

## ALARMS AND MESSAGES DISPLAY

# DISP 2



## User's Manual

Notes:

- Information in this document may be modified without notice.
- For additional information and details contact: **DUENMEGI** srl, via LONGHENA 4 - 20139 MILANO – ITALY - Tel.: 02 / 57.30.03.77 Fax: 02 / 55.21.36.86

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## 1- INTRODUCTION

The displays of **DISP2** family by **DUEMMEGI** are devices allowing to report, in a customized way, messages for controlling purpose in many applications, such as industrial and domestic plants. Thanks to the flexibility of these devices, the displays of **DISP2** family make easy to understand any information related to the occurrence of alarms or events. These devices may be employed in several applications as in the following examples:

- |  |  |
|--|--|
| <input type="checkbox"/> Machinery             | <input type="checkbox"/> Building automation |
| <input type="checkbox"/> Industrial processing | <input type="checkbox"/> Home automation     |
| <input type="checkbox"/> Plants                | <input type="checkbox"/> Alarm signaling     |

DISP2 replaces the old family of messages display made by the models DISP16D, DISP15B, DISP31B, DISP63B, DISP127B and DISP255B. This because DISP2 device may be set by the user for operation with direct inputs (up to 16 messages) or for operation with binary code input (up to 255 messages). Moreover, in respect to the previous family, DISP2 performs several features as listed in the following paragraph.

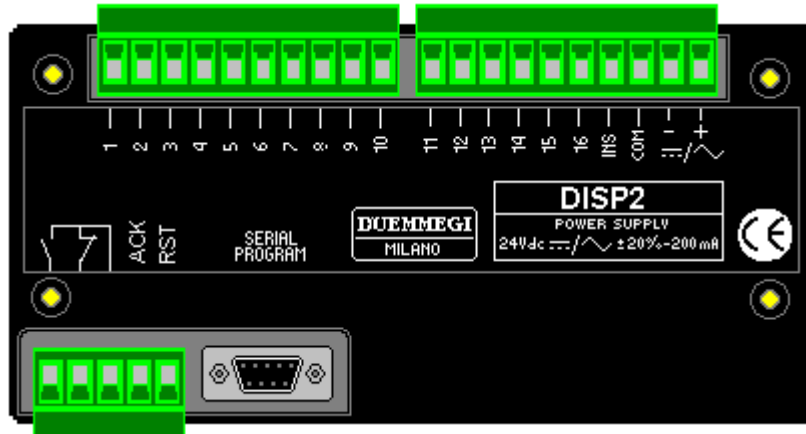
## 2- DISP2: GENERAL CHARACTERISTICS

- |  |  |
|--|--|
| ➤ LCD display 2 x 16 characters with back-lighting                     | ➤ 1 alarm pending message made by 2 lines  |
| ➤ LCD contrast may be adjusted by the button on the front panel        | ➤ Cyclic displaying of more messages; the cycle time may be set by user in the range 1 to 10 seconds           |
| ➤ Message programming by front panel pushbuttons or by PC              | ➤ Events storing (MEM) or current status display (NOMEM)   |
| ➤ Messages and parameters stored into DISP2 memory may be read by a PC | ➤ Events are displayed in chronological order (up to 64); information about the total amount of pending alarms |
| ➤ The inputs may be insulated by internal photo-couplers               | ➤ Internal buzzer for alarm acoustic signaling; the buzzer operation may be disabled                           |
| ➤ 16 messages direct mode or 255 messages binary mode                  | ➤ 2 potential free contacts (internal relays) for additional acoustic/visual signaling (siren and flasher)     |
| ➤ In direct mode each input may be set for NO or NC operation          | ➤ 2 inputs for remote ACK and RESET commands   |
| ➤ Up to 255 messages, each one made by 2 main lines and 2 hidden lines | ➤ Keyboard lock to avoid unwanted operations by unauthorized personnel   |
| ➤ 1 base message made by 2 lines (stand-by message)                    |  |

The firmware of DISP2 device may be updated directly by the user through a PC and the RS232 communication port; this feature allows future developments of the product concerning new functions and possible special versions. For more details about this feature, contact **DUEMMEGI** commercial office.

