DIGITAL PANEL METER N1500G

USER GUIDE V2.3x H

We Measure, We Control, We Record

1 PRESENTATION

N1500G is a universal indicator that accepts several input signals and sensors. It has a 5-digit LED display to indicate the measured value and other programming parameters.

Configuration is performed via keyboard, with no changes to the circuit. This allows you to select the type of input, set the mode in which the alarms are activated, and perform other special functions via keypad.

In the basic version, its main features are:

- Universal input: Pt100, thermocouples, 4-20 mA, 0-50 mV, and 0-5 V.
- 24 Vdc power supply for field transmitters.
- Ability to store minimum and maximum values.
- **Hold**, **Peak Hold**, and **Reset Tare** functions.

Optionally, it can display:

- PV retransmission programmable between 0-20 mA or 4-20 mA.
- RS485 Modbus RTU serial communication.
- Digital input.

1.1 FRONT PANEL IDENTIFICATION

Display: Displays the value of the measured variable (PV) and mnemonics of the programming parameters.

ALM1 and ALM2 alarm flags: Indicate the occurrence of an alarm.

INDEX key: Key used to scroll through the successive programmable parameter screens of the indicator.

BACK **BACK key:** Key used to go back to the parameter previously displayed.

MAX **INCREMENT key / MAX and** MIN **DECREMENT key / MIN:** Keys used to change parameter values. They are also used to display the maximum and minimum values stored.

F **SPECIAL FUNCTION key:** Key with programmable function (see SPECIAL FUNCTION KEY chapter).

2 PROCESS VARIABLE INPUT (PV)

The input type must be programmed via keyboard, from among the types listed below (see parameter INPUT TYPE (IntYP) in the Configuration Cycle):

TYPE	CODE	FEATURES
J	tc J	Range: -50 to 760 °C (-58 to 1400 °F).
K	tc h	Range: -90 to 1370 °C (-130 to 2498 °F).
T	tc t	Range: -100 to 400 °C (-148 to 752 °F).
E	tc E	Range: -35 to 720 °C (-31 to 1328 °F).
N	tc n	Range: -90 to 1300 °C (-130 to 2372 °F).
R	tc r	Range: 0 to 1760 °C (32 to 3200 °F).
S	tc S	Range: 0 to 1760 °C (32 to 3200 °F).
B	tc b	Range: 150 to 1820 °C (302 to 3308 °F).
Pt100	Pt 100	Range: -199.9 to 530 °C (-327.8 to 986 °F).
Pt100	Pt 100	Range: -200 to 530 °C (-328 to 986 °F).
4-20 mA	L In J	J Linearization. Adjustable range: -110 to 760 °C (-166 to 1400 °F).
4-20 mA	L In h	K Linearization. Adjustable range: -150 to 1370 °C (-238 to 2498 °F).
4-20 mA	L In t	T Linearization. Adjustable range: -160 to 400 °C (-256 to 752 °F).
4-20 mA	L In E	E Linearization. Adjustable range: -90 to 720 °C (-130 to 1328 °F).
4-20 mA	L In n	N Linearization. Adjustable range: -150 to 1300 °C (-238 to 2372 °F).
4-20 mA	L In r	R Linearization. Adjustable range: 0 to 1760 °C (32 to 3200 °F).
4-20 mA	L In S	S Linearization. Adjustable range: 0 to 1760 °C (32 to 3200 °F).
4-20 mA	L In b	B Linearization. Adjustable range: 100 to 1820 °C (212 to 3308 °F).
4-20 mA	L InPt	Pt100 Linearization. Adjustable range: -200 to 530 °C (-328 to 986 °F).
4-20 mA	L InPt	Pt100 Linearization. Adjustable range: -200 to 530 °C (-328 to 986 °F).
0 to 50 mV	0 - 50	Linear. Adjustable range: -1999 to 9999.
4-20 mA	4 - 20	Linear. Adjustable range: -1999 to 9999.
0 to 5 V	0 - 5	Linear. Adjustable range: -1999 to 9999.
0 to 50 mV	0.25 c.	User defined linearization.
4-20 mA	0.25 c.	User defined linearization.
0 to 5 V	0.25 c.	User defined linearization.

Table 1

All the input types are already calibrated at the factory. Recalibration is not recommended for inexperienced operators.

