Natural Gas Solutions

100T-HON Honeywell Telemetry Module Installation Guide

Identification

100T-HON Honeywell Telemetry Module Installation Guide
13 March 2013 TDC-1346-000
100T-HON
100-T HON part number: TEL-1000-002

Copyright

Confidentiality Notice

The information contained herein is proprietary and confidential and is provided subject to the condition that (i) it is held in confidence except to the extent required otherwise by law and (ii) it is used only for the purposes described herein. Any third party given access to this information is similarly bound in writing.

Trademark Notice

Itron is a registered trademark of Itron, Inc.

All other product names and logos in this documentation are used for identification purposes only and may be trademarks or registered trademarks of their respective companies.

Compliance Statement

This device complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference that may cause undesirable operation.

This device must be permanently mounted such that it retains a distance of 20 centimeters (7.9 inches) from all persons in order to comply with FCC RF exposure levels.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Compliance Statement

This equipment complies with policies RSS-210 and RSS-GEN of the Industry Canada rules. Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Déclaration de conformité

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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Modifications and Repairs

To ensure system performance, this device and antenna shall not be changed or modified without the expressed approval of Itron. Any unauthorized modification will void the user's authority to operate the equipment.

Transportation Classification

The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, the 100T-HON is considered an operating transmitter and receiver and cannot be shipped by air. All product returns must be shipped by ground transportation.

Safety Statements

Warning Follow these procedures to avoid injury to yourself or others:

- The lithium battery may cause a fire or chemical burn if it is not disposed of properly.
- Do not recharge, disassemble, heat above 100º Celsius (212º Fahrenheit), crush, expose to water, or incinerate the lithium battery. Fire, explosion, and severe burn hazard.
- Keep the lithium battery away from children.
- Replace the lithium battery only with batteries meeting Itron specifications. Any other battery may cause a fire or explosion.

Warning Only authorized Itron personnel should attempt repairs on Itron equipment. Attempts to do so by others might void any maintenance contract with your company. Unauthorized service personnel might also be subject to shock hazard on some Itron equipment if removal of protective covers is attempted.

Warning To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

Warning Substitution of components may impair intrinsic safety.

Warning Potential Electrostatic Charging Hazard. Clean only with a damp cloth.

Suggestions

If you have comments or suggestions on how we may improve this documentation, send them to TechnicalCommunicationsManager@itron.com

If you have questions or comments about the software or hardware product, contact Itron Technical Support:

Contact

- Internet: www.itron.com
- E-mail: support@itron.com
- Phone: 1 877 487 6602

Contents

Before You Begin

Document Purpose

This installation guide provides step-by-step instructions for installing the 100T-HON telemetry module on a Honeywell Mercury Instrument.

Document Conventions

The following documentation conventions are used in this installation guide.

⚠️ **Caution**   A Caution warns the installer that failure to follow the information in the note could result in loss of data. Be sure to carefully read a Caution note and follow the advice or instructions.

⚡ **Warning**   A Warning alerts the installer about potential physical harm to the installer or hardware. It is critical that you pay strict attention to Warning notes, read the information carefully, and follow the advice or instructions.

💡 **Tip** A Tip provides the installer with extra hints or tips to make a task easier to perform or a concept easier to understand.

ℹ️ **Note** A Note supplies generic information to the installer. The installer can ignore the information and continue the task without suffering any adverse consequences.

C H A P T E R 1

About the 100T-HON Honeywell Telemetry Module

Itron 100T-HON telemetry modules are radio-frequency (RF) devices designed to transmit meter and instrument data to an RF meter reading device within transmission distance of the module. The 100T-HON is designed to interface specifically with Honeywell Mercury Instrument devices and communicates using a protocol similar to other Itron AMR devices. The 100T-HON provides both a traditional meter reading RF interface and a new telemetry RF interface. The 100T-HON module physically connects to the Honeywell device.

Honeywell devices support several output mechanisms, but the majority of the information required for the 100T-HON module is collected over an RS-232 serial connection with the exception being the pulse output representing uncorrected mechanical volumes that can be optionally added to Mini-Max, Mini-Max AT, Mini-Max ATX, Mini-Max Rotary, and Mini-AT volume correctors.

The 100T-HON telemetry module features cut, tilt-tamper and cable-tamper reporting and security seals to indicate physical tampering and minimize theft. Cut cable is reported when the cable is cut or disconnected from the instrument or telemetry module. The module circuitry senses an electrical current *break* to report a cut cable tamper event.

Mercury Devices Supported by the 100T-HON

The 100T-HON telemetry module supports two Mercury Instrument types:

Electronic Volume Corrector

- Mini-Max, Mini-Max AT, Mini-Max ATX and Mini-Max Rotary Correctors
- Mini-AT

Mini-AT   Mini-Max

Electronic Pressure Recorder

- ERX

Honeywell product features are beyond the scope of this installation guide. Please reference the Honeywell product information for your particular Mercury Instrument.

Transmission Modes

The 100T-HON telemetry module can be set to transmit in fixed network or mobile and handheld mode.

- **Fixed Network Mode.** The 100T-HON telemetry module transmits a high-powered network interval message (NIM) RF message every five minutes. Output power in this mode is 500 milliwatts or +27 dBm. Interspersed with the high power NIM, the 100T-HON telemetry module transmits a medium power RF message every 60 seconds at 10 milliwatts or +10 dBm; expected battery life is 20 years.

- **Mobile and Handheld Mode.** The 100T-HON telemetry module transmits a medium-powered RF message (Beacon) every 15 seconds. Output power in this mode is 10 milliwatts or +10dBm; expected battery life is 20 years.

An FCC license is not required to read 100T-HON telemetry modules.

100T-HON Telemetry Module Messaging

The 100T-HON telemetry module messaging is dependent on the transmission mode. 100T-HON telemetry module messaging supports two bubble-up (BUP) message types and two-way commands.

