Connecting and Operating Manual

GIR1002 Pt100
GIA1000 Pt100

Version: 4.06
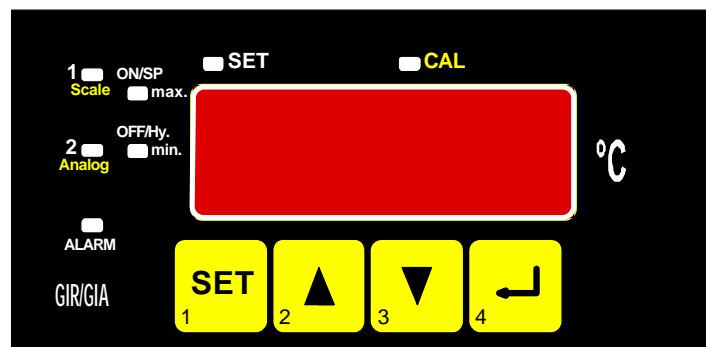
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In accordance with
EN50081-1 and EN50082-2
for unrestricted use in
housing and industrial areas

This connecting and operating manual may be subject to technical alternations.

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Introduction

The following manual gives a description for the connection and operation of the units GIA1000 Pt100 and GIR1002 Pt100. Please note that in this manual the GIR1002 Pt100 control unit only will be mentioned from now on to facilitate matters. The GIA 1000 Pt100 unit is to be connected and operated in the same way with functions relating to relay outputs not being valid.
The GIR1002 Pt100 is a micro-processor controlled temperature controller for universal application.

The large 4-digit numeric LED as well as seven additional LEDs ensure a clear and well legible display of all measuring values and operating parameters.

The GIR1002 Pt100 is designed for direct connection of a Pt100 temperature sensor in accordance with DIN 43760, CEI 751, BS 1 904 and NFC 42-330.

All parameters and limit values can be entered via four buttons located at the front side of the unit.

The front side of the controller is splash water and wipe resistant fulfilling all requirements of the IP65 rating.

All programmable parameters of the GIR1002 Pt100 are stored in an EEProm and in case of a current failure they will be safe for at least ten years.

The GIR1002 Pt100 is equipped with a self-diagnosis function constantly monitoring the essential parts of the controller for their trouble-free operation. Together with the self-diagnosis function the monitoring functions for „breaking of the measuring sensor" and „sensor short-circuit" as well as values falling below or exceeding the limited range ensure optimum operational reliability.
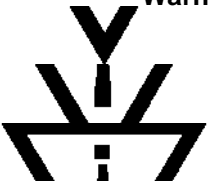We will supply the GIR1002 Pt100 factory tested and completely calibrated.
Befor you ca actually use it, make sure to configurate your GIR1002 Pt100 unit for your special application. Please also refer to the chapter "Configuration".

Safety Regulations

In order to exclude any risk whatsoever for the operator the following points have to be observed:

a) Immediately switch off the unit in case of visible damage or obvious malfunctions.
b) Make it a rule to always disconnect voltage source and unit before opening it up. The entire unit and its connection have to be fingerproof after installation.
c) Standard regulations for operation and safety for electrical, light and heavy current equipment have to be observed, with particular attention having to be paid to national safety regulations (e.g. VDE 0100).
d) When connecting the GIR1002 Pt100 to other units (e.g. PC) the interconnection has to be designed most thoroughly as internal connections in third-party units (e.g. connection GND with protective earth) may lead to undesired voltage potentials

Warning: When running electric devices parts of these devices will always be highly energised. Unless the warnings are observed serious personal injuries or damage to property may result. Skilled personnel only should be allowed to work with this unit. For trouble-free and safe operation of the unit please ensure professional transport, storage, installation and connection as well as proper operation and maintenance.

Skilled personnel

are persons familiar with installation, connection, commissioning and operation of the product and have a professional qualification relating to their job.

For example:

- Training or instruction and/or qualification to switch on/off, isolate, ground and mark electric circuits and devices/systems.
- Training or instruction according to the state of the art of safety technology to maintain and operate adequate safety equipment.
- First-aid training.

Electric Connection

All connections for the GIR1002 Pt100 are located at the back side of the unit.

Connections are made via screw-type/plug-in terminals.

