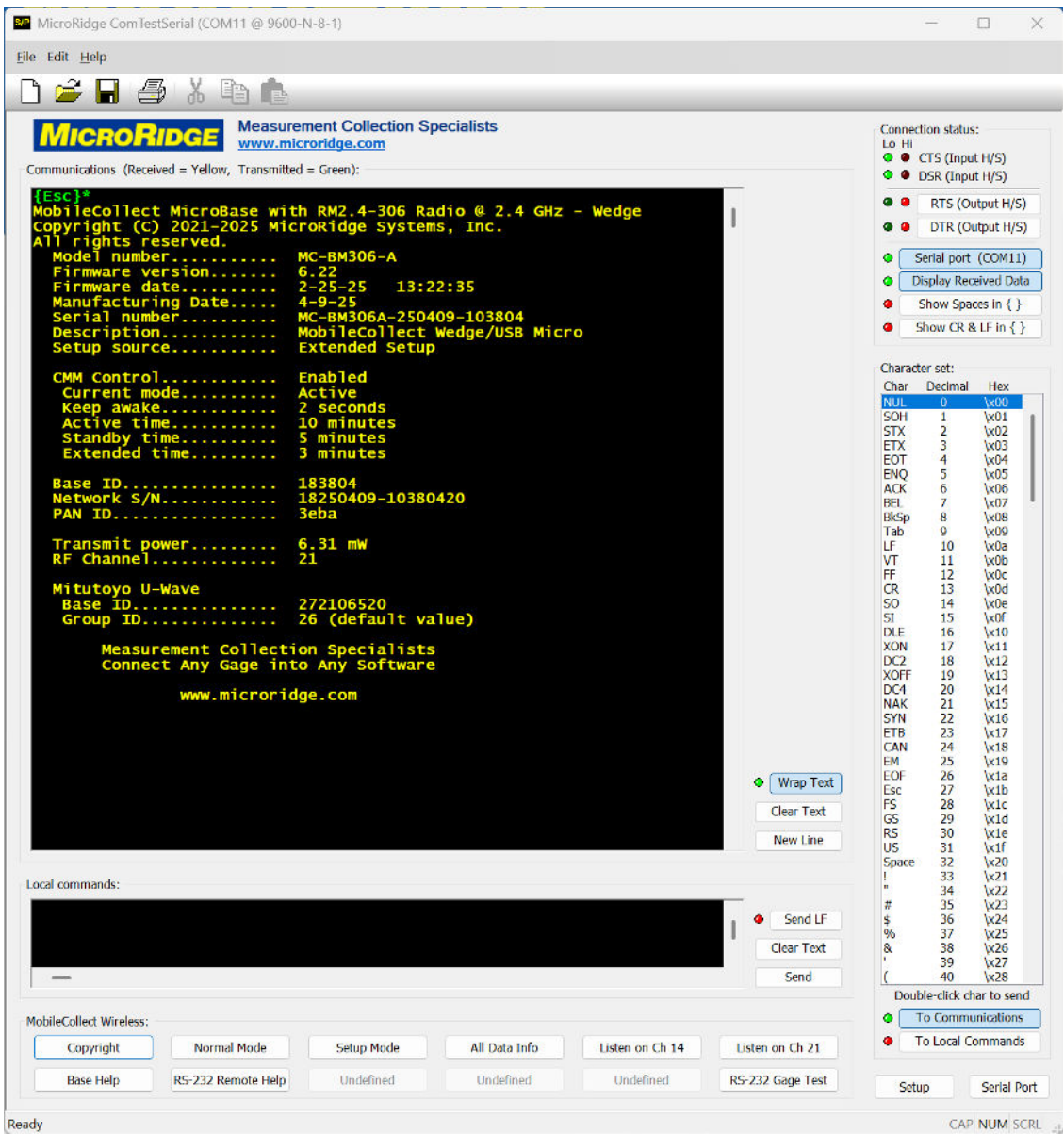
6.4 Command Mobile Module

The commands that can be sent to a Base for controlling a Command Mobile Module are detailed in the [Commands for Command Mobile Module](#)⁶¹ section in the [Command Mobile Module](#)⁵⁶ chapter.

7 ComTestSerial

A free serial communications test program will be installed when you install a Setup Program. ComTestSerial is a valuable program for setting up and troubleshooting MobileCollect Systems. ComTestSerial can be started directly from the Setup Program Utility menu.

