OPERATION MANUAL

FOR DISPLAYS SERIES

DN-109NP, DN-119NP,

DN-129NP AND DN-189NP

1490K06H

Index

1. INTRODUCTION

The numerical displays for series **DN-109NP, DN-119NP, DN-129 and DN-189NP**, are industrial displays for control by Profibus network. 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-109NP of **57mm** legible at 30m.

DN-119NP of **100 mm** legible at 50m.

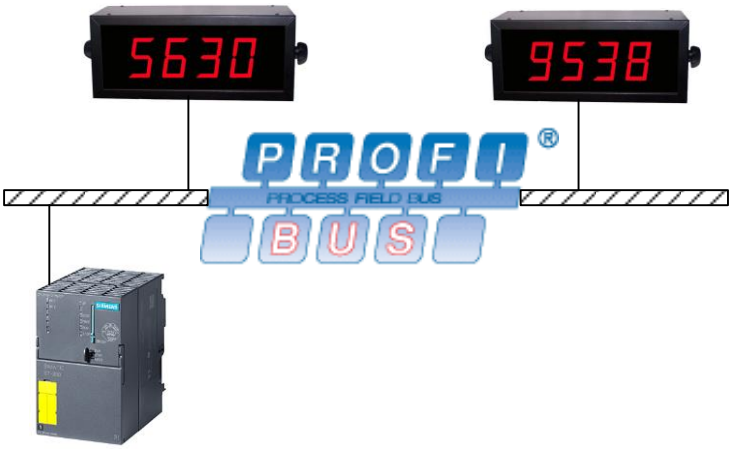
DN-129NP of **250 mm** legible at 120m.

DN-189NP of **180 mm** legible at 90m.

As with other display series, the **DN-109NP, DN-119NP, DN-129 and DN-189**NP 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 Profibus network. They can be used to display Scada program values, counter values from a PLC.



2. GENERAL CHARACTERISTICS.

2.1. Electrical characteristics

2.1.1. Electrical characteristics of the DN-109 displays.

Supply Voltage.....88 to 264 VAC 47 to 63Hz.
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 .....Profibus DP slave.
.....Auto-detection baud rate. Max. 12MHz
Data type .....Integer, real or ASCII code.
Environmental Conditions.....Operation Temperature: -20 to 60ºC.
.....Storage temperature: -30ºC to 70ºC.
.....Humidity: 5-95% RH non condensing.
.....Maximum environmental illumination: 1000 lux.
.....Sealing: IP41 or IP65.

2.1.2. Electrical characteristics of the DN-119 displays.

Supply Voltage.....88 to 264 VAC 47 to 63Hz.
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 .....Profibus DP slave.
.....Auto-detection baud rate. Max. 12MHz
Data type .....Integer, real or ASCII code.
Environmental Conditions.....Operation Temperature: -20 to 60ºC.
.....Storage temperature: -30ºC to 70ºC.
.....Humidity: 5-95% RH non condensing.
.....Maximum environmental illumination: 1000 lux.
.....Sealing: IP41 or IP65.

2.1.3. Electrical characteristics of the DN-189 displays.

Supply Voltage.....88 to 264 VAC 47 to 63Hz.
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 .....Profibus DP slave.
.....Auto-detection baud rate. Max. 12MHz
Data type .....Integer, real or ASCII code.
Environmental Conditions.....Operation Temperature: -20 to 60ºC.
.....Storage temperature: -30ºC to 70ºC.
.....Humidity: 5-95% RH non condensing.
.....Maximum environmental illumination: 1000 lux.
.....Sealing: IP41 or IP65.

2.1.4. Electrical characteristics of the DN-129 displays.

Supply Voltage.....88 to 264 VAC 47 to 63Hz.
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 .....Profibus DP slave.
.....Auto-detection baud rate. Max. 12MHz
Data type .....Integer, real or ASCII code.
Environmental Conditions.....Operation Temperature: -20 to 60ºC.
.....Storage temperature: -30ºC to 70ºC.
.....Humidity: 5-95% RH non condensing.
.....Maximum environmental illumination: 1000 lux.
.....Sealing: IP41 or IP54.

