CET s.r.l.

MESSAGE DISPLAY

MVMC

Instruction, Use and Installation Manual.

Version 1.2

CET s.r.l. - S.S. 211 Km 53 - 28071 Borgolavezzaro (NO)
Tel. 0321-885180 / 885301 FAX. 885560
Internet address: http://www.cet-italy.com / e-mail: info@cet-italy.com

CONTENTS

1. OVERVIEW

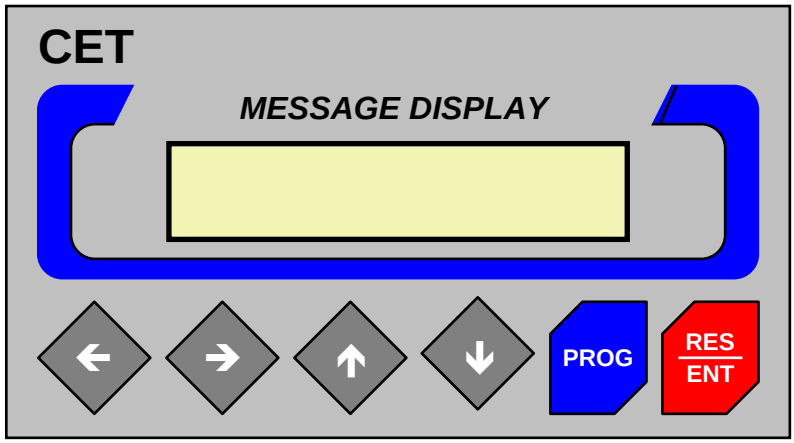
The MVMC Message Display is a diagnostic device which allows visualising and memorising a series of programmed texts by a simple recall either from signals in BINARY or BCD logic or from electro-mechanical contacts.
The input interface can be either in positive (10 - 30 Vcc) or negative logics and can be directly used with all kinds of programmable logics (PLC).
The device is completely programmable through its keys, placed on the front panel.
The possibility of direct modifications of any of its features assures a considerable flexibility of use.

1.1. TECHNICAL FEATURES

POWER SUPPLY	24 Vdc +10% -15%
ABSORPTION	250 mA at 24 VDC
OPERATING TEMPERATURE	(-0 / +45) ℃ (without conden sate)
WEATHER CONDITIONS	U. R. 95% a 40℃ (without conden sate)
VISUALISATION	40 high-luminosity alphanumeric characters (h 5.1 mm), back-lit LCD.
ALARM NUMBER	512 Maximum with BINARY inputs (divided in 4 banks) 199 Maximum with BCD inputs (divided in 4 banks) 16 Maximum with inputs from contacts on MVMC 272 Maximum with inputs from contacts with 8 MVS32 cards
ALARM MEMORY	32 Maximum
INPUTS (POSITIVE OR NEGATIVE LOGICS)	BINARY coded 9 lines + synchronism BCD coded 9 lines + synchronism INDEPENDENT coded 16 lines External Controls: RELAY RESET MESSAGE ACKNOWLEDGMENT MANUAL ADVANCING
INPUT SIGNAL LEVEL	POSITIVE LOGICS 0 = 0 Vdc / 6 Vdc 1 = 10.5 Vdc / 30 Vdc NEGATIVE LOGICS 0 = 0 Vdc / 3 Vdc 1 = 12 Vdc / 30 Vdc
INPUT ABSORPTION	6 mA per input
DEDICATED SERIAL LINE	**RS 232** for text reception/transmission with PC **RS 485** for communication with MVS 32 board
OUTPUTS	**RL1,** 3 working contacts with 2A RATE, resistive at 250 Vac. **RL2,** 3 working contacts with 2A RATE, resistive at 250 Vac.
MEMORY	Non volatile
CONNECTIONS	With extractable terminals
EXECUTION	DIN 72 x 144 x 102
ASSEMBLING	Built-in, fixing with appropriate squares

1.2. FRONT KEYS

6 membrane keys, as shown in the scheme below, are arranged on the device front panel to control all MVMC functions.



➔➔ **CURSORS** for horizontal right or left movement, used to move inside the programming menus; in code programming they move the cursor.

CURSORS for vertical UP or DW movement. Used to scan the alphabet in code programming and to go through the functions of the programming menus. In case of DIRECT or INVERSE DISPLAY, they allow visualising all the memorised alarms. In EDITOR mode, they allow moving through the single alarm messages.

PROG Programming key. This key, if kept pressed for more than two seconds, gives access to the input code programming; if pressed again, it allows to exit the function programming.

RES/ENT: RESET and ENTER key. This key allows confirming the code programming, and any kind of menu programming. It also allows the acknowledgement of the active alarms (if the Set Up is of the SELECTIVE, CONDITIONAL or COMMON ACKNOWLEDGMENT mode) and the disabling of the alarm relays RL1 and RL2 according to the programmed mode.

1.3. FIRST SWITCH-ON OF THE MVMC.

On powering the MVMC, message number 0, recorded in the FLASH memory, will appear on display.

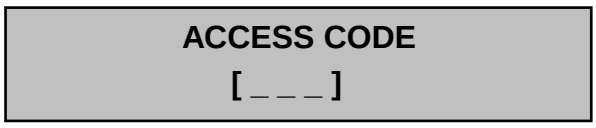
After the first switch-on, the following initial SET UP parameters are programmed:

VISUALIZATION	**DIRECT**
ACKNOWLEDGMENT	**COMMON ACKNOWLEDGMENT**
INPUT MODE	**INDEPENDENT CONTACTS**
INPUT LOGICS	**CLOSED ACTIVE**
CONTACT DEBOUNCE	**0.1 SECONDS**
ALARM SCANNING	**3 SECONDS**
RELAY MODE	**MODE 1**
MENU LANGUAGE SETTING	**ITALIAN**
NETWORK SETTING	**MASTER**

The above-listed parameters and the texts stored in the display can be modified by entering the programming mode.

1.4. PROGRAMMING FROM MVMC KEYPAD

To modify the messages and functions programmed in the display, enter a three-letter PASSWORD.
To modify the set parameters, keep the key **PRG** pressed for at least 2 seconds; the display shows the following:



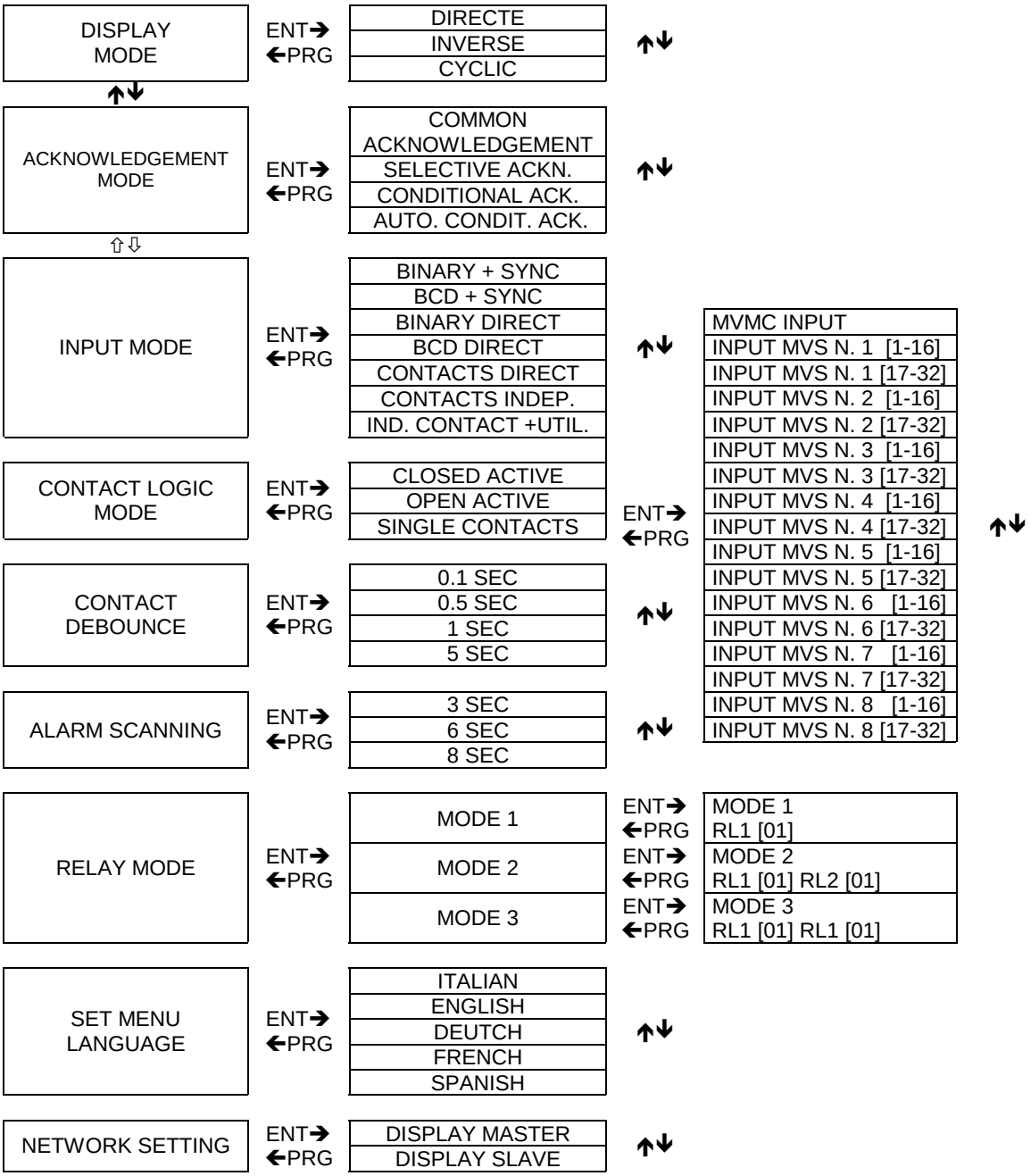
To modify/set the **functions** of **menu 1** enter the **[SYS]** code**.**

To modify/set the **texts** of **menu 2** enter the **[CET]** code**.**

Use the ↑↓ key to scroll the alphabet and the →← keys to move the cursor until the access code is formed.
Press the ENT key to enter the programming menu.

