

**OPERATION MANUAL
FOR DISPLAYS SERIES
DN-109NE, DN-119NE,
DN-129NE AND DN-189NE**

1479K03J



TETRALEC E.I. S.L.
Certified company

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1. INTRODUCTION

The numerical displays for series DN-109NE, DN-119NE, DN-129NE, and DN-189NE are industrial displays for control by Ethernet network and can be configured for use with TCP/IP, UDP et Modbus/TCP protocols. All of the units have the option of adding a symbol, in text format, of a maximum of three characters.

The selection of the parameters and the communication protocol is done using two buttons with a system of easily programmable codes.

One of its main characteristics is the large size of the characters,

DN-109NE of **57mm high** readable from 30m.

DN-119NE of **100 mm high** readable from 50m.

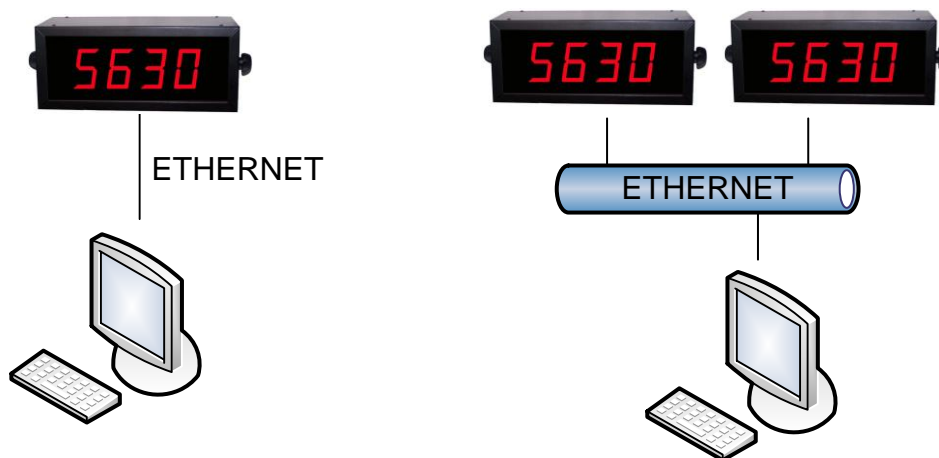
DN-129NE of **250 mm high** readable from 120m.

DN-189NE of **180 mm high**, readable from 90m.

As with other display series, the **DN-109NE, DN-119NE, DN-129NE and DN-189NE** series is also available in **one or two-sided** versions, which provides multiple solutions and installation possibilities.

It is surface mounted, with fixtures to a wall or partition wall, or suspended by the side anchoring.

The application field of these displays is very wide in all types of industrial applications utilising the advantages of the Ethernet network. They can be used to display Scada program values, counter values from a PLC.



2. GENERAL CHARACTERISTICS

2.1. Electrical characteristics of the DN-109 displays

2.2. Electrical characteristics of the DN-109 displays

Supply Voltage	88 to 264 VAC 47 to 63Hz or optional 19 to 36VDC.
Consumption	See “Display weight and power consumption”
Display	7 segments, 57mm high + decimal point. Red LED colour. Viewing distance: max 30 meters.
Text (LED)	Formed by LEDs of 5mm diameter, 50mm character height.
Text (Vinyl)	White vinyl. 50mm character height.
Parameter memory	Eeprom.
Communication	Ethernet 10/100. RJ-45 connector.
Communication Protocols	TCP/IP, UDP/IP and Modbus/TCP.
Environmental Conditions	Operation Temperature: -20 to 60°C. Storage temperature: -30°C to 70°C. Humidity: 5-95% RH non condensing. Maximum environmental illumination: 1000 lux. Sealing: IP41 or IP65.

2.3. Electrical characteristics of the DN-119 displays

Supply Voltage	88 to 264 VAC 47 to 63Hz or optional 19 to 36VDC.
Consumption	See “Display weight and power consumption”
Display	7 segments, 100mm high + decimal point. Red LED colour. Viewing distance: max 50 meters.
Text (LED)	Formed by LEDs of 5mm diameter, 65mm character height.
Text (Vinyl)	White vinyl. 65mm character height.
Parameter memory	Eeprom.
Communication	Ethernet 10/100. RJ-45 connector.
Communication Protocols	TCP/IP, UDP/IP and Modbus/TCP.
Environmental Conditions	Operation Temperature: -20 to 60°C. Storage temperature: -30°C to 70°C. Humidity: 5-95% RH non condensing. Maximum environmental illumination: 1000 lux. Sealing: IP41 or IP65.

2.4. Electrical characteristics of the DN-189 displays

Supply Voltage	88 to 264 VAC 47 to 63Hz or optional 19 to 36VDC.
Consumption	See “Display weight and power consumption”
Display	7 segments, 180mm high + decimal point. Red LED colour. Viewing distance: max 90 meters.
Text (Vinyl)	White vinyl.
Parameter memory	Eeprom.
Communication	Ethernet 10/100. RJ-45 connector.
Communication Protocols	TCP/IP, UDP/IP and Modbus/TCP.
Environmental Conditions	Operation Temperature: -20 to 60°C. Storage temperature: -30°C to 70°C. Humidity: 5-95% RH non condensing. Maximum environmental illumination: 1000 lux. Sealing: IP41 or IP65.

2.5. Electrical characteristics of the DN-129 displays

Supply Voltage	88 to 264 VAC 47 to 63Hz or optional 19 to 36VDC.
Consumption	See "Display weight and power consumption"
Display	7 segments, 250mm high + decimal point.
.....	Red LED colour. Viewing distance: max 120 meters.
Text (Vinyl)	White vinyl.
Parameter memory	Eeprom.
Communication	Ethernet 10/100. RJ-45 connector.
Communication Protocols	TCP/IP, UDP/IP and Modbus/TCP.
Environmental Conditions	Operation Temperature: -20 to 60°C.
.....	Storage temperature: -30°C to 70°C.
.....	Humidity: 5-95% RH non condensing.
.....	Maximum environmental illumination: 1000 lux.
.....	Sealing: IP41 or IP54.

