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## Features and Benefits of the Badger® ORION® Automatic Meter Reading System

FEATURE	BENEFITS	
Badger ORION transmitter utilizes a bubble-up technology, bubbling-up every four seconds.	Eliminates the need for FCC licensing.	
System utilizes a single transmitter for indoor and submerged applications.	Allows the transmitter to be placed in a variety of locations, ensuring communication in extreme environmental conditions.	
Uses Badger Meter, Inc. patented Recordall® Transmitter Register (RTR®) and its superior design features.	<ul style="list-style-type: none"> <li>✓ Simplicity</li> <li>✓ Long Service Life</li> <li>✓ Excellent Reliability</li> </ul>	<ul style="list-style-type: none"> <li>✓ Reduced Friction</li> <li>✓ Digital Output</li> <li>✓ Highest System Resolution</li> </ul>
Uses Badger Meter, Inc. Absolute Digital Encoder (ADE®)	<ul style="list-style-type: none"> <li>✓ Frictionless, non-contact wheel position encoding</li> <li>✓ Light emitting diode (LED) Technology</li> <li>✓ Requires no programming during installation or repair</li> <li>✓ Available in four, five, or standard six-dial resolution</li> <li>✓ Designed for Integral, Remote, or Pit Installations</li> </ul>	
Tamper Detection	If the wiring has been cut or shorted a tamper code will be received.	
Leak Detection	<p>Badger ORION transmitters with an RTR look at a 24-hour time period for one hour of non-usage. If there is continuous water consumption a leak tamper will be received.</p> <p>Badger ORION transmitters with an ADE look at a 24-hour time period for two hours of non-usage. If there is continuous water consumption a leak tamper will be received.</p>	
Digital Meter Reading Accuracy	Reading by unique ID number eliminates wrong meter reads, meter reading validation and data error detection features work together to achieve a high accuracy level.	
Walk-by/Drive-by Versatility	Flexibility in reading water meters with a walk-by handheld device (Trimble® Ranger™) or a drive-by solution with the Badger ORION laptop.	
Compatibility with Badger Meter, Inc. Reading Data Management Software.	Provides the ability to load/unload the Trimble Ranger through Badger Meter, Inc. user-friendly, Windows® based data management software.	

## What is Badger ORION?

The Badger ORION Automated Meter Reading (AMR) system uses radio frequency technology to transmit meter readings between a transmitter that is connected to Badger's encoder register and a data collection device. This communication works by assigning a unique ID number for each individual transmitter. A signal containing this ID number is sent from the transmitter to the collection device. The Badger ORION system uses the Trimble Ranger handheld or a laptop to collect meter readings. After data from the meter is captured into the collection device, it is unloaded into Badger Meter, Inc. reading data management software program and then passed to a billing system.

## General Badger ORION Hardware

### RECORDALL® Transmitter Register (RTR®)



The RTR is designed for use with all Recordall Disc Series, Turbo Series (excluding Turbo I meters), Compound Series meters, Fire Series meters and assemblies. It provides an output compatible with Badger ORION's transmitter solutions. The RTR provides a digital output from Badger's patented piezoelectric solid-state switch to the transmitter. When the Trimble Ranger is in proximity to an ORION transmitter, it captures and stores the reading for billing purposes, sends a signal to the Trimble Ranger handheld. The RTR is mounted on top of the meter using a bayonet style mounting system and is driven by a high-strength magnetic coupling through the meter body to the meters magnet. The RTR must be ordered by meter model and unit of measure. The RTR glass and copper can enclosure is manufactured with an adhesive seal to withstand harsh pit environments.

### Absolute Digital Encoder (ADE®)



The ADE is designed for use with all Recordall Disc Series, Turbo Series (excluding Turbo I meters and Recordall Compound meters), Compound Series meters, and the Fire Series meters and assemblies. It provides an output compatible with Badger ORION transmitter solutions. Digital output from the ADE includes the option of either a four-, five-, or six-dial resolution. The ADE is mounted on top of the meter using a bayonet style mounting system and is driven by a high-strength magnetic coupling through the meter body to the meters magnet. The ADE must be ordered by meter model and unit of measure. The ADE may be ordered with a glass and copper can enclosure that is manufactured with an adhesive seal to withstand harsh pit environments.

## General Badger ORION Hardware (continued)



### **Pit and Remote Transmitters**

A single transmitter is designed for underground pit installations where the system may be subject to submergence or mounted in the interior of the building for a customer who is concerned about cosmetic appearance of their building's exterior. The transmitters are entirely waterproof and can be mounted either through the pit lid or one-inch to two-inch air gap under the lid. The radio transmission performance is dependent on a number of factors that include lid design, foliage, below grade mounting and metal objects either in the path or near the desired line of site. Transmitters can be mounted up to 75 feet away from the meter.

The optional Data Profile feature provides utilities with 21,000 consumption data points with leak detection and tamper alarms for analysis of water usage patterns. It is helpful when addressing customer service issues, billing complaints, leak detection studies, audit conservation programs and other water usage studies.



### **Integral Transmitter**

The Integral Module is designed for wet, dry and fully water submersible applications, i.e. meters located in pits and indoor applications such as closets, utility rooms, etc. The Integral transmitter will give excellent tamper resistance. Unlike the Pit and Remote transmitters the Integral does not have any exposed wires. The ease of installation is as simple as taking the integral unit and placing it on the meters bayonet and positioning to the desired location.

The optional data profile feature is also available with the Integral module, it is suggested that if this feature is available to mount the Integral at a 90-degree angle relative to the water piping to facilitate ORION profiling.



### **Universal Pit and Remote Transmitter**

The Badger ORION Universal 1 transmitter is available in a three wire pit or remote transmitter configuration for connection to approved Sensus®, Neptune®, AMCo® and Hersey® meters and encoder registers. All Badger ORION Universal 1 transmitters are shipped from the factory pre-programmed and can be connected to any compatible encoder. Electronic readings broadcast from the Badger ORION Universal 1 transmitter will contain the active number wheels programmed into the encoder, with a maximum of seven digits.

## Installing Badger ORION System Components

### ORION Transmitter Pit Installation

The ORION transmitter for pit applications is supplied with a Badger Encoder Register and completely wired and factory sealed for use in meter Pits or vaults subject to submersion. The standard length of the encoder to module lead wire is three feet. For deep meter settings additional wire lengths up to 75-feet, lead wires are available at an additional charge. The transmitter includes an integral antenna assembly with provisions for a through the lid mounting. Depending on the lid design and the material that the lid is made of, the Pit transmitter can be mounted in a variety of ways.

With cast iron or metal lids Badger Meter, Inc. recommends using a through-the-lid mounting system (see Diagram 1). If there are limitations that prevent the use of this mounting system, an under-the-lid mounting bracket is available. Although, not using the through-the-lid mounting system will hinder radio transmission and limit the distance of a receivable signal.

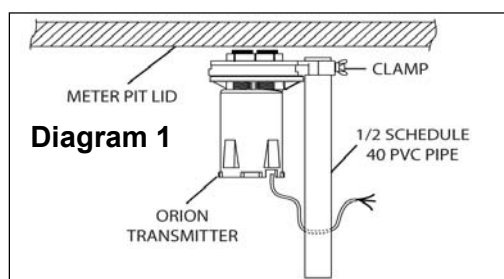
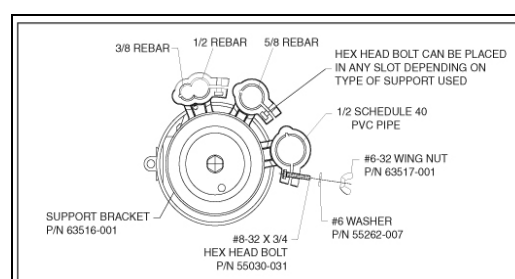


Diagram 2



For concrete meter lids the transmitter may be mounted below the lid using either the pit mounting bracket or the “C” clamp bracket. The pit transmitter should be mounted between one to two inches below the lid.

With plastic meter lids, the transmitter can be mounted using a mounting system similar to the concrete lids, go through the lid like metal lids, or some plastic lids have a molded bracket on the underside of the lid designed to hold the radio transmitter.

The Badger Meter, Inc. Pit transmitter Support Bracket (see Diagram 2) is available for installations that do not allow for mounting directly through the water meter pit lid. The support bracket is designed to hold the transmitter upright under the pit lid using 3/8-inch rebar, 1/2-inch rebar, 5/8-inch rebar, and/or 1/2-inch schedule 40 PVC pipe.

The mounting clamp pictured in (see Diagram 3) can be used in a variety of applications. The bracket has two holes that can be used to mount the bracket and the transmitter is then inserted into the bracket and turned to lock it in place. For best results the transmitter must always be mounted in a vertical position.

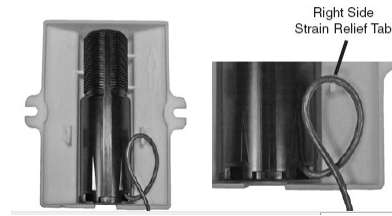


Diagram 3

## Installing Badger ORION System Components (continued)

### ORION Transmitter – Indoor/Outdoor Installation

ORION transmitters come from Badger Meter, Inc. pre-wired to the register and require only the mounting of the module and the register. The standard length of the lead wire is 10 feet. Additional wire lengths of up to 75 feet are available for an additional charge. To mount a transmitter indoors or outdoors, an ORION Remote Box Enclosure Kit (64394-021) may be needed. If a splice is needed to get the transmitter outdoors, the ORION Remote Enclosure Kit allows for a secure space to protect the gel caps from the elements.



(Close-up of strain relief)

Transmitters manufactured for remote application will be labeled with non-metal on the serial label. It is essential that the correct transmitter be used for indoor applications. Failure to do so will result in a violation of FCC regulations.

To install, affix the mounting clamp in a secure location on a wall or joist away from metal objects or faced insulation that can reduce the performance of the radio. The transmitter must be installed in an upright, vertical position with the bottom of the transmitter (end with wire) pointing toward the ground.

