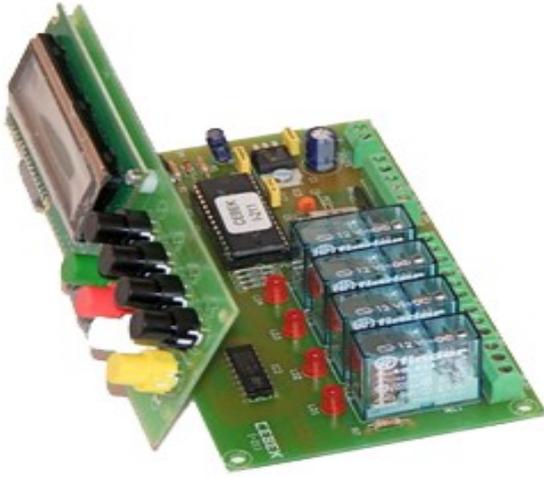


4 OUTPUTS PROGRAMMABLE SEQUENTIAL I-211



CHARACTERISTICS

Voltage	12 V.DC.
Minimum Consumption	30 mA.
Maximum Consumption	210 mA.
Maximum Load per Output	5 A.
Outputs Number	4.
Programs number per Output	1.
Maximum Programs Capability	240 Steps.
Selectable step times	From 0.5 sec. to 99 min. 59 sec. 9 mil.
Confirmation or Stop Inputs Number	1 for each output.
Main board dimensions	142 x 77 x 30 mm.
Display and Control board dimensions	142 x 50 mm.

The I-211 is a 4 outputs programmable automaton. Each output will be able to control a program up to 240 steps. Steps can be configured in three states: "connected output", "disconnected output" and "output according to input level". The step time will be adjustable between 0,5 sec. and 100 minutes.

Through the incorporated keyboard and a simple interface that you can visualize through circuit's LCD, the module will allow the steps grouping and configuration, establishing in graph mode, wished operating rules for each output.

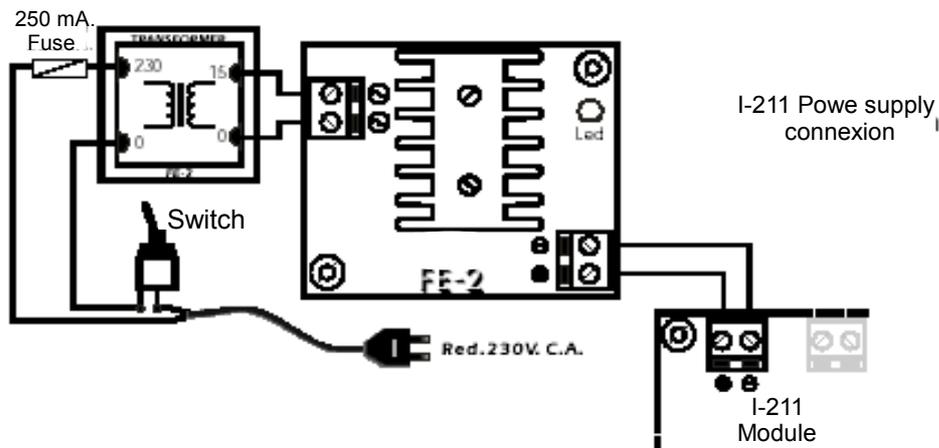
It will maintain in memory programs done, even after disconnecting the power supply.

It allows to visualize relays state and connection indicator leds as well as tips for the wiring

POWER SUPPLY. The I-211 circuit had to be supplied by a 12 VDC power supply correctly filtered. We recommend you to use the FE-2 power supply, which has been developed to perfectly answer to the circuit needs. Install a fuse and a switch has it is indicated on the schedule. Both are necessary for the module's protection as well as for your own safety, as it is required by the "CE" regulations.

Do not use the same power supply to feed I-211 module and other devices who can generate industrial parasites like Relays, motors, coils, etc...

Connect the positive and the negative of the power supply to the respective positive and negative terminals of the module, indicated in the wiring map. The distance between the power supply and the module has to be as short as possible. Verify that the assembly is correct.



Note: Install a fuse and a switch has it is indicated on the schedule. Both are necessary for the module's protection as well as for your own safety, as it is required by the "CE" regulations.

Consult the corresponding power supply's instruction manual. Then, Verify that the assembly is correct.