1.5. FUNCTION PROGRAMMING - MENU 1

Enter the **SYS code** to access the programming menu.
The functions present in the programming menu can be represented as a tree structure; the ↑↓ keys allow the vertical movement through various levels while the **ENT** key confirms a specific programming. The functions, selected at any menu level, are visualised as blinking, while the other options that can be selected are visualised as fixed; obviously, for each horizontal level it is possible to program just a single kind of selection.
By pressing the **PROG** key at any moment, you go back horizontally to the previous level; if the key is pressed for at least 4 seconds you exit the programming phase, going back to the normal operating phase, and the changes are saved. If the keys are not used for at least 60 seconds, the display automatically exits the programming mode and all the entered changes will be lost.



1.5.1. VISUALIZATION

It includes all the management modes of the alarm messages. The ACKNOWLEDGEMENT, INPUT MODE and RELAY MODE described below are valid only for the ALARM MESSAGES. The alarm messages are all messages of the active bank, with the exception of no. 0, with a MEM property value [*] MEMORIZE.
The pages WHICH CANNOT BE MEMORISED and other properties are described under chapter 1.6.

1.5.1.1. Direct visualisation

The last alarm is always displayed. The message starts blinking if other alarms present in memory arrived earlier (valid only for INDEPENDENT CONTACTS, INDEPENDENT + UTILITIES, DIRECT and BIN or BCD + synchronism). On passing the 32nd alarm in memory, the first to arrive (i.e. the oldest one) is automatically cancelled. To scan the messages in memory use the arrows ↑↓.

1.5.1.2. INVERSE visualisation

It differs from the previous one only in the fact that it is the first message which has come to be shown on display (i.e. the oldest one)**.** To scan the messages in memory use the arrows ↑↓. If a new alarm arrives and the others are already in the memory, the new alarm is temporarily displayed for 4 seconds.

1.5.1.3. CYCLIC visualisation

The alarms present in memory are visualised one after the other, with a time gap predefined through the function “ALARM SCANNING”.

1.5.2. AKNOWLEDGEMENT

It manages the cancellation (acknowledgement) of the alarms present in memory by means of the RES button or the ACQ input, thanks to the modes programmed in the RELAY MODE (see chapter 1.5.7).

1.5.2.1. COMMON acknowledgement

By keeping the RES key pressed, as programmed in the RELAY MODE, all the alarms in memory are cancelled. While pressing the key the last message visualised remains on display.
After the cancellation, the alarms which are still present on the display inputs are not shown again.

1.5.2.2. SELECTIVE acknowledgement

This function differs from the previous one in the fact that it is just a single alarm at a time that is acknowledged, i.e. the last come.
After the cancellation, the alarms which are still present on the display inputs are not shown again

1.5.2.3. CONDITIONAL acknowledgement

It allows the acknowledgement of all the alarms whose recall command is no longer present at the device inputs on pressing the RES key.
This function is possible only if coupled with the inputs set as INDEPENDENT CONTACTS and INDEPENDENT CONTACTS + UTIL. Its programming involves, in case a different input mode has been set, the automatic setting of INDEPENDENT CONTACTS

1.5.2.4. AUTOMATIC CONDITIONAL acknowledgement

The function is identical to the previous one, but the acknowledgement of the messages whose recall command is no longer present at the device inputs occurs automatically.

1.5.3. INPUT MODE

All the possibilities of use of the inputs are defined in this group. The modes with coded inputs (BINARY or BCD, with or without synchronism) are mainly used with signals coming from PLC or microprocessor controllers, while the modes based on DIRECT or INDEPENDENT inputs are used in the direct connections to electro-mechanical contacts.

1.5.3.1. BINARY + SYNCHRONISM

The input commands are interpreted with binary codification on 9 lines (inputs from **IN0** to **IN8**) and represent the 512 possible addresses to any of which an alarm message is associated.
A further synchronism line activates the address reading. Such signal, corresponding to the **IN9** input, must be of the impulsive kind and last no less than 5msec, with a 25msec pause. The recalled messages are memorised in order, up to a maximum of 32; when this limit is exceeded the last message recalled is kept, and the oldest one is discarded. It is also possible to check the alarm acknowledgement and visualisation from external devices by using the three inputs:

IN13 (ADV)	PRESENT ALARM SCANNING
IN14 (RES)	RELAY RESET **RL1** and **RL2**
IN15 (ACK)	PRESENT ALARM ACKNOWLEDGMENT (The acknowledgement can be either COMMON or SELECTIVE or CONDITIONAL, depending on the parameters fixed in the initial Set Up)

1.5.3.2. BCD + SYNCHRONISM

The input commands are interpreted with BCD codification on 9 lines, with the possibility of recalling up to 199 addresses with an associated alarm.
The synchronism acts as previously described. The recalled messages are memorised as above and the three inputs **IN13**, **IN14** and **IN15** are still available.
When a non-valid BCD address is formed, the following message is displayed: “BCD CODE ERROR”

1.5.3.3. DIRECT BINARY

This function does not allow the message memorising. Only the 9 lines in address binary (from **IN0** to **IN8**), representing 512 possible addresses, all associated to an alarm message, are taken into account in input, and the message is directly visualised. All acknowledgement functions are ignored; the alarm message remains on display as long as its relevant binary value is on the inputs.

1.5.3.4. DIRECT BCD

This function does not allow the message memorising. Only the 9 lines in BCD (from **IN0** to **IN8**), representing 199 possible addresses, all of them associated to an alarm message, are taken into account in input, and the message is directly visualised. All acknowledgement functions are ignored; the alarm message remains on display as long as its relevant BCD value is on the inputs.

1.5.3.5. DIRECT [16 on MVMC + 256 inputs on MVS32]

As in the two previous cases, there is no message memorisation and the acknowledgement functions are ignored. The 272 inputs (16 on MVMC and 32 x 8 on MVS) are cyclically read and displayed as programmed in the VISUALIZATION MODE. More details on the MVMC connection with the MULTIPLEXER MVS32 boards and their programming are provided in chapter 5.

1.5.3.6. INDEPENDENT [16 inputs on MVMC + 256 inputs on MVS32]

The device interprets the 272 inputs (16 on MVMC and 32 x 8 on MVS) as 272 independent lines by associating the relevant alarm message to all of them. The device memorising capacity is limited to a maximum of 32 alarms.
Each input line is considered as impulsive (with a programmable minimum recall time thanks to the DEBOUNCE function) i.e. the message is activated only by the variation (from rest to active) of the relevant input. In this case all messages are memorised

1.5.3.7. INDEPENDENT + UTILITIES [13 MVMC contacts] and [13 MVMC + 256 MVS32 contacts]

This function is identical to the previous ones; the only difference is the different function of the last three local inputs (i.e. **IN13**, **IN14** and **IN15**) on the MVMC. They no longer correspond to alarm inputs but to the three specific functions:

- **IN13 (ADV)** PRESENT ALARM SCANNING
- **IN14 (RES)** RELAY RESET **RL1** and **RL2**
- **IN15 (ACK)** PRESENT ALARM ACKNOWLEDGMENT

1.5.4. CONTACT LOGICS

Usually, when working with electro-mechanical contacts, it is important for the alarms to be enabled when the relevant contact is closed or opened.
This programming becomes very important, i.e. the individual inputs can be programmed as OPEN ACTIVE or CLOSED ACTIVE.

1.5.4.1. OPEN ACTIVE CONTACTS

The OPEN CONTACT is considered as significant, i.e. the device sets itself to operate with NORMALLY CLOSED inputs and to enable the alarm when they OPEN.