For outdoor installations, locate the transmitter in the best line-of-site location to the reading route and away from devices that produce electrical interference. The transmitter should be installed at a minimum of three feet above grade and away from shrubs and other foundation plantings.

After installation, a Quick Read function could test the module for radio transmission and range.



## Retrofitting Badger ORION System Transmitter

**CAUTION** The Badger Encoder Register and Badger ORION transmitter should only be connected to a Badger Meter, Inc. approved product. Connection to an unapproved product will void the respective product warranty.

Should an RTR/ADE or transmitter require replacement or the lead line wire require repair, the following splicing procedure should be used:

The factory lead line is a double insulated RFI shielded three-wire cable (one is red, one is black and one is green).

1. Using caution not to damage the inner wire's insulation, strip approximately 1½ inches of the outer insulation off of the ends of the transmitter and RTR/ADE lead line wires.
2. Remove the foil that provides radio interference protection revealing the three control wires. Spread these three wires apart.
3. Cut the red and black insulated wires down to approximately ¾"-inch length, leaving the green insulated wire at 1½ inches in length.

**Note:** Make the splice indoors or inside of the Remote Box Enclosure for extra protection of the splice.

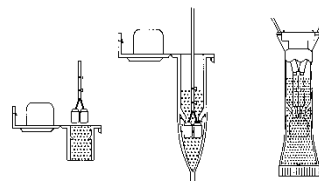
4. Use gel-connectors (Badger Meter, Inc. Part # 59761-001) to splice the black-to-black wires, red-to-red, green-to-green wires together.

**Note:** When splicing a Universal 1 ORION transmitter to competitor encoders refer to ORI-I-39 Installation Data sheet for wiring instructions.

5. Use wire ties to provide strain relief to the splices by securing the two cables together, approximately one-inch and again at two inches from the gel-connections.
6. To reprogram the transmitter using the Trimble Ranger, following the instructions on pages 23-25 of this guide.
7. Test the entire installation after splicing and reprogramming the transmitter by reading the meter and verifying the tamper cleared.

### Pit Product Splicing

Perform the above steps and then insert the entire splice into the splice enclosure assembly (Badger Meter, Inc. Part # 62085-001). Ensure that the lead wires exit tube on alternating sides and close splice enclosure. See Diagram 1.



**Diagram 1**

## Features and Benefits of the Trimble Ranger

<b>Features</b>	<b>Benefits</b>
Operates on Microsoft® Windows® Mobile Platform	<ul style="list-style-type: none"> <li>• Flexible computing platform provides an easy to use interface with operator.</li> </ul>
Rugged Design and Construction	<ul style="list-style-type: none"> <li>• Wide operating temperature (-5°F to 140°F) for reading in all environments.</li> <li>• Waterproof and dustproof design sealed to IP67 rating.</li> <li>• Rated to withstand a four-foot drop on concrete.</li> <li>• Internal or external Badger ORION receiver option.</li> </ul>
Connectivity to Manual, BadgerTouch®, ORION, and GALAXY® Solutions	<ul style="list-style-type: none"> <li>• One handheld provides full migration path from manual to all Badger AMR solutions.</li> </ul>
Flexible Design	<ul style="list-style-type: none"> <li>• Optimized 53-key customized alphanumeric keyboard with custom-raised keyboard.</li> <li>• Connects to multiple, technology solutions including ORION, GALAXY touch and manual read accounts.</li> <li>• Optional work-order tool application available to assist with ORION installs and to provide a paperless work order process.</li> </ul>
Infrared Data Port	<ul style="list-style-type: none"> <li>• Provides programming capabilities for ORION transmitters.</li> <li>• Trimble Ranger can be utilized as a reading device, troubleshooting tool or an optional installation tool.</li> </ul>
Intelligent Lithium-Ion Power Packs	<ul style="list-style-type: none"> <li>• Maximum usage between charge.</li> <li>• Battery provides a full day of use on full charge.</li> <li>• Field-replaceable battery allows operator flexibility in maintaining the reading device.</li> </ul>

<b>Features</b>	<b>Benefits</b>
Leak Detection, Reverse Flow and No Usage Notification	<ul style="list-style-type: none"> <li>• Identification and alarm for potential leak, reverse flow, and no usage conditions.</li> <li>• Provides meter reader and management with additional information on the status of each water account.</li> <li>• System automatically resets when the next one-hour window of no usage is found.</li> </ul>
Utilizes Flash Disk or Wireless Communication Protocol	<ul style="list-style-type: none"> <li>• Advanced communication protocol ensures accurate data communication.</li> <li>• Data communication options provide utility with flexible solution to meet their needs.</li> </ul>
Charger	<ul style="list-style-type: none"> <li>• Cradles can be connected together to charge up to 10 Trimble Ranger units with one power supply.</li> <li>• Charger can be desk or wall mounted.</li> </ul>
320 Pixel X 240 Pixel Color Touch Display	<ul style="list-style-type: none"> <li>• Large easy-to-read display with back light.</li> <li>• Reading software is controlled through touch screen or easy-to-use key pad operation.</li> <li>• Select up to five fields from Badger Meter, Inc. reading data management software for display in the handheld.</li> </ul>
Badger Meter, Inc. Technical Support	<ul style="list-style-type: none"> <li>• 24-hour professional technical support.</li> </ul>



## What is the Trimble Ranger?

It is a ruggedized, handheld computer for use with the Badger Meter, Inc. ORION and GALAXY® AMR systems. It reads meters equipped with Badger ORION transmitters, touch-type modules that can be read with VersaProbe reading wands. The Trimble Ranger can also accept manual reads to support utilities as they transition from manual read to AMR technology.

It can be used for fully automated data collection along a meter route. Manual readings may be entered at any point, allowing gradual implementation of the ORION system. The Trimble Ranger also functions as a programming device for initial setup of transmitters in retrofit installations where matching existing readings is required.

## How the Trimble Ranger Operates

The Trimble Ranger listens for the Badger ORION narrow band and Frequency Hopping Speech Spectrum (FHSS) transmitters, which send a signal approximately every four seconds. If the Trimble Ranger hears a transmitter, it tries to match the unique Badger ORION transmitter ID number to one that is stored in the handheld's unlicensed 902-928 MHz frequency band.



The Trimble Ranger can be used as a manual data collector by entering a reading with the numeric keypad. This reading is stored as a normal record and transferred with route information. **A total of 5000 accounts can be stored in the Trimble Ranger.** The data stored in the Trimble Ranger is transmitted wirelessly to the utility PC, or through a USB memory drive, as based on the utility's needs.



## How the Trimble Ranger Operates (continued)

### Conserving The Battery

The Trimble Ranger conserves battery power by turning itself off when not in use. The battery will support a full day's worth of reading, if used under normal conditions. Pressing the green power button will turn the unit back on and the Trimble Ranger will show the same screen that was displayed when the unit was turned off.

**Note:** When the Trimble Ranger is on the Read screen or the Quick Read screen, it will NOT turn off automatically, because the Badger ORION Reading functions are active. If you wish to conserve the battery, be sure to return to the main menu.

### Charging The Battery

When using the Trimble Ranger cradle to charge the battery pack assembly be sure that the Trimble Ranger is fully seated into the cradle. To verify that the unit is being charged, the top line of the screen will indicate "(Batt: A/C)." Please note that it may take a few minutes for the screen to update from the rate of battery charge to the indication that it is being charged by A/C power. To immediately check battery pack charging status exit the ReadCenter Field Application and then restart the Application, the top line of the screen will show the battery charge status.

The cradle is designed to be set up on a flat surface or mounted on a wall. Up to 10 cradles can be connected together and use a single power cord



## **Cradle Function**

1. Insert the Badger Trimble Ranger into the charging cradle. Make sure that the handheld is fully seated in the charger and that the charging pins are in full contact with the handheld. The unit will be fully charged in approximately four to five hours.
2. The Cradle has a Light Emitting Diode (LED) that indicates the charging status. The following table describes the various states indicated by the LED.

### **Cradle LED Status**

<b>LED Light</b>	<b>Cradle Status</b>
Off	Charging cradle unplugged or Trimble not fully seated
Fast Blink	Fast charge in progress
Slow Blink	Top off charge in process
Solid	Charging complete

### **Wall Charger LED Status**

<b>Normal usage:</b>	
Off	No charger present or it is unplugged
Fast Blink	Fast Charge
Slow Blink	Topoff Charge
On	Charging Complete
Error conditions:	
One to two	Temperature out of range for charging
Three short flashes	Wrong Charger

**Note:** If the fully-charged unit is still connected to the charger, the status found in Settings / System / Power will report the battery power remaining as if the unit were still on battery power.



## **Swapping the Battery Pack Assembly:**

If you are using the Trimble Ranger and the battery is becoming too low to continue operation, the Trimble Ranger will show you a message stating that the battery is very low.

The Battery Pack Assembly is designed to be quickly swapped out while in the field (if you have purchased additional Battery Pack Assembly). If the current Battery Pack Assembly runs low, replace it and continue with your work.

The unit saves enough power that if you swap the Battery Pack Assembly within a couple of minutes, it will not trigger a reset. If the saved power runs out before the new Battery Pack Assembly is connected, the unit will reset. This will not impact saved data, programs or configuration, however unsaved data will be lost and the time will need to be reset.

### **To change a Battery Pack Assembly, perform the following steps:**

1. Remove the hand strap from the Battery Pack Assembly.
2. Ensure the unit is turned on. (The unit will automatically turn itself off when you loosen the screws in the next step.)
3. Use a screwdriver or a coin to unlock the two screws on the Battery Pack Assembly by turning them counter-clockwise until the Battery Pack Assembly can be removed. Unscrewing the screws turns the unit off and puts it in a special state that prevents it from turning on for alarms and notifications.
4. Remove the Battery Pack Assembly by taking it out of the unit. Be careful to not press the Power key while the Battery Pack Assembly is detached.
5. Quickly insert the new Battery Pack Assembly onto the unit.
6. Fasten the Battery Pack Assembly securely into place by turning the two screws clockwise.
7. Replace the hand strap.
8. Turn the unit on to resume operation.