2.6. Display weight and power consumption

2.6.1. DN-109 weight and power consumption

Reference	Display Weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)
DN-109/3S	3,0	5,9	DN-109/3S+TL	3,0	7,9	DN-109/3S+TV	3,0	5,9
DN-109/3D	3,0	10	DN-109/3D+TL	3,0	11,7	DN-109/3D+TV	3,0	10
DN-109/4S	3,0	7,54	DN-109/4S+TL	3,5	9,6	DN-109/4S+TV	3,5	7,54
DN-109/4D	3,5	14,44	DN-109/4D+TL	3,5	15,1	DN-109/4D+TV	3,5	14,44
DN-109/5S	3,0	9,2	DN-109/5S+TL	3,5	11,2	DN-109/5S+TV	3,5	9,2
DN-109/5D	3,5	18	DN-109/5D+TL	4,5	21,7	DN-109/5D+TV	4,0	18
DN-109/6S	3,5	10,7	DN-109/6S+TL	4,0	12,8	DN-109/6S+TV	4,0	10,7
DN-109/6D	4,0	20,85	DN-109/6D+TL	4,5	25	DN-109/6D+TV	4,0	20,85
DN-109/7S	4,0	12,36	DN-109/7S+TL	4,0	14,4	DN-109/7S+TV	4,0	12,36
DN-109/7D	4,5	24,1	DN-109/7D+TL	5,0	28,1	DN-109/7D+TV	5,0	24,1
DN-109/8S	4,0	14	DN-109/8S+TL	4,5	16	DN-109/8S+TV	4,5	14
DN-109/8D	5,0	27,3	DN-109/8D+TL	5,5	31,3	DN-109/8D+TV	5,5	27,3
DN-109/9S	4,5	15,7	DN-109/9S+TL	4,5	17,6	DN-109/9S+TV	4,5	15,7
DN-109/9D	5,0	30,5	DN-109/9D+TL	5,5	34,6	DN-109/9D+TV	5,5	30,5
DN-109/10S	4,5	17,2	DN-109/10S+TL	5,0	19,2	DN-109/10S+TV	5,0	17,2
DN-109/10D	5,5	33,7	DN-109/10D+TL	6,0	37,7	DN-109/10D+TV	6,0	33,7

2.6.2. DN-119 weight and power consumption

Reference	Display Weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)
DN-119/3S	4,0	10,8	DN-119/3S+TL	4,5	13,4	DN-119/3S+TV	4,5	10,8
DN-119/3D	4,0	18	DN-119/3D+TL	5,0	20	DN-119/3D+TV	5,0	18
DN-119/4S	4,5	14	DN-119/4S+TL	5,5	16,6	DN-119/4S+TV	5,5	14
DN-119/4D	5,0	26,6	DN-119/4D+TL	5,5	31,9	DN-119/4D+TV	5,5	26,6
DN-119/5S	5,0	17	DN-119/5S+TL	5,5	19,7	DN-119/5S+TV	5,5	17
DN-119/5D	5,5	32,9	DN-119/5D+TL	6,0	38,1	DN-119/5D+TV	6,0	32,9
DN-119/6S	5,5	20,2	DN-119/6S+TL	6,0	22,8	DN-119/6S+TV	6,0	20,2
DN-119/6D	6,0	39,2	DN-119/6D+TL	6,5	44,5	DN-119/6D+TV	6,5	39,2
DN-119/7S	6,0	23,3	DN-119/7S+TL	7,0	25,9	DN-119/7S+TV	7,0	23,3
DN-119/7D	3,5	25,5	DN-119/7D+TL	7,5	50,8	DN-119/7D+TV	7,5	25,5
DN-119/8S	6,5	26,4	DN-119/8S+TL	7,5	29	DN-119/8S+TV	7,5	26,4
DN-119/8D	7,0	51,6	DN-119/8D+TL	8,0	56,8	DN-119/8D+TV	8,0	51,6
DN-119/9S	7,0	29,4	DN-119/9S+TL	8,0	32	DN-119/9S+TV	8,0	29,4
DN-119/9D	7,5	57,6	DN-119/9D+TL	8,5	62,9	DN-119/9D+TV	8,5	57,6
DN-119/10S	7,5	32,5	DN-119/10S+TL	8,5	35,2	DN-119/10S+TV	8,5	32,5
DN-119/10D	8,0	64	DN-119/10D+TL	9,0	69	DN-119/10D+TV	9,0	64

2.6.4. DN-189 weight and power consumption

Reference	Display Weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)
DN-189/2S	4,0	13,3	DN-189/2S+TV	5,5	13,3
DN-189/2D	4,5	25,8	DN-189/2D+TV	6,5	25,8
DN-189/3S	5,0	19,4	DN-189/3S+TV	6,5	19,4
DN-189/3D	6,0	38,2	DN-189/3D+TV	8,0	38,2
DN-189/4S	6,0	25,7	DN-189/4S+TV	7,5	25,7
DN-189/4D	7,5	50,8	DN-189/4D+TV	9,0	50,8
DN-189/5S	7,0	31,8	DN-189/5S+TV	9,0	31,8
DN-189/5D	8,5	63,2	DN-189/5D+TV	10,5	63,2
DN-189/6S	8,5	37,8	DN-189/6S+TV	10,0	37,8
DN-189/6D	10,0	75,5	DN-189/6D+TV	11,5	75,5
DN-189/7S	9,5	44	DN-189/7S+TV	11,0	44
DN-189/7D	11,0	88,1	DN-189/7D+TV	13,0	88,1
DN-189/8S	10,5	50,3	DN-189/8S+TV	12,0	50,3
DN-189/8D	12,5	100,6	DN-189/8D+TV	14,0	100,6
DN-189/9S	11,0	56,6	DN-189/9S+TV	13,0	56,6
DN-189/9D	13,5	113,2	DN-189/9D+TV	15,5	113,2
DN-189/10S	12,0	62,9	DN-189/10S+TV	14,0	62,9
DN-189/10D	15,0	125,8	DN-189/10D+TV	16,5	125,8

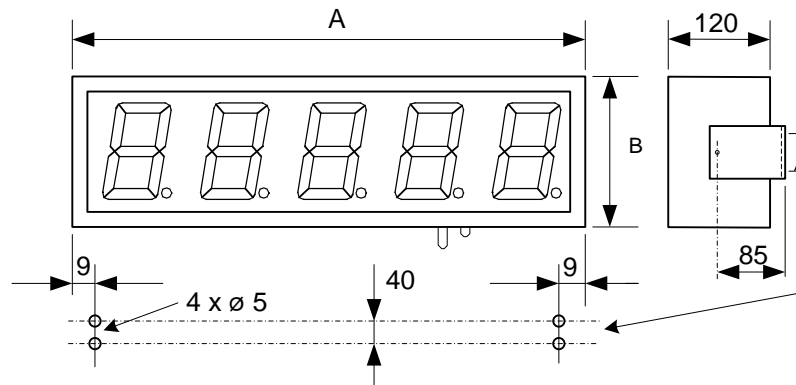
2.6.5. DN-129 weight and power consumption