1.5.4.2. CLOSED ACTIVE CONTACTS

The CLOSED CONTACT is considered as significant, i.e. the device sets itself to operate with NORMALLY OPEN inputs and to enable the alarm when they CLOSE

1.5.4.3. SINGLE CONTACTS

In this programming mode, the CLOSED ACTIVE or OPEN ACTIVE mode can be selected for any input. This programming is valid for **both the MVMC and the 8 connected MVS**. The device on which the individual inputs, MVMC and MVS, must be programmed is selected when entering the following menu, by displaying 16 inputs at a time. Therefore MVMC displays its 16 inputs, MVS 1 displays the first 16 inputs, MVS n.1 displays the remaining 16 inputs from 17 to 32 and so on up to the MVS no. 8, with 16 displayed inputs. The inputs are displayed as follows: **0 for the ACTIVE OPEN contact** and **1 for the ACTIVE CLOSED contact, and can be modified using the ↑↓arrow keys.**

1.5.5. CONTACT DEBOUNCE

When electro-mechanical contacts are used, the DEBOUNCE time can be programmed, i.e. the time during which the contact must be stable (CLOSED or OPEN) in order to be detected. The following time periods are available:

0.1 second 0.5 seconds 1 second 5 seconds

1.5.6. ALARM SCANNING

Thanks to this programming, the display automatic scanning time can be selected for all the memorised messages.
The available times are:

3 seconds 6 seconds 8 seconds

1.5.7. RELAY MODE

The operation mode of the two relays RL1 and RL2 can be programmed when an alarm is recalled. **3 operation modes** are available:

MODE 1: RL1 timed, RL2 alarm presence.

When a new alarm is recalled from outside, the relay RL1 is enabled for a period of time, to be programmed from 0 (**continuous**) to 99 seconds.
By selecting the **continuous** option (0), the RL1 relay remains energised until the RES button is pressed or the RESET command is given by an external contact (**IN14**). This reset mode can also be applied when the RL1 energising time has already been programmed.

MODE 2: RL1 timed, RL2 timed.

When programming the alarm messages from MVMC or WINTEXT, the relay to be enabled can be programmed for any alarm. Therefore the enabling time of the relays RL1 and RL2 can be programmed by following the same method of MODE 1 for the relay RL1.
Press the RES button once to reset the relays RL1 and RL2; press it again to acknowledge the alarm message.

MODE 3: RL1 timed, RL2 timed.

RL1 RL2 operate as MODE 2, but the RES key operation is different. Press it once to reset the relay RL1, press it again to reset RL2; if you press it three times, the alarm message is acknowledged.

NOTE: the relays are enabled only if messages, programmed as messages which can be memorised, are recalled (see chapter 1 .6).

1.5.8. MENU LANGUAGE SETTING

The display messages can be shown in one of the following languages: ITALIAN, ENGLISH, GERMAN, FRENCH, SPANISH.

1.5.9. NETWORK SETTING

The display can run as MASTER or SLAVE in the network configuration. Up to 8 MVMC's can be used, **only one is the MASTER, while all the others work as SLAVE**, and 8 MVS's. The MASTER display manages the network and controls the MVS and network parameter programming.

1.6. ALARM TEXT MODIFICATION - MENU 2

The alarm messages can be created or modified without using the PC program, but using this function.
Enter the **"CET" code** to access the programming menu.
The menu 2 has a tree structure, similar to the menu 1 structure; the sub-menus SET BANK and PAGE EDITOR can be selected from the main branch by using the UP and DOWN arrow keys.
Press ENT to open the selected sub-menu, press PROG to close the sub-menu and go back to the main branch.
At any menu level, if the PROG key is kept pressed for more than 2 seconds, the system goes back to the normal operation and all changes (with the exception of the texts and page properties, which are immediately saved after entering them) are saved in the eeprom memory of the display.
The first displayed sub-menu is SET BANK, which can be used to select and enable the current message bank.
The display can store as many as 512 different messages: the message memory can be divided into 1-4 different banks thanks to WINTEXT.
The memory is divided into banks when different versions, with messages in different languages, must be created within the same project.

Example:
bank 1 Italian messages,
bank 2 French messages, etc...

The messages are saved in the display and the various languages can be quickly recalled by the user, without loosing the alarm buffer content.
If the memory is divided into banks, the number of messages per bank will be reduced according to the following table:

1 bank 512 total messages (from no. 0 to no. 511)
2 banks 256 messages per bank (from no. 0 to no. 255)
3 banks 170 messages per bank (from no. 0 to no. 169)
4 banks 128 messages per bank (from no. 0 to no. 127)

The recalled messages are included among the ones memorised on the selected bank. The display shows the system message when the recalled message number is higher than the max. number of messages available on the bank .

PAGE OVER 180 RANGE

example: the message 180 of a 3-bank project was recalled.
When the ENT key is pressed, the number of the active bank and the number of banks blink on the second line.

(e.g.: Active bank no. 1 out of 2 banks)

Press the UP and DOWN keys to enable a new bank among the available ones.
Press the ENT key to enable the selected bank.
Press the PROG key to go back to the main branch.

NOTE: No new banks can be created from the MVMC menu, but a bank, among the ones created with WINTEXT, can be selected and enabled.

Use the UP and DOWN arrow keys to select the PAGE EDITOR sub-menu from the main branch and edit the page text and properties in the active bank.
Press ENT to open the sub-menu; the following is displayed:

PAGE [000] OUT [n]
MEM [ ] PRN [ ]

The cursor on the selected page number.
Press the UP and DOWN arrow keys to select the page to be edited.

NOTE: Keep the UP DWN keys pressed for more than 2 seconds to enable the SELF-UPDATE function of the page number (one-step change).
After 10 consecutive updates, the self-update will continue at 10-step intervals. This function is enabled after releasing the key.

Press the LEFT and RIGHT keys to select the OUT [n] MEM [ ] PRN [ ] property fields of the selected page.
The properties are described below. Press the UP DWN keys to change the properties.
Press the ENT key with the cursor on any property field; the properties are immediately enabled and saved in the memory and the cursor goes back to the page selection field PAGE [000].

NOTE: The page properties can be modified by using the LEFT and RIGHT keys; press ENT to confirm them at the end of the change procedure.

With the cursor in the page selection field, press ENT to access the selected page text editor.
The text of the selected page is displayed, with the cursor in the upper left-hand position

Use the LEFT and RIGHT arrow keys to move the cursor inside the page.
Use the UP and DOWN arrow keys to scroll the ASCII characters.
Press the ENT key to save the text changes and go back to the PAGE EDITOR sub-menu
Press the PROG key to go back to the PAGE EDITOR sub-menu, without saving the text changes.

1.6.1. PAGE PROPERTY DESCRIPTION

The page properties define some events which are enabled by the display when the page is recalled. The page property values are individually set in the various banks and DO NOT HAVE ANY MEANING FOR PAGE 0.

1.6.1.1. OUT [n]

It is used to select the relay to be enabled when the page is recalled; the following options are available: **n=no relay, RL1 and RL2**. This property is enabled only in the relay 2 and 3 modes.
The default value on WINTEXT and on the display is OUT [n] (none)

1.6.1.2. MEM [*]

It defines whether the page is memorised in the alarm buffer. If enabled, an asterisk is shown (THE PAGE CAN BE MEMORISED). The default value on WINTEXT and on the display is MEM [*] (active).

The messages which can be memorised are those messages that, when recalled, are stored and kept in the alarm buffer; they are acknowledged according to the function menu programming (SYS).

The messages which cannot be stored are meaningful ONLY with an INDEPENDENT input mode or IND. + UTIL. When the corresponding input is enabled, the message is inserted in the alarm buffer and displayed according to the visualisation mode programming.
When the corresponding input is disabled, the message is automatically removed from the alarm buffer and from the display.
The messages which cannot be memorised can normally enable the relays and be printed.

If alarms which can or cannot be memorised are present on the buffer, the alarms which CAN be memorised can be manually acknowledged according to the function menu programming, while the messages which CANNOT be memorised can be manually acknowledged but in fact are automatically acknowledged when the input is disabled.

1.6.1.3. PRN [ ]

It defines whether the text is printed by the serial printer ST 42 when the page is recalled.
The default value on WINTEXT and on the display is PRN [ ] (not active).
The text CAN ALWAYS BE PRINTED if the system is equipped with MVS32 cards.
The following limitations exists when the MVS32 cards are present:
When the printer is connected to the MASTER display, the communication with the MVS32 cards is blocked; if the pages which can be printed are recalled when the printer is NOT present, the communication with the MVS32 cards is temporarily slowed down.
The messages recalled by the cards MVS32 can be printed by connecting a SLAVE display to the network and the printer to the serial port of the SLAVE.