**Notes:** The screws MUST be tightened securely before turning the unit on or it will not turn on. The back of the stylus can be used as a screw driver.

Any readings stored in the Trimble Ranger will not be lost.

## **Changing the Date/Time**

If you need to change the time after swapping out the Battery Pack Assembly or any other reason, follow the steps below:

1. Click on the **Start** button.
2. Then click on **Settings**, a window will open.
3. At the bottom of this window, click on the **System** tab.
4. Tap **Clocks and Alarms**.
5. You can change the **Time Zone**, **Date**, and **Time** on this window.
6. Once finished, tap okay button to close the windows.

## **Restarting The Trimble Ranger**

There may be cases when you need to reboot, or restart the Trimble. To perform a restart, press and hold the green power key. The screen will show a countdown timer. Continue holding the power key down until the countdown is completed. The unit will automatically restart. Readings will not be lost if the handheld is restarted using the above-mentioned steps.

If the restart process does not clear the condition, please call Badger Meter, Inc. Technical Support at (800)-456-5023, for assistance.

## **General Care of the Trimble Ranger**

Cleaning the Trimble Ranger is easy. Use a mild detergent and a clean soft cloth to clean the body of the Trimble Ranger. Do not clean the Trimble Ranger with solvents, such as paint thinners. Use only a lint-free cloth to clean the infrared port. Do not clean the infrared port or display window with detergents or solvents.

The Trimble Ranger has a wide operating range of -5° F to 140° F. However it is important to avoid subjecting the handheld to extreme temperatures. Leaving the unit on a vehicle's dashboard on a hot, sunny day or in a vehicle on a frigid night could affect the Liquid Crystal Display (LCD) screen and drain the battery.

### **Care of the Touch Screen**

***Use the screen protectors included with the unit to keep the touch screen clean and protected.*** To get you started, a screen protector has been added to the display at the factory. To apply a screen protector, first clean the display thoroughly. Peel the backing from the screen protector. Align the edge, and then drop the remainder onto the display. Use a credit card, if necessary, to squeeze the air from underneath the screen protector.

Use only the included stylus or other devices designed specifically for use with touch screens. The use of ballpoint pens, nails, or other sharp objects to operate the touch screen will scratch and/or damage the unit. Abrasives may scratch touch screens. Keep the touch screen clean by gently wiping the display, using a soft cloth dampened with clean water or glass cleaner. **Do not apply any cleaner directly to the display. Do not use any abrasive cleaners.**

**Note:** Failure to use the screen protectors will void your Trimble Ranger warranty.

## Getting Started

Pressing the green power key on the keypad will turn the Trimble Ranger on or off. The unit, when turned on, will display the last screen that was in use when the unit was turned off.

The Trimble Ranger has two modes of software security. Administrator mode allows full use of all software loaded onto the Trimble Ranger. In this mode, battery life may be affected by running applications such as Internet services and e-mail applications. The User mode allows only access to the Badger Meter, Inc. software to include READCENTER® Field Computer, READCENTER Quick Read and Programming Application, Orion Profile Extraction Tool, and date and time Changes. At the time of training, the two modes should be discussed and the Badger Meter, Inc. Trainer will set up the Trimble Ranger accordingly.

If the Trimble Ranger is in User mode or you are already at the Home Screen, go to next step “Home Screen.”

If the Trimble is in the Administrator mode perform the following steps to start the READCENTER Field Application (meter reading route).

On top of the Window’s mains screen, tap on “Start.”

A drop down list appears and towards the bottom of the list “Programs” appears tap on “Programs.”

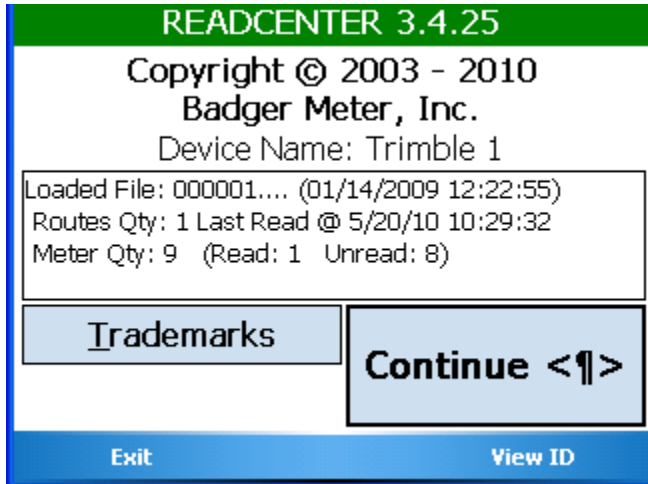
After tapping “Programs” in the upper left hand corner; tap a folder labeled “BMI.” Then choose ReadCenter Field Computer.



## Home Screen

### **From the home screen**

Tap the start button, select the READCENTER Field Application. If the READCENTER Field Application is not in the Start menu, select programs, then find and then tap the READCENTER Field Application to start meter reading.



## Copyright Screen

Besides the current version of meter reading software loaded on to the Trimble the copyright screen displays the following information.

1. Version of software.
2. Battery capacity by tapping green bar.
3. Time.
4. Device Name.
5. The last time the Trimble was loaded with a route file from the READCENTER / CONNECT software.
6. The number of routes that are loaded into the TRIMBLE.
7. Total number of meters loaded.
8. Total number of Read and Unread meters.

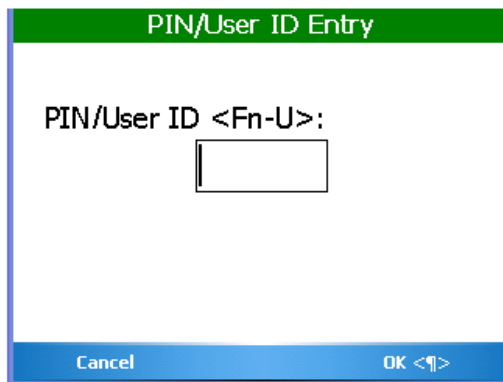
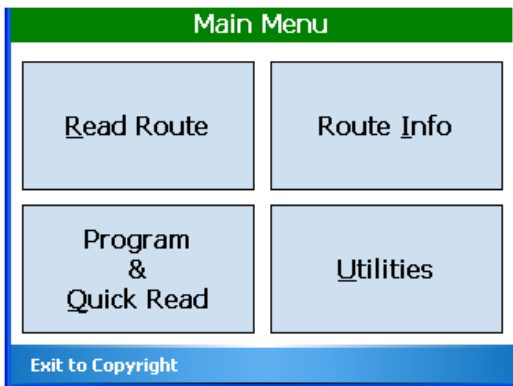
This information is useful in determining whether the Trimble is ready to be loaded or unloaded. To continue using the software, tap the **Continue** button on the screen or the keypad, or press the **Enter** button.

## Main Menu

The main menu is the starting point for all meter reading functions. There are five functions on the main menu to choose from. These options can be selected by using the Stylus to tap the box containing the desired function or by pressing the appropriate underlined alpha character on the keyboard:

- Read Route “R” – Begin reading meters
- Quick Read and Program “Q” – Use the Trimble to read meters when you do not have any loaded, i.e., for checking a Badger ORION transmitter, for obtaining final reads, troubleshooting, etc., and program Badger ORION transmitters to set an odometer, clear a tamper, or stop/start a transmitter. You can also read touch modules and program/clear tamper flags for Badger DIALOG® modules.
- Route Info “I” – Displays information about the meters and routes currently loaded into the handheld. See example of Route Information below.
- Utilities “U” – Display the Utilities Menu screen.
- “Exit to Copyright” – Go back to the Copyright Screen so that someone else can use the Trimble handheld.

Pressing any of the above buttons begins that function’s operation. If you press any other buttons, they will be ignored.



### To start reading a route

Tap **Read Route** using the stylus or press the **R** on the keypad.

### Login Screen

The Login screen accepts your 3 to 5-character personal ID (PIN). Your PIN can be your name, your initials, an ID number, etc. Using the keypad, enter your PIN and press **OK** on the screen or the **ENTER** button on the keypad to proceed to the first customer record.

If the PIN is too long or too short, the program will display, “You MUST enter 3 to 5 characters for your PIN/ID” and allow you to either retry or cancel.

## Reading Badger ORION Meters

### Read Route

Customer information is displayed. The first five lines of information can be changed by the Badger READCENTER®/CONNECT® operator to display a variety of information. There are two modes to choose from when reading routes using the Trimble Ranger. Regardless of which mode is active, Badger ORION reads will be applied to the appropriate accounts as they are received. The handheld will accept the read, beep, and store the read data.

### Manual Mode

- Advances to the next account in the reading order once a read is entered or received.
- When an account comes up that already has a Badger ORION read, the read will be shown and the meter reader will need to manually advance to the next account.
- **Prev** and **Next** are used to navigate through the accounts.

### Auto Mode

- Automatically advances to the next unread account once a read is received.
- No manual navigation capabilities.

### Choosing Mode

1. From a Badger ORION account, press the **A** key on the keypad.
2. The word **AUTO** will appear in the upper left hand corner of the screen to indicate the Trimble Ranger is now in the AUTO mode. The screen will no longer display **Prev** or **Next**.
3. To return to MANUAL mode, press the **A** key again.

**Note:** The handheld cannot be put into the AUTO mode if the account displayed is a manual read or touch account. Move to an ORION account and press **A** for AUTO.

