

Model RTR®

Recordall® Transmitter Register  
HRT to RTR Upgrade

# Installation Data

## REQUIRED MATERIALS

3 - 59761-001 Gel Connectors  
1 or 2 - 26017-001 18.5" Seal Wire  
1 or 2 - 16279-001 Lead Seal

## SUGGESTED MATERIALS

59999-001 Non Corrosive Staples  
Wall Anchors, Screws, Cable Ties

## REQUIRED TOOLS

TRACE Model PI Portable Interrogator  
59983-001 E-9E Parallel Jaw Crimping Tool  
59989-001 Coax Stripping Tool  
59991-001 Diagonal Wire Cutting Pliers  
59995-001 Screwdriver  
62658-004 Torx Screwdriver - #15 Bit  
62657-001 Torx Bit #10  
62016-001 RT Programming Link

## SUGGESTED TOOLS

34027-000 Portable Tester-Battery Operated  
59996-001 Wire Stapler  
ESD Grounded Wrist Strap  
Utility Pliers, Cordless Drill, Standard  
and Masonry Bits

## IDENTIFICATION

The Badger Meter Recordall® Transmitter Register (RTR®) is available for all remote and pit settings where a water meter can be located. The RTR is permanently sealed to eliminate moisture, dirt, and other contaminants to insure reliable operation in submerged or indoor applications.

Available for all Recordall Disc and Turbo II meters, each RTR is clearly identified on the face of the dial with an assembly number, unit of measure, and meter model (Figure 1).



Figure 1. Identification

## INSTALLATION

Before proceeding with the change out, be certain that the meter type and size correspond with the RTR.

### DISCONNECTING THE HIGH RESOLUTION TRANSMITTER (HRT)

Cut and remove the seal wire from the HRT. Loosen the seal screw and remove the HRT from the water meter. Record the odometer reading on the HRT.

Cut and remove the seal wire from the Remote Transponder (RT) housing. Remove the four screws holding the cover and carefully remove the cover and cover gasket. Place the cover, gasket, and screws in a clean, dry, safe location for reinstallation as needed.

## ⚠ CAUTION

Working with the Remote Transponder electronics requires the use of proper electrostatic discharge (ESD) protection. Grounded wrist straps are recommended when working inside the Remote Transponder housing.

Carefully cut the wires that are gel spliced together inside the RT housing as close to the gel caps as possible. Remove the transmission wire back to the HRT, removing the staples, cable ties or other hardware securing the wire.

### INSTALLING THE RTR

A factory installed two conductor shielded cable with drain wire is the output lead from the RTR provided for connection to remote modules.

Strip approximately 1-1/2" of outer insulation sheath from the RTR cable using the 59989-001 Coax Stripping Tool. Use caution in removing the outer sheath so that the inner signal wire insulation is not damaged.

Unwind the outer foil shield from the cable and cut it off even with the outer sheath using the 59991-001 Wire Cutting Pliers. Do not cut the un-insulated shield drain wire.

Cut the two insulated conductors to approximately 3/4" in length as indicated in Figure 2.

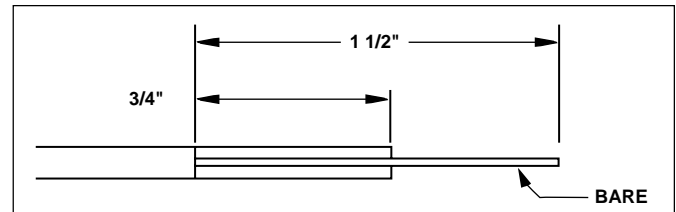


Figure 2. Wire Stripping Detail

Route the RTR transmission cable along the most direct and convenient route between the meter and transponder. Secure the cable using appropriate non corrosive staples, cable ties or other hardware to provide strain relief and protection for the signal cable.

### WIRE TERMINATION

Using the 59761-001 Gel Connectors carefully connect the wires of the RTR to the RT, observing proper polarity. Badger specifications call for the black conductors to be the negative (-) conductors, the red or white conductors to be the positive (+) conductors and the bare or green conductor to be the shield/drain wire. Connect the conductors by inserting them completely into the Gel Connectors and crimping firmly using only the 59983-001 E-9E Parallel Jaw Crimping Tool. First connect the two black conductors, then the unshielded drain wire and green conductor, and finally the two red or white conductors.

## ⚠ WARNING

Use of tools or pliers other than the E-9E Parallel Jaw Crimping Tool may cause damage to the connector and a poor connection.

### TRANSPONDER PROGRAMMING

After completing all connections, wait two minutes and then using the Portable Interrogator (PI), obtain the reading from the RT. The first interrogation should indicate "OPEN". Interrogate the transponder again to clear the tamper flag. The RT must now be reprogrammed to match the odometer reading on the RTR.

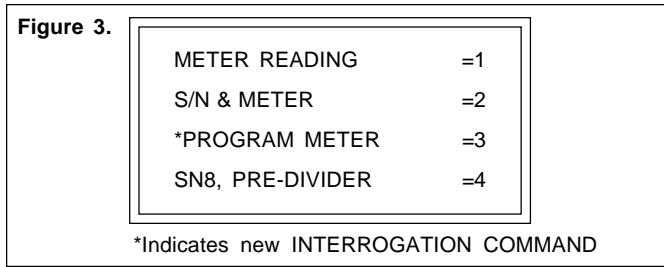


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On the PI enter the EDITOR mode and then press the CMD key to display the COMMAND menu on the LCD. Press the 3 key and then ENTER to move to the PROGRAM METER mode. The LCD will then look like Figure 3.

