

# Operating manual for digital indicator module

## GIA 2448 / GIA 2448 WE



### Specification:

<b>Input signals:</b>	<input type="checkbox"/> 0-200mV <input type="checkbox"/> 0-1V <input type="checkbox"/> 0-2V <input type="checkbox"/> 0-10V <input type="checkbox"/> 0-20V <input type="checkbox"/> 0-20mA <input type="checkbox"/> 4-20mA <i>to be selected via soldering jumper or preset by manufacturer (GIA2448WE)</i>
<b>Display range:</b>	<input type="checkbox"/> _____ <i>to be set via soldering jumper and potentiometer or preset by manufacturer (GIA2448WE)</i>
<b>max. display range:</b>	-1999 ... +1999 digits
<b>measuring range:</b>	100 ... 3998 digits
<b>zero point offset:</b>	max. +/- of measuring range set
<b>decimal point:</b>	can be set at any position by means of soldering jumpers.
<b>Display:</b>	3½-digit, red LED-display, 10 mm high
<b>Scan rate:</b>	approx. 3 measurements/sec.
<b>Accuracy:</b>	±0.2% ±1digit (at nominal temperature).
<b>Input resistance:</b> (at 0-x V)	approx. 100kOhm / V input signal range (e.g. for input signal 0-10V: approx. 1 MOhm)
<b>Shunt resistance:</b> (at 0(4)-20mA)	approx. 20 Ohm
<b>Nominal temperature:</b>	25°C
<b>Working temperature:</b>	0 to 50°C
<b>Relative humidity:</b>	5 to 95 % r.h. (non-condensing)
<b>Storage temperature:</b>	-20 to 85°C
<b>Voltage supply:</b>	<input type="checkbox"/> 12V DC (8 - 20VDC) resp. 12V AC (8 - 20V AC) <input type="checkbox"/> 24V DC (18 - 29V DC) resp. 24V AC (18 - 27V AC) <i>to be selected via soldering jumper or preset by manufacturer (GIA2448WE)</i>
<b>Power consumption:</b>	max. 20 mA
<b>Housing:</b>	glass fibre reinforced Noryl, front screen PC.
<b>Dimensions:</b>	24 x 48 mm (H x W) (dimensions of front frame)
<b>Mounting depth:</b>	approx. 65 mm (incl. screw-type/plug-in terminals)
<b>Panel mounting:</b>	by means of VA- elastic spike, allowed panel thickness: from 1 to approx. 10 mm
<b>Panel cut-out:</b>	21.7 <sup>±0.5</sup> x 45 <sup>±0.5</sup> mm (H x W).
<b>Connection terminals:</b>	4-pin screw-type/plug-in terminals for wire dias ranging from 0.14 to 1.5 mm <sup>2</sup>
<b>EMC:</b>	Device has been tested according to EN50081-1 and EN50082-2 additional fault: <1%
<b>IP rating:</b>	front IP54 (with optional O-rings IP65).

## Electric connection:

Electric connections for the GIA 2448 are located at the back of the device.

Connection is made via screw-type/plug-in terminals (max. terminal range 1,5mm<sup>2</sup>).

*Make it a rule to always mount screw-type/plug-in terminals while they are still loose and connect only later. If terminals are mounted after connection there is a risk that soldering eyes may come loose. Please use suitable screw-driver and do not tighten screws by force.*

**Supply voltage:** 12 V DC/AC or 24 V DC/AC  
 Terminal assignment: +Uv = supply voltage +  
 GND = supply voltage -

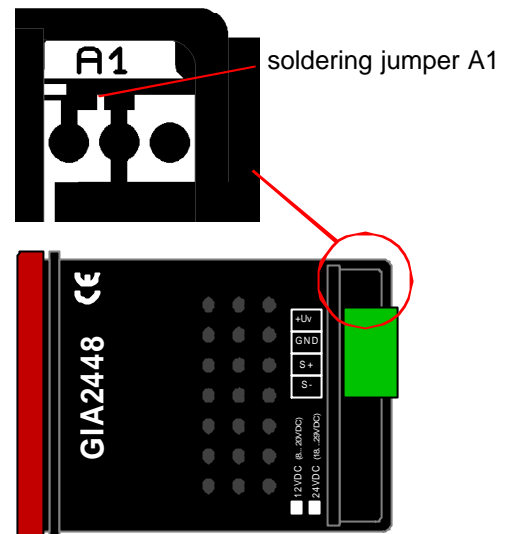
*Please make sure to check if supply voltage and voltage range set conform to each other.*

*Use the soldering jumper next to the connection terminal to select supply voltage:*

Jumper "A1" open: 24 V ( 18 - 29 V DC or 18 - 27 V AC)  
 Jumper "A1" closed: 12 V ( 8 - 20 V DC or 8 - 20 V AC)

**Signal connection:** standard signals (0-200mV, 0-1V, 0-2V, 0-10V, 0-20V, 0-20mA bzw. 4-20mA)  
 Terminal assignment: S+ = signal +  
 S- = signal -

Please note: The terminal S- (signal -) and GND (supply voltage -) are connected within the device!