Make it a rule to mount screw-type/plug-in terminals while they are still loose and to put them on only afterwards. When mounting terminals already put on there is a risk that soldering eyelets may be pulled out. Please use suitable screw driver and do not tighten screws by force.

 Supply voltage: 230V AC, 50/60Hz and/or instructions on device

Please make sure that the mains voltage applied corresponds to the supply voltage stated on the unit.

Switching output: 1 potential-free relay (changeover-contact); 10A, 250V AC (ohmic load)

1 potential-free relay (make-contact); 10A, 250V AC (ohmic load)

When using inductivs loads the contact has to be conected to a suitable RC-element (for example 'RC220').
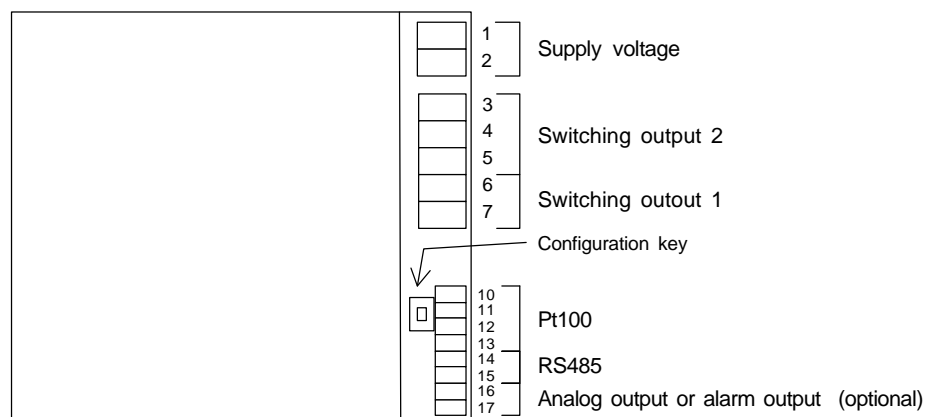
Alarm output: [optional]   1 potential-free relay (break or make contact); 0.5A, 40V DC/AC

Switching characteristic is set by jumper at backside behind the rear cover.

(To switch 230V~ loads, a seperate relay module 'GNR10' is available!)

Electric connection and commissioning of the unit must be carried out by trained and skilled personnel. Wrong connection may lead to the destruction of the controller, in which case we cannot assume any warranty.

Terminal Assignment

Terminal number	Max. terminal range	Assignment	Notes
1 2	2,5 mm²	Supply voltage Supply voltage	230 V AC 50/60 Hz or as specified on unit housing
3 4 5	2,5 mm²	Relay, normally-closed Relay, input Relay, normally-open	Switching output 2 or alarm output
6 7	2,5 mm²	Relay, input Relay, normally-open	Switching output 1
8 9	1,5 mm²	Transmitter supply + Transmitter supply -	18 V DC / 25mA
10 11 12 13	1,5 mm²	Sensor connection Sensor connection Sensor connection Sensor connection	Pt100
14 15	1,5 mm²	Connection B Connection A	RS485
16 17	1,5 mm²	Analog output + Analog output -	only for units with optional analog output
16 17		Relay, (break or make contact) Relay, input	only for units with optional alarm output

Assignment diagram

1 2	Supply voltage
3 4 5	Switching output 2
6 7	Switching outout 1

Configuration key

| 10 11 12 13 | Pt100 |
| 14 15 | RS485 |
| 16 17 | Analog output or alarm output (optional) |

GIR1002 Pt100 (plan view)

Transmitter Connection

The Pt100 sensor should be connected to the GIR1002 Pt100 unit by means of 4-wire technology as, then, line resistances (even if unsymmetrical) will not influence the measuring accuracy.

If 4-wire connection is not possible, the Pt100 sensor can also be connected to the GIR1002 Pt100 by means of 2- or 3-wire technology according to the sketches below (please watch bridges!). Long connecting lines may, however, lead to a wrong (too high) temperature display (fault depending on line resistance). In such a case we recommend to compensate for the fault by inputting an offset value (shifting of zero point, please also refer to chapter „configuration").

