GRD101-5V 0 - 5V Input Remote Display

FEATURES

- **ACCEPTS 0 - 5V INPUT**
- **THE INPUT IS OVER-VOLTAGE PROTECTED**
- **TOTAL ERROR LESS THAN 0.01% FS, TYPICAL 0.005% FS**
- **SIX 14.2 mm (0.56") HIGH DIGITS, BRIGHT RED LED DISPLAY**
- **PROVIDES REGULATED 24VDC / 50 mA FOR THE SENSOR, SHORT CIRCUIT AND OVER CURRENT PROTECTED**
- **PROGRAMMABLE DIGITAL FILTER**
- **PRELOADED CALIBRATION TABLE FOR LINEARIZATION**
- **PROGAMMABLE DECIMAL PLACES**
- **ISOLATED POWER SUPPLY 15-40VDC, 1.7VA WITH SURGE, TRANSIENTS AND REVERSE POLARITY PROTECTION**
- **PROGRAMMABLE THROUGH RS232 MODBUS RTU**
- **WEIGHT LESS THAN 145 g (5.1 oz)**
- **DIN 43700 PANEL MOUNT 48x96 mm ENCLOSURE. SELF-EXTINGUISHING PPO**

APPLICATIONS

- **TO POWER, MEASURE AND DISPLAY ANALOG SIGNALS FROM VARIOUS SENSORS AND DEVICES**
- **FLOW RATE DISPLAYS**
- **PROCESS INDICATORS**
- **TEMPERATURE DISPLAYS**
- **PRESSURE DISPLAYS**
- **6 DIGIT VOLTMETERS**

1. DESCRIPTION

GRD101-5V is one of the analog input versions of our remote displays. It accepts 0 - 5V signals from any sensor or device, scales and displays them on a bright red 6 digit display. The input signal is filtered and conditioned, then accurately measured. After that our special proprietary algorithms further process the signal and provide programmable digital filter to the user. Our proprietary adaptive/predictive self-adjusting digital filter or a few others can be chosen.

A calibration table is preloaded to linearize and convert the input signal to engineering units with very high accuracy. Programmable are the decimal places from none to 5 thus offering the ability to display very small to very big numbers.

The communication with GRD101-5V displays is a RS232 MODBUS RTU, so a PLC or another equipment can also be used to program or read data from GRD101-5V.

If an external RS232 to RS485 converter is used the display can be connected to a MODBUS network.

2. ABSOLUTE MAXIMUM RATINGS *

Operating temperature	0 ℃ to +70 ℃
Continuous input voltage	150 V DC
Sensor consumption	50 mA DC
Power supply voltage	40 V DC

*** NOTICE: Stresses above those ratings may cause permanent damage to the device.**

3. CHARACTERISTICS

Parameter	Conditions	Min	Typ	Max	Units
Power Supply					
Voltage	25 ° C, non-isolated power supply version	8		36	V DC
Voltage	25 ° C, isolated power supply version	18		36	V DC
Power Consumption	25 ° C, 24 VDC, display at '888888'			1.7	VA
Input					
Input resistance	Input 0 – 5V	120			kohm
Sensor Power					
Voltage	25 ° C, non-isolated power supply version, NOTE 1	15		36	V DC
Voltage	25 ° C, isolated power supply version, NOTE 2		24		V DC
Accuracy					
Error	Input 0 – 5 V, 24 V, 25 ℃, NOTE 3		0.005	0.01	% FS
Temperature coefficient	Input 0 - 5V, 0 ℃ to +70 ℃ , 24 V DC		25		ppm/℃
RS232					
TxD voltage levels	0 ℃ to +70 ℃, receiver input re sistance 5 kohm		+/-5.5		V DC

Note 1: When the power of GRD101-5V is not isolated the voltage to the sensor equals the power supply voltage

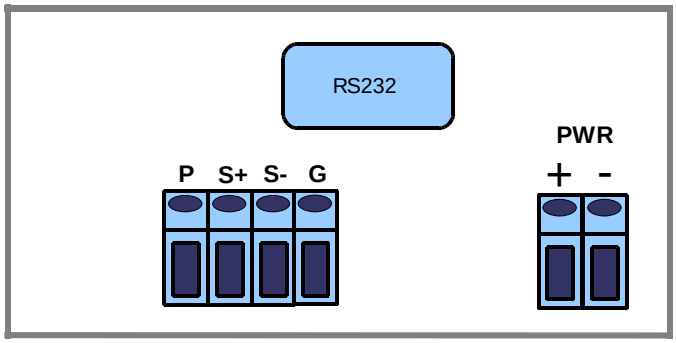
Note 2: When the power of GRD101-5V is isolated the voltage to the sensor is 24 VDC regulated, regardless of the power supply voltage