2.2. Display weight and power consumption.

2.2.1. 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

2.2.2. 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

2.2.3. 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

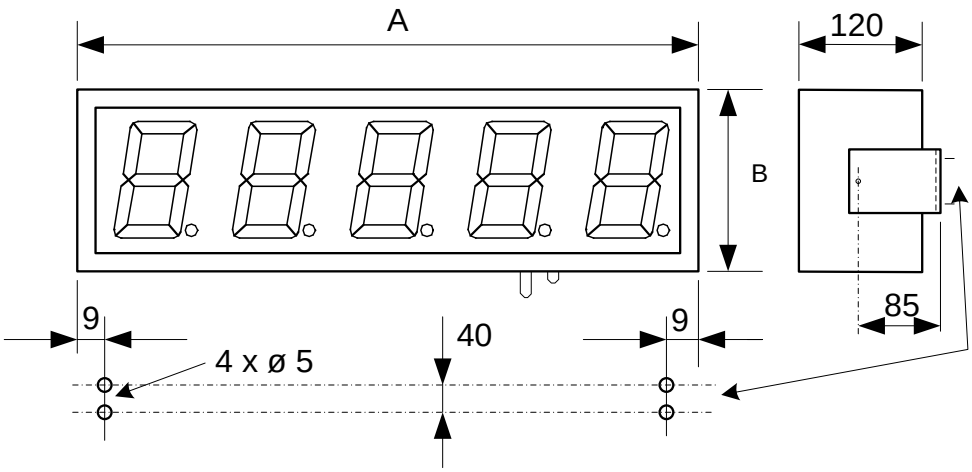
2.2.4. DN-129 weight and power consumption.

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

2.3. Dimensions and mounting of the displays

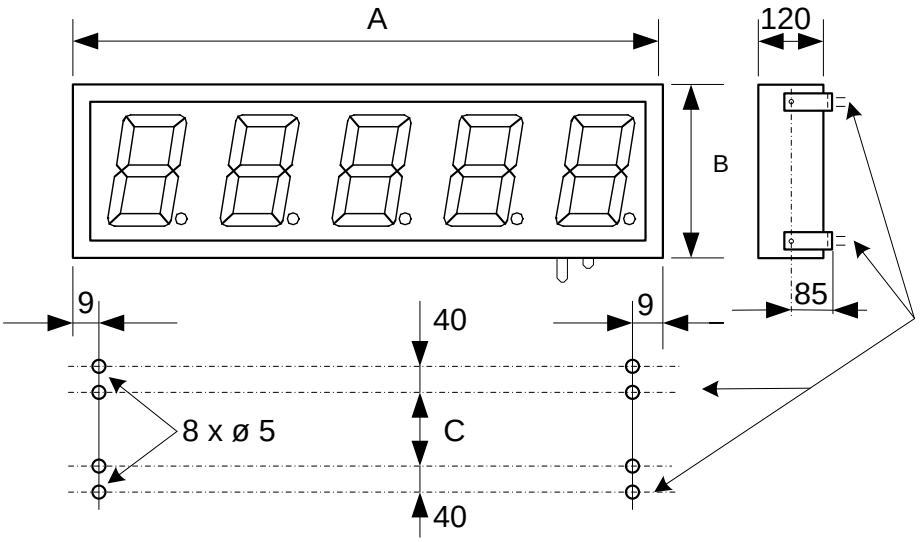
2.3.1. Dimensions and mounting of the DN-109 and DN-119

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



2.3.2. 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



3. INSTALLATION

The installation of the DN-109NP, DN-119NP, DN-129NP and DN-189NP 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-109NP, DN-119NP, DN-129NP and DN-189NP 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-109NP, DN-119NP, DN-129NP and DN-189NP 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.

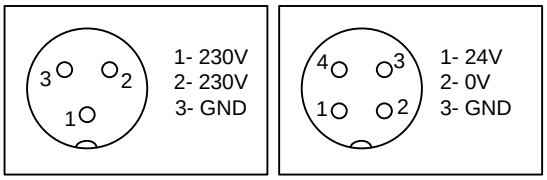
3.1. Power supply.

The power supply must be 88 to 264VAC, 47 to 63 Hz or 24VDC.