An offset value can also be used to compensate for sensor tolerances, if any.

| 4-wire connection | 3-wire connection | 2-wire connection |
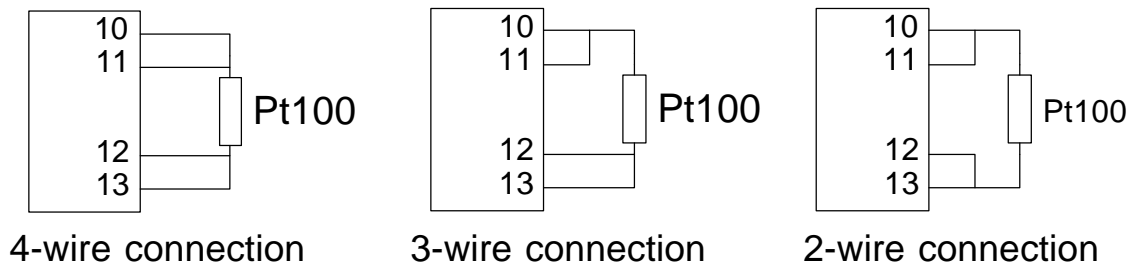
Technical specifications

Sensor connection:	Pt100 4-wire, 3-wire- or 2-wire connection (automatic compensation of line resistance for 4-wire technology)
Measuring range:	-199.9°C up to + 650.0°C
Resolution:	0.1 °C
Measuring accurancy:	±0.1% ± 1 Digit
Control function:	2-level controller
	3-level controller
	2-level controller with alarm
	3-level controller with alarm [only option: alarm output]
Analog output: [optional]	4-20mA resp. 0-10V, scale to be selected individually
Alarm delay: [optional]	0 - 99 min, selectable
Interface:	RS485
Interface:	RS485
Power supply:	230VAC or as specified on unit housing
Power consumption	5W (230VAC), 3W (24VDC), 1,5W (12VDC)
Relay switching power:	10A, 250V AC (ohmic load) use RC-element when switching inductive loads
alarm output:	0.5A, 40V DC/AC
Nominal temperature:	25° C
Ambient temperature:	0 to 50° C
Atmospheric humidity:	0 to 80% r.h. (no condensing)
Electromagnetic compatibility:	in accordance with EN50081-1 and EN50082-2 for unrestricted use in housing and industrial areas additional error: <1%
Housing:	standard rack housing, 48 x 96 x 100 mm (H x W x D)
Control panel cutout:	43 x 90.5 mm (H x W)
Connecting terminal:	screw-type/plug-in terminals

Operation

Start-up

As soon as the supply voltage has been applied the GIR1002 Pt100 will carry out a segment test for approx. 8s. Then the current measuring value will be displayed.

Table of functions

The various functions are called up/input by means of the 4 buttons located at the front side of the unit. We would like to point out that depending on the output configuration (also refer to chapter 'configuration') only a certain number of functions will be available.

The following table shows all the functions of the GIR1002 Pt100 unit. The right hand column indicates the controller configuration for the various functions.

Functions	To be called up by	Output configuration
display of current measuring value:	briefly pressing button 4	0 .. 8
set tara function:	briefly pressing button 4	optional
alarm reset:	pressing button 4 for 4 s	2,3,5,6
tara function reset:	pressing button 4 for 4 s	optional
display of max. value:	briefly pressing button 2	0 .. 8
max. value reset:	pressing button 2 for 4 s	0 .. 8
display of min. value:	briefly pressing button 3	0 .. 8
min. value reset:	pressing button 3 for 4 s	0 .. 8
Switching point output 1		
display/setting of making point:	button 1 .. 4	1,2,3,7
display/setting of switching point:	button 1 .. 4	4,5,6,8
display/setting of breaking point:	button 1 .. 4	1,2,3,7
display/setting of hysteresis:	button 1 .. 4	4,5,6,8
Switching point output 2		
display/setting of making point:	button 1 .. 4	1
display/setting of switching point:	button 1 .. 4	8
display/setting of breaking point:	button 1 .. 4	1
display/setting of hysteresis:	button 1 .. 4	8
Alarm		
display/setting of max. alarm limit:	button 1 .. 4	2,3,5,6
display/setting of min. alarm limit:	button 1 .. 4	2,3,5,6
display/setting of alarm delay:	button 1 .. 4	optional (2,3,5,6)

Please note: When pressing key 1 the option „**set-point value locked**" allows an indication of the set-point values only; a change of the settings is not possible. The „SET" LED is blinking.