Thermocouples are calibrated according to the NBS standard; RTD's according to DIN 43760 (α = 0.00385).

3 ALARMS

In its full version, the indicator has 2 alarm outputs.

Each alarm has a **flag** on the front panel. It shows when the respective alarm is activated.

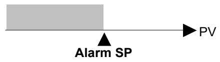
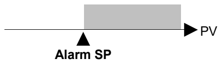
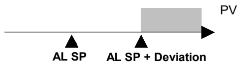
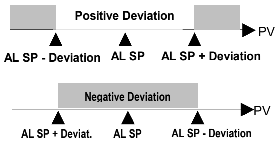
TYPE	SCREEN	PERFORMANCE
Off	oFF	Alarm off.
Open sensor *(Input Error)*	IErr	It is activated when the sensor is broken.
Minimum Value (*Low*)	Lo	
Maximum Value (*High*)	HI	
Minimum Differential (*Differential Low*)	dIF.Lo	
Maximum Differential (*Differential High*)	dIF.HI	
Differential (*Differential*)	dIF	

Table 2

3.1 ALARM FUNCTIONS

You can program the alarms to operate with 6 functions: Open Sensor, Minimum Value, Maximum Value, Minimum Differential, Maximum Differential, or Differential (Band).

These functions are listed in **Table 2** and described below.

3.1.1 OPEN SENSOR

The open sensor alarm is activated whenever the input sensor is poorly connected or broken.

3.1.2 MINIMUM VALUE

It is activated when the measured value is **below** the value defined by the alarm Setpoint.

3.1.3 MAXIMUM VALUE

It is activated when the measured value is **above** the value defined by the alarm Setpoint.

3.1.4 DIFFERENTIAL (OR BAND)

For Differential alarms, you must define 2 parameters: **1)** Reference Value for Differential Alarm (ALrEF) and **2)** Differential Setpoint for the Alarm (Deviation).

For a positive deviation, the Differential alarm will be activated when the measured value is **outside** the range defined by:

(ALrEF - Deviation) and (ALrEF + Deviation)

For a negative deviation, the Differential alarm will be activated when the measured value is **within** the range defined above.

3.1.5 MINIMUM DIFFERENTIAL

It is activated when the measured value is **below** the point defined by:

(ALrEF - Deviation)

3.1.6 MAXIMUM DIFFERENTIAL

It is activated when the measured value is **above** the point defined by:

(ALrEF + Deviation)

3.2 ALARM TIMERS

The indicator allows you to program the **Alarm Timers**. In them, it is possible to set delays for the alarm to be activated, set it to produce only one pulse at the time of the activation, or to make the activation happen in the form of sequential pulses.

The figures shown below represent these functions. In them, the T1 and T2 times can vary from 0 to 6500 seconds and are defined when programming the indicator.

For the alarms to operate normally, without timers, simply set T1 and T2 to 0.

The flags linked to the alarms light up whenever an alarm condition occurs, regardless of the status of the output relay, which may be de-energized momentarily depending on the timing.

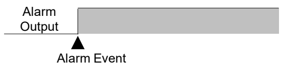
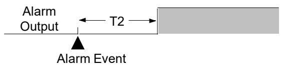
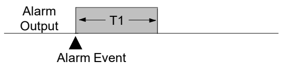
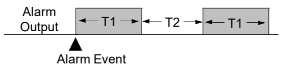
ADVANCED FUNCTION	T1	T2	PERFORMANCE
Normal operation	0	0	
Delay	0	1 to 6500 s	
Pulse	1 to 6500 s	0	
Oscillation	1 to 6500 s	1 to 6500 s	

Table 3

3.3 ALARM INITIAL BLOCK

The **Initial Block** option inhibits the alarm from being activated if there is an alarm condition in the process when the indicator is turned on. The alarm can only be activated after the occurrence of a non-alarm condition followed by an alarm condition.

This function is not valid when the alarm is programmed as Open Sensor.

4 SPECIAL FUNCTIONS

4.1 MAXIMUM AND MINIMUM

The indicator is continuously storing the extreme values of its measurements (maximums and minimums). These values are displayed by pressing the MAX or MIN keys.

By pressing MAX and MIN simultaneously, the values stored in memory up to that point will be erased and a new cycle of registers will begin.

