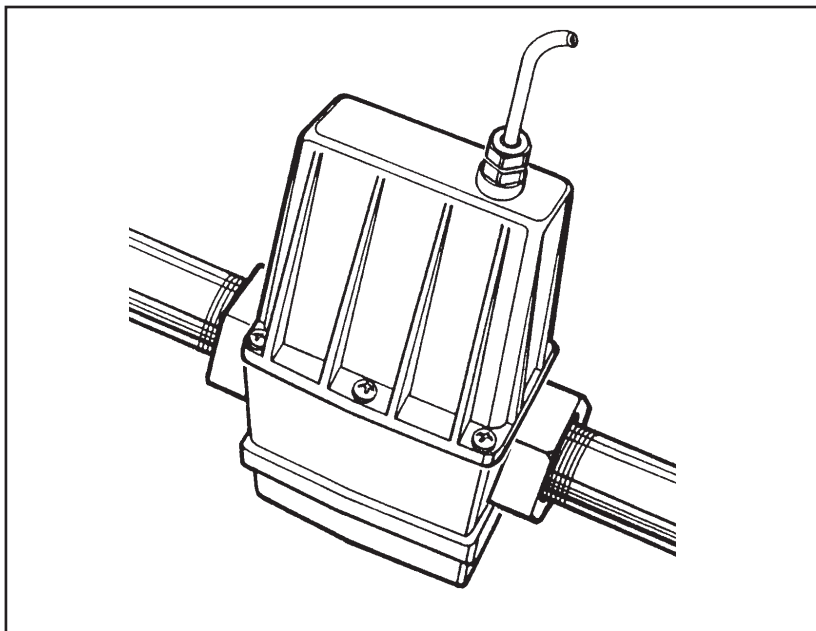


Industrial Grade 4-20 mA MODULE Part # 125100-1 Owner's Manual



CE



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GREAT PLAINS INDUSTRIES, INC.

"A Great Plains Ventures Subsidiary"

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To the owner . .

Congratulations on receiving your GPI Industrial Grade 4-20 mA Module. We are pleased to provide you with a product designed to give you maximum reliability and efficiency.

Our business is the design, manufacture, and marketing of liquid handling, agricultural, and recreational products. We succeed because we provide customers with innovative, reliable, safe, timely, and competitively-priced products. We pride ourselves in conducting our business with integrity and professionalism.

We are proud to provide you with a quality product and the support you need to obtain years of safe, dependable service.

President
Great Plains Industries, Inc.

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INTRODUCTION

Caution: This 4-20 mA Module is not FM Approved. Therefore, use of this module with an approved metering system, voids FM Approval.

NOTE: This module requires an input power supply of 7 to 30 volts DC. (24 VDC is recommended) The DC signal will power the meter electronics, leaving the batteries as backup for the meter electronics.

NOTE: Field Calibration is NOT required (SEE TABLE 1).

This module is designed to be used only with G2 Series Turbine Meters.

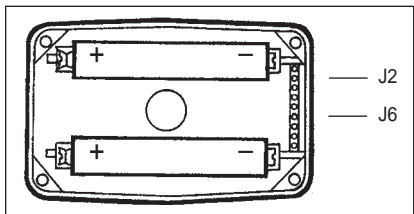
INSTALLATION

To install this module, follow the instructions given below.

1. Remove the back coverplate from the turbine housing.
2. Remove the display electronics from the front of the turbine.

NOTE: If you are installing more than one module at a time, take care to keep the proper electronics paired with the original turbine.

3. The 4-20 mA Module connects to a 10-pin connector located on the back side of the computer electronics next to the negative battery connectors. The 10-pin connector is sealed with a clear plastic sealant that must be carefully pried out with a small sharp tool inserted gently at the edges.
4. Remove the backing from the double-sided tape on the module's circuit assembly.



