



QSB & QSI Electronic Module for G2 Meters

Installation Instructions

These installation instructions cover the installation of the following electronic modules to G2 meters:

- QSB pulse output, with or without a display.
- QSI1, QSI2, QSI3 versions of communications electronics, with or without a display.

The basic mechanical installation is the same for all electronic modules. The wiring connections and wiring diagrams differ depending on the electronic module being installed.



MODULE CONTENTS

Check the contents of your module using the list below as reference.

- (1) Completely assembled QSB or QSI module (with or without a display).
- (4) #4-40 x 7/8 in. Fillister Head Screws. (For metallic G2)
- (4) #4-20 x 7/8 in. Fillister Head Plastite® Screws. (For PVDF G2)
- (1) Gasket
- (1) Instruction sheet.
- (1) Q09 Owner's manual (if module includes Q09 display).
- (1) Set of (4) Strain reliefs

Additional items included with **Display Ready** module only:

- (1) Display seal
- (4) #4-20 x 7/8 in. tapping screws
- (1) 10 pin male connector

DIMENSIONS

Dimensions are shown in inches and [mm]

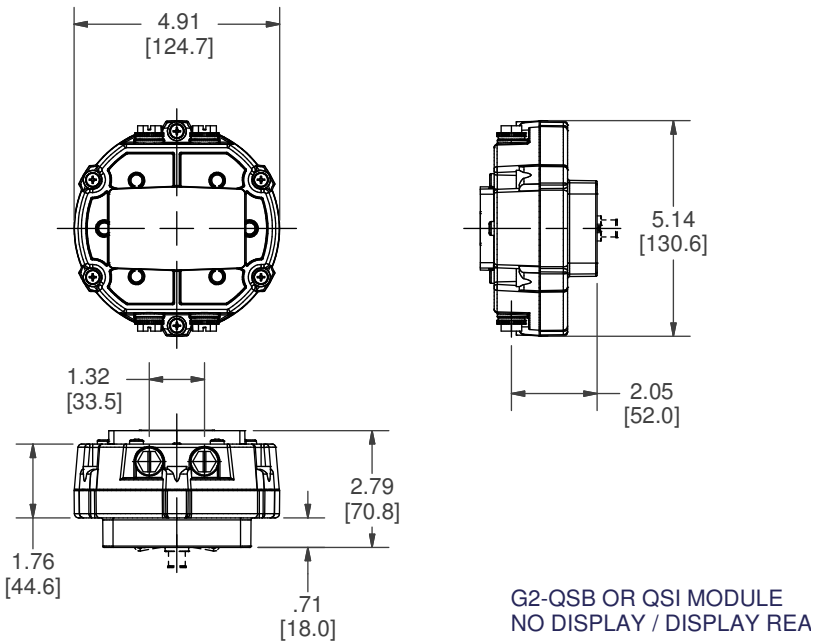
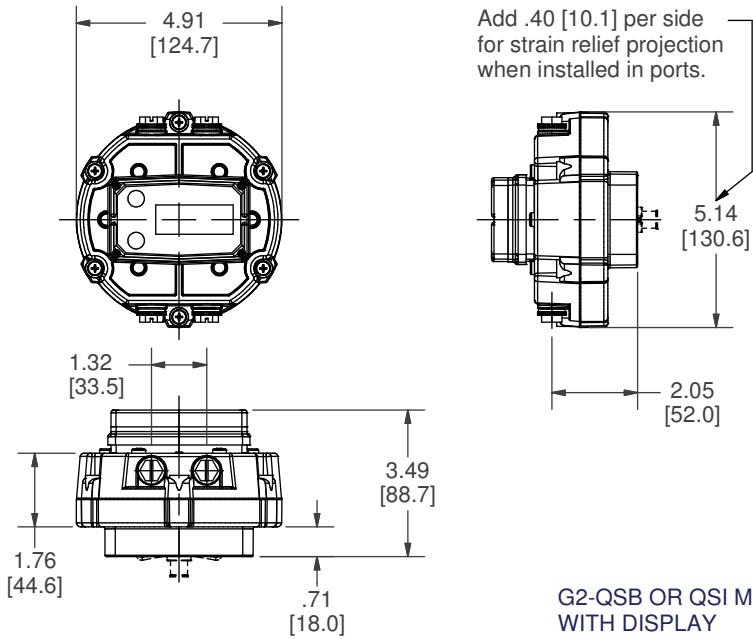


Figure 1

The QSB and QSI modules are available with or without a display. The QSI modules are also available as a “display ready” version with no display installed, but ready for the customer to install his own GPI display.

QSB:

The QSB module is equipped with pulse-out electronics. Pulse out electronics is the default standard regardless of type of module or style of cover plate. This manual contains information and meter wiring diagrams for the QSB pulse-out electronics.

QSI:

The QSI communications module is a multiple capability electronics package and has three versions (QSI1, QSI2 or QSI3) available; each with its own mix of capabilities to better serve the customer (See Versions below).

