

OPERATION MANUAL
FOR DISPLAYS OF SERIES
DT-203NP, DT-105NP AND DT-110NP

1480K03I



TETRALEC E.I. S.L.
Empresa certificada

Index

1	INTRODUCTION.....	1-1
2	GENERAL CHARACTERISTICS.....	2-1
2.1	Electrical characteristics of the displays.....	2-1
2.1.1	Electrical characteristics of the DT-203 displays.....	2-1
2.1.2	Electrical characteristics of the DT-105 displays.....	2-1
2.1.3	Electrical characteristics of the DT-110 displays.....	2-1
2.2	Display Weight and power consumption.....	2-2
2.3	Dimensions of the displays.....	2-3
3	INSTALLATION.....	3-1
3.1	Power supply.....	3-1
3.2	Connecting to the Profibus line.....	3-2
3.3	Characteristics of temperature & humidity probe. (Option).....	3-2
3.4	Wiring of temperature & humidity probe (Option).....	3-2
3.5	Reset button.....	3-2
4	OPERATION.....	4-1
4.1	Initial Start Up.....	4-1
4.2	Leds Profibus module.....	4-1
4.3	Set parameters.....	4-2
4.3.1	Enter to modify parameters.....	4-2
4.3.2	Exit modify parameters.....	4-2
4.3.3	Function of each parameter.....	4-2
4.4	Memory message programming.....	4-3
4.5	Profibus protocol.....	4-4
4.5.1	Block Structure.....	4-4
4.5.2	Valid characters.....	4-5
4.5.3	DW1 Register.....	4-5
4.5.4	Message and variable management.....	4-7
4.5.5	Variable control register.....	4-7
4.5.6	Register DW1-A = 1. Functions of bytes B, C and D of register DW1.....	4-7
4.5.7	Message text.....	4-8
4.5.8	Register DW1-A = 2. Control commands.....	4-8
4.6	GSD module installation.....	4-9

1 INTRODUCTION

The alphanumerical displays for series **DT-203NE**, **DT-105NE** and **DT-110NE**, are industrial displays for control by Profibus network.

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

One of its main characteristics is the height of the characters:

DT-203NP of **30mm**, readable from up to 15m.

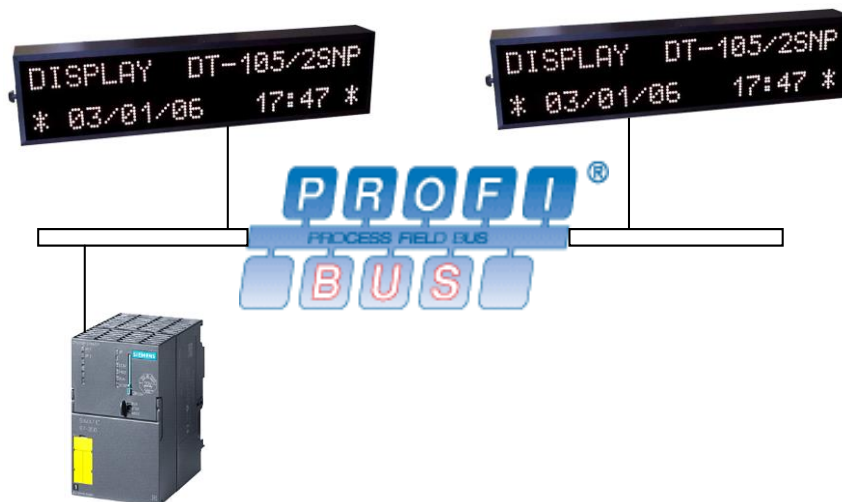
DT-105NP of **50mm**, readable from up to 25m.

DT-110NP of **100mm**, readable from up to 50m.

As with other display series, the **DT-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, warning messages, advertisements.



2 GENERAL CHARACTERISTICS.

2.1 Electrical characteristics of the displays

2.1.1 Electrical characteristics of the DT-203 displays.

Supply Voltage	88 to 264 VAC 47 to 63Hz. Option 24VDC.
Consumption	Read chapter 2.2.
Display	7x5 Dot matrix of 30mm high.
.....	Red Led colour. Visibility 15 meters.
Parameter memory	Eeprom.
Watch calendar	Second / Minute / Hour / Day / Month / Year.
Communication	Profibus DP slave
.....	Auto detection baud rate. Max.12MHz.
Communication protocol	Profibus and TDL. Selection by parameters.
Environmental Conditions	Operation Temperature: -20 to 60°C.
.....	Storage temperature: -30°C to 70°C.
.....	Humidity: 5-95% without condensation.
.....	Maximum environmental illumination: 1000 lux.
.....	Sealing: IP41, IP54 and IP65.