### Quick Keys

The following Quick Keys can be pressed to make finding and bookmarking of accounts easier for the operator (these keys can be set to double or single tap setup):

- Bookmark – BB
- Next Bookmark – CC
- Toggle Route Reading Direction – DD
- Route Start – FF
- View High/Low Reads for Current Account – HH
- Settings Screen – KK
- Manual Read Entry – MM
- Read Extended Comment From READCENTER/CONNECT – OO

## Quick Keys, continued

- Progress –QQ
- Reader Code - RR
- Search – SS
- Trouble Code - TT
- Next Unread – UU
- Next Skipped – WW
- Reader Code – ZZ
- Text Message – FN key + N

**Note:** Depending on the Utility Settings of the Trimble, a single tap of a key may be used instead of a double tap. See Settings section of this guide to change this setting.

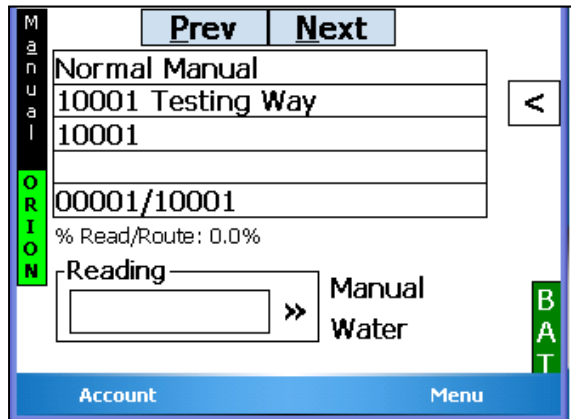
A number of possible results can occur when a Badger ORION transmitter sends a reading.

- The Badger ORION receiver receives the transmission. The Trimble Ranger stores the reading. If the meter was displayed on the screen, the display will advance to another customer record.
- The Badger ORION receiver receives the transmission that reports either a tamper or a potential leak. The Trimble Ranger logs the condition and will store a read in the case of a potential leak. If the meter with a “tamper” was displayed on the screen, the Trimble Ranger will sound an audible alert and prompt you to process the tamper before advancing to the next account.
- No transmission is received from the meter. To increase your chances of a successful read, move closer to the meter. If you choose to skip this meter, press the **Next (N)** button.

Here are some reasons for not receiving the reading:

- Transmitter ID number is wrong.
- Transmitter has not been started.
- Transmitter is not loaded into the Trimble Ranger.
- The Trimble Ranger is too far away from the transmitter.
- There may be something obstructing the line of site between Trimble Ranger and the transmitter.

## Manually Read Meters



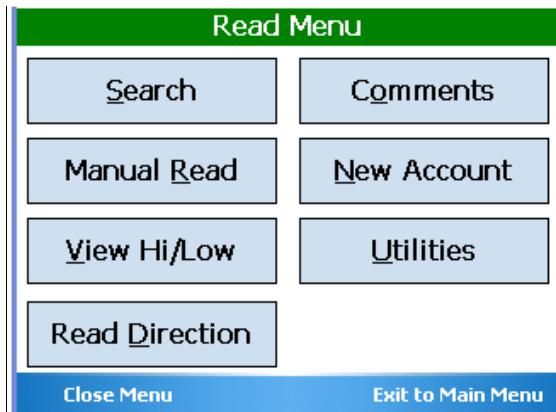
The Trimble Ranger can read touch pads, Badger ORION radio transmitters, and manually read meters. If the route contains a mix of meters the Trimble Ranger will always stop at a manual account and allow a manual meter reading. The unit cannot be put in the Auto mode while a manually read account is displayed.

To enter a manual read, enter the meter reading on the keypad and press **ENTER**.

If the meter reading is high or low the Trimble Ranger will sound an alarm, display the condition, and request further action. A manual read can always be entered, even for a Badger ORION meter.

To access the Read Menu screen, press **Menu** on the touch screen.

## Read Menu Options



The Read Menu has several selections from which to choose. Most selections are associated with the account that was last displayed.

**Close Menu** returns to the last account displayed, and **Main Menu** cancels out of Read Route. The rest of the options are described below.

**Note:** The commands on the very bottom of the screen may be used by either touching them or pressing related command button

## Search Menu



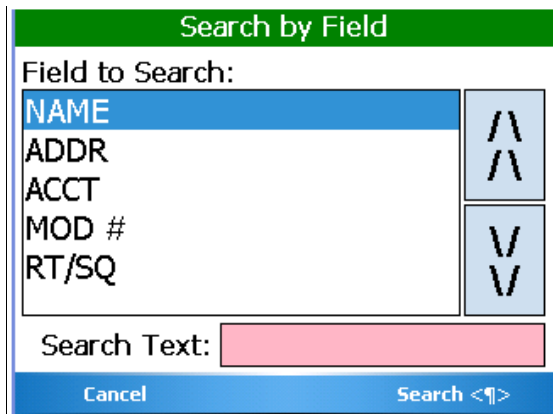
To get into the Search Menu, press the **S** key or tap **Search** using the stylus.

## Search Menu (continued)

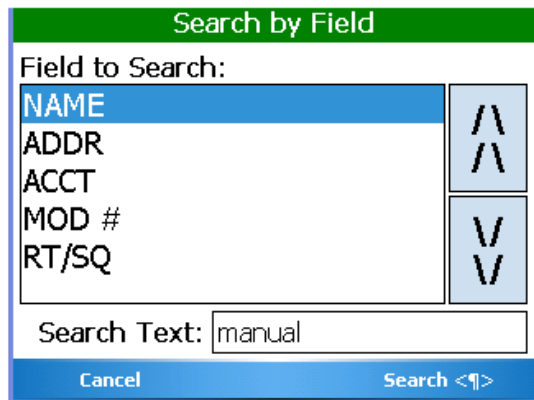
There are different ways to search for a particular meter. These searches can be started by tapping on the screen using the appropriate alpha key to begin the search.

- F – Find a meter that has a particular value in one of the five read screen fields
- T – Search for a particular Trouble or Reader Code.
- R – Select a route to search (see the Route Operations section for more details)
- B – View a list of all Bookmarked Accounts
- S – Go to the first skipped account in the current route. View a list of all Skipped Accounts
- U – Go to the next unread meter in the current route

If you wish to find a meter that has a particular name or is at a particular address, press the Search Field's "F" button. The Search Field screen allows the reader to specify the information. In our example, the five fields being used are name, address, meter location, meter serial number, and the meter model field. In addition, the account number and the AMR module number can also be searched.

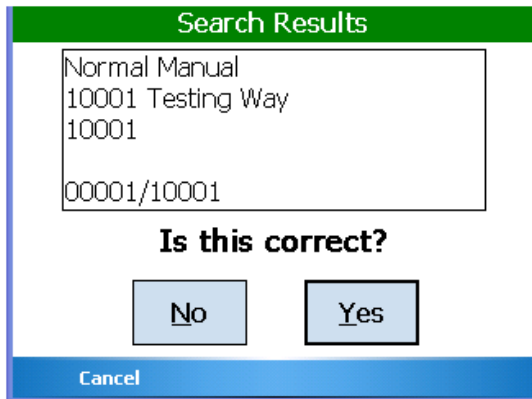


Tap the up or down arrows to move the highlight field up or down; you can also tap the desired field. Once you have the proper field selected you can now start typing the text via the keyboard for which you want to search in the Search Text field.



Clicking the on screen **Search** button will start the search.

## Search Menu (continued)



Once the Trimble Ranger finds an account that potentially matches the requested search, it will summarize account data and ask if the displayed account is correct.

Press the **Yes** key to view the account displayed.

Press the **No** key to continue the search. You will be able to search through all accounts loaded to the handheld.

Pressing the on screen **Cancel** button will return you to the Search by Field Screen.



Allows the reader to find all accounts tagged with specific reader or trouble codes

Allows the reader to go to the start of another route.

Displays the first account loaded in the handheld.

## Skipped Account s <S>

Displays the accounts that have been skipped, allowing the reader to return to those meters and perform additional actions.

## Next Unread <U>

This option searches for unread accounts. The unit will ask if you want to start your search from the **Next Account** or **Start of Route**. Tap the button on the screen or hit the underlined letter on the keypad.

### **Close**

Tap close to return to the Search Menu or Read Menu.

## Read Menu Options (continued)

### Manual Read

The screenshot shows the 'Read Menu' screen with a green header. The menu items are arranged in a grid: Search, Comments, Manual Read (highlighted with a blue background), New Account, View Hi/Low, Utilities, and Read Direction. At the bottom, there are two buttons: 'Close Menu' and 'Exit to Main Menu'.

Another option in the Read Menu screen is the **Manual Read** option. This option allows you to edit a meter reading that is already stored on the account for which you were viewing prior to choosing the Read Menu option.

Type the manual read value and press **ENTER** to store the reading. This will automatically take you to the next account in the sequence.

The screenshot shows the 'Read Menu' screen with a blue header. The menu items are arranged in a grid: Search, Comments, Manual Read, New Account, View Hi/Low, Utilities, Read Direction, and Erase Read (highlighted with a blue background). At the bottom, there are two buttons: 'Close Menu' and 'Exit to Main Menu'.

### Erase Read <E>

Tapping **Clear Read** or **E** will allow the reader to return a customer record to an unread status. **Note:** If a reading is not stored in the customer record the Clear Read **E** option is not available.

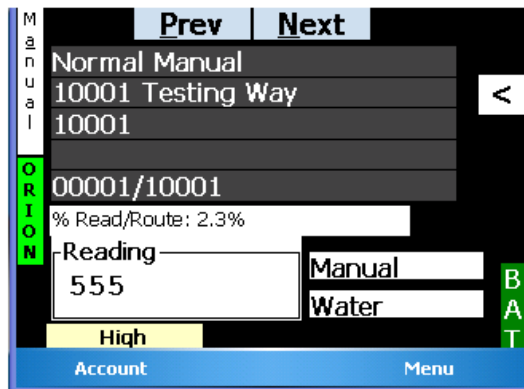
The screenshot shows the 'View High/Low' screen with a green header. It displays the 'Account Number' as 10001. Below that, it shows 'High Value: 500', 'Low Value: 250', and 'Previous Value: 200'. At the bottom, there is a 'Close <F1>' button.