### 3- CONNECTIONS

The terminals of DISP2 devices have a different meaning depending on the chosen setting among direct and binary mode. The two following tables list the meaning in the two cases.



#### DISP2 set for direct inputs: terminal description

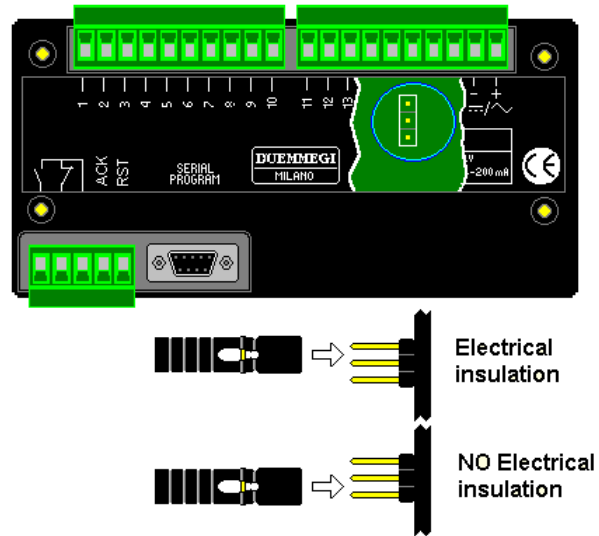
<b>1 – 16</b>	Input terminals: each input is activated applying a positive voltage to the related terminal; if the electrical insulation of inputs is not needed, the COM terminal must be used to supply the inputs (through free potential contacts). The status of each input, to be accepted, must be stable for 50 msec minimum.
<b>INS</b>	This terminal allows the electrical insulation of the inputs (see next paragraph); connect this terminal to 0V of the external voltage source used to supply the input terminals
<b>COM</b>	Positive voltage output to be used as common terminal of the contacts connected to the inputs
<b>SUPPLY</b>	Power supply input: 24 Vac/dc $\pm$ 20% (refer to the shown polarity when supplied by a dc source)
<b>SERIAL PROGRAM</b>	Connector for the serial programming trough a PC
<b>OUTPUT CONTACTS</b>	N.O.: Relay output contact for external alarm device (e.g. siren) N.C.: Relay output contact for external alarm device (e.g. flasher)  <i>Note:</i> since the flasher output is a normally closed contact, then the signaling on the flasher is guaranteed even if the power supply of DISP2 fails.
<b>EXT ACK</b>	Input for remote acknowledgement pushbutton; the external pushbutton must be connected to this terminal and to «COM» (but only if the electrical insulation of the inputs is not needed)
<b>EXT RESET</b>	Input for remote reset pushbutton; the external pushbutton must be connected to this terminal and to «COM» (but only if the electrical insulation of the inputs is not needed)