2.1.2 Electrical characteristics of the DT-105 displays.

Supply Voltage	88 to 264 VAC 47 to 63Hz. Option 24VDC.
Consumption	Read chapter 2.2.
Display	7x5 Dot matrix of 50mm high.
.....	Red Led colour. Visibility 25 meters.
Parameter memory	Eeprom.
Watch calendar	Second / Minute / Hour / Day / Month / Year.
Communication	Profibus DP slave
.....	Auto detection baud rate. Max.12MHz.
Communication protocol	Profibus and TDL. Selection by parameters.
Environmental Conditions	Operation Temperature: -20 to 60°C.
.....	Storage temperature: -30°C to 70°C.
.....	Humidity: 5-95% without condensation.
.....	Maximum environmental illumination: 1000 lux.
.....	Sealing: IP41, IP54 and IP65.

2.1.3 Electrical characteristics of the DT-110 displays.

Supply Voltage	88 to 264 VAC 47 to 63Hz. Option 24VDC.
Consumption	Read chapter 2.2.
Display	7x5 Dot matrix of 100mm high.
.....	Red Led colour. Visibility 50 meters.
Parameter memory	Eeprom.
Watch calendar	Second / Minute / Hour / Day / Month / Year.
Communication	Profibus DP slave
.....	Auto detection baud rate. Max.12MHz.
Communication protocol	Profibus and TDL. Selection by parameters.
Environmental Conditions	Operation Temperature: -20 to 60°C.
.....	Storage temperature: -30°C to 70°C.
.....	Humidity 5-95% without condensation.
.....	Maximum environmental illumination: 1000 lux.
.....	Sealing: IP41, IP54 and IP65.

2.2 Weight and power consumption. Exterior option use column h(VA)

Reference	Weight (kg)	Power (VA)	Power h (VA)	Reference	Weight (kg)	Power (VA)	Power h (VA)
DT-105/1S-6	4	12	25	DT-110/1S-6	6,5	12	25
DT-105/1D-6	4	16	46	DT-110/1D-6	7,5	16	46
DT-105/1S-13	5,5	16	46	DT-110/1S-13	10,5	16	46
DT-105/1D-13	6	28	90	DT-110/1D-13	13	28	90
DT-105/1S-20	7	22	68	DT-110/1S-20	14,5	22	68
DT-105/1D-20	8	38	134	DT-110/1D-20	18	38	134
DT-105/1S-26	9	28	90	DT-110/1S-26	19	28	90
DT-105/1D-26	10	50	179	DT-110/1D-26	23,5	50	179
DT-105/1S-33	10,5	34	112	DT-110/2S-6	9	16	48
DT-105/1D-33	12	60	222	DT-110/2D-6	11,5	28	90
DT-105/1S-40	12	38	136	DT-110/2S-13	15	28	90
DT-105/1D-40	14	72	266	DT-110/2D-13	20	50	178
DT-105/2S-6	5	16	48	DT-110/2S-20	21	38	134
DT-105/2D-6	5,5	28	90	DT-110/2D-20	28	72	266
DT-105/2S-13	7	28	90	DT-110/2S-26	27	50	180
DT-105/2D-13	8	50	178	DT-110/2D-26	36,5	92	354
DT-105/2S-20	9	38	134	DT-110/3S-6	12	22	68
DT-105/2D-20	10,5	72	266	DT-110/3D-6	15,5	38	112
DT-105/2S-26	11	50	180	DT-110/3S-13	20	38	136
DT-105/2D-26	13,5	92	354	DT-110/3D-13	27	72	244
DT-105/2S-33	13,5	60	220	DT-110/3S-20	27,5	55	200
DT-105/2D-33	16	115	442	DT-110/3D-20	38,5	105	376
DT-105/2S-40	15,5	72	266	DT-110/3S-26	35,5	72	266
DT-105/2D-40	19	138	530	DT-110/3D-26	49,5	138	510
DT-105/3S-6	5,5	22	68	DT-110/4S-20	34	72	268
DT-105/3D-6	6,5	38	112	DT-110/4D-20	48,5	138	486
DT-105/3S-13	8,5	38	136	DT-110/5S-20	41	88	330
DT-105/3D-13	10	72	244	DT-110/5D-20	58	170	600
DT-105/3S-20	11	55	200	DT-110/6S-20	47,5	105	400
DT-105/3D-20	13,5	105	376	DT-110/6D-20	68,5	204	700
DT-105/3S-26	13,5	72	266	DT-110/7S-20	53,5	120	465
DT-105/3D-26	17	138	510	DT-110/7D-20	78,5	240	820
DT-105/3S-33	16	90	332	DT-110/8S-20	60	140	530
DT-105/3D-33	20,5	170	640	DT-110/8D-20	88,5	280	930
DT-105/3S-40	18,5	105	400	DT-203/2S-20	6	35	----
DT-105/3D-40	24	205	770	DT-203/2D-20	6,5	60	----
DT-105/4S-20	12,5	72	268	DT-203/2S-40	9	60	----
DT-105/4D-20	16	138	486	DT-203/2D-40	10,5	120	----
DT-105/5S-20	14,5	88	330	DT-203/4S-20	7,5	60	----
DT-105/5D-20	18,5	170	600	DT-203/4D-20	9	120	----
DT-105/6S-20	16,5	105	400	DT-203/4S-40	12	120	----
DT-105/6D-20	21,5	204	700	DT-203/4D-40	15	240	----
DT-105/7S-20	18	120	465	DT-203/6S-20	9	90	----
DT-105/7D-20	24	240	820	DT-203/6D-20	11,5	180	----
DT-105/8S-20	20	140	530	DT-203/8S-20	11	120	----
DT-105/8D-20	27	280	930	DT-203/8D-20	14	240	----