4.2 SPECIAL FUNCTION KEY AND DIGITAL INPUT

The F key (special function key), as well as the digital input (**DIG IN**), available on terminals 12 and 13 of the internal connector, can perform specific functions, which are defined when configuring the equipment.

These functions can be chosen independently for both the F key and the Digital Input.

The digital input is suitable for Dry Contact and is activated by closing the contact between its terminals.

The available functions are defined below.

4.2.1 HOLD

The **Hold** function freezes the indication of the measured variable (PV) shown on the display. Each press of the F key or Digital Input alternates between **Hold** and normal modes.

When the indicator is in **Hold** mode, the message ***hoLd*** will be displayed briefly, alerting the operator to this condition.

4.2.2 PEAK HOLD

The indicator automatically assumes the **Peak Hold** operating mode whenever the F key or Digital Input is programmed as ***PhoLd***.

This mode of operation means that the indicator always displays the maximum value measured since the last time F was pressed, or the Digital Input was activated.

When you press F or activate the Digital Input, a new **Peak Hold** cycle will start, resetting the display reading to the current value of the measurement.

4.2.3 *rESEt* (CLEARING MAXIMUM AND MINIMUM)

This function is equivalent to the Maximum and Minimum function when the MAX and MIN keys are pressed simultaneously.

If programmed with ***rESEt***, each press of the F key or activation of the Digital Input clears the memory for a new setting of maximum and minimum values.

4.2.4 *ALoFF* – BLOCKING ALARMS

When programmed, this function allows you to prevent the alarm relays from operating. Each press of the F key or activation of the Digital Input alternates the condition of the alarms between active and non-active.

If any alarms are activated when the F key is pressed or the Digital Input is activated, they will be turned off immediately.

The alarm flags will remain flashing when an alarm condition occurs, and the alarms are inhibited.

4.2.5 RESET TARE

Used to reset the indication (only valid for the 4-20 mA, 0-50 mV, and 0-5 V inputs). The residual tare value is added (with the sign reversed) to the **Indication Offset** parameter.

Function intended primarily for load cell applications.

4.3 PROCESS VARIABLE RETRANSMISSION

The indicator displays an analog output, electrically isolated from the rest of the equipment, suitable for retransmitting the Process Variable (PV) in 0-20 mA or 4-20 mA.

The PV values that define the extremes of retransmission (0 mA / 4 mA minimum and 20 mA maximum) are programmed in the Indication **Lower Limit** and Indication **Upper Limit** parameters.

PV retransmission is not affected by the special **Hold** and **Peak Hold** functions.

4.4 CUSTOM LINEARIZATION

The indicator displays 3 types of input signal, allowing you to create a customized linearization. You can configure the device to obtain accurate indications for electrical signals with non-linear and ever-**increasing** characteristics.

The 3 types of input signal are: **c.0-50**, **c.4-20**, and **c.0-5**. When selected, the indicator creates the **Custom Linearization Cycle**.

The input signal must be divided into segments (maximum 19), defined to minimize the error between the input signal and the corresponding indication.

In the **Custom Linearization Cycle**, you will find the parameter **InP.01**, which corresponds to the start point of the first segment and must define the minimum value of the input signal. Then the parameter **out.01**, which corresponds to the desired indication for this first point. This is followed by parameter **InP.02**, which is the starting point of the second segment.

In **InP.o1**, you must define the minimum value for the selected signal type: 0.0 mV for **c.0-50**, 4.0mA for **c.4-20**, and 0.0 V for **c.0-5**.

For linearization that do not require all 19 segments, simply define the maximum value of the selected input type for the last segment required.

The **Lower Limit** and **Upper Limit** Indication parameters must be defined before the Custom Linearization settings.

In this mode, the sampling rate is 4 measurements per second.

5 INSTALLATION

5.1 PANEL MOUNTING

The indicator consists of 2 parts: the fixing base and the main body. The base must be removed from the main body and fixed to the wall using 4 appropriate holes, as shown below:

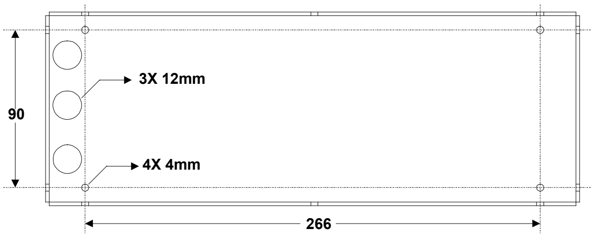


Figure 1

The main body of the indicator is only fixed to the base once the electrical connections have been made.

