OPERATION MANUAL
FOR DISPLAYS OF
SERIES DN-109NW, DN-119NW and DN-129NW

1503K06A

Index

1. Introduction.

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

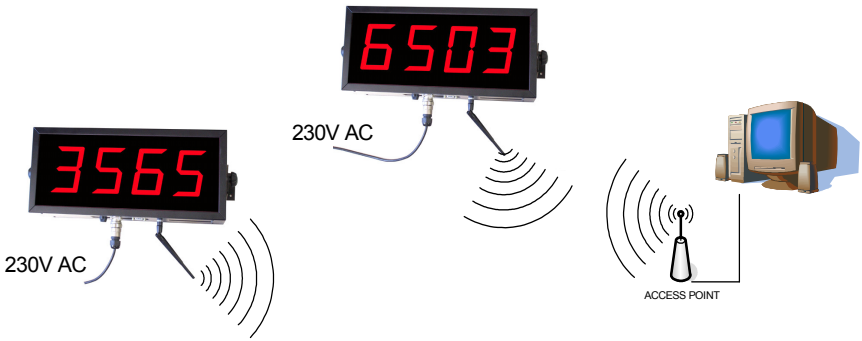
The selection of the parameters and the communication protocol is done using two buttons with a system of easily programmable codes.

One of its main characteristics is the large size of the characters,
DN-109NW of **57mm** legible at 30m.
DN-119NW of **100 mm** legible at 50m.
DN-129NW of **250 mm** legible at 100m.

As with other display series, the **DN-109NW, DN-119NW and DN-129NW** 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.

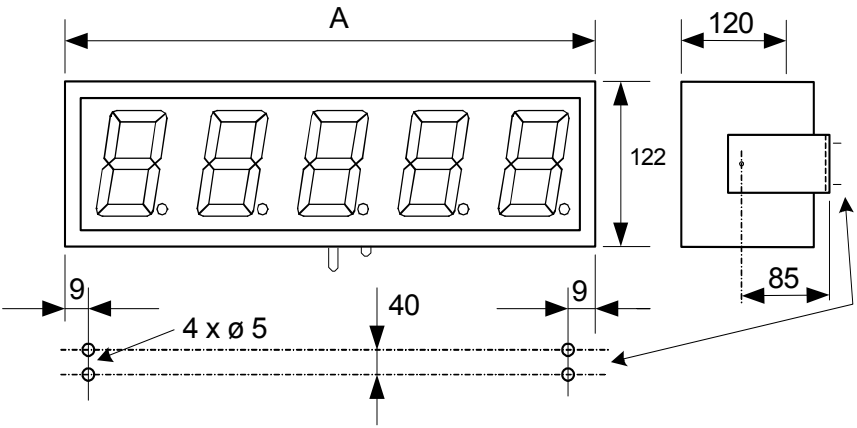
The application field of these displays is very wide in all types of industrial applications utilising the advantages of the Wifi network. They can be used to display Scada program values, counter values from a PLC.



2. General characteristics.

2.1 Electrical characteristics of the DN-109NW displays.

Supply Voltage .....100 VAC to 240 VAC 50/60Hz
Consumption.....1 Side = (3 x No. of digits) VA.
.....1 Side + Text = (3 x No. of digits) + 3VA
.....2 Sides = (7 x No. of digits) VA.
.....2 Sides + Text = (7 x No. of digits) + 7VA
Display .....7 segments of 57mm in height + decimal point.
.....Red Led colour. Visibility 30 metres.
Text .....Formed by leds of a 5mm diameter with a char-
.....acter height of 50 mm.
Parameter memory.....Eeprom.
Communication.....IEEE 802.11b and IEEE 802.11g
Communication Protocols.....TCP/IP and Modbus/TCP.
Environmental Conditions.....Operation Temperature: 0 to 50ºC.
.....Storage temperature-10ºC to 60ºC
.....Humidity 5-95% without condensation
.....Maximum environmental illumination: 1000 lux.
.....Protection IP41.