Reference	Display Weight (kg)	Power (W)	Reference	Display weight (kg)	Power (W)
DN-129/2S	6,5	13	DN-129/2S+TV	9,5	13
DN-129/2D	8,0	26	DN-129/2D+TV	11,5	26
DN-129/3S	8,5	20	DN-129/3S+TV	11,5	20
DN-129/3D	10,5	40	DN-129/3D+TV	13,5	40
DN-129/4S	10,5	26	DN-129/4S+TV	13,0	26
DN-129/4D	13,0	52	DN-129/4D+TV	16,0	52
DN-129/5S	12,0	32	DN-129/5S+TV	15,0	32
DN-129/5D	15,5	64	DN-129/5D+TV	18,5	64
DN-129/6S	14,0	40	DN-129/6S+TV	17,0	40
DN-129/6D	18,0	77	DN-129/6D+TV	21,0	77
DN-129/7S	16,0	45	DN-129/7S+TV	18,5	45
DN-129/7D	20,0	90	DN-129/7D+TV	23,5	90
DN-129/8S	17,5	51	DN-129/8S+TV	20,5	51
DN-129/8D	23,0	102	DN-129/8D+TV	26,0	102
DN-129/9S	19,5	58	DN-129/9S+TV	22,5	58
DN-129/9D	25,5	115	DN-129/9D+TV	28,5	115
DN-129/10S	21,5	64	DN-129/10S+TV	24,0	64
DN-129/10D	28,0	128	DN-129/10D+TV	31,0	128

2.7. Dimensions and mounting of the displays

2.7.1. Dimensions and mounting of the DN-109 and DN-119

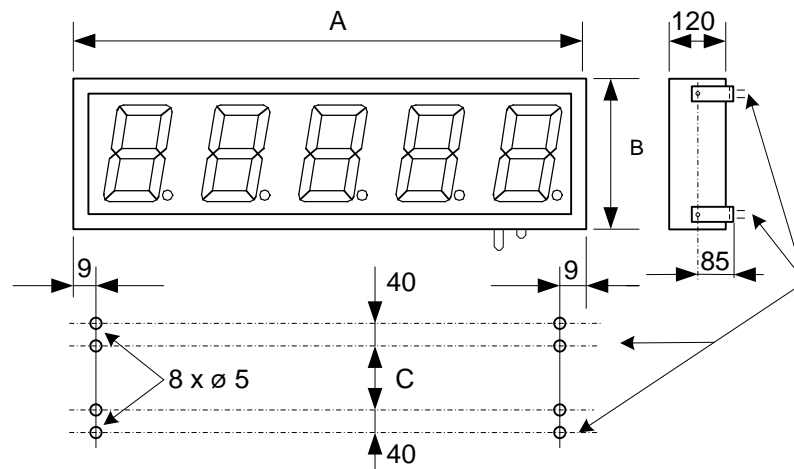
Reference	A	B	Reference	A	B
DN-109/3S	288	122	DN-109/3S+T	288	122
DN-109/4S	288	122	DN-109/4S+T	336	122
DN-109/5S	288	122	DN-109/5S+T	382	122
DN-109/6S	336	122	DN-109/6S+T	430	122
DN-109/7S	382	122	DN-109/7S+T	478	122
DN-109/8S	430	122	DN-109/8S+T	526	122
DN-109/9S	478	122	DN-109/9S+T	574	122
DN-109/10S	526	122	DN-109/10S+T	622	122
DN-119/3S	324	177	DN-119/3S+T	504	177
DN-119/4S	414	177	DN-119/4S+T	594	177
DN-119/5S	504	177	DN-119/5S+T	684	177
DN-119/6S	594	177	DN-119/6S+T	774	177
DN-119/7S	684	177	DN-119/7S+T	864	177
DN-119/8S	774	177	DN-119/8S+T	954	177
DN-119/9S	864	177	DN-119/9S+T	1044	177
DN-119/10S	954	177	DN-119/10S+T	1134	177



All measures are in millimetres.

2.7.2. Dimensions and mounting of the DN-129 and DN-189

Reference	A	B	C	Reference	A	B	C
DN-189/2S	340	251	67	DN-189/2S+TV	660	251	67
DN-189/3S	500	251	67	DN-189/3S+TV	820	251	67
DN-189/4S	660	251	67	DN-189/4S+TV	980	251	67
DN-189/5S	820	251	67	DN-189/5S+TV	1140	251	67
DN-189/6S	980	251	67	DN-189/6S+TV	1300	251	67
DN-189/7S	1140	251	67	DN-189/7S+TV	1460	251	67
DN-189/8S	1300	251	67	DN-189/8S+TV	1620	251	67
DN-189/9S	1460	251	67	DN-189/9S+TV	1780	251	67
DN-189/10S	1620	251	67	DN-189/10S+TV	1940	251	67
DN-129/2S	515	366	186	DN-129/2S+TV	985	366	186
DN-129/3S	750	366	186	DN-129/3S+TV	1220	366	186
DN-129/4S	985	366	186	DN-129/4S+TV	1455	366	186
DN-129/5S	1220	366	186	DN-129/5S+TV	1690	366	186
DN-129/6S	1455	366	186	DN-129/6S+TV	1925	366	186
DN-129/7S	1690	366	186	DN-129/7S+TV	2160	366	186
DN-129/8S	1925	366	186	DN-129/8S+TV	2395	366	186
DN-129/9S	2160	366	186	DN-129/9S+TV	2630	366	186
DN-129/10S	2395	366	186	DN-129/10S+TV	2865	366	186



All measures are in millimetres

3. INSTALLATION

The installation of the DN-109NE, DN-119NE, DN-129NE and DN-189NE is not particularly delicate but some important considerations must be taken into account.

The display must not be anchored to places subject to vibrations, nor should it be installed in places which generally surpass the limits specified in the display characteristics, both in terms of temperature and humidity.

The degree of protection of displays DN-109NE, DN-119NE, DN-129NE and DN-189NE is IP41, meaning that they are protected against penetration by solid foreign objects of a diameter of about 1mm and against the vertical fall of water droplets.

Displays DN-109NE, DN-119NE, DN-129NE and DN-189NE should not be installed in places with an illumination level in excess of 1000 lux. Neither should the display be placed in direct sunlight as visibility would be lost.

In the electrical installation, proximity to lines of high intensity circulation and high voltage lines must be avoided, as well as proximity to High Frequency generators and U/F converters for motors.

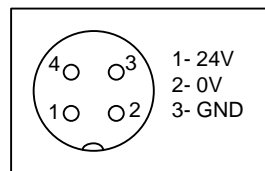
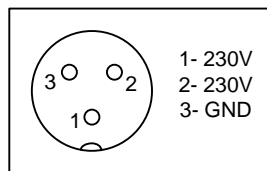
3.1. Power supply

The power supply must be 88 to 264 VAC 47 to 63Hz or 19 to 36VDC.