- Normal BUP

- Alarm BUP. If a critical alarm is detected, the 100T-HON telemetry module enters an alarm state and transmits the alarm details. An alarm state causes the following events:

  - While the alarm window is active, any scheduled normal fixed network or mobile BUP messages are not transmitted.

  - If an acknowledgment is received, the 100T-HON telemetry module returns to its normal BUP transmission schedule. The normal mobile and fixed network BUP messages will contain the appropriate tamper flags set in the message.

  - If an acknowledgment is not received by the 100T-HON telemetry module after the programmed number of alarm BUP retries, the device returns to its normal BUP transmission schedule. The 100T-HON telemetry module transmits normal mobile and fixed network BUP messages with the appropriate alarm tamper flags set.

Alarm BUP messages contain the following information:

  - Alarm ID defining the cause of the alarm

  - Endpoint ID

  - Utility ID

  - Current extended tamper field values (ready to secure mode only)

Two-Way Commands. Fixed network and mobile command messages manage and control the status of the 100T-HON telemetry module.

Itron Security Manager

The 100T-HON telemetry module addresses two types of security, ChoiceConnect networking and 100T-HON to Honeywell device communication, provided by Itron Security Manager.

ChoiceConnect Networking

The first model is a traditional Itron protocol that includes a complete system knowledge of the content and purpose of each message. Security related decisions such as which key type (for example, reading or command keys) to use when securing a message are based on the command function.

100T-HON Telemetry Module Security

The second message model is a telemetry security model. The application level message details are not known to the ChoiceConnect system components. Messages may contain commands ranging from reading data to those that update the state of the Honeywell device. The 100T-HON telemetry module allows 100T two-way requests to be sent and processed through the 100T-HON telemetry module in a basic security fashion, if the command does not change the security state of the Honeywell device.

Operating Modes

The 100T-HON telemetry module operating modes determine the module's default packet types, bubble-up rates, and transmit power levels.

Factory Ship. Factory ship mode conserves the module battery between the time it ships from the factory until it is deployed in the field. In factory ship mode, the module will not transmit but will periodically turn on its receiver and listen for a command. While the module is in factory ship mode, the module will not attempt to periodically log onto the Honeywell device to retrieve data.

Audit Mode. Audit mode reduces the read latency time so an audit can be performed on a population of modules after installation.

Quiet Mode. Quiet mode is very similar to factory ship mode except that the module exits quiet mode automatically after a pre-configured period of time.

Fixed Network. Fixed network mode is chosen when the device will be read by a fixed network. The 100T-HON telemetry module behavior varies based on the connected Honeywell device.

- **EVC**. When the module is connected to a Honeywell EVC device, the following message types are supported:

   Bubble-up Messages:

      Channel-based hourly consumption (NIM-chl)

      Handheld and mobile contingency (SCM+)

      Optional gas day take (GDT)

      Optional Honeywell alarm messages (100T-HON telemetry module Alarm BUP).

Channel-based data logging requests/responses

    Datalogging request channel

    Datalogging response channel

Telemetry requests/responses

    100T-HON telemetry module two-way request

    100T-HON telemetry module two-way response

- **ERX**. When the module is connected to a Honeywell ERX device, the following message types are supported:

Bubble-up messages:

    100T fixed network BUP message

    Optional Honeywell alarm message (100T alarm BUP)

Telemetry requests/responses

    100T-HON telemetry module two-way request

    100T-HON telemetry module two-way response

Mobile Mode. The 100T-HON telemetry module is set to mobile mode when the device will be read by a handheld and/or mobile system. Mobile mode can support varying data loads and RF propagation challenges. Mobile mode sub-modes are listed in the following table:

Mobile Sub-Mode	Description
Normal	Normal defines the typical mobile mode. Characteristics of normal mode include frequent bubble-up rates at relatively low power levels.
Hard-to-read	Hard-to-read mode is used for cases where there are RF signal issues but the size of the data transmitted is in line with the endpoints operating in the normal mode. Characteristics of hard-to-read mode include less frequent bubble-up rates (to conserve power) at higher transmit power levels.
Mobile high power	Mobile high power mode is used for times when the data amount retrieved from the 100T-HON telemetry module is so large that drive-by collection is not practical. In mobile high power cases, the mobile unit will have to park for some time to capture all of the requested data. Characteristics of mobile high power mode include less frequent bubble-up rates (less than hard-to-read mode) at higher transmit power levels.

Like fixed network mode, the 100T-HON telemetry module behavior in mobile mode varies based on the connected Honeywell device.

- **EVC**. When the 100T-HON telemetry module is connected to a Honeywell Mini-Max device, the following message types are supported:

  Bubble-up standard consumption message (SCM+)

  Channel-based data logging requests/responses

  > Datalogging request channel

  > Datalogging response channel

  Telemetry requests/responses

  > 100T two-way requests

  > 100T two-way responses

- **ERX**. When the 100T-HON telemetry module is connected to a Honeywell ERX device, the following message types are supported:

  Bubble-up 100T mobile BUP message

  Telemetry requests/responses

  > 100T two-way requests

  > 100T two-way responses

Specifications

The functional and operational specifications for the 100T-HON telemetry module are listed below.

