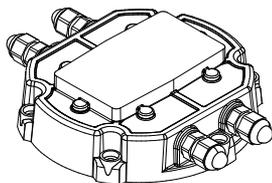
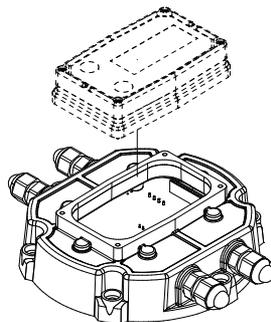


# QSB (Q-Star) Electronics for QSE Electromagnetic Meter

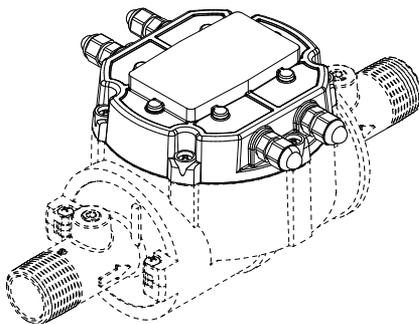
## Owner's Manual



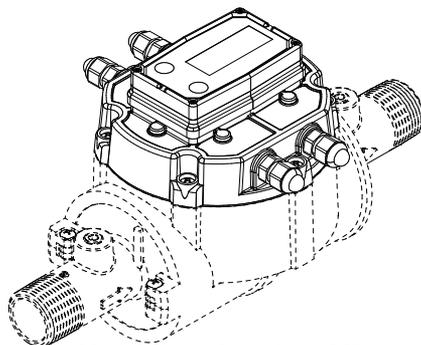
Plain Cover Plate and  
Pulse-Out Transmitter (QSB)



Display Mount Cover Plate  
(to mount a Q09 Display)  
and Pulse-Out Transmitter (QSB)



Plain Cover Plate QSB  
Shown on 1 inch NPT Meter



Display Mount Cover Plate QSB  
(with Q09 Display mounted)  
Shown on 1 inch NPT Meter

### TABLE OF CONTENTS

INTRODUCTION.....	2	MAINTENANCE.....	6
IMPORTANT NOTICE.....	2	SPECIFICATIONS.....	6
GENERAL INFORMATION.....	2	SERVICE.....	7
SAFETY.....	2	LIMITED WARRANTY.....	8
INSTALLATION.....	3		
WIRING.....	4		
ISOLATED POWER SUPPLY WIRING.....	4		
ISOLATED PULSE OUTPUT WIRING.....	5		

## INTRODUCTION

The QSE meter has multiple types of output electronics available. The electronics for the operation of the meter coils and flow tube is housed within the meter body casing. The cover plate is designed in two versions; a plain cover plate and a display mount cover plate. The QSB pulse-out electronics can be housed within either of the two cover plates. A display (Q09) is also available mounted to the “display mount” cover plate.

All meters are equipped with pulse-out electronics (QSB) as the default standard regardless of style of cover plate. This manual contains information and meter wiring diagrams for the QSB pulse-out electronics

## IMPORTANT NOTICE

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

## GENERAL INFORMATION

As a conductive liquid passes through the magnetic field created by the meter, a voltage is induced into the liquid that is directly proportional to the velocity of the flow. Electrodes in the meter flow tube transfer this induced voltage to the meter electronics.

The QSB electronics convert the induced voltage into usable information. The pulse-out information is one function of the electronics; another function supplies the display (when installed) with the information and power it needs to operate as designed.

The QSB electronics is a signal conditioner with industry standard pulse output. It can transmit those pulses to customer equipment up to 5,000 feet away. It is 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.

## INSTALLATION

**CAUTION:** Installation near high electromagnetic fields and high current fields is not recommended and may result in inaccurate readings.

If you ordered your QSB electronics with a meter, it is installed at the factory. If you ordered your QSB electronics separately from a meter, follow the instructions below. In every case, please review and thoroughly understand all manuals and installation instructions before proceeding.

QSE meters are designed to measure flow in only one direction. To mount your QSB electronics (with or without a display):

- Install the cover plate seal.
- Connect the QSB module PC board connector to the AFE module PC board connector inside the meter housing with the ribbon cable. The ribbon cable connectors are polarized and cannot be incorrectly connected (see Figures 1 & 2).
- Install the cover plate with screw holes aligned.
- Install the (6) cover plate screws and tighten. Make sure the cover plate seal is fully seated before tightening the screws.

A ribbon cable connects the QSB electronics within the cover plate to the AFE electronics within the meter body and allows 180 degrees of movement in either direction (see Figure 1).