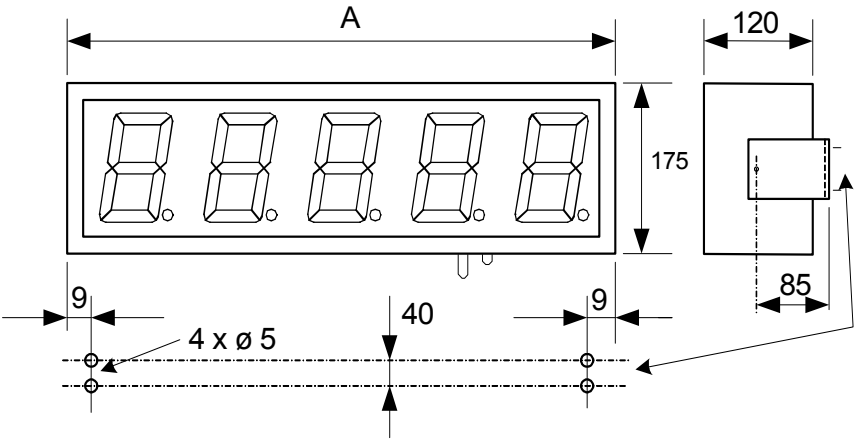


A according to digit's number

n (digit's num.)	3	4	5	6	7	8	9	10
DN-109/SnNW	210	288	288	318	364	412	460	508
DN-109/SnNW+T	306	384	384	414	460	508	556	604
DN-109/DnNW	----	288	288	318	364	412	460	508
DN-109/DnNW+T	306	384	384	414	460	508	556	604

2.2 Electrical characteristics of the DN-119NW displays.

Supply Voltage ..... 100 VAC to 240 VAC 50/60Hz
Consumption ..... 1 Side = (3.6 x No. of digits) VA.
..... 1 Side + Text = (3.6 x No. of digits) + 3.6VA
..... 2 Sides = (7.2 x No. of digits) VA.
..... 2 Sides + Text = (7.2 x No. of digits) + 7.2VA
Display ..... 7 segments of 100mm in height + decimal point.
..... Red Led colour. Visibility 50 metres.
Text..... Formed by leds of a 5mm diameter with a character height of 65 mm.
Parameter memory..... Eeprom.
Communication ..... IEEE 802.11b and IEEE 802.11g
Communication Protocols..... TCP/IP and Modbus/TCP.
Environmental Conditions..... Operation Temperature: 0 to 50ºC.
..... Storage temperature -10ºC to 60ºC
..... Humidity 5-95% without condensation
..... Maximum environnemental illumination: 1000 lux
..... Protection IP41.

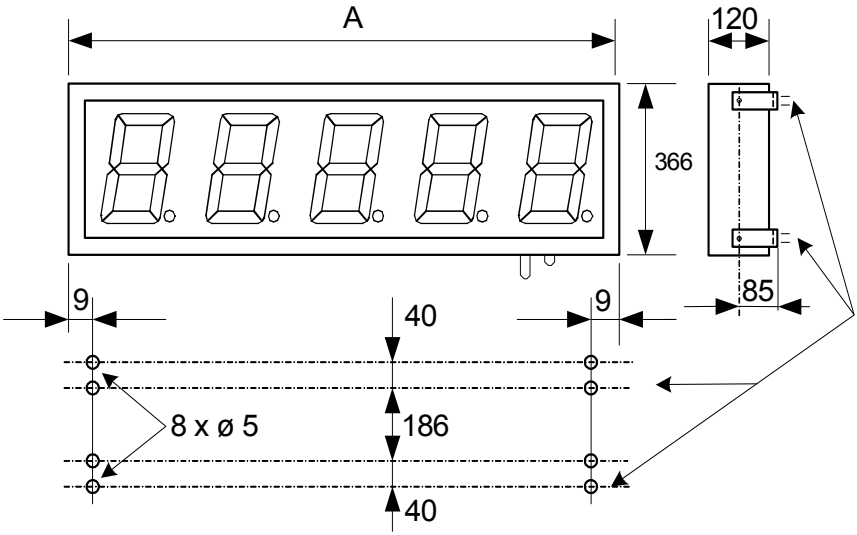


A according to digit's number

n (digit's num.)	3	4	5	6	7	8	9	10
DN-119/SnNW	324	414	504	594	684	774	864	954
DN-119/SnNW+T	504	594	684	774	864	954	1044	1134
DN-119/DnNW	324	414	504	594	684	774	864	954
DN-119/DnNW+T	504	594	684	774	864	954	1044	1134