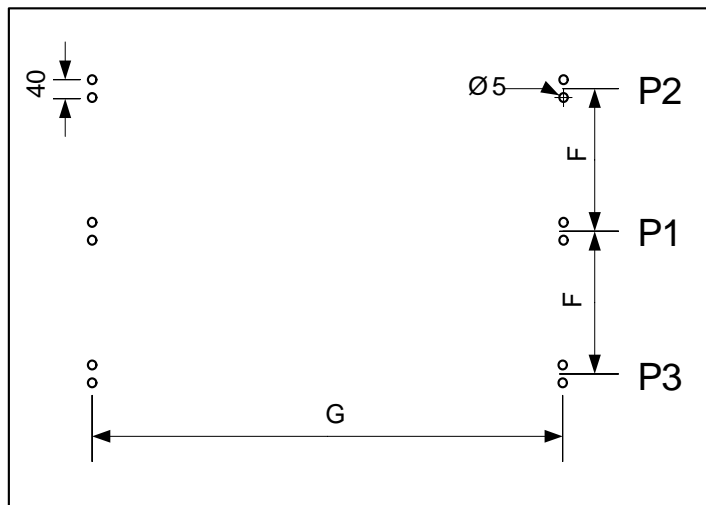
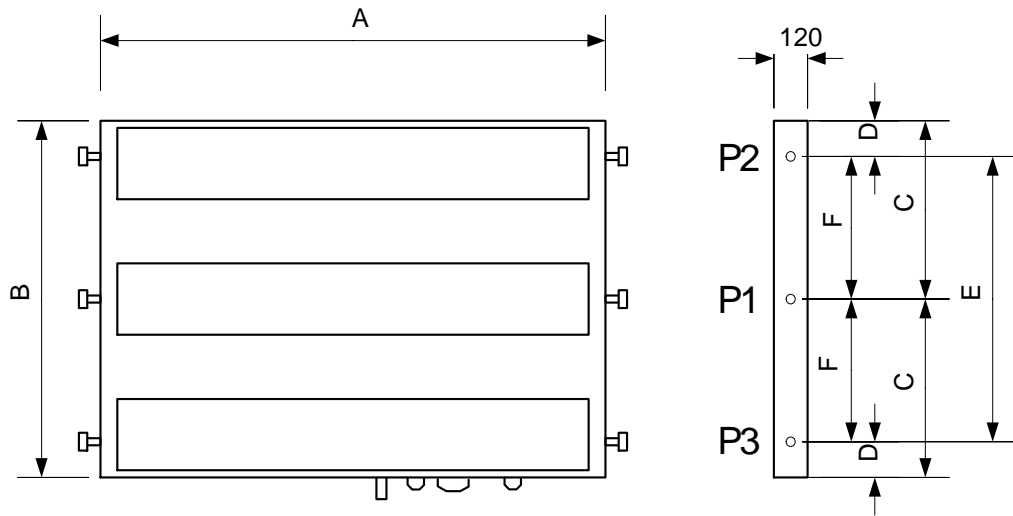
2.3 Dimensions of the displays