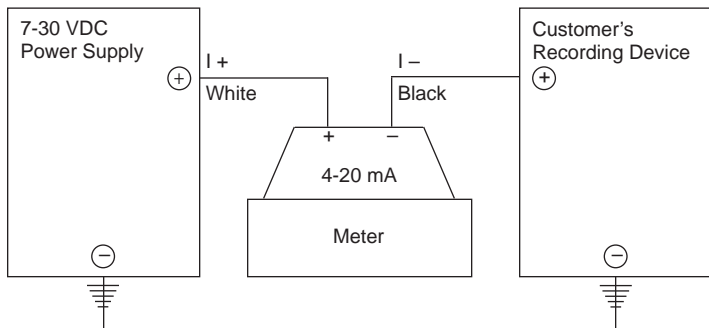
5. Carefully align the top pin on the circuit assembly with the J2 position on the 10-pin connector and gently press the module's circuit assembly into position between the batteries. The bottom pin will align with the J6 position.
6. Guide the loose ends of the wires from the circuit assembly through the housing's cavity to the back side of the turbine.
7. Install the display electronics to the front side of the turbine and tighten the four screws snugly.
8. Connect the loose ends of the wires from the electronics circuit assembly to the terminal block marked "From EDM." Connect wires per colors noted beside connection pins.

NOTE: Ten feet of wire is provided with the module. If trimming is necessary, do it now. If you provide your own wire, prepare it for connection prior to the next step.

9. Connect the wires at the module's terminal block marked "Cable from Customer" as illustrated in Wiring Section.
10. Complete connections to the interface device according to the manufacturer's instructions.
11. Determine if field calibration is needed (See Table 1). Before installing the module onto the turbine housing, adjust the ZERO and SPAN trim pots as noted in Calibration Section. When adjustments are finished, make sure the O-ring is fully seated and no wires are pinched. Then, secure the module onto the housing by snugly tightening the six screws provided with the module.

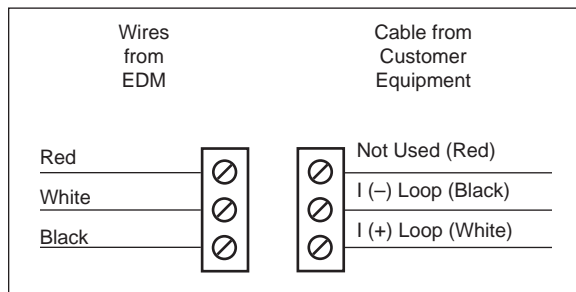
WIRING

This is the wiring diagram for the 4-20 mA output.



Output (4-20 mA)

4-20 mA Module Terminal Connections

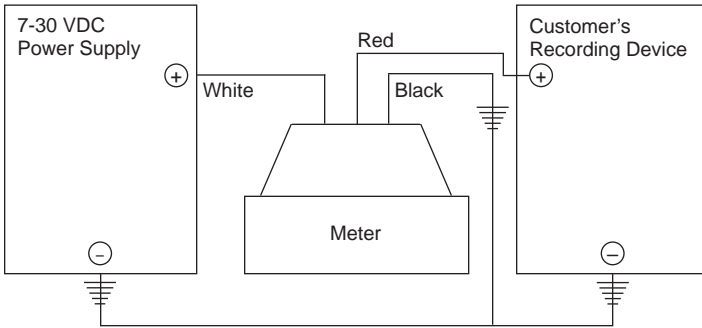


Wires from EDM detail:

- White wire from 10-pin connector J2.
- Red wire from 10-pin connector J5.
- Black wire from 10-pin connector J6.

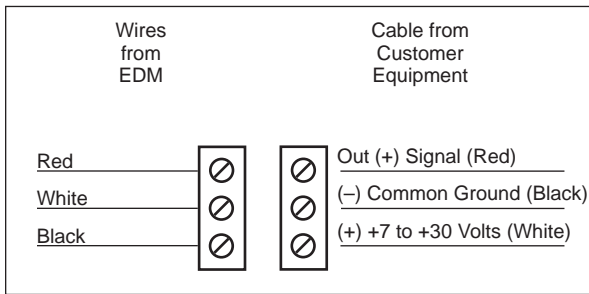
WIRING

This is the wiring diagram for the 0-5 V output.