- QSI1 is equipped with: Bluetooth®, **coil/digital pulse input, pulse output (flow or energy & scalable), RS485 (Modbus® RTU), temperature inputs, BTU calculator.
- QSI2 is equipped with: Bluetooth®, **coil/digital pulse input, pulse output (flow or energy & scalable), data logger, temperature inputs, BTU calculator.
- QSI3 is equipped with: Bluetooth®, **coil/digital pulse input, pulse output (flow scalable), data logger, 4-20mA output.

This manual contains information and meter wiring diagrams for the three different QSI electronics modules.

IMPORTANT NOTICE

QSB and QSI module electronics are very sensitive to electric noise if operated within 6 inches of some electric motors, relays, transformers or other sources of electronic noise.

If the QSB or QSI electronics are used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

GENERAL INFORMATION

QSB and QSI electronics are available factory installed on designated meters, or as modules that will adapt the electronics to other GPI meters.

The QSB and QSI electronics converts the voltage (or pulses) from the meter into usable information to support the various capabilities of the modules. The modules also supply the display (when installed) with the information and power it needs to function as designed.

The QSB and QSI module electronics are powered by customer- supplied external power.

SAFETY

This product is not approved for use in hazardous locations.

- Be sure O-rings and seals are kept in good repair.
- When applying power, adhere to specifications in this manual.
- Disconnect external power before attaching or detaching input or output wires.

ASSEMBLY INSTRUCTIONS

NOTE: For *Display Ready* QSI Modules Only.

For the “Display Ready” QSI module, follow these initial instructions first to install your customer provided display to the cover plate in the kit. Then follow the Installation Instructions to install this customer assembled unit to the meter.

1. Make sure the QSI module is disconnected from power source.
2. Remove batteries from your display, they will no longer be needed.
3. Remove the pickup coil from the back center of your display by cutting the two wires that attach it to the display. Cut the wires as close to the display as possible to ensure the cut ends do not touch the PC board inside the QSI module. Discard the removed coil.
4. Using a small regular screwdriver, remove the clear sealant from the 10 pin female connector holes on the backside of your display.
5. Insert the “long legs” of the 10 pin male connector that came with the kit into the 10 pin female connector on the QSI circuit board (see Figure 2).
6. Install the formed display seal into the seal gland on the backside of the display.
7. **CAREFULLY** mount the display onto the cover plate ensuring the legs of the male 10 pin connector are inserted into ALL 10 pin female connector holes of the display (see Figure 3).
8. Secure the display to the cover plate using the four #4-20 x 7/8 in. tapping screws. Torque to 80-96 oz-in (0.56-0.67 Nm).

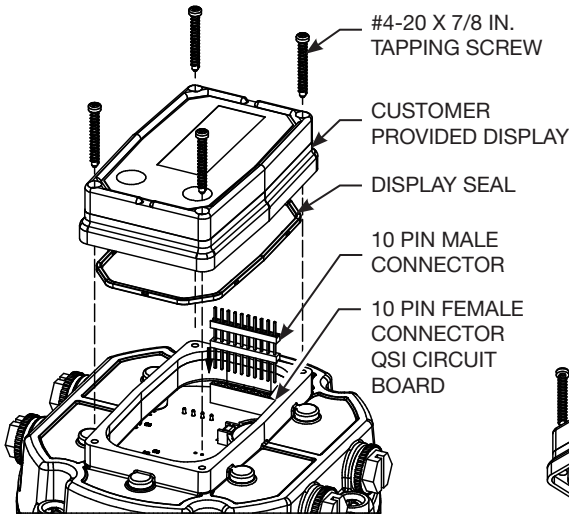


Figure 3

COIL & BATTERIES REMOVED

10 PIN FEMALE CONNECTOR (DISPLAY)
10 PIN MALE CONNECTOR (SHOWN SEATED IN DISPLAY CONNECTOR)

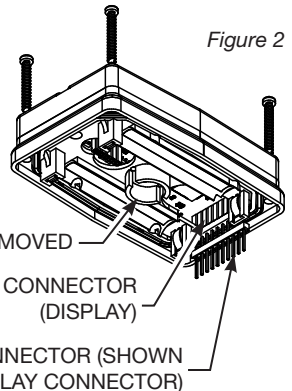


Figure 2

INSTALLATION INSTRUCTIONS

NOTE: For **ALL** electronic modules.