5.2 ELECTRICAL CONNECTIONS

The connections are made to the internal connector of the indicator. They must be carried out before attaching the indicator to the fixing base.

The layout of the signals in the internal connector is shown below:

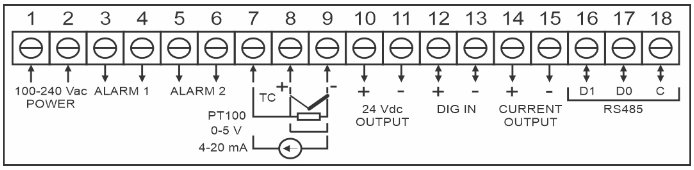


Figure 2

5.2.1 INSTALLATION RECOMMENDATIONS

- Input signal conductors should run through the plant separate from output and supply conductors. If possible, in grounded conduits.
- The power supply for electronic instruments must come from a network specific to the instrumentation.
- In control applications, it is essential to consider what can happen when any part of the system fails. The internal alarm relay does not guarantee full protection.
- It is recommended to use RC FILTERS (noise suppressors) in contactor coils, solenoids, etc.

5.2.2 SENSOR CONNECTION OR INPUT SIGNAL

It is important that these connections are made properly, with the sensor or signal wires securely attached to the terminals on the rear panel. If thermocouples need to be spliced, this must be done with suitable compensating cables.

You must use a 3-wire RTD (Pt100). To avoid errors due to the length of the cable, the wires connected to terminals 7 and 8 must have similar resistance (same gauge).

If the sensor has 4 wires, leave one disconnected next to the indicator.

For a 2-wire Pt100, make a short circuit between terminals 7 and 8, connecting the Pt100 to terminals 8 and 9.

6 OPERATION

For the equipment to operate correctly, you must configure it or define the parameters displayed on the display. You need to define, for example, input type (T/C, Pt100, 4-20 mA, etc.), alarm activation point, alarm functions, etc.

The parameters are divided into 5 levels (or groups), called Cycles:

CYCLE	ACCESS
1 – Operation	Free access
2 – Alarms	
3 – Functions	
4 – Configuration	Restricted access
5 – Calibration	

Table 4

The Operation Cycle has free access. All other cycles require a certain combination of keys to be accessed. The combination is:

and BACK keys pressed simultaneously

Within the chosen cycle, simply press for the display to show the other parameters. At the end of each cycle, the indicator returns to the Operation Cycle.

On the desired parameter screen, press the MAX or MIN keys to change the parameter condition. All changes made are stored in non-volatile memory when you change the screen.

If you have not pressed a key for 25 seconds, the indicator returns to the Measurements screen in the Main Cycle (first level cycle or Operation Cycle).

6.1 SCREEN PROTECTION

It is possible to protect the parameter values of a given cycle against inadvertent reprogramming. With this block, the parameters continue to be displayed, but cannot be changed.

To protect the cycle, press BACK and MAX for 3 seconds.

To unprotect the cycle (allow parameter changes), press BACK and MIN for 3 seconds.

The display will flash briefly, confirming that the cycle has been protected or unprotected.

7 PROGRAMMING THE INDICATOR

7.1 OPERATION CYCLE

This is the first level. When turned on, the indicator displays the value of the Process Variable (PV).

This cycle also displays the parameters that define the point at which alarms are activated (alarm SP). To advance through the cycle, press .

When you program an alarm with any of the Differential functions, the Setpoint adjustment screen (**SP.AL 1**, **SP.AL2**, ...) for that alarm is blocked, displaying the **d IF** message to warn the operator that this parameter is a configuration parameter, and that the corresponding deviation value must be programmed in the Alarm Cycle.

The **AL.rEF** screen also appears, displaying the reference value for alarms programmed with Differential functions.