Secondary Output (0-5 Volt) (1-4 VDC)

0-5 Volt Terminal Connections



Wires from EDM detail:

White wire from 10-pin connector J2.

Red wire from 10-pin connector J5.

Black wire from 10-pin connector J6.

CALIBRATION FOR 0-5V

Adjusting ZERO and SPAN

The factory recommends when using 0-5 V signal, do not go below 1 V or above 4 V as output signal in the linear range.

Before initial adjustments, set the ZERO trimpot to its maximum position by turning it clockwise twenty (20) full turns minimum. You set the SPAN trimpot to its maximum position by turning it clockwise a minimum of twenty (20) full turns.

To adjust Zero reading, start fluid flow at its lowest anticipated flowrate within the linear flow range of the turbine. Then turn the ZERO trimpot counterclockwise until the indicated reading is 1 V.

To adjust SPAN, start the fluid flow to its highest anticipated flowrate within the linear flow range of the turbine. Then, turn the SPAN trimpot counterclockwise until the indicator just drops to 4 V. Any flowrate above this will produce an indication higher than 4 V.

Further adjustment will be required. Adjustments in ZERO trimpot will require adjustments in SPAN. The converse is also true, adjusting the SPAN setting will effect the ZERO setting. You will need to fine tune both the ZERO trimpot and the SPAN trimpot several times. Once you have both ZERO and SPAN fine tuned to 1 V and 4 V respectively, you will need no further adjustments.

CALIBRATION FOR 4-20mA

Reference TABLE 1 to determine if the module needs adjusting for your application.

NOTE: Frequency input difference must be at least 75Hz between ZERO and SPAN.

Adjusting ZERO and SPAN

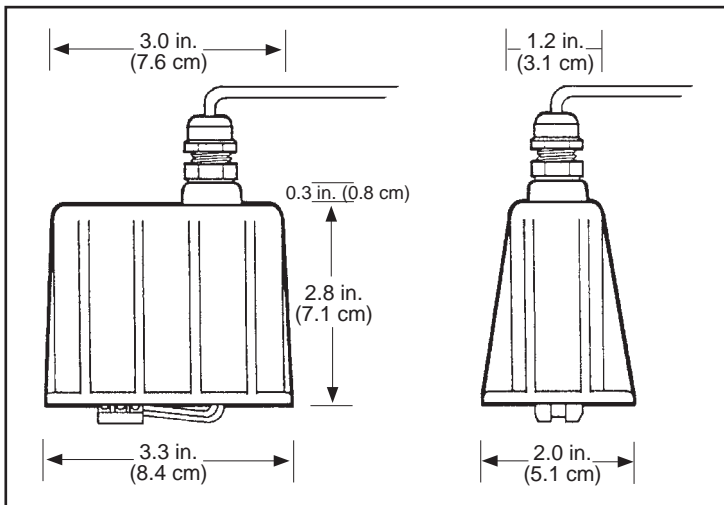
Before initial adjustments, set both trimpots to their maximum position by turning each control clockwise twenty (20) full turns minimum.

To adjust ZERO reading, start fluid flow at its lowest anticipated flowrate within the linear flow range of the turbine. Then turn the ZERO trimpot counterclockwise until the indicated reading begins to rise from 4 mA. Then turn back to the 4 mA reading. This is the true ZERO read. Any flowrate below this "threshold," including no flow, will produce a 4 mA reading.

To adjust SPAN, start the fluid flow to its highest anticipated flowrate within the linear flow range of the turbine. Then, turn the SPAN trimpot counterclockwise until the indicator just drops to 20 mA. Any flowrate above this will produce an indication higher than 20 mA.

Usually, no further adjustment will be required. However, if "fine tuning" is required, note that adjustments in ZERO trimpot will require adjustments in SPAN. The converse is not true, adjusting the SPAN setting will have little or no effect on the ZERO setting.