**Both the connection and commissioning of the device must only be carried out by skilled personnel. In case of a wrong connection, the device may be destroyed - no warranty claims can be accepted !**

## Setting of the GIA2448:

*Below you will find a description as to how a GIA2448 can be adapted to its signal source.*

### 1. Remove PC-board from housing:

To be able to reach the soldering jumpers on the bottom of the PC-board or the potentiometers the PC-board has to be taken out of its housing.

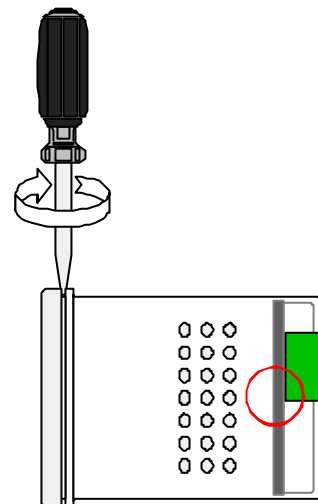
#### How to remove the front screen:

- Place screw driver in the gap between screen and housing.
- Separate front screen from housing by turning the screw driver carefully.

#### How to remove the back screen bolt:

- Carefully insert small screw driver between housing and back screen bolt.
- Use screw driver to push bolt backwards and slightly lift it till the bolt locking is visible.
- Pull back screen upwards and remove it.

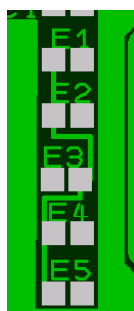
Push PC-board out of its housing (do not forget to take off the screw-type/plug-in terminals prior to doing so).



### 2. Selection of input signal:

Use soldering jumpers E1 to E5 to select the input signal required.

Please refer to the opposite table for information which soldering jumper needs to be set for the required input signal.



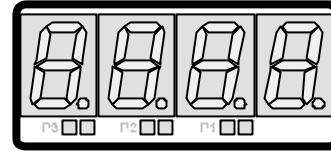
**PLEASE NOTE !** Never set any other soldering jumpers but the ones required. All other soldering jumpers need to be open.

input signal	soldering jumpers to select				
	E1	E2	E3	E4	E5
0 ... 200 mV	X	--	--	--	--
0 ... 1 V	--	X	--	--	--
0 ... 2 V	--	--	X	--	--
0 ... 10 V	--	--	--	X	--
0 ... 20 V	--	--	--	--	--
0 ... 20 mA	X	--	--	--	X
4 ... 20 mA	X	--	--	--	X

### 3. Selection of decimal point:

One soldering jumper is located beneath each of the first 3 LEDs on the PC-board. To set the decimal point use the soldering jumper

- P3 - soldering jumper for position 1000 (display e.g. 1.234)
- P2 - soldering jumper for position 100 (display e.g. 12.34)
- P1 - soldering jumper for position 10 (display. 123.4)



### 4. Display adjustment:

To adjust the GIA2448 a transducer corresponding to the input signal selected is required.

Please note: The accuracy of the adjustment and thus of your GIA2448 is highly dependant on the transducer accuracy. To guarantee optimum adjustment results your transducer accuracy should be 0.05%, preferably better.

#### 4.1 Adjustment:

Use soldering jumpers B1, B2 or B4 to roughly divide the display range.

##### 4.1.1 Measuring range:

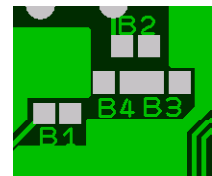
To facilitate setting of the device its measuring range (difference between max. and min. display value) has been roughly divided into 2 areas.

Please refer to the opposite table for the soldering jumper to be set.

*note: Due to tolerances the jumper to be set cannot be established for the range 500 to 750. If your measuring range is within this area, please select the area next to your measuring range (e.g. for 600 select range: 100 to 500 (jumper 2)).*

*To set device proceed according to the description under 4.2. If setting is not working, set alternative jumper (for our example jumper 4) and repeat setting procedure.*

measuring range	B2	B4
100 ... ~500 at all input signal	X	--
~500 ... ~750 at input signal: 0...? V, 0...20 mA	X	--
~500 ... ~750 at input signal: 4-20mA or B1 is set	refer note	
~500 ... ~750 at input signal: 4-20mA and B1 is set	--	X
~750 ... ~3998 at all input signal	--	X



##### 4.1.1 Zero point displacement:

A zero point displacement is possible for the range of +/- of the measuring range selected (display value for 0V, 0mA or 4 mA).

The zero point displacement has also been divided into two areas.

- Set soldering jumper B1 for a positive displacement (display for 0V or 0mA exceeding 0).

- Do not set soldering jumper B1 (display for 0V or 0mA less than 0).