1.7. DIAGNOSTICS - MENU 3

The menu 3 (diagnostics) can be used to set the display in a diagnostic mode whereby 4 different tests can be carried out to check the correct operation of the MVMC, the MVS32 cards and the system they are installed on.
To enter the diagnostic menu, enter the **DBG code**. The diagnostic menu has a circular structure; press the ENTER key to move from one test to the following.
When in diagnostic mode, the display ignores the contact logic programming, e.g. OPEN / CLOSED / INDIVIDUAL and the debounce time programming; all the detection, alarm memorisation, relay enabling and reset operations are disabled; the relays are disabled and the MVS32 cards are enabled.
When the diagnostic mode is abandoned, the display goes back to the previous conditions and if alarms were present in the memory, they are shown again. The first displayed test is the firmware release.

Test no. 1:
The display shows the firmware release:

firmware release
MVMC 04/2001 v1.00

When in test no. 1, keep the PROG key pressed for at least 2 seconds to leave the diagnostic mode and simultaneously execute the WATCH DOG circuit test.
Press the ENTER key to move to the test no. 2.

Test no. 2:
The display executes the keyboard and relay operation test.

Keyboard-relay test
[ENTER]

By pressing the keyboard keys one at a time, the number of the pressed key is displayed.
The LEFT and RIGHT arrow keys also enable the relays RL1 and RL2
Press the ENTER key to move to the test no. 3.

Test no. 3:
The display executes the physical check of the 16 local contacts in real time and all the MVS32 card inputs are tested in groups of 16.
This test also verifies the correct communication between the MVS 32 cards and the display.
The first line shows the 16 inputs being tested while the second line shows the test result.

MVMC INPUTS [1-16]
0000000000000000

The values 0 and1 correspond to the OPEN (0) and CLOSED (1) contact, respectively.
The first number on the left is the state of the input 1 of the selected group, while the last number on the right is the input 16 state.
Use the UP DWN arrow keys to assess the input state, in groups of 16, and the state of the inputs of all the MVS 32 cards of the system.
Example:

INPUT. MVS 1 [17-32]
0000000000000010

Test of inputs from 17 to 32 of MUS no. 1 with input 31 CLOSED

If an MVS 32 card is not on the system or does not correctly communicate with the MVMC display, the following is shown

INPUT MVS 3 [1-16]
off line

Press ENTER to move to test no. 4.

Test no. 4:
The display tests the LCD display by scrolling all the ASCII characters of the display.
It can also be useful to identify the available fonts (Cyrillic or katakana) of the display.

Press the ENTER key to go back to the test no. 1.

2. DEVICE PROGRAMMING FROM THE PC

The **Functions** and **Texts** of all the displays of this series can be programmed through a serial line, using a Personal Computer. The displays must be energised during the programming stage.

2.1. PROGRAMMING FROM PERSONAL COMPUTER

The WINTEXT software package is needed. Thanks to a guided logic menu, the necessary messages can be created and the functions programmed.
The serial lines of the Personal Computer and display must be connected as shown in the drawing to transfer the program.
The display must be de-energised when the cable is connected between the PC and display.
When the devices are connected and energised, the display shows the following message “WAITING FOR TX/RX COMMAND”; when the PC transmission starts, the display shows the message “MEMORY CANCELLATION ” while the previously programmed data are cancelled. When the cancellation stage is over, the PC program starts the transmission and the first line of the display shows “RECEIVING PROGRAM”; the second line shows the current state.
When the transmission process is over, the message “PROGRAMME RECEIVED OK” is displayed. If the programme was not successfully received or is incomplete, the display shows: “RECEPTION NOT OK ”. In such a case, make sure that the project created with the WINTEXT programme is suitable for the MVMC.
These messages are displayed until the programming cables is disconnected from the serial port of the display or the programming is tried again.

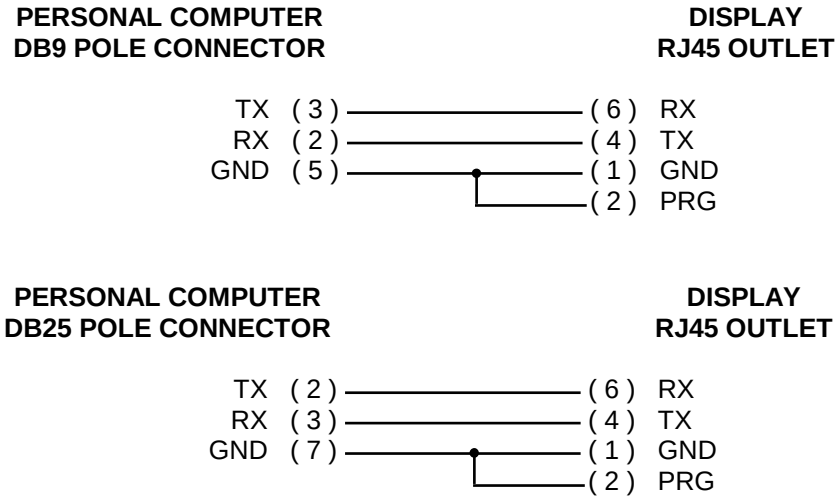
NOTE: Make sure that the display and PC have an equi-potential supply, i.e. they have the same grounding reference (the display has an external power supply); power differences may damage the serial ports.

2.2. TRANSMISSION TO PERSONAL COMPUTER

The texts and functions of the display can be re-transmitted to a Computer which has the WINTEXT software package in order to be filed or modified.
The Personal Computer and display serial lines must be connected as shown in the drawing to execute the programme transfer.
When the two devices are connected and power is supplied to them, the display shows the message: “WAITING FOR TX/RX COMMAND”; when the reception is enabled from the PC, the first line of the display automatically shows: “PROGRAMME TRANSMISSION ”, while the second line shows the current status.
When the transmission process is over, the following message is displayed: “PROGRAMME TRANSMISSION OK”. If the programme was not successfully received or is incomplete, the display shows: “TRANSMISSION FAILED”. In such a case, check the cable and the WINTEXT programme options.
These messages are displayed until the programming cables is disconnected from the serial port of the display or the programming is tried again.

NOTE: Make sure that the display and PC have an equi-potential supply, i.e. they have the same grounding reference (the display has an external power supply); power differences may damage the serial ports.

2.3. PC / DISPLAY CONNECTION

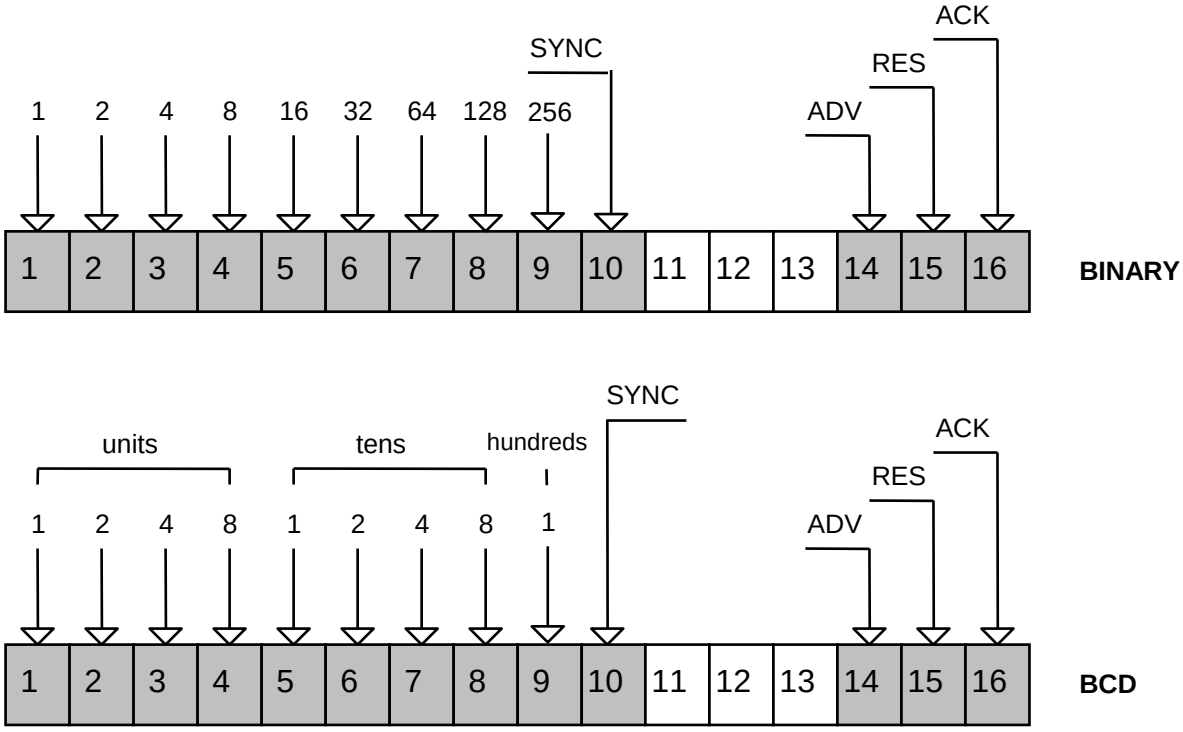


3. DESCRIPTION OF OPERATION

When the device is fully programmed, its operation is quite simple and in any case related to its programmed features. When the input signals are given according to the correct logics, the relevant coding message is recalled and displayed.
If the selected functions do not have memory features (DIRECT BINARY and BCD, DIRECT CONTACTS), the input signals will be considered fixed and if they are removed, the corresponding message will be removed from the display, too.
If the programming includes memorisation features (BINARY and BCD + SYNCHRONISM, INDEPENDENT CONTACTS), the inputs are coded with the corresponding message (i.e. the inputs are considered as impulsive) and the visualisation can be cancelled only as a result of the operator's ACNKOWLEDGEMENT.
The programmed MESSAGE NUMBER 0 text is displayed when no external commands or memorised display messages are present.