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



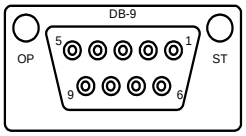
3.2. Connecting to the Profibus line

Profibus line connection is carried out using an DB-9 connector located in the lower part of the unit.

The terminal resistances will be enabled on the ends of the network to adjust network impedance The Profibus connectors include a switch to enable resistances.

Power lines that may generate electrical interference will be avoided where possible on the network layout.

PROFIBUS CONNECTOR



OP : Operation ST : Status

Pin 1 : NC	Pin 6 : +5V Bus Output
Pin 2 : NC	Pin 7 : NC
Pin 3 : **Line B (+)**	Pin 8 : **Line A (-)**
Pin 4 : RTS	Pin 9 : NC
Pin 5 : GND Bus	Case : Shield

4. OPERATION

4.1. Initial reset.

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.

When the Profibus module has been initialised correctly, the ST led will light up green. If the network is configured correctly and the display is connected to the network, the OP led will light up green.

From this point any one of the following three situations may occur:

a) The display receives data from the Ethernet 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. LEDs Profibus module

The Profibus module has two LEDs to indicate the operation and status.

LED OP	Operation	LED ST	Status
OFF	Not online / No power	OFF	No power or not initialized
Green	Online, data exchange	Green	Initialized
Flashing Green	Online, clear	Flashing Green	Initialized, diagnostic event.
Flashing red	Service error	Red	Exception error

In the equipment with IP65 protection degree LEDs aren't accessible. To know the status of Profibus module see ¡Error! No se encuentra el origen de la referencia..

4.3. Programming parameters.

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

1- Display address.
2- Data type.
3- Time without receiving data.
4- Decimal point position.
5- To exit modify parameters.
Only displays with colour option.
6- Define the internal bit r1.
7- Set up the trigger level of internal bit r1.
8- Define the internal bit r2.
9- Set up the trigger level of internal bit r2.
nr- Colour if both internal bits are OFF.
r1- Colour if internal bit r1 is ON.
r2- Colour if internal bit r2 is ON
r3- Colour if both internal bits are ON.
E- 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.

4.3.1. 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, showing the most significant 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.

4.3.2. Exit modify parameters.

In order to exit the sequence for modifying parameters, parameter E must be selected. Then press "*".

4.3.3. Function of each parameter.

4.3.3.1. Parameter 1: Display address in Profibus network

Valid values between 04 and 99.

4.3.3.2. Parameter 2: Data type

Selects the data type used in the communication transfer

Value	Data type
0	Integer
1	Integer hexadecimal
2	ASCII
3	Real

When displaying data of Real type, there can be small differences in the less significant digits between the data in the PLC and the displayed value. This difference is due to the precision of the conversion of each display

4.3.3.3. 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
00	Without time
01	2 s
02	4 s
03	6 s
04	8 s
05	10 s
06	14 s
07	20 s
08	26 s
09	30 s
10	40 s

Code	Time
11	1 min.
12	2 min.
13	5 min.
14	10 min.
15	20 min.
16	40 min.
17	1 hour
18	2 hours
19	5 hours
20	10 hours
21	25 hours

4.3.3.4. Parameter 4: Decimal point position

This parameter fixes the decimal point position

Type = Integer	Type = ASCII	Type = Real
0 = 000000	X	0 = Automatic
1 = 00000.0	X	1 = 00000.
2 = 0000.00	X	2 = 00000.0
3 = 000.000	X	3 = 0000.00
4 = 00.0000	X	4 = 000.000
……	X	……

4.3.3.5. Parameter 5: Profibus status

To display the Profibus network status using the display digits.

Value = 0. Don't display the status.

Value = 1. Display the network status.

Displayed values.

-0- Initializing Profibus module.

-1- Module Profibus iniatlized. Waiting network operation.

-2- Waiting for the Master

-3- Profibus module Stopped

-4- Active process. This starts the data displaying.

-5- and -7- Profibus module error

When Profibus network is working properly, the value sent through the net is displayed.

4.3.3.6. Parameter 6

Colour option displays. See 4.6 "Colour configuration".