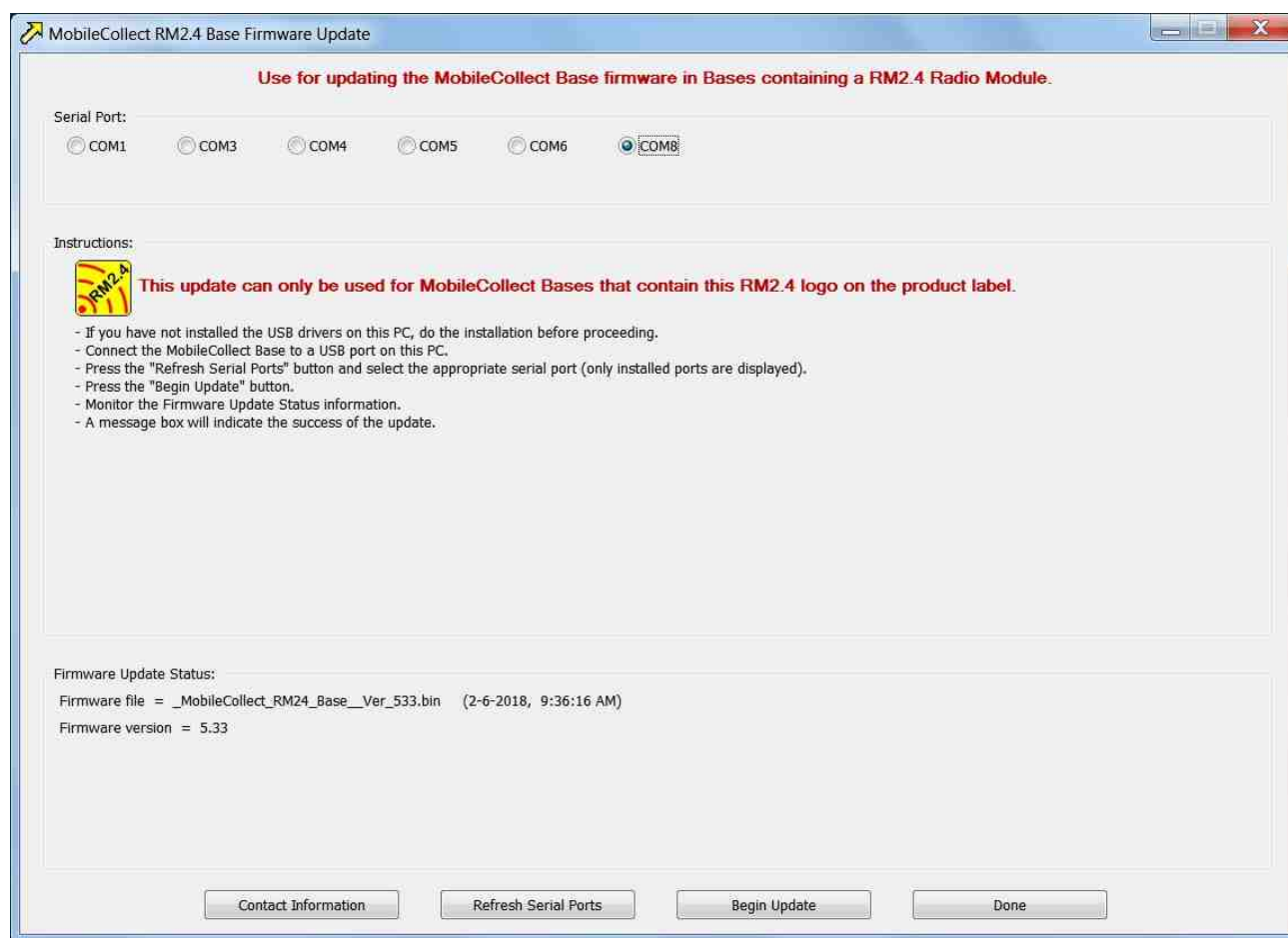
ComTestSerial can be loaded on as many computers as required. To install ComTestSerial on other computers, download the latest version at: <https://www.microridge.com/comtestserial>. ComTestSerial is designed for use on Windows XP and later.



8 Firmware Updates

Firmware is the software that runs in the Bases, Remotes, and Mobile Modules. There are different firmware updates required for MobileCollect with the EVO Radio Module, RM2.4 Radio Module, and ATZB Radio Module. The most current firmware updates for the wireless products can be downloaded from the MicroRidge web site at <https://www.microridge.com/mobilecollect-wireless/firmware-updates/>.

All of the firmware updates are installed via a firmware update utility. The screen below shows the firmware update for Bases that contain the RM2.4 Radio Module. The firmware update procedure is designed so that you cannot install an incorrect firmware update in any of the MobileCollect products.



The firmware update process for the Bases and Remotes takes less than 15 seconds. The firmware update process for the Mobile Module has a few more steps involved with the update. Be sure to read the instructions included with the firmware update utilities.

9 Accessories & Spare Parts

Several accessories and spare parts are available for use with MobileCollect. Some of these items may be included as standard components with a Base, Remote or Mobile Module.