## DISP2 set for binary code input: terminal description

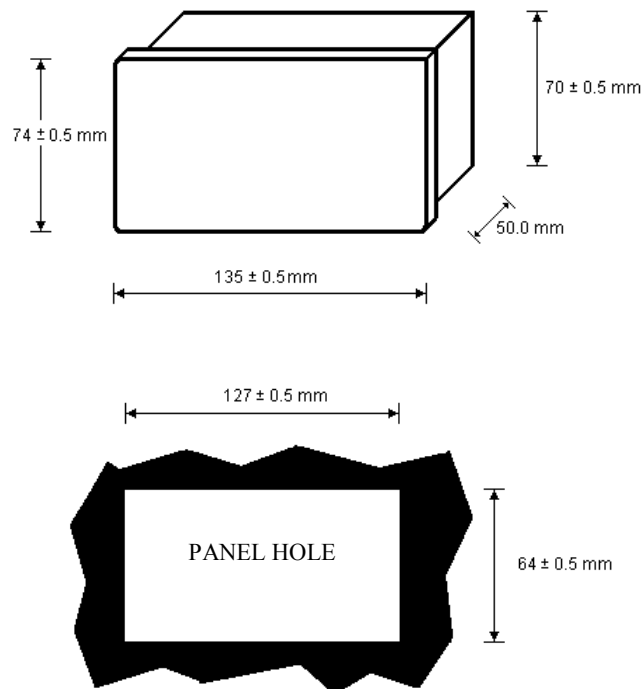
<b>1 – 8</b>	Binary code input terminals: each input is activated applying a positive voltage to the related terminal; if the electrical insulation of inputs is not needed, the COM terminal must be used to supply the inputs (through free potential contacts). Each applied binary code recalls the related message; the less significant bit is terminal 1, the most significant bit is terminal 8. The applied binary code at terminals 1 ÷ 8 will be read by DISP2 when STROBE input is activated. The status of each input, to be accepted, must be stable for 50 msec minimum.
<b>9 STROBE</b>	DISP2 reads the binary code input when this STROBE input is active (positive voltage applied to the terminal)
<b>12 CLEAR ALL + STROBE</b>	Clear the current messages queue when a positive voltage is applied both to this terminal and to the STROBE terminal
<b>13 CLEAR ALL</b>	Clear the current messages queue (regardless of the status of STROBE input)
<b>14 CLEAR ONE + STROBE</b>	At the STROBE activation, the message related to the binary code currently applied to inputs 1 ÷ 8 will be removed
<b>INS</b>	This terminal allows the electrical insulation of the inputs (see next paragraph); connect this terminal to 0V of the external voltage source used to supply the input terminals
<b>COM</b>	Positive voltage output to be used as common terminal of the contacts connected to the inputs
<b>SUPPLY</b>	Power supply input: 24 Vac/dc $\pm$ 20% (refer to the shown polarity when supplied by a dc source)
<b>SERIAL PROGRAM</b>	Connector for the serial programming trough a PC
<b>OUTPUT CONTACTS</b>	N.O.: Relay output contact for external alarm device (e.g. siren) N.C.: Relay output contact for external alarm device (e.g. flasher)  <i>Note:</i> since the flasher output is a normally closed contact, then the signaling on the flasher is guaranteed even if the power supply of DISP2 fails.
<b>EXT ACK</b>	Input for remote acknowledgement pushbutton; the external pushbutton must be connected to this terminal and to «COM» (but only if the electrical insulation of the inputs is not needed)
<b>EXT RESET</b>	Input for remote reset pushbutton; the external pushbutton must be connected to this terminal and to «COM» (but only if the electrical insulation of the inputs is not needed)

### 3.1- Electrical insulation of the inputs

The inputs may be electrically insulated from the DISP2 circuit; to do this, move the internal jumper as shown in the first case of the figure on the right side, and connect the 0 volt terminal of the external supply source to the terminal «INS» of DISP2. If the electrical insulation is not needed, use terminal «COM» to supply the external contacts connected to the inputs, and move the jumper as shown in the second case of the figure. The factory setting of this jumper is for NO electrical insulation.



### 4- OUTLINE DIMENSION



## 5- TECHNICAL DATA

<b>Power supply</b>	24V ~ / $\pm 20\%$
<b>Current consumption:</b> at 24V $\overline{\text{---}}$ at 24V ~	110mA MAX 200mA MAX
<b>Input current (each input)</b>	5mA @ 24V $\overline{\text{---}}$
<b>Allowed voltage on the inputs</b>	12 ÷ 30V $\overline{\text{---}}$
<b>Output contacts:</b> Max switching voltage Max switching current Max operating power	60Vdc or 125Vac 1A 30W dc – 60VA ac
<b>PC interface</b>	RS232C full duplex opto-coupled
<b>Display</b>	LCD with back-lighting
<b>Characters (each line)</b>	16
<b>Lines</b>	2
<b>Characters height</b>	8mm
<b>Number of messages</b>	In direct mode: 16 x 4 lines + 1 x 2 lines (stand-by message) + 1 x 2 lines (pending messages)  In binary mode: 255 x 4 lines + 1 x 2 lines (stand-by message) + 1 x 2 lines (pending messages)
<b>Connections</b>	By removable terminal blocks
<b>Protection degree</b>	Front: IP 53 – Back IP20
<b>Operating temperature</b>	0 ÷ +50°C
<b>Storage temperature</b>	-10 ÷ +70°C

## 6- OPERATING OPTIONS

### DIRECT OR BINARY MODE

DISP2 may be set for two distinct operation modes, each one corresponding to a different handling of the information coming from the inputs as here explained.