1. Make sure the QSB or QSI module and meter are disconnected from power source.
 2. Remove any attached product, if it exists, from the top of your G2 meter. It will be replaced with the module components.
 3. Remove the (6) #8-16 x 3/4 in. screws attaching the module cover plate to the base and separate. Do not damage the seal between the two components. The (2) wires connecting the QSB or QSI PC board to the screw terminal of the pick-up circuit board are long enough to allow separation of parts. The wires may be disconnected from the screw terminal if necessary. The wires are non-polarized and may be connected to either screw of the screw terminal (see Figure 4).
 4. Install the gasket received with the module on the bottom of the base. Mount the base to the G2 meter, seating the pick-up coil in the meter recess. Secure base with (4) screws provided with the module. Tighten screws.
- NOTE:** Use #4-40 screws for metallic meters or #4-20 Plastite® screws for PVDF meters.
5. Make sure the seal is in place on top of the base prior to reattaching (if previously disconnected) the (2) wires to the screw terminal of the pick-up circuit board.
 6. To route external power and/or electronic cables to the QSB or QSI PC board screw connectors, prepare the cover plate by removing the plug and sealing washer from each port that you intend to use. Replace the removed plugs with a strain relief w/O-ring. The strain relief will accommodate cable sizes of 0.11 in. (2.8 mm) through 0.26 in. (6.6 mm) diameter. Leave the factory installed plugs in any unused ports.
 7. (Make sure the power is disconnected from external cables before beginning this step): Route external cables through the strain relief(s), and then tighten the dome nut securely around the cable to provide an environmental seal.
 8. Connect cable wires to the QSB or QSI PC board screw connectors (see Figure 6, 8, 10, or 12 depending on your module version).
 9. Mount the cover plate on the base making sure the seal is seated properly between them. Replace the (6) previously removed screws to secure the cover plate to the base. Tighten screws.
 10. Connect power to QSB or QSI module and meter.

NOTE: The module was packaged with the coil pickup in the unseated position to prevent coil damage during shipping. The coil has a foam

spacer attached. Remove the liner from the foam spacer, exposing the adhesive layer, and seat the coil/spacer combination in its recess on the adapter (see Figure 4).

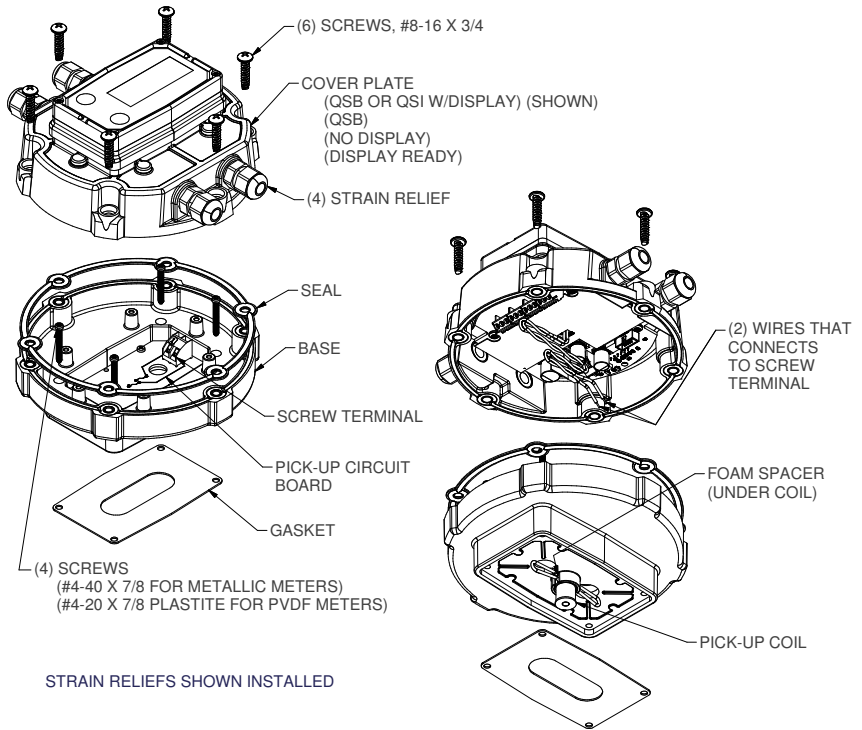


Figure 4

TERMINAL CONNECTIONS CHART

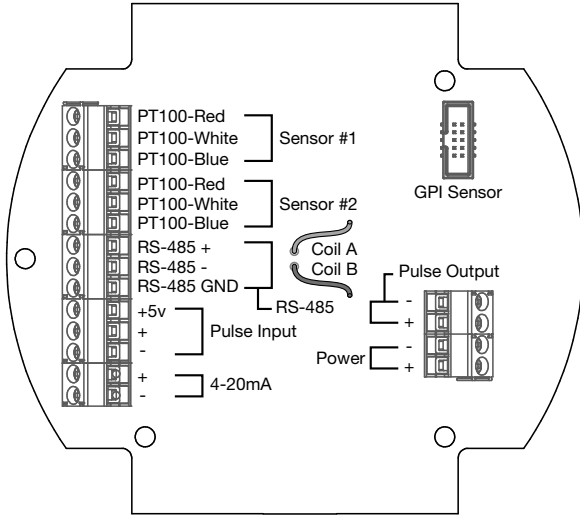


Figure 5

TEMP SENSOR	
PT100-Red	Sensor VCC Output
PT100-White	Input High Side
PT100-Blue	Input Return
RS-485 (Galvanically Isolated)	
RS485 (+)	Positive Signal
RS485 (-)	Negative Signal
RS485 GND	Circuit Ground*
PULSE INPUT	
+5V	5 V (dc) output to power external sensor
(+)	Digital Pulse Frequency Input, up to 3kHz
(-)	Digital Pulse Return
4-20mA (Galvanically Isolated)	
(+)	4 to 20mA current loop - current in to transmitter
(-)	4 to 20mA current loop - current out of transmitter*