The power supply conductor section will be in line with consumption and the ground conductor will be a minimum section of 1.5mm².

The power supply connector for 220VAC has 3 contacts and is situated in the lower part of the unit. Connect the power wires following the schema below

The power supply connector for 24VDC has 4 contacts and is situated in the lower part of the unit. Connect the power wires following the schema below

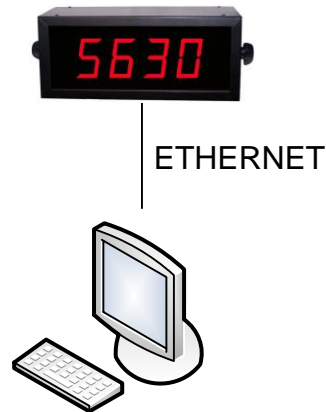


3.2. Connecting to the Ethernet line

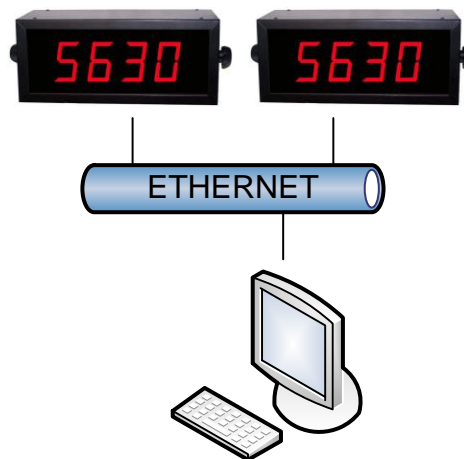
Ethernet line connection is carried out using an RJ-45 connector located in the lower part of the unit.

The connection between a display and a computer using an Ethernet link can be done in two ways: Direct connection using a crossover cable or connection via a switch type concentrator or hub and a category 5 100Base-T4 cable is recommended.

For direct connection between a computer and a display, a crossover cable must be used.



To connect various displays, a switch type concentrator or hub must be used with a port for each unit.



IMPORTANT: Displays with IP54 or IP65 protection level need a special RJ45 connector to ensure the level of protection. The connector is included in the equipment. The connector has assembly instructions that must be followed strictly. It is essential to use this connector for the input cable to the equipment.

Failure to use it implies loss of warranty.

4. OPERATION

4.1. Initial start-up

Before connecting the display to the network, we must ensure that all of the connections have been carried out correctly and that the display is firmly in place.

Each time we connect the display to the power supply network, an initial reset occurs which tests all of the segments comprising the display. The test consists of the sequential illumination of all of the digits with the number "8", all of the digits with the value "0", all of the decimal points are lit up and finally the version code. From this point any one of the following three situations may occur:

- The display receives data from the Ethernet network and displays it.
- The display does not receive data and the time without data equals zero. Continues to show the decimal points.
- The display does not receive data and the time without data is not equal to zero. After a time without data it displays a dash in each digit.

4.2. Parameter programming

Displays DN-109NE, DN-119NE, DN-129NE and DN-189NE can be adapted to the specifications of each client by the programming of parameters. The parameters which can be configured are:

- 1- Reserved Not used
- 2- End of block code
- 3- Time without receiving data
- 4- Response Message
- 5- Unit MAC code
- 6- Load the default configuration to the Ethernet port

Displays with color option

- b- Activation conditions and timing of output/colour 1.
 - c- Value of the alarm 1.
 - d- Activation conditions and timing of output/colour 1.
 - e- Value of the alarm 2.
- nr – Colour if no relay is activated
r1 - Colour if bit r1 is activated
r2 - Colour if bit r2 is activated
r3 - Colour if bit r1 and r2 are activated

- 7- Exit modifying parameters

To program the parameters, the digits on the right of the display are used. The number of the parameter is indicated by the digit on the left and the decimal point flashes while the digit on the right is off.

4.2.1. Enter to modify parameters

In order to enter the sequence to modify the parameters, the Advance key “*” must be pressed and held for three seconds. After this, the first parameters will be displayed, with the digit flashing.

There are then two options:

1- Modify the parameter value

By pressing the Advance key “*”, entry is gained to modify the parameter value.

To go back to displaying the parameter number, press “*” again.

To increase the parameter value, press the “+” key. After parameter 7 it returns to 1.

2- Select another parameter

In order to select another parameter, the parameter number must be made to flash using the “*” key and then the new parameter may be selected using the “+” key.

4.2.2. Exit modify parameters

In order to exit the sequence for modifying parameters, parameter 7 must be selected then press “*”.

4.2.3. Function of each parameter

4.2.3.1. Parameter 1:Protocol

0 = Protocols TCP/IP and UDP/IP

1 = Protocol Modbus/TCP

4.2.3.2. Parameter 2:End of Block. Only TCP/IP and UDP/IP protocols

Allows for code selection to indicate that the block has been completely sent.

Value	End of block	
0	CR	0Dh
1	LF	0Ah
2	CR LF	0Dh 0Ah
3	LF CR	0Ah 0Dh
4		03h
5		02h
6	* CR	2Ah 0Dh
7		04h

4.2.3.3. Parameter 3: Time without receiving data

This parameter allows the programming of a time to warn that it is not receiving data or that the data is incorrect. The warning occurs if the programmed time is exceeded.

Each time that a communication is received correctly, the time is reset to zero. The code "00" (No time) does not trigger any warning.

To indicate that the time limit has been exceeded, a dash will be displayed on each digit.

Code	Time	Code	Time
00	No time	11	1 min.
01	2 s	12	2 min.
02	4 s	13	5 min.
03	6 s	14	10 min.
04	8 s	15	20 min.
05	10 s	16	40 min.
06	14 s	17	1 hour.
07	20 s	18	2 hours.
08	26 s	19	5 hours.
09	30 s	20	10 hours.
10	40 s	21	25 hours.

4.2.3.4. Parameter 4: Response Message. Only TCP/IP and UDP/IP protocols

For configuring the display's response message.

Value	Response message
0	Without response
1	06h + End of block
2	ACK + End of Block
3	06h
4	ACK

The end of block is the one selected in parameter 3.

If value 1 has been selected, the 06h code is sent, followed by the block selected in parameter 2

If value 2 has been selected, the ACK characters are sent followed by the block selected in parameter 2.

4.2.3.5. Parameter 5: MAC

The MAC code is a code which identifies each port which connects to an Ethernet network. It is unique to each unit and is needed to configure the port.