Functional Specifications	Description
Power source	One "D" cell lithium battery
Tamper detection	Tilt tamper and cut cable tamper
FCC compliance	Part 15 certified
Industry Canada compliance	RSS-210 certified
Intrinsically safe per	UL Class I, Division 1, Groups C and D
Product identification	Numeric and bar-coded module type and serial number
Construction materials	Gray polycarbonate housing and back plate with encapsulated electronics

Operational Specifications	Description
Operating temperatures	-40° to 158° F (-40° to +70° C)
Operating humidity	5 to 95 percent relative humidity
Program frequency	908 MHz
Transmit frequency	Spread spectrum 908 to 924 MHz ISM band
Data integrity	Verified in every data message

Related Documents

Document Title	Document Part Number
100 Series and CENTRON Tamper Reference Guide	TDC-1028-XXX
Gas and Telemetry Module Ordering Guide	PUB-0117-001
100T-HON Honeywell Telemetry Module Specification Sheet	Publication 100
Field Deployment Manager Endpoint Tools Mobile Application Guide	TDC-0934-XXX
Field Deployment Manager Field Representative's Guide	TDC-0936-XXX

Note The last three digits of the user and installation guides represent the document's revision level. The revision level is subject to change without notice.

Installation Prerequisites

The following tools are required to install, program, and check the 100T-HON telemetry module. Some specific tools may be required dependent on instrument type.

- Medium flat-blade screwdriver

- Small flat-blade screwdriver

- Medium Phillips screwdriver

- Hand pliers

- Side-cutting pliers

- 1/4-inch nut driver or similar blunt tool

- Adjustable wrench

- 3M Scotchlock E-9Y crimping tool, 3M Scotchlock E-9C cartridge tool, or similar crimping tool

- All-weather electrical tape

- Size T-10 Torx screwdriver

- Itron programming device to program and check 100T-HON telemetry module installation and operation:

  - FC300 with SRead loaded with Field Deployment Manager (FDM) software version 1.1 or higher

  or

  - 900 MHz Belt Clip Radio and a customer-supplied laptop loaded with Field Deployment Manager (FDM) software version 1.1 or higher

Note Reference the appropriate programming guide or specification sheet for the correct software version (see).

- A 100T-HON telemetry module compatible to a volume corrector or instrument

- A volume corrector or ERX instrument compatible with the 100T-HON telemetry module

CHAPTER 2

Mounting the 100T-HON Telemetry Module

This chapter provides the instructions to mount the 100T-HON telemetry module on a pipe or other flat vertical surface (wall).

Installation Options

Mount the 100T-HON telemetry module using the Pipe Mount or Wall Mount (Flat Surface) procedure.

- **Pipe Mount**. Pipe mounting is used in conjunction with the Remote Mount Kit (Itron part number CFG-0005-003). The pipe mount option places the module on a pipe near the meter or instrument (not on a wall surface). This option requires a meter manufacturer's cable to connect the module to the meter or instrument.

- **Flat Vertical (Wall) Mount**. Installation using the wall mount option places the module on a wall or other vertical surface. A cable connects the module to the meter or instrument.

Mounting Screw Specifications

Application	Itron Part Number		Description
To mount adapter plates on pipe brackets	575-9930-016		8-16 x 1/2-inch length, type 8 slotted pan-head tapping screw, corrosion-resistant steel
To mount the module on adapter plates	575-9930-032		8-16 x 1-inch type 8, slotted pan-head tapping screw, corrosion-resistant steel
To mount the module on sheet metal surfaces (to mount modules to wood surfaces, a comparable wood screw is required)	SCR-0009-001		10-16 x 1 1/2-inch type AB thread for sheet metal, Phillips pan-head tapping screw, corrosion-resistant steel

Mounting Installation Considerations

Select a proper mounting location. Itron recommends mounting the module in close proximity to the meter or instrument. Some applications may require an extended cable-length.

Mount the module in a vertical position with the label directional arrow pointed upward.

⚠️ **Caution** Upright vertical positioning is very important because:

- 100T-HON modules are designed with the antenna in a vertical direction so the antenna is parallel to the reading device (which has a vertical antenna). Matching antenna polarity can greatly affect RF performance and enable easy module reading.
- 100T-HON modules are designed so the tilt tamper is vertical. It is important to maintain vertical positioning in the field to enable tilt tamper stability.

⚡ **Warning** Do not mount the module in an orientation other than vertical (module label arrow pointed upward). Violating the mounting orientation requirements will void the product warranty.

Mounting the 100T-HON Telemetry Module on a Pipe

The following items are required to mount the 100T-HON telemetry module on a pipe or vertical flat surface (wall):

Itron Part Number	Description	
TEL-1000-001	100T-HON telemetry module	
CFG-0005-003	Remote Mount Installation Kit Kit includes: (2) two band clamps (2) two tamper seals pipe bracket cable ties adapter plate Screws: (2) 1/2-inch, to attach the adapter plate to the pipe bracket (2) 1-inch, to attach the module to the adapter plate (3) 1-1/2-inch, to attach the module to a vertical surface (wall)	

⚡ **Warning** Install the 100T-HON telemetry module in an upright position. Any position other than upright, can negatively affect radio performance and reduce battery life.

To mount the pipe bracket on a vertical pipe

1. Remove the pipe bracket and band clamp from the Remote Mount Installation Kit (Itron part number CFG-0005-003).


2. Loosen the band clamp screw until the end of the band releases.

3. Push the end of the clamp's band through the holes in the pipe bracket. The pipe bracket must be oriented as shown below.

4. Place the band clamp around the pipe. The band will loosely wrap around the pipe. Push the end of the band through the band clamp screw assembly. Turn the band clamp's screw assembly to fit into the pipe bracket opening. Tighten the clamp screw until the band clamp is secure on the pipe.
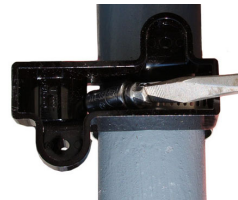
Caution The pipe bracket must fit firmly against the pipe to prevent slippage.

To mount the adapter plate on the pipe bracket

Caution Vertical mounting position is important to maximize RF performance. Mount the 100T-HON telemetry module with the module label arrow pointing up. The module's arrow must never point to either side or upside down. The module tilt tamper functionality is designed to operate with the module installed vertically.