4.3.3.7. Parameter 7

Colour option displays. See 4.6 "Colour configuration".

4.3.3.8. Parameter 8

Colour option displays. See 4.6 "Colour configuration".

4.3.3.9. Parameter 9

Colour option displays. See 4.6 "Colour configuration".

4.3.3.10. Parameter nr, r1, r2, r3

Colour option displays. See 4.6 "Colour configuration".

4.3.3.11. Parameter E

Exit modify parameters

Push the key "*" to exit the option modify parameters. Before exiting the parameters are saved.

Push the key "+ until reaching the parameter to be modified to keep on modifying parameters.

4.4. Profibus protocol

In this paragraph, the different protocols will be explained, as well as the programmation 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.

4.4.1. Block structure

4 double words (DW) are sent in each transmission block. Total 16 bytes. The information that the block must contain is different depending on the type of frame programmed in parameter 2. The transmission sequence is started with DW1 byte A and ends with DW4 byte P.

DW1				DW2				DW3				DW4			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

4.4.2. Data type = 0

Display a double integer. (DW). The value to be displayed must be entered in DW1, where A is the most significant byte.

Block examples for a 4 digits display.

DW1				DW2				DW3				DW4			
00h	00h	06h	D8h	X	X	X	X	X	X	X	X	X	X	X	X

Display			
1	7	5	2

DW1				DW2				DW3				DW4			
00h	00h	06h	D8h	X	X	X	X	X	X	X	X	X	X	X	X

Display			
	2	4	6

4.4.3. Data type = 1

Display a double integer in hexadecimal format. (DW). The value to be displayed must be entered in DW1, where 0 is the least significant byte.

Block examples for a 4 digits display.

DW1				DW2				DW3				DW4			
00h	00h	06h	D8h	X	X	X	X	X	X	X	X	X	X	X	X

Display			
0	6	D	8

4.4.4. Data type = 2

Display a string of digits. The value to be displayed must be entered in DW1, DW2 and DW3, where the last valid byte sent will be the one to the right of the display.

Block examples for a 6 digits display. Code in ASCII.

DW1				DW2				DW3				DW4			
35h	36h	37h	38h	39h	00	00	00	00	00	00	00	00	00	00	00

Display					
	5	6	7	8	9

DW1				DW2				DW3				DW4			
35h	36h	37h	38h	39h	31h	32h	33h	00	00	00	00	00	00	00	00

Display					
7	8	9	1	2	3

4.4.5. Data type = 3

Display a real number.

31	30 ... 23	22 ... 0
S	Exponent	Mantisa

$N= (-1)\ S*2^{(Exponent-127)}*1.Mantisa$

The value to be displayed must be entered in DW1, where A is the most significant byte. The real numbers must be in 4-byte IEEE format. Block example for a 6 digits display. 2 decimals.

DW1				DW2				DW3				DW4			
43h	9Ah	C1h	3Dh	00	00	00	00	00	00	00	00	00	00	00	00

Display					
	5	6	7	8	9

DW1				DW2				DW3				DW4			
42h	F6h	14h	7Bh	00	00	00	00	00	00	00	00	00	00	00	00

Display					
7	8	9	1	2	3

4.4.5.1. Valid characters

Numerical displays can only display numbers and some characters.

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	42h
DEC	48d	49d	50d	51d	52d	53d	54d	55d	56d	57d	65d	66d

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	
DEC	80d	114d	85d	117d	32d	44d	46d	45d	22d	39d	40d	

Other orders can be sent

These are the characters for starting and ending blinking digits. The start of blinking must be indicated before the first blinking characters and ,the end, after the last one.

- 08h: Start of blinking
- 09h: End of blinking

4.4.6. Colour option

In the equipment with colour option is possible to set the colour modifying the value of register DW4 in bytes 14 and 15. In byte 14 character X (88d or 58h) must be placed while in byte 15 we will place the colour code.

The valid colour codes are:

Red colour = 0

Green colour = 1

Yellow colour = 2

The value in registers DW1, DW2, DW3 and DW4 bytes 12 and 13 aren't significant.