The MAC code is formed by 6 bytes in a hexadecimal format. The 3 bytes on the left are always the same for units DN-109NE/DN-119NE /DN-129NE/DN-189NE.

This parameter allows you to ascertain the 3 bytes on the right. In order to identify them, a decimal point is used. Byte 4 has the point of the right digit activated. Byte 5 has the point of the left digit activated. Byte 6 has both points activated.

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
00h	20h	4Ah			
			XX.	X.X	X.X.

4.2.3.6. Parameter 6: Load the default configuration to the port

If the configuration of the port has been modified and the factory parameters cannot be reset, this parameter can be used to load them.

To load the factory parameters, value 99 must be input and the advance key “*” pressed. During the parameter loading time, the three digits are displayed flashing. When finished, parameter 6 is displayed.

4.2.3.7. Exit parameter configuration

In order to exit parameter configuration, select parameter 7 and press the advance key “*”.

4.3. Protocols

In this paragraph, the different protocols will be explained, as well as the programming of the displays through them. The formats of values of the numbers and characters are written in this manual are:

- When telling about a hexadecimal number, this will be followed by an “h”.
- When telling about a decimal number, this will be followed by a “d”.
- When telling about a binary number, this will be followed by a “b”.
- When telling about an ASCII character, this will be explained in the context.

As an example, the X ASCII character can be explained as 58h, 88d or 1011000b, as needed in the moment. Number 15 ASCII can be seen as 31h 35h, 49d 53d or 110001d 110101d.

4.3.1. TCP/IP Protocol

In order to use TCP/IP and Modbus/TCP protocols, the communication port must be programmed with the default configuration. See 4.2.3.6 “Parameter 6: Load the default configuration to the port”.

In order for the display to be able to accept a block, it must end with an end of block that is recognised by the display. The end of block coding which the display expects to receive can be found in 4.2.3.2 “Parameter 2:End of Block. Only TCP/IP and UDP/IP protocols”

The last character sent is displayed on the right of the display.

Port 10001 must be used.

4.3.2. UDP Protocol

In order for the display to be able to accept a block, it must end with an end of block that is recognised by the display. The end of block coding which the display expects to receive can be found in 4.2.3.2 “Parameter 2:End of Block. Only TCP/IP and UDP/IP protocols”

The last character sent is displayed on the right of the display.

In order to use UDP protocol, the communication port must be programmed with the default configuration (See 4.2.3.6 “Parameter 6: Load the default configuration to the port”.) excepting the following parameters.

Local port 10001 must be used for UDP/IP.

UDP Datagram Mode

Datagram Type must be set to 01.

Active Connection

Remote Host: IP address of the computer to which it is connected.

Remote Port: Port of the computer to which it is connected.

See 4.5.1 “Configure to use the UDP/IP protocol” to learn how to make changes.

4.3.3. Modbus/TCP Protocol

End of block not necessary.

The last character sent is displayed on the right of the display.

Port 502 must be used.

The data block transmitted must have the following values:

Byte 6. Slave ID = 01h.

Byte 7. Function Code = 16(10h)

Byte 8 and 9. Start address = 00h 00h.

4.3.3.1. Function 06h.

It allows to use integers with or without sign. The address sent determines if the values are signed or unsigned.

Parameter 1 can be equal to 1 or 2. See 4.2.3.1 “Parameter 1:Protocol”.

Address 40003 (02h) Signed integer. - 32767 to +32767

Address 40007 (06h)..... Unsigned integer. 0 to 65535

In this example the identifier has the value 01C9h and the value to write is -4096.

Block to send:

Identifier	Protocol	Number of bytes	Unit	Function	Start Address	Data
01h C9h	00h 00h	00h 06h	01h	06h	00h 02h	F000h

Response from the display:

The response from the display is the same block received.

4.3.3.2. Function 10h mode Word

It allows the user to send blocks with ASCII characters to the display

Parameter 1 must have value 2. See 4.2.3.1 “Parameter 1:Protocol”.

In the block, the following values must be codified:

Unit = 01h

Function = 10h

It allows to use integers with or without sign. The address sent determines if the values are signed or unsigned.

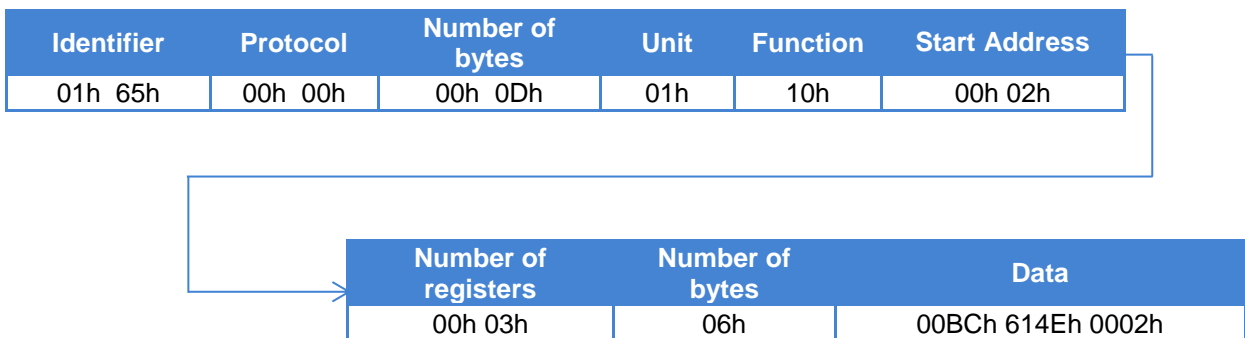
Address 40003 (02h) Signed integer. - 2147483647 a +2147483647

Address 40007 (06h)..... Unsigned integer. 0 a 4294967295

The Data field must contain 3 Words. The two first fields must contain the Data and the third must contain the position of the decimal point

- Value 0001h for 00000000,0
- Value 0002h for 0000000,00
- Value 0004h for 000000,000
- Value 0008h for 00000,0000
- Value 0010h for 0000,00000
- Value 0011h for 000,000000
- Value 0012h for 00,0000000
- Value 0014h for 0,00000000

Example 3:



In this example the visualized value is: 123456,78.

Response from the display:

The response from the display is the same block received from the identifier until the number of registers.

Identifier	Protocol	Number of bytes	Unit	Function	Start Address	Number of registers
01h 65h	00h 00h	00h 0Dh	01h	10h	00h 02h	00h 03h

Example 4:

Identifier	Protocol	Number of bytes	Unit	Function	Start Address
01h 65h	00h 00h	00h 0Dh	01h	10h	00h 06h

Number of registers	Number of bytes	Data
00h 03h	06h	8761h 2C36h 0000h

In this example the visualized value is: 123456,78.