From the Read Menu, the user can select **View Hi/Low (V)** to see the high and low values for the account that was displayed before entering into the Read Menu. This screen displays the account number, the high and low set by the billing program, and the previous reading that was stored in READCENTER / CONNECT.

**Note:** This information can be blocked by the READCENTER/CONNECT operator.

## Read Menu Options (continued)

### Read Direction



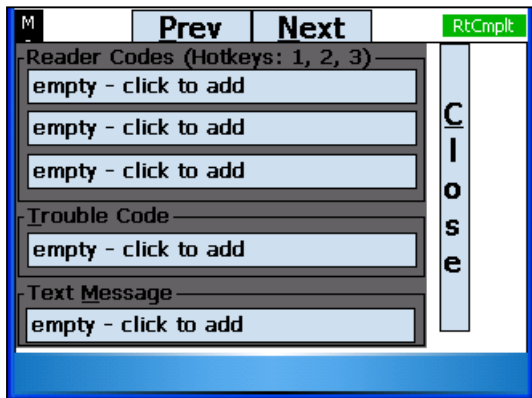
#### **Read Direction (D)**

Read Direction allows the reader to walk the route in reverse order that it was loaded into the Trimble. Pressing the **D** key will take you to the Reverse Direction Screen, “Read your route in Reverse direction?” tap Yes (**Y**) or No/ Cancel (**C**). Selecting **Yes** will display the route in reverse order, the background is black and the text is white. To revert to the “forward” direction repeat the above steps.

### Comments Menu

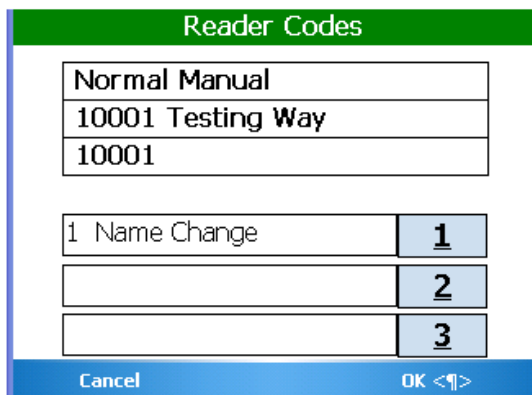
If the meter reader finds conditions he/she wishes to make the office aware of, the Trimble Ranger allows three different ways to send information back to the office.

From the **Read Menu**, press **Comments (O)** to get to the **Comments Menu**.



By selecting the arrow on the middle right hand side of the account screen, you can quickly and easily access the Reader code, Trouble Code and Text message screen. The Trimble allows three Reader codes, One Trouble code and a 140-character text message. To exit this screen, simply tap **CLOSE** or press **C** on your keypad to return the account screen.

### Reader Codes

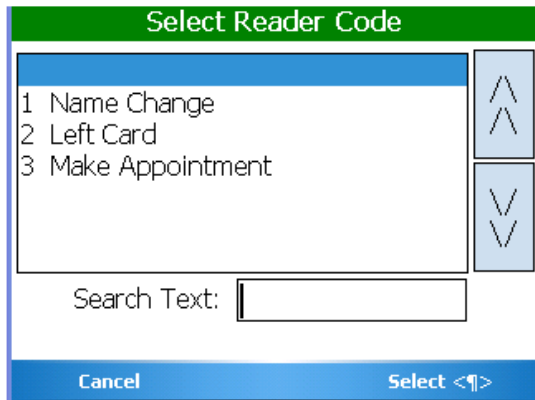


Reader Codes allow the user to attach up to three codes from a pre-defined list to an account.

1. Select **Reader Codes (R)**.
2. Select **1, 2, or 3** to enter the first, second, or third code, respectively.
3. A list of available codes will display. This list is generated by Badger CONNECT and can be modified by the Badger CONNECT operator prior to loading a Route in the Trimble Ranger.

## Read Menu Options (continued)

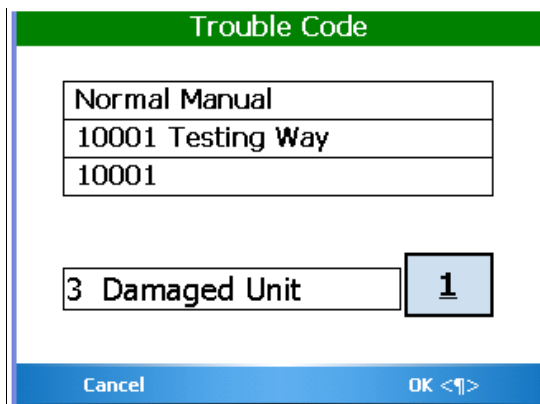
### Reader Codes (continued)



1. Use the key to go up, and the **D** key to move down to highlight the code you want.
2. There are 99 Reader Codes available to the user. Use the optional **Search** function to find the appropriate code quickly.
3. Once the desired code is highlighted press the **ENTER** key to accept your choice and return to the **Reader Codes** screen.

You may now enter another Reader Code, or select **ENTER** for **OK** and the handheld will return to the **Comments Menu**.

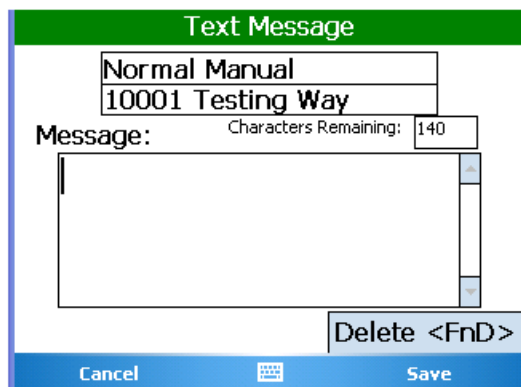
### Trouble Codes <T>



**Trouble Codes (T)** are entered similar to Reader Codes, however only one Trouble Code may be entered. Due to the types of reports that CONNECT can generate, Trouble Codes are assumed more urgent than Reader Codes. CONNECT software has the ability to pass this code to your billing software.

### Text Messages <M>

Text Messages (**M**) are used to enter account information when trouble or reader codes do not indicate sufficient information. You may attach an alphanumeric text message with up to 140 characters to each account.

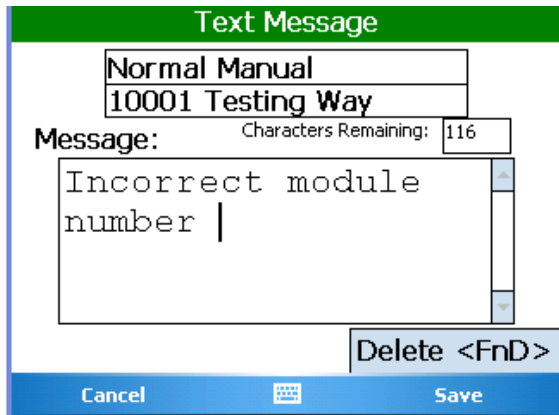


From the **Comments Menu**, select **Text Message** or press the **M** key to get to the **Text Message** screen.

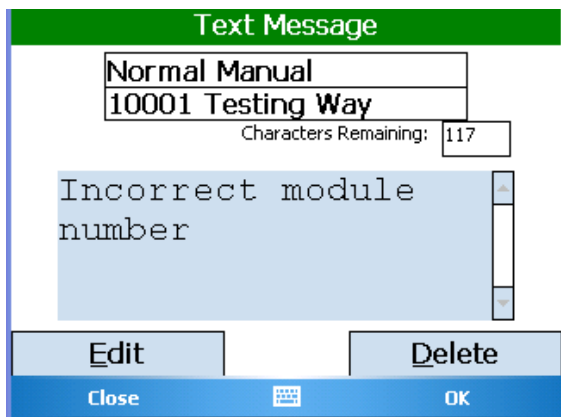
1. To create a Text Message, select **Create** or press the **E** key from the **Text Message** screen.
2. The **Text Message Edit** screen will be displayed.

## Read Menu Options (continued)

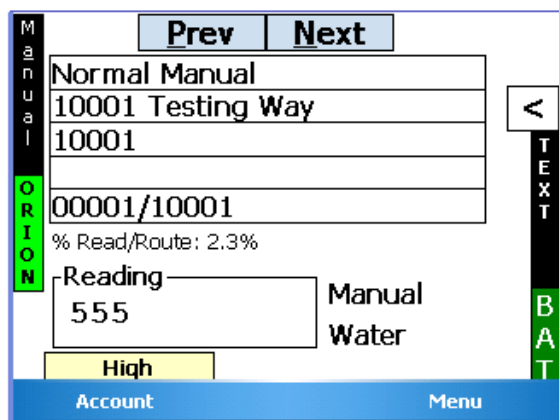
### Text Messages <M>



1. Use the keyboard to enter your message using letters, numbers and spaces.
2. To accept the Text Message, select **OK** or press the **FN-S** keys. This will take you back to the Comments Menu
3. To delete the text message, select **Delete** or press the **D** key. You have the final option here to delete by pressing **Yes (Y)** or **No (N)**.
4. Press **Close (C)** to return to the Comments Menu, then tap close to return to the Read Menu.



When the text message has been entered, the message may need to be edited or deleted. Simply return to the Text Message screen and the **Edit** and **Delete** options will be available.



After a Reader Code, Trouble Code, or Text Message is entered against an account, the read screen will display an indicator for which form of comments have been entered

As a convenience the comments screen is available at this level by tapping the "<" key or by touching the text box.

## Read Menu Options (continued)

Read Menu	
Search	Comments
Manual Read	New Account
View Hi/Low	Utilities
Read Direction	
Close Menu	Exit to Main Menu

An additional feature of the Trimble Ranger is New Account. From the **Read Menu**, select **New Account** or on the keypad press the **N** key to enter the New Account feature.