Coil A	Low level sine wave input
Coil B	Low level sine wave input
GPI SENSOR	
Ribbon cable connection to GPI custom sensor designs	
PULSE OUTPUT (Galvanically Isolated)	
(-)	Pulse Output return current*
(+)	Pulse Output frequency output. This is a "current sinking open collector" output.***
POWER INPUT	
(-)	12-30 V (ac) or 12-36 V (dc) Input A**
(+)	12-30 V (ac) or 12-36 V (dc) Input B**

***NOTE:** It is not recommended to connect isolated ground connections together or to board common.

****NOTE:** Polarity of voltage for AC/DC is not important. However an earth ground isolated power supply is required to prevent earth ground loop currents and ground fault conditions.

*****NOTE:** This output may require an external pull up resistor if interfacing equipment does not include one.

WIRING DIAGRAMS

QSB PC BOARD Pulse Out - Open Collector Square Wave

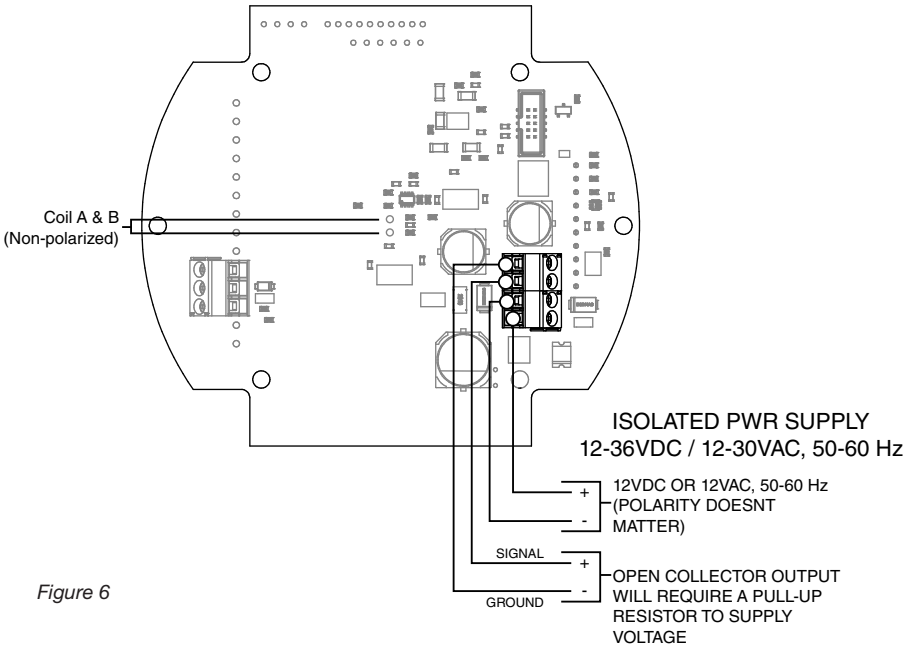


Figure 6

The pulse output from the QSB provides 2500V galvanic isolation from the QSB digital circuitry to the external customer equipment. The QSB pulse output is an open collector design which requires an external pull up resistor to

an external power supply. The resistance must be chosen such that the QSB will not sink more than 30mA of current. The external power supply voltage must also be less than +36VDC to prevent damage to the QSB.

WIRING DIAGRAMS

WIRING DIAGRAM

Output: Pulse Output

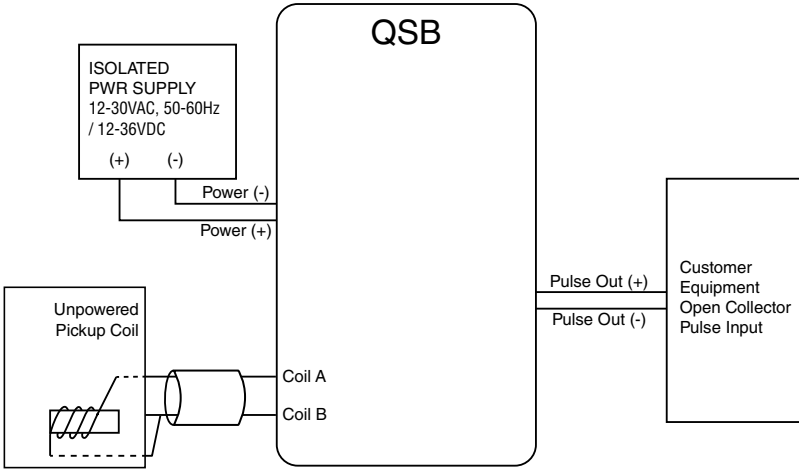


Figure 7

The wire gauge for the pulse output cable should be between 16 to 26 AWG to properly fit in the wire termination connector.