For 4-20mA the area assignment changes - p.r.t. table.

input signal	possible zero point displacement	B1
0...200mV, 0...x V, 0...20 mA	-measuring range span...0	--
	0...measuring range span	X
4...20 mA	-meas. span ... 1/5*meas. span	--
	1/5*meas. span...meas. span	X

### 4.2. Abgleich:

Below you will find 2 different procedures for the adjustment of the GIA2448:

1. Interactive adjustment: Advantage: simple, no calculation required  
Disadvantage: slow as adjustment is carried out in several runs
2. Adjustment with calculation: Advantage: adjustment in only one run.  
Disadvantage: the values to be set need to be calculated

#### 4.2.1 Interactive adjustment:

##### a.) Zero adjustment:

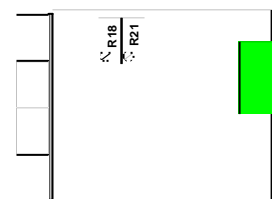
- Use transducer to apply an input signal of 0V, 0mA or 4mA.
- Set display of GIA2448 to the value desired using the R21 potentiometer  
(2nd potentiometer after the display)

If this value cannot be set use the R18 potentiometer.

##### b.) Adjustment of lead:

- Use transducer to apply an input signal of 200mV, 1V, 2V, 10V, 20V or 20mA.
- Set display to the value desired using the R18 potentiometer (the potentiometer directly after the display).

Repeat points a.) and b.) till the display values for 0V, 0mA or 4mA and for 200mV, 1V, 2V, 10V, 20V or 20mA are correct. (The procedure should be completed after a max. of 10 runs.).



### 4.2.2 Adjustment with calculation:

#### a.) Zero point calculation :

- Calculate input signal required for the display value 0:

#### Calculation for input signals: 0 - ?V or 20mA

$$\text{Input signal for display "0"} = - \frac{200\text{mV}, 1\text{V}, 2\text{V}, 10\text{V}, 20\text{V or } 20\text{mA}}{\text{span of measuring range}} * \text{display for } 0\text{V or } 0\text{mA}$$

#### Calculation for input signal: 4 - 20mA

$$\text{Input signal for display "0"} = - \frac{16\text{mA}}{\text{span of measuring range}} * \text{display } 4\text{mA} + 4\text{mA}$$

#### b.) Zero point adjustment:

- Use transducer to apply calculated value of input signal.

- Set the display of the GIA2448 to 0 using the R21 potentiometer (2nd potentiometer after the display).

#### c.) Adjustment of lead:

- Use transducer to apply 200mV, 1V, 2V, 10V, 20V or 20mA.

- Set display to value desired using the R18 potentiometer (potentiometer directly after the display).

Check display values for 0V, 0mA or 4mA and for 200mV, 1V, 2V, 10V, 20V or 20mA once again.

## Safety regulations

Make it a rule to always observe the following points to exclude any risk whatsoever for the operator.

- In case of any obvious damage and/or functional problems disconnect device immediately
- Prior to opening it, disconnect device and supply voltage source. Make sure that all parts of the device are protected against direct touching when mounting the device and setting its connections.
- Please always adhere to the standard safety regulations for electric devices, power systems and light-current installations, and make sure that your national safety regulations (e.g. VDE 0100) are observed.
- If device is to be connected to other devices (e.g. via serial interface) the circuitry has to be designed most carefully. Internal connection in third party devices may result in not-permissible voltages.



**Warning:** When operating electric devices parts of these devices will, as a matter of course, be live. Unless the warnings are observed severe damage to life and limb or to property may be the result. Make sure that only skilled personnel is working with this device. Trouble-free operation of this device can only be guaranteed if it is properly transported and stored. Carefull installation, mounting, operation and maintenance are vital factors for the safe operation of this device.



#### **Warning:**

Do not use these product as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury or material damage. Failure to comply with these instructions could result in death or serious injury and material damage.

## Skilled personnel

These are persons who are familiar with the installation, mounting, commissioning and the operation of the product and have acquired a qualification for their job:

- Training or instructions or qualification to switch on/off, isolate, ground and apply markings to circuits and devices/systems in accordance with the latest state of the art standards of safety technology.
- Training or instructions regarding the proper care and use of suitable safety equipment in accordance with the latest state of the art standards of safety technology.
- First aid training.

## Accessories: (small selection - for our complete accessories refer ro our catalogue)

<b>GNG220/1-12V</b>	<b>power supply (230VAC) for GIA2448</b>	input: 230V AC;output: 12V DC stabilised, max. 40mA
<b>GNG12/24V</b>	<b>power supply (12VDC)</b>	input: 12V DC; output: 24V DC electr. isolated, max. 80mA
<b>GNG24/24V</b>	<b>power supply (24VDC)</b>	input: 24V DC; output: 24V DC electr. isolated, max. 80mA
<b>IP65 SET</b>	<b>O-rings</b>	O-rings for IP rating IP65 at the front (2 off)