SCREEN	PARAMETER DESCRIPTIONS
8.8.8.8.8	Measurement screen. Displays the measured value of the variable. For thermocouple or Pt100, it displays the absolute value of the measured temperature. For 4-20 mA, 0-50 mV, and 0-5 V, it displays values relative to the limits defined on the **In.LoL** and **In.h IL** screens. When programming the indicator with the **Hold** function, the variable is frozen and shown on the display alternately with the message **hoLd**. When programming the indicator with the **Peak Hold** function, the maximum measured value will be displayed alternately with the **P.hoLd** message. When a failure prevents measurements, this screen will display error messages.
AL.rEF	Reference value for the differential alarm. Displayed only when an alarm has been programmed with one of the differential functions. Value used as a reference for these alarms.
SP.AL 1 **SP.AL2**	Setpoints for Alarms 1 and 2. Allows you to define the operating point of alarms programmed with **Lo** or **h I** functions. For alarms programmed with differential functions, the alarm SP value cannot be changed in this cycle. The **d IF** message will be displayed. The differential SP value (deviation) is defined in the Alarm Cycle.

7.2 ALARM CYCLE

Fu.AL 1 **Fu.AL2**	Alarm functions. Allows you to define the function of alarms 1, 2, 3, and 4: **oFF** Alarm off. **IErr** Open sensor or short-circuited sensor. **Lo** Minimum value. **h I** Maximum value. **d IFL** Minimum differential. **d IFh** Maximum differential. **d IF** Differential.
dF.AL 1 **dF.AL2**	Differential SP for Alarms 1 and 2. Allows you to define the deviation of the operating point of the alarms from the Reference Value for Differential Alarm configured on the **AL.d IF** screen. For alarms with a non-differential function, this value cannot be changed in this cycle. The **AbS** message will be displayed.
HY.AL 1 **HY.AL2**	Alarm hysteresis. Allows you to define the difference between the measured value at which the alarm is activated and the value at which it is deactivated.
bL.AL 1 **bL.AL2**	Initial Block function. Allows you to prevent alarms from being activated at the beginning of the process, when the system is powered up.
AL 1t 1 **AL 1t2** **AL2t 1** **AL2t2**	Timer functions for alarms. Screens that define the times T1 and T2 (in seconds) shown in **Table 3**. They allow you to set delays for alarms to be activated, momentary activations, or sequential activations. To disable the timing functions, set T1 and T2 to 0.

7.3 FUNCTIONS CYCLE

F.Func	Allows you to define a function for the [F] key. The functions are: **oFF** Key not used. **hoLd** Hold PV. **AL.oFF** Alarms disabled. **rESEt** Resets minimum and maximum. **PhoLd** Peak Hold. **tArE** Reset Tare.
dIG.In	Digital input function. Allows you to define a function for the digital input. The functions available are the same as for the [F] key.
FILtr	Digital input filter. Used to reduce noise in the measured value display. Adjustable between 0 and 20. At 0 means that the filter is off. At 20 means that the filter is at maximum. The larger the filter, the slower the response of the measured value.
oFSEt	Indication Offset. Value added to the measured value to change the indication. Expressed directly in the unit of the programmed input type. For indications in °F, the null reference is 32 °F.
bAud	Communication Baud Rate. Transmission rate used in the serial communication (RS485). The available rates are: 1200, 2400, 4800, 9600, and 19200 bps.
AdrES	Communication address. Number that identifies the indicator on the serial communication network.

7.4 CONFIGURATION CYCLE

In.tYP	Input type. Allows you to select the type of signal or sensor connected to the PV input. **Table 1** shows the options available. By changing this parameter, all other parameters related to PV and alarms will be changed. When programming the indicator, it should be the first parameter to be set.
dP.PoS	Decimal point position. When configuring the input (**In.tYP**) with temperature sensors (J, K, Pt100, etc), in addition to the integer part of the measurement, the **dP.PoS** parameter will only display decimal values (XXX.X). When configuring the input (**In.tYP**) with linear signals (mA, mV, V), the **dP.PoS** parameter determines the position of the decimal point of the measured value (XXXX, XXX.X, XX.XX, X.XXX).
unIt	Temperature unit. Allows you to select the type of display: °C or °F. This screen will not be displayed when selecting the linear input types (0 to 50 mV, 4 to 20 mA, or 0 to 5 V) in the **In.tYP** parameter.
S.root	Allows you to enable the square root. This screen will be displayed when selecting the linear input types (0 to 50 mV, 4 to 20 mA, or 0 to 5 V) in the **In.tYP** parameter. The **YES** option applies the quadratic function to the input signal, within the limits programmed in **In.LoL** and **In.hIL**. The indication assumes the value of the lower limit when the input signal is less than 1% of its excursion.
In.LoL	Indication lower limit. Allows you to define the minimum indication limit for inputs such as 0 to 50 mV, 4 to 20 mA, or 0 to 5 V. When using **PV Retransmission**, this value defines the point that will correspond to 4 mA (or 0 mA) for any programmed input type.
In.HIL	Indication upper limit. Allows you to define the maximum indication limit for inputs such as 0 to 50 mV, 4 to 20 mA, or 0 to 5 V. When using **PV Retransmission**, this value defines the point that will correspond to 20 mA for any programmed input type.

