INDEX

1 SAFETY SUMMARY

The symbols below are used on the equipment and throughout this document to draw the user's attention to important operational and safety information.

	
CAUTION or WARNING: Read complete instructions prior to installation and operation of the unit.	**CAUTION or WARNING:** Electrical Shock Hazard

All safety related instructions that appear in the manual must be observed to ensure personal safety and to prevent damage to either the instrument or the system. *If the instrument is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.*

2 TECHNICAL ASSISTANCE

If you encounter a problem with your controller, review the configuration with regard to inputs, outputs, alarms, etc. If the problem persists, contact your supplier.

SPECIAL RECOMMENDATIONS

Should the indicator be repaired, some special handling care should be taken. The device must be withdrawn from the case and immediately placed in an anti-static wrap; protected from heat and humidity.

3 PRESENTATION

N1500LC is a universal process indicator which accepts a large variety of input signals and sensors. A six-digit LED display shows measured value and all programming parameters.

Instrument configuration is achieved from the keypad, without any hardware change. Thus, the selection of input type and alarms modes, besides other special functions, are accessed and defined from the frontal keypad.

The user should read this manual thoroughly before using the instrument. It must be handled with care and should be used accordingly for best results.

Some of the features of the basic version are:

- Input:: 4 to 20 mA, 0 to 20 mA, 0 to 20 mV, -20 to +20 mV and 0 to 50 mV
- 2 alarm relays
- 10 Vdc (or 5 Vdc) power supply for load cells;
- Memory for **maximum** and **minimum** values.
- **Hold, peak hold, tare, zero tare and automatic zero** functions;
- Process Variable (PV) retransmission in 0-20 mA or 4-20 mA.
- RS485 MODBUS RTU serial communication.
- 3rd and 4th alarm relays.

The front panel is shown below.

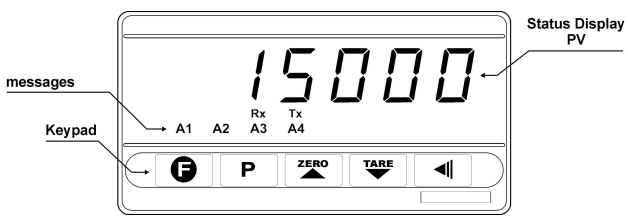


Figure 1 - Front panel identification

Status Display: Shows the process variable (PV) and the programming prompts.

Indicators A1, A2, A3 and **A4**: show active alarms.

Indicators Rx and **Tx**: indicate RS485 communication line is active.

P **PROGRAM key** - This key is used to access different displays with the programmable parameters of the device.

◀‖ **BACK key** - This key is used to go back to the previous parameter displayed in the menu cycle.

ZERO ▲ **INCREMENTS/ZERO key and** TARE ▼ **DECREMENTS/ZERO key –** They make possible the change the parameter values. They are also used to display maximum and minimum values stored in memory.

Ⓕ **FUNCTION key** - This special function key is used for pre-programmed functions as explained in the SPECIAL FUNCTION KEY section of this manual.

4 PROCESS VARIABLE INPUT - PV

The process variable (PV) input type is configured through the frontal keypad according to the codes shown in table 1 (refer to INPUT TYPE parameter " **InLYP**"). All input types are factory calibrated and no additional calibration is required.

Type	Code	Measurement Range
Non-linear 4-20 mA	c.4-20	Programmable indication range. Three **maximum** range options: -32000 to +32000 0 to 60000 0 to 120000 (only even values are shown) Non linear signals will be linearized according to the programmed custom linearization.
Non-linear 0-20 mA	c.0-20	
Linear 4-20 mA	4-20 A	
Linear 0-20 mA	0-20 A	
Linear 0 – 50 mV	c.50	
Non-linear -20 a 20 mV	c.-20	
Non-linear 0 – 20 mV	c.20	
Linear 0 – 50 mV	50	
Linear -20 a 20 mV	-20.20	
Linear 0 –20 mV	20	

Table 1 - Input type codes

5 ALARMS

The indicator has 2 alarm outputs in the basic version and up to 4 alarms outputs optionally.

Each alarm has a corresponding LED message in the front panel to show alarm status.

5.1 ALARM FUNCTIONS

The alarms can be set to operate in seven different modes. These modes are shown in table 2 and described below. The alarm can also be set as 'disabled'.

5.1.1 Sensor break - **tErr**

The alarm is triggered whenever the sensor breaks or is badly connected.

