CEBEK® ELECTRONIC CIRCUITS
EC-4
LIGHTING LCD OF 2 X 16.

The EC-4 module is a LCD display with 2 lines composed by 16 characters completely programmable by yourselves. It include determinate functions as the possibility to visualise several messages at the same time, in hierarchical order or in rotary mode, with the possibility to activate the module by contacts as well as normally open and normally closed. Also included, the luminous function allowing to read the display in a complete darkness and serial comunicaction fuction to Transmission between several CEBEK displays.
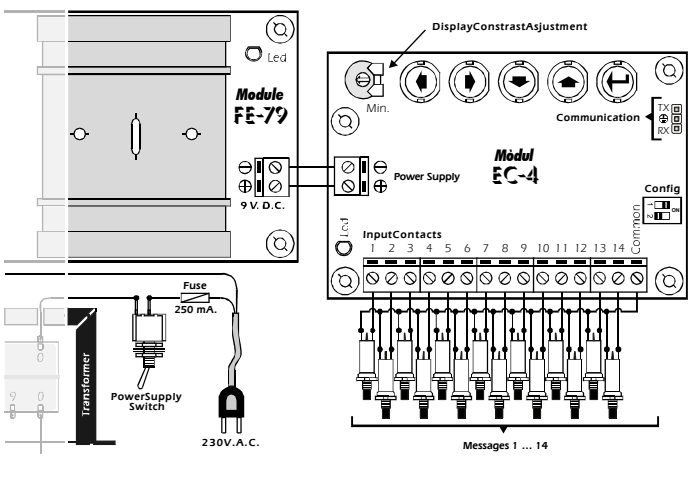
TECHNICAL CHARACTERISTICS.

Voltage.	9 - 12 V. D.C.
Minimum Consumption.	110 mA.
Maximum Consumption.	450 mA.
Display.	2 Lines with 16 types.
Input Contacts.	Normally Closed/Normally Open.
Luminous Function.	Led.
Protection Against Polarity Inversion.	Yes.
Circuit's Sizes.	95 x 64 x 32mm.
Display's Sizes.	123 x 45 x 32 mm.
Screen Display's Sizes.	115 x 35 x 10 mm.

PWER SUPPLY and CONNECTION.

POWER SUPPLY. The EC-4 circuit had to be supplied by 9 V DC (from 9 up to 12 VDC) with a power supply correctly filtered. Do not use suppliers or rectifiers disturbing the module's operating. Then, we recommended you the FE-79 power supply that has been developed to perfectly answer to the circuit needs. Connect the positive of the power supply to the positive terminal (of the module) indicated in the wiring map, then do the same operation with the negative terminal. The maximum length between the power supply and the module has to be as short as possible (60 cm. max.).
Verify that the assembly is correct and do not activate the switch before to read the entire instruction manual.
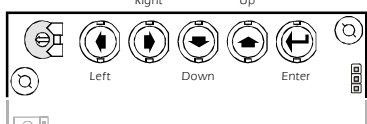
Fig. 1. General Wiring Map.

TO PROGRAM.

TO PROGRAM MESSAGES. You can work with the module in Program mode or in Operating mode, (usual working common). In the Programer mode, the EC-4 allows to program 15 messages. Then, thanks to the connections you could activate 14 (the number 15 appear when the module is not used).
According to the drawing Fig. 2. The module offer 5 push buttons: Left, Right, Down, Up and Enter.. You only have to use this keyboard to program the module.

Fig. 2. Keyboard to program.