## Adding a New Account

New Account		
Name:	Chris Smith	
Addr:	102 Favre St.	
AMR Type:	Manual <Fn-T>	
AMR S/N:		
Service:	Unknown Service <Fn-S>	
Clear <Fn-E>		
Cancel	Keypad Icon	Save

The New Account selection allows the meter reader to enter a new account while reading the route. Although Badger CONNECT will display the new account if added here, Badger CONNECT cannot apply this information to its database. **The new account needs to come from the billing system in order for Badger CONNECT to store the meter readings.** If the meter reader uses this option, they will need to inform the Badger CONNECT operator of a new account. The Badger CONNECT operator can view and print the information in the View Un-loaded Reading area of Badger CONNECT.

Return to the **Main Menu** by selecting **Main Menu (X)**.

## Utilities Menu

Utilities Menu		
Progress	Battery Info	Settings
Close <Q>		

The **Utilities Menu** is accessed from the **Read Menu** by pressing **Utilities** or **U** on the keypad.

## Read Menu Options (continued)

### Utilities Menu

Overall Progress		
<b>Read</b>	<b>Total</b>	<b>Unread</b>
245	387	142
<b>Tampers</b>	<b>Unprocessed Tampers</b>	
48	0	
<b>Enc Err</b>	<b>Unprocessed Enc Err</b>	
6	0	
<b>Unexpected Manual</b>	<b>Unviewed Comments</b>	
9	12	
Close		Route Progress

### Progress <P>

Displays a summary of how many meters have been loaded to the device, number of meters read, and other miscellaneous information about the routes loaded.

To see the extended information for each item, tap the associated key with the underlined letter. For example to see Tampers item, press the Trimble's **R** key.

Route '1': 1 of 11 (CURR)		
<b>Prev</b>		<b>Next</b>
<b>Read</b>	<b>Total Meters</b>	<b>Unread</b>
1	44	43
<b>Unex. Manual</b>	<b>Unviewed Comments</b>	
0	12	
<b>Tampers</b>	<b>Unprocessed Tampers</b>	
0	0	
<b>Enc Err</b>	<b>Unprocessed Enc Err</b>	
0	0	
Close <P>		

**Route Progress** displays a summary per route tap **Prev (P)** or **Next (N)** to view previous or route summary.

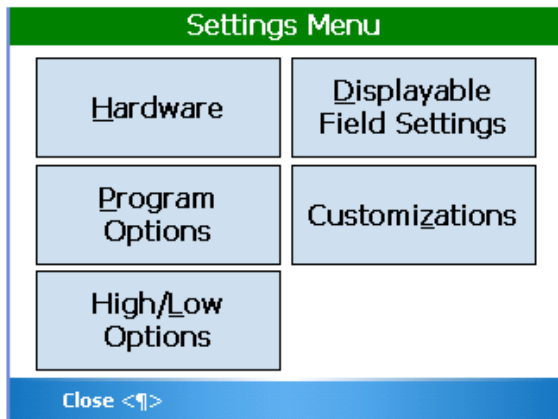
Battery Info	
95%	Battery %
100%	Backup Battery %
Close <P>	

### Battery Info <B>

This displays the percentage of battery power left in the device. You can access more battery information by touching the green utility bar at the top of the screen from anywhere within the ORION Reading software.

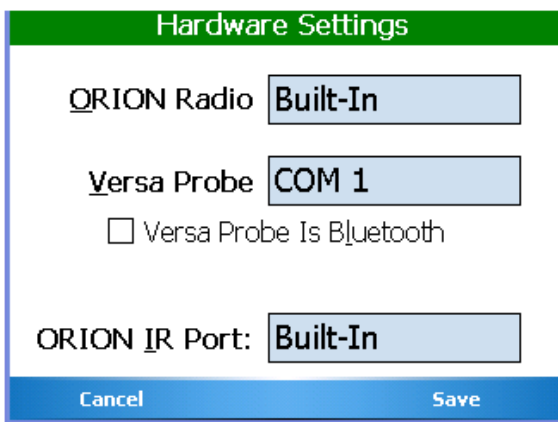
## Read Menu Options (continued)

### Settings <S>



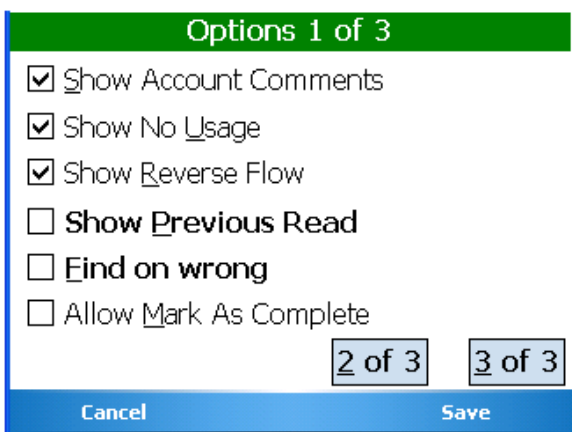
**Settings Menu** allows the meter reader to view the parameters at which the unit operates or how it treats certain situations. Although the meter reader can change these settings in the handheld, the next time the unit is loaded with a new route from Badger CONNECT, it will return to the default settings in Badger CONNECT. If the settings need to be changed permanently, the Badger CONNECT operator should be consulted.

### Hardware Settings <H>



**Hardware Settings** tells the Trimble Ranger where the accessories are connected. Hardware Settings is where the Wireless Bluetooth® VersaProbe™ option is selected. Should it be required to change any of these fields, tap the box and a different setting will be displayed. Keep tapping the box until the desired option is selected. To save the change, select Save in the lower right hand corner before exiting.

### Program Operations <P>

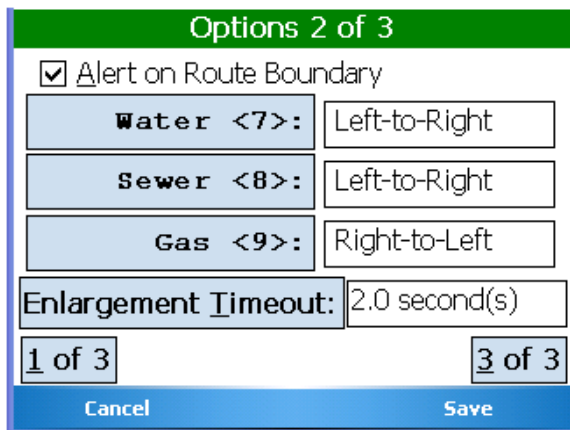


**Program Operations** tells the Trimble Ranger how to handle certain operations and conditions. These settings are set by the READCENTER/CONNECT operator, changes can be made here but they are temporary unless the READCENTER/CONNECT operator makes the change in READCENTER/CONNECT.

To advance to the next page of settings touch the **2 of 3** square or press the **2** key.

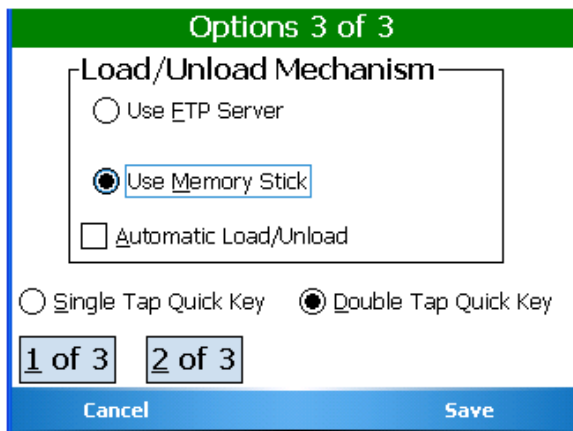
## Read Menu Options (continued)

### Program Operations <P> (continued)



The screenshot shows a screen titled "Options 2 of 3" with a green header. It contains a checked checkbox for "Alert on Route Boundary". Below this are three input fields: "Water <7>:" with "Left-to-Right", "Sewer <8>:" with "Left-to-Right", and "Gas <9>:" with "Right-to-Left". There is also an "Enlargement Timeout:" field with "2.0 second(s)". At the bottom, there are "1 of 3" and "3 of 3" indicators, and "Cancel" and "Save" buttons.

Page 2 of **Program Operations** has an option to alert the meter reader when they cross from one route to another, direction in which the meter reading is typed into the Trimble Ranger, and how long the enlargement feature will be activated if that featured is used.



The screenshot shows a screen titled "Options 3 of 3" with a green header. It features a "Load/Unload Mechanism" section with three radio button options: "Use ETP Server", "Use Memory Stick" (which is selected), and "Automatic Load/Unload". Below this is a "Quick Key" section with two radio button options: "Single Tap Quick Key" and "Double Tap Quick Key" (which is selected). At the bottom, there are "1 of 3" and "2 of 3" indicators, and "Cancel" and "Save" buttons.

Page 3 of Program Operations is where the options for Loading/Unloading is chosen.

This area also has the option to select how the Quick Keys are used, one tap would mean that the Quick key needs only to be pressed once, double-tap requires the Quick key to be press twice quickly.

### High/Low Options <L>



The screenshot shows a screen titled "High/Low Options" with a green header. It contains four checked checkboxes: "Advance on High/Low", "Beep on High/Low", "Show High/Low Values", and "Hi/Low Readings Eail". Below these is a "Hi/Low Entry Disposition" section with a text input field containing "Accept/Reject". At the bottom, there are "Cancel" and "Save" buttons.

To enter the High/Low Options from the Settings Menu touch the High/Low Options square on the screen or press the **L** key on the key pad.

The first two options apply to ORION radio reads, and the last two options relate to manually entered reads.

The CONNECT operator can select to NOT display the High/Low values from the billing system on the Trimble Ranger. If this is set in CONNECT changing the setting in this screen will NOT display the high/ lows.

## Read Menu Options (continued)

### Displayable Field Settings <D>

**User Defined Fields**

Predefined Display Fields:

Name
Addr
Acct
Mod #
Rt/Sq

Custom Field: % Read

Cancel Save

**Displayable Field Settings (D)** displays customer account information. The first five settings are set by the CONNECT operator and must be changed at that level. However a sixth display field may be chosen by the meter reader by touching the Custom Field box or pressing the F key.