3.1. INPUT CONFIGURATION AND SPECIAL OPERATION

3.1.1. BINARY OR BCD INPUTS WITH SYNCHRONISM

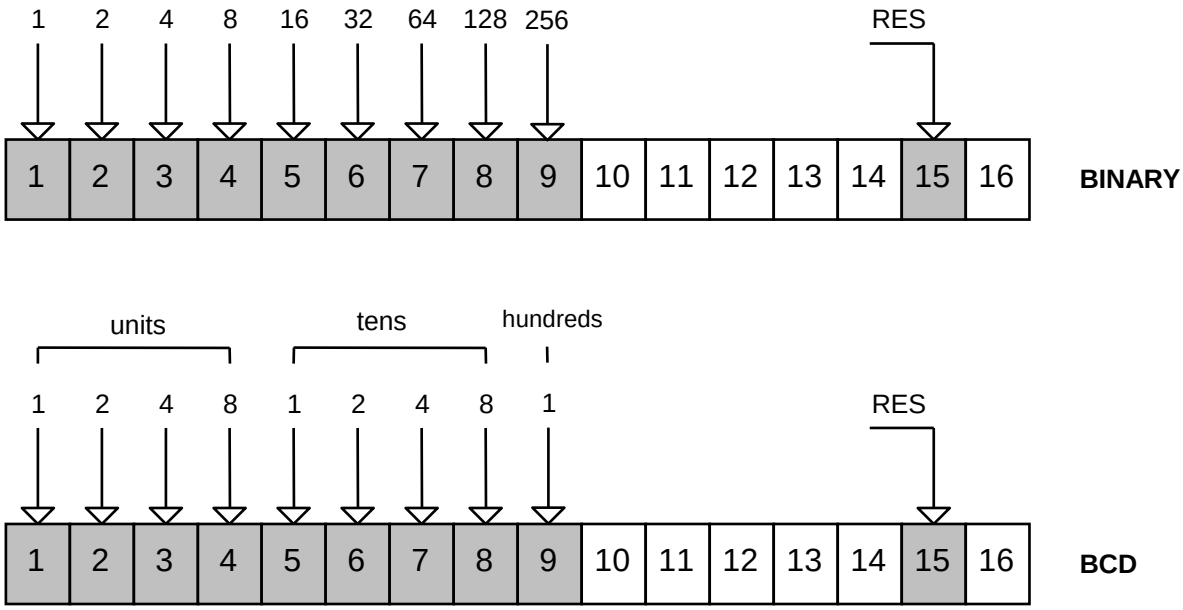


In this operation mode, three function inputs are available, in addition to the message recall inputs (ADDRESS + SYNC):

RES to stop the alarm relay,
ACK to acknowledge the messages in the memory (with the programmed modes),
ADV to advance the display of the memorised messages

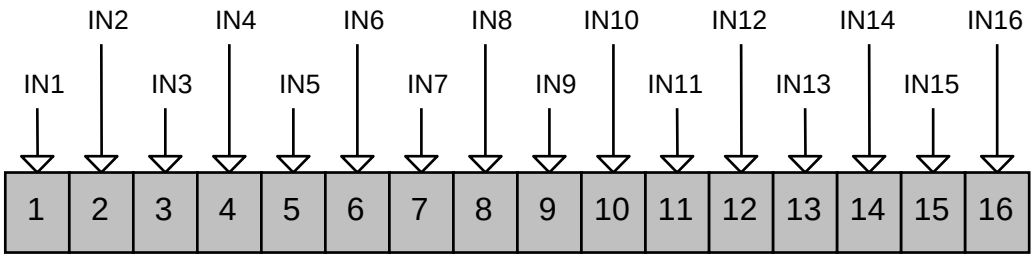
These commands are the external repetition of the ones on the front panel.

3.1.2. BINARY OR DIRECT BCD INPUTS



In this operation mode, the RES function input is available to stop the alarm relay according to the programming mode, in addition to the alarm message management inputs.

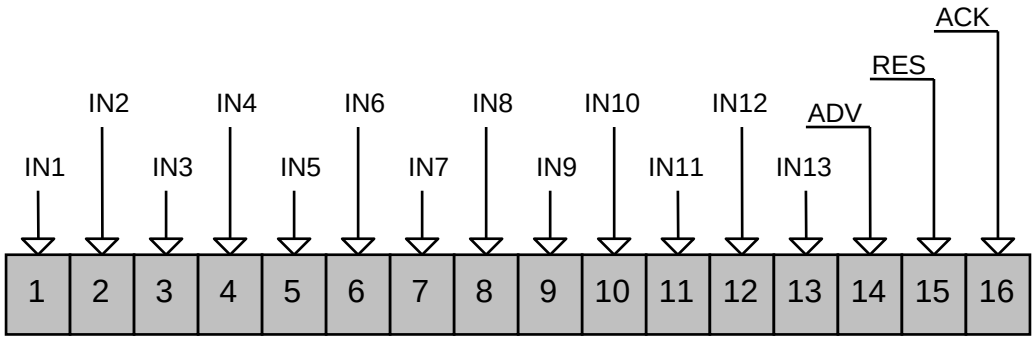
3.1.3. INPUTS IN INDEPENDENT OR DIRECT CONTACTS



The operation modes are specified in the description of the functions. By programming the contact reading time, only pulses longer than the programmed time or inputs with a set delay can be read in this configuration.
If the reading logics is accurately programmed, the NORMALLY CLOSED CONTACT (usually alarm contacts) and the NORMALLY OPEN CONTACT (usually for sequence reading) operation can be set.
The use of the devices with these configurations, as alarm or operative sequence display, is recommended for small environments and systems. The connections between the device to be controlled and the device input should not be longer than 18/20 metres; for longer connections, use the multiplexer MVS32.

3.1.4. INPUTS IN INDEPENDENT CONTACTS + UTILITIES

The operation is identical to the operation of independent contacts with or without a multiplexer; the management of the last 3 contacts is the only difference between them:



RES to stop the alarm relay
ACK to acknowledge the messages in the memory (with the programming modes),
ADV to advance the display of the memorised messages.

These commands are the external repetition of the ones on the front panel.
This function does not include the detection of the alarms associated to the contacts 14, 15 and 16.

NOTE: When programming the texts in the PC, when there is connection with the MVS32, the messages 14, 15 and 16 must not be programmed, because they are not taken into consideration by the display, which starts from no. 17.

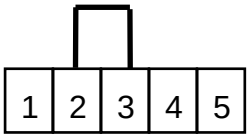
3.2. INPUT AND POWER SUPPLY LOGICS

In addition to the 16 inputs on the two connectors CN3 and CN4 (see silk screening on the device), the third connector CN1 contains the supply inputs (input 1 of CN1: **+ 24Vdc**, input 2 of CN3: **GND**), for the connection to the MVS32 card (inputs 4 and 5, described in the next chapters) and the logics preparation (input 3: **PRI**). This input must be connected to +24Vdc or GND; it defines the input signal logics type, according to the following diagrams.

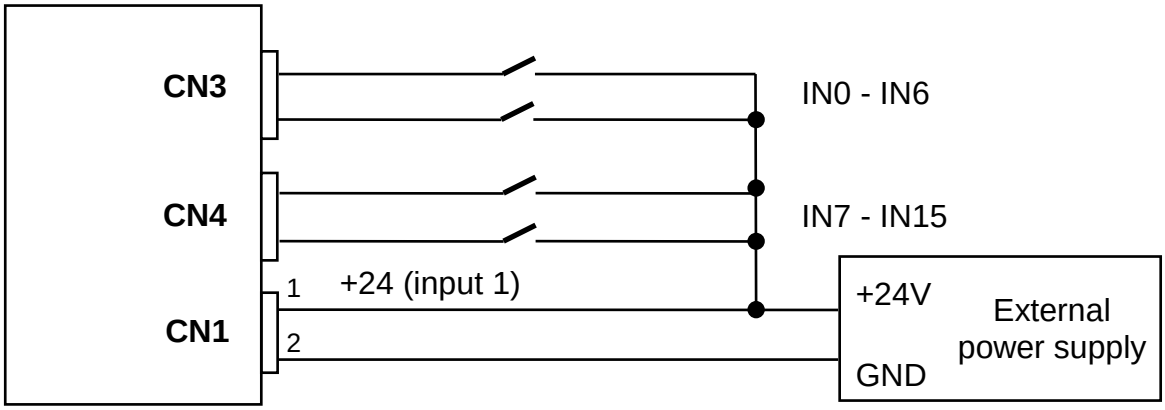
IMPORTANT: regardless of the use, with electro-mechanical, Binary or BCD inputs, the device must always be programmed in Positive or Negative Logics!