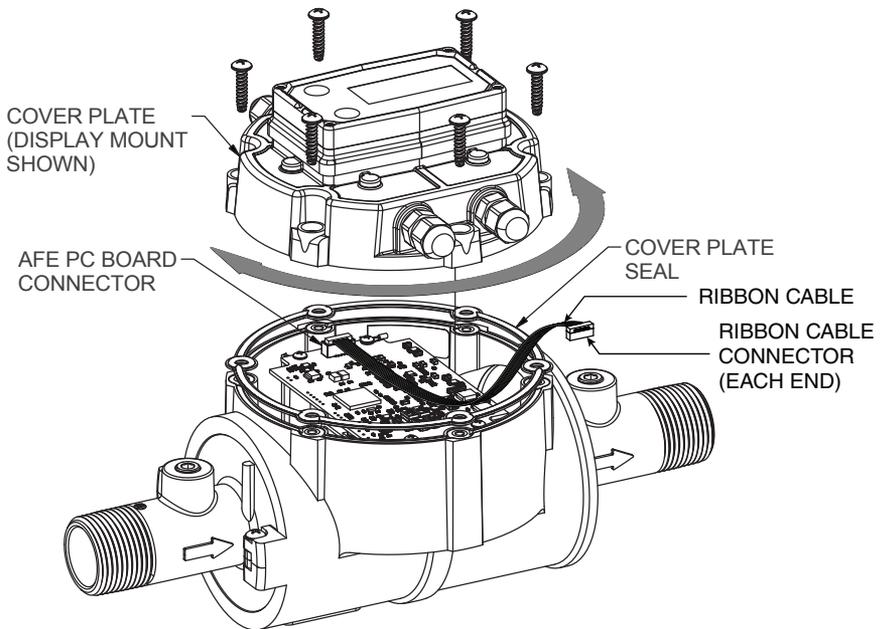


Figure 1

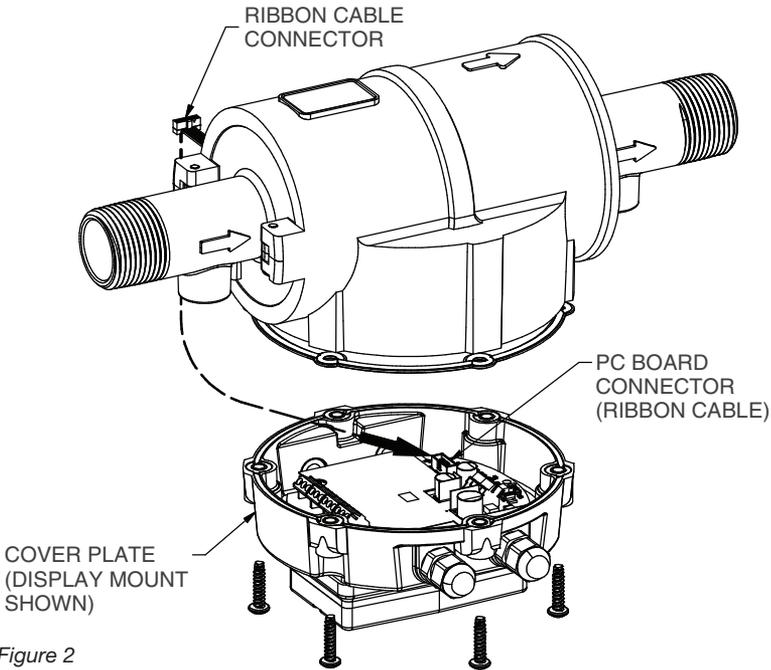


Figure 2

## WIRING

All electronic options are associated with a matching style of meter cover plate. This cover plate has four 1/2-20 UNF threaded ports, compatible with PG7 threads, for wiring access to the electronics inside the cover plate. The meter is shipped with the ports environmentally sealed with PG7 threaded strain reliefs fitted with mushroom plugs. The mushroom plugs are inserted into the cable glands of the strain reliefs to maintain the seal until the port is used for wiring. Strain reliefs with mushroom plugs can be left in any unused port indefinitely. Remove the mushroom plugs to run cable into the cover plates.

The strain reliefs will accommodate a cable diameter of 0.11 - 0.26 inches (2.79 - 6.6mm) and provides an environmental seal around the cable when tightened.

- Cable to be provided by customer to accommodate job requirements. Cable is not included with meter.

**NOTE:** Some connectors installed on the PC board are not used for this QSB application. Do not attempt to use these connections for other envisioned unauthorized purposes or circuit damage to the electronics will occur.

## Isolated Power Supply Wiring

The QSE meter has an internal connection to the conductive fluid through one of the electrodes. The fluid and/or plumbing in most applications should be earth grounded to prevent any static buildup and provide a proper grounding for the system. Therefore, the power supply connection to the QSB should have an earth ground isolated output to prevent ground loop currents. Failure to

use an isolated power supply could result in ground faults and could cause accuracy issues caused by stray voltages due to the ground loop currents. Proper grounding is a requirement.