### Customizations <Z>

**Customization 1 of 3**

Bookmarks Display Using Field:  
Addr

Search Hot Key:

Search By Trouble/Reader Code

2 of 3 3 of 3

Cancel Save

**Customizations <Z>** has three pages of customizations that only the meter reader controls, CONNECT has no affect on these settings.

The first page is used to determine what information will be displayed when a bookmark is set. This aids the meter reader in finding the Bookmark in the search mode.

**Customization 2 of 3**

Unread Hot Key:  
Next unread from Current

Treat Skipped in Progress as Unread

Limit Searches to Current Route

1 of 3 3 of 3

Cancel Save

Page 2 of customizations has two options. A skipped account in progress is an unread account or an account that was only an attempted read. Searches to the current route can also be set as limited searches.

The meter reader has the option to limit searches to the current route, if this box is checked. Left unchecked the Trimble Ranger will use all the Routes loaded into the Trimble to conduct searches.

## Read Menu Options (continued)

### Customizations <Z> (continued)

Customization 3 of 3

Skipped Meter Definition:  
Skip Not Used

Show message when automated read is applied to a skipped service.

Extended Comments from CONNECT Automatically Popup

1 of 3 2 of 3

Cancel Save

Page 3 of customizations allows the user to choose how the Trimble Ranger will treat a skipped meter. When a meter is skipped the Trimble Ranger will automatically display the Reader/Skip code list, Trouble code list or both if this feature is checked.

If an Account/Service is Skipped, you must remove the skip prior to entering a reading. Furthermore, if an Account/Service is Skipped and an automated reading is read, that reading will be applied to the Account/Service and the skip condition will be removed (the user is optionally notified of this happening: Settings Menu-> Customizations-> Customization 3 of 3-> "Show message when automated read is applied to a skipped service" checkbox).

### Badger ORION Quick Read

From the **Main Menu**, **Program & Quick Read (Q)** is used to clear tampers on RTRs<sup>®</sup>, reset the odometer, and obtain radio reads for selected transmitters or all transmitters in range.

Main Menu

Read Route Route Info

Program & Quick Read Utilities

Exit to Copyright

Select **Program & Quick Read (Q)**.

Quick Read Menu

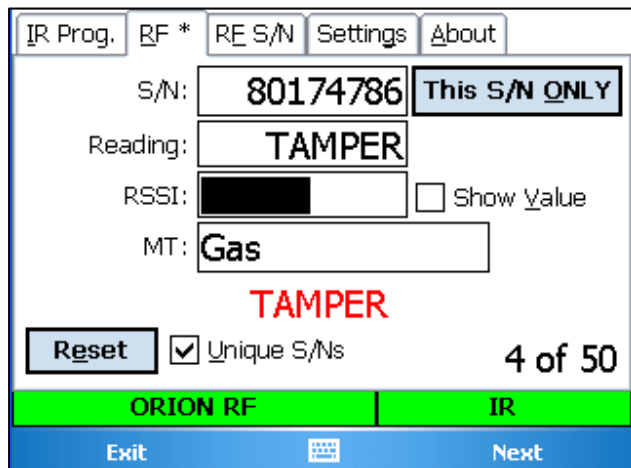
ORION Versa Probe

Close <F1>

A screen will appear asking to choose between Badger ORION or VersaProbe™. The standard choice is **ORION (O)**. The VersaProbe is a Touch Read option

Once you choose Badger ORION, the Badger ORION Quick Read screen appears. Enter your initials and then the ORION Utility program will appear.

## Badger ORION Quick Read (continued)



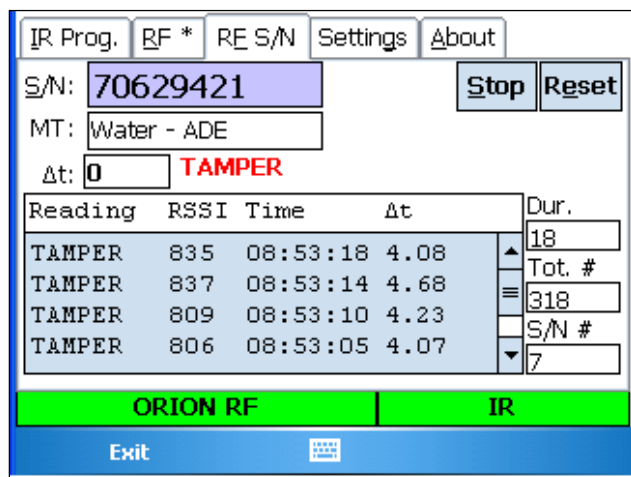
Select the **RF \*** tab near the top.

To listen for all transmitters in range, select the **RF \*** tab and wait a few seconds.

- Press **Next (N)** in the bottom right-hand corner to scroll through the transmitters and view the readings.
- Press **Reset (E)** to reset the display, and collect readings again.

To obtain a reading for a specific transmitter tap **This S/N Only** or press **O**.

Manually key the ORION S/N, the unit will display an initial read and updated readings every time the transmitter communicates with the Trimble Ranger. Press **Exit** on the bottom left-hand side of the screen.



## GAS Orion Quick Read

Select your desired Drive Circle and then press select in the bottom right hand corner.

The screenshot shows a software interface with the following elements:

- Top navigation: IR Prog., RF \*, RE S/N, Settings, About
- S/N: 70629421 (highlighted in purple)
- Buttons: Stop, Reset
- MT: Water - ADE
- Δt: 0, TAMPER (in red)
- Table of readings:
 

Reading	RSSI	Time	Δt	Dur.
TAMPER	835	08:53:18	4.08	18
TAMPER	837	08:53:14	4.68	Tot. #
TAMPER	809	08:53:10	4.23	318
TAMPER	806	08:53:05	4.07	S/N #
				7
- Bottom status bar: ORION RF, IR, Exit, and a keyboard icon.

If Orion Gas Meters are present you will be presented with a drive circle selection screen.

The screenshot shows a configuration screen with the following elements:

- Unknown, Pressure: 1.0000
- Units: Et<sup>3</sup> (selected), m<sup>3</sup>, Both
- Dials: 4 (selected), 5, 6, All
- Res.: 100 (selected), 1000, All
- List of drive circles:
  - 1 CuFt Int (100:4)1
  - 2 CuFt Int (100:4)1
- Navigation: ^ (up), v (down)
- Bottom bar: Cancel, keyboard icon, Select <¶>

Every read that comes in for the selected S/N is displayed in the table.

For Gas ORION, you get “Index-Sub” for the reading.

If RSSI is available, you see the RSSI values of each read.

Finally, you see the time the Read came in, and the seconds elapsed (Δ-T) since the previous read.

“Dur.” On the right hand side of the screen is total number of seconds you’ve been reading on this screen. This increases every second.

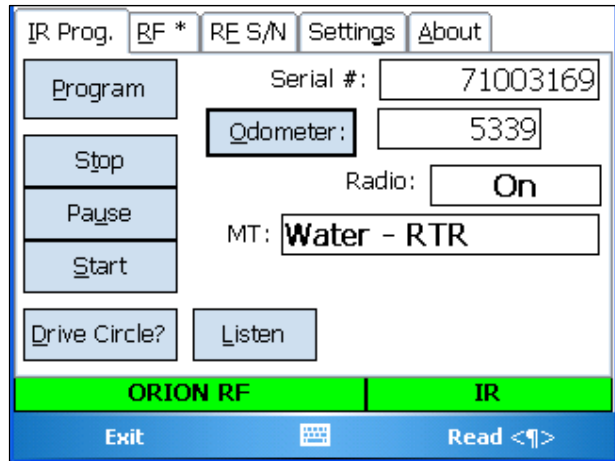
“Total #” is the total number of packets or readings heard, from ALL GAS S/Ns.

“S/N #” is the total number of readings heard from the selected S/N.

## IR Programming <I>

The function of IR Programming is to Start, Stop, Pause, and Program transmitters. A transmitter that is connected to a Badger RTR and has a tamper (cut wires between transmitter and RTR) will need to be programmed after the wires are repaired. The following steps are used to program an ORION transmitter connected to a Badger RTR.

**Note:** ORION transmitters connect to a Badger ADE® or approved competitor encoders DO NOT require programming if the wires get cut. The first hour after the wires have been properly repaired the ORION transmitter will update itself with the new encoder reading.

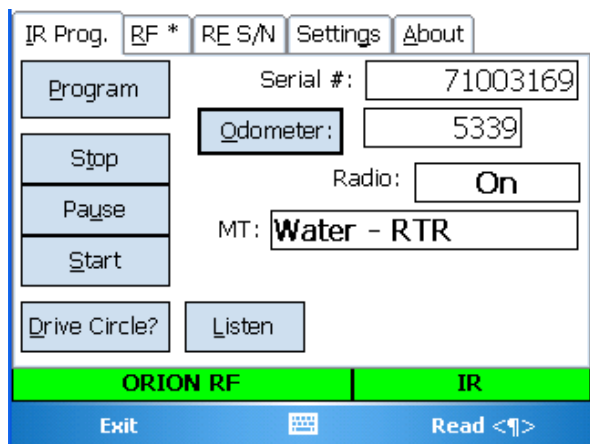


From the Quick Read Screen press **IR Prog (I)** tab to access Badger ORION programming software.

Connect the IR sensor to the nine-pin port at the bottom of the Trimble Ranger.