If the values have to be changed, call up the set-point level by pressing the key at the back-side of the device (LED „SET" is illuminated). A change of the set-points is achieved by pressing key 1 again.

Display of Current Measuring Value and/or Acitvate Tara Function

To be called up by:	briefly pressing button 4
Note:	If the controller is set to the function „display of max. value" respectively „display of min. value", pressing of button 4 will result in the display switching over to show the current measuring value. If the current measuring value is already on display, pressing of button 4 results in a reset of the tara function.
Display:	The current measuring value is shown on the 7-segment display
LED „1":	gives status of relay 1
LED „2":	gives status of relay 2
	LED illuminated: relay contact made
	LED not illuminated: relay contact broken
LED „ALARM":	LED flashing in case of alarm.
LED „min":	LED flashing in case of MIN alarm.
LED „max.":	LED flashing in case of MAX alarm.
LED „CAL":	LED flashing in case of tara function being active

Alarm reset and deactivate tara function

To be called up by:	pressing button 4 for approx. 4s
Display:	please refer to „display of current measuring value"

Display of max. value

To be called up by:	briefly pressing button 2
Display:	The 7-segment display shows the max. value
LED „1":	gives status of relay 1
LED „2":	gives status of relay 2
	LED illuminated: relay contact made
	LED not illuminated: relay contact broken
LED „ALARM":	LED flashing in case of alarm.
LED „max.":	LED flashing

Max. value reset

To be called up by:	pressing button 2 for approx. 4s
Display:	please refer to „display of max. value"

Display of min. value

To be called up by:	briefly pressing button 3
Display:	The 7-segment display shows the min. value
LED „1":	gives status of relay 1
LED „2":	gives status of relay 2
	LED illuminated: relay contact made
	LED not illuminated: relay contact broken
LED „ALARM":	LED flashing in case of alarm.
LED „min.":	LED flashing

Min. value reset

To be called up by:	pressing button 3 for approx. 4s
Display:	please refer to „display of min. value"

Display/setting of making point/switching point for switching output 1 or 2

To be called up by:	pressing button 1 till LEDs „SET", „1" or „2" and „ON/SP" are illumianted.
Display:	The 7-segment display shows the making point/switching point for switching output 1 or 2.
Setting:	Set making point/switching point by means of buttons 2 and 3. LEDs „1" or „2" and „ON/SP" will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new making point/switching point.

LEDs „1" or „2" and „ON/SP" will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Display/setting of breaking point/hysteresis for switching output 1 or 2

To be called up by: pressing button 1 till LEDs „SET", „1" or „2" and „OFF/Hy" are illuminated.

Display: The 7-segment display shows the breaking point/hysteresis for switching output 1 or 2.

Setting: Set breaking point/hysteresis by means of buttons 2 and 3.

LEDs „1" or „2" and „OFF/Hy" will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new breaking point/hysteresis.

LEDs „1" or „2" and „OFF/Hy" will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Display/setting of max. alarm limit

To be called up by: pressing button 1 till LEDs „SET", „ALARM" and „max." are illuminated.

Display: The 7-segment display shows the max. alarm limit.

Setting: Set max. alarm limit by means of buttons 2 and 3.
LEDs „ALARM" and „max." will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new max. alarm limit.

LEDs „ALARM" and „max." will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Display/setting of min. alarm limit

To be called up by: pressing button 1 till LEDs „SET", „ALARM" and „min." are illuminated.

Display: The 7-segment display shows the min. alarm limit.

Setting: Set min. alarm limit by means of buttons 2 and 3.
LEDs „ALARM" and „min." will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new min. alarm limit.

LEDs „ALARM" and „min." will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Display/setting of alarm delay [optional]

To be called up by: Push the button at the rear of the GIR1002 till the LED "SET" is illuminated. Pressing button 1 till LEDs "SET", "ALARM" are illuminated.

Display: The 7-segment display shows "d." and the alarm delay.