16D: the 16 inputs are handled one by one in direct mode; this means that each input is related to a well defined message. The amount of message, in this mode, is 16.

255B: the inputs 1...8 are handled as binary code (input 1 is the less significant bit and input 8 is the most significant bit); this means that each code is related to a well defined message. The amount of message, in this mode, is 255.

The setting of the direct/binary mode can be done *only* by the configuration program DISPTools running on the PC.




### ALARM OUTPUTS



Each message of DISP2 (regardless of direct or binary mode) may be set to cause or less the activation of the 2 centralized alarm outputs (siren and flasher) and of the buzzer (if enabled). In other words, the difference between the two settings only concerns the handling of the two centralized alarm outputs (siren and flasher) and the buzzer (if enabled): a message having the alarm outputs enabled will cause the activation of siren, flasher and buzzer, while a message having the alarm outputs disabled will not cause any action on these devices.

The setting of the ALARM OUTPUTS for each message can be done *only* by the configuration program DISPTools running on the PC.

### DISPLAY CONTRAST

The contrast of the LCD display may be adjusted according to the user preferences. To execute this adjustment, enter in

the DISP2 setting menu pushing down at the same time the buttons  +  +  and move in the menu until

the DISPLAY CONTRAST parameter is reached using the buttons  and . To modify the displayed parameter refer to paragraph 8.1.






The setting of this parameter can be done through the keyboard on DISP2 front panel or by the configuration program DISPTools running on the PC.

## MEMORY OPTION

MEM (memory): the input activation occurrence will be stored; in other words, the related message remains in the queue even if the input has been de-activated.

NOMEM (no memory): the displaying cycle shows the current condition of the inputs; this means that each message will be automatically removed from the queue when the related input is de-activated.

The cyclic displaying occurs both in MEM and NOMEM mode, but in the first case DISP2 shows all messages related to the inputs activated after the last reset, while in the second case DISP2 shows only the messages currently activated.

To modify this option, enter in the DISP2 setting menu pushing down at the same time the buttons  +  +  and move in the menu until the MEMORY OPTION is reached using the buttons  and . To modify the displayed option refer to paragraph 8.1.






The setting of this option can be done through the keyboard on DISP2 front panel or by the configuration program DISPTools running on the PC.

## BUZZER OPTION

BUZZER ON: this option enables the buzzer inside DISP2. This is a global option, because it applies to all messages. The buzzer, if enabled, follows the status of the siren relay.

Note: the buzzer, as for the siren and flasher outputs, will be activated only for the messages that were configured for this function.






BUZZER OFF: this option disables the buzzer inside DISP2 for all alarm messages (but siren will be however enabled).

To modify this option, enter in the DISP2 setting menu pushing down at the same time the buttons  +  +  and move in the menu until the BUZZER OPTION is reached using the buttons  and . To modify the displayed option refer to paragraph 8.1.

The setting of this option can be done through the keyboard on DISP2 front panel or by the configuration program DISPTools running on the PC.

## CYCLE TIME






This parameter identifies the time between the displaying of a message and another one. Allowed values are in the range 1 to 10 seconds, with 1 second step.

To modify this parameter, enter in the DISP2 setting menu pushing down at the same time the buttons  +  +  and move in the menu until the CYCLE TIME is reached using the buttons  and . To modify the displayed parameter refer to paragraph 8.1.

The setting of this parameter can be done through the keyboard on DISP2 front panel or by the configuration program DISPTools running on the PC.