Press the Enter button, connect the power supply of the module up to obtain on the display the following message: "RECORD-MODIFY". When this message appears, the Program Menu will be activated and you could stop to press the Enter button. With the Up and Down buttons you could move among different program options.
Go to the "RECORD MODIFY" option and press again quickly on the Enter button. You could read on the display: "MESSAGE No:1". Thanks to the Up and Down buttons you could go from the message 1 to 15. When you are in the wished message press the "Enter" button and you automatically read the text corresponding to the selected message. From the factory, there are 15 messages already recorded, for this reason when you will enter in each message the following message appear: "MESSAGE...." according to the message number that you have selected.
When you select a message, instead of the included text, the cursor will appear on the first place at the left, and using Left and Right buttons, you could move the cursor among these 16 types. Select the type that you wish to modify and thanks to the Up and Down button you could select required letter, number, symbol. To obtain a quick type presentation you have to maintain pressed the corresponding button.
Once the message wrote or modified, to save modifications and come back to the main menu, you have to press the Enter button. On the display you could read "RECORD-MODIFY".
To leave the Program Menu and obtain the Usual Operating, from the "RECORD-MODIFY" step, you have to press the Up button up to find "NORMALLY WORK" menu; then press Enter and the module stay in usual operating mode, waiting for an exterior message.

TO ERASE THE MEMORY. The circuit maintain in memory recorded messages, even if you disconnect the power supply, but it also includes an option to erase messages. To go to this option, you have to be onto the Program Mode and to select the option "MESSAGES ERASER".
When you will press the button ENTER, the display asks you to press again this button after the blinking message "PRESS ENTER FOR 3 SECONDS". **Be careful**, if at this moment you press this button during more than 3 seconds, the memory will be erased and all stored messages are irreversibly erased. Then, the display will indicate the message "ERASED MESSAGES".
If you wish to cancel the erase function, you only have quickly to press the ENTER button, or after 20 seconds without activity, the module will automatically cancel this operation, indicating an error message "FAILURE COMMAND", and it will return to the main program without erasing any messages.

DISPLAY CONSTRAT.

CONTRAST ADJUSTMENT FOR SCREEN. According to the angle that you seed the screen, this last could appear defective. To solve this problem you had to adjust the variable resistor indicated in the drawing till to perfectly read messages.

OPERATING MODE.

TO ACTIVATE MESSAGES. See the General Wiring map. To activate messages thanks to external signals, you could use connection terminals. Connect according to the drawing. Use contact without power as push buttons, switch, relays, etc... Do not use contact with voltage or use a cable (for inputs) superior than 40 cm.
If you do not activate any message, the module will display the message number 15. To activate the other messages, you firstly have to configure the module according the input contacts, Normally Open (NO) contacts or Normally Closed (NC) contacts.
"NO" contacts will activate the message when you connect common with any terminals from 1 up to 14, displaying the corresponding message. "NC" contacts when you stop to connect common with any terminals from 1 up to 14.
The indication to the module of the type of entry that it must admit is fulfilled by means of the switch 2, (see dip "CONFIG"). If you place the switch 2 in position OFF, the circuit only recognise contacts normally open (NO). If you place it in the position ON, it will recognise contacts normally closed (NC). Select the option that you wish.
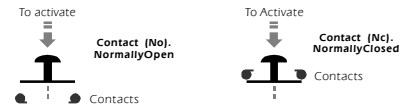
Fig. 3. Activation Modes.

Fig. 4. To configure the Dip for the Activation mode for messages.

Contacts Normally Open (No).   Contacts Normally Closed (Nc).

TO SELECT THE DISPLAY MODE. The EC-4 accept the activation of two or more messages at the same time, and offer two different display mode for this case. Messages could be displayed in hierarchical mode or rotary mode. The first mode, among all messages selected at the same time, the module will only show the bigger, where the message Nº1 is the bigger and the Nº14 is the smaller. Then, if you select messages Nº3, 5 & 10, the message Nº3 will be displayed. If you desactivate the Nº3, the message Nº5 will appear. The rotary mode will display all selected messages at the same time, showing in the display one by one with an interval of 3 sec. (approximately).
For both modes (hierarchical and rotary), each time you will activate more than a message at the same time, the LED inserted onto the circuit lights, independently of the selected operating mode. When this situation will disappear, the LED goes out.
To select hierarchical or rotary mode, you have to place the Switch Nº1 (see microswitches "CONFIG") in ON position to obtain the Hierarchical mode and in OFF position to obtain the rotary mode.
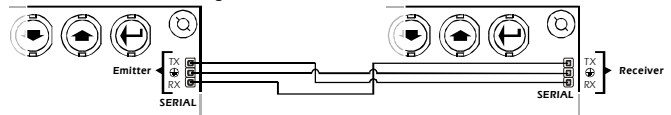
Fig. 5. To configure the Dip to select the Display Mode

Rotary Mode.   Hierarchical Mode

SERIAL COMMUNICATION BETWEEN EC-4 CEBEK.