The pulse output ground should be properly connected to the customer equipment ground, while

the pulse output signal should be properly connected to both the customer equipment pulse input and an external pull up resistor to an external supply (if the customer equipment doesn't contain the pull up resistor).

WIRING DIAGRAMS

QSI VERSION 1 PC BOARD RS-485 BTU

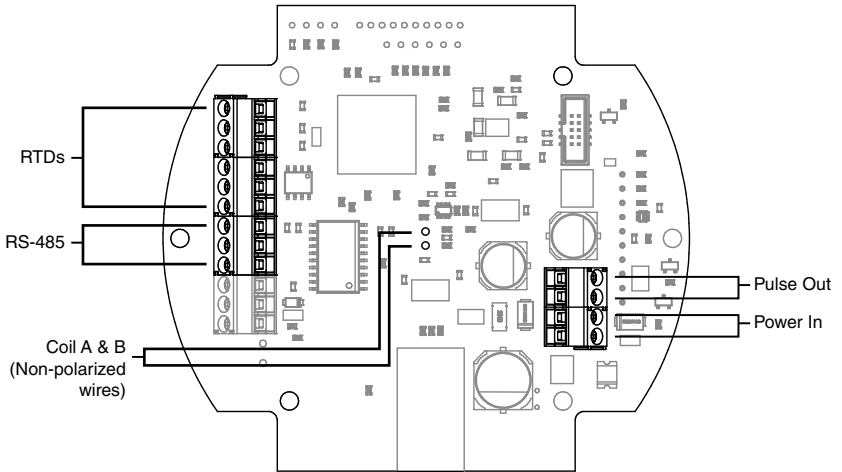


Figure 8

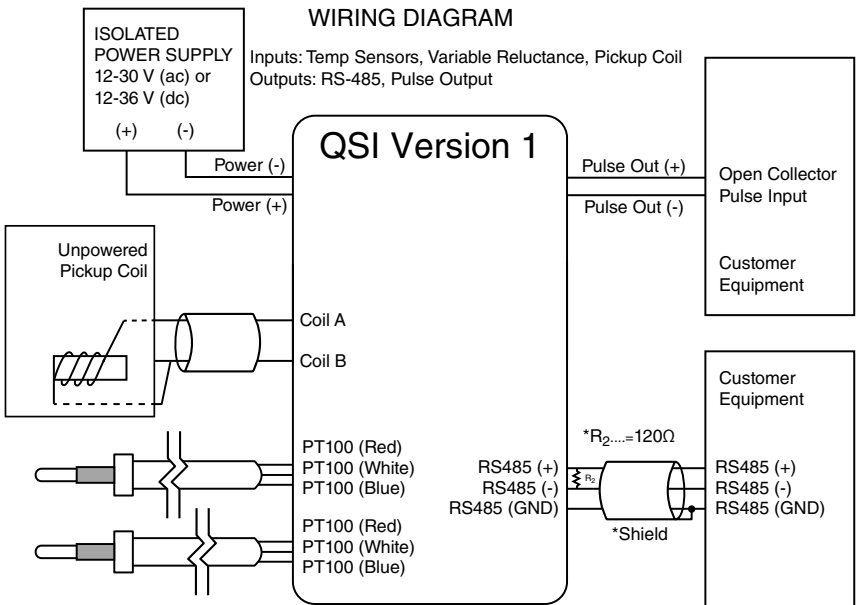


Figure 9

WIRING DIAGRAMS

QSI VERSION 2 PC BOARD

Pulse In
BTU

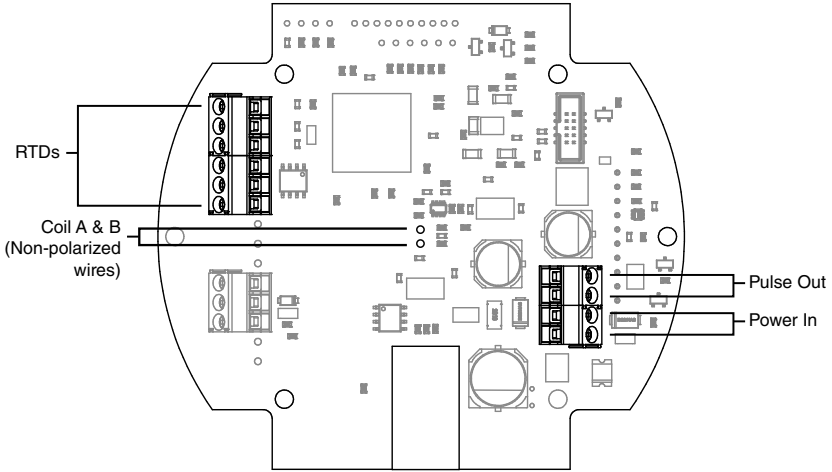


Figure 10

WIRING DIAGRAM

Input: Temp Sensors, Variable Reluctance, Pickup Coil