Purchase On the Web

Most of these items are available for purchase directly from the MicroRidge website on the MobileCollect Store.

MobileCollect: <https://www.microridge.com/shop/>

Hand Switch



HNSW-MPLG: The hand switch is an external read switch that plugs into the read switch port on the MobileCollect Base Receivers and Remote Transmitters. They are used to send trigger readings with Bases and Remotes

Foot Switch



FTSW-MPLG: The foot switch is an external read switch that plugs into the read switch port on the MobileCollect Base Receivers and Remote Transmitters. They are used to send trigger readings with Bases and Remotes

Transmitter Connectors



MobileCollect Mobile Modules interface with a gage via a Transmitter Connector. Connectors are based on the OEM SPC cables and utilize OEM pins, ports, buttons, and cable where possible. Due to the position of the connectors and variety in OEM cable material and design, transmitter connectors are considered consumable items. Environmental conditions and general wear & tear will cause connectors to fail at some point. It is highly recommended to keep spare connectors to replace a failed connector to minimize downtime.

When using connectors for Mitutoyo gages that contain a read button on the connector, the most common item to failure is the read button. The read button on the Mobile Module can be used in conjunction with the cable read button. The read button on the Mobile Module is rated for 1 million cycles.

The unique design of the Mobile Module allows you to access the gage cable by removing a few screws. To replace the cable, simply unplug the defective cable and plug in a new cable. Reach out to MicroRidge Support with any questions about replacing your Transmitter Connectors.

10 Warranty Information

The standard MicroRidge warranty for products it manufactures and resells is described below:

- MicroRidge warrants that equipment manufactured by MicroRidge is free from defects in material and workmanship when adequately maintained under normal use for twelve (12) months from the date of purchase of the product (the “warranty period”). The manufacturer of the products warrants some products sold and distributed by MicroRidge.
- The warranty for gage and RS-232 interface cables is 30 days from the date of shipment.
- MicroRidge will determine if products that do not conform to their description or are defective in material or workmanship can be replaced or repaired. At MicroRidge’s option, credit for the original purchase price may be allowed if the reseller or customer notifies MicroRidge in writing of such defect within thirty (30) days of discovery and returns such products following the MicroRidge instructions. No products may be returned without MicroRidge prior written authorization.
- This warranty does not apply to any product subjected to misuse, abuse, negligence, or accident by the reseller, customer or third parties.
- MicroRidge makes no other warranty or representation of any kind with respect to the products, either express or implied, including that of merchantability or fitness for a particular use. Failure to make any claim in writing, or within the thirty (30) day period set forth above, shall constitute an irrevocable acceptance of the products and an admission by the reseller or customer that the products fully comply with all terms, conditions, and specifications of the reseller’s or customer’s purchase order. MicroRidge shall not be liable for direct, indirect, incidental, special, or consequential damages under any circumstances, including, but not limited to, damage or loss resulting from the inability to use the products, increased operating costs or loss of sales, or any other damages. To make a claim under this warranty, the customer or reseller must notify MicroRidge within the warranty period.
- The customer or reseller will pay all shipping charges (including duty and taxes) for equipment returned to MicroRidge for warranty service. MicroRidge will pay shipping charges for equipment returned to the customer. Customers and resellers are responsible for duty and taxes on equipment returned to them.
- Software developed by MicroRidge is warranted to operate under the software documentation on the hardware specified in such documentation for six (6) months from the date of shipment. During the warranty period, MicroRidge will, at no charge, correct any programming error in the software that interferes with the normal operation of the software if MicroRidge can reproduce the error on MicroRidge’s computer.

11 Contact MicroRidge

Email:

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Information: info@microridge.com

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PO Box 3249

Sunriver, OR 97707-0249

Physical Address:

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56888 Enterprise Drive

Sunriver, OR 97707

Note: There is no mail delivery to this address. This address should only be used for UPS and FedEx package delivery services.

Web: www.microridge.com

12 Version History

Enter topic text here.

| Version | Date | Updates |
|---------|------------|---|
| 2.0 | 05/22/2025 | Updated Contact Info Updated Warranty Page - Added Returns and Repairs Updated Accessories & Spare Parts Added EVO Base Receiver Information throughout Manual for PNs: MC-BASE-USB-EVO, MC-BASE-RS232-EVO, MC-BASE-KW-EVO, MC-MB-A-EVO, MC-MB-C-EVO. Restructured Base Receivers section Added Section: Wireless Certifications Various other updates and corrections |
| 2.1 | 05/28/2025 | Update hyperlinks throughout |
| 2.2 | 06/20/2025 | Updated Remote LED Light Section - Added AutoBaud Added AutoBaud section under RS-232 Remote Updated Pairing Sections for Remotes and Mobile Modules |
| 2.3 | 9/19/2025 | Minor grammatical updates. |