5.1.2 Low alarm - **Lo**

The alarm relay is triggered whenever the measured value is below the alarm set point.

5.1.3 High alarm - **Hi**

The alarm relay is triggered whenever the measured value is **above** the alarm set point.

Differential low – **dIFLo**

Deviation alarm. Alarm relay is triggered whenever the difference (deviation) between the Process Variable and the reference value (**RLrEF**) is lower than the values defined in **SPAL**. For this function, the triggering point is defined as:

(RLrEF – SPAL)

Differential High – **dIFHi**

Deviation alarm. Alarm relay is triggered when the difference (deviation) between the Process Variable value and the reference value (**RLrEF**) is greater than the value defined in **SPAL**. For this function, the triggering point is defined as:

(RLrEF + SPAL)

4.1.6 Differential (or Band) out of range – **dIFou**

Deviation alarm. Alarm relay is triggered when the difference (deviation) between the Process Variable value and the reference value (**RLrEF**) has its modulus greater than the value configured in **SPAL**. For this function, the triggering point is defined as:

(RLrEF – SPAL) and (RLrEF + SPAL)

4.1.7 Differential (or Band) within range – **d IF. In**

Deviation alarm. Alarm relay is triggered when the difference (deviation) between the Process Variable value and the reference value (**RLrEF**) has its modulus lower than the value defined in **SPAL.** For this function, the triggering points are defined as:

(RLrEF – SPAL) and (RLrEF + SPAL)

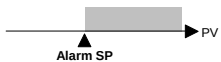
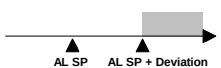
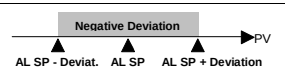
TYPE	PROMPT	ACTION
Disabled	oFF	Alarm is inactive
Sensor Break (**i**nput **Err**or)	iErr	Alarm will go ON if sensor breaks
Low Alarm (**Lo**w)	Lo	
High Alarm (**Hi**gh)	HI	
Differential Low (**dif**ferential **Lo**w)	d IF.Lo	
Differential High (**dif**ferential **Hi**gh)	d IF.HI	
Differential out of range (**dif**ferential out)	d IF.ou	
Differential within range (**dif**ferential **With**in)	d IF. In	

Table 2 - Alarm functions

5.2 ALARM TIMER

The alarms can be configured to perform timing functions. The configuration allows the alarm output to be delayed, or to deliver a single pulse or a train of pulses. The delay, the pulse width and the period are defined by the user.

Table 3 shows these advanced functions. Times T1 and T2 can be programmed from 0 to 6500 seconds. Programming 0 (zero) in the timer parameters T1 and T2 disables the timer function.

The display alarm indicators (**A1**, **A2**, **A3** or **A4**) remain ON while their respective alarm conditions are present, regardless of the current output status, which may be temporarily off due to the timer action.

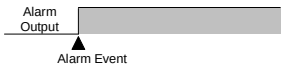
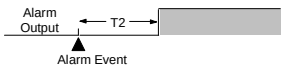
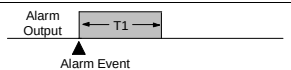
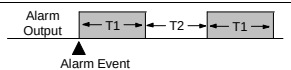
Advanced Function	T1	T2	ACTION
Normal Operation	0	0	
Delayed	0	1 s to 6500 s	
Pulse	1 s to 6500 s	0	
Oscillator	1 s to 6500 s	1 s to 6500 s	

Table 3 - Timer Alarm Functions

5.3 ALARM INITIAL BLOCKING

The initial blocking option inhibits the alarm from being recognized if an alarm condition is present when the controller is first energized. The alarm will be triggered only after the occurrence of a non alarm condition followed by a new occurrence for the alarm.

The initial blocking is disabled for the **sensor break** alarm function.

6 SPECIAL FUNCTIONS

6.1 SPECIAL FUNCTION KEY AND DIGITAL INPUT

The [F] key (special function key) in the frontal panel of the controller as well as the Digital Input may be assigned different functions that will be chosen by the user during the setup: These functions can be chosen independently, both for the [F] key and the Digital Input. The [F] key and Digital Input functions are explained below.

6.1.1 HoLd – Freeze measured value

The **hold** function freezes the measured value showed in the display. Each time the [F] key or the Digital Input is selected, there is a change from **hold** to normal mode.