Output: Pulse Output

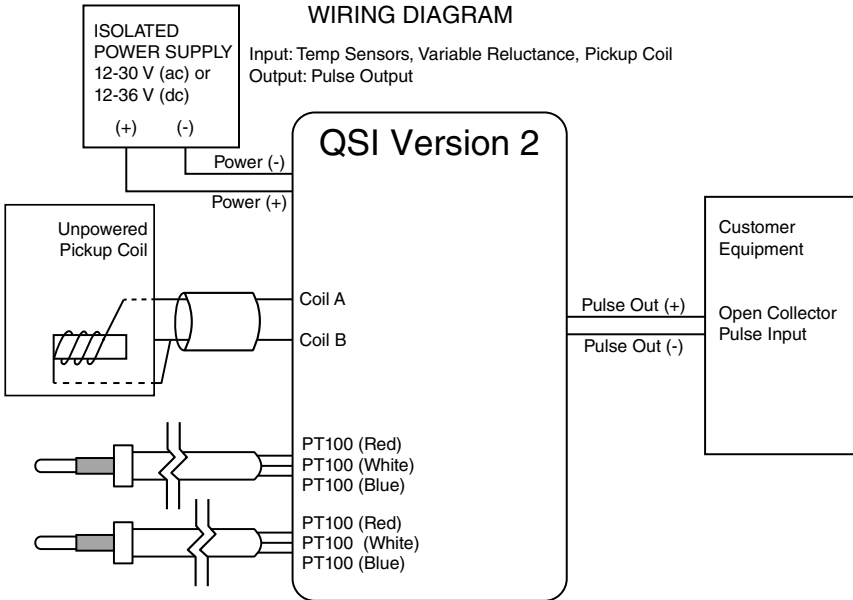


Figure 11

WIRING DIAGRAMS

QSI VERSION 3 PC BOARD

4-20mA

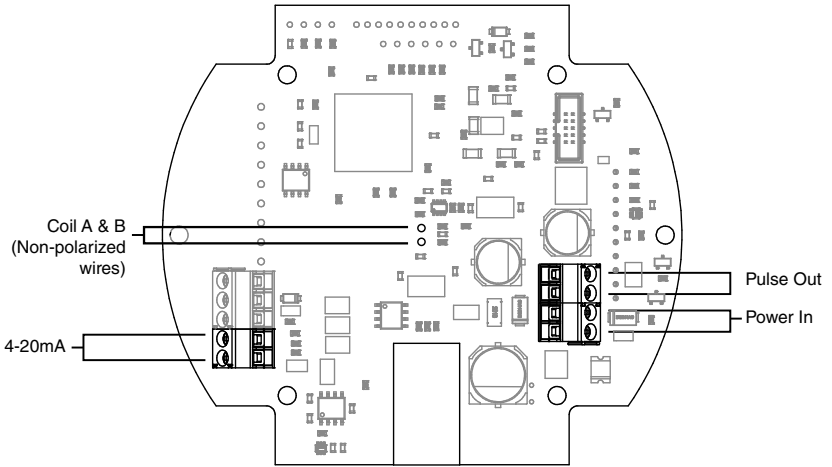


Figure 12

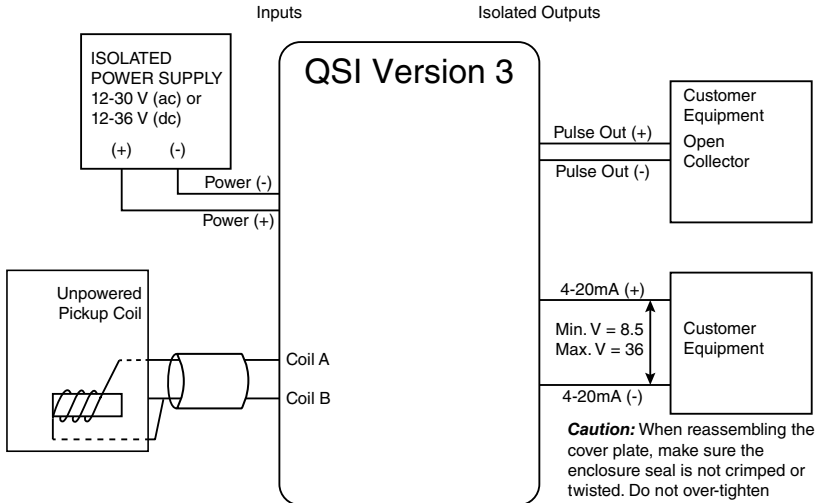
WIRING DIAGRAM

- 4-20mA and Pulse Outputs

Customer Equipment with Built-in Power Supply

Inputs: Standard Remote Sensor (Variable Reluctance Pickup Coil)

Outputs: Customer Equipment, 4-20mA Sensing, Built-in Loop Power Supply



Minimum signal amplitude required for normal operation approx. 15mV P-P

Recommended cable type - twisted pair with shield

Recommended maximum cable length - 20ft.