Response from the display:

The response from the display is the same block received from the identifier until the number of registers.

Identifier	Protocol	Number of bytes	Unit	Function	Start Address	Number of registers
01h 65h	00h 00h	00h 0Dh	01h	10h	00h 06h	00h 03h

4.3.3.3. Function 10h mode ASCII

It the user to send blocks with ASCII characters to the display
 Parameter 1 must have value 1. See 4.2.3.1 "Parameter 1:Protocol".
 In the block, the following values must be codified:
 Unit = 01h
 Function = 10h
 Start Address = Any Address. Recommended 00h 00h.

Example 1

Identifier	Protocol	Number of bytes	Unit	Function	Start Address
00h 24h	00h 00h	00h 0Fh	01h	10h	00h 00h

Number of registers	Number of bytes	Data
00h 04h	08h	34h 36h 37h 31h 33h 30h 39h 38h

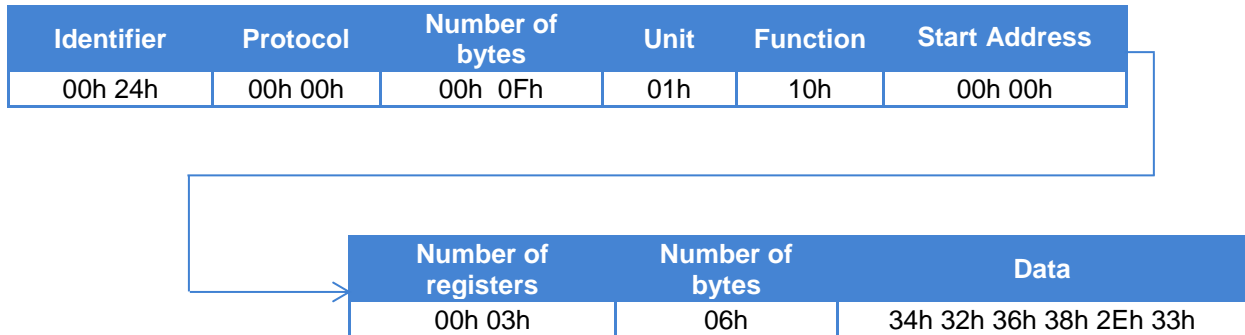
In this example the visualized value is: 46713098.

Response from the display:

The response from the display is the same block received from the identifier until the number of registers.

Identifier	Protocol	Number of bytes	Unit	Function	Start Address	Number of registers
00h 24h	00h 00h	00h 0Fh	01h	10h	00h 00h	00h 04h

Example 2



In this example the visualized value is: 4268,3.

4.3.4. Valid Characters

Numerical displays can only display numbers and some characters. All valid characters and their representation in hexadecimal format are shown below.

Character	0	1	2	3	4	5	6	7	8	9	A	B
HEXA	30h	31h	32h	33h	34h	35h	36h	37h	38h	39h	41h	62h
DEC	48d	49d	50d	51d	52d	53d	54d	55d	56d	57d	65d	98d

Character	C	c	d	E	F	H	h	i	J	L	n	O
HEXA	43h	63h	64h	45h	46h	48h	68h	69h	4Ah	4Ch	6Eh	6Fh
DEC	67d	99d	100d	69d	70d	72d	104d	105d	74d	76d	110d	111d

Character	P	r	U	u	,	.	-	_	'	-	=	
Hexa	50h	72h	55h	75h	20h	2Ch	2Eh	2Dh	16h	27h	28h	3Dh
DEC	80d	114d	85d	117d	32d	44d	46d	45d	22d	39d	40d	61d

For a character or group of characters to be displayed, flashing codes 08h(Start) and 09h(End) must be used.

Example Protocols TCP/IP and UDP/IP:

On a 6-digit display to display: 123456 with digits 3 and 4 flashing.

In decimal code the following must be sent: 49d 50d 08d 51d 52d 09d 53d 54d + end of block.

In hexa code the following must be sent: 31h 32h 08h 33h 34h 09h 35h 36h + end of block.

Example Protocols Modbus/TCP:

On a 6-digit display to display: 123456 with digits 3 and 4 flashing.

In decimal code the following must be sent: 49d 50d 08d 51d 52d 09d 53d 54d.

In hexa code the following must be sent: 31h 32h 08h 33h 34h 09h 35h 36h.

Colour Option: In the displays with the option colour, the colour may be modified using a command. Character X (58h) followed by the colour code force the display to use that colour. While using colour control by code, parameters B and D must be equal to 0 and colour control depending on displayed value must not be used. Colour is only applicable in function 10h ASCII and TCP/IP.

The colour codes are:

- 0 (30h) -> Red colour
- 1 (31h)-> Green colour
- 2 (32h)→ Yellow colour.

4.4. IP Address.

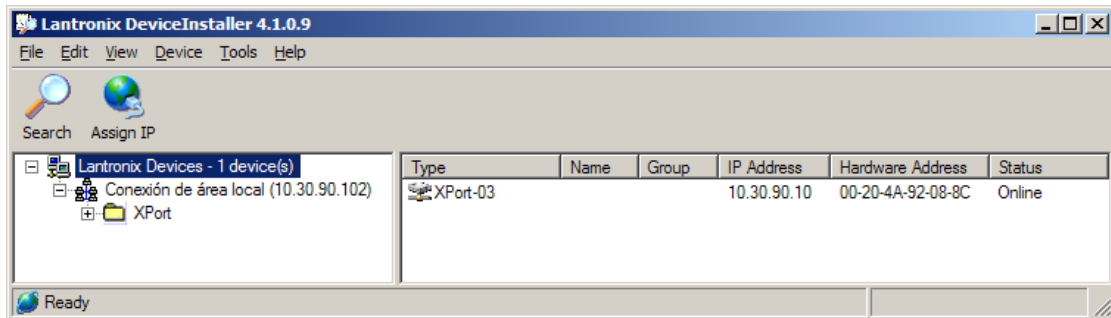
Before being able to communicate with the display an IP address must be assigned. To assign an IP address the DeviceInstaller program from Lantronix must be used, which can be downloaded free from their website: www.lantronix.com

Select: Support → Technical Support → Firmware/Downloads.

Select: DeviceInstaller.

Once the program is installed and running, press the “Search” button to locate the connected displays. The display must be turned on and connected to the network.

If there are no network problems, a screen similar to this should be displayed.



The IP address with which the equipment is supplied is: 10.30.90.10

The Hardware Address is the unit MAC code.

To assign the IP address you must first select the equipment by clicking on the XPort-03 to which you wish to assign the address. Then press Assign IP and follow the instructions.