	A	B	C	D	E	F	G	P1	P2	P3
DT-105/1S(D)-6	375	118	109	X	X	X	358	O	X	X
DT-105/1S(D)-13	680	118	109	X	X	X	663	O	X	X
DT-105/1S(D)-20	985	118	109	X	X	X	968	O	X	X
DT-105/1S(D)-26	1290	118	109	X	X	X	1273	O	X	X
DT-105/1S(D)-33	1595	118	109	X	X	X	1578	O	X	X
DT-105/1S(D)-40	1900	118	109	X	X	X	1883	O	X	X
DT-105/2S(D)-6	375	230	112	X	X	X	358	O	X	X
DT-105/2S(D)-13	680	230	112	X	X	X	663	O	X	X
DT-105/2S(D)-20	985	230	112	X	X	X	968	O	X	X
DT-105/2S(D)-26	1290	230	112	X	X	X	1273	O	X	X
DT-105/2S(D)-33	1595	230	112	X	X	X	1578	O	X	X
DT-105/2S(D)-40	1900	230	112	X	X	X	1883	O	X	X
DT-105/3S(D)-6	375	338	X	72	186	X	358	X	O	O
DT-105/3S(D)-13	680	338	X	72	186	X	663	X	O	O
DT-105/3S(D)-20	985	338	X	72	186	X	968	X	O	O
DT-105/3S(D)-26	1290	338	X	72	186	X	1273	X	O	O
DT-105/3S(D)-33	1595	338	X	72	186	X	1578	X	O	O
DT-105/3S(D)-40	1900	338	X	72	186	X	1883	X	O	O
DT-105/4S(D)-20	985	436	X	72	292	X	968	X	O	O
DT-105/5S(D)-20	985	542	X	92	358	X	968	X	O	O
DT-105/6S(D)-20	985	648	X	112	424	X	968	X	O	O
DT-105/7S(D)-20	985	754	377	72	610	305	968	O	O	O
DT-105/8S(D)-20	985	860	430	72	716	358	968	O	O	O
DT-110/1S(D)-6	666	177	82,5	X	X	X	649	O	X	X
DT-110/1S(D)-13	1276	177	82,5	X	X	X	1259	O	X	X
DT-110/1S(D)-20	1886	177	82,5	X	X	X	1869	O	X	X
DT-110/1S(D)-26	2496	177	82,5	X	X	X	2479	O	X	X
DT-110/2S(D)-6	666	378	X	80	218	X	649	X	O	O
DT-110/2S(D)-13	1276	378	X	80	218	X	1259	X	O	O
DT-110/2S(D)-20	1886	378	X	80	218	X	1869	X	O	O
DT-110/2S(D)-26	2496	378	X	80	218	X	2479	X	O	O
DT-110/3S(D)-6	666	591	X	80	430	X	649	X	O	O
DT-110/3S(D)-13	1276	591	X	80	430	X	1259	X	O	O
DT-110/3S(D)-20	1886	591	X	80	430	X	1869	X	O	O
DT-110/3S(D)-26	2496	591	X	80	430	X	2479	X	O	O
DT-110/4S(D)-20	1886	805	403	80	646	322,5	1869	O	O	O
DT-110/5S(D)-20	1886	1018	509	80	858	429	1869	O	O	O
DT-110/6S(D)-20	1886	1232	616	80	1072	536	1869	O	O	O
DT-110/7S(D)-20	1886	1445	723	80	1286	643	1869	O	O	O
DT-110/8S(D)-20	1886	1654	830	80	1500	750	1869	O	O	O
DT-203/2S(D)-20	615	177	85	X	X	X	598	O	X	X
DT-203/2S(D)-40	1170	177	85	X	X	X	1153	O	X	X
DT-203/4S(D)-20	615	317	X	72	173	X	598	X	O	O
DT-203/4S(D)-40	1170	317	X	72	173	X	1153	X	O	O
DT-203/6S(D)-20	615	464	X	91	282	X	598	X	O	O
DT-203/8S(D)-20	615	611	X	112	387	X	598	X	O	O

See the draw on the next page

Measures in millimeters. X = Not valid for these model.

P1, P2 and P3: Anchorage point. Used = O. Not used = X. Anchorage holes position on the wall. See valid point (P1, P2 o P3) on the table in the previous page.



3 INSTALLATION.

The installation of the **DT-203**, **DT-105** and **DT-110**, 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 **DT-203**, **DT-105** and **DT-110** 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. The **DT-203f**, **DT-105f** and **DT-110f** are IP54, which mean that are more protected. **DT-203e**, **DT-105e** and **DT-110e** are IP65.

Displays **DT-203**, **DT-105** and **DT-110**, should not be installed in places with illumination level higher than 1000 lux. Neither should the display be placed in direct sunlight as visibility would be lost. Displays **DT-105h** and **DT-110h** can be read in sunlight.

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.