## INPUT LOGIC (for direct mode only):

When DISP2 is set for direct mode operation, the input logic, for each one of the 16 inputs, can be set to normally open logic (O, the message will be shown at the contact closing), or normally closed logic (C, the message will be shown at the contact opening).

To modify this option, enter in the DISP2 setting menu pushing down at the same time the buttons  +  +  and move in the menu until the SET NO/NC option is reached using the buttons  and . The display will show a sequence of 16 symbols "O" and "C (respectively for N.O. and N.C. setting); the first symbol on the left side is referred to input 1, the last symbol on the right side is referred to input 16. To modify the displayed options refer to paragraph 8.1.

The setting of this option can be done through the keyboard on DISP2 front panel or by the configuration program DISPTools running on the PC.

## 7- OPERATION


DISP2 shows for 2 seconds about, at power on, the current setting as here bottom listed:




- on the first line: DISP2, direct (16D) or binary (255B) mode, firmware release (e.g. 1.0)
- on the second line: memory (MEM) or no memory (NOM) mode, buzzer enabled (BZ=ON) or disabled (BZ=OFF), cycle time (e.g. T=2s)



When no messages are pending, the stand-by message is displayed (line 1 and line 2 of the message zero). At the activation of an input, the related message will be recalled from the internal memory and shown on the display (line 1 and 2). This message will be cyclically displayed together to the alarm pending message (line 3 and line 4 of the message zero) with a time period chosen by the user in the range 1 and 10 seconds.

Pushing the button  during the displaying of a message, the line 3 and 4 of the message itself will be shown.









Pushing the button  when one or more messages are pending, it is possible to change between automatic and manual displaying; in manual mode, it is possible to display the previous and the following messages using the buttons




 (next message) and  (previous message). To restore the automatic scrolling of messages push the button .

If another input is activated, the related code will be added to the displaying cycle (queue) and the scrolling is always restored to automatic mode. All pending messages will be displayed in chronological order as they occur. The first message after the alarm pending message is the first occurred event, the next one is the second and so on. The number on the bottom left side in the alarm pending message is the total amount of messages in the queue. DISP2 can store up to 64 messages in chronological order.

### 7.1- Pushbuttons function and keyboard lock

The 6 pushbuttons on the front panel, during normal operation and regardless of the chosen operating mode, perform the following functions:

	ACK: acknowledge, siren silencing and displaying of the first occurred event ("first out")
	Request of queue reset; the confirmation must occur within 3 seconds by pressing the ACK button
	Show next message when the manual scrolling of messages is enabled
	Show previous message when the manual scrolling of messages is enabled
	Switch from the automatic to manual scrolling of messages and vice-versa. DISP2 returns to automatic scrolling at the activation of a new input
	Show the auxiliary lines of the current message (lines 3 and 4 of each message). The displaying of auxiliary lines, in automatic cyclic mode, remains until the cycle time T (set by the user) elapses. During the manual displaying mode, lines 3 and 4 remain on the display until the pressing of button  or 

The keyboard can be locked pushing and holding down the buttons    for at least 3 seconds (display will show "Keyboard Disable" for some seconds). To unlock the keyboard press and hold down the same buttons for at least 3 seconds (display will show "Keyboard Enable" for some seconds).

During the programming mode, these pushbuttons perform other functions; refer to the related paragraph for details.





## 7.2- Centralized alarm outputs and “first out”

As said in a previous paragraph, each message of DISP2 may be set for the activation or less of the centralized alarm outputs (siren and flasher).

If a message has the centralized alarm outputs disabled, then it does not affect the output relays, and the activation of the related input simply will cause the displaying of the message.

If instead a message has this function enabled, then the siren output relay will be energized and the flasher output relay will be de-energized at the activation of the related input (or binary code); this means that both signaling devices will be activated.

To silence the siren press the button  (but the flasher remains activated); the siren will be restarted at the activation of a new alarm not yet inserted in the queue. Every pressing of the button  will cause the displaying of the first message in the queue, that is the first occurred event (“first out”).

