



# EC-16 50 MESSAGES LCD DISPLAY with RS-232 CONNECTION.



The EC-16 module is a LCD display composed by 4 lines and 20 characters. Thanks to the software that it includes, and using the RS-232 port of the PC, it allows to create and to record up to 50 different messages, stored in the memory even if you stop to supply the module. Messages are displayed when you select the corresponding terminal in the input pins (through the 7 x 7 inputs matrix selection). It includes special functions like displaying of several messages at the same time in a hierarchical or rotary order. It also includes relay, which can be programmed to be activated by each message activation, or when it coincides with the selection of several at the same time, with a timed disconnection, or when the activation condition disappears. It includes led to indicate the relay's activation, control of the LCD's contrast, luminescent function allowing to read the display in total darkness and it can be fitted into our DIN-RAIL Ref. C-7585.

## TECHNICAL CHARACTERISTICS.

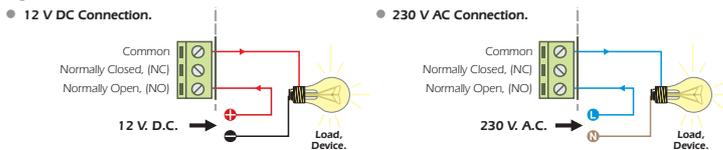
Voltage	12 V. D.C.
Minimum Consumption	20 mA.
Maximum Consumption	500 mA.
Max Load for the relay	5 A.
Memory life	1 Million write cycles aprox.
LCD Display/Characters' size	4 Lines of 20 characters/4,8 mm.
Messages activation, (7 x 7 matrix connection)	Switching is done at zero crossing.
Luminous Function	Led.
Protection against polarity inversion, (P.I.P.)	YES.
Main Board 'size	107 x 76,25 x 30 mm.
Display 'size	98 x 60 x 20 mm.
Visible display 's area	77 x 26 mm.

## INSTALLATION.

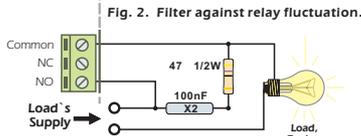
**POWER SUPPLY.** The EC-16 circuit had to be supplied by a 12 VDC power supply correctly filtered. We recommend you to not use standard suppliers or rectifiers which can damage the module, but a power supply. We suggest you our FE-133 power supply, which has been developed to perfectly answer to the circuit needs. Install a fuse and a switch has been indicated on the drawing, both are necessary for the module's protection as well as for your own safety, as it is required by the "CE" regulations. Connect the positive and the negative of the power supply to the respective positive and negative terminals of the module, indicated in the general wiring map. The distance between the power supply and the module has to be as short as possible. Before to follow, you have to adjust the power supply at 12 V and verify that the assembly is correct.

**OUTPUT CONNECTION. LOAD.** The EC-16 output is controlled by a relay, that's mean an element electrically insulated regarding the rest of the circuit and it accepts any device up to 5 A. The relay is not a component supplying voltage but its function is limited to accept or deny the voltage passage like a standard switch. For this reason, you have to supply the load through this component. The relay has three output terminals: The normally open quiescent (NO), the normally closed quiescent (NC) and the common. Install it between the Common and the NO in accordance with the schedule "Output Connection. Load". For the inverse function you have to place the load between the NC and Common.

Fig. 1. How to connect the load.



**INFORMATION ABOUT THE RELAY.** Specially for inductive loads, a relay output can produce a fluctuation or incorrect operating mode. In such case, you have to install an anti-spark circuit between both contacts of the relay used for the connection, as it is indicated on the drawing. If the load connected to the relay is supplied at 230V, you have to use a 100 nF/400V Type X2 Capacitor and a 47W 1/2 W resistor. See the Fig. 2. If the load is supplied at 12 or 24V, you have to eliminate the resistor and to leave between both contacts of the used relay a X2 type capacitor. If necessary, you have to test values, from 10 nF till 47 nF, till the fluctuation disappear.

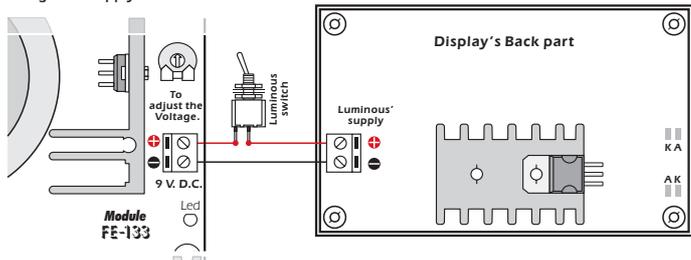


**TO INSTALL CONTACTS INPUTS.** The module has a connector composed by 14 terminals to activate the 50 messages stored in the LCD memory. For the installation of each contact input, the cable length as to be as short as possible. If the distance is superior than 50cm, then you have to use shielded cable and to connect the braid to the negative. The maximum length being 1m. To excite messages inputs, you have to use contactos libres de potencial, like push button, relays, switches, etc.

**SERIAL CONNECTION WITH A PC.** The connection between the module and the PC has to be done when the computer is light off, through a serial connection crossed cable, male DB9-DB9 female type, like the used one for the connection with modems. See the posterior part of the PC, where are usually all connectors and find a free serial port like Com1 or Com2. Then connect the cable between the circuit and the PC. The serial port used for the connection is not basic, the software will be charged to identify the selected in which the EC-16 has been installed. Do not forget that the maximum length for the RS-232 cable is 3m.