Whenever the indicator is in the **hold** mode, the message "***HoLd***" will be displayed so that the operator will be aware that the value displayed is the frozen value and not the current reading.

6.1.2 PHoLd – Maximum value

The indicator will automatically work in the **Peak Hold** mode whenever the [F] key or the Digital Input are programmed as "***PHoLd***".

While in this operation mode the indicator always shows the maximum value measured, since the last time the [F] key or the Digital Input were pressed.

Each activation of the [F] key or digital input triggers a new **Peak Hold** cycle and the display resets with a new peak value.

6.1.3 Hi – Displays Maximum

Displays the **maximum (High)** value the indicator measured since the last reset.

6.1.4 Lo – Displays Minimum

Displays the minimum **(Low)** value the indicator measured since the last reset.

6.1.5 rESEt - Clears Maximum and Minimum

If this "rESEt" function is programmed, every touch of the [F] key or Digital Input activation clears the memory and a new cycle of maximum and minimum values memorization will start.

6.1.6 2Ero – Zero Function

Available only for the [F] key. It resets the scale. This function is used to eliminate the influence of interference or small deviations in the zero of a scale. Reset is only accomplished if the value shown in the scale is within 2% of the end of scale. Zero is not lost if the scale is turned off.

6.1.7 tArE –Tare function

It is available only in the Digital Input configuration or through the [TARE] key. It changes indication to zero (0000.0), regardless of the value applied to the input. It is used to eliminate indications of defined values. In order to eliminate the tare, the user must press the [ZERO] key.

6.2 [TARE] AND [ZERO] KEYS

The same Tare function available for the Digital Input can be quickly applied by using the [TARE] key, which does not need to be set up. The [ZERO] key is used to eliminate the tare applied.

The indicator accepts successive tares provided that the input signal (gross weight) does not exceed the equipment end of scale.

6.3 POWER SUPPLY FOR LOAD CELLS (10 VDC)

N1500LC provides a 10 Vdc (or 5 Vdc) output to excite load cells. This power supply capacity is 50 mA.

6.4 PROCESS VARIABLE RETRANSMISSION

As an option, the indicator can be supplied with an isolated 0-20 mA or 4-20 mA analog output for Process Variable (PV) retransmission.

The PV values that define the scale of the 0 mA / 4 mA to 20 mA retransmission can be programmed by the user in the **high and low output limits** (**OuLoL** e **OuHoL**), at configuration level. High and low limits can be freely programmed, even with a low limit higher than high limit, resulting in a reversed retransmission signal (decreasing signal when PV increases).

When this option is available, retransmission will be always active, so that the user will not be required to turn it on or off.

For a voltage output signal an external shunt (calibrated resistor) should be installed at the analog output terminals.

6.5 CUSTOMIZED LINEARIZATION

Three types of signals can be user-customized to fit particular linearization profiles. This means that the operator can configure the instrument to read non-standard crescent non-linear signals with high accuracy.

7 INSTALLATION

The indicator is designed to be panel mounted. Remove the two plastic fixing clamps from the instrument, insert the unit into the panel cut-out and slide firmly the fixing clamps from the rear against the panel.

7.1 RECOMMENDATIONS FOR INSTALLATION

- Input signal wires should be laid out away from power lines and preferably inside grounded conduits.
- Instrument mains (line) supply should be suitable for this purpose and should not be shared.
- In controlling and monitoring applications, possible consequences of any system failure must be considered in advance. The internal alarm relay does not warrant total protection.
- Use of RC filters (47 R and 100 n, serial) are highly recommended when driving solenoids, contactor coils or other inductive loads.

7.2 ELECTRICAL CONNECTIONS

The internal electronics can be removed from the front panel without any cable disassembly. The input signals and power connections are shown in Figure 2.

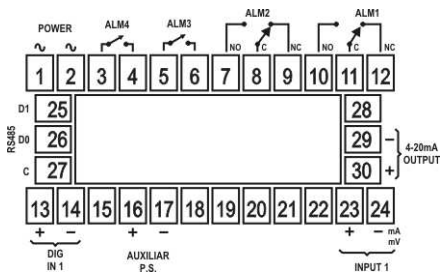


Figure 2 – Back Panel Terminals

7.2.1 Power Connection

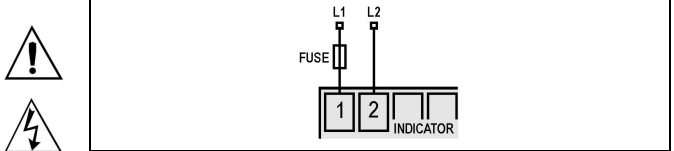


Figure 3 – Power Connection

7.2.2 Input signal connection

It is important that they are very well connected, the sensor wires must be well fixed in the terminals of the rear panel.