## Programming Badger ORION Modules

**Note:** You must perform a Read function before you can complete any other function.

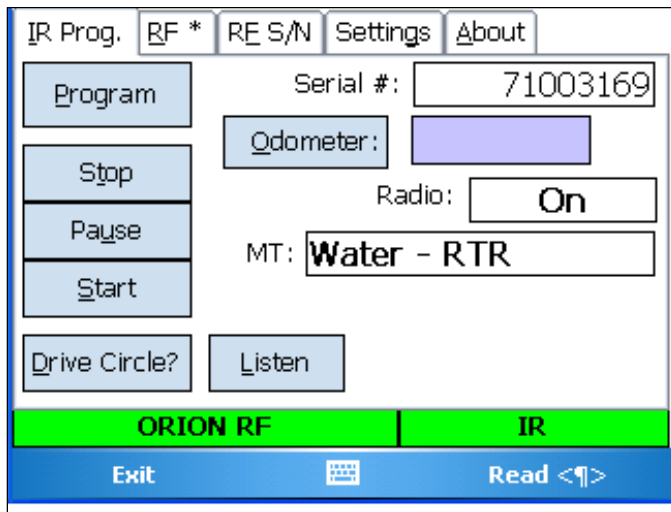


Align the IR sensor with the transmitter's LED and tap **Read** at the bottom right-hand side of the screen to read the transmitter.

The screen will display the transmitter's serial # and odometer value, plus radio status, meter type (MT) and any alarms that are set.

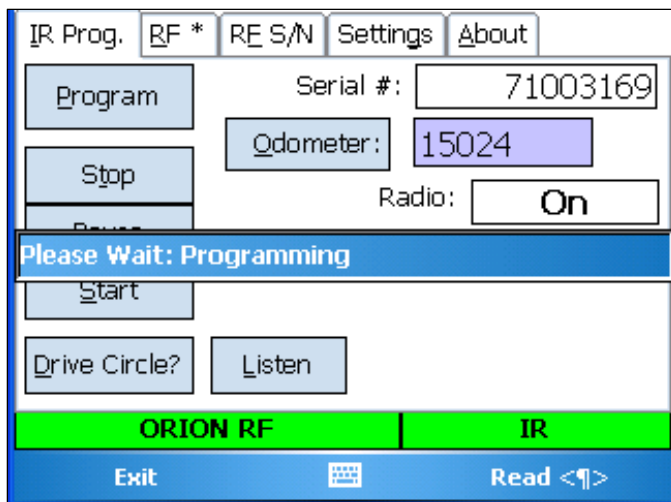
Once the module has been read, select **Odometer (O)** to adjust the stored odometer value.

If required use the **DELETE** key on keypad to remove each character, first place the cursor at the end of odometer read, then press the delete key.



Type in the meter reading you wish to program the transmitter to. There is no need to enter leading zeros; however it may help to enter leading zeros so that the transmitter is programmed correctly. Only seven digits (6 moving dials and sweep hand) can be entered when programming a transmitter regardless of meter size.

Align the Trimble Ranger IR sensor with the LED of the transmitter and press the **Program (P)** key. The Trimble Ranger will beep when the new value is stored.



To verify that the programming and the splicing was successful; select **RF \*** and perform a Quick Read on the transmitter.

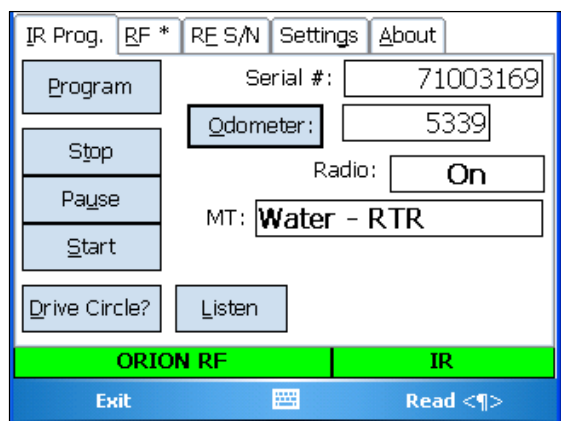
If the transmitter still reports a Tamper, check all the splices and repair as necessary.

Once the transmitter information has been successfully read, the fields on the screen will be updated.

The Program ORION screen allows you to perform these functions:

- **Read** or **ENTER** imports the transmitter's information through the optical LED
- **Program** or **P** change odometer, clear a tamper
- **Start Radio** or **S** starts the transmitter
- **Stop Radio** or **T** stops the transmitter until the transmitter is reprogrammed to start Radio
- **Pause Radio** or **U** pauses the transmitter until a unit of water flows through it
- To exit tap **OK** in upper right hand corner

## Pause, Start, and Stop Radio



Each Badger ORION transmitter is programmed at the factory to begin sending its meter reading when the register senses flow through the meter. This lets you install Badger ORION transmitters on meters without having to manually start the transmitter. When water usage has been registered on the meter the transmitter will send a signal every four seconds.

However, if you want to start the transmitter before installing the meter, you can use the **Start Radio (S)** function.

The **Pause Radio (U)** function pauses the radio signal until water passes through it again or the transmitter is reprogrammed to start radio broadcast.

The **Stop Radio (T)** function does just that, it stops the transmitter from sending any signals until the Start Radio option is used and turns the transmitter back on. **Stopped Radios MUST be reprogrammed to start the radio signal.**

**Note:** Stopped units continue to record consumption. Badger Meter, Inc. recommends that meters be paused not stopped.

Tap **Exit** in the bottom left-hand corner of the screen to exit the ORION Utility.

Here's an example to help you through the steps of setting an odometer value.

Let's assume that you are installing a Badger ORION transmitter on an active meter with usage on the RTR<sup>®</sup>. Follow these steps to ensure that the value stored in the transmitter matches the current odometer value on the RTR.

When programming Badger ORION transmitters, you need to **enter the six moveable odometer wheels plus the sweep hand, regardless of your usual reading resolution.** The sweep hand takes the place of the fixed zeros. You will enter a seven-digit number if you choose to enter leading zeros.

For this example, we'll assume that the odometer value (both black digits and white digits) is "001234." The RTR odometer would look like this.

0 0 1 2 **3 4**



Let's also assume that the sweep hand is pointing between the 6 and the 7. Because the sweep hand has not yet hit the 7, use a value of 6 as the last digit of the meter reading.

### Programming Badger ORION Modules (continued)

The value to be entered into the Badger ORION transmitter is "0012346."

First, place the Trimble Ranger optical port over the transmitter's LED and perform the **READ (Read)** function.

Set the new odometer value on the display by choosing **Odometer (O)**, tap behind the reading and then use the **DELETE** key on the keypad to delete the current odometer value. Enter the desired odometer reading (0012346).

**Note:** Leading zeros do not have to be entered; however on larger meters it might be helpful to enter them as placeholders. The Trimble Ranger will only allow 7 digits to be entered during this function.

Now set the optical port over the transmitter's LED and press the **Program (P)** key. The Trimble Ranger will beep when communication between the optical port and the transmitter has been completed. The transmitter now holds the new odometer value.

To verify that the odometer value has been properly stored, place the optical port over the LED and perform the **READ (Enter)** function again.

## Trimble Ranger Keypad Functions

The Trimble Ranger software contains a number of Hot Keys and Quick Keys that will allow you to perform a meter reading function. To use a Hot Key first press the **FN** key then quickly press the corresponding hot key for the function you wish to perform. Release both buttons. To use a Quick Key either double tap or single tap (depending on settings) the corresponding Alpha character.

Key	Associated Hot Key	Read Screen On Screen Usage	Associated Quick Key
A	--	Auto-Mode	
B	BOOKMARK	--	Toggle Bookmark
C	--		Next Bookmark
D	RD DIRECTION		Toggle reading direction
E	RESEG		Resequence (not active)
F	RTSTART		Route Start
G			
H	HI/LO		View High/Low reads for current account displayed
I			
J		Encoder Error processing	
K	SETTINGS		Settings Screen
L			
M	MAN RD		
N	MESSAGE	Next Account	
O			Read Extended Comment from READCENTER/CONNECT
P		Previous Account	
Q	PROGRESS		Progress
R	RD CD		Reader Code
S	SEARCH		Search
T	TRBL CODE		Trouble Code
U	UNREAD		Next Unread
V			
W	NXT SKIP		Next Skipped
X			
Y			
Z	RD CD		Reader Code

## **Technical Support**

### **Questions**

If the Trimble Ranger screen displays become abnormal, record the information and call the Badger Meter, Inc. Technical Support telephone number: **1-800-456-5023**. The Technical Support Specialist will help you gather any additional information and will investigate to find the cause of the problem.

It is also very helpful for you to record the situation that led to the strange behavior. Record the steps you took, and the entries you made, that brought about the display. This information will be very valuable in the investigation, and will help find the solution more quickly.

### **When You Call the Technical Support Hotline**

When you call Technical Support's 800 number explain the situation, and go over the information that you recorded. This is where your notes on the display or the behavior and the steps you took will be very valuable. If possible, give the following information to the support specialist:

- The Trimble Ranger screen that was active
- The steps being performed at the time
- Any entries that were made on the screen
- Any error message displayed, including any error code or explanation that was shown
- The current state of the Trimble Ranger

### **What To Report To Technical Support**

It is important that you report all occurrences of errors to the Technical Support Hotline. It allows Badger Meter, Inc. to improve its products and improve your system at the same time. In some cases, the problem may have already been solved, and the specialist can send you a software upgrade to correct the problem. In other cases, the specialist can advise you on how to perform the function in such a way as to avoid the problem.

In some cases, the specialist will direct you to perform specific steps if the problem happens again. The specialist will gather very valuable information that will speed the investigation of the problem. If the problem does happen again, please follow those steps and call the Hotline. The specialist will gather the information for that particular problem, and direct you if further action is needed.

### **Faxing the Technical Support Group**

The Badger Meter, Inc. Technical Support Group can also be reached by fax at 1-888-371-5982. This may be a convenient way to follow up with your support specialist on particular steps. The number is available 24 hours per day, seven days per week.

### **E-Mailing the Technical Support Group**

The Badger Meter, Inc. Technical Support Group is also available via electronic mail. Send questions or comments to the Technical Support group at: [TechSupport@BadgerMeter.com](mailto:TechSupport@BadgerMeter.com). The Technical Support Group can respond via phone, fax, or e-mail. Just let us know in your message the type of response you would prefer.

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Please see our website at  
**[www.badgermeter.com](http://www.badgermeter.com)**  
for specific contacts.

Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists.



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