1. Place the adapter plate on the pipe bracket with the mounting lug at the top or bottom. The adapter plate screw bosses fit into the pipe bracket recess.

2. Ensure the adapter plate is positioned as shown below with the mounting lug (1) at the top or bottom. To install the adapter plate on a vertical pipe, use the two shortest (1/2-inch) adapter plate mounting screws from the installation kit. Place the mounting screws (2) in the holes shown below.
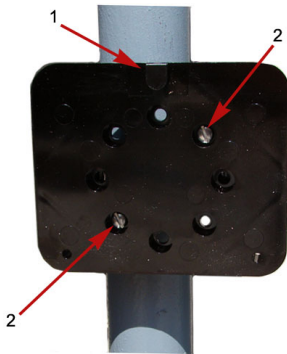
3. Tighten both screws securely in an alternating pattern. Tighten to 9 - 12 inch-pounds torque.

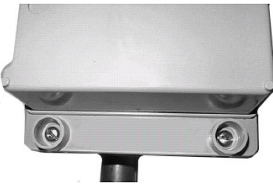### *To mount the 100T-HON telemetry module on the adapter plate*

1. Place the back of the module against the face of the adapter plate. The adapter plate mounting lug (1) must be positioned just above the module mounting lug recess (2).

2. Slide the module up onto the adapter plate mounting lug until the mounting lug (1) is as far as possible inside the module mounting lug recess (2).

3. Align the module back plate mounting holes with the pipe mount adapter plate holes. Install the two one-inch mounting screws from the installation kit.


4. Tighten the module mounting screws evenly in an alternating fashion. Torque the screws to 9 - 12 inch-pounds of pressure.

Mounting the 100T-HON Telemetry Module on a Wall or Other Flat Vertical Surface

🛈 **Note** For easier installation, drill three pilot holes in the mounting surface (use the correct size drill bit to accommodate the module mounting screws [see the drilling template below]). The drilled pilot holes for the two bottom screws must be on a horizontal line. To mount the module on a sheet metal surface, use the mounting screws included with the Mounting kit. Use a comparable wood screw to mount the module on a vertical wood surface.

Carefully select a mounting location free from electrical wires. The mounting location must have the proper clearance to accommodate the 1-1/2-inch module mounting screws so nothing is damaged by the drill or mounting screws.
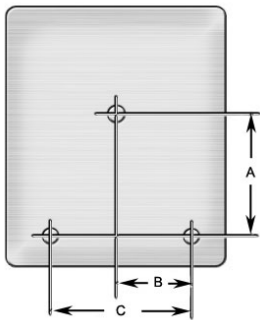
Module drilling template
A   3 inches
B   1-11/16 inches
C   3-3/8 inches

To mount the 100T-HON telemetry module on a wall or other flat vertical surface

1. Using one of the three 1-1/2-inch mounting screws from the module installation kit, turn the mounting screw for the mounting lug (top of the module) part way into the mounting surface.

2. Place the 100T-HON telemetry module mounting lug recess (on the top of the module's backplate) just under the screw head.

3. Slide the module upward until the screw head fits completely inside the mounting lug recess. Several adjustments may be necessary to properly position the screw for module mounting.

4. Install the bottom two mounting screws. Fasten the screws in an alternating pattern until fully tightened to secure the module firmly in position.

To install tamper seals and cable ties

1. Place the new tamper seals from the module installation kit over the 100T-HON telemetry module mounting screws.

2. Firmly push both tamper seals all the way into place with a 1/4-inch nut driver or similar blunt tool.

> **Note** A tamper seal is fully seated when the top of the tamper seal is approximately 1/16-inch below the top of the screw recess.

3. To reduce the risk of cable damage, secure the excess module cable with the cable ties from the module installation kit. Pull the cable tight. Remove and properly dispose the excess cable tie.

4. Alternatively, the cable may be wrapped around the adapter plate as shown.
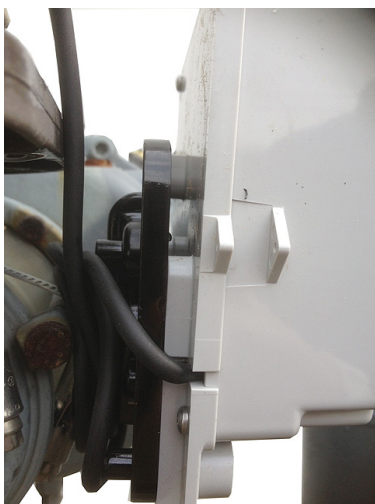
100T-HON telemetry module installation on a vertical flat surface or wall is complete.

CHAPTER 3

Connecting and Configuring the Module and Instrument

This section provides the instructions to install the 100T-HON telemetry module on Honeywell Instruments:

- Mini-AT
- Mini-Max
- ERX

Mini-AT   **Mini-Max**   **ERX**

Installation Overview

Installing the 100T-HON telemetry module to a Honeywell Mercury instrument involves five tasks:

1. Programming the instrument (for more information, see Programming the Mercury Instrument Parameters on page 15 or reference the Mercury Instrument Programming Guide for more information).

2. Installing Mercury retrofit parts (if required).

3. Attaching the 100T-HON telemetry module to a pipe or vertical flat surface (wall) (for more information, see Mounting the 100T-HON Telemetry Module on page 8).

4. Connecting the 100T-HON telemetry module to the Mercury Instrument Volume Corrector (see To wire the 100T-HON telemetry module to the Mercury Instrument).

5. Programming the 100T-HON telemetry module (see Programming the 100T-HON Telemetry Module).

Programming the Mercury Instrument Parameters

The Honeywell Mercury Instrument configuration must support the connection of the 100T-HON telemetry module. Complete instrument configuration using a separate application (not using the Itron network, applications, or 100T-HON).