2.3 Electrical characteristics of the DN-129NW displays.

Supply Voltage .....100 VAC to 240 VAC 50/60Hz
Consumption.....1 Side = (7 x No. of digits) VA.
.....1 Side + Text = (7 x No. of digits) + 7VA
.....2 Sides = (14 x No. of digits) VA.
.....2 Sides + Text = (14 x No. of digits) + 14VA
Display .....7 segments of 250mm in height + decimal point.
.....Red Led colour. Visibility 100 metres.
Text .....In white vinyl
Parameter memory.....Eeprom.
Communication.....IEEE 802.11b and IEEE 802.11g
Communication Protocols.....TCP/IP and Modbus/TCP.
Environmental Conditions.....Operation Temperature: 0 to 50ºC.
.....Storage temperature -10ºC to 60ºC
.....Humidity 5-95% without condensation
.....Maximum environmental illumination: 1000 lux.
.....Protection IP41.



A according to digit's number

n (digit's num.)	2	3	4	5	6	7	8	9	10
DN-129/SnNW	515	750	985	1220	1455	1690	1925	2160	2395
DN-129/SnNW+T	985	1220	1455	1690	1925	2160	2395	2630	2865
DN-129/DnNW	515	750	985	1220	1455	1690	1925	2160	2395
DN-129/DnNW+T	985	1220	1455	1690	1925	2160	2395	2630	2865

3. Installation.

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

It 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.

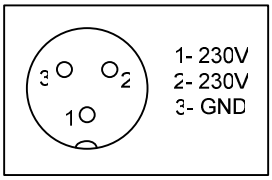
The degree of protection of displays DN-109NW, DN-119NW and DN-129NW is IP41, meaning that they are protected against penetration by solid foreign objects of a diameter of about 1mm and against the vertical fall of water droplets.

Displays DN-109NW, DN-119NW and DN-129NW 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 **100VAC to 240VAC, 50/60 Hz.**
The protection fuse built into the equipment is **2A**. If for any reason it is necessary to change the fuse, never use a higher calibre fuse.



3.1 230 VAC Power Supply

The power supply conductor section will be in line with consumption and the earth conductor will be a minimum section of 1.5m².
Although the displays are specially prepared for environments with high levels of electrical noise, should you suspect that the power supply line is very noisy, we advise a separating transformer be connected between the supply line and the display and/or an exterior network filter be connected

The power supply connector has 3 contacts and is situated in the lower part of the unit. The connection should be carried out following figure 3.1

3.2 Connecting the antenna

Wifi connection is carried out using an antenna located in the lower part of the unit.

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:

a) The display receives data from the Wifi network and displays it.
b) The display does not receive data and the time without data equals zero. Continues to show the decimal points.
c) 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 Programming the Parameters.

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

1- Protocol.
2- End of block code
3- Time without receiving data
4- Reply Message
5- Unit MAC code
6- Load the default configuration to the Ethernet port
7- Set up IP address using serial line.
8- To exit modify 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 “7-> 5” 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 "7->5", entry is gained to modify the parameter value.
To go back to displaying the parameter number, press “7->5”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 “7->5” 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 "7->5".

4.2.3 Function of each parameter.

4.2.3.1 Parameter 1: Protocols
0 = TCP/IP Protocol.
1= Modbus/TCP Protocol.

4.2.3.2 Parameter 2: End of block. Only TCP/IP protocol.
Allows for code selection to indicate that the block has beencompletely sent.

Value	End of block
0	CR (0x0D)
1	LF (0x0A)
2	CR LF (0x0D 0x0A)
3	LF CR (0x0A 0x0D)
4	(0x03)
5	(0x02)
6	* CR (0x2A 0x0D)
7	(0x04)

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:- Reply Message. Only TCP/IP protocol.

For configuring the display's reply message.

Value	Replay message
0	Without replay
1	0x06 + End of block
2	ACK + End of block
3	0x06
4	ACK

End of block is the end of the block selected in parameter 2.

If value 1 has been selected, the hexadecimal code 06 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 Code

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-109NW/DN-119NW /DN-129NW.