Note 3: The parameter includes all errors, non-linearity and noise at constant voltage and temperature

4. APPLICATION

4.1. ELECTRICAL

On the rear panel there are 2 terminals for the power and 4 terminals for the sensor.



P power to the sensor, positive
S+ signal from the sensor, positive
S- signal from the sensor, negative
G power to the sensor, negative

NOTE: On the non-isolated version "G" and "-" terminals are shorted. Terminals "S-" and "G" are shorted inside the device on all versions.

4.2. MECHANICAL

4.2.1. Dimensions

The front panel has dimensions 48 x 96 mm (1.89" x 3.78"). The maximum length/depth including rear panel terminals is 100 mm (3.94").

4.2.2. Cut out

The cut out dimensions are:

- width 92 mm, max 92.8 mm (3.622", max 3.654")
- height 45 mm, max 45.6 mm (1.772", max 1.795")

5. COMMUNICATION

GRD101-5V communication port is a 3 wire RS232 – TxD, RxD and common. The connector is DB9 female. Pin 5 is the common, pin 3 is in-coming data from the master (PC) to GRD101-5V, pin 2 is out-going data from GRD101-5V to the master.

The serial port settings are: baud rate 19 200, 8 bit character, 1 stop bit, even parity, no handshaking.

The communication protocol is MODBUS RTU. Functions 0x03 (read holding registers), 0x04 (read input registers) and 0x06 (write a single holding register) are implemented. The remote display handles exceptions 1, 2, 3 and 6.

Here are the registers implemented:

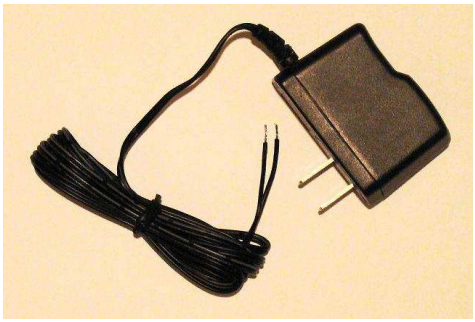
Register address	***Register Type***	***Read/Write***	***Description***	***Format***
21	Input	R	The input signal in percents	0 – 10000 = 0.00% – 100.00%
1000	Holding	R/W	MODBUS slave address	1 - 247, default is 1
1001	Holding	R/W	Digital filter	0 – 7, default is 0 = auto
1007	Holding	R/W	Cut OFF	0-50 = 0.0 – 5.0 %, default is 1 = 0.1%
1025	Holding	R/W	Decimal places to display	0 – 6, default is 6 = auto
1038	Holding	R/W	Correction coefficient	0 – 65535 = 0.0000 – 6.5535, default is 10 000 = 1.0000

6. VERSIONS OF GRD101-5V

GRD101-5V	is the non-isolated version. It is a good choice if the sensor is well known and there are no other devices connected to the sensor or to GRD101-5V.
GRD101-5V-ISO	is the isolated version. It is recommended for all other cases.

7. POWER SUPPLY

GRD101-5V can be powered by any DC adapter for 18 – 36VDC or by another device. An excellent choice for a power supply is the adapter GPS124 on the picture below that we offer. It provides 24VDC / 250 mA regulated and filtered. It also has high isolation, protection and small size.



If an AC voltage in the range 90 - 264 VAC is only available then a GPS122 would be an excellent solution.

8. ORDERING

For ordering please use the following G Instruments part numbers:

Description	*G Instruments PN*
GRD101-5V remote display, non-isolated	30247
GRD101-5V-ISO remote display, isolated	30248
GPS124 power supply, 115VAC to 24VDC/0.25A, regulated	30138
GPS122 power supply board	30225
GPS122 mounted in a blind water proof enclosure with 2 cable glands	30241
RS232 extension cable, DB9M to DB9F, 6' long	30175

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