SCALE	Scale factor. Allows you to multiply the displayed value by 10. Valid for linear inputs.
out.ty	Type of analog output. Allows you to select the type of analog output signal: 0 to 20 mA or 4 to 20 mA.

7.5 CUSTOM LINEARIZATION CYCLE

InP.01 InP.20	Allows you to define the endpoints of the custom linearization segments. Values in the unit of the input signal: 0 a 50 mV, 4 a 20 mA, or 0 a 5 Vdc.
out.01 out.20	Allows you to define the indications corresponding to the custom linearization segments. Values in the desired display unit (within the **Lower Limit** and **Upper Limit**).

7.6 CALIBRATION CYCLE

All the input types are already calibrated at the factory. Recalibration is not recommended for inexperienced operators. When a recalibration is necessary, it must be performed by a specialized professional.

If you access it by accident, do not press MAX and MIN. Go through all the screens until you return to the Operation Cycle.

In.LoC	Zero input calibration. Allows you to calibrate the PV Offset. To change a unit, you may need to press MAX or MIN several times.
In.HIC	Input Span calibration. Allows you to calibrate the PV gain. To change a unit, you may need to press MAX or MIN several times.
ou.LoC	Zero calibration of the analog output. Allows you to adjust the value to calibrate the analog output Offset (0 or 4 mA).
ou.HIC	Span calibration of the analog output. Allows you to adjust the value to calibrate the analog output gain (20 mA).
CJ Lo	Cold Junction calibration. Allows you to adjust the temperature value at the indicator terminals in degrees.
H.tYPE	Hardware type. Parameter that adapts the indicator to the available option. It must not be changed by the user. 0 No optional. 1 With optional alarms 3 and 4. 2 With digital input.

The table below displays the sequence of cycles and parameters shown on the display. There are parameters that must be defined for each available alarm.

OPERATION CYCLE	ALARM CYCLE	FUNCTIONS CYCLE	CONFIGURATION CYCLE	CUSTOM LINEARIZATION CYCLE	CALIBRATION CYCLE
8.8.8.8.8.8.	* Fu.AL 1	F.FunC	In.tYP	InP.01 - InP.20	In.LoC
AL.rEF	* dF.AL 1	dIG.In	dP.PoS	out.01 - out.20	In.HIC
* SP.AL 1	* HY.AL 1	FILtr	unIt		ou.LoC
	* bL.AL 1	oFSEt	Sroot		ou.HIC
	* AL. It 1	bAud	In.LoL		CJ Lo
	* AL. It2	AdrES	In.HIL		H.tYPE
			SCALE		
			out.ty		

* Parameters that need to be set for each available alarm.

Table 5

8 SERIAL COMMUNICATION

The indicator can optionally be supplied with an RS485 asynchronous serial communication interface, master-slave type, for communication with a supervisor (master) computer. The indicator always acts as a slave.

Communication is always initiated by the master, which transmits a command to the address of the slave it wishes to communicate with. The addressed slave takes over the line and sends the corresponding response to the master.

The indicator accepts Broadcast type commands (addressed to all the instruments on the network). In this type of command, the indicator does not send any reply or confirmation of receipt.

8.1 FEATURES

Signals compatible with the RS485 standard. 2-wire connection between 1 master and up to 31 indicators (it can address up to 247) in bus topology.