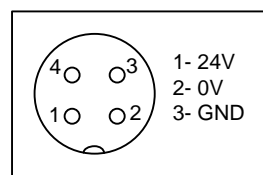
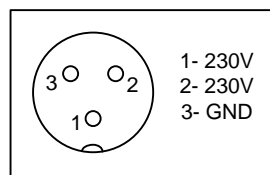
3.1 Power supply.

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

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

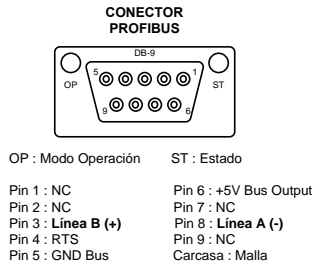
The power supply connector for 24VDC has 4 contacts and is situated in the lower part of the unit. Connect the power wires following the schema below



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.



3.3 Characteristics of temperature & humidity probe. (Option)

Relative humidity

Resolution Typical 1%.
Accuracy $\pm 3,5\%$ between 30% and 70%.
Warm-up time 4s.

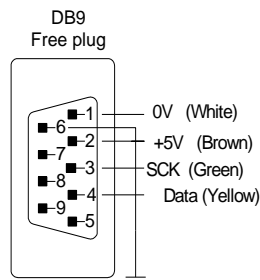
Temperature

Resolution Typical 0,1°C.
Accuracy $\pm 0,5^\circ\text{C}$ at 25°C.
Warm-up time 20s.
Range From -20°C to $+80^\circ\text{C}$.

3.4 Wiring of temperature & humidity probe (Option)

The temperature & humidity probe is delivered with 5m cable and a Sub-D9 connector ready to use.

The wiring of connector probe is shown in the diagram (cable connector).



3.5 Reset button

If the computer has been out of power for many days, the battery may be discharged. If, when the power is restored, the battery is not fully charged, it may be necessary to force the device to be reset. The reset button is next to the power connector. The display must be connected to the power supply for the reset to be operative.

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.

Every time the display is connected to the power supply there is an initial reset, which check all points of the display. After the initial reset the version code is displayed.

Following the initial reset, the display reads the message memory and initialises the messages table. The word "INICI" is shown until the display is prepared to receive messages.

Where 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.

When the initialisation process is finished, the display is ready to receive data. While waiting for the first message the display shows a programmed message on the memory.

Protocol TDL: Display all memory messages.

Protocol Profibus: Display message 0.

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 initialised
Green	On line, data Exchange	Green	Initialised
Flashing Green	On line, clear	Flashing Green	Initialised, diagnostic event present
Flashing red	Service error	Red	Exception error

4.3 Set parameters.

Before using the display the user must set the parameters:
The parameters are:

- 1- Menu language
- 2- Display address
- 3- Protocol.
- 4- Number of register DW.
- 5- Display's date.
- 6- Display's time.
- 7- Level of leds luminosity.
- 8- Test Profibus.
- 9- Connectors position.
- 10- Exit menu.

To set the parameters, the display has a pair of pushbuttons located at the bottom of the case. The menu is in four languages.

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, with the digit flashing.

There are then two options:

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 EXIT it returns to parameter LANGUAGE.

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 EXIT must be selected then press "*".

4.3.3 Function of each parameter.

4.3.3.1 Parameter 1: LANGUAGE or LA.

The language menu. There are four languages available: Catalan, Spanish, French and English.

4.3.3.2 Parameter 2: ADDRESS or AD.

The display address in the Profibus network.
Valid values from 04 to 99.

4.3.3.3 Parameter 3: PROTOCOL or PR

The protocols available are:
PROFIBUS To be used with Profibus network
TDL To program the messages with TDLWin and RS-232 port.

4.3.3.4 Parameter 4: N.REGS DW or DW:

Number of DW registers to be read from PLC.

If the register number is equal 0, the number of registers to be read is indicated in paragraph 4.6. If the register number is greater than 0 it must be equal to the number assigned in the GSD setup.

4.3.3.5 Parameter 5: DATA or DA

Allows you to modify the display date

4.3.3.6 Parameter 6: TIME or TM

Allows you to modify the display time.

The time, with seconds equal to 0, is set at menu exit.

4.3.3.7 Parameter 7: BRIGHTNESS or BRI

Allows you to modify the display brightness. Level 1 is the minimum brightness while level 8 is the maximum brightness.

4.3.3.8 Parameter 8: TEST PROFIBUS or TP

Communications status with the network can be seen

The value 0 does not display the status. The value 1 displays the network status when communications are not possible.