**LUMINESCENT FUNCTION.** The LDC includes a retro-luminescent function. This function allows to internally illuminate the display, allowing its vision in darkness or with a very few light. The luminescent mode is activated when the circuit, based in the posterior part of the display (see Fig.2) is supplied. You can use the same power supply than the main board, or if you wish, an independent 9 V DC power supply.

Fig. 3. To supply the luminous function.



**DO NOT FORGET ABOUT THE INSTALLATION.** You can't increase the length neither manipulate the communication cable between main board and display. Otherwise, the module doesn't correctly operate.

**CONTRAST ADJUSTMENT.** The vision of the display, according to the view angle can be imperfect. To correct this problem the variable resistor indicated in the General wiring map, allows to adjust the contrast level up to offer a perfect vision of the messages.

## OPERATING MODE.

**MESSAGES ON THE DISPLAY. [ACTIVATION].** Messages previously recorded in the module's memory, will be maintained even if you stop to supply the module. Inputs activate messages according to a matrix connection (7 x 7), by contacts closing between the column represented by numbers and the column represented by 7 letters. To excite them, you have to use switching is done at zero crossing. According to the union between terminals of both columns, you can activate a single or several wished messages. See the following drawing.

Fig. 4. To Activate messages.

Terminals	1	2	3	4	5	6	7
A	1	8	15	22	29	36	43
B	2	9	16	23	30	37	44
C	3	10	17	24	31	38	45
D	4	11	18	25	32	39	46
E	5	12	19	26	33	40	47
F	6	13	20	27	34	41	48
G	7	14	21	28	35	42	49

Selected messages

The message number 50 can't be externally selected, its function is to exactly appear on the display when there is no activated message. The device offers the possibility to select different messages at the same time. The vision mode on the display will depend on the previous program done by the software.

**Rotary Mode.** The display will constantly indicate all activated messages, sequentially, one by one, with an interval that you can adjust between 0,5 and 2 sec. using the dip switch "Config" in the PCB. See the Fig.5.

Fig. 5. Interval between message on the rotary display ode.



**Hierarchical Mode.** Independently of the number of messages selected at the same time, the display will only display the message with the higher hierarchical value (where the message N°1 corresponds to the high value and the N°49 to the lower). During the displaying, when the higher value message activation disappears, automatically the device will indicate the following one by hierarchical order, maintaining this process till there is no more activated message.

## SOFTWARE.

### SYSTEM'S MINIMUM REQUIREMENTS.

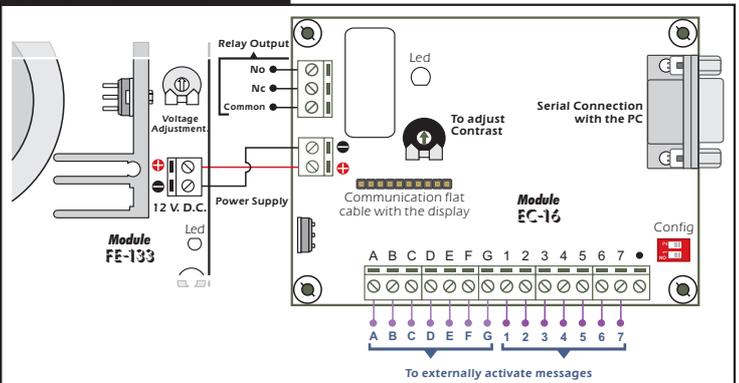
- Pentium II.
- 64 MB Ram.
- 25 MB of free space in the Hard disk.
- Free RS-232 Serial port
- Windows 98/2000/Millennium/XP.

**AUTOMATIC INSTALLATION.** Insert the CD-ROM on the computer, after some seconds it will be automatically executed into the installation menu. When the installation windows will appear, you have to follow the displayed indications.

**MANUAL INSTALLATION.** If for any reason, the installation menu doesn't appear, you can manually install the software. You have to pen the windows "my PC", select the unit where the CD-ROM is placed and click two times on it. When the information inserted into the CD-ROM will appear, you have to select the file "install.exe" and click two times on it. When the installation display will appear, you only have to follow instructions.

**WORKING WITH THE SOFTWARE.** The software allows to create 50 messages that you can display, store into the hard disk, recuperate or print, etc... or to transmit and to obtain messages and the configuration with the module through the serial port. Check the software's operating mode.

## GENERAL WIRING MAP.



## GARANTIA E INCIDENCIAS TECNICAS.

All Cebek modules offer a total warranty of 3 years as concern components and manpower. Damages and break-down provoked by external causes are excluded of this warranty. More over, they are also excluded all connection, installations or operating no specified in the instruction manual, as well as a wrong handling. Then, it will be necessary to show the module's purchase invoice in case of damage.



This documentation can be adapted or modified without forewarning, without involve Fadisel S.L's responsibility.

The use of any module manufactured and supplied by Fadisel S.L, mentioned in this documentation indicates the acceptance of commercial terms and corresponding warranty.

In order to contact with our technical depart, please contact: sat@cebek.com or by fax. (+34) 93.432.29.95 or by mail at the address: c/Quetzal, 17-21. (08014), Barcelona, SPAIN.



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