- Maximum connection distance: 1000 meters.
- Indicator disconnection time: Maximum 2 ms after last byte.
- The communication signals are electrically isolated from the rest of the equipment, with a selectable speed of 1200, 2400, 4800, 9600, or 19200 bps.
- Number of data bits: 8, no parity.
- Number of Stop bits: 1.
- Response transmission start time: Maximum 100 ms after receiving the command.
- Used protocol: Modbus (RTU).

8.2 ELECTRICAL CONNECTIONS

The RS485 signals are:

D1	**D**	**D +**	**B**	Bidirectional data line.	Terminal 16
D0	$\overline{D}$	**D -**	**A**	Inverted bidirectional data line.	Terminal 17
C				Optional connection that improves communication performance.	Terminal 18
GND					

Table 6

If the supervisor computer does not have a RS485 interface, an external RS232 ↔ RS485 converter must be used.

To configure the serial communication interface, use 2 parameters: the Communication Baud Rate (**bAUd** parameter) and the Communication Address.

8.3 COMMUNICATION PROTOCOL

The equipment supports the Modbus RTU slave protocol. All configurable parameters can be read and/or written via serial communication.

It is also possible to write to the registers in Broadcast mode, using address 0.

The following Modbus commands are available:

01	*Read Coils*
03	*Read Holding Register*
05	*Write Single Coil*
06	*Write Single Register*

8.4 SIMPLIFIED TABLE OF HOLDING REGISTERS

The most used registers are displayed below.

For complete information, see the **Table of Registers for Serial Communication**, available on the **N1500G** page.

The registers in the table below are 16-bit integer with sign.

ADDRESS	PARAMETER	REGISTER DESCRIPTION
0000	PV	Reading: Process variable. Writing: Not allowed. Maximum range: From **InLoL** to the value set in **InH IL**. The decimal point depends on the **dPPoS** screen.
0003	PV	Reading: Process variable in absolute process. Writing: Not allowed. Maximum range: 0 to 62000.

Table 7

9 PROBLEMS WITH THE INDICATOR

Connection errors and improper programming represent most problems encountered when using the controller. A final review can prevent wasted time and damage.

The indicator displays some messages to help you identify problems:

MESSAGE	PROBLEM DESCRIPTION
uuuuu	The measured value is above the limits allowed for this sensor or signal.
nnnnn	The measured value is below the limits allowed for this sensor or signal.
-----	Open input. No sensor or signal.
Err 1	The resistance of the Pt100 cable is beyond the limits allowed (or the cable is poorly connected).

Table 8

Other error messages displayed by the indicator should be reported to the manufacturer. You must also inform the serial number of the device, which can be obtained by pressing BACK for more than 3 seconds.

The version of the software used is displayed when the indicator is turned on.

When configured improperly, the indicator can display false error messages, especially regarding the type of input selected.

10 SPECIFICATIONS

- Power supply: 100 to 240 Vac, 50/60 Hz.
- Maximum consumption: 10 VA.
- Internal resolution: 19500 levels.
- Display: 12000 levels (from -1999 to 9999).
- Sampling rate: 5 measurements per second.
- Accuracy:
  - Thermocouples J, K, T, and N: 0.25 % of span ± 1 °C (33.8 °F).
  - Thermocouples E, R, S, and B: 0.25 % of span ± 3 °C (37.4 °F)
  - Pt100: 0.2 % of maximum range.
  - Linear current or voltage: 0.2 % of maximum range.
- Minimum heating time: 15 minutes.
- Input resistance:
  - 0-50 mV, Pt100, and thermocouples: > 10 MΩ
  - 0-5 V: 1 MΩ
  - 20 mA: 22 Ω
- Pt100 measurement: 3-wire circuit.
- Current: 0.170 mA.
- PV retransmission resolution: 1500 levels, 550 Ω max.
- Relays: SPST-NO – 3 A / 250 Vac.
- Digital input: Dry Contact or NPN open collector.
- Auxiliary voltage source: 24 Vdc (±10 %) / 25 mA max.
- Operating temperature: 0 to 55 °C (32 to 131 °F).
- Relative humidity: 80 to 30 %. For temperatures above 30 °C (86 °F), decrease by 3 % per °C (or °F).
- Approximated weight: 1 kg.
- Dimensions: 310 x 110 x 37 mm (L x H x W).
- Protection degree: IP30 (when properly installed).

11 WARRANTY

Warranty conditions are available on our website www.novusautomation.com/warranty.