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
00	20	4A			
			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 “7->5” pressed. During the parameter loading time, the three digits are displayed flashing. When finished parameter 6 is displayed.

4.2.3.7 Parameter 7: Set up IP address using serial line.

In order to set up the IP address you must use the serial line and a computer with the Hyperterminal. See paragraph 4.4.

4.2.3.8 Parameter 8: Exit parameter configuration

In order to exit parameter configuration, select parameter 8 and press the advance key “7->5”.

4.3 Protocols.

4.3.1 Block Structure:

4.3.1.1 Protocols TCP/IP

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 section 4.2.3.2.
The last character sent is displayed on the right of the display.
Port 10001must be used.

4.3.1.2 Protocol Modbus/TCP

End of block not necessary.
The last character sent is displayed on the right of the display.
Port 502 must be used.

4.3.2 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
Hexadécimal	30	31	32	33	34	35	36	37	38	39	41	62
ASCII	48	49	50	51	52	53	54	55	56	57	65	98

CHARACTER	C	c	d	E	F	H	h	i	J	L	n	o
Hexadécimal	43	63	64	45	46	48	68	69	4A	4C	6E	6F
ASCII	67	99	100	69	70	72	104	105	74	76	110	111

CHARACTER	P	r	U	u		,	.	-	___	´	¯	=
Hexadécimal	50	72	55	75	20	2C	2E	2D	16	27	28	3D
ASCII	80	114	85	117	32	44	46	45	22	39	40	61

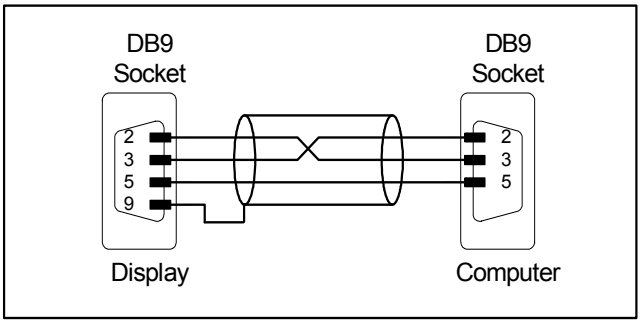
For a character or group of characters to be displayed, flashing codes 08(Start) and 09 (End) must be used.
Example:
On a 6-digit display to display: 123456 with digits 3 and 4 flashing.
In ASCII code the following must be sent: 49 50 08 51 52 09 53 54 + end of block.
In hexa. code the following must be sent: 31 32 08 33 34 09 35 36 + end of block.

4.3.3 Protocol TCP/IP and Modbus/TCP:

In order to use TCP/IP and Modbus/TCP protocols, the communication port must be programmed with the default configuration. See section 4.2.3.6.

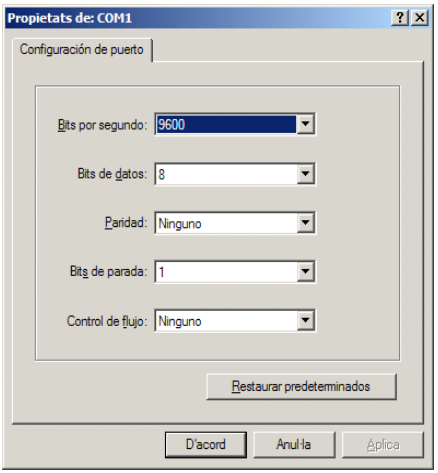
4.4 IP Address.

The easiest way to set up the IP address is by using the Hyperteminal program and the serial line of computer. The cable's wiring diagram is the classic crossover.