PNP positive logics inputs

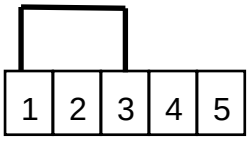
MVMC



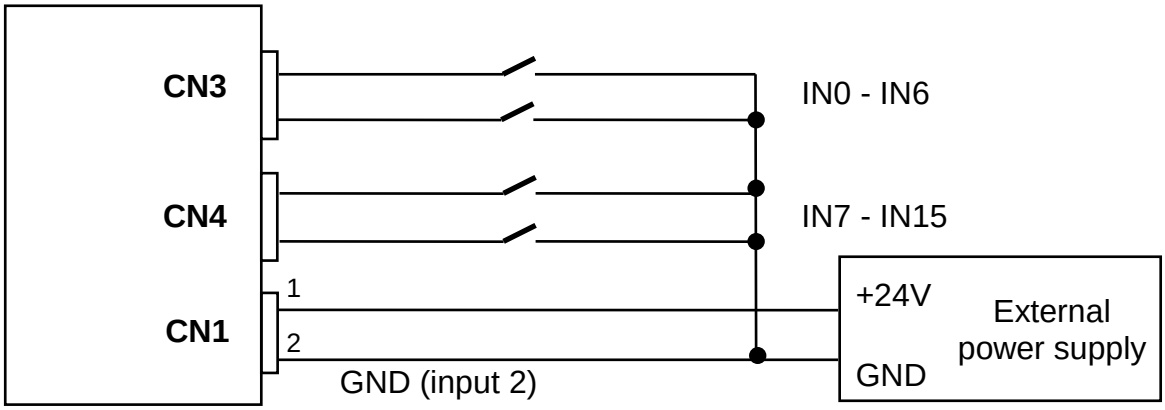
CN1



Inputs in NPN NEGATIVE logics

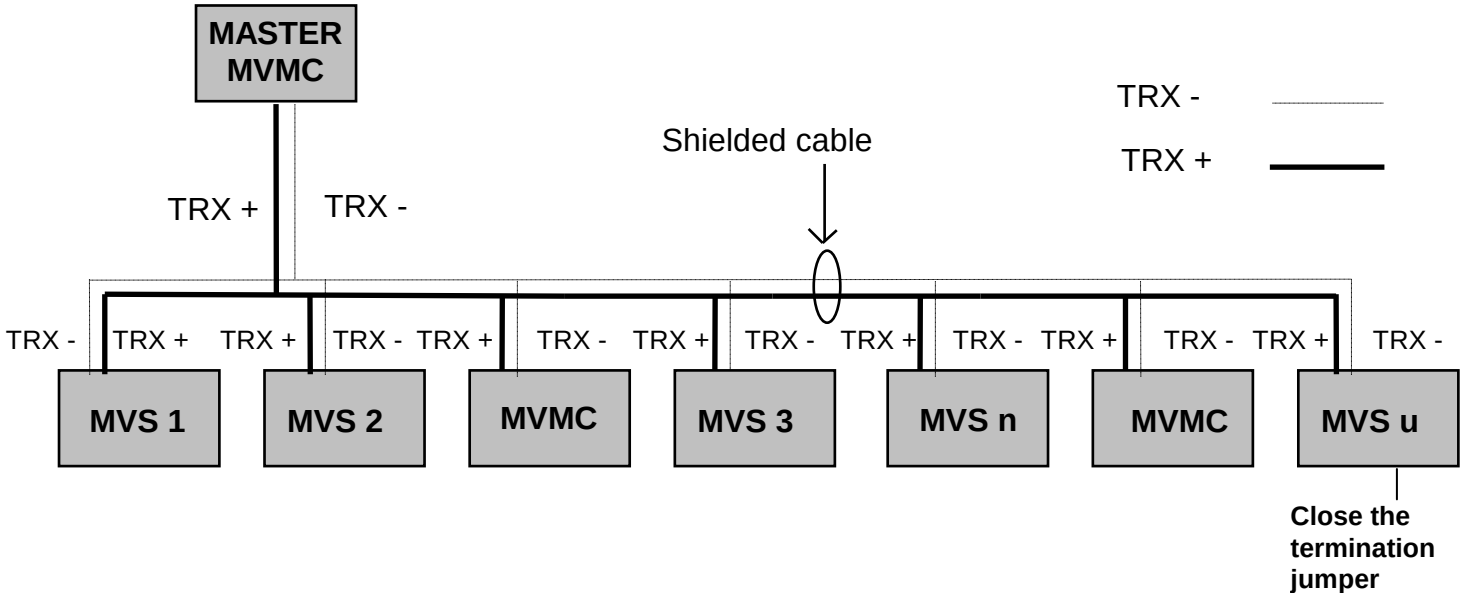


CN1



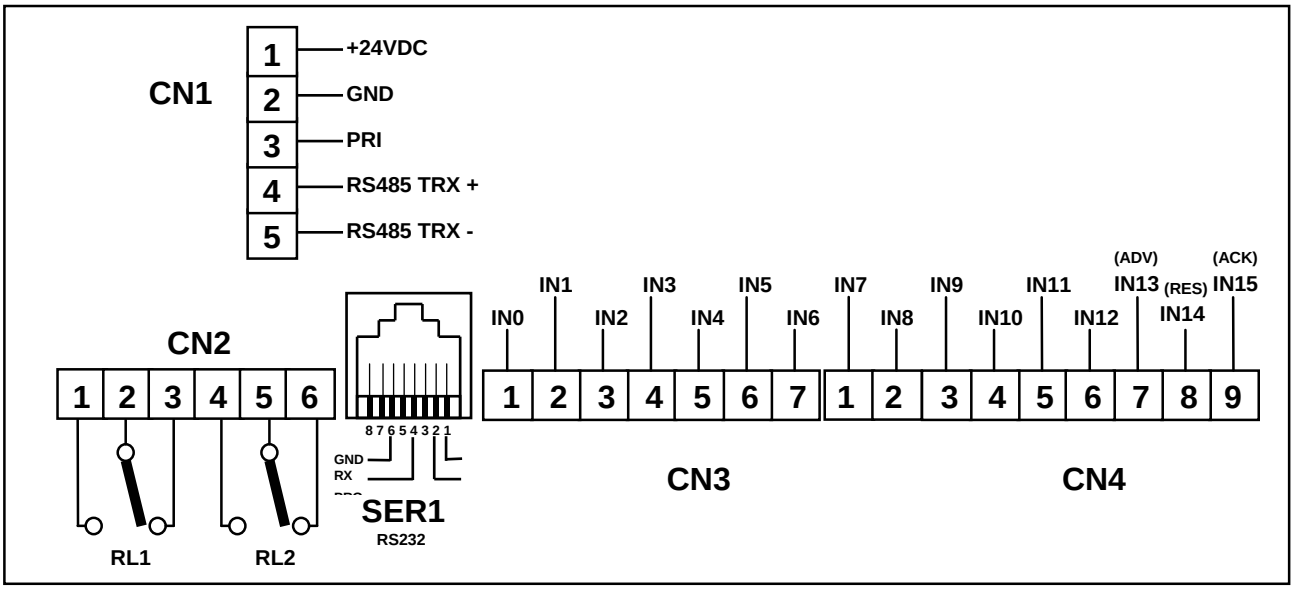
3.3. NETWORK CONFIGURATION

The devices MVMC and MVS can create a closed network inside which they can communicate. The network takes advantage of the serial connection RS485, available on all the devices, to connect max. 8 MVMC and 8 MVS.
The number of devices which can be included in the network also depends on the distance between them and the conductor type; the longer the network, the lower the device signal quality; hence the communication problems.
The max. connection distance is approx. 1000 metres.
One MVMC display must be programmed as MASTER and all the others as SLAVE in the menu 1 of function programming.
The MASTER display controls all the other devices and its position within the network is not important.
The network is self-configured, i.e. it automatically recognises the integrated devices because the MVMC displays do not have a network address. The MVS address configuration must be respected and the termination jumper on the last MVS card of the network must be closed.
As a result of the network structure, the displays only show the alarms of the MVS cards included in the network. Each MVMC can also show the alarms of its 16 inputs, but they will never be shown by the other MVMC's in the network.
The SLAVE displays can be integrated in the network if they are programmed in INPUT MODE, i.e. the mode which includes the MVS32 cards (INDEPENDENT CONTACTS, INDEPENDENT + UTILITIES, DIRECT).
It is not useful to connect multiple displays in the network because each display shows its alarms in local mode.