Honeywell Instrument Call-In Configuration

The installer must configure the Honeywell Instrument properly to support the instrument-controlled alarm call-in feature. Automatic instrument configuration is not supported by the 100T-HON module. Configure the call-in feature using the following item codes.

Mini-Max

Item Number	Item Description	Set Value	Value Meaning
126	Instrument baud rate	0	9600 Baud
139	Serial link access	0	Full read/write
238	Serial Log Trigger	1	Active
333	Call-in trigger	1	Alarm call-in enabled
336	Call-in retry by	0	Host
405	Call-in delay time	4	4 seconds
486	Modem AT enable	1	call-in using AT commands
491	Modem init-string	ATE0Q0V0X4	-
492	Modem dial string	ATDT	-
493	Alarm call-in phone number	924-9900	-
494	Modem hangup string	ATH0	-
495	Modem retry interval A	5	5 minutes
496	Modem retry interval B	1440	1440 minutes
497	Modem retry A count	3	3 retries
821	Modem wake-up delay	50	5 seconds

Mini-AT

Item Number	Item Description	Set Value	Value Meaning
126	Instrument baud rate	0	9600 Baud
139	Serial link access	0	Full read/write
238	Serial Log Trigger	1	Active
333	Call-in trigger	1	Alarm call-in enabled
336	Call-in retry by	0	Host
405	Call-in delay time	4	4 seconds
486	Modem AT enable	1	call-in using AT commands
491	Modem init-string	ATE0Q0V0X4	-
492	Modem dial string	ATDT	-

Mini-AT			
Item Number	Item Description	Set Value	Value Meaning
493	Alarm call-in phone number	924-9900	-
494	Modem hangup string	ATH0	-
495	Modem retry interval A	5	5 minutes
496	Modem retry interval B	1440	1440 minutes
497	Modem retry A count	3	3 retries
821	Modem wake-up delay	50	5 seconds

ERX			
Item Number	Item Description	Set Value	Value Meaning
333	Call-in trigger	1	Alarm call-in enabled
336	Call-in retry by	0	Host
588	Instrument baud rate	0	9600 baud
602	Serial Log Trigger	1	Active
780	Modem init string	ATE0Q0V0X4	-
781	Modem dial string	ATDT	-
782	Modem hangup string	ATH0	-
784	Alarm call-in phone number 1	924-9900	-
785	Alarm call-in phone number 2	<BLANK>	-
786	Modem retry interval A	5	5 minutes
787	Modem retry interval B	1440	1440 minutes
788	Modem retry A count	3	3 retries
789	Modem AT enable	1	Call-in using AT commands
821	Modem wake-up delay	50	5 seconds

Connecting the 100T-HON Telemetry Module to the Instrument

The 100T-HON module has a single serial RS232 interface to the Honeywell instrument. Some of the compatible instruments (ERX, MMX) require the installation of an internal CMOS to RS232 adapter board. If the adapter board is not installed in the field units, contact Honeywell to obtain the board.

Serial access to the Honeywell instrument requires an instrument access code. The Honeywell instrument requires this access code from the 100T-HON module to log on to the instrument prior to every data read. You must program the access code into the 100T-HON module at installation time.

The Mechanical Uncorrected Volume Switch

The 100T-HON telemetry module supports a connection to a mechanical uncorrected volume switch output from the Honeywell Mini-Max and Mini-AT instruments. This switch output allows the 100T-HON telemetry module to independently count the mechanically uncorrected volume, even if the instrument losses power. To collect mechanical uncorrected volume data, the following must be true:

- The instrument must have the mechanical pulse output option board installed.

- The module's mechanical pulser cable must be connected to the Honeywell instrument.

- The module must be configured to use the mechanical uncorrected volume as its channel 2 data stream.

The 100T-HON telemetry module pulse counter supports a maximum of 1 pulse per second with at least 1/3 second on, and 1/3 second off.

Electronic Corrected Pulse Output

The 100T-HON telemetry module *does not* provide a connection to an instrument electronic corrected pulse output. Electronic corrected volume data is collected through the serial connection.

Electronic Uncorrected Pulse Output

The 100T-HON telemetry module *does not* include a connection to an instrument electronic uncorrected pulse output. Electronic uncorrected volume data is collected through the serial connection.
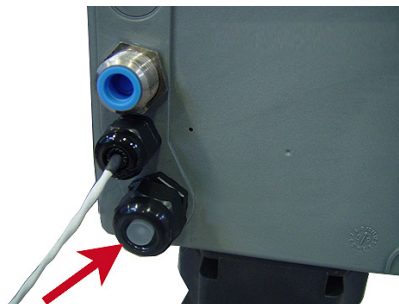
Alarm Switch

The 100T-HON telemetry module *does not* include a connection to an instrument alarm switch. The instrument alarm data is collected through the serial connection.

Honeywell Instrument Cable Connections

The 100T-HON telemetry module cable enters the Honeywell instrument through a watertight compression connector on the back of the instrument.

Mini-AT compression connector   **ERX/MiniMax compression connector**

The 100T-HON telemetry module connects to the Honeywell Mini-AT, MiniMax, and ERX instruments.
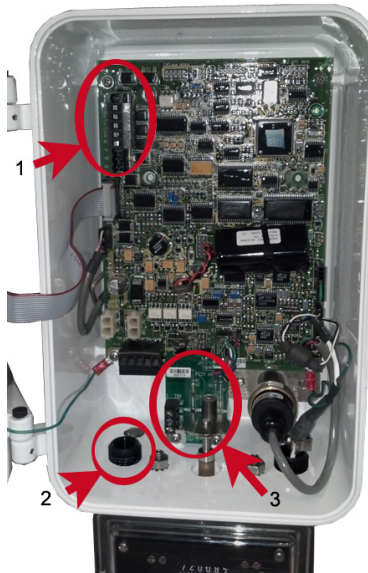
The 100T-HON telemetry module includes a single 5-foot cable. The cable accommodates the RS232 serial connection or connection to the mechanical uncorrected volume.