Setting: Set alarm delay by means of buttons 2 and 3.
Use button 4 to acknowledge new min. alarm limit.

Switch over to display of current measuring value by pressing button 4 once again.

Configuration

1) Press button 1 (front side)
Press miniature push button on the back side of the GIR1002 Pt100 unit (located behind the sensor connection terminal) in addition (for approx. 1 s) till LED „CAL" (on front side) is illuminated.

2) LEDs „Scale", „OFF/Hy" and LED „CAL" are illuminated.
The display will show the offset value stored in the GIR1002 Pt100 (zero point offset).
Use buttons 2 and 3 to set new offset (LED „OFF/Hy" will start flashing) and acknowledge by pressing button 4.
Please note: The value entered will influence the values displayed on the GIR1002 Pt100. As a standard the offset value set should be 0.0.

3) LED „CAL" is illuminated.
The display will show „FIL.0", „FIL.1", „FIL.2" or „FIL.3".
Use buttons 2 and 3 to select filter desired (point will start flashing).

„FIL.0"	no filter
„FIL.1",	filter 1 active
„FIL.2"	filter 2 active
„FIL.3"	filter 1 and filter 2 active

***Filter1:** for filtering short pikes occurring when relays and contactors are switched. Make sure to always activate filter 1 if high loads are switched in the vicinity of the controller, wires or sensor or if large pikes are to be expected.*
Additional display delay: approx. 0.5s

***Filter 2:** prevents „jumping" of the last figure, a phenomenon often found with digital displays and controllers. Make sure to always activate filter 2 if the display range exceeds 2000 digits.*
Additional display delay: approx. 1s

Acknowledge filter selected by pressing button 4.

4) LED „CAL" is illuminated.
The display shows the letter combination „nr." followed by the interface address set (0 .. 15).
Use buttons 2 and 3 to set new interface address (point will start flashing) and acknowledge by pressing button 4.
If the RS485 interface is not used, please ignore this setting (please also refer to description of interface).

5) LEDs „Analog", „max." and LED „CAL" are illuminated.
The display will show the measuring value stored in the GIR1002 Pt100 unit for which a 20mA signal will be given at the analog output.
(This function is only available for units equipped with the option „analog output".)
Use buttons 2 and 3 to set new display value for an output current of 20mA (LED „max." will start flashing); acknowledge by pressing button 4.

6) LEDs „Analog", „min." and LED „CAL" are illuminated.
The display will show the measuring value stored in the GIR1002 Pt100 unit for which a 4mA signal will be given at the analog output.
(This function is only available for units equipped with the option „analog output".)
Use buttons 2 and 3 to set new display value for an output current of 4mA (LED „min." will start flashing); acknowledge by pressing button 4.

7) LED „CAL" is illuminated.
The display shows the letter combination „out." followed by the controller type set 0 .. 8 (or 9 if the unit is a special version)..

(This function is not available for GIA1000 Pt units).

Use buttons 2 and 3 to set desired controller type (point will start flashing).

„out.0":	display only
„out.1:	3-level controller
„out.2":	2-level controller with alarm, self-extinguishing
„out.3":	2-level controller with alarm, with hand-shake
„out.4":	2-level controller with hysteresis preselectable
„out.5":	2-level controller with hysteresis preselectable and alarm with interacting set-point value, self-extinguishing
„out.6":	2-level controller with hysteresis preselectable and alarm with interacting set-point value, with hand-shake
„out.7":	2-level controller
„out.8":	3-level controller with hysteresis preselectable.
"out.9":	special version (f.e. option: 3-level controller with alarm)

Attention: "out.9" cannot be changed!

Acknowledge controller type selected by pressing button 4.
The display will show the current measuring value again.

The configuration of the GIR1002 Pt100 has now been completed.
Steps 1 to 7 can be repeated any number of times to either correct a setting error or to input a new setting.
Unless a button is pressed at least approx. every 2 minutes during the setting process, the GIR1002 Pt100 will stop the setting process. Then, „CAL" will stop flashing. In such a case we recommend to repeat the setting process.

Choice of switching characteristic of alarm-output of special version 3-level controller with alarm:

- disconnect unit from mains supply.

- disconnect rear cover.

- choose relay function by jumper setting.
  (jumper settings revere right)

- remount rear cover.