Where the Profibus module has been correctly started but there are no communications with the network, the following is displayed: Profibus = 10 or Pro=10. Any value from Profibus = 0 or Pro=0 to Profibus = 9 or Pro=9 corresponds to the Profibus module start up process. Where the value Profibus = 10 or Pro=10 is not displayed 5 seconds after starting the start-up process, the equipment must be repaired.

4.3.3.9 Parameter POS. CONNECTORS or CON

Selects the power and Profibus connectors' position. Depending on the installation, it may be more convenient for the connectors to come out at the top or at the bottom of the display. This parameter reverses the text if the display is installed in reverse position.

4.3.3.10 Parameter 10: END

To exit modify parameter menu, push advance key ("**").

4.4 Memory message programming

Two forms of communications are possible with the Profibus-DP protocol:

- 1- By sending all the text to be displayed in ASCII format
- 2- By sending the code of a message previously saved on the display.

To use the second method, messages must be saved on the display using a PC and the **TDLWin** program **version 1.5** or above, which allows for messages to be edited, saved and transferred.

This program must also be used to modify the message appearing when equipment starts up is complete (message 0).

To transfer messages to the display, use a cable as indicated in Section 2.7, configure the display parameter **PROTOCOL = TDL** and the TDLWin program: 9600 Bauds, parity even, 8 data bits, 2 stop bits.

In the display model, adjust the one with the same number of lines as the equipment to be programmed.

4.5 Profibus protocol.

4.5.1 Block Structure

The length of the transmission block varies depending on the number of lines on the display. The double word (DW) is the basic block unit. The following table indicates the number of double words (DW) that must be sent, depending on the number of lines. The fact that the display has two sides does not affect the frame because the same message is displayed on both sides.

By means of parameter N.REGS DW the number of registers to be read from PLC may be modified. If N.REGS DW is equal to 0 the number of register to be read follows the table below.

Numbers of lines	1	2	3	4	5	6	7	8
Number of registers	6	11	16	21	21	21	21	21

The way in which the message, the values of the variables or the text is sent is coded in the DW1 register.

1 Line

DW1				DW2				DW3				DW4				DW5				DW6			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	V	W	X	Y

2 Line

DW7				DW8				DW9				DW10				DW11			
E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	V	W	X	Y

3 Line

DW12				DW13				DW14				DW15				DW16			
E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	V	W	X	Y

4 to 8 Line

DW17				DW18				DW19				DW20				DW21			
E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	V	W	X	Y

4.5.2 Valid characters.

Alphanumerical displays can display all the alphabet characters, numbers and some special characters. The table in the next page shows all the valid characters. ASCII code in hexadecimal is used.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1									↑	↓	→	←		.	▲	▼
2		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	↑	←
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	£	¥	½	-	△
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	€	f
A	á	í	ó	ú	ñ	Ñ	ª	º	¿		¬			¡	«	»
B								↓	↑	→	←	→	←	-		
C																
D														=		
E	α	β														
F		±	≥	≤					°							

4.5.3 DW1 Register

This is the most important register as it directs all the other registers in the frame. Each one of the four bytes (A, B, C, D) forming it, has the following function:

DW1-A: Indicates the type of message

DW1-A = 0 To display the text of a message previously saved in the display memory. The number is coded in bytes C and D.

DW1-A = 1 To indicate that the text of the message is sent within the rest of the frame. Maximum 20 characters per line.

DW1-A = 2 The frame sent is a control command. This does not affect the text displayed.

4.5.3.1 Register DW1-A = 0. Function of bytes B, C and D of DW1 register.

If the register DW1-A is equal to 0, the text of a message previously saved in the display memory is displayed using the TDLWin program.

DW1-B: On displays with over 4 lines, an indication must be given as to whether the information on the frame is for the 4 upper lines or the 4 lower.

DW1-B = 0 Data for the 4 upper lines and displays of 1 to 4 lines.

DW1-B = 1 Data for the 4 lower lines. Displays of 5 to 8 lines.

DW1-C: Heavy weight of the message number to be displayed. In hexadecimal

DW1-D: Light weight of the message number to be displayed. In hexadecimal

Example:

Enabling message 24 DW1-C = 0 DW1-D = 18

Enabling message 363 DW1-C = 1 DW1-D = 6B

4.5.3.2 Register DW1-A = 0. Function of registers DW2, DW7, DW12 and DW17

Where the register DW1-A is equal to 0, the registers DW2, DW7, DW12 and DW17 indicate how the variables are managed.

Remember that more or less registers are used depending on the number of lines on the equipment.