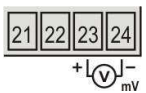


Figure 3 – voltage connection

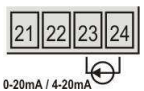


Figure 4 – current connection

7.2.3 Digital Input (Dig In)

The digital input is activated by connecting a switch (or equivalent) to its terminals, as shown in Figure 5 above.

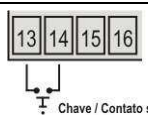


Figure 5 – Digital Input

6.2.2 Analog output

The N1500LC can deliver either 0-20 mA or 4-20 mA analog output, depending on how the instrument is configured. The output is available at terminals 29 and 30.

8 OPERATION

For best results, this indicator requires correct basic setting of parameters or a definition for parameters displayed. It is necessary to define, for example: Type of input, triggering point, alarm function, etc.

These parameters are divided in five levels (or groups) of parameters which we will refer to as CYCLES.

Cycle	Access
1- Work	free access
2- Alarms	reserved access
3- Functions	
4- Configuration	
5- Customized Linearization	
6- Calibration	

Table 4 - Parameters Cycles

The work cycle has free access. All other cycles require a certain combination of key strokes to be accessed. The combination is:

P and ◄|| keys pressed simultaneously

Once within a cycle, just press P to move to the subsequent parameters of this cycle. At the end of each cycle the display will go back to the work cycle.

After reaching the intended prompt just press the MIN or ZERO keys to change this parameter accordingly. All changes are recorded in non-volatile memory as we move to next prompt. After 25 seconds with no key pressed the indicator will return to the measuring cycle (work cycle).

8.1 CONFIGURATION PROTECTION

As a safety measure, changes can be prevented by a combination of keys for each cycle Parameters can be seen but not changed.

To protect a cycle just press the ZERO and ◄|| keys simultaneously for 3 seconds at the beginning of the referred cycle

To unlock this cycle (and allow for changes) just press the TARE and ◄|| keys for 3 seconds.

Displays will flash briefly to confirm locking or unlocking operation.

Within the controller, the **PROT** key completes the locking function. When PROT is **OFF** the user is allowed to lock and unlock the cycles. When PROT is **ON** changes are not allowed. if cycles are protected, protection cannot be removed, if there aren't cycles protection, they cannot be made.

9 PROGRAMMING THE INDICATOR

9.1 WORK CYCLE

This is the first cycle. At power up the indicator will display the Process Variable (PV). The alarm triggering points are also displayed at this cycle (alarm Setpoints). To advance in this cycle simply press P.

TELA	PROMPT PARAMETER DESCRIPTION
88888	**Measure prompt -** Shows the variable measured according to the limits defined in the "**InLoL**" and "**InH IL**" prompts. If the ***Hold*** function is programmed, the display shows the frozen variable measure alternating it with the "**HoLd**" message. If the ***Peak Hold*** function is programmed, the display shows maximum variable measured alternating it with the "**P.koLd**" message. Should any failure occur, the indicator will display an error message, which is described in item 11 of this manual.
RLrEF	**Differential Alarm Reference Value** - This prompt is shown only when there is an alarm programmed with differential function. This value is used as a reference for differential alarms triggering.
SPAL 1 SPAL2 SPAL3 SPAL4	**SP of Alarms 1, 2, 3 and 4** – Value that defines the alarms triggering points programmed with "**Lo**" or "**H I**" functions. Note: For alarms programmed with differential functions, the alarm SP value can not be changed, and the "**diF**" message is displayed. The value of differential SP (deviation) is defined in the Alarms Cycle. NOTE: The SP adjustment parameters are presented only if the corresponding alarm function is configured.