To reset the flasher, all alarms in the queue must be removed by the reset sequence (if no more inputs or binary codes are still active).

## 7.3- Messages displaying in MEM or NOMEM modes

If the NO MEMORY mode has been selected (NOM) the displayed messages show, in direct mode, the current condition of the inputs in the chronological order they occurred. In binary mode, instead, the message related to the binary code currently applied to the inputs will be displayed .

If the MEMORY mode has been selected (MEM), the displayed message show the inputs (or binary codes) that have been activated from last reset sequence, in the chronological order as they occurred. This last operating mode is the recommended when handling temporary events.




Note that if DISP2 is set for binary mode, the NOMEM setting should be avoided because, as said above, DISP2 will show only the message related to the currently applied binary code; the NOMEM mode will be instead useful when DISP2 is connected to an intelligent device (e.g. PLC) and DISP2 is used as a “monitor” of the PLC.

## 7.4- Reset of the queue

The reset sequence, in MEM mode, allows to clear the displaying queue; this means that all messages in the queue related to the inputs that are not still active will be removed.

The reset sequence is the following:






- Silence the siren pressing the button 
- Press the button ; DISP2 will display the message as in the figure here shown
- Press the button  within 3 second to confirm the clearing of the queue

If no confirmation occurs within 3 seconds, then the reset sequence will be automatically aborted.

## 8- PROGRAMMING

### 8.1- Manual programming by the panel buttons

The message and parameters programming may be executed by the front panel keyboard of DISP2 or by the program DISPTools running on a PC connected to the display through RS232 port (this last solution is faster and easier).

To enter the programming mode of DISP2, press down at the same time the buttons  +  +  .  
 During the manual programming the display shows the number of the current message and the number of the current line on the first line, and the text of the related message on the second line. First displayed line is 000,0 (message 0 line 0) and it is related to the input logic programming. The parameters and options that can be modified are:

- LCD display contrast
- MEM/NOMEM option
- BUZZER ON/OFF option
- Cycle time for messages scrolling
- NO/NC setting (for direct mode only)
- Messages text







The programming procedure counts two operating modes:

- Search of the parameter or option or message to be modified
- Parameter or option or message edit







These modes can be easily identified because in the edit mode a cursor under the current character to be edited is shown (the cursor is a small line under the character); the cursor is not displayed during searching mode.

**Note:** direct/binary and centralized alarm outputs options cannot be changed from the DISP2 keyboard; these options can be changed by the PC only (see next paragraph).









In the searching mode the pushbuttons perform the following functions:

	Next message or parameter. Hold down this button to quickly scroll forward the searching.
	Previous message or parameter. Hold down this button to quickly scroll backward the searching.
 o 	Enter the edit mode.
 + 	Quit programming.

In the parameter edit mode the pushbuttons perform the following functions:

	Increase the parameter. Hold down this button to quickly scroll forward.
	Decrease the parameter. Hold down this button to quickly scroll backward.
 + 	Save the current parameter and go to searching mode.
 + 	Quit programming without saving.

In the message edit mode the pushbuttons perform the following functions:

	Next character. Hold down this button to quickly scroll forward.
	Previous character. Hold down this button to quickly scroll backward.
	Move cursor to right.
	Move cursor to left.
 + 	Save the current parameter and go to searching mode.
 + 	Quit programming without saving.

## 8.2- Programming by Personal Computer

DISP2 features a DB9 connector to allow the connection to a PC through the RS232 serial port.

The connection cable to be used is of standard type with a 9-way male connector on a side and a 9-way female connector on the other one. The connections between this two connectors are pin to pin (pin 1 to pin 1, pin 2 to pin 2 and so on); all pins must be connected.

The operating parameters, options and messages of DISP2 can be fully programmed by the PC; in addition, the reverse operation can be also performed, so it is possible to read all parameters, options and message stored in the DISP2.

The PC must be equipped with a program named DISPTools and free distributed by **DUEMMEGI**. This program runs in Windows 98, 2000, XP, NT.

For detail on using DISPTools refer to the on line help of the program itself.