For every line on the display, up to 16 variable characters can be managed. Each character is assigned two control bits

	CONTROL		REGISTER WITH THE VALUES			
	DW 2	DW 3	DW 4	DW 5	DW 6	
	DW 7	DW 8	DW 9	DW 10	DW 11	
	DW 12	DW 13	DW 14	DW 15	DW 16	
Variable	DW 17	DW 18	DW 19	DW 20	DW 21	
1	31-30 E	I				
2	29-28 E	J				
3	27-26 E	K				
4	25-24 E	L				
5	23-22 F		M			
6	21-20 F		N			
7	19-18 F		O			
8	17-16 F		P			
9	15-14 G			Q		
10	13-12 G			R		
11	11-10 G			S		
12	9-8 G			T		
13	7-6 H				V	
14	5-4 H				W	
15	3-2 H				X	
16	1-0 H				Y	

Variable 1 is located in the position which is furthest left of the text.

The values of the variables must be coded in ASCII code.

High	Low	Action
0	0	Clear the variable
0	1	Load the variable
1	0	Not modified
1	1	Not modified

4.5.4 Message and variable management

Two types of messages can be managed. Messages without variables and messages with variables.

To display the text of messages without variables, the number of the message must be coded in hexadecimal in bytes C and D of register DW1, with bytes A and B equal to 0.

Example:

In messages without variables, the other registers are not used but must also be configured for the exchange of data with the Profibus network.

See 4.5 GSD module installation.

In messages with variables, the values of the variables must be coded as well as the message code. In displays with 1 to 4 lines, the values of the variables of all the lines can be coded together, although two steps must be taken in displays with 5 or more lines:

1– Code the values of the variables of lines 1 to 4 with DW1-B = 0

2– Code the values of the variables of lines 5 to 8 with DW1-B = 1 Where the display does not have 8 lines, the variables not used are rejected.

Once the values have been loaded, those of one part (lines 1 to 4 or 5 to 8) can be modified without having to modify those of the other (lines 1 to 4 or 5 to 8).

Example:

6-line display. A part counter that is constantly increasing is displayed in line 5. Lines 5 and 6 can be continuously updated without having to update lines 1 to 4.

4.5.5 Variable control register

The variable control register makes variable handling easier. 3 values can be coded for each variable on each line.

Value = 00: Deletes the value of the variable on the display.

Value = 01: Loads the value of the variable in ASCII code.

Value = 10: Does not modify the value of the variable.

Value = 11: Does not modify the value of the variable.

High	Low	Action
0	0	Clear the variable
0	1	Load the variable
1	0	Not modified
1	1	Not modified

4.5.6 Register DW1-A = 1. Functions of bytes B, C and D of register DW1.

If register DW1-A is equal to 1, the text sent in the data registers is displayed. Maximum 20 characters per line.

DW1-B: On displays with over 4 lines, an indication must be given as to whether the information on the frame is for the 4 upper lines or the 4 lower.

DW1-B = 0 Data for the 4 upper lines and displays of 1 to 4 lines.

DW1-B = 1 Data for the 4 lower lines. Displays of 5 to 8 lines.

DW1-C: Not used

DW1-D: Not used

4.5.7 Message text.

The texts of the messages on each line must be in ASCII code in registers DW2 to DW21. Depending on the number of lines on the equipment.

Examples:

1 line display: DW1-B = 0. Data from DW2 to DW6

3 lines display: DW1-B = 0. Line 1 data from DW2 to DW6.
 Line 2 data from DW7 to DW11.
 Line 3 data from DW12 to DW16.

6 lines display: DW1-B = 0. Line 1 data from DW2 to DW6.
 Line 2 data from DW7 to DW11.
 Line 3 data from DW12 to DW16.
 Line 4 data from DW17 to DW21.
 Line 5 data from DW2 a DW6.
 Line 6 data from DW7 a DW11.

DW1-B = 1

4.5.8 Register DW1-A = 2. Control commands.

Using the control commands, the internal clock can be adjusted and the brightness of the leds can be modified.

DW1-B: The type of command is coded in byte DW1-B.

DW1-B = 1C (Hexadecimal) To adjust the internal calendar clock.

DW1-B = 22 (Hexadecimal) To adjust the brightness level of the leds.

DW1-C: Not used

DW1-D: Not used

4.5.8.1 Adjusting the internal calendar clock.

The data regarding the new time and date must be entered in registers DW2, DW3 and DW4 in the following format:

DW 2				DW 3				DW 4			
D	D	Mo	Mo	Y	Y	H	H	Mi	Mi		

D = Day	H = Hour
Mo = Month	Mi = Minute

The values must be in ASCII code.

The clock is updated by resetting the seconds to zero when the frame is received. Although the frame is maintained, the clock is not updated until a change in any of the values is detected.