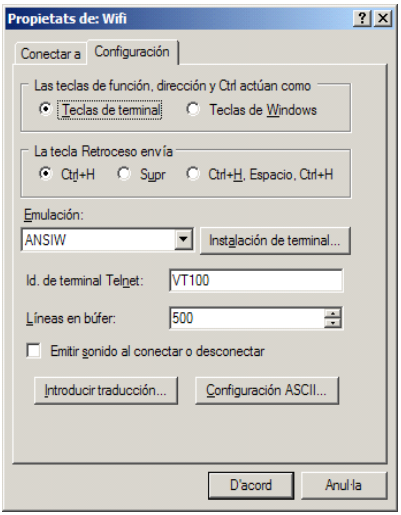


Cable's wiring diagram between display and a computer

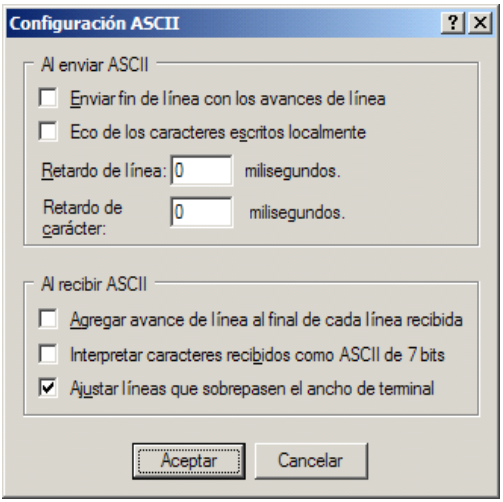
The set up Hyperterminal is:



Baud rate: 9600 Bauds
Data Bits: 8
No parity
Stop Bits: 1
Hardware flor control: None.



The attached Hyperterminal set up have been verified and work correctly, but any other set up may work also correctly.



To set up the Wifi module using the Hyperterminal or any other program, you must follow a time sequence. A time error on steps 5 and 6 forces to return to step 3.

4.4.1 Access to Wifi module configuration.

In order to access to Wifi module configuration the next steps must be followed:

1– Connect the serial cable (see 4.4) between the computer and the display.

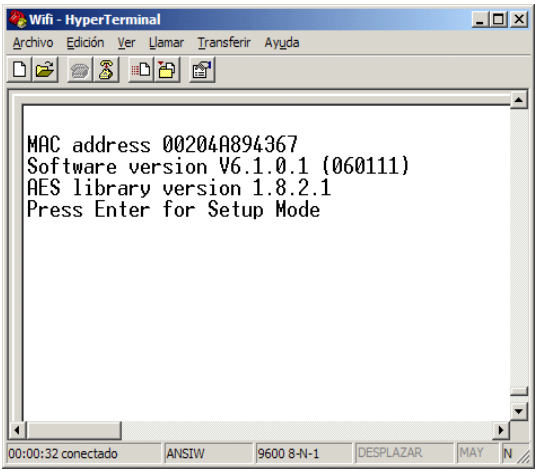
2– Open Hyperterminal.

3– Select the display's parameter 7. See 4.2.1.

4- Push the advance key. (Key 7->5)

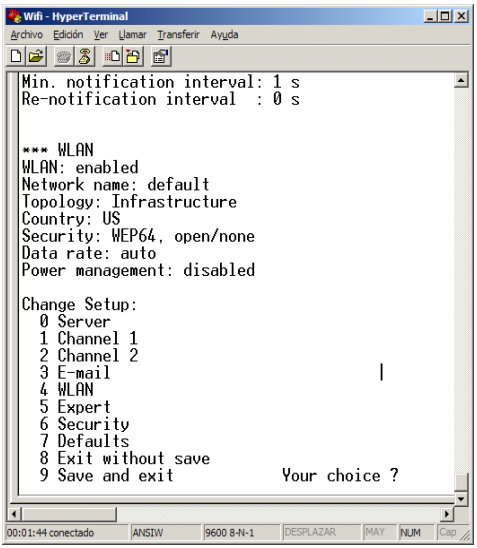
5– Keep pushed the lower case letter **x** before the display counters equals 0. Remain pushing until the right screen is displayed.

The maximum delay since to push the advance key (step 4) until to push x key is 10 seconds.



6– At this time you have **3 seconds** to push the Intro key on your keyboard .