DATA EMISSION - RECEPTION. An other function offer by our EC-4 module is the communication with others CEBEK displays (2 lines and 16 types), **models EC-4 and EC**-2. This communication allows transferring all messages from a module to an other one to avoid to manually does that.
For this operation, firstly you have to disconnect the power supply of modules that you wish to communicate. Each LED autonomous Cebek module has a connector composed by three pins with the "serial" reference. The connection between the emitter's connector and the receiver's one, has to be done according to the Fig.6.

Fig. 6. Serial Communication.

Connect the TX pin from the emitter module to the RX pin of the receiver module. Connect together pins with the ground of both circuits. Finally, connect the RX pin from the emitter to the TX pin of the receiver. Be careful assembling both modules to avoid to damage (this damage is not contemplated by the warranty). For the connection you have to use shielded cable with a maximum length of 50cm, and to connect the braid to the ground pins.
Once this operation done, you have to supply both modules with the same power supply. If you wish to use different power supplies, you have to connect their negative terminals.

Then, you have to go to the program menu of both modules. When the message "RECORD-MODIFY" will be displayed, **firstly on the receiver**, you have to select **the option "TO RECEIVE"**. Then, press the ENTER button. The message "RECEIVING" will be displayed and the circuit is waiting for data from emitter. Now, on the emitter, you have to select the option "TO TRANSMIT" and to press ENTER button. The message "TRANSMITTING" will be displayed and the communication between both circuits will start. This operation will last 20 sec. (approximately). At the end of the transmission, if this one has been successfully done, the message "RECEIPT END" will be displayed on both circuits, and they will automatically return to the main program menu.
If during the transmission you wish to stop the process, you have to press the "Enter" button in one of the two modules (emitter or receiver). If you do that, or if the transmission isn't done correctly, the following error message will appear on the display "TRANSM. FAILURE".

LUMINOUS FUNCTION.

The EC-4 module offers the luminous function. This functional lows to light the display to offer a better displaying in a complete darkness. To activate the luminous function, you have to supply the module placed in the displays' lateral (as shown in the drawing) with the same power supply (FE-79) used to supply the module or if you wish an independent 9 VDC power supply.
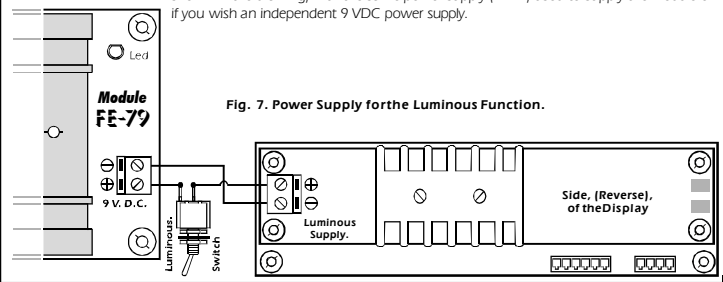
Fig. 7. Power Supply for the Luminous Function.

TECHNICAL CONSULTATIONS.

If you have any doubt, you could contact your wholesaler or our Technical Department.
- E-Mail, **sat@cebek.com | Fax**. 34.93.432.29.95 | by mail. P.O. Box. 23455 - 08080 Barcelona - Spain.
- **Keep the invoice of this module.** For any repair, the corresponding invoice had to be added. If the invoice is not presented together wish this module, the module's warranty will be automatically cancelled.

All the module's CEBEK have **3 years of total warranty** in thecnical repairing, and apears from the date of buy.

Much more CEBEK module's are aviable in our products range, please, require our general catalogue or visit our Web side. **Http://www.cebek.com**

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