4.5.8.2 Modify the display brightness

To modify the display brightness use the first byte of DW2 register. The value must be in ASCII code.

The value for the minimum brightness is **1**.

The value for the maximum brightness is **8**.

4.6 GSD module installation.

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

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

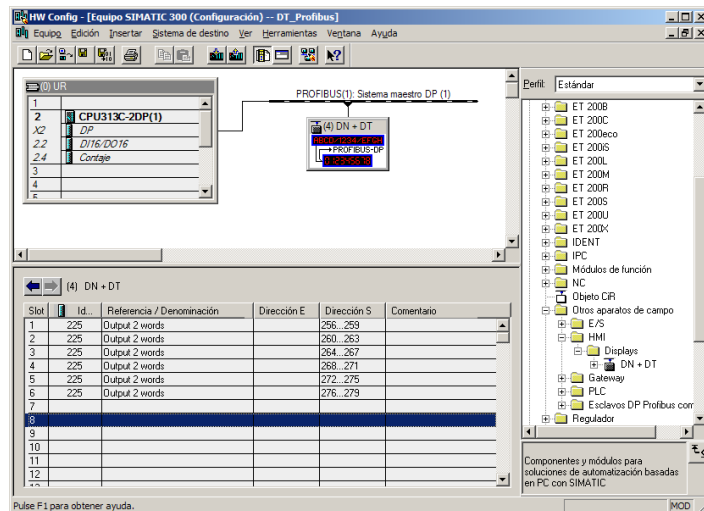
To install new equipment, drag the module marked as **DN+DT** to the Profibus bar, assign the unit number on the network (display address) and then add the communications registers (2 Output words) depending on N.REGS DW value. If parameter N.REGS DW is greater than 0 the number of registers assigned must be equal to the parameter value. If parameter N.REG. DW is equal to 0 the register number must be according to the following table.

Number of lines	1	2	3	4	5	6	7	8
Number of registers	6	11	16	21	21	21	21	21

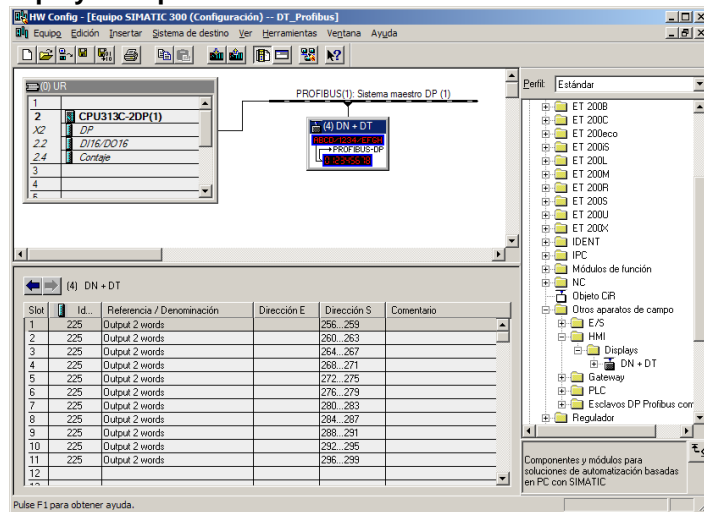
The displays with 4 to 8 lines use 21 registers.

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

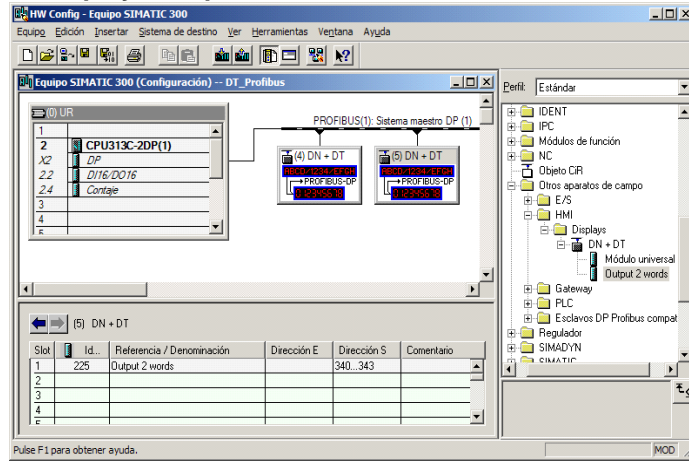
Example of 1 line display with parameter N.REGS. DW = 0



Example of 2 lines display with parameter N.REGS. DW = 0



Example of 1 to 8 lines display with parameter N.REGS. DW = 1



STATEMENT OF CONFORMITY



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

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

DT-203NP in all versions.
DT-105NP in all versions.
DT-110NP 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, February 13th, 2013