- reinstall unit.

jumper setting	relay under alarm
○ ▣ ○	open
▣ ○ ○	close

Note: the optional alarm output has a switching capability of 40VDC/AC, 0.5A. If higher power is needed, a external relay module (GNR10) can be connected. Switching capability with module ist 250VAC/10A.

To connect GIR to GNR10:

GIR terminal 16, 17 -> GNR terminal 10 and 11 (Relay 1) or GNR terminal 9 and 11(Relay 2).

Fault Codes

In case of unacceptable conditions in the system a fault code will be displayed.

Fault codes have been defined as follows:

FE 1:   Measuring range has been exceeded

This fault code indicates that the measuring range of the GIR1002 Pt100 has been exceeded.

Potential fault cause: temperature to be measured exceeds 650.0°C
                                sensor damage
                                sensor connection interrupted

Remedies: FE 1 will be reset as soon as the measuring values are back within their permissible range. Please check your Pt100 sensor and sensor connecting cables.

FE 2:   Measuring values have fallen below permissible range

This fault code indicates that the measuring values of the GIR1002 Pt100 have fallen below the permissible range.

Potential fault cause: temperature to be measured lower than -199.9°C
                                sensor damage
                                interruption/short-circuit in sensor connection

Remedies: FE 2 will be reset as soon as the measuring values are back within their permissible range. Please check your Pt100 sensor and sensor connecting cables.

RS485 interface

The serial interface of the GIR1002 Pt100 allows communication of the unit with a host computer. Data polling and transfer is done in the master/slave mode, i.e. the GIR1002 Pt100 will only transmit data upon request. A separate unit address can be attributed to each GIR1002 Pt100. Addresses 0 to 15 are implemented. The GIR1002 Pt100 will respond when requested to do so by the host, provided the unit number of the request string corresponds to the one set (response of GIR1002 Pt100 unit 20 to 60ms after request has been completed). This method as well as the fact that the interface operates in the half-duplex mode ensure that up to 16 devices can be called via only one 2-wire line.

Interface configuration

Type	RS485
Transfer mode	half-duplex
Connection	2-pin screw/plug-in connection
Connecting cable	2-pin, twisted.

Data transfer format

2400 Baud
1 start bit
7 data bits
no parity bit
S1 stop bit

Communication is entirely achieved by means of printable ASCII code.

Data transfer processing protocol

Request data from GIR1002 Pt100

Request string to GIR1002 Pt100:

!	Nr.	Nr.	F1	F2	/
1	2	3	4	5	6

Byte

Response from GIR1002 Pt100

#	F1	F2	$	D1	D2	D3	D4	/
1	2	3	4	5	6	7	8	9

Byte

Send data to GIR1002 Pt100:

Send string to GIR 1002 Pt100

!	Nr.	Nr.	#	F1	F2	$	D1	D2	D3	D4	/
1	2	3	4	5	6	7	8	9	10	11	12

Byte

Response from GIR1002 Pt100

#	a	/	
1	2	3	if data habe been successfully taken over

Byte

Description of characters used:

! :   ASCII-Code: 21H

This character interrupts a connection, if any is existing, and resets all GIR1002 Pt100 units connected to their original state thus initialising a check to ensure that the following two characters correspond to their respective unit numbers.

Nr.:   Permissible range „0" to „9" and „A" to „F"

(corresponding to ASCII code 30H to 39H and 41H to 46H)

As a precaution unit number will be transmitted twice.

Data will not be processed by the GIR1002 Pt100 unit unless the unit number transmitted is identical to the one set in the respective GIR1002 Pt100. If numbers are not identical the unit will only check if the data stream contains another „!" character thus indicating a new data circuit.

F1,F2:   Permissible range see table 1

Functional codes, specifying the parameter and/or value to be processed. For assignments please refer to table 1 of chapter 'functional code'.

/:   ASCII-Code: 2FH

Indicates the end of a data transfer process.

Each data transfer process, either from host to GIR1002 Pt100 or from GIR1002 Pt100 to host is completed by putting „/".

:   ASCII-Code: 23H

Indicates the beginning of a data transfer process.