Wire Color	Wire Function	Instrument Connection
100T-HON telemetry module to Mercury Instrument Connections		
White	Pulse Interface (Count Sense)	Pulser Board--COM
Red	Pulse Interface (Count Enable)	Pusler Board - NO
Black	RS232 Ground	RS232 Main or Adapter Board--COM
Green	RS232 Tx	RS232 Main or Adapter Board--Tx
Yellow	RS232 Rx	RS232 Main or Adapter Board--Rx

To connect the 100T-HON telemetry module to the Mini-AT Mercury Instrument

If the 100T-HON telemetry module will be connected to the Honeywell Mini-AT, the module must have an RS232 connection to the instrument. (*Optional*) The module connection to the Mini-AT may be a mechanical uncorrected volume pulser connection.
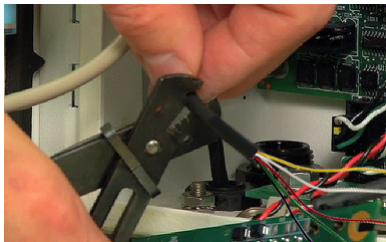

1. RS232 Terminal Block

2. Compression Connector

3. Pulser Board

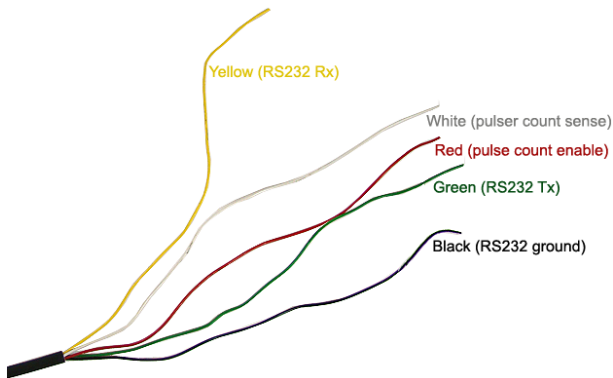1. Insert the 100T-HON telemetry module cable into the instrument's compression connector.
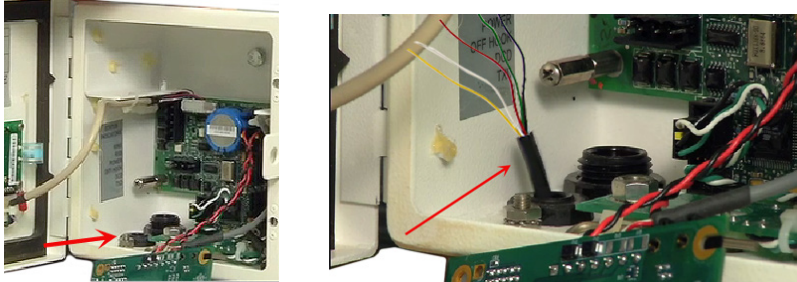
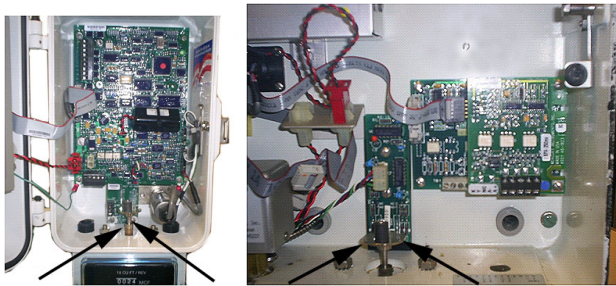2. Strip five inches of the outer insulation from the 100T-HON telemetry module cable.

3. Individually strip 1/4-inch individual wire insulation from the red, white, yellow, black, and green lead wires. Complete each connection prior to stripping the next wire.
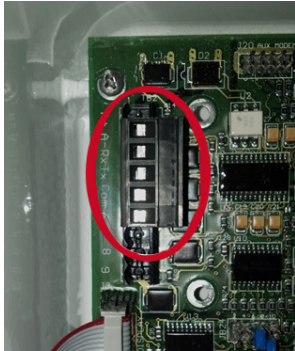
Warning Strip wires one at a time to prevent shorting stripped wires.

Yellow (RS232 Rx)
White (pulser count sense)
Red (pulse count enable)
Green (RS232 Tx)
Black (RS232 ground)

Caution Keep wires away from the rotating magnetic spindle in the Mercury Instrument.

4. Connect the 100T-HON telemetry module to the instrument RS232 terminal block connections.

5. (*Optional*) To connect the 100T-HON telemetry module for mechanical uncorrected volume pulser data, connect the 100T-HON telemetry module to the three-wire screw terminal connector on the mechanical pulser board. Connect only to the NO and COM.
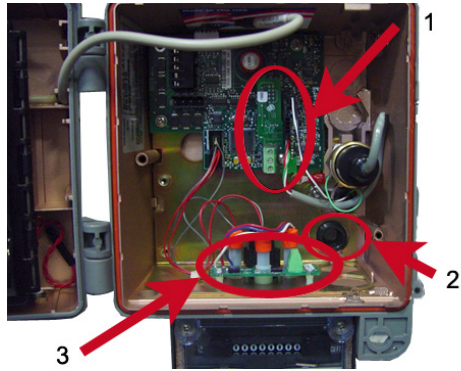

6. After the 100T-HON telemetry module is wired to the instrument, see Mounting the 100T-HON Telemetry Module for module mounting instructions.