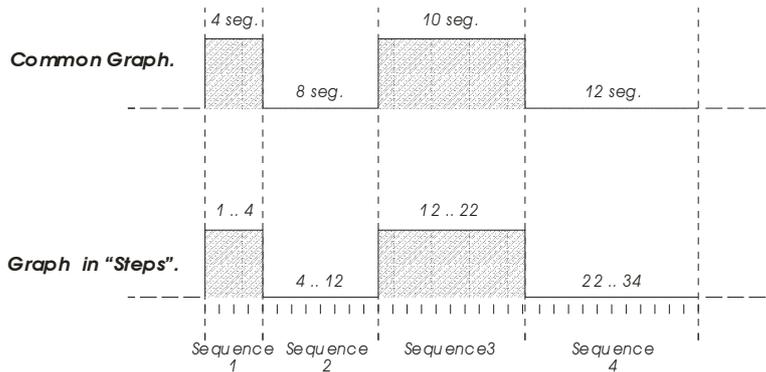
PROGRAMMING

The I-211 is a programmable automaton, a module allowing you to program a complete one of operating rule for each output. The circuit, thanks to its capacity to program step by step, will also allow to configure a flexible operating graph. Habitually it appears operating needs on different equipment, requiring an asynchronous and complex operating mode. These operating rules are hardly applicable with simple timers. Normally, these equipments require capricious cycles as for example, connection = 4sec and immediately later disconnection = 8 sec., after connection = 7 sec. and again disconnection = 12 sec., etc.... These "operating rules", can be easily programmed using the I-211 module. Nevertheless instead a standard gauge allowing to do the graph, for example, sec., as we previously illustrated, the circuit uses "steps", being a smaller measure.

Later we will describe how to assign a real time measure to the division by steps.

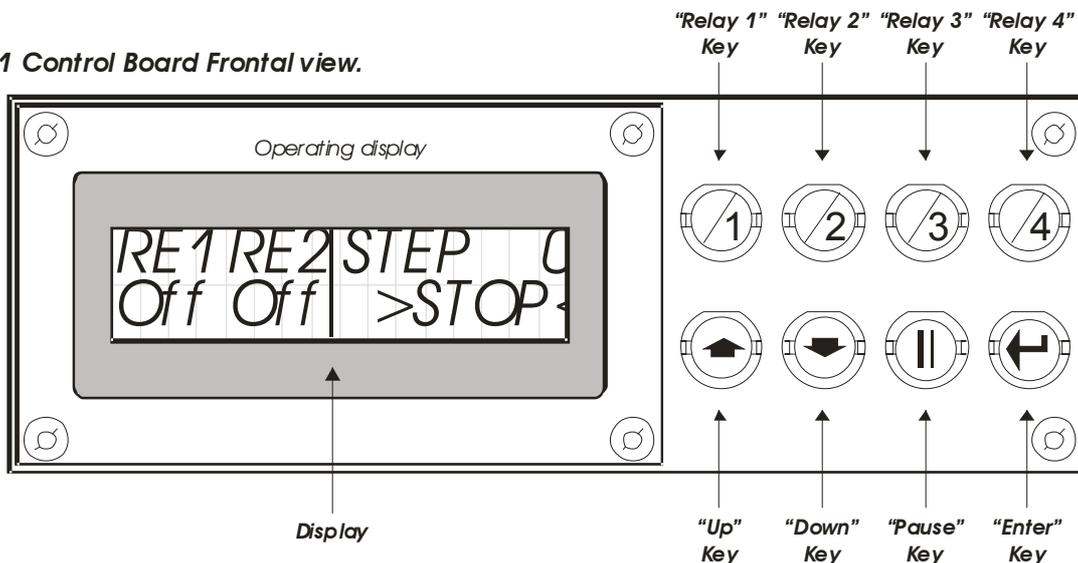
The graph will be done grouping steps. Returning to the previous example, the circuit should be programmed grouping firstly steps from 0 to 4, which will be configured in "connection"; from steps 4 to 12 in "disconnection"; from 12 to 22 in "connection", and finally from 22 to 34 in disconnection mode. Finally it will be assigned as time measure by step, 1 sec. See fig 1.

Fig. 1. Operating mode graph



PROGRAMMING. The I-211's programming is similar to the used in the household videos. All the functions will be done through the keys and the display incorporated in the module's control board control. See fig 2. Supply the module. On the display it will briefly appear the module's description and after data will be visualized in fig 2.

Fig. 2. I-211 Control Board Frontal view.



Each output, composed by a relay, has an independent program with a maximum capacity of 240 steps. To accede to the program of each output, from the Operating Display, you have to press the "Enter" key and maintaining it pressed, you have to press the relay key, (output), you wish to accede. See fig 3. If you correctly do this operation correctly, you will accede to the programming display of the corresponding relay.

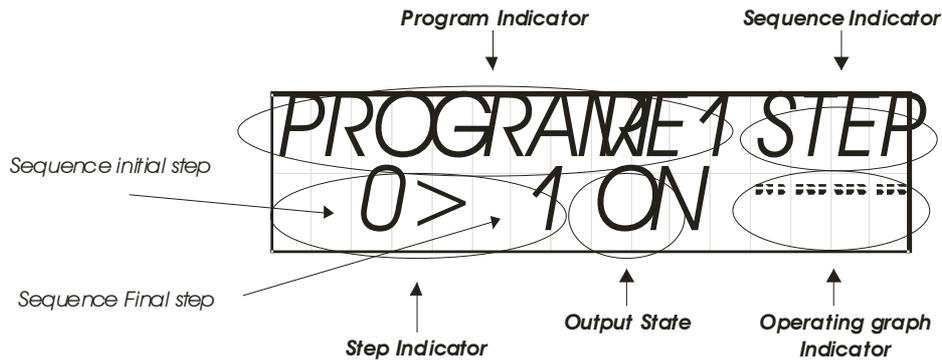
Fig. 3. How to accede to the Relay 1 Program.



In display it will appear the relay's program indicator, as well as the sequence indicator, the steps indicator, the output state indicator and the operating graph. See fig 4.

To make easier the I-211 programming understanding, we will illustrate its description, programming the operating graph of fig 1. Please, do the following indicated operations.

Fig. 4. Description of the "Programming" display .



Graph of fig. 1 Please, do the following Indicated operations .

Presses the "Enter and Relay 1" key to enter the program in this relay. When you accede to the display programming, the cursor will be placed in the steps indicator. The steps indicator will always show on symbol left ">" the initial step after which the order will start on the output, and on the right, the final step where this one will finalize, composing a "Sequence".

For each pulsation on "Up" and "Down" keys, you can increase or decrease the sequence final step. If you maintain pressed both keys the increase or decrease will be done faster.

Now, press "Up" key until the sequence end step is placed in 4.

Then, you have to indicate how the output module must acts during that sequence. The module offers three possible output states: ON, OFF, EX-, included in the "Output State" indicator. If you select ON, during the sequence, the output will be connected; if you select OFF, the output will remain disconnected. And if you press EX-, the output will act according to the corresponding "Confirmation or Stop" input state. This output mode is detailed explained in the "Confirmation or Stop Entries" section.

To place the cursor in the "Output State", you have to press the "Pause" key. Each pulsation on this key will cyclical rotate the cursor situation among Sequence, Step and Output State indicators.

Place you on the "Output State" indicator. Through the Up and Down keys you could select one of the three output states. Select the ON state.

After composing the sequence, and assigning a state to the output, you have to indicate to the module if this one is the last, being the end of the program, or if you wishes to connect with a next one. In order to do this operation you must be placed in the Sequence Indicator. Press the Pause key until you are on it.

By defect, the circuit will always show the word "STEP". If you press the Up or Down keys it will rotate among the four possible functions of the Sequence Indicator of: Step, End, End*, and Del.

The "Del" option is described in the Programs Erase section.

The "End" option finalizes and records the program into the memory.

The "End*" option, do the same function that End, but converting the program in a cyclical mode. In this mode, on the circuit standard operating mode, when it reach the last recorded step, the module will continuously reinitiate the program, or by defect till you disconnect the program.

The Step option, will record the done sequence, and will connect with the next, allowing to configure a new and the program continuity.

The Up or Down key until the Sequence indicator shows the Step option. Then, press the Enter key. The Steps Indicator will change, showing the last passage of the previous sequence on the symbol left ">", and the first of the new one, on the right. If changing of sequence, there is an output change, the Operating graph will indicate it.

Press the key Up until the final step is in 12. Then, press the Pause key to be placed in the output Indicator. Like by defect, in the new sequences the module will always indicate Off, and in this case it will coincide with the state that we wished to assign to the output, we will not do any change on it, press again the Pause key.

The cursor will change to the Sequence Indicator. We will select the Step option, and we will press the Enter key to record the done sequence and to initiate a new one.

The display will show "12> 13" steps. Change the final step up to 22, (using the Up key).

Now, placed the cursor in the "Output State", (Pause key), and change the state to On, (Up Key). Then, place the cursor in the "Sequence Indicator", (Pause Key), and presses Enter. The sequence will be recorded and the module will show the following one.

Now you only have to program the last sequence. Change the final Step until it shows 34, assign Off to the Output State, and place the cursor in the Sequence Indicator. This time, because we wished to finalize and not to continue the program, instead of selecting the Step option, we will choose the End option. After pressing Enter, the program will be finalized and recorded into memory, and the module will return to the operating display.

Do not erase this program, more ahead we will use it to explain other circuit functions.

Before initiating a new programming, we recommend you to always draw on a paper, the operating graph that you wish to introduce in the module, it will avoid many modifications and rectifications allowing you to save time.

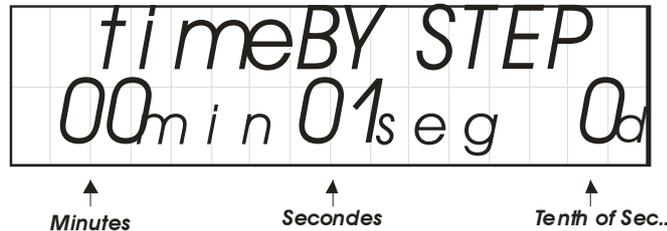
When you will accede into a relay program on which yet nothing has been recorded, (without a "End" or "End*" signal), you will not leave this display, until you indicate a "End", "End*" or "Of" in the Sequence Indicator,

Note. The I-211 allows to adjust the display contrast. To do it you have to regulate the potentiometer inserted in the circuit's board.

TIME ASSIGNATION BY STEP

As we indicated in the section Programming, the module configures the program in "steps", without using a concrete time measure. Through the "Time By Step" Function, the module will assign a determined adjustable time from a minimum (0,5 sec) up to a maximum (99 minutes, 59 sec., 9 tenth); that will configure the equivalence in time for a "step". In this mode, if we consider the step equivalence in 1 sec., the program previously done, would suppose a total time of 34 sec. At the opposite, if the "Time by Step", (step equivalence) in 1 minute, the previous program would have a total of 34 minutes. In order to enter in the "Time by Step" function, from the Operating Display, press the Enter key, and without stopping to press it, press the Pause key. If you have correctly done this operation, the display will appear as in fig 5.

Fig. 5. "Time by Step" Display.



By defect, when you accede to the display, the cursor will be placed in tenth of sec. To cyclically move from tenth, to seconds, or to minutes, you have to press the Pause Key. In order to change the value of some of them, you have uses the Up or Down keys.

Once changes done, you have to press the Enter key and the module will record the new time reference, returning to the operating display.

Remembers that the minimum operating time is 5 tenth. If you select an inferior time, although the display visualizes it, the module will automatically record it with its minimum allowed, 0,5 sec.

Besides, the time by configured step will be assigned as equivalence by step to all module's programs.

TO DELETE A PROGRAM

The I-211 admits the complete program erasure. To do this operation, you firstly have to accede to the program you want to delete, (Enter + relay n° keys). Then, in any point of the program, you have to be on the Sequence Indicator and select the "Del" option and press the Enter key. Immediately after this operation, the module will completely erase this program, returning to the operating display.

To only erase one part of the program you have to do a modification of it. Please consult the "Modification and Visualization Programs" section.

PROGRAM VISUALIZATION AND MODIFICATION

PROGRAM CONSULTATION. In order to consult a program you have to firstly accede to it. Using the recently created program, from the Operating Display and pressing the Relay 1 + Enter keys, you will accede to the mentioned program. Then, press successively, or maintaining pressed the "Relay 1" key, you could see how the display visualizes step by step the contents and go on with the program until you arrive at the end. Press the "Relay 2" key to return backwards. Do not use the Up or Down keys to move into the program, the function of these keys is to increase or to decrease the final step of each sequence, modifying the program ant not to visualizing it. To move into the program, you have to use Relay 1 and Relay 2 keys.

PROGRAM MODIFICATION. When you move through the Relay 1 and Relay 2 keys, you will be able to be placed in the wished program point. In that point, and through the Up or Down keys you could modify the program, following the usual programming mode.

Supposing that in the last program sequence, (sequence in Off from step 22 to 34), you wish to insert one in "On" between step 26 and step 30. To do this operation, use Relay 1 or Relay 2 keys to place the cursor in the step indicated in the display as "26 > 27", then, once placed in the Steps Indicator, press the Up key until the final step remains in 30. Press the Pause Key to go to the Output State and changes to the ON state (Up or Down keys). After this operation, using again the Pause Key, go on to the Sequence Indicator, verify that it indicates STEP option and press Enter. The modification will be done and you could check these changes using the Relay 1 and Relay 2 keys.

In order to leave to the operating display, you have to maintain pressed during 2 sec. the Pause Key. If the program does not contain a "End" or "End*" signal, you must have to create one to be able to leave the program.

CONFIRMATION OR STOP INPUTS

The I-211 module incorporates "an External" input for each relay. Each of these inputs will act on the program of the corresponding relay.

In those program sequences where the Output State was configured in "Ex", when the module reach these sequences and while they are still present, it will continuously check the corresponding input. If the input is in contact with the Common, the relay will be connected, at the opposite, if the input is open, the relay will be disconnected. See General Wiring Map section.

OPERATING MODE

The Operating Display (fig 1, p 2), is the main one of the module, in this display keys will acquire different functions from the rest. The Up and Down keys will allow to alternatively visualize both relays that the display respectively shows, "Re1/Re2", and "Re3/Re4", indicating underneath, its present state at any moment, On, Off, or Ex-.

Anyone of the Relay 1 to Relay 4 keys, when they are pressed will activate all prerecorded programs, initiating the module's operating.

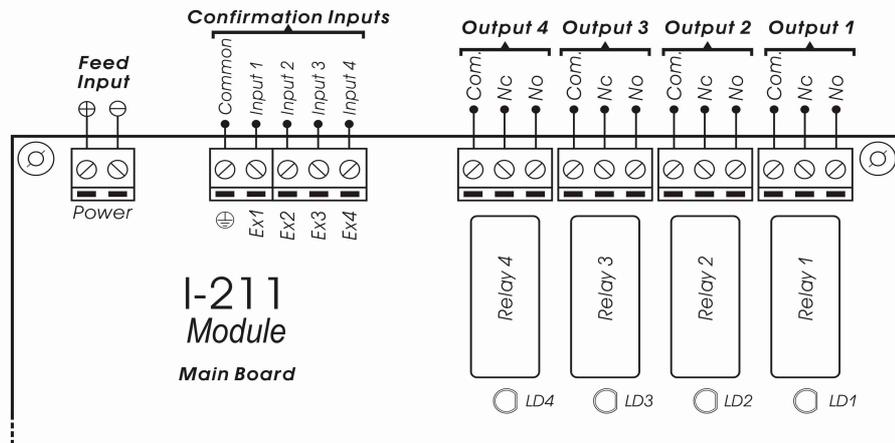
The Pause Key, as its name indicates, will do a pause that will freeze the program in the step in which it has been pressed, restoring the system once the key is pressed again.

The Enter key, pressed without combination with another key, will do a stop in the program, "Stop", leaving the circuit awaiting for a new initiation.

The Operating Display will indicate at any moment if the program is being executed, if it is in pause or if it is stopped, visualizing the corresponding following messages: ">RUN<", ">Pause<", and ">Stop<".

The display will also continuously show the step in which the program is, showing the "STEP n°" message, where "n°" will suppose the present step of the counter.

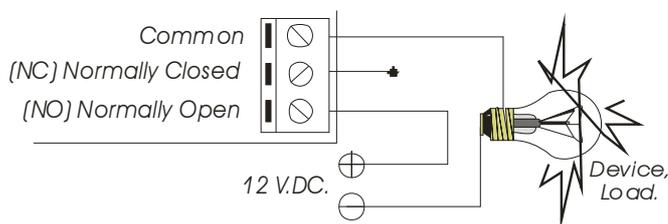
Do not forget that all programs will not have the same length or duration. For this reason, although the module will execute them at the same time, those with minor duration will remain dull, awaiting that major finish. This point is very important especially, if some programs are cyclical, because after the end of the major duration one, (and after the end of the function the rest), only the cyclical one will be reinitiated, continuing indefinitely its operating till a "Stop" is done.



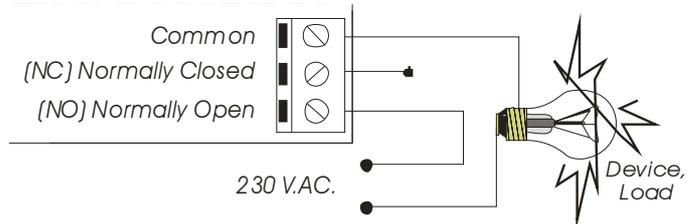
OUTPUT CONNECTION. LOAD. The I-211 output is controlled by a relay, and accepts any device up to 5 A. The relay is not a component supplying voltage but its function is limited to accept or deny the voltage passage like a standard switch. For this reason, you have to supply the load through this component.

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. For the inverse function you have to place the load between the NC and Common. In the following "Wiring Map" you can see how to operate at 12 V DC and 230 V AC.

12 V DC CONNECTION



230 V AC CONNECTION



fluctuation or an incorrect operating of the output. In such case, you have to install an anti-spark circuit between both contacts of the used relay, as it is indicated on the drawing