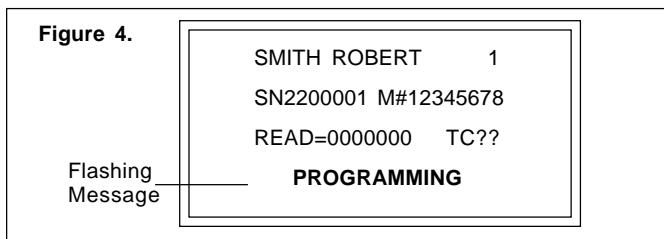


Press MODE to return to the EDITOR mode. The LCD will display the current account record. Check the serial number (S/N) of the RT to be programmed. If needed, change the S/N field on the PI to match the RT S/N. Position the cursor in the S/N field and enter the correct seven digit S/N with leading zeros. The S/N field must match the serial number on the transponder label.

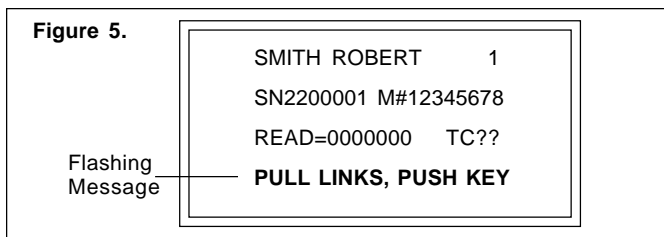
Enter the meter reading from the RTR odometer stack in to the Read field on the PI. For transponders with a serial number of 2500000 or more, enter the meter reading starting with the far left wheel of the odometer in the left most position of the Meter field. Enter all seven digits including the sweep hand. For transponders with a serial number of 2499999 or less, enter the meter reading starting with the fifth number wheel of the odometer and enter the first five digits of it in the Read field.

When the S/N field and Read field agree with the installation, set up the transponder for programming. For transponders with a S/N of 2500000 or higher, locate the group of three jumper pins on the lower left corner of the circuit board. For transponders with a S/N of 2499999 or lower, locate the group of four jumper pins on the lower right corner of the circuit board.

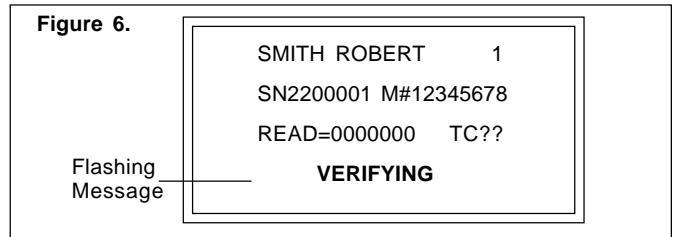
- Slide the socket end of the 62016-001 RT Programming Link over these pins to set the RT for programming.
- On the PI press INT. The LCD will display the word 'PROGRAMMING' on the last line of the screen for about two seconds (Figure 4).



- After programming is complete, for transponders with a S/N of 2499999 or less a flashing message 'PULL LINKS, PUSH KEY' will be displayed (Figure 5). For transponders with a S/N of 2500000 or more no message will be displayed.



- Immediately remove the programming link from the RT. On the PI press 'ENTER'. The message 'VERIFYING' will appear for about two seconds (Figure 6).



- After verification, the LCD will display 'GOOD PROGRAM' or 'PROGRAMMING FAILED'. If the good program message appears, press 'NEXT' on the PI to record the data and advance to the next record. If the programming failed message appears, return to step 1 above.

- To exit the PROGRAM COMMAND mode, turn the PI off and back on.

### TESTING

Using the PI, obtain the reading from the installed RT by pressing the 'INT' key in the DATA COLLECTION mode. Compare the returned reading with the odometer reading on the RTR. If the readings do not match, return to step one of the TRANSPONDER PROGRAMMING section. If the tamper flag does not clear refer to the TROUBLE SHOOTING section of these instructions.

For transponders with a S/N of 2500000 or more, advance the RTR one revolution of the sweep hand. For transponders with a S/N of 2499999 or less, advance the RTR 10 revolutions of the sweep hand. Either the 34027-000 Portable Tester-Battery Operated register tester or running water through the meter can be used to advance the sweep hand. After advancing the RTR, interrogate the transponder again to insure that the system is working and the transponder is in correlation with the RTR.

### TROUBLESHOOTING

Open connections or shorts in the RTR transmission cable or wire connections are detected by the transponder electronics. Even an intermittent problem will be detected and 'OPEN' or 'SHORT' is displayed on the next interrogation of the transponder. If the problem is cleared, a second interrogation should clear the tamper flag from the PI screen.

IF the tamper flag will not reset:

- Inspect all wire runs and connections for open or shorted connections.
- Wait a minimum of two minutes and interrogate again.

### COVER AND TAMPER SEAL

After all components of the system are installed and successfully tested, replace the housing cover and gasket and secure with the four screws. Make certain that the gasket is properly seated to insure that water does not leak into the housing. Thread the seal wire and crimp the ends using the lead seal.

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



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