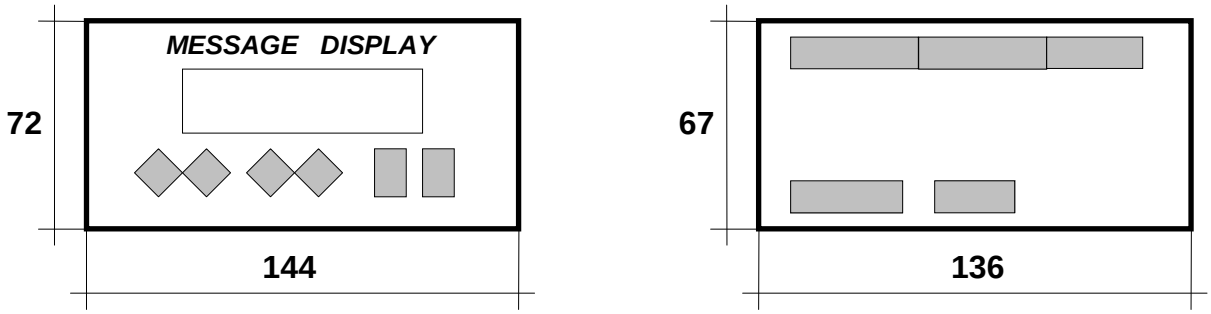


4. WIRING AND MECHANICAL DIMENSIONS

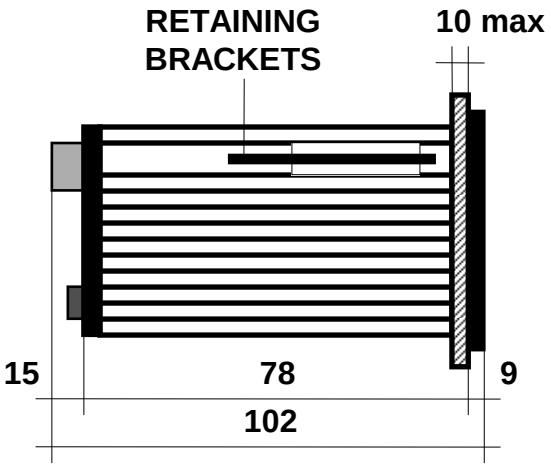
4.1. WIRING



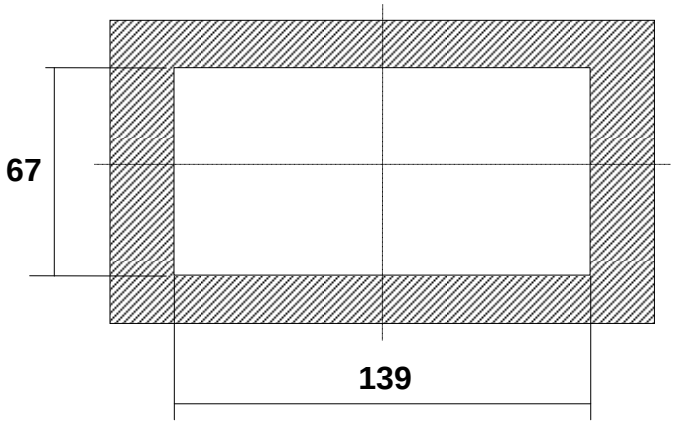
4.2. DIMENSIONS



SIDE



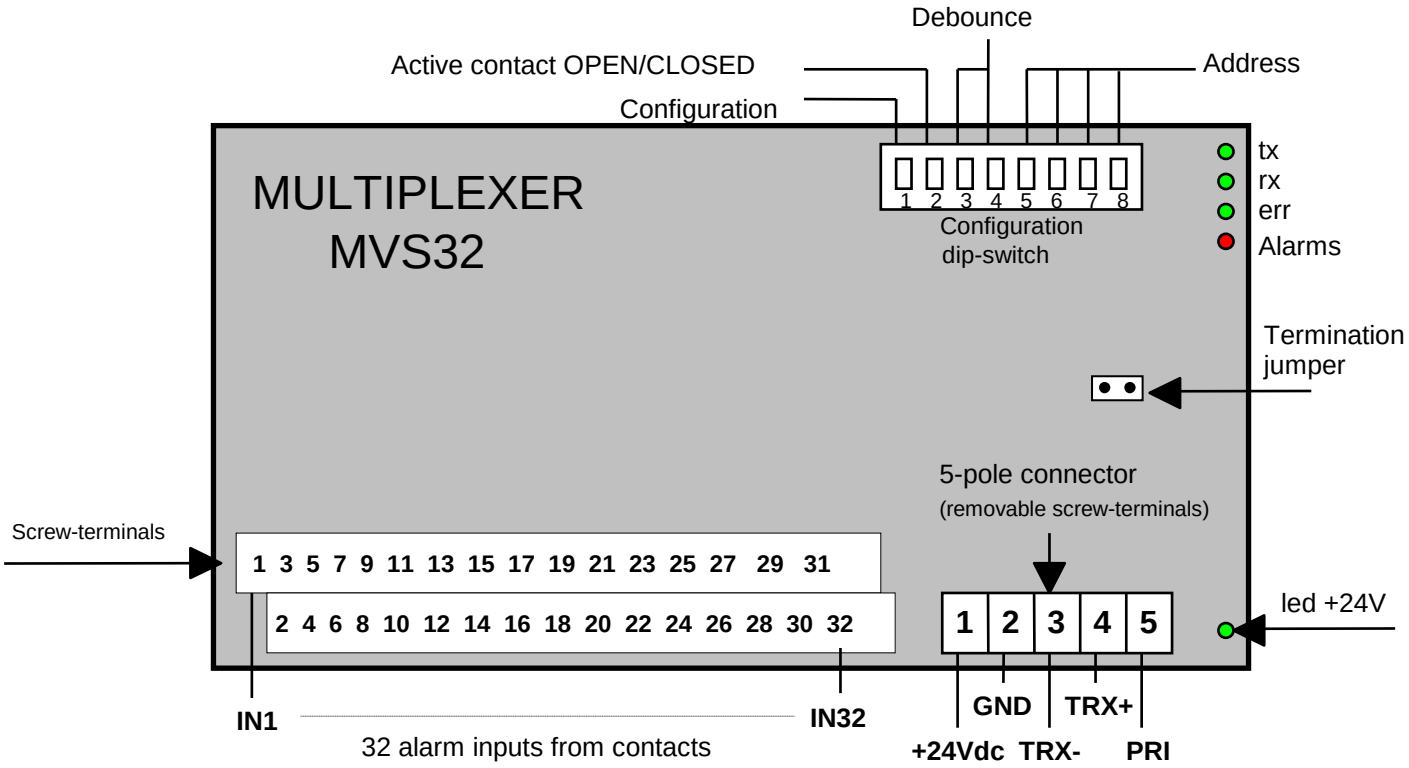
DRILL TEMPLATE



5. MULTIPLEXER MVS32

5.1. OVERVIEW

The MULTIPLEXER expands the external contact detection capacity of an MVMC, from min. 16 (only MVMC) to max. 272 contacts (1 MVMC + 8 MVS32).
Each multiplexer can detect the presence of 32 different contacts.
The multiplexer can be used only if the MVMC is programmed with the DIRECT CONTACTS, INDEPENDENT CONTACTS or INDEPENDENT CONTACTS + UTILITIES options.
The MVS32 has an electronic card and an installation support for the DIN rail. The diagram below shows the layout of the connectors and dip-switches on the card.



5.1.1. Technical features

POWER SUPPLY	24 Vdc +10% -15%
ABSORPTION	Approx. 100 mA
WORKING TEMPERATURE	(-0 / +45) ℃ (without condensa te)
WEATHER CONDITIONS	U. R. 95% a 40℃ (without conden sate)
INPUTS (POSITIVE OR NEGATIVE LOGICS)	32 from electro-mechanical contacts
INPUT SIGNAL LEVEL	POSITIVE LOGICS 0 = 0 Vdc / 6 Vdc 1 = 10.5 Vdc / 30 Vdc NEGATIVE LOGICS 0 = 0 Vdc / 3 Vdc 1 = 12 Vdc / 30 Vdc
INPUT ABSORPTION	6 mA per input
DEDICATED SERIAL LINE	RS 485 for connection with MVMC and MVS 32
CONNECTIONS	Removable terminals
INSTALLATION	DIN, DIN rail

5.2. MVMC - MVS32 CONNECTION

Each MVMC can be connected to max. 8 MULTIPLEXER units through the serial port RS485. Connect the poles 3 and 4 of the 5-pole connector (see table 5) to the corresponding poles on the MVMC. The use of a shielded cable is recommended; lay the cables which may cause interference separately (AC power supply 220V/380V, control of actuators, power cables, inverters, etc).