Caution: When reassembling the cover plate, make sure the enclosure seal is not crimped or twisted. Do not over-tighten screws (hand-tighten only).

Figure 13

WIRING DIAGRAMS

WIRING DIAGRAM

Customer Equipment without Built-in Power Supply
- 4-20mA Output with Separate Power Supply

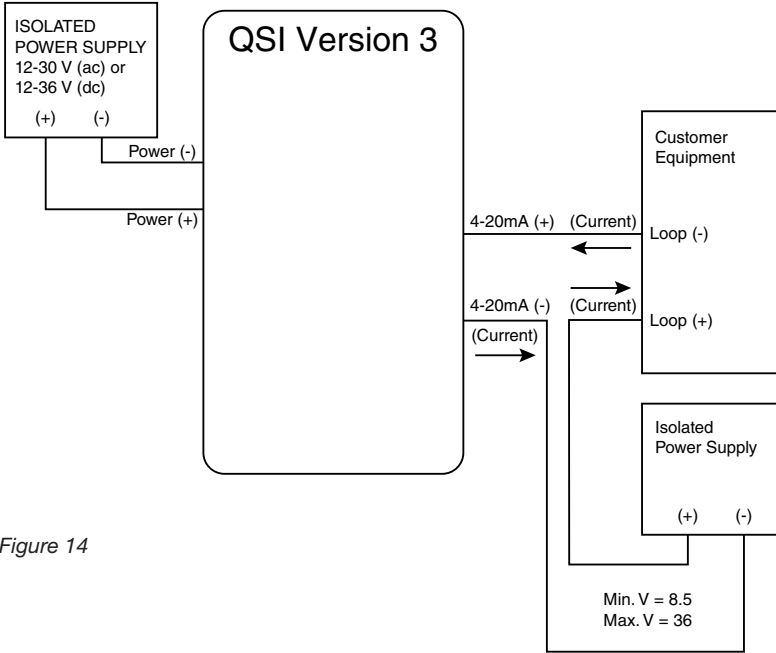


Figure 14

SPECIFICATIONS

MECHANICAL	
Cover Plate Port Threads	Female 1/2-20 UNF-2B (Compatible with PG7 thread)
Port Strain Relief	Hubble PG7
Grip Range	0.11"-0.26" (2.79 - 6.6mm)
Operation Temperature	+32°F to +140°F (0°C to +60°C)
Ambient Air Operation Temp	0°F to +140°F (-18°C to +60°C)
POWER SUPPLY	
Voltage Requirement	Min. 12 VDC or 12 VAC, 50-60 Hz
	Max. 36 VDC or 30 VAC, 50-60 Hz (higher voltage may damage unit)
MAX POWER CONSUMPTION	
QSB	50mA

FLOMECE APP FOR ANDROID

To learn how to get started using the FLOMECE App, visit:

[FLOMECE.net/downloads/flomece-app-quickstart.pdf](https://www.flomece.net/downloads/flomece-app-quickstart.pdf)



MAINTENANCE

Check cable-entry seals periodically. Tighten and/or apply sealant if needed. This is especially important in environments containing heavy concentrations of dust, oil mist, or other residue.

Check all wiring connections occasionally for oxidation or corrosion. Clean and re-seat if such conditions are noted.

If necessary, check and re-seat any connections that may have been subjected to strain (during rework or construction, for example).

REPLACING BATTERY

The QSI2 and QSI3 communications module has a 3V lithium coin cell battery installed on the PC board. In case of power failure the battery functions as power backup to maintain the internal system time. Any QSI2 or QSI3 feature that uses a time reference as part of its functionality will be immediately accurate to the current time when power is restored.

To Replace Battery:

DISCONNECT POWER TO METER

WITHOUT DISPLAY

- Remove (6) screws retaining the cover plate to the base and lift the cover plate free of the base (see Figure 15).
- Flip the cover plate over and remove (4) screws retaining the PC board assembly (see Figure 16).
- Remove and replace the coin cell battery (CR2032) on the back side of PC board (see Figure 17).
- Reverse the procedure to reassemble the cover plate to the base. Make sure the cover plate seal is seated before tightening the (6) cover plate screws.

WITH DISPLAY

On units with a display, only the display needs to be removed to replace the coin cell battery. The battery is accessible through the opening where the display is installed (see Figure 18).

- Remove (4) screws retaining the display to the cover plate. Lift the display straight up to disconnect the 10-pin bridge connector. The bridge connector could disengage from either socket connector (display or PCB assembly) or both.
- Remove and replace the coin cell battery (CR2032).
- Reverse the procedure to reassemble the display to the base. Make sure the display seal is seated before tightening the (4) display screws.