DIMENSIONS



SPECIFICATIONS

Mechanical

Housing Material: Nylon 6/6
 Strain Relief: Hubble PG7. Grip range 0.11-0.26
 Strain Relief Thread: Female 1/2-20 UNF-2B
 Cable: Belden 9363 (22AWG-2 conductor w/drain wire and shield)
 Cable Length: 10 ft. (3m) provided
 Operation Temperature: 0° to +150°F (-17° to 65°C)
 Storage Temperature: -40° to +180°F (-40° to +82°C)

Power

Type: Loop powered
 Burden (Minimum): 7 VDC
 Maximum: 30 VDC
 Isolated: No

Primary Output (4-20 mA)

Type: Loop
 Minimum: 4 mA
 Maximum: 25 mA

Output (0-5 Volt)

Type: Voltage Mode
 Minimum: 1 Volt
 Maximum: 4 Volts

Input

Open Collector from G2 Series Electronics or Conditioned Signal Module (#113435-1). 4-20 mA Module will accept frequencies generated only by G2 Series turbine housings. This module should not be used with frequency generating devices other than G2 Series Models.

PARTS LIST

Part Number	Description	Qty.
901002-52	O-ring	1
125061-1	Circuit Assembly Kit (10 pin connector)	1
904005-27	Screws	6

TROUBLESHOOTING

Symptom	Probable Cause	Corrective Action
No output signal	1. Incorrect or no input power 2. Not wired correctly 3. Broken connection 4. Defective PC board connector 5. Defective unit	Supply correct power requirements. Check owner's manual for correct installation. Check resistance to determine location of break. Contact distributor or factory for replacement. Contact distributor or factory for replacement.
Signal does rise above 4 mA	1. ZERO trimpot not set correctly 2. No signal from meter	Reinitiate ZERO & SPAN adjustments - careful to increase ZERO read above 4 and then turn back to 4 mA reading to avoid false 4 mA signal. See Turbine and Display Electronics owner's manual.
Span will not set to 20mA	1. Frequency range is too narrow	Make sure range between ZERO and SPAN equals at least 75Hz

TABLE 1**Approximate Values when using factory settings**

Factory Settings: Zero = 10 Hz; Span = 465 Hz.

Amp readings at minimum and maximum meter flow rates

	Minimum Flowrate			Maximum Flowrate		
	GPM	Hz.	mA Reading	GPM	Hz.	mA Reading
G2X 05 1/2"	1	42	5.48	10	420	18.77
G2X 07 3/4"	2	37	5.30	20	370	17.01
G2X 10 1"	5	47	5.65	50	470	20.00
G2X 15 1-1/2"	10	36	5.27	100	360	16.66
G2X 20 2"	20	33	5.16	200	330	15.60

Meter flow rates at 4 and 20mA

	Flowrate @ 4mA	Flowrate @ 20mA
G2X 05 1/2"	0.24 GPM	11.07 GPM
G2X 07 3/4"	0.54 GPM	25.13 GPM
G2X 10 1"	1.06 GPM	50.00 GPM
G2X 15 1-1/2"	2.78 GPM	129.2 GPM
G2X 20 2"	6.06 GPM	281.8 GPM

X = S/Stainless, B/Brass, A/Aluminum, P/PVDF

SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, call the GPI Customer Service Department in Wichita, Kansas, during normal business hours.

1-888-996-3837

To obtain prompt, efficient service, always be prepared with the following information:

1. The model number of your turbine.
2. The serial number or manufacturing date code of your turbine.
3. Specific information about part numbers and descriptions.

For warranty work always be prepared with your original sales slip or other evidence of purchase date.

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 turbines 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 turbines for rework unless they are completely free of liquid residue.

CAUTION: Turbines not flushed before shipment can be refused and returned to the sender.

WEEE DIRECTIVE

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.

Limited Warranty Policy

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).



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