9.2 ALARM CYCLE

FunAL 1 FunAL2 FunAL3 FunAL4	**Alarm Function** – Defines the alarm functions: 1, 2, 3 or 4, as defined in item 4.1. **oFF** : Alarm is inactive **IErr** : Broken or shorted sensor. **Lo** : Minimum value **HI** : Maximum value **d IFL** : Minimum differential **d IFh** : Maximum differential **d IF F** : Differential out of range **d IF d** : Differential within range
HYAL 1 HYAL2 HYAL3 HYAL4	**Alarm hysteresis** Defines the difference between the value at which the alarm is turned on and the value at which it is turned off.
bLAL 1 bLAL2 bLAL3 bLAL4	**Initial blocking function** It makes possible to prevent alarms activation at the process start, when all the system is powered. See item 4.3.
AL 1t 1 AL 1t2 AL2t 1 AL2t2 AL3t 1 AL3t2 AL4t 1 AL4t2	**Alarm Timer:** Prompts that define time T1 and T2, in seconds, shown in table 3. They allow the user to delay the alarm triggering, to activate alarms momentarily or sequentially. To disable timer function, just set zero for T1 and T2.

9.3 FUNCTION CYCLE

F.Func	**F Key function –** Makes possible to define the F key function. Available functions: **oFF** - Key not used; **HoLd** - Hold PV **rESEt** - Resets maximum and minimum values **PHoLd** - Peak Hold **HI** - Displays maximum **Lo** - Displays minimum **2Ero** - Automatic zero These functions are described in item 5.2.
d IG. In	**Digital input function –** Makes possible to define the digital input function. Functions available are the same as the ones available for the **F** key, except for the Zero function, replaced by the Tare function. **oFF - HoLd - rESEt - PHoLd HI - Lo - tArE** These functions are described in item 5.2.
F ILtr	**Input digital filter** - It is used to reduce instability of the measured value. Adjustable between 0 and 60. 0 when the filter is off and 60 for the maximum filtering. The higher the filter value, the lower is the measured value response.
oFSEt	**Displayed offset –** This is a value added to the measured value to shift PV indication. The offset is shown in the programmed unit. For °F indications the zero reference is at 32°F.
En A2.	**Enables auto zero -** Enables the auto-zero function of the indication. The indication will turn to zero if the input value is within the programmed range in A2 tEu for 3 seconds. Auto-zero occurs when the indication is relatively stable. It is used to eliminate the influence of interference or small deviations in the zero of a scale.
A2rAn	**Maximum level for zero -** Maximum level of the scale zero deviation, where auto-zero is activated. This value can be programmed up to 2% of the end of scale.

bAud	***Communication Baud-Rate*** – Transmission rate used in the serial communication of the device (RS-485), in **bps**. Available rates are: 1200, 2400, 4800, 9600,19200, 38400 and 57600 bps.
AdrES	**Communication address –** Number that identifies the indicator in a network.

9.4 CONFIGURATION CYCLE

InTYP	**Input Type** - Selects the input signal or sensor type to be connected to the PV terminals. Refer to table 1 for options. *Changing the input type causes all other parameters related to PV and alarms to be changed as well, therefore, this parameter shall be the first to be set.*
dPPoS	**Decimal Point Position** - Defines the decimal point position in the displayed value.
ScALE	**Scale** - Defines the indication range. **0** Configurable indication from – 31000 to + 31000. **1** Configurable indication from 0 to + 60000. **2** Configurable indication from 0 to +120000. Only even values will be displayed (resolution is not improved). The selected scale affects values of PV, alarm setpoints and Offset.
InLoL	**Input Low Limit –** Determines the minimum limit for input signals. When the PV retransmission is used, this value defines the point that will correspond to the 4 mA (or 0 mA) for any type of programmed input.
InH IL	**Input High Limit –** Determines the maximum limit for input signals. When the PV retransmission is used, this value defines the point that will correspond to the 20mA for any type of programmed input.
outtY	**Analog Output Type** - Selects the analog output type to either 0-20 mA or 4-20 mA.
oULoL	**Low Limit for Analog Retransmission** – Defines the PV value that results in a 4 mA (or 0 mA) analog output current.
oUH IL	**High Limit for Analog Retransmission** – Defines the PV value that results in a 20 mA analog output current.
outEr	**4-20 mA Output behavior in case of failures** – Defines the output as 4-20 mA when there is an error in the indication. ***do*** – Applies a value < 4 mA; ***UP*** – Applies a value > 20 mA

9.5 CUSTOMIZED LINEARIZATION CYCLE

inP.01 inP.30	Defines the extreme points (lower and upper) of the customized linearization. Values must be in the input signal unit.
out.01 out.30	Defines the proportional indications in respect to each segment of the customized linearization. Values are in the intended indication unit (within the **Indication Lower and Upper Limits).**

Figure 10 shows the sequence of cycles and parameters presented in the indicator display. There are parameters that must be defined for each alarm available