To connect the 100T-HON telemetry module to the Mini-Max Mercury Instrument

Note If the 100T-HON telemetry module will be connected to the Honeywell Mini-Max, the module must have an RS232 connection to the instrument. (*Optional*) The module connection to the Mini-Max may be a mechanical uncorrected volume pulser connection.
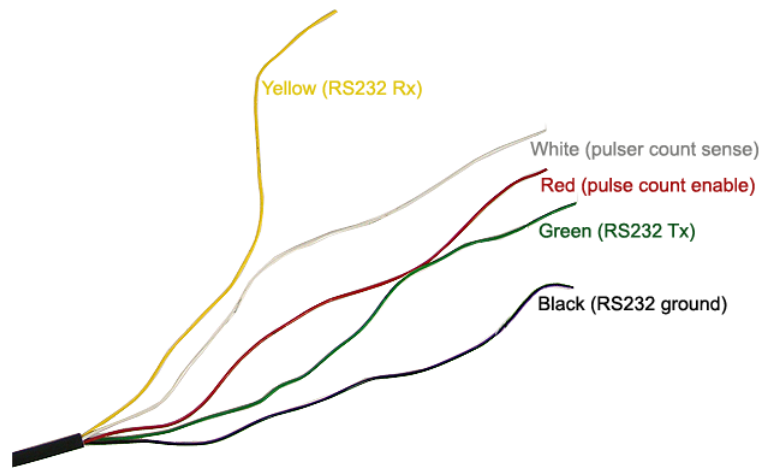

1. RS232 Terminal Block

2. Compression Connector

3. Pulser Board

Note For more information about routing the cable through the compression connector and stripping the cable's outer jacket, refer to To connect the 100T-HON telemetry module to the Mini-AT Mercury Instrument on page 19.

1. Insert the 100T-HON telemetry module cable into the instrument's compression connector.

2. Strip five inches of the outer insulation from the 100T-HON telemetry module cable.

3. Individually strip 1/4-inch individual wire insulation from the red, white, yellow, black, and green lead wires.

Warning Strip wires one at a time to prevent shorting stripped wires.

Yellow (RS232 Rx)

White (pulser count sense)

Red (pulse count enable)

Green (RS232 Tx)

Black (RS232 ground)

4. Connect the 100T-HON telemetry module to the instrument RS232 terminal block connections on the CMOS to RS232 adapter board. Connect Rx, Tx, and COM (Gnd).
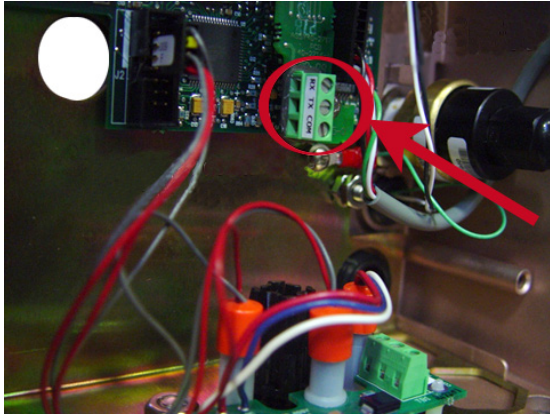

Note The Mini-Max may have the RS232 adapter board connected to the external RS232 case connector. The external case connector must be replaced with the connector capable of using an external shorting plug and the RS232 connection. The 100T-HON telemetry module wires are gel connected to the internal wires and the external shorting plug is installed.
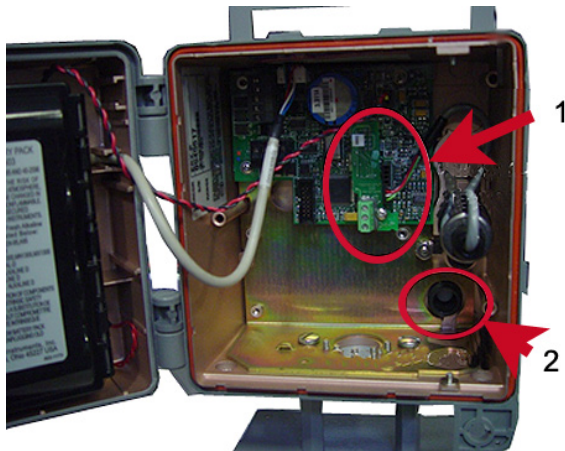
5. (*Optional*) To connect the 100T-HON telemetry module for mechanical uncorrected volume pulser data, connect the 100T-HON telemetry module to the three-wire screw terminal connector on the mechanical pulser board. Connect only to the NO and COM.
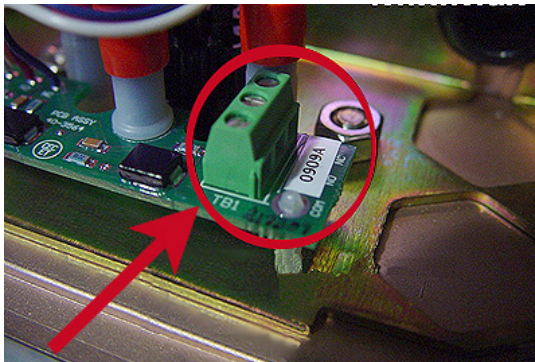
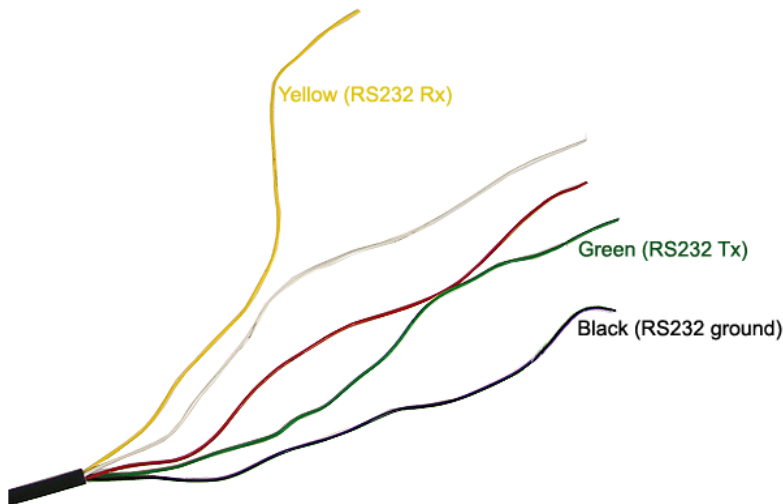### *To connect the 100T-HON telemetry module to the ERX Mercury Instrument*

Note If the 100T-HON telemetry module is connected to the ERX Mercury Instrument, the connection is only made to the RS232 connection in the instrument.