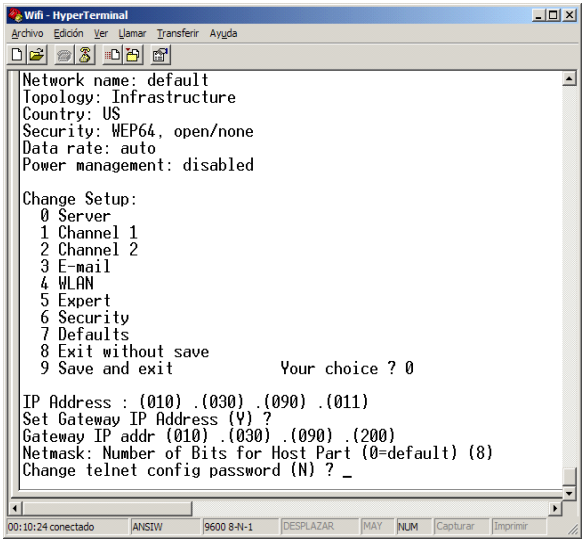
7– The screen on the right is shown.



8– You must set up:

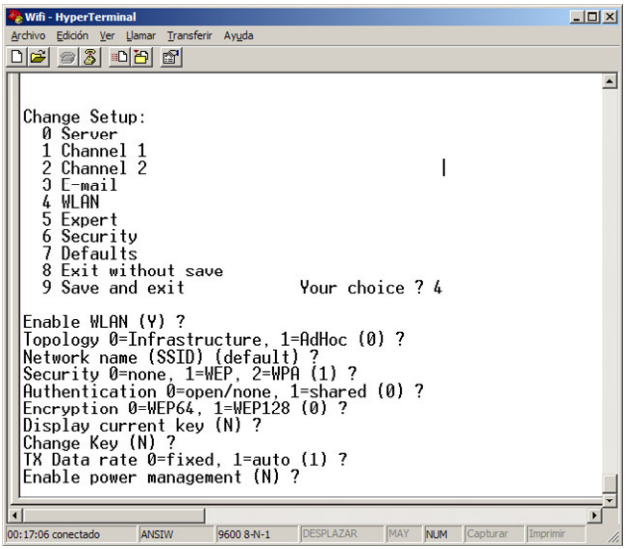
0 Server + Intro

4 WLAN + Intro



Example of Server Set up

Ask your network administrator the IP and Gateway address.



Example of WLAN Set up

Ask your network administrator the correct values

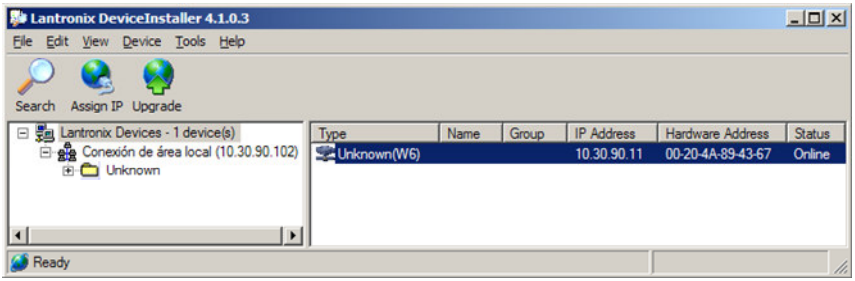
To exit select 8 (Exit without save) or 9 (Save and exit).

4.5 Set up IP address using the DeviceInstaller.

It is also possible to modify the IP address with the DeviceInstaller but this is only possible if the display IP address falls in the computer IP address. 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.
Select: Latest version of DeviceInstaller.
Select to download the product: XPort.

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: 10.30.90.11
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.

4.6 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.
Select: Latest version of DeviceInstaller.
Select to download the product: XPort.

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 section 4.4.

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

STATEMENT OF CONFORMITY

CE

DISEÑOS Y TECNOLOGIA, S.A.
Poligon Industrial Les Guixeres
c/ Xarol 8C
08915 BADALONA Spain

As the builder of the equipment of the **DITEL** brand**:**
Numerical display with series connection.
Model : DN-109NW in all versions.
Model : DN-119NW in all versions.
Model : DN-129NW in all versions.

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

Directive: 73/23/CEE Low Voltage Directive modified by 93/68/CEE.
Standard UNE-EN61010-1 Security in electric equipment.

Directive: 89/336/CEE Electromagnetic Compatibility Directive modified by 92/31/CEE and 93/68/CEE.
Standard UNE-EN 61000-6-4 Generic Emission Standard. Industrial environment.
Standard UNE-EN 61000-6-2 Generic Immunity Standard. Industrial environment.

Badalona, January 10, 2007

Josep Manel Edo
Technical Manager