Work Cycle	Alarm cycle	Function Cycle	Configuration Cycle	Customized linearization cycle	Calibration cycle	Automatic calibration cycle
8.8.8.8.	* FuAL 1	FFunc	InTYP	inP.01 - inP.30	InLoC	ACALL
ALrEF	* HYAL 1	diG.in	dPPoS	out.01 - out.30	InH IC	ACALH
* SPAL 1	* bLAL 1	FiLtr	ScALE		ouLoC	
	* AL.it 1	oFSEt	InLoL		ouH IC	
	* AL.it2	En A2	InH IL		HtYPE	
		A2 rAn	outtY			
		bAud	ouLoL			
		AdrES	ouH IL			
			outEr			

Table 5

9.6 CALIBRATION CYCLE

All input and output types are factory calibrated. This cycle should only be accessed by experienced personnel. If this cycle is accidentally accessed do not touch the TARE or ZERO keys, just press the P key a few times to go back to the Work Cycle.

inLoC	**Input Low Calibration** - Sets the Process Variable low calibration (offset). Several key strokes at ZERO or TARE might be necessary to increment one digit.
inH iC	**Input Hi Calibration** - Sets the Process Variable span calibration (gain).
ouLoC	**Analog Output Low Calibration** - Sets the analog current output low calibration (offset).
ouH iC	**Analog Output Span Calibration** - Sets the analog current output high calibration (span) of the analog output (20 mA).
HtYPE	**Hardware Type** - This parameter adapts the firmware to the actual indicator hardware (optional features) and should not be changed by the user. 2 Alarms.....**3** 2 Alarms and 4-20 mA.....**19** 2 Alarms and RS485 .....**35** 2 Alarms, 4-20 mA and RS485 .....**51** 4 Alarms.....**15** 4 Alarmes and 4-20 mA.....**31** 4 Alarmes and RS485 .....**47** 4 Alarmes, 4-20 mA and RS485..... **63**

9.7 AUTOMATIC CALIBRATION CYCLE

This is an alternative calibration method where the user teaches the indicator the desired indication values for two extreme input signals. First a low signal is applied to the indicator input (for example, 0 kg) and the desired value (0) is entered in ACALL parameter. Then a high signal is applied to the input (close to the upper measurement limit, for example 40000 kg) and the desired indication value (40000) is entered in ACALH parameter. After this 2 calibration steps, the internal calibration parameters are automatically calculated to achieve the desired indication range.

ACALL	**Automatic calibration of input low value** – Low calibration value. Must only be entered during a calibration procedure while applying a known input signal to the indicator.
ACALH	**Automatic calibration of input high value** – High calibration value. Must only be entered during a calibration procedure while applying a known input signal to the indicator.

P and ◀| 30 seconds.

10 SERIAL COMMUNICATION

The indicator can be supplied with an asynchronous RS-485 digital communication interface for master-slave connection to a host computer (master).

The indicator works as a slave only and all commands are started by the computer which sends a request to the slave address. The addressed unit processes the command and sends back the answer.

Broadcast commands (addressed to all indicator units in a multidrop network) are accepted but no response is generated.

CHARACTERISTICS

- RS-485 compatibility with two-wire bus from the host to up to 31 slaves in a multidrop network topology.
- Up to 247 units can be addressed by the MODBUS RTU protocol.
- Maximum network distance: 1200 m.
- Time of indicator disconnection: Maximum of 2 ms after the delivery of the last byte.
- Communication signals electrically isolated from the rest of the instrument.
- Baud rate: 1200, 2400, 4800, 9600, 19200, 38400 or 57600 bps.
- Number of data bits: 8, without parity or even parity
- Number of stop bits: 1
- Time to start response transmission: 100 ms maximum delay after acknowledging the command.
- Protocol: MODBUS (RTU)

Dois parâmetros devem ser configurados para utilização da interface de comunicação serial: o *Baud-Rate* de Comunicação (parâmetro **bAud**) e o Endereço de Comunicação (parâmetro **AdrES**).

10.1 RS485 INTERFACE: ELECTRICAL CONNECTION

The RS-485 signals are:

D1 = D: Bidirectional data line

D0 = $\overline{D}$: Inverted bidirectional data line

C = GND: Optional connection. Improves communication performance for long cable runs.

11 PROBLEMS WITH THE INDICATOR

Connection errors or improper configuration will result in malfunctioning of the indicator. Carefully revise all cable connections and programming parameters before operating the unit.