The wire gauge for the power supply cable should be between 16 to 26 AWG to properly fit in the wire termination connector. The external power supply used for supplying power to the QSB should be rated for a minimum of 0.25 Amps.

The power supply polarity is not a requirement for either the DC or AC supply types as long as the supply is properly earth ground isolated.

### Isolated Pulse Output Wiring

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.

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).

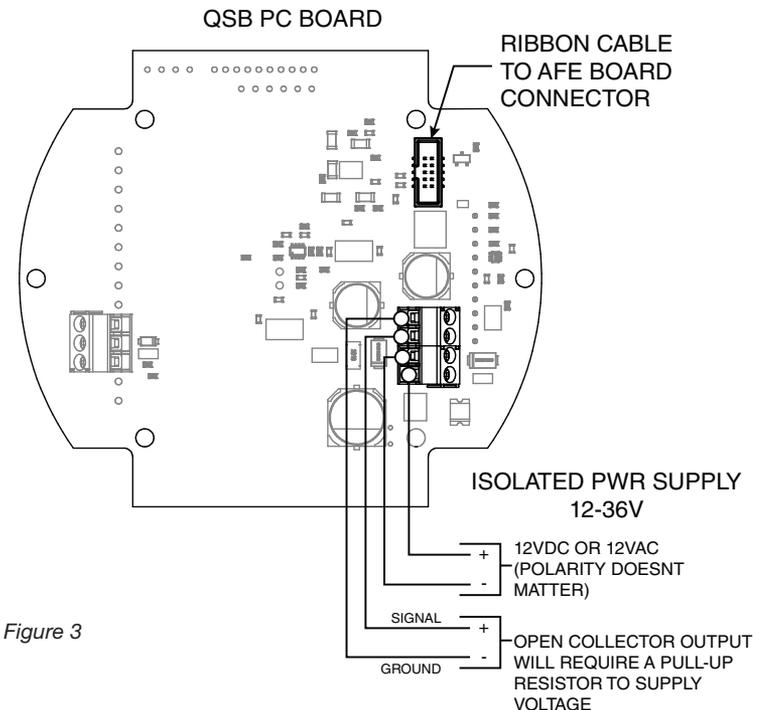


Figure 3

## WIRING DIAGRAM

Input: AFE Board  
Output: Pulse Output

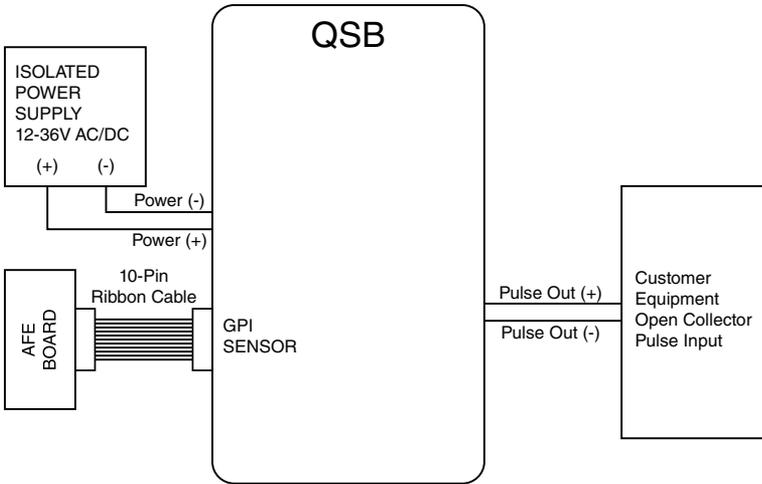


Figure 4

### 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).

### SPECIFICATIONS

MECHANICAL	
Strain Relief	Hubble PG7
Grip Range	0.11" - 0.26" (2.79 - 6.6mm)
Strain Relief Thread	Female 1/2-20 UNF-2B
Operation Temperature	+32°F to 140°F (0°C to 60°C)
POWER SUPPLY	
Voltage Requirement	Min. 12 VDC or 12 VAC
	Max. 36 VDC or 36 VAC (higher voltage may damage unit)
MAX POWER CONSUMPTION	
QSE Meter with QSB	75mA 2 watts @ 24VDC 3 watts @ 36VDC

## 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.

If possible leave customer installed fittings or ample length of bare pipe for reinstallation.

**CAUTION:** Do not return the meter 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 meters for rework unless they are 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.

## Environmental Rating: IP65

## LIMITED WARRANTY

Great Plains Industries, Inc. 5252 E. 36<sup>th</sup> 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. 36<sup>th</sup> 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).

***GPI* meters.com**

**FLOWMETERS FOR LIQUID MEASUREMENT**

**P.O. BOX 1008, SPARTA, NJ 07871**

**www.gpimeters.com email: sales@gpimeters.com**

**Phone: 973-940-1684 Fax: 973-940-1651**

**1-888-722-3569**