1. RS232 Terminal Block

2. Compression Connector

Note For more information about routing the cable through the compression connector and stripping the cable's outer jacket, refer to To connect the 100T-HON telemetry module to the Mini-AT Mercury Instrument on page 19

1. Insert the 100T-HON telemetry module cable into the instrument's compression connector.

2. Strip five inches of the outer insulation from the 100T-HON telemetry module cable.

3. Strip 1/4-inch individual wire insulation from the yellow, black, and green lead wires.

Yellow (RS232 Rx)

Green (RS232 Tx)

Black (RS232 ground)

4. Connect the 100T-HON telemetry module to the instrument RS232 terminal block connections on the CMOS to RS232 adapter board. Connect Rx, Tx, and COM (Gnd).
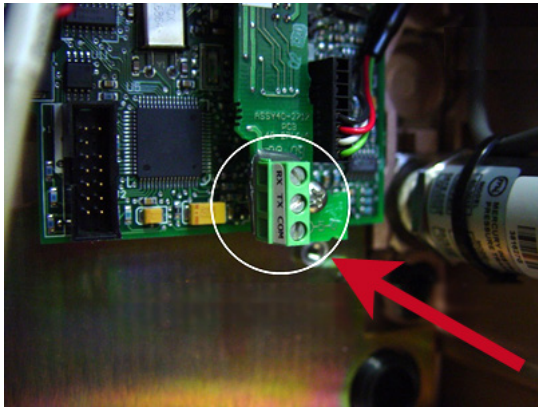
Note The ERX may have the RS232 adapter board connected to the external RS232 case connector. The external case connector must be replaced with the connector capable of using an external shorting plug and the RS232 connection. The 100T-HON telemetry module wires are gel connected to the internal wires and the external shorting plus is installed.

5. To protect the unused red and white wires from shorting inside the instrument, place and compress a gel connector over each red and white wire.

CHAPTER 4

Programming the 100T-HON Telemetry Module

After the 100T-HON telemetry module is installed, you must program the module using an Itron handheld or 900MHz Belt Clip Radio and your PC loaded with Field Deployment Manager (FDM) software. FDM supports configuration of the following parameters:

- (*Optional*) Injecting ChoiceConnect security keys.

- Setting the fixed network or mobile operation mode (setting the operation mode establishes the transmit power, default packet type, and BUP rates).

- Setting the Honeywell communication access code.

- Setting the utility ID.

- Setting the 100T-HON telemetry module time.

- Setting connected device-specific parameters:

  - Honeywell EVC devices

    o Configure channel 2 (for none, electronic uncorrected volume, or mechanical uncorrected volume).

    o For mechanical uncorrected volume channel 2 only (implies the existence of an uncorrected mechanical input):

      - initial index read

      - drive rate

  Configure gas day take (GDT) options.

  - Enable or disable GDT

  - GDT capture time

  - GDT BUP frequency

  - Number of GDT transmissions

  ⚠️ **Caution** You must program the 100T-HON telemetry module before use.

Program the 100T-HON telemetry modules using:

- An FC200SR handheld computer with Field Deployment Manager (FDM) software version 3.2 or higher
  or

- An FC300 with SRead handheld computer with Field Deployment Manager (FDM) software version 3.2 or higher
  or

- A 900MHz Belt Clip Radio and your laptop with Field Deployment Manager (FDM) software version 3.2 or higher. The Belt Clip Radio connects to the user-supplied laptop using a USB cable or Bluetooth.

See the *Field Deployment Manager Endpoint Tools Mobile Application Guide* (TDC-0934) for more complete programming information.

FC200SR   **FC300 with SRead**   **900MHz Belt Clip Radio**

To program the 100T-HON telemetry module

1. Program the meter drive rate into the 100T-HON telemetry module using a handheld computer or Belt Clip Radio and laptop computer. For all programming and **Check Endpoint** operations using a handheld computer, hold the handheld as close to vertical as possible. For best success, keep the handheld within six feet of the target endpoint. Verify you have the correct programming mode (Fixed Network Mode, or Mobile/Handheld Mode) for your application. Programming parameters are based on the configuration file loaded into the programming device.

2. To verify 100T-HON telemetry module installation and configuration, FDM supports the ability to read electronic corrected volume (for Honeywell EVC devices only), read channel 2 if available (electronic uncorrected or mechanical uncorrected volume—for Honeywell EVC devices only), get tampers, perform check ERT functions, and perform network coverage tool (NCT) operation.

To verify proper communications

Note Itron recommends the following operations to verify communications between the 100T-HON telemetry module and the Mercury Instrument.

1. For an EVC instrument: send a channel 1 EMMIMO read immediately to collect an electronic corrected read. Compare the collected read to the Mercury Instrument LCD reading.

2. For and EVC instrument with channel 2 data <u>not</u> set to **None**: send a channel 2 EMIMO to collect an uncorrected read. Compare the collected read to the Mercury Instrument meter dial.

3. Confirm the *Invalid Access Code* tamper is not set. If the tamper is set, check the wire connections and repeat the EMIMO and tamper check.