IMPORTANT: All units are dispatched from the factory with the same IP address. Therefore to configure various units, they must be connected to the Ethernet and the address must be assigned one by one.

4.5. Modifying the port settings.

To modify the port configuration the DeviceInstaller program from Lantronix must be used, which can be downloaded free from their website: www.lantronix.com

Select: Support → Technical Support → Firmware/Downloads.

Select: DeviceInstaller.

Once the program is installed and running, press the “Search” button to locate the connected displays. The display must be turned on and connected to the network.

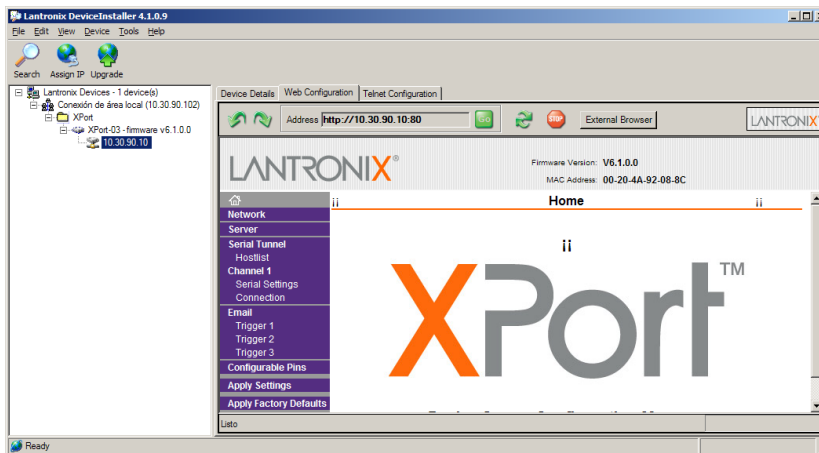
If there are no network problems, the same screen for configuring an IP address should be displayed. See 4.4 “IP Address.”

To access the setup you must first select the unit clicking on the XPort-03 that you wish to modify.

Then press Web Configuration and the GO key placed at the right side of IP address.

Enter your computer User Name and Password.

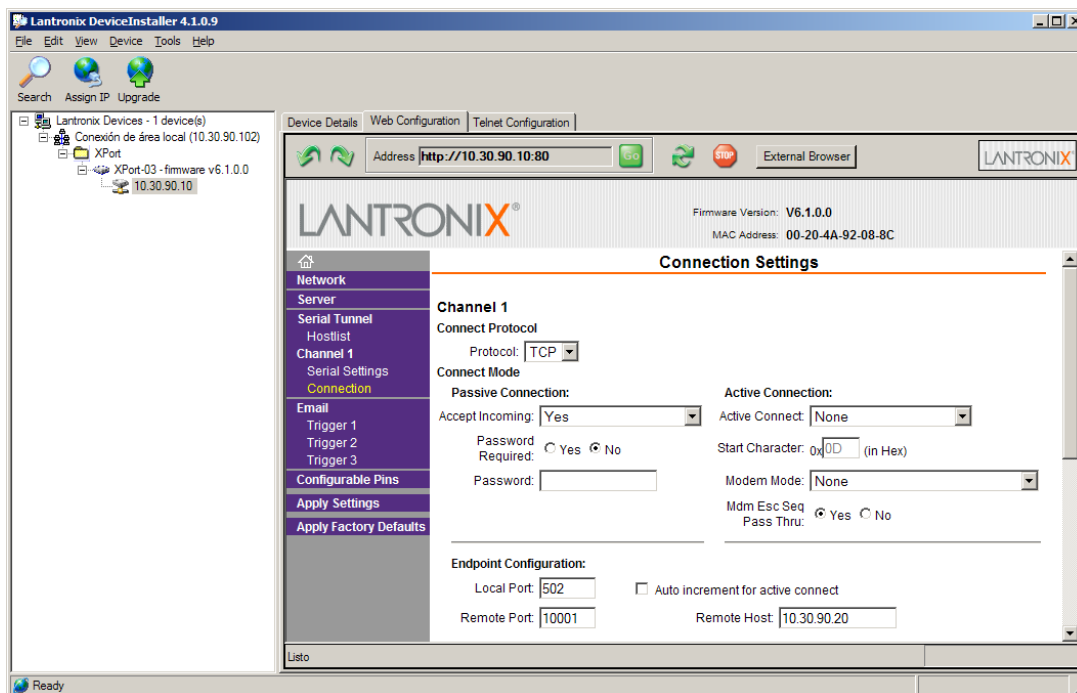
You will see a screen similar to the one above.



To access the setup the Local Port, select **Channel1->Connection**.

You will see a screen similar to the one above.

In Local Port insert the new value and click **OK** on the bottom of the page.



4.5.1. Configure to use the UDP/IP protocol

To access the setup the Local Port select **Channel1->Connection**.

Select the protocol: UDP in Connect Protocol.

Select **Datagram Type = 1** in Datagram Mode.

In Endpoint Configuration set:

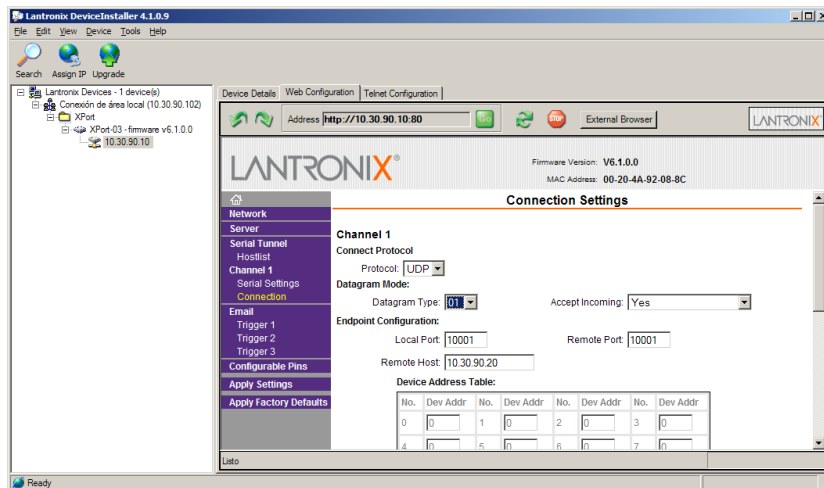
Local Port = 10001

Remote Host: IP address of the computer to which it is connected.

Remote Port: Port of the computer to which it is connected.

Click **OK** on the bottom of the page.

Click **Apply Settings** on the menu.