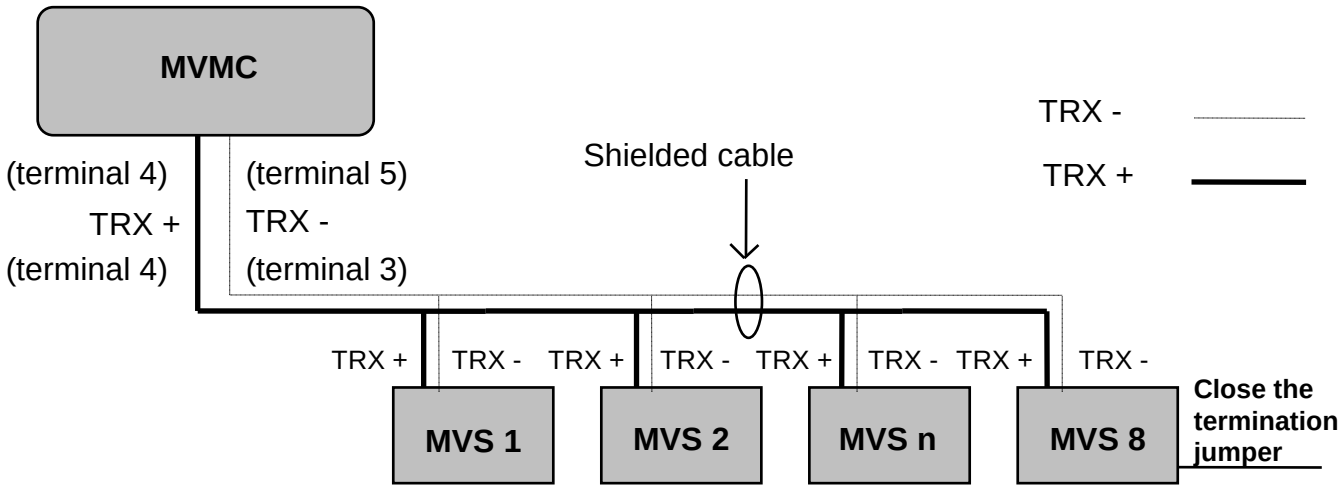
NOTE: Make sure that the MVMC and MVS are not energised when making the connections

The connections must be: TRX - (MVMC) with TRX - (MVS32)
TRX + (MVMC) with TRX + (MVS32)

5.2.1. INPUTS ON THE 5-POLE CONNECTOR (Table 5)

TERMINAL 1	+24 Vdc
TERMINAL 2	GND
TERMINAL 3	TRX - (RS485)
TERMINAL 4	TRX + (RS485)
TERMINAL 5	PRI Negative logics: jumper with +24V Positive logics: jumper with GND

Each MVS32 added to the configuration must have a specific address. The acceptable addresses range from 1 to 8 and must be set from the DIP (DIP 5, 6, 7 e 8) as per table 5.a.



NOTE 1. The RS485 connection is multidrop; therefore the bus termination resistance must be selected on the last card of the connected multiplexer, by closing the removable jumper; this jumper must be open on the intermediate multiplexer cards.

NOTE 2. To prevent power differences which may damage the serial connection, a single DC power supply is recommended for both MVMC and MVS32. If the connections are longer than 10 metres, all the devices should be supplied through the same 4-pole + shield shielded cable.

5.2.2. CONFIGURATION DIP-SWITCHES

In addition to the bus termination dip (DIP8) and card address definition dip (DIP 5, 6, 7 e 8), the remaining switches can be used to customise some features of the MULTIPLEXER MVS32 cards, thus rendering their use more flexible:

DIP SWITCH CONFIGURATION TABLE (table 5.a)

DIP 1				**Configuration type**
ON				Set Up parameters reading from MVMC
OFF				Parameter reading from external DIP
DIP 2				**Contact logics type**
ON				ACTIVE OPEN
OFF				ACTIVE CLOSED
DIP 3	**DIP 4**			**Contact debounce time**
OFF	OFF			Contact debounce 0.1 second
ON	OFF			Contact debounce 0.5 seconds
OFF	ON			Contact debounce 1 second
ON	ON			Contact debounce 5 seconds
DIP 5	**DIP 6**	**DIP 7**	**DIP 8**	**Multiplexer MVS32 address**
ON	OFF	OFF	OFF	Multiplexer MVS 1 address
OFF	ON	OFF	OFF	Multiplexer MVS 2 address
ON	ON	OFF	OFF	Multiplexer MVS 3 address
OFF	OFF	ON	OFF	Multiplexer MVS 4 address
ON	OFF	ON	OFF	Multiplexer MVS 5 address
OFF	ON	ON	OFF	Multiplexer MVS 6 address
ON	ON	ON	OFF	Multiplexer MVS 7 address
OFF	OFF	OFF	ON	Multiplexer MVS 8 address

The DIP no. 1 can define whether the other parameters (with the exception of the multiplexer address) are automatically assigned by the MVMC to all the MVS32 or are individually customised.

DIP 1 = ON — The CONTACT DEBOUNCE time and the CONTACT LOGICS TYPE are set from the MVMC programming menu

DIP 1 = OFF — The CONTACT DEBOUNCE time is read by the DIP 3 and 4, while the CONTACT LOGICS TYPE is read by DIP 2

The DIP no. 3 and 4 (when DIP no. 1 = ON) define the debounce time for the 32 inputs of the MVS32 card, according to the codes of the table 5 above.
The DIP 2 defines the type of the contacts of the card (ACTIVE OPEN or ACTIVE CLOSED).

NOTE: the selection change made using the dip switches is immediately active after the change.

5.2.3. LED MEANING

Each MULTIPLEXER card has 5 LED's; the most important LED's are the green ones, which indicate the presence of a valid contact on the MVS32 and the communication with the MVMC.

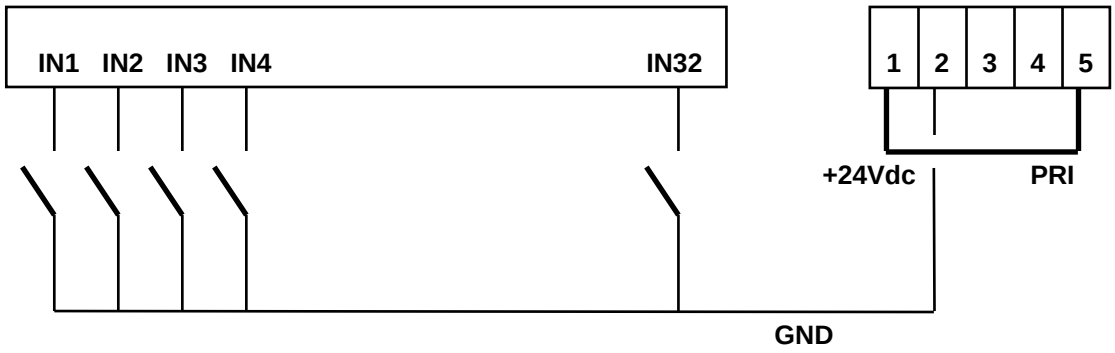
- **LED configuration table** (Table 5.b)

TX	Green 1	Ongoing transmission to MVMC
RX	Green 2	Receiving from MVMC
ERR	Green 3	Communication errors
ALARMS	Red 4	At least one active alarm input on the card
+24Vdc	Green	Power is being supplied

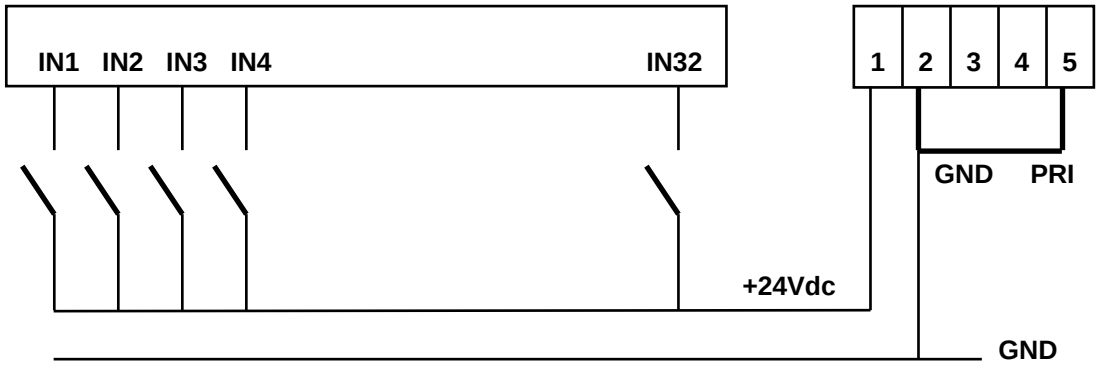
5.3. CONNECTIONS

For the correct operation of the MVS32 card, the Negative or Positive logics connection must be carried out, as shown in the diagram below.

NPN NEGATIVE LOGICS CONNECTION



PNP POSITIVE LOGICS CONNECTION



Note: the programming of the Contact Logics ACTIVE CLOSED or ACTIVE OPEN, carried out by means of the dip 2 from the MVMC menu or using the WINTEXT programming software, does not depend on the Positive or Negative Logics connection.

5.4. DIMENSIONS