Some error messages will help the user identify possible problems.

Message	Possible Problem
uuuuu	Measured value is above the value allowed for the selected sensor or above the configured input signal limit.
nnnnn	Measured value is below the value allowed for the selected sensor or below the configured input signal limit.
-----	Open input. No sensor is connected or the sensor is broken.
Err 1	Pt100 cable resistance is too high or the sensor is badly connected.

Different messages other than the ones above should be reported to the manufacturer. Please inform the serial number if this should occur. The serial number can be viewed at the display by pressing the ◄|| key for about 3 seconds.

The software version of the instrument can be viewed at the time the unit is powered.

When not properly configured, the instrument may show false error messages, particularly those related to the type of input selected.

9.1 SPECIAL RECOMMENDATIONS

Should the indicator be repaired, some special handling care should be taken. The device must be withdrawn from the case and immediately placed in an anti-static wrap; protected from heat and humidity.

12 SPECIFICATIONS

DIMENSIONS: ..... 48 x 96 x 92 mm (1/16 DIN). Approximate weight: 250 g

PANEL CUT-OUT: ..... 45 x 93 mm (+0.5 -0.0 mm)

TERMINAL CONNECTION: ..... 18 screws accepting 6.3 mm fork lugs.

POWER: ..... 100 to 240 Vac/dc ±10 %, 50/60 Hz
Optional: ..... 24 Vdc/ac ±10 %
Max. Consumption: ..... 7.5 VA

ENVIRONMENTAL CONDITIONS:
Operating temperature: ..... 5 to 50 ºC
Maximum RH: ..... 80 % up to 30 ºC
..... For temperatures above 30 ºC, decrease 3 % per ºC
..... for indoor use; Installation category II, pollution degree 2; altitude < 2000 m

INPUT ..... Keyboard selection of input type (refer to table 1)
Internal resolution: ..... 128000 levels
Display resolution: 62000
Input sample rate: ..... 15 per second
Accuracy: ..... 0.15 % of span.
Input impedance: ..... mV >10 MΩ
..... mA: 15 Ω

ANALOG OUTPUT: ..... 0-20 mA or 4-20 mA, 550 Ω max.; 4000 levels, Isolated

RELAY OUTPUT: ..... ALM1 and ALM2: SPDT: 3 A / 240 Vac (3 A / 30 Vdc Res.)
..... ALM3 and ALM4: SPST-NO: 1.5 A / 250 Vac (3 A / 30 Vdc Res.)

EMC: ..... EN 61326-1:1997 and EN 61326-1/A1:1998

SAFETY: ..... EN61010-1:1993 and EN61010-1/A2:1995

START UP 3 SECONDS AFTER POWER UP;

12.1 ORDERING INFORMATION:

N1500LC -	4R -	RT -	485 -	24V
A	B	C	D	E

A: Series model: **N1500LC**

B: Relays outputs: **blank** (2 relays); **4R** (4 relays)

C: Analog output: **RT –** (Retransmission of the input signal) or **Blank**

D: Digital Communication: **485 –** (RS485, ModBus protocol) or **Black**

E: Voltage rating: **blank** (100-240 Vac/dc); **24 V** (24 Vdc/ac)

13 WARRANTY

This product is covered by a 12-month warranty provided the purchaser presents the sales receipt and the following conditions are met:

- Products are covered for one year from the original date of purchase. Please retain the dated sales receipt as evidence of the date of purchase. You will need it for any warranty service
- Within this period, warranty against defects in material and workmanship under normal use is free of charge.
- For repair, send the product and the sales receipt to our address. Expenses and transportation risks are under the purchaser's responsibility.
- This warranty does not cover any damage due to accident, misuse, abuse, or negligence.

V 2.3 a

For pricing information contact Omni Instruments by phone on +44 845 9000 601 or via email at info@omniinstruments.co.uk

UK / Europe Office
Tel: +44 (0)845 9000 601
Fax: +44 (0)845 9000 602
info@omniinstruments.co.uk
www.omniinstruments.co.uk

Australia / Asia Pacific Office
Tel +61 (0)282 442 363
Fax +61 (0)294 751 278
info@omniinstruments.com.au
www.omniinstruments.com.au

USA / Canada Office
Tel +1-866-849-3441
Fax +1-866-628-8055
info@omniinstruments.net
www.omniinstruments.net