4.5.2. Configure to use the ModBus/TCP protocol

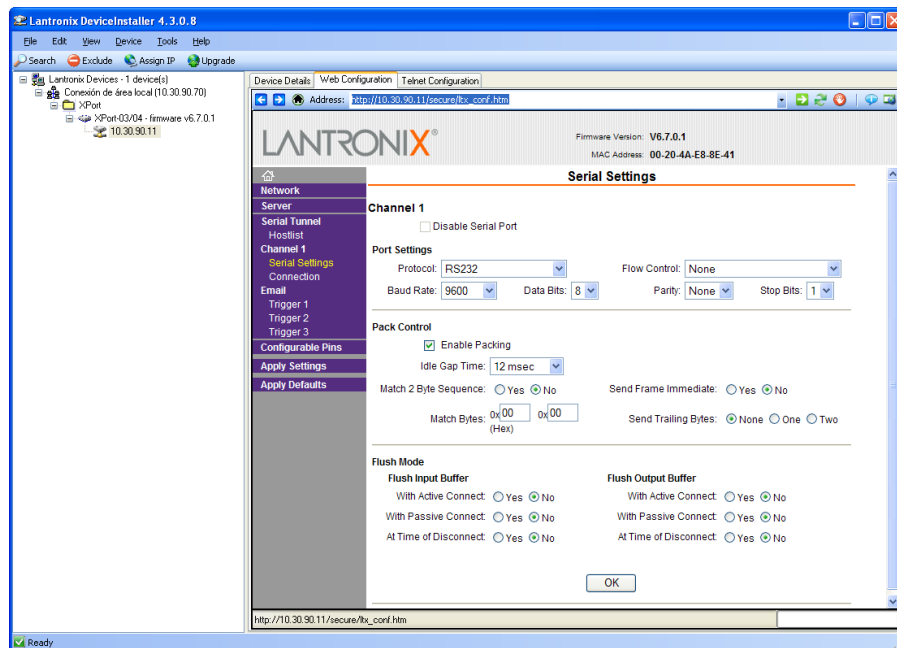
To use the ModBus protocol is recommended to set Enable Packing bit. Follow the steps below:

On the left side menu select **Channel 1-> Serial Settings**.

Set **Enable Packing** bit in the **Pack Control** area.

Click **OK** on the bottom of the page.

Click **Apply Settings** on the menu.



In order to check **Enable Packing** bit setting you must exit the Web Configuration page and re-enter. Click **Search** on menu and enter again into the Web Configuration.

Remember to set the Local Port to 502. [See paragraph 4.5](#)

4.6. Colour configuration

The colour option allows you to modify automatically the display colour according to the present value. The possible colours are: Red, Green and Yellow.

In order to be able to manage the colour 2 internal bits are used, they change depending on display value. Eight parameters are needed to set up the levels. Four parameters are used to define the activation form and the activation level. The other four allow defining the colour according to a combination of the 2 internal bits.

4.6.1. Parameters to define the internal bit r1.

To set up the internal bit **r1** parameters **b** and **C** are used.

Parameter **b** is used to set up the activation form and delay or hysteresis.

Parameter **C** is used to set up the trigger level. The most significant digit allow setting up a negative value.

Parameter b			
Left Digit	Control bit	Right Digit	Set/Reset
0	ON if Value > Parameter C	0	No delay / No hysteresis
1	ON if Value < Parameter C	1	Delay 1s
2	Always OFF	2	Delay 2s
		3	Delay 4s
		4	Delay 6s
		5	Delay 10s
		6	Hysteresis = 2
		7	Hysteresis = 4
		8	Hysteresis = 8
		9	Hysteresis = 12

4.6.2. Parameters to define the internal bit r2.

To set up the internal bit **r2** parameters **d** and **E** are used.





Parameter **d** is used to set up the activation form and delay or hysteresis.

Parameter **E** is used to set up the trigger level. The most significant digit allow setting up a negative value.

Parameter d			
Left Digit	Control bit	Right Digit	Set/Reset
0	ON if Value > Parameter E	0	No delay / No hysteresis
1	ON if Value < Parameter E	1	Delay 1s
2	Always OFF	2	Delay 2s
		3	Delay 4s
		4	Delay 6s
		5	Delay 10s
		6	Hysteresis = 2
		7	Hysteresis = 4
		8	Hysteresis = 8
		9	Hysteresis = 12

4.6.3. Parameters to define the colour.

To define the colour the 2 internal bits (**r1** and **r2**) are used.
The following parameters are used to define colours.

	Colour if internal bits are OFF. To change the colour press * key. Upon pressing + the next parameter is shown.
	Colour if internal bit r1 is ON. To change the colour press * key. Upon pressing + the next parameter is shown.
	Colour if internal bit r2 is ON. To change the colour press * key. Upon pressing + the next parameter is shown.
	Colour if internal bits r1 and r2 are ON. To change the colour press * key. Upon pressing + the next parameter is shown.

4.6.4. Work with only one colour.

To work always with only one colour set up the following parameters:

Parameter	Value
b	20
C	0
d	20
E	0
nr	colour
r1	colour
r2	colour
r3	colour

Parameters **C** and **E** may have any value.

Parameters **nr**, **r1**, **r2** and **r3** should have the same colour.

Independently of work colour, the parameters set up always uses RED colour.

Revision history

Revision E (March 2013).

Updated introduction in 4.4.
Added paragraph 4.5.1
Added paragraph 4.6.

Revision F (September 2013).

Updated dimensions and weight of DN-109/3. Paragraphs 2.2.1 and 2.3.1.

Revision G (October 2014)

Updated electrical characteristics of the 24VDC power. Paragraphs 2.1 and 3.1.
Updated section 4.2.3.2
Added remote colour specifications

Revision H (October 2015)

Updated Configure ModBus/TCP. Paragraph 4.5.2

Revision I (May 2014)

Statement of conformity modification.

STATEMENT OF CONFORMITY



Tetralec Electronica Industrial S.L.
c/ Severo Ochoa, 80
Polígono Industrial Font del Radium
08403 Granollers

As the builder of the equipment of the **LARTET** brand:

DN-109NE in all versions.
DN-119NE in all versions.
DN-129NE in all versions.
DN-189NE in all versions.

We declare under our sole responsibility that the aforementioned product complies with the following European directives:

Directive: LVD 2006/95/CEE Low Voltage Directive.
Standard UNE-EN61010-1 Security in electric equipment.

Directive: EMC 2014/30 UE Electromagnetic Compatibility
Standard UNE-EN 61000-6-4 Generic Emission Standard. Industrial environment.
Standard UNE-EN 61000-6-2 Generic Immunity Standard. Industrial environment.
Directive 2011/65/CE: Restriction of the use of certain hazardous substances in electrical and electronic equipment

Granollers, 18th November 2015