'#' is issued by the GIR1002 Pt100 prior to starting transfer of data to the host. If the character '#' is transferred by the host after issuing of the unit number, the GIR1002 Pt100 unit will know, that data are to be transferred from the host to the GIR1002 Pt100 (programming of the GIR1002 Pt100).

$:   ASCII-Code: 24H

Signals that the data following will be transferrede in hexadecimal code

D1..D4:   Permissible range '0' to '9' and 'A' to 'F'.

(corresponding to ASCII code 30H to 39H and 41H to 46H)

Data will be presented in the hexadecimal mode. For more detailed information please refer to chapter 'Data formats'.

a :   ASCII-Code: 61H

Transferred as hand-shake signal by the GIR1002 Pt100 after successful data input to the memory.

Functional code

The value (parameter) to be read respectively re-programmed is specified by two bytes, designed F1 and F2 in the data transfer protocol.

Table 1 illustrates the assignment of functional code and value (parameter) as well as of the valid data format.

It is vital to ensure that only those functional codes and their permissible data as stated in table 1 are transmitted to the GIR1002 Pt100 unit as otherwise internal settings of the unit could be changed.

Parameter resp. value		ASCII character		ASCII code		Data format
		F1	F2	F1	F2	
Display value		0	0	30H	30H	1
Max. value		0	1	30H	31H	1
Min value		0	2	30H	32H	1
System state		0	3	30H	33H	2
Switching output 1	Making point Switching point	0	4	30H	34H	1
Switching output 1	Breaking point Hysteresis	0	5	30H	35H	1
Switching output 2	Making point Switching point	0	9	30H	39H	1
Switching output 2	Breaking point Hysteresis	0	A	30H	41H	1
Max. alarm limit		0	B	30H	42H	1
Min. alarm limit		0	C	30H	43H	1
Zero point offset		1	0	31H	30H	1
Filter		1	1	31H	31H	5
Display value for 20mA analog output		1	3	31H	33H	1
Display value for 4mA analog output		1	4	31H	34H	1
Interface address		1	2	31H	32H	6

Table 1

Data format

General information:

The four bytes termed D1 to D4 in the data transfer protocol represent the parameter value specified by F1 and F2.

The value is represented in hexadecimal printable ASCII characters.

The GIR1002 Pt100 treats all values as 16 bit words, which means that a range of values from -32768 to +32767 and correspondingly a range from 8000H to 7FFFH can be displayed.

The following 4 data bytes contain the 16 bits mentioned above:

D1	equalising	Bit 15 to	12
D2	equalising	Bit 11 to	8
D3	equalising	Bit 7 to	4
D4	equalising	Bit 3 to	0

Examples:

Value		ASCII-character				ASCII-code			
dezimal	hex	D1	D2	D3	D4	D1	D2	D3	D4
0	0000H	0	0	0	0	30H	30H	30H	30H
-1	FFFFH	F	F	F	F	46H	46H	46H	46H
-1999	F831H	F	8	3	1	46H	38H	33H	31H
9999	270FH	2	7	0	F	32H	37H	30H	46H

Data format 1 :

Data format 1 corresponds to the general data format. It is only the range of values that is limited to the display range of -1999 to +9999 equalising F831H to 270FH.

The decimal point will not be considered. The decimal point position can be called up separately.

Data format 2 :

This format is used to call up and reset the system state. Data bytes D1 to D4 contain information regarding the alarm and fault state of the GIR1002 Pt100.

The assignment is as follows:

Data byte D2:	Bit 0 = 1:	Fault FE1 active
	Bit 1 = 1:	Fault FE2 active
Data byte D4:	Bit 0 = 1:	max. alarm
	Bit 1 = 1:	min. alarm
	Bit 3 = 1:	alarm

Data format 5 :

This format is used to call up and program the filter.

The assignment is as follows:

0 :   filter off (FILt = 0)
1 :   filter 1 on (FILt = 1)
2 :   filter 2 on (FILt = 2)
3 :   filter 1 and filter 2 on (FILt = 3)

Data format 6 :

This format is used to program the unit address. Permissible unit addresses range from 0 to 15. Data format 6 corresponds to the general data format. It is only the range of values that is limited to the permissible unit addresses 0 to 15, respectively 0000H to 000FH.