DW1				DW2				DW3				DW4			
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	X	c

xx: Any value

C: Colour

X: Character X

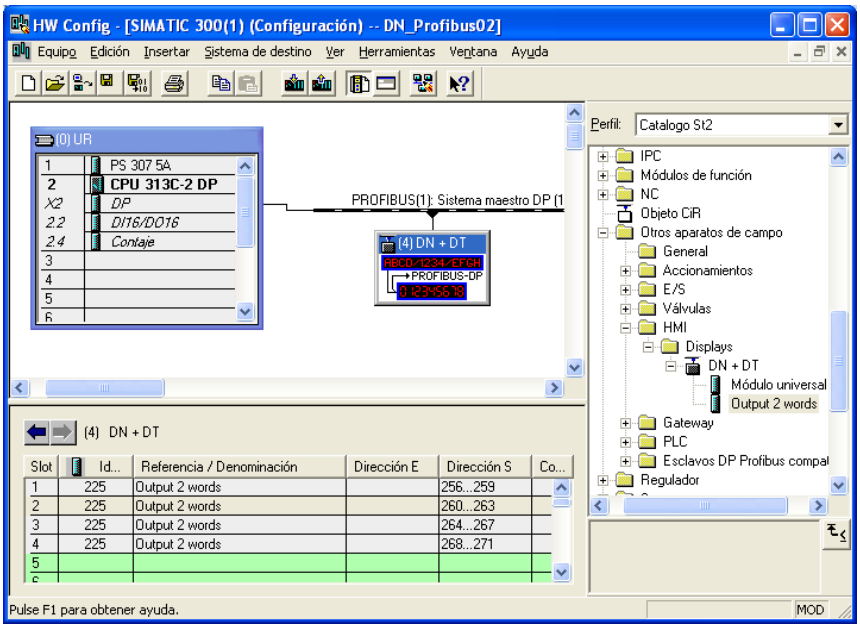
4.5. GSD module installation.

The appropriate GSD module must be installed to communicate with a display. This can be obtained from the website.

Hardware configuration must be selected to install the GSD module. Select "Tools" from the menu, then "Install new GSD file" and follow the instructions.

To install new equipment, drag the module marked as DN+DT to the Profibus bar, assign the unit number on the network (display address) and then add 4 "Output 2 Words" to the new equipment.

The DN+DT Module is valid for both DN-109-119-129 type displays and DT-203-105-110 type displays.



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 6 and 7 are used.

Parameter 6 is used to set up the activation form and delay or hysteresis.

Parameter 7 is used to set up the trigger level. The most significant digit allow setting up a negative value.

Parameter 6			
Left Digit	Control bit	Right Digit	Set/Reset
0	ON if Value > Parameter 7	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 **8** and **9** are used.

Parameter 8 is used to set up the activation form and delay or hysteresis.

Parameter 9 is used to set up the trigger level. The most significant digit allow setting up a negative value.

Parameter 8			
Left Digit	Control bit	Right Digit	Set/Reset
0	ON if Value > Parameter 9	0	No delay / No hysteresis
1	ON if Value < Parameter 9	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.

nr	Colour if internal bits are OFF. To change the colour push * key. Upon pressing + the next parameter is shown.
r1	Colour if internal bit **r1** is ON. To change the colour push * key. Upon pressing + the next parameter is shown.
r2	Colour if internal bit **r2** is ON. To change the colour push * key. Upon pressing + the next parameter is shown.
r3	Colour if internal bits **r1** and **r2** are ON. To change the colour push * 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
6	20
7	0
8	20
9	0
nr	colour
r1	colour
r2	colour
r3	colour

Parameters **7** and **9** 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 G (March 2013).

Updated introduction in 4.4.

Revision H (September 2013).

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

STATEMENT OF CONFORMITY

CE

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

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

Model : DN-109NP in all versions.
Model : DN-119NP in all versions.
Model : DN-129NP in all versions.
Model : DN-189NP 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 2004/108/CEE Electromagnetic Compatibility
Standard UNE-EN 61000-6-4 Generic Emission Standard. Industrial environment.
Standard UNE-EN 61000-6-2 Generic Immunity Standard. Industrial environment.

Badalona, 5th February 2013

Alicia Alarcia
Technical Director