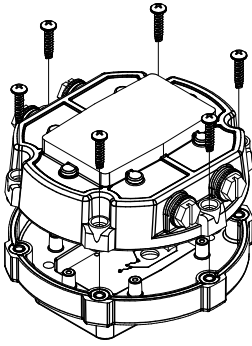


Figure 15

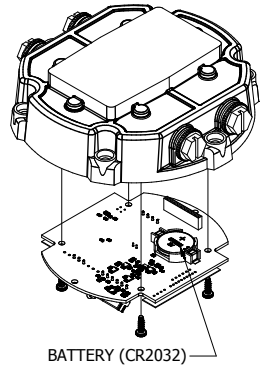


Figure 17

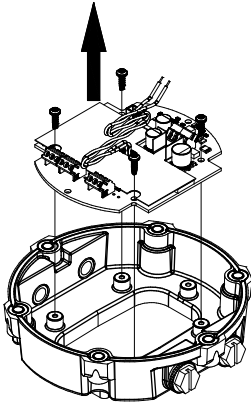


Figure 16

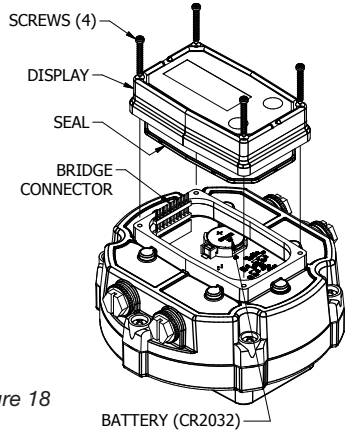


Figure 18

SERVICE

For warranty consideration, contact your local distributor. If you need further assistance, contact the GPI Customer Service Department at:

1-888-996-3837

You will need to:

- Provide information from the decal on your meter.
- Receive a Return Authorization number.
- Flush any fluid from the meter before shipping to the factory.

RETURNING PARTS

Please contact the factory before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call. GPI can also inform you of any special handling requirements you will need to follow covering the transportation and handling of equipment which has been used to transfer hazardous or flammable liquids.

CAUTION: Do not return equipment without specific authority from the GPI Customer Service Department. Due to strict regulations governing transportation, handling, and disposal of hazardous or flammable liquids, GPI will not accept equipment for rework unless it is completely free of liquid residue.



The Waste Electrical and Electronic Equipment (WEEE) directive (2002/96/EC) was approved by the European Parliament and the Council of the European Union in 2003. This symbol indicates that this product contains electrical and electronic equipment that may include batteries, printed circuit boards, liquid crystal displays or other components that may be subject to local disposal regulations at your location. Please understand those regulations and dispose of this product in a responsible manner.

RoHS Compliant (2011/65/EU)

This product is in compliance with the RoHS Directive of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

LIMITED WARRANTY

Great Plains Industries, Inc. 5252 E. 36th Street North, Wichita, KS USA 67220-3205, hereby provides a limited warranty against defects in material and workmanship on all products manufactured by Great Plains Industries, Inc. This product includes a 1 year warranty.

Manufacturer's sole obligation under the foregoing warranties will be limited to either, at Manufacturer's option, replacing or repairing defective Goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyer's exclusive remedy for breach of any such warranties will be enforcement of such obligations of Manufacturer. The warranty shall extend to the purchaser of this product and to any person to whom such product is transferred during the warranty period.

The warranty period shall begin on the date of manufacture or on the date of purchase with an original sales receipt. This warranty shall not apply if:

A. the product has been altered or modified outside the warrantor's duly appointed representative;

B. the product has been subjected to neglect, misuse, abuse or damage or has been installed or operated other than in accordance with the manufacturer's operating instructions.

To make a claim against this warranty, contact the GPI Customer Service Department at

**316-686-7361 or 888-996-3837. Or by mail at:
Great Plains Industries, Inc.
5252 E. 36th St. North
Wichita, KS, USA 67220-3205**

The company shall, notify the customer to either send the product, transportation prepaid, to the company at its office in Wichita, Kansas, or to a duly authorized service center. The company shall perform all obligations imposed on it by the terms of this warranty within 60 days of receipt of the defective product.

GREAT PLAINS INDUSTRIES, INC., EXCLUDES LIABILITY UNDER THIS WARRANTY FOR DIRECT, INDIRECT, INCIDENTAL AND CONSEQUENTIAL DAMAGES INCURRED IN THE USE OR LOSS OF USE OF THE PRODUCT WARRANTED HEREUNDER.

The company herewith expressly disclaims any warranty of merchantability or fitness for any particular purpose other than for which it was designed.

This warranty gives you specific rights and you may also have other rights which vary from U.S. state to U.S. state.

Note: In compliance with MAGNUSON MOSS CONSUMER WARRANTY ACT – Part 702 (governs the resale availability of the warranty terms).



Wichita / Sydney / Mexico City

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