Tutorial

Millenium

NTR 737 A/E

TUTORIAL : PROGRAMMING A LOGIC DIAGRAM

Crouzet

Solutions in automation

SCHEDULE OF REVISIONS

REV. NO	DATE	ITEM
A	MAY 1999	First edition

1/ Programming the software.

The software can be installed in one of the five available languages (English, German, French, Italian, Spanish).

1.1/ Application 1 : Access management – Automation of a gate.

This section will deal with an example of automation of a gate as shown in figure 1.1.

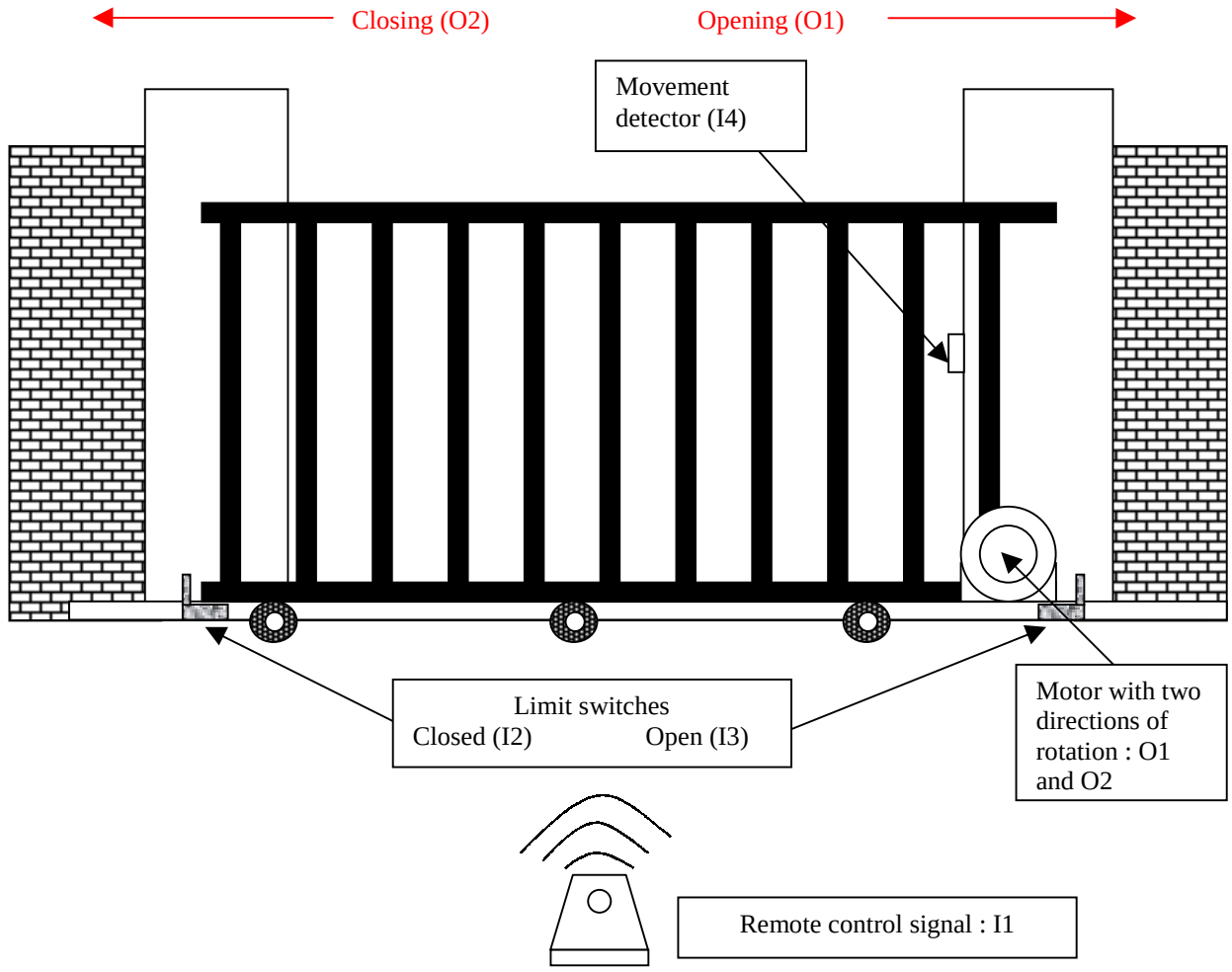


Fig. 1.1 Automation of a gate (schematic diagram)

Operation :

➔If the gate is closed or partially open, the remote control signal causes the gate to open fully unless another remote control signal is activated.
➔If the gate is open, it starts to close after 4 seconds unless the movement detector is activated.
➔During closing, the gate opens fully if the movement detector is activated.

The logic diagram which corresponds to this type of operation (figure 1.2) can be deduced easily and intuitively.

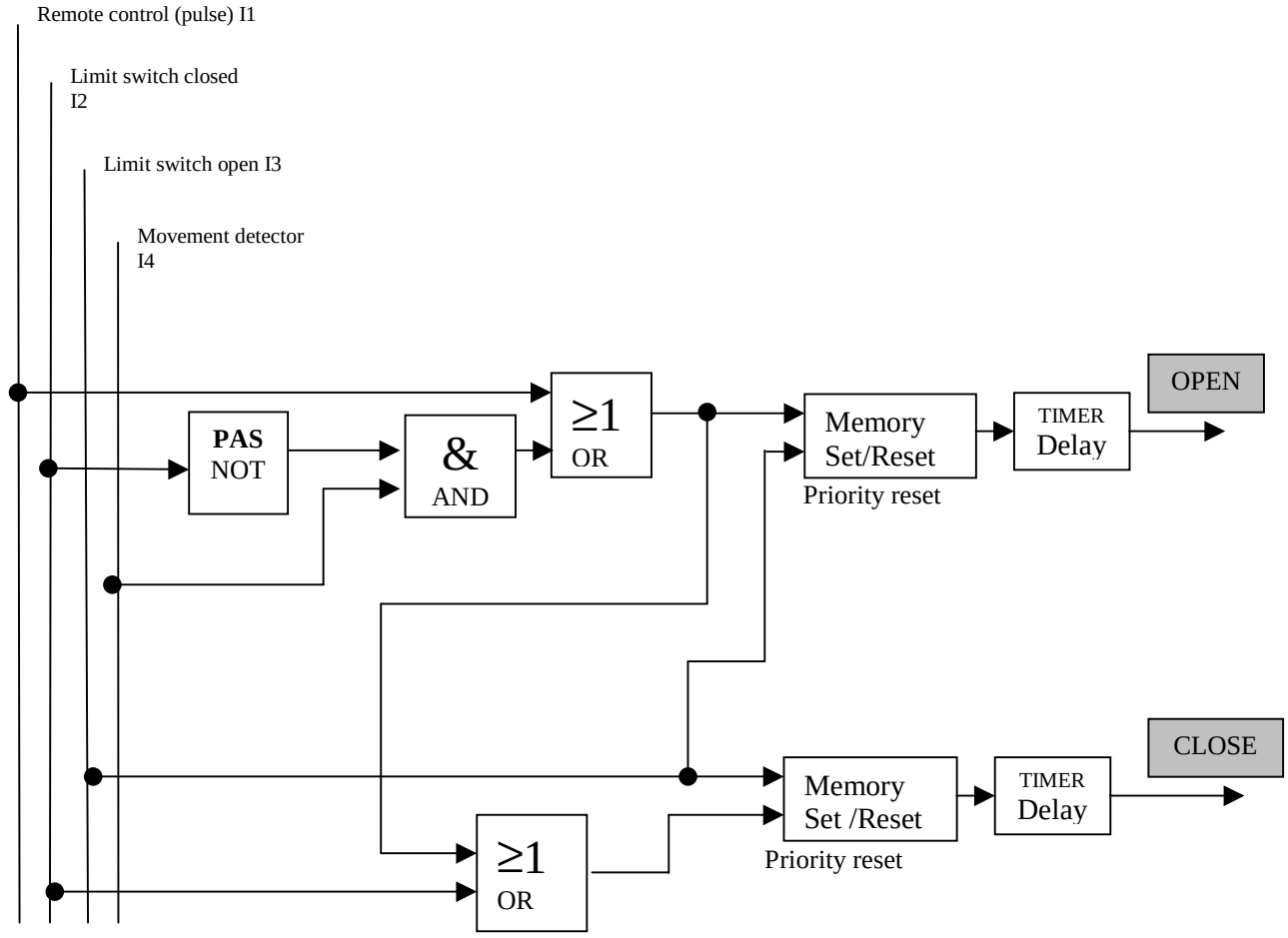


Fig. 1.2 Logic diagram of automation of a gate.

1.1.1/ Fast and easy programming.

Before starting programming, the following two steps should be performed :

➔Make a list of the number of inputs and outputs to be used.

INPUTS	
I1	Remote control signal
I2	Limit switch closed
I3	Limit switch open
I4	Movement detector

OUTPUTS	
O1	Gate opening
O2	Gate closing

➔Launch the application and select a module (4-2 ; 6-4 or 12-8), see figure 1.3.

The example shown requires a module with 4 inputs and 2 outputs.

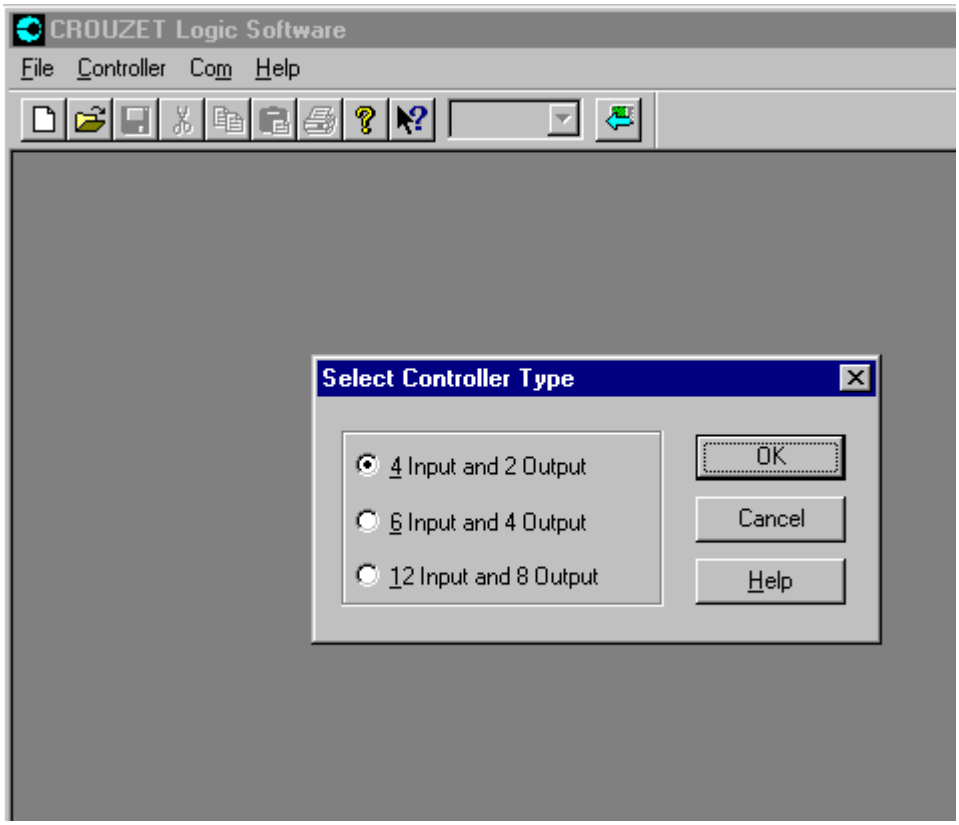


Fig. 1.3 Selecting the number of inputs and outputs.

➔Select the **IN** key to define the type of inputs to be inserted in the diagram (figure 1.4).

Fig. 1.4

➔Choice of inputs (figure 1.5) :

Note: If necessary, use the slider indicator (scroll bar) to access the complete list of inputs.

1-Place the mouse cursor on the required icon  (pushbutton).

2-Click once with the left mouse button. The mouse pointer will display a cross on the workscreen (or **FBD: Function Block Diagram**) if the selection is correct.

Slider indicator (scroll bar) offering access to all the available elements.

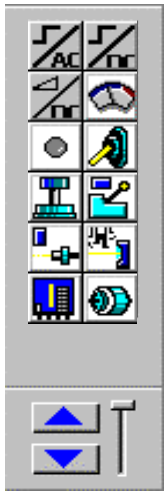


Fig. 1.5

3-Position the cross in one of the empty boxes numbered I01 to I04.

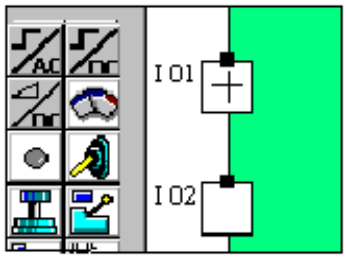


Fig. 1.6 Step 4

4-Click once in this zone to complete the entry.

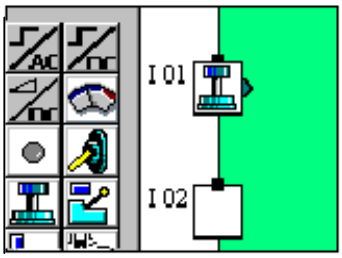


Fig. 1.7 Step 5

5-Repeat operations 1, 2, 3 and 4 to place the three other inputs shown below :

Position contactor : 

Position contactor : 

Proximity switch : 

The screen obtained is as follows (figure 1.8) :

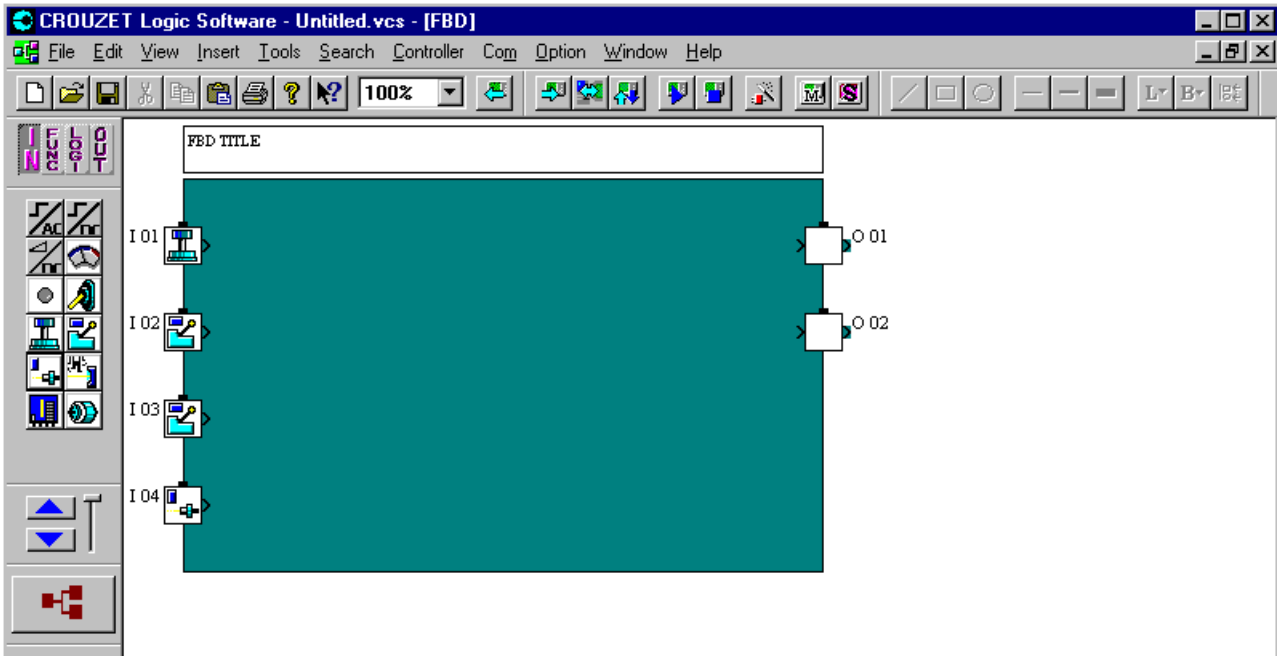


Fig. 1.8 Inputs in place.

➔Select the **OUT** key to define the type of outputs to be used (figure 1.9).

Fg. 1.9

➔ Choice of outputs (figure 1.10) :
The procedure is exactly the same as that for inputs. The motor with two directions of rotation will be assimilated by two separate outputs.

Fig. 1.10

The diagram is as follows (figure 1.11) :

Fig. 1.11 The inputs and outputs are positioned.

➔Choice of functions : * Logic functions are accessed via the **LOGI** menu (figure 1.12).

Fig. 1.12

* More advanced functions (function blocks) are accessed via the **FUNC** menu (figure 1.13).

Fig. 1.13

➔Positioning the blocks.

Note : Selecting the blocks is similar to selecting the inputs/outputs.
If a block is positioned too close to the limits of the working window (F.B.D.), an error message will appear.
It is possible to extend the window. To do this, place the pointer on one of the edges of the F.B.D. and, holding down the left-hand button, move the window.

1-Select an **AND** logic block from the **LOGI** menu (logic functions, figure 1.14).
2-Place this in the F.B.D.

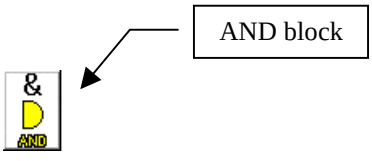
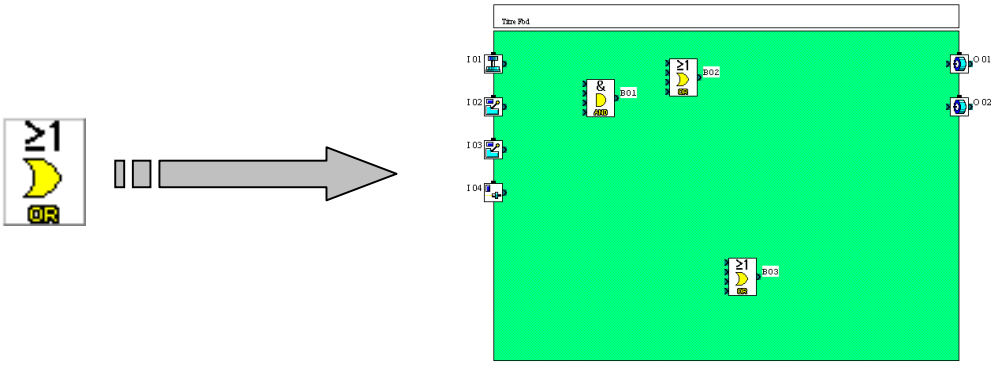
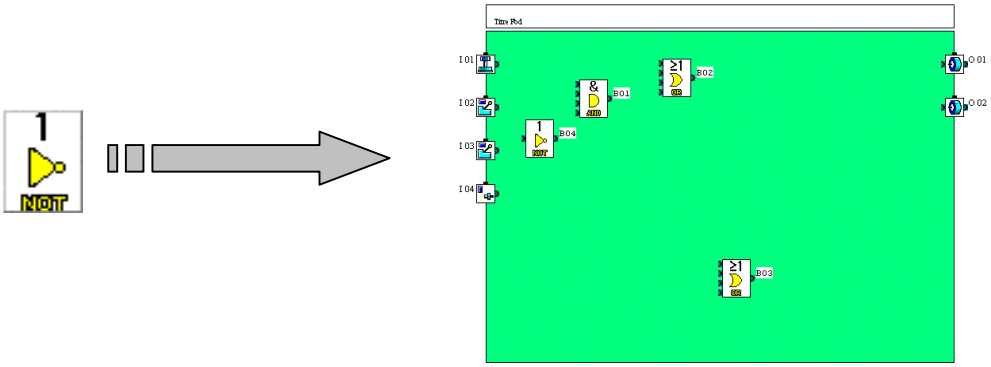


Fig. 1.14

3-Place one **OR** logic block, then another.

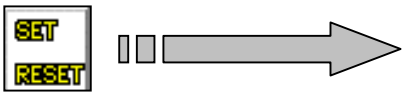


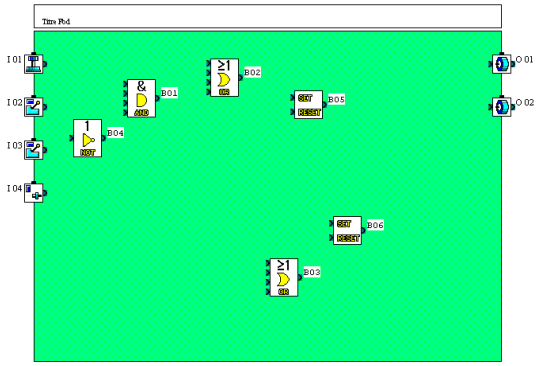
4-Place a **NOT** logic block.



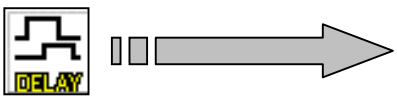
5-Place one **SET/RESET** function block (**FUNC** menu fig. 1.15), then another.

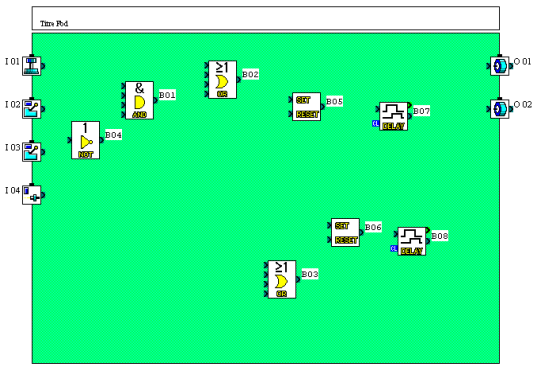
Fig. 1.15





6-Place one **DELAY** function block, then another.





➔Make the connections.

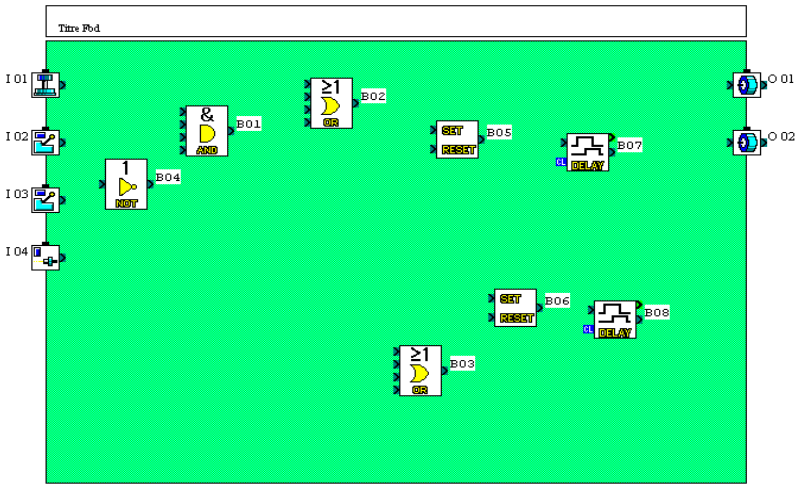


Fig. 1.16 Arrangement of blocks before connection.

Connection rules :

- Connections are made from the output of one block to the input of another block.
- An output can be connected to several inputs.
- An input can only be connected to a single output.
- For successful connection, the mouse pointer must be correctly positioned on the special marks.

- An analogueue output (or input) cannot be linked to a discrete input (or output).
- Connection is only possible if the corresponding mode is activated.

- Removing a connection : Click on it with the left-hand button then press **Delete** on the keyboard or select **Clear** from the drop-down **Edit** menu.

1-Activate wiring mode (see above): the icon is highlighted.
2-Place the mouse cursor on the **I1** output, keeping the left-hand button pressed.
3-Drag the pointer to one of the inputs on the **OR** block (B02) (figure 1.17).
4-Release the mouse button (see figure 1.18 or 1.19).

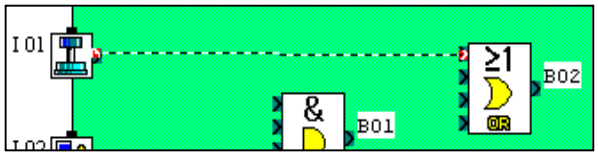


Fig. 1.17 Connection in progress.

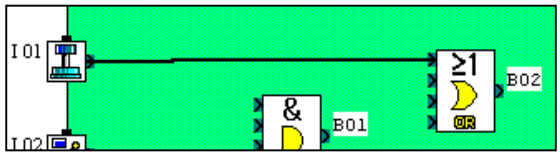
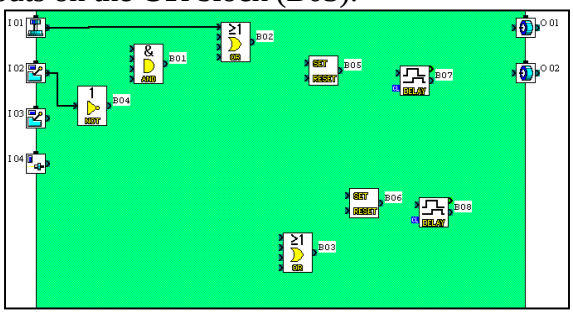
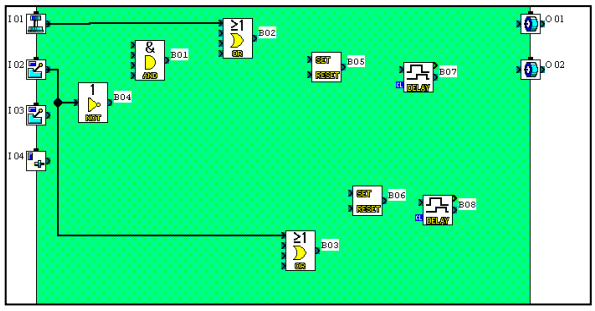


Fig. 1.18 Connection complete.

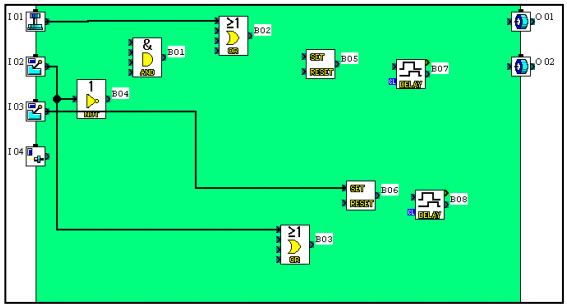
Fig. 1.19 Error message: the connection has not been made. Repeat steps 2, 3, 4.

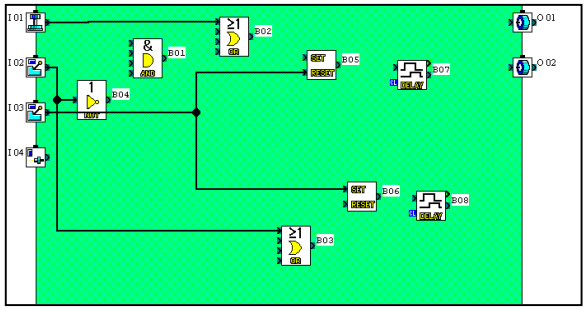
5-Repeat the operation to link **I2** to the input on the **NOT** block (B04), and to one of the inputs on the **OR** block (B03).



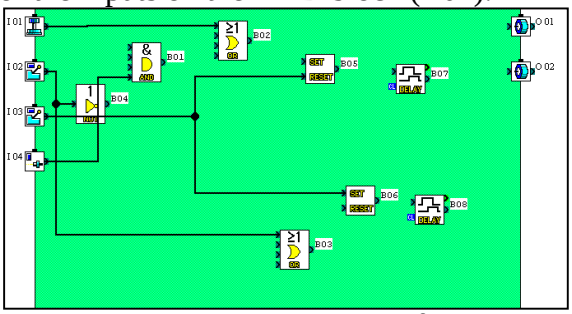


6-Connect **I3** to the **SET** input on the **SET/RESET** block (B06), then to the **RESET** input on the **SET/RESET** block (B05).

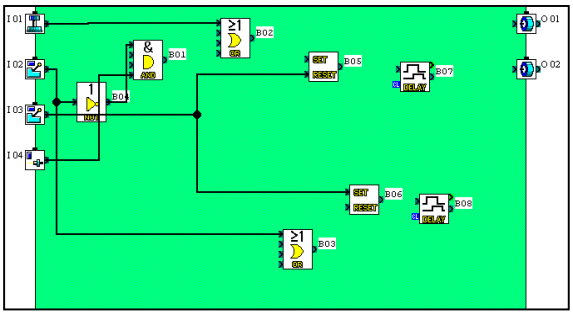




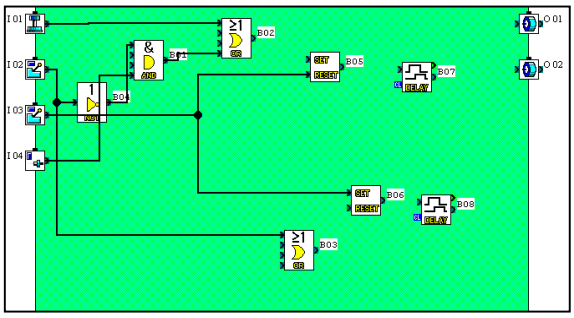
7-Connect **I4** to one of the inputs on the **AND** block (B01).



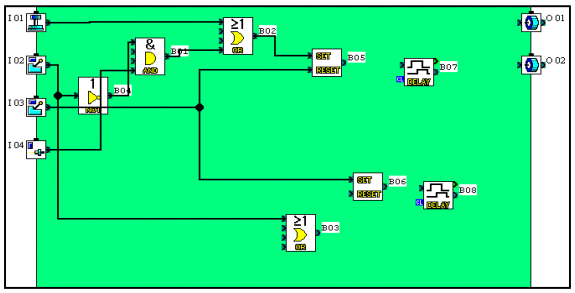
8-Connect the output on the **NOT** block (B04) to one of the inputs on the **AND** block (B01).

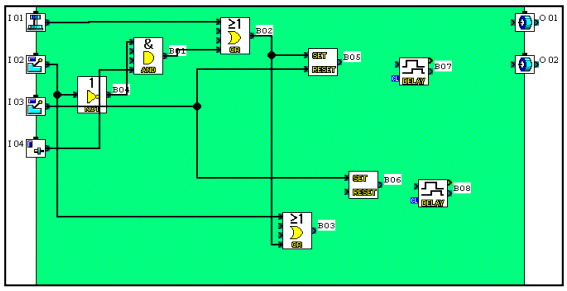


9-Connect the output on the **AND** block (B01) to one of the inputs on the **OR** block (B02).

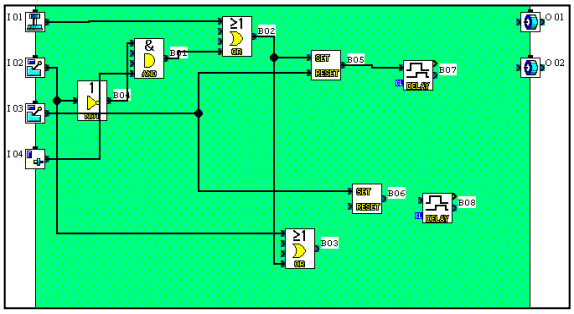


10-Connect the output on the **OR** block (B02) to the **SET** input on the **SET/RESET** block (B05), then to one of the inputs on the **OR** block (B03).

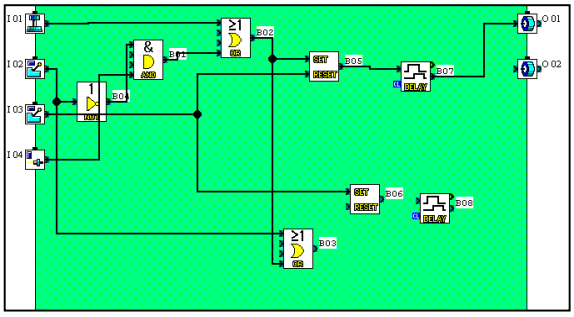




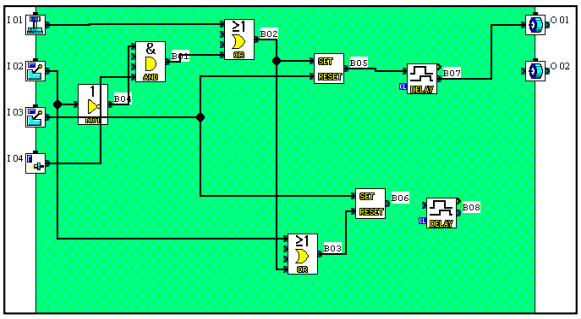
11-Connect the output on the **SET/RESET** block (B05) to the discrete input on the **DELAY** block (B07).



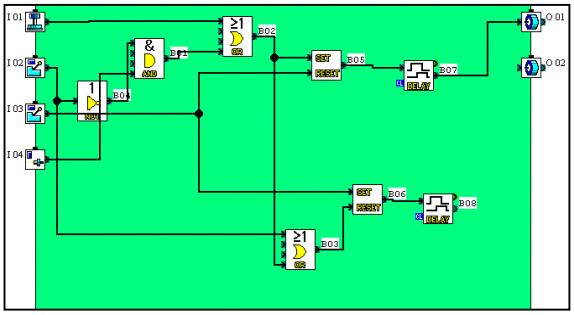
12-Connect the discrete output on the **DELAY** block (B07) to the output **O01**.



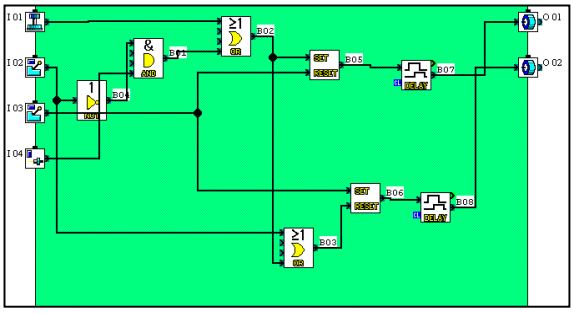
13-Connect the output on the **OR** block (B03) to the **RESET** input on the **SET/RESET** block (B06).



14-Connect the output on the **SET/RESET** block (B06) to the discrete input on the **DELAY** block (B08).



15-Connect the discrete output on the **DELAY** block (B08) to the output **O02**.



16-Reposition the blocks to make the diagram clearer, figures 1.20 and 1.21 (see *General remarks* on the following page).

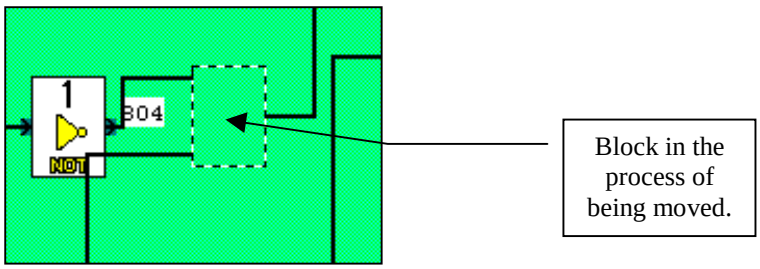


Fig. 1.20

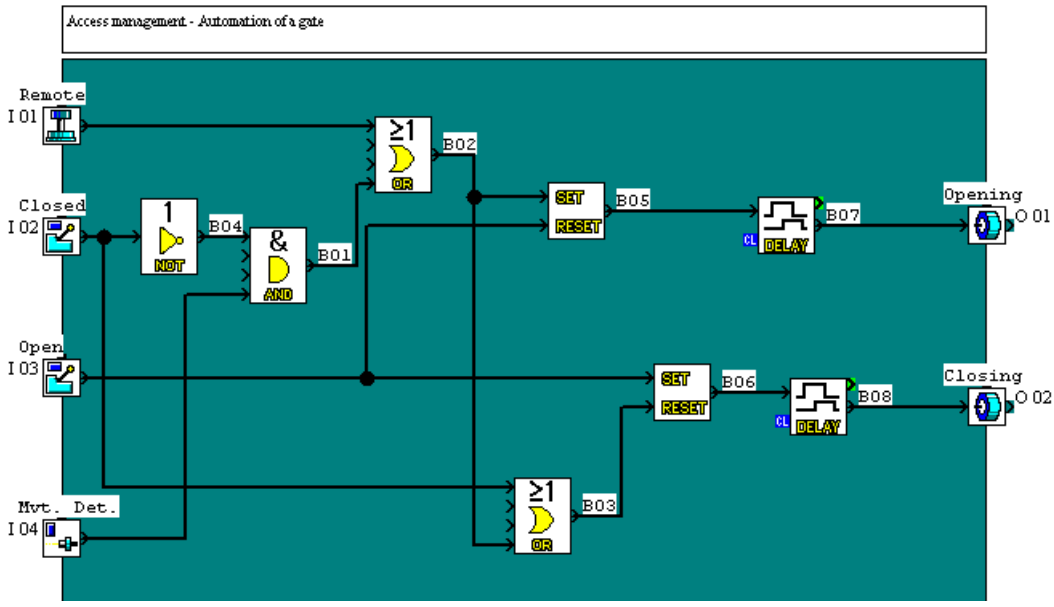
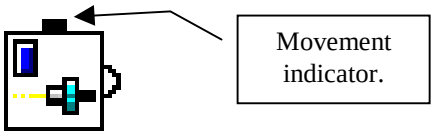


Fig. 1.21 Reorganized F.B.D.

General remarks :

- In order to make the diagram clearer, it is possible to reorganize the elements of the F.B.D. (blocks, connection cables, inputs, outputs). To do this, click on the element to be moved and, holding down the left mouse button, place it in the desired position.
- To move an input or an output, the mouse pointer should be positioned on the black mark above the icon. A vertical arrow will then appear.
- Comments can also be added to each block or in the F.B.D. title by



double-clicking on the element in question. For example, show the action associated with output O1 (figure 1.22) :

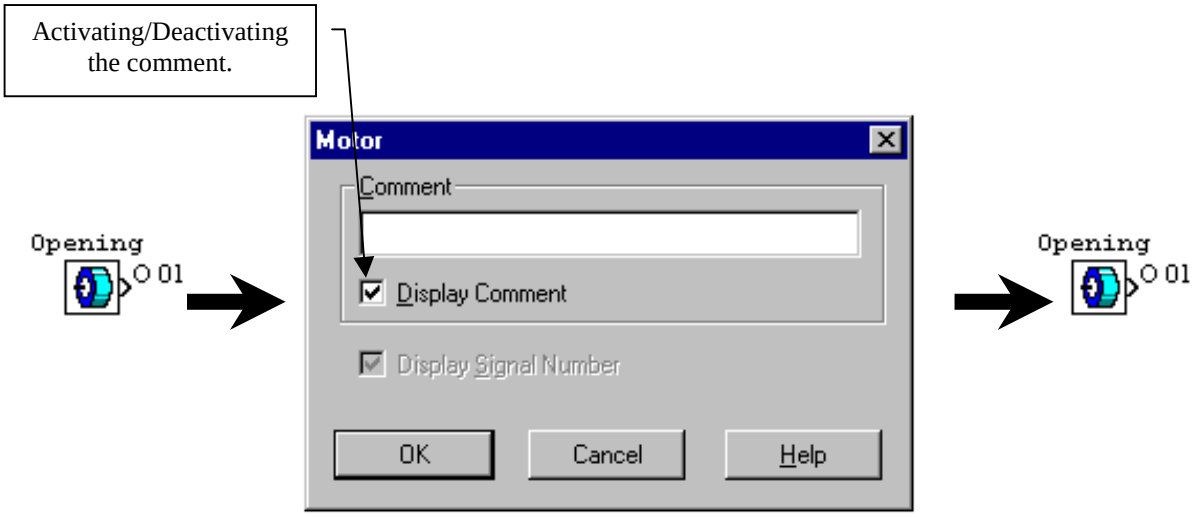


Fig. 1.22 Adding a comment.

- Each of the blocks is numbered by default. This option can be inhibited by deactivating the corresponding item.

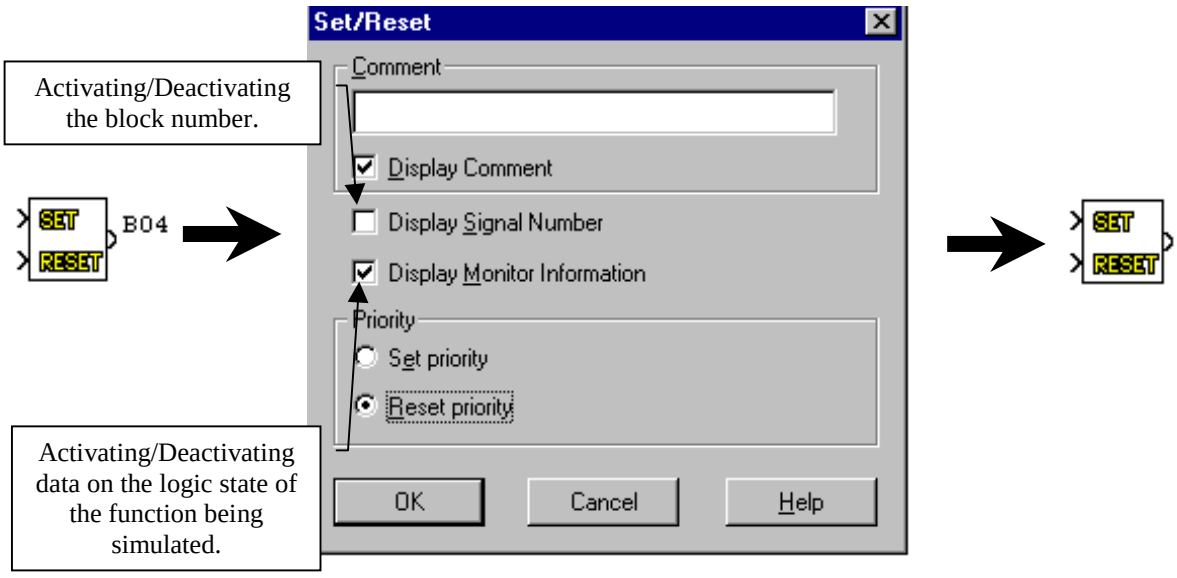


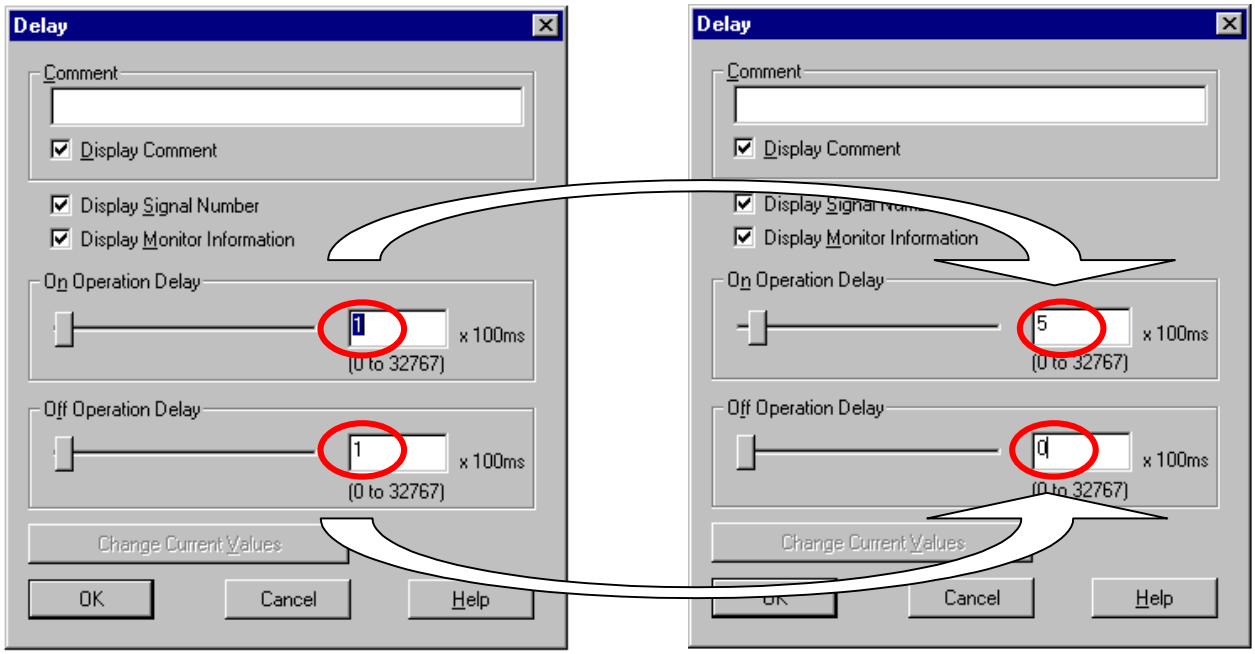
Fig. 1.23 Options for a SET/RESET function block.

➔Setting the parameters for the **DELAY** and **SET/RESET** functions.

1-Double-click on the **DELAY** function block (B07) to call up the dialogue box associated with the block.

2-In the ***On Operation Delay*** field, enter **5** (5 x 100ms = 5 tenths of a second, to stop the gate between the opening phase and the closing phase).

3-In the ***Off operation Delay*** field, enter **0**.



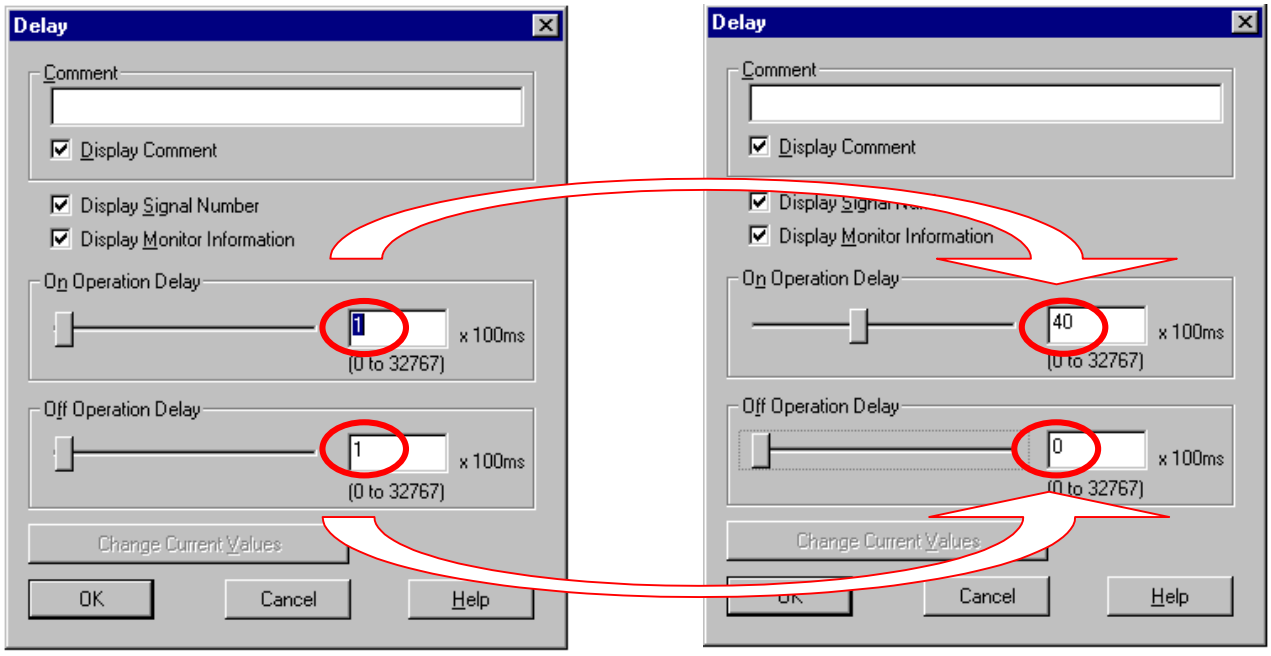
4-Confirm by pressing **OK**.

5-Double-click on the **DELAY** function block (B08).

6-In the ***On operation Delay*** field, enter 40 (40 x 100ms = 4 seconds to stop the gate opening completely).

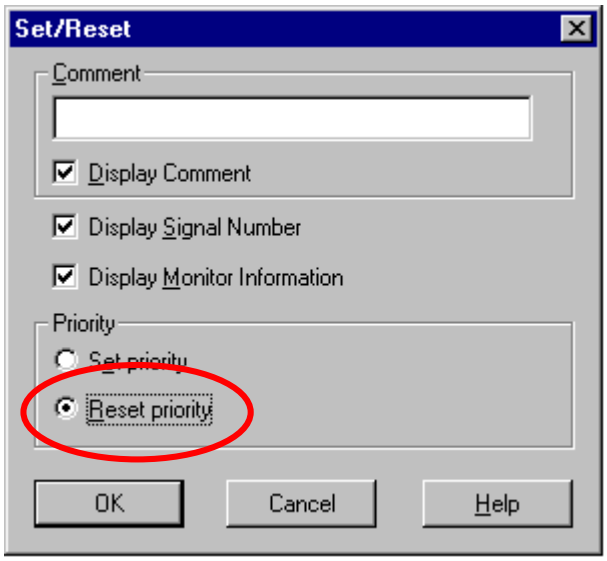
7-In the ***Off operation Delay*** field, enter **0**.

8-Confirm by pressing **OK**.



9-Double-click on the **SET/RESET** function block (B05).

10-In the ***Priority*** field, check that the option **Initialize the priority** (**Reset priority)** is checked.



11-Confirm by pressing **OK**.

 ***Start/Stop Simulation*** *icon for starting the simulation.*

12-Repeat steps 9, 10, 11 with the **SET/RESET** function block (B06).

➔Start simulation using the icon in the toolbar.
Simulation consists of clicking on the inputs to recreate the operating conditions.

1.1.2/ DISPLAY mode.

The DISPLAY block in the FUNCTION menu (figure 1.24) creates a true Man Machine Interface (M.M.I.).
In certain conditions (signals given by inputs), it is possible to display process monitoring messages on a screen.

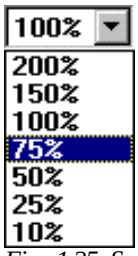


Fig. 1.25 Scale modification drop-down menu

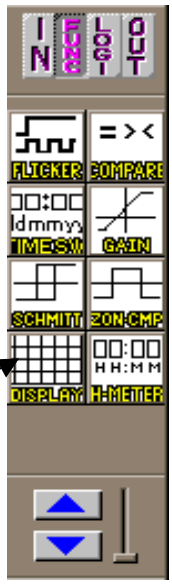


Fig. 1.24

➔Enlarge the working window if it is too small (it is also possible to reduce the scale of the project by changing the ZOOM – (figure 1.25).
➔Arrange the **DISPLAY** functions as shown in figure 1.26.

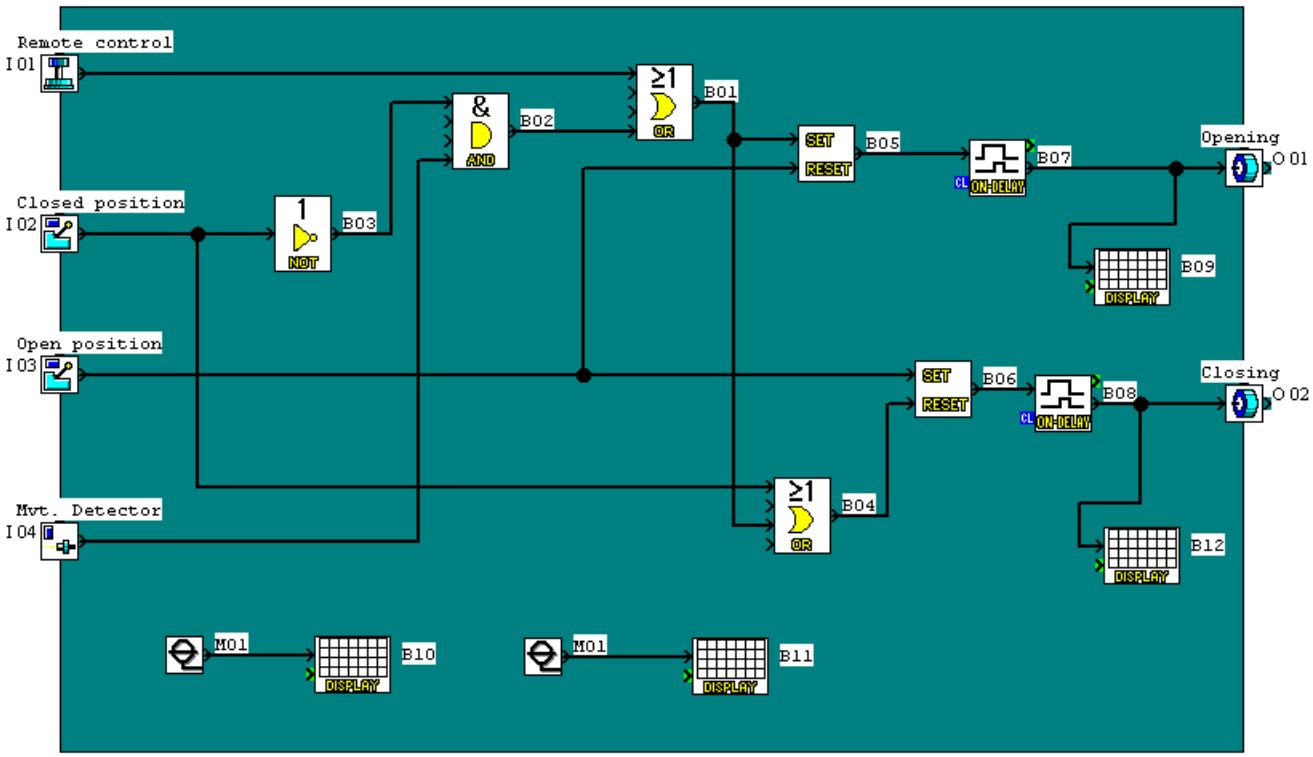
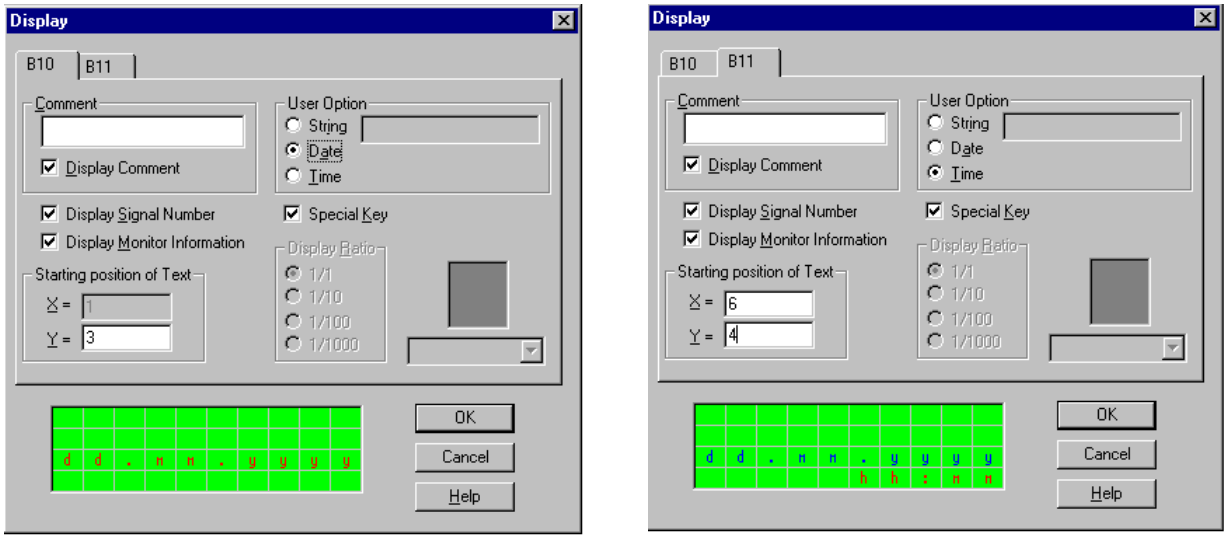


Fig. 1.26 Adding DISPLAY functions. This block enhances the M.M.I.

The  block is an internal bit which executes forcing to 1. It enables a message to be continuously displayed on the LCD screen of the module. It is accessed via the **IN** menu using the scroll bar (up and down arrows).

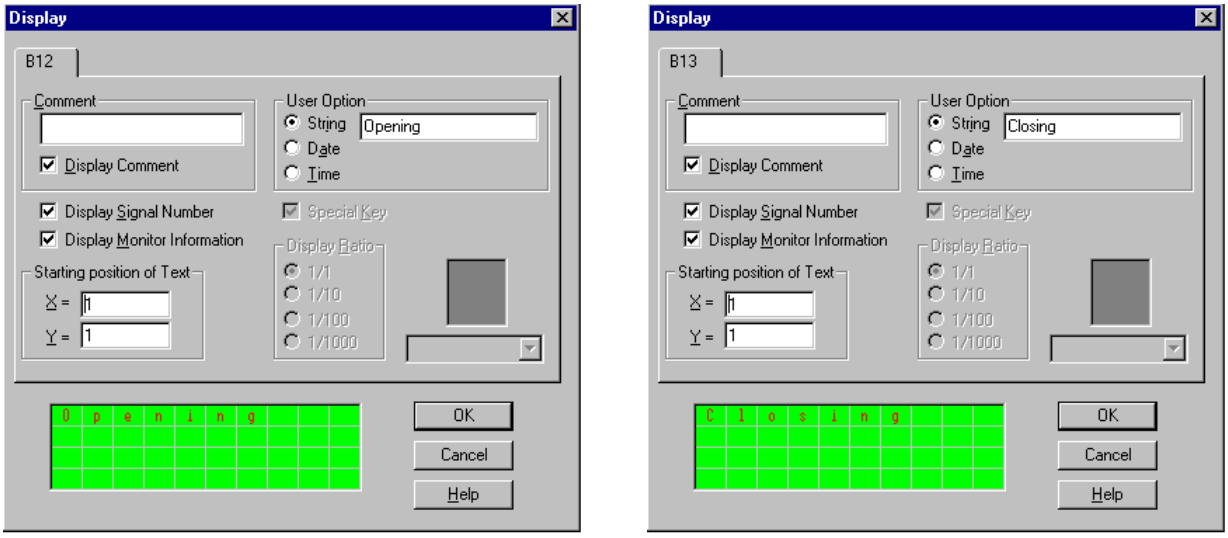
➔Setting the function parameters.



Double-click on block B10 then block B11. The menu shown in figure 1.27 will appear.

*Fig. 1.27 Window for setting the parameters of **DISPLAY** functions. Screens displayed simultaneously appear in the same window. Each screen can be accessed by the corresponding tab. The text of the active block is shown in red. So, block B10 will display the current date (**User option**) on line **Y=3** of the display. Similarly, block B11 will display the current time in **X=6** and **Y=4**. In this way the messages are not superimposed.*

The other two blocks, B12 (figure 1.28) and B13 (figure 1.29), show the action performed



(opening or closing).

*Fig. 1.28 Text is displayed (**String** option checked in the **User option** menu) by entering characters (restricted to 10 per line) in the entry field in this option. The alphanumerical string can then be positioned using its X and Y coordinates. This block is connected to the output which activates opening of the gate.*

Fig. 1.29 This block is connected to the output which activates closing of the gate.

The Opening and Closing texts can have the same coordinates since activation of the corresponding screens is subject to two mutually exclusive conditions (i.e. the gate cannot open and close at the same time).

➔In the menu bar, select the **Window** drop-down menu, then the **Tile** option (figure 1.30).

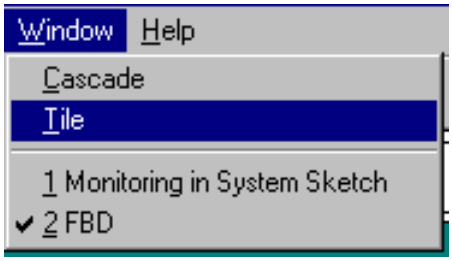


Fig. 1.30

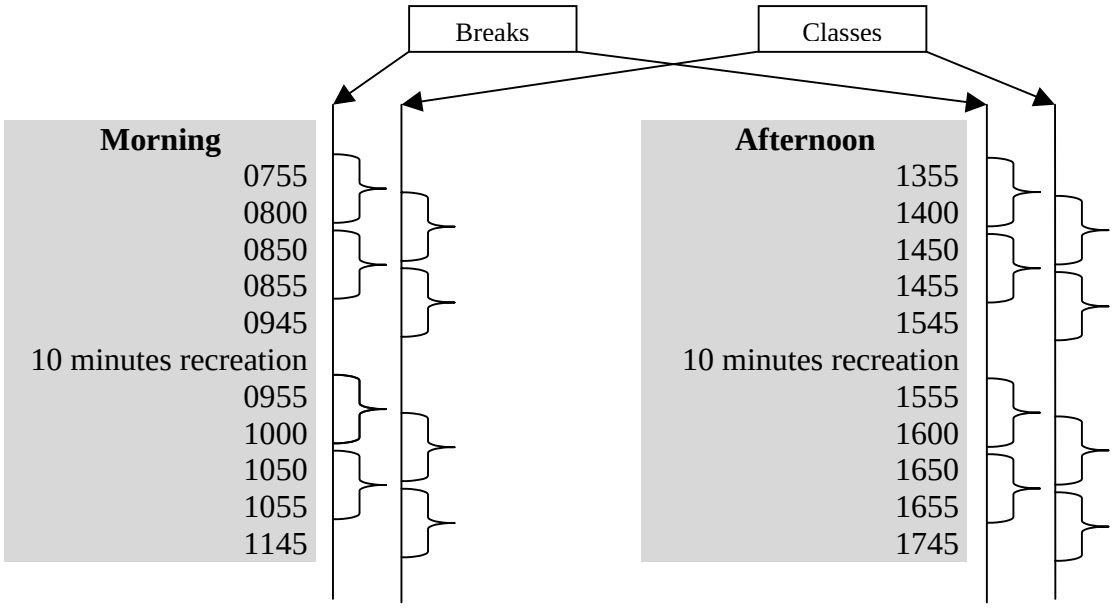
➔Start the simulation using the **Start/ Stop Simulation** button.
➔A dialogue box (figure 1.31) offers to display the screen during simulation. Press **Yes** to display the interface.

Fig. 1.31 Start of simulation with LCD screen display.

1.2/ Application 2 : School bell.

A school wishes to install a clock which is capable of managing when bells ring during the school day, including holidays and bank holidays.
The specifications are shown below.

The bell should ring for 3 seconds, Monday to Friday at the following times :



However, it should not ring during school holidays or on bank holidays :
The example is based on the French holidays for 1999.

School holidays (1999)	
Christmas	: afternoon 18 December 98 to morning 4 January 99.
Winter	: afternoon 12 February 99 to morning 1 March 99.
Easter	: afternoon 09 April 99 to morning 26 April 99.
Summer	: afternoon 30 June 99 to morning 6 September 99.
Hallowe'en	: afternoon 29 October 99 to morning 8 November 99.
Bank holidays (including those in the school holidays)	
1 January (New Year’s Day)	
1st Monday in April (Easter Monday)	
1 May (Labour Day)	
8 May (VE day)	
2nd Thursday in May (Ascension)	
4th Monday in May (Pentecost)	
14 July (Bastille Day)	
15 August (Assumption)	
11 November (Armistice Day)	
25 December (Christmas)	

Two **TIME SWITCH (Clock)** functions will be employed. One will manage the daily ringing of the bell, the other will switch the system off during the holidays. A **ONE SHOT** function will set the duration of the bell.

The logic diagram is shown below (figure 1.32) :

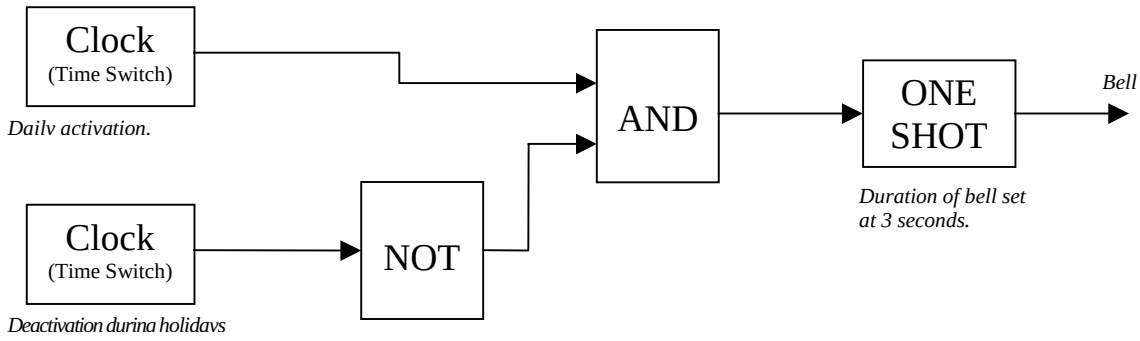


Fig. 1.32 Logic diagram for a school bell.

The steps for selecting and positioning the blocks will be less detailed than for the previous example. Refer back in case of difficulty.

A module with 4 inputs and 2 outputs will be sufficient for this example.
The output (bell) will be represented by an icon of a lamp in order to clearly identify activation during the simulation.

1.2.1/ Positioning the blocks.

➔After opening a new file, taking care to select a 4/2 module, enter the title of the program to be executed by double-clicking on the **Fbd title** window (figure 1.33).

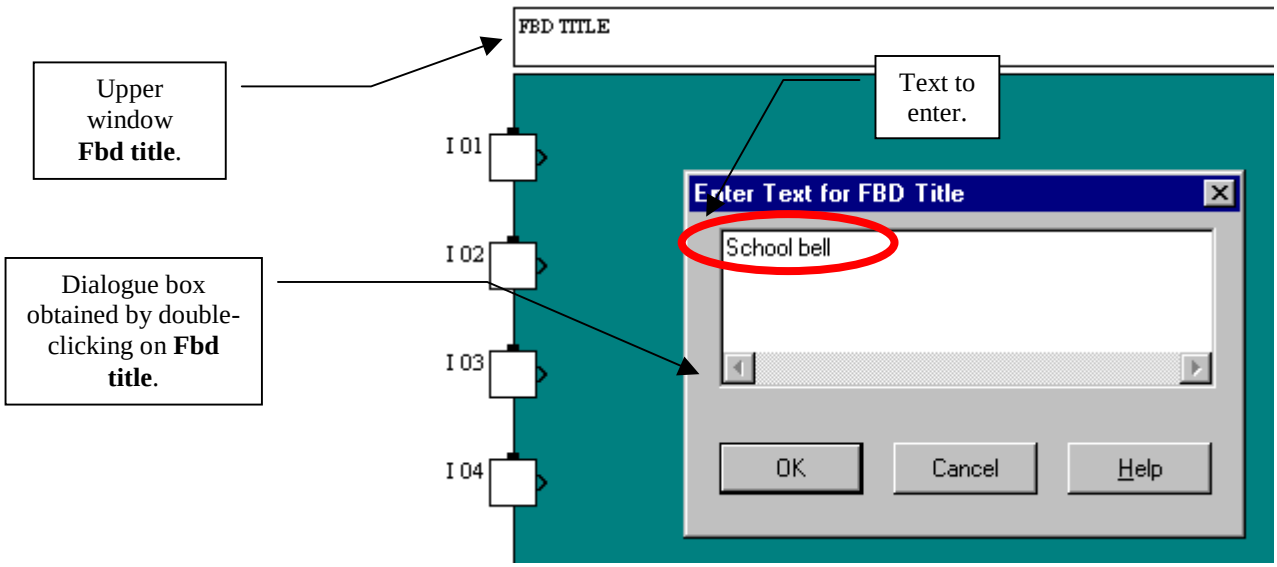


Fig. 1.33

➔Select a lamp from the **OUT** menu to place in one of the slots reserved for outputs (figure 1.34).

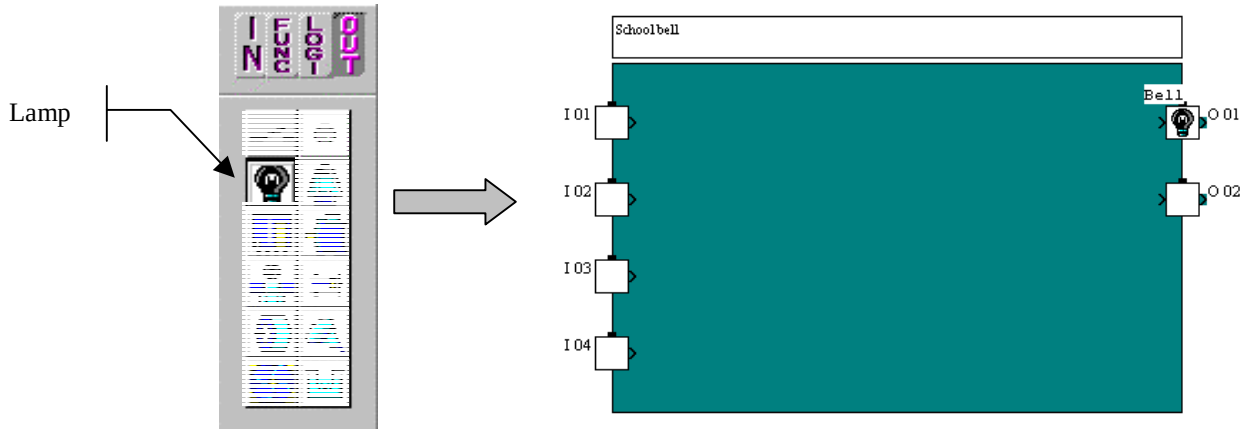


Fig. 1.34

➔Using the **LOGI** menu, place an **AND** block then a **NOT** block in the work screen (figure 1.35). It is possible to include a comment on the output.

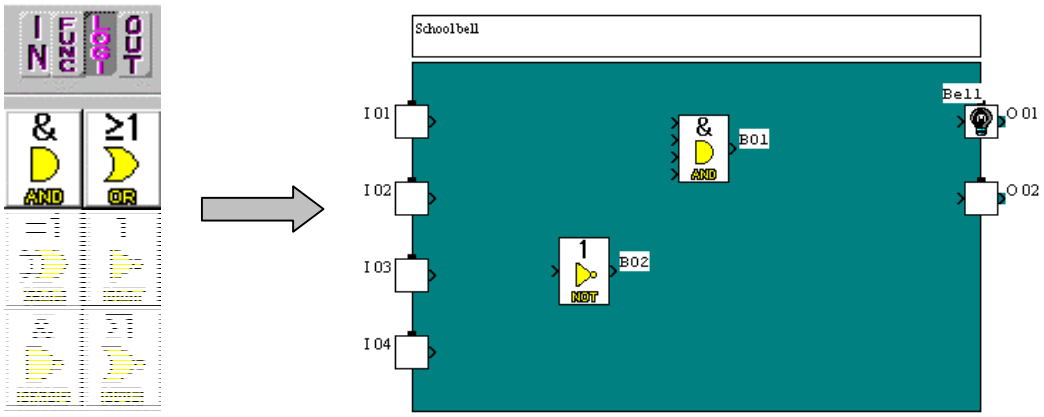


Fig. 1.35

➔Using the **FUNC** menu, select one **ONE SHOT** block function and 2 **TIMESW** function blocks (figure 1.36). Use the scroll bar to access one or other of these functions.

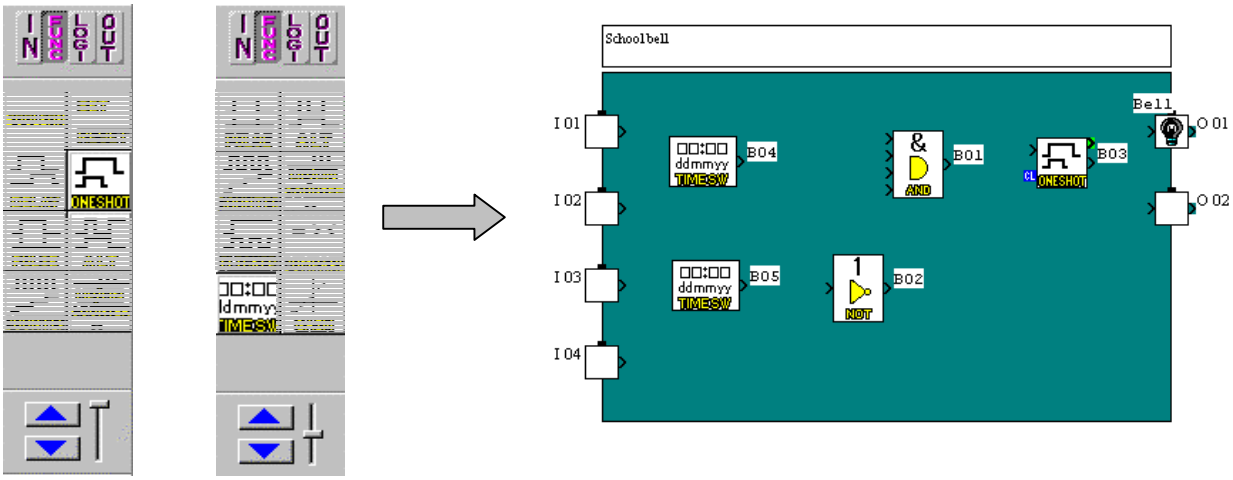


Fig. 1.36

➔Create the wiring (figure 1.37). To do this, activate the wiring mode.

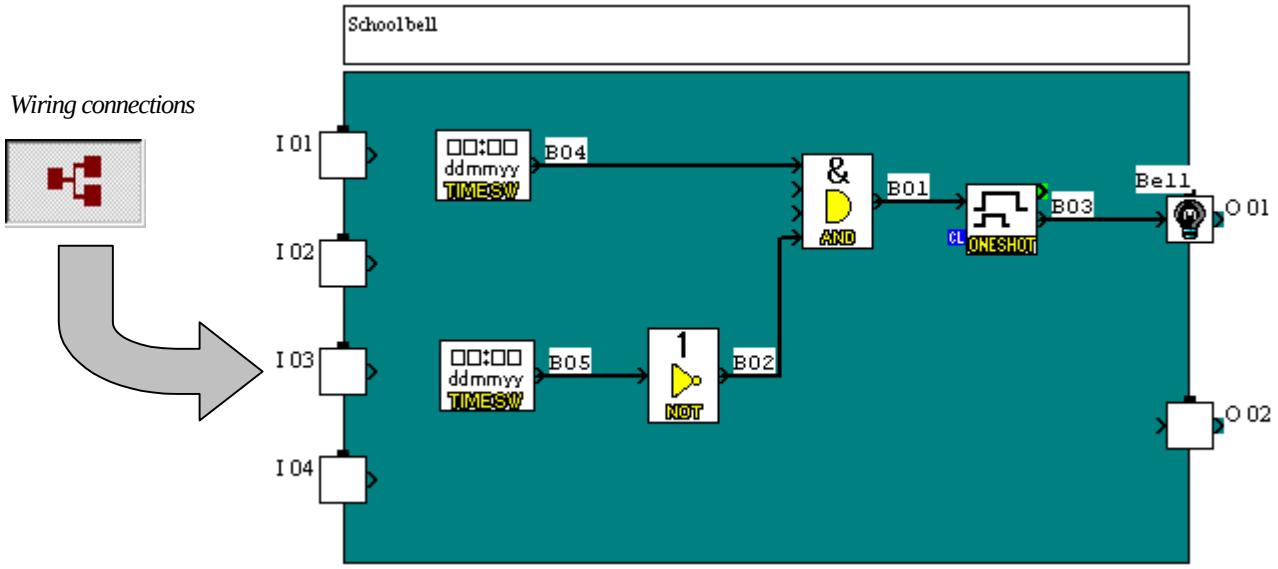


Fig. 1.37

Note : Arrange the blocks and connections so that the diagram is as clear as possible.

1.2.2/ Positioning the blocks.

The parameters for the **ONE SHOT** blocks (3-second pulse signal) and **TIME SWITCH** blocks (hourly, daily, monthly clock) must now be set.

➔Double-click on the **ONE SHOT** function block. A dialogue box (figure 1.38) prompts you to enter the length of the signal corresponding to the time of the bell.

➔Enter the value 30 (30x100ms = 3 s).

Press the **Details** button in the **One Shot** dialogue box, and ensure that the **None** option has been checked (figure 1.39).

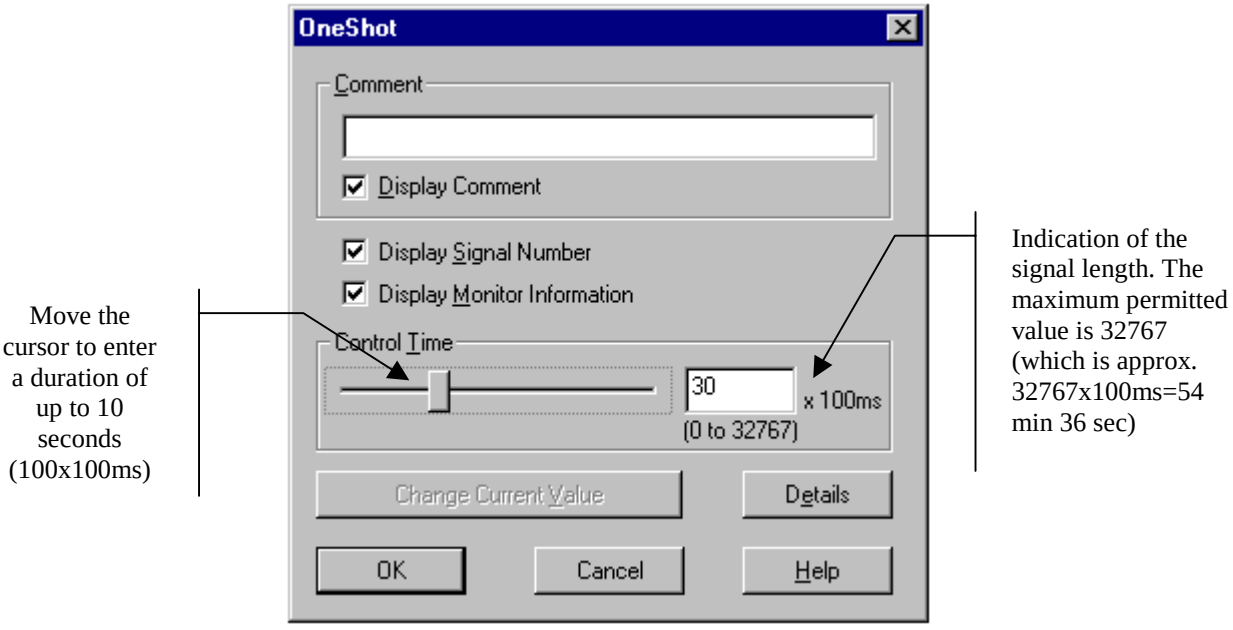


Fig. 1.38

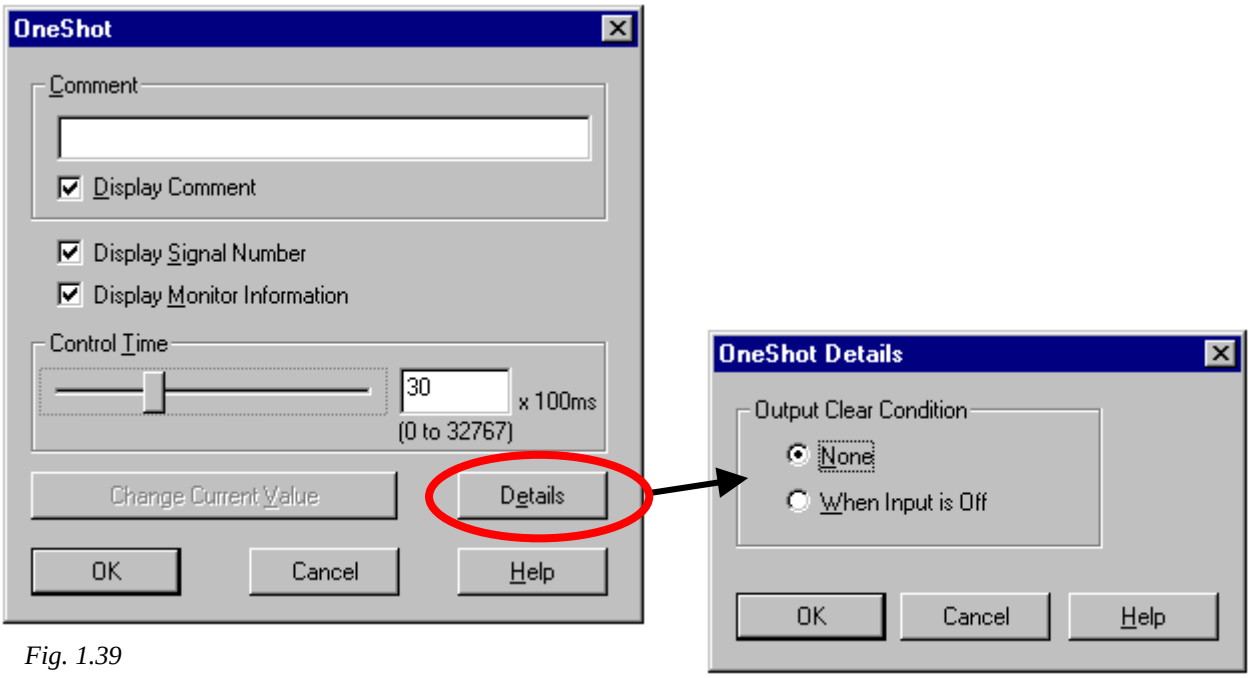


Fig. 1.39

Confirm all entries by pressing OK.

➔Specify which should be the parameters of the 2 clock functions.
The first clock deals with the time the bell is activated.

Double-click on the **Time Switch** connected directly to the **AND** block (numbered **B04** in the example in this document). The dialogue box associated with it (figure 1.40) accesses several menus.

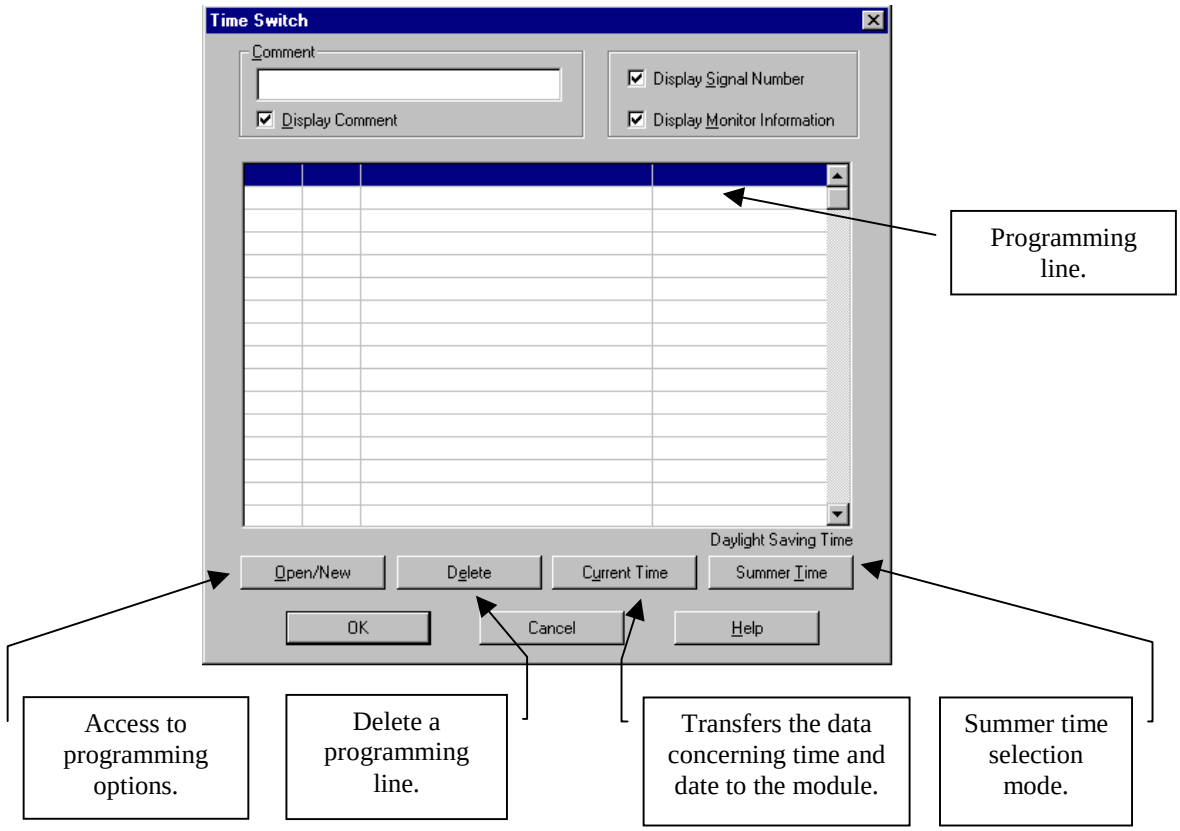


Fig. 1.40

Note : A single **Time Switch** function block can contain up to 50 programming lines (or ON/OFF cycles). A program (logic diagram) accepts 356 ON/OFF cycles, i.e. 7 clock blocks with the maximum number of cycles and 1 clock block of 6 cycles.

Summer time is automatically activated according to the selection mode (see part 2 of this document – "Programming via the module front panel"- to see the relevant specifications.

Entering the first programming line.

According to the specifications, the bell should ring at 07.55, Monday to Friday.

1-From the dialogue box on figure 1.40, click on the **Open/New** button. The corresponding dialogue box (figure 1.41) offer three types of programming :

Weekly (choice of one or more weeks per month),

Daily (choice of one or more days of the week),

Calendar ("date") (choice of a specific date according to a calendar which is year 2000 compliant (1900 to 2100)).

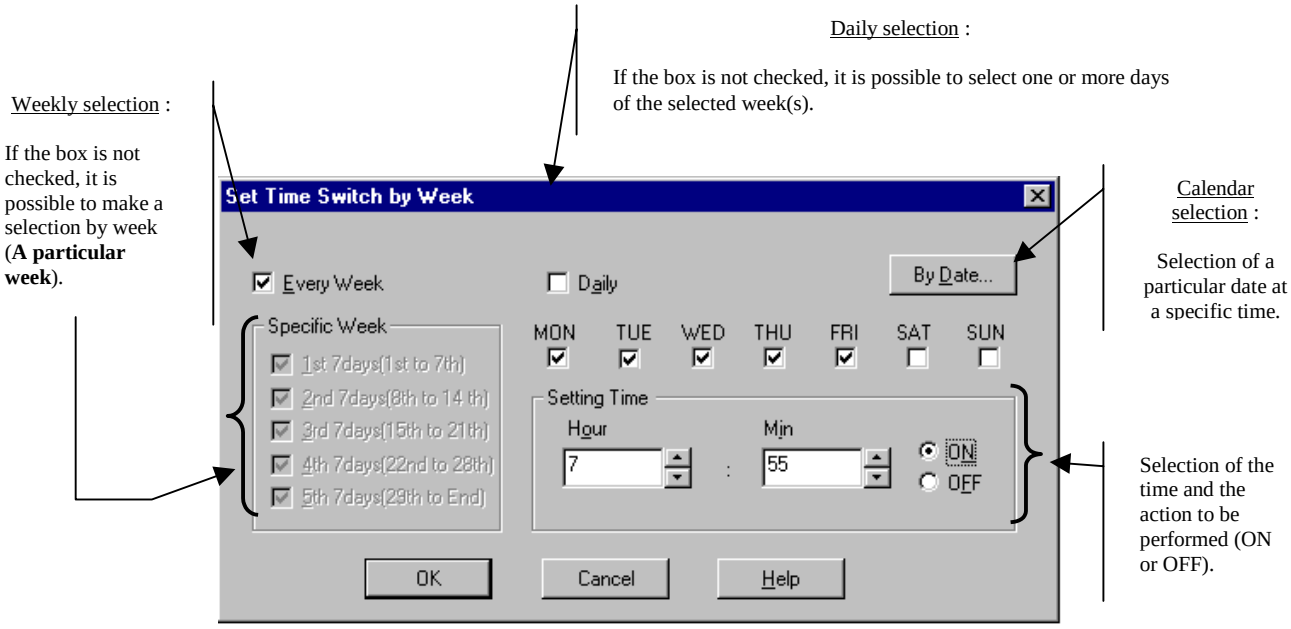


Fig. 1.41

2-Copy the data from figure 1.41 into the dialogue box so that the clock transmits an **ON** signal **at 07.55 on Monday to Friday every month**.

3-Confirm by pressing **OK**.

The first programming line should be as shown in figure 1.42.

ON	7 : 55	Mon Tue Wed Thu Fri	Every week

Fig. 1.42

In order to be able to send another ON signal to the bell, the first one must be stopped. This should happen one minute later.

4-Click on the next blank programming line.

5-In the **Weekly Time Switch** dialogue box change the time to **0756**, and check the **OFF** box.

6-Confirm by pressing **OK**.

The display will be as shown in figure 1.43.

ON	7 : 55	Mon Tue Wed Thu Fri	Every week
OFF	7 : 56	Mon Tue Wed Thu Fri	Every week

Fig. 1.43

Continue in this way for all the times detailed in the specifications.

Do not forget to deactivate the ON signal each time, one minute later.

The grid should display the following lines (figure 1.44).

ON	7 : 55	Mon Tue Wed Thu Fri	Every week
OFF	7 : 56	Mon Tue Wed Thu Fri	Every week
ON	8 : 00	Mon Tue Wed Thu Fri	Every week
OFF	8 : 01	Mon Tue Wed Thu Fri	Every week
ON	8 : 50	Mon Tue Wed Thu Fri	Every week
OFF	8 : 51	Mon Tue Wed Thu Fri	Every week
ON	8 : 55	Mon Tue Wed Thu Fri	Every week
OFF	8 : 56	Mon Tue Wed Thu Fri	Every week
ON	9 : 45	Mon Tue Wed Thu Fri	Every week
OFF	9 : 46	Mon Tue Wed Thu Fri	Every week
ON	9 : 55	Mon Tue Wed Thu Fri	Every week
OFF	9 : 56	Mon Tue Wed Thu Fri	Every week
ON	10 : 00	Mon Tue Wed Thu Fri	Every week
OFF	10 : 01	Mon Tue Wed Thu Fri	Every week
ON	10 : 50	Mon Tue Wed Thu Fri	Every week
OFF	10 : 51	Mon Tue Wed Thu Fri	Every week
ON	10 : 55	Mon Tue Wed Thu Fri	Every week
OFF	10 : 56	Mon Tue Wed Thu Fri	Every week
ON	11 : 45	Mon Tue Wed Thu Fri	Every week
OFF	11 : 46	Mon Tue Wed Thu Fri	Every week
ON	13 : 55	Mon Tue Wed Thu Fri	Every week
OFF	13 : 56	Mon Tue Wed Thu Fri	Every week
ON	14 : 00	Mon Tue Wed Thu Fri	Every week
OFF	14 : 01	Mon Tue Wed Thu Fri	Every week
ON	14 : 50	Mon Tue Wed Thu Fri	Every week
OFF	14 : 51	Mon Tue Wed Thu Fri	Every week
ON	14 : 55	Mon Tue Wed Thu Fri	Every week
OFF	14 : 56	Mon Tue Wed Thu Fri	Every week
ON	15 : 45	Mon Tue Wed Thu Fri	Every week
OFF	15 : 46	Mon Tue Wed Thu Fri	Every week
ON	15 : 55	Mon Tue Wed Thu Fri	Every week
OFF	15 : 56	Mon Tue Wed Thu Fri	Every week
ON	16 : 00	Mon Tue Wed Thu Fri	Every week
OFF	16 : 01	Mon Tue Wed Thu Fri	Every week
ON	16 : 50	Mon Tue Wed Thu Fri	Every week
OFF	16 : 51	Mon Tue Wed Thu Fri	Every week
ON	16 : 55	Mon Tue Wed Thu Fri	Every week
OFF	16 : 56	Mon Tue Wed Thu Fri	Every week
ON	17 : 45	Mon Tue Wed Thu Fri	Every week
OFF	17 : 46	Mon Tue Wed Thu Fri	Every week

Fig. 1.44

Programming the second clock which prevents the bell ringing during school and bank holidays.

7-Double-click on the second clock function block in the programming screen to access the dialogue box in figure 1.45.

8-Press the **Open/New** option.

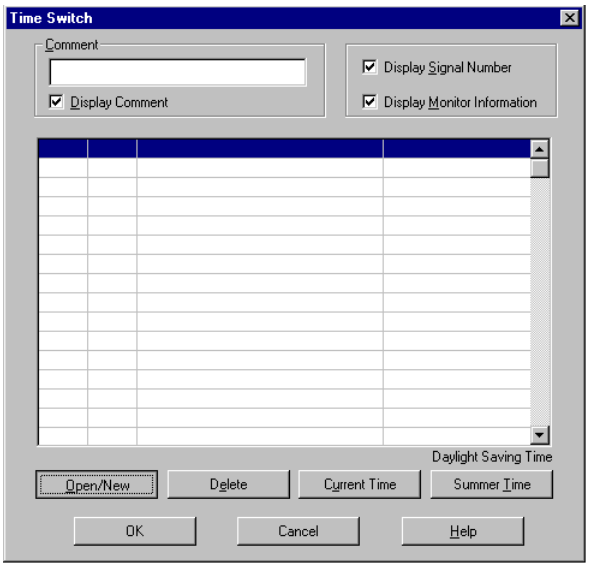


Fig. 1.45

9-Since holidays and bank holidays to be programmed are calendar dates, according to the specifications, press the **date** option in the **TimeSwitch** box (figure 1.46).

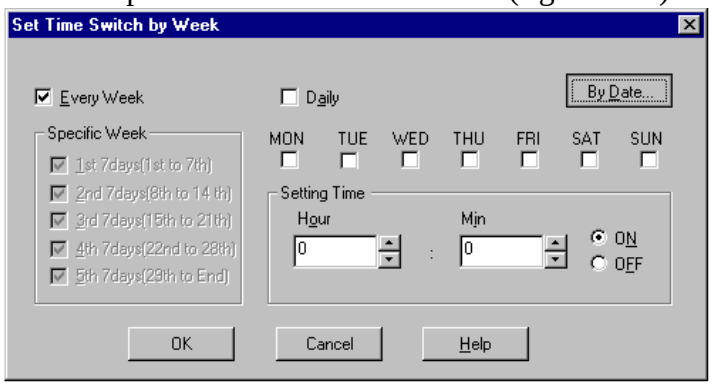


Fig. 1.46

10-A further box will open (**Define the Date Time Switch**) from which it will be possible, once the **Date** option has been checked (step **1** figure 1.47), to enter these dates using the **Calendar** option (step **2** figure 1.47).

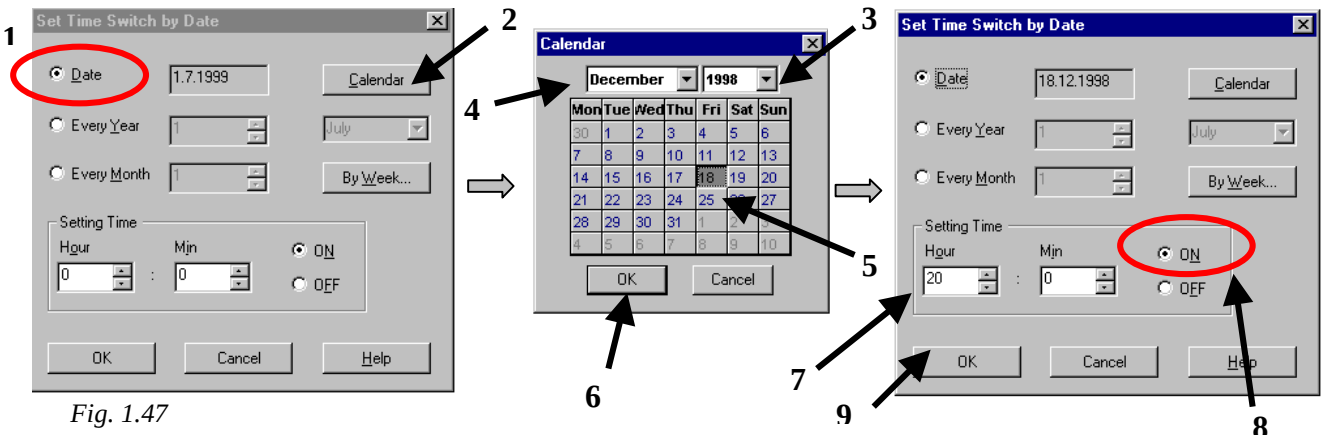


Fig. 1.47

11-Once the calendar is activated, select the year of the first date (18 December **1998** in the evening, say 20.00, for example). Then, select the month of **December**, and then the day **18**.

12-Confirm by pressing OK (step **6** figure 1.47).

13-Enter the hour, i.e. **20.00** (step **7** figure 1.47) and the command **ON**.

14-Confirm by pressing OK.

The command line should display the following information (figure 1.48).

ON	20 : 00	18.12.1998	Date

Fig : 1.48

Now the clock signal needs to be deactivated for the end of the Christmas holidays on **4 January 1999** in the morning at say **05.00**.

15-Proceed in the same way as before. The expected result is shown in figure 1.49. Be careful, this date requires the deactivation command **OFF**.

ON	20 : 00	18.12.1998	Date
OFF	5 : 00	4.1.1999	Date

Fig : 1.49

The remainder of the holidays can be programmed in the same way. However, bank holidays which occur each year on the same date can be recalled by the **Every year** option in the **Define the Date TimeSwitch** dialogue box (figures 1.50 and 1.51).

16-For example, activate the signal on 1 January at 00.00 (figure 1.50) and deactivate it on 2 January at 00.00 (figure 1.51).

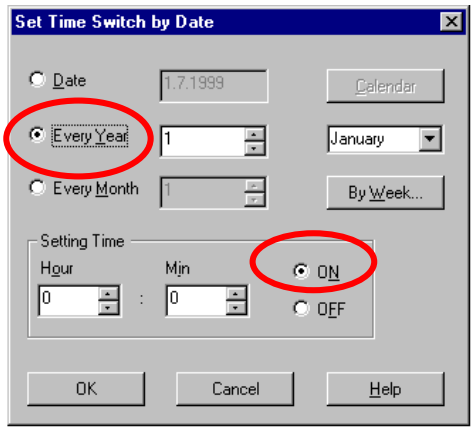


Fig. 1.50 Start of bank holiday.

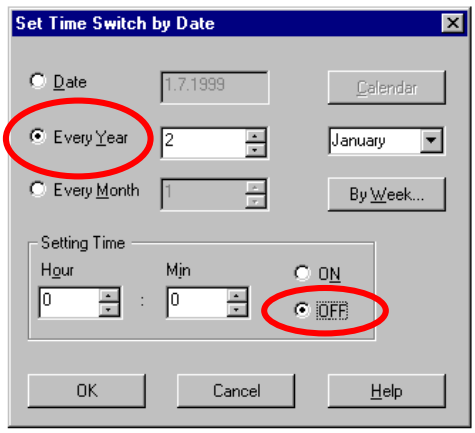


Fig. 1.51 End of bank holiday.

The entry should appear as follows (figure 1.52).

ON	0 : 00	Every Year 1 january	Date
OFF	0 : 00	Every Year 2 january	Date

Fig : 1.52

17-Define all the ON/OFF cycles as shown in figure 1.53.

Holidays	ON	20 : 00	18.12.1998	DATE
	OFF	5 : 00	4.1.1999	DATE
	ON	20 : 00	12.2.1999	DATE
	OFF	5 : 00	1.3.1999	DATE
	ON	20 : 00	9.4.1999	DATE
	OFF	5 : 00	26.4.1999	DATE
	ON	20 : 00	30.6.1999	DATE
	OFF	5 : 00	6.9.1999	DATE
	ON	20 : 00	29.10.1999	DATE
Bank holidays	OFF	5 : 00	8.11.1999	DATE
	ON	0 : 00	Every Year 1 January	DATE
	OFF	0 : 00	Every Year 2 January	DATE
	ON	0 : 00	5.4.1999	DATE
	OFF	0 : 00	6.4.1999	DATE
	ON	0 : 00	Every Year 1 May	DATE
	OFF	0 : 00	Every Year 2 May	DATE
	ON	0 : 00	Every Year 8 May	DATE
	OFF	0 : 00	Every Year 9 May	DATE
	ON	0 : 00	13.5.1999	DATE
	OFF	0 : 00	14.5.1999	DATE
	ON	0 : 00	24.5.1999	DATE
	OFF	0 : 00	25.5.1999	DATE
	ON	0 : 00	Every Year 14 July	DATE
	OFF	0 : 00	Every Year 15 July	DATE
	ON	0 : 00	Every Year 15 August	DATE
	OFF	0 : 00	Every Year 16 August	DATE
	ON	0 : 00	Every Year 11 November	DATE
	OFF	0 : 00	Every Year 12 November	DATE
	ON	0 : 00	Every Year 25 December	DATE
	OFF	0 : 00	Every Year 26 December	DATE

Programming is complete.

Important note : The clock whose parameters have just been set is connected to a **NOT** logic block which can be used to reverse the output signal (see logic diagram figure 1.32). In an effort to maximize memory space, it would have been possible to avoid inserting this block by reversing the clock signal activation and deactivation commands.

1.3/ Application 3 : Temperature control.

The aim is to control the temperature of a part within a range of 20 and 18 °C. Refer to previous applications for more details regarding programming.

This requires the use of a temperature/voltage converter (CROUZET Pt100 temperature probe for a temperature range of –50 to +80 °C (130 degree range) with 0-10V output). The voltage is then itself converted into a digital value on 8 bits using an A.D.C.(Analogue to Digital Converter).

⇨ 130 / 250 = 1 digital value every 0.5 °C

The diagram shown in figure 1.54 illustrates the operation of the system :

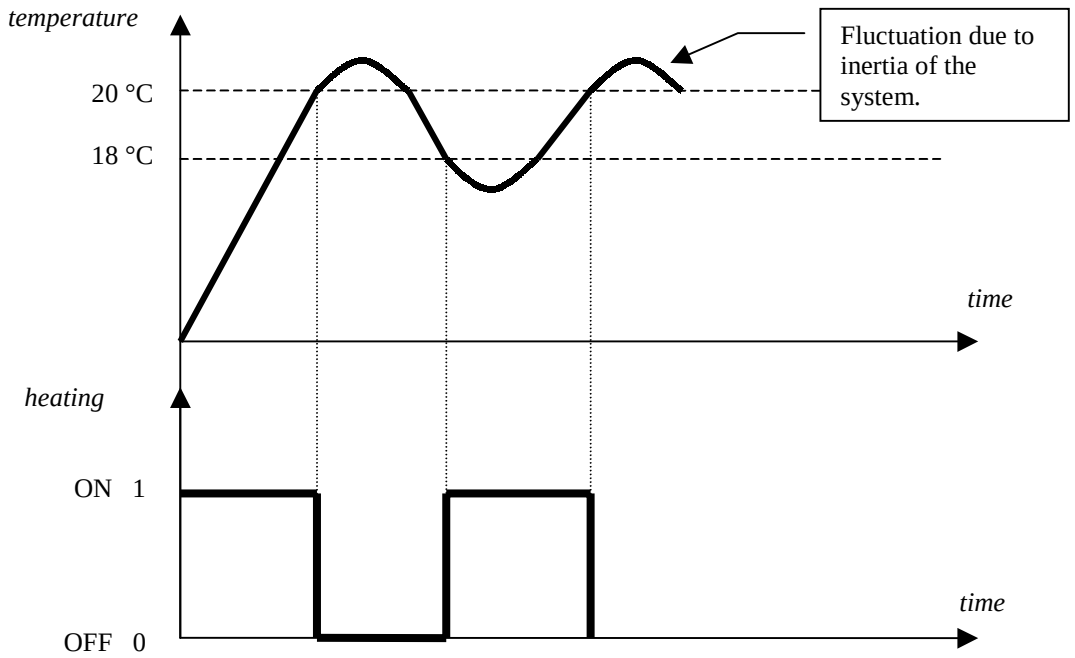


Fig. 1.54

The part is heated to 20°C, then heating is stopped until the probe detects 18°C, then heating restarts.

The logic diagram is as follows (figure 1.55) :

Fig. 1.55 Logic diagram for temperature control.

➔In the **IN** menu, select the analogue input (figure 1.56).

Fig. 1.56

➔In the **OUT** menu, select the **Heating** output (figure 1.57).

Fig. 1.57

➔From the **FUNC** menu, place the **Gain** and **Trigger** function blocks as shown in figure 1.58.

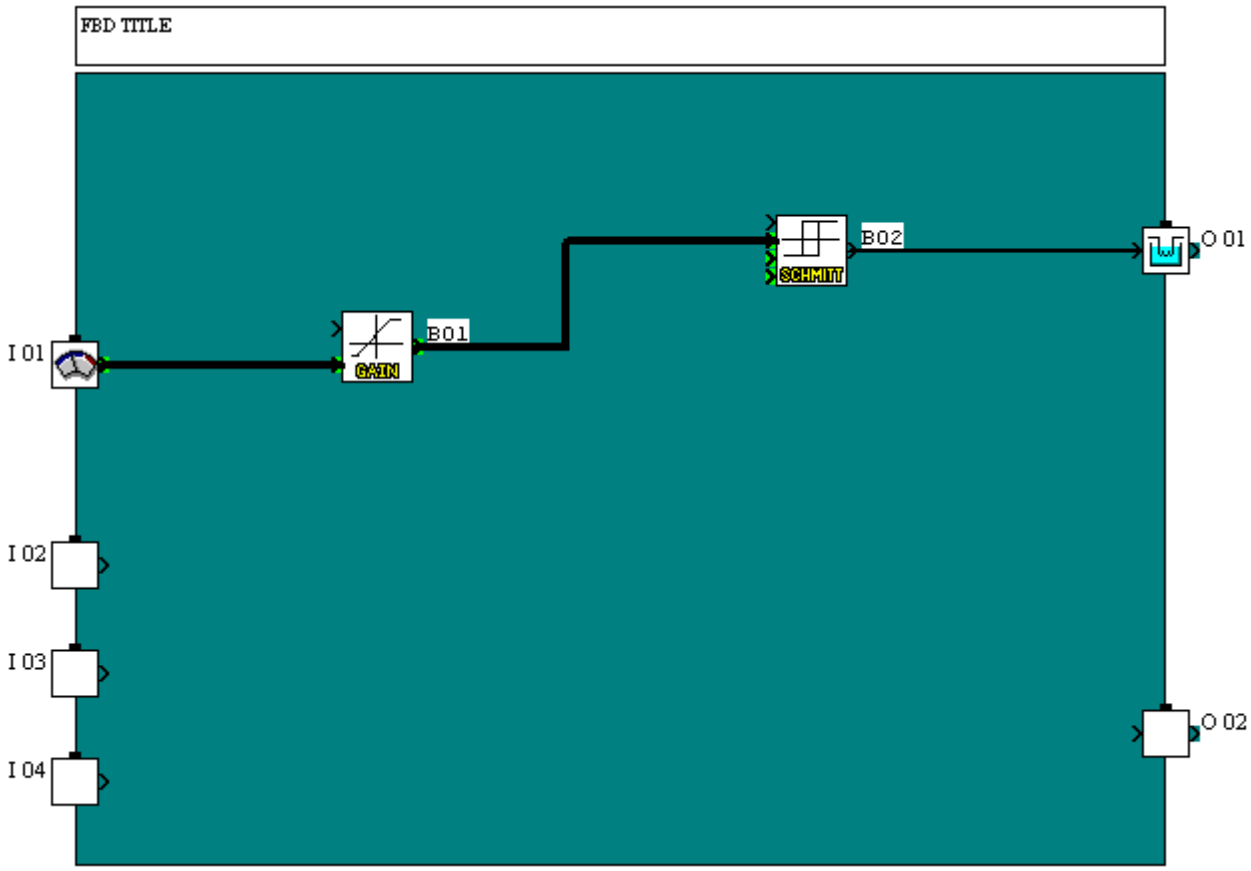


Fig. 1.58

➔Connect the blocks :

1-Link the analogue output **I01** to the analogue input of the **Gain** block**.**

2-Connect the output of the **Gain** block to the first input of the **Trigger** block (figure 1.58).

3-Join the output of the **Trigger** block to the output **O01**.

➔Set the parameters for the **Gain** function block.

1-Double-click above to obtain the associated dialogue box (figure 1.59).

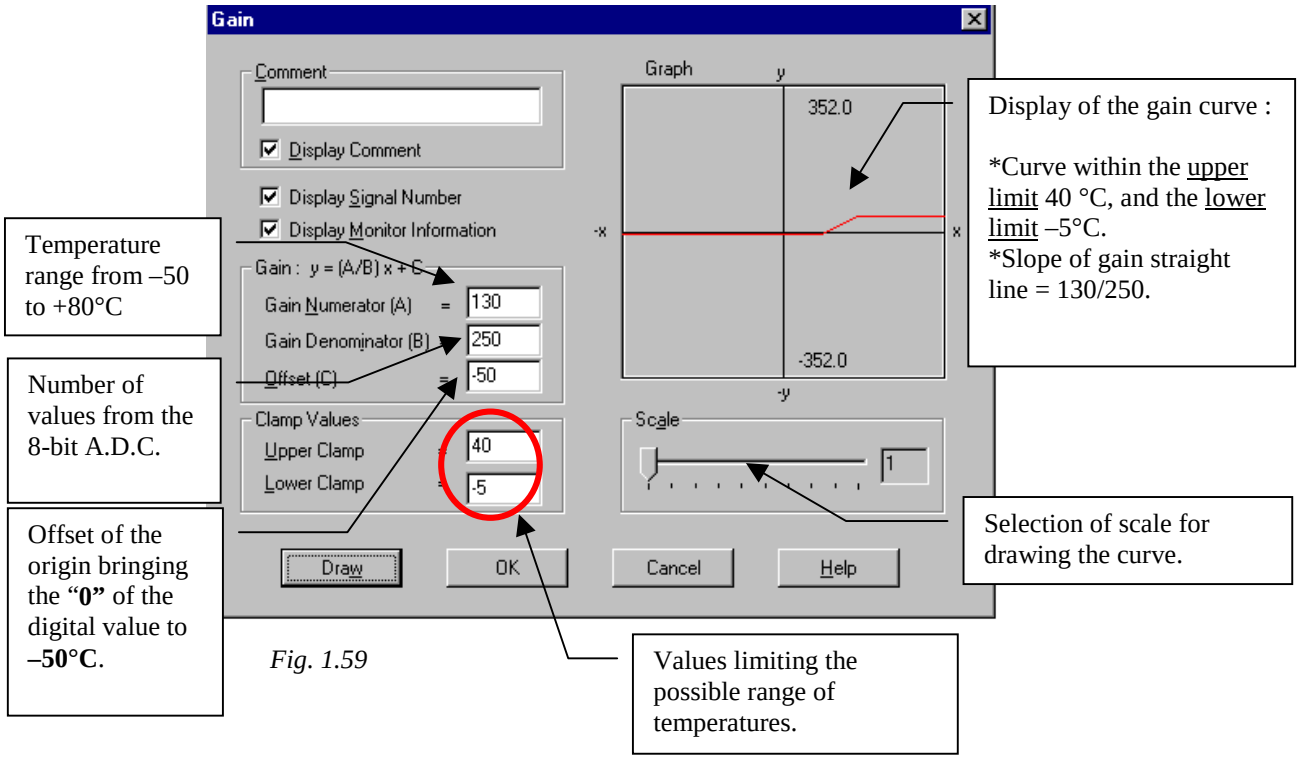


Fig. 1.59

2-Enter the values shown on figure 1.59 :

Using the formula y=(A/B)x + C

C : Offset = -50 (offset of the origin).where x=0 : C=y

A : Gain numerator = 130 (temperature range detectable by the probe).

B : Gain denominator = 250.

A/B=(y-C)/x = (80 + 50)/250 = 130/250

Upper limit = 40 (limited to a detection of +40°C).

Lower limit = -5 (limited to a detection of –5°C).

3-Press the **Draw** key to plot the gain curve.

4-Press **OK** to confirm the entry.

➔Set the parameters of the **Trigger** function block. The control zone must be defined.

1-Double-click above to obtain the associated dialogue box (figure 1.60).

2-Enter an "ON to OFF" value of 20°C.

3-Enter an "OFF to ON" value of 18°C.

4-Press **OK** to confirm the entry.

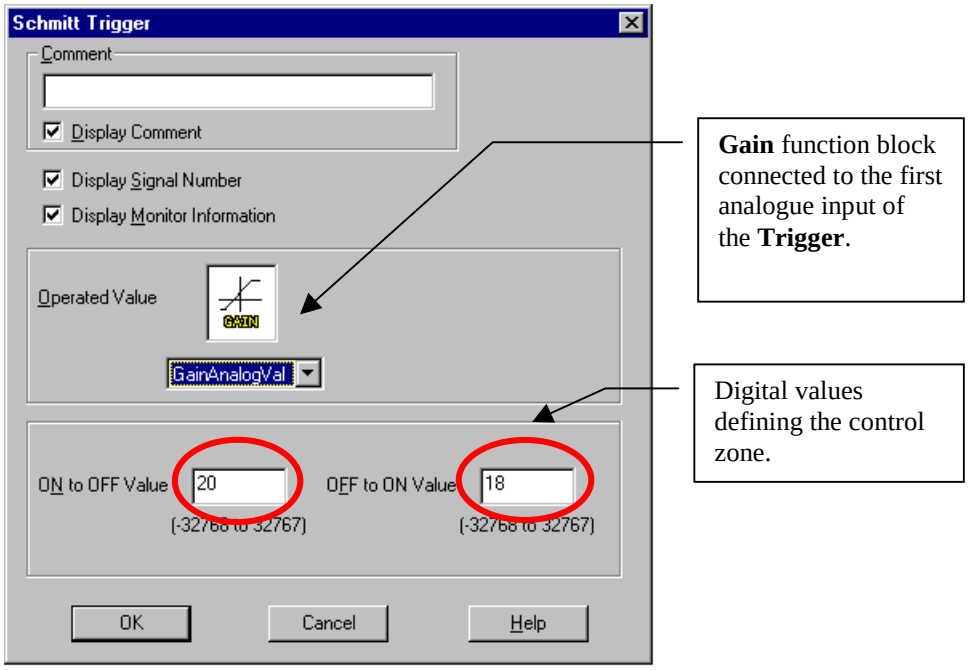


Fig. 1.60

➔Simulate the system by pressing the **Start/Stop Simulation** (see page 14) or by going to the **Controller** drop-down menu and selecting the **Simulation** and **ON** option.

➔A digital value (temperature analogue data) is entered by clicking once on the **analogue input I01** during simulation (figure 1.61). Enter a value between 0 and 255 in the dialogue box which appears.

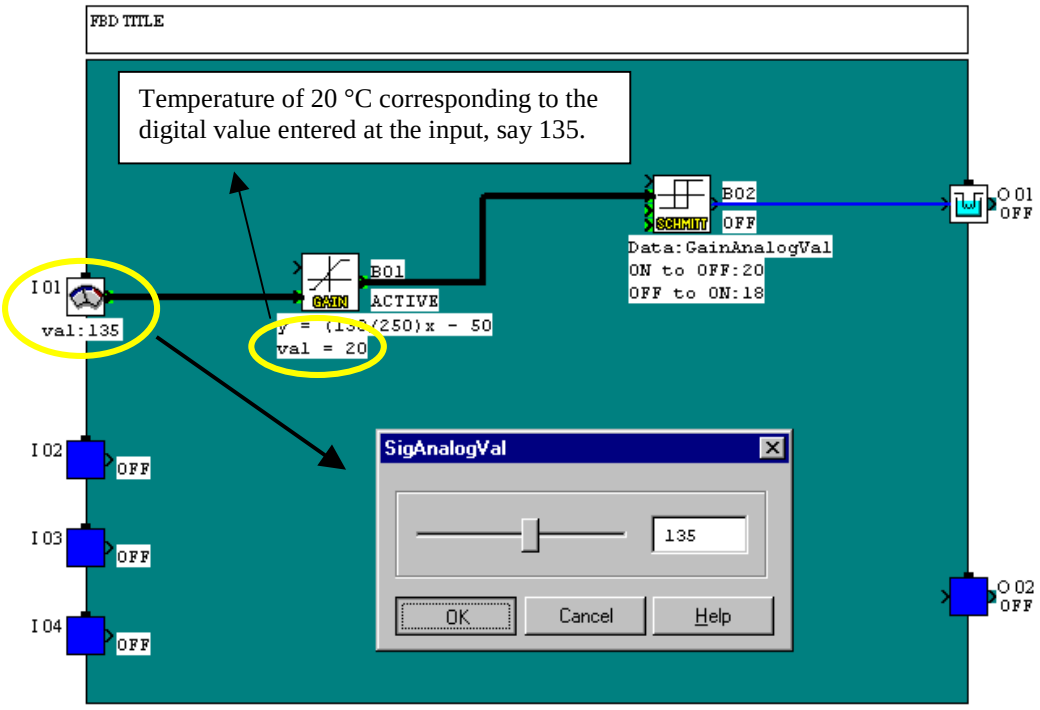


Fig. 1.61

2/ Programming via the module front panel.

The model shown here has 6 inputs and 4 outputs (figure 2.1).

This section explains the various menus available on the module, and the technique of programming directly from the 8 keys on the front panel. The examples which will illustrate the procedure are very easy.

Figure 2.1

2.1/ Presentation of the options available.

During module setup, the display is as follows (figure 2.2):

Time display

Inputs: The 6 circles on the line represent the 6 inputs. When one of them is activated, the corresponding circle is blacked out. In this example, input 4 (I04) is active.

Outputs: The 4 outputs are shown schematically, like the inputs. Here, output 1 (O01) is active.

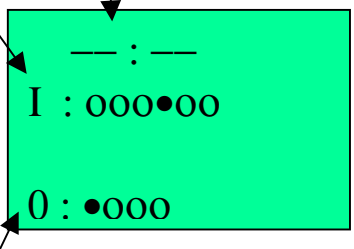


Fig. 2.2 Screen which appears when the unit is first switched on. The display is 4 lines of 10 characters.

Fig. 2.3 Main menu

Pressing one of the keys leads to the main menu (see figure 2.3).
The prompt (>>) indicates which option can be selected.

Note : - A flashing text is ready to be selected.
- If a key which cannot be used is pressed, a question mark (**?**) appears at the top of the display screen.

Key no. (figure 2.4)		Key no. (module)	Function
1	ESC	K02	Cancels an operation, returns to previous menu.
2	+	K03	Increments, used for connecting blocks.
3	-	K04	Decrements, disconnects blocks.
4	OK	K01	Accesses a menu, confirms an entry.
5	▲	K05	Scrolls up.
6	▼	K06	Scrolls down.
7	▶	K07	Moves to the right.
8	◀	K08	Moves to the left.

Fig. 2.4 Key identification.

Each block used occupies a memory space which mainly depends on the complexity of the function. In a program, the memory is limited to **1500 bits**, and the number of blocks which can be inserted is **64**. The internal bits and the module keys do not occupy any bit. Connections to an output each account for **10 bits**.
The following table summarizes all the function blocks.

Function Block		Memory space (bits)	Description
AND (up to 4 discrete inputs)		19	**AND/** Output ON when all the inputs present are ON/ Inputs not connected are considered to be ON.
OR (up to 4 discrete inputs)		19	**OR/** Output ON when at least one input present is ON/ Inputs not connected are considered to be OFF.
XOR (2 discrete inputs)		13	**EXCLUSIVE OR/** Output ON when a single input is ON.
NOT (1 discrete input)		10	**NOT/** Reverses the signal/ Output ON if input OFF, and output OFF if input ON.
NAND (up to 4 discrete inputs)		19	**NOT AND/** Output ON when at least one input present is OFF/ Inputs not connected are considered to be OFF.
NOR (up to 4 discrete inputs)		19	**NOT OR/** Output ON when all the inputs present are OFF/ Inputs not connected are considered to be ON.
BOOLEAN (up to 4 discrete inputs)		*	Can be used to create logic equations between the connected inputs/ It is possible to test the equation.

SET/RESET		14	Bistable memory/ Output activated by SET (discrete input), deactivated by RESET (discrete input)/ Priority assigned either to SET or RESET.
DELAY		19	Delays a signal (discrete) from a rising edge, from a falling edge, or both at the same time/ Possible to RESET (discrete input)/ 1 digital output (value).
ONE SHOT		17	Sends an impulse signal which can be reset/ Conditions for removing the discrete output : deactivation of the discrete input or end of delay/ Possible to RESET (discrete input)/ 1 digital output (value).
PULSE		11	Sends a pulse from a rising edge, from a falling edge, or both at the same time/ 1 discrete input/ 1 discrete output.
ALT		13	Impulse relay function/ Alternates the output signal (discrete) on each rising edge of the input (discrete)/ Possible to RESET (discrete input)
COUNTER		16	Counting incremented on each rising edge of the input (discrete)/ Possible to RESET (discrete input)/ Preset value can be assigned by a digital value/ 1 discrete output/ 1 analogue output.
UP/DW COUNTER		22	Counting incremented (discrete input), decremented (discrete input) on each rising edge/ Preset value can be assigned by a decimal value (parameter) or by an analogue input/ 1 discrete input to obtain the preset value directly/ Possible to RESET (discrete input)/ 1 discrete output/ 1 analogue output.
FLICKER		19	Sends a train of impulses (set ON, set OFF) according to various modes : ON/OFF cycle counting (preset), time counting (preset), continuous/ 1 discrete input/ 1 discrete output/1 digital output (value).
COMPARE		17	Compares two analogue or digital quantities if the discrete input is activated (by default, the pin is considered to be active)/ Activates the discrete output if the equation is verified/ (If there is no connection on the analogue pins, two decimal values will be compared.)
TIME SWITCH		**	Program clock/ Uses the module internal time and date to activate or deactivate the discrete output/ Daily, weekly, calendar timetables/ Year 2000 compliant/ Manages Summer time/ 356 ON-OFF cycles.
GAIN		22	Can be used to convert an analogue value by changing the scale and offset/ Parameters : gain numerator, gain denominator, FB offset (offset of the origin), upper and lower conversion limits/ 1 discrete input/ 1 analogue input. 1 digital output (value).
SCHMITT		19	Defines an activation zone with hysteresis (ON value, OFF value) of the discrete output/ The function can be performed if the discrete input is active (by default, the pin is considered to be active)/ 3 analogue inputs.
ZONE COMPARE		20	Defines a range (digital or analogue values) in which activation (or deactivation according to the option checked) of the discrete output is a function of the value used/ 1 discrete input/ 3 analogue inputs.
DISPLAY		***	Displays digital, analogue data, character strings, date, time, messages for the man-machine interface.
HOUR METER		19	Time counting (preset hour, minute) during each activation of the discrete input/ Elapsed time memory/ Possible to RESET (discrete input)/ 1 discrete output/ 1 digital output (value).

* : 19 + 1 x (term in the equation)
** : 8 + 4 x (number of ON/OFF cycles)
*** : 13 + 1 x (each character displayed on the screen)

2.1.1/ Main menu : MainMenu.

2.1.1.1/ **Run:**Executes a program (figure 2.5).

Fig. 2.5

➔Press OK to access the following display (figure 2.6).

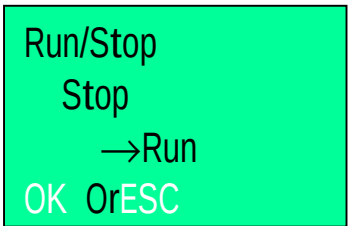


Fig. 2.6

➔The OK key executes the program, the ESC key cancels the selection and returns to the previous menu.

Note : The program is running when three small vertical bars flash at the top of the screen (figure 2.7).

Fig. 2.7

2.1.1.2/ **Stop:**Stops a program.

When a program is in **Run** mode, the **Stop** mode is activated in the main menu. It will then be impossible to edit or clear a program.

➔From the main menu (figure 2.8), place the **Stop** option next to the prompt.

Fig. 2.8

➔Press OK to confirm the selection.

➔Now there are two choices (figure 2.9): either confirm with OK, or cancel the procedure with ESC.

Fig. 2.9

2.1.1.3/ **Monitor:**Display of the logic diagram during execution.

When the program is launched (check this by making sure that the small vertical bars are flashing at the top of the screen), the **Monitor** mode appears in the main menu (figure 2.10).

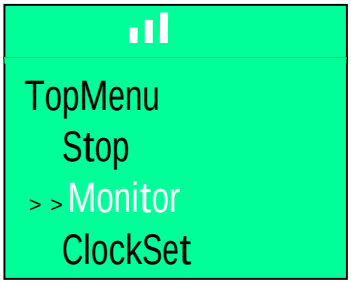


Fig. 2.10

➔Select the **Monitor** option, and press OK. Part of the logic diagram is displayed (figure 2.11). Keys 5 (▲), 6 (▼), 7 (▶), and 8 (◀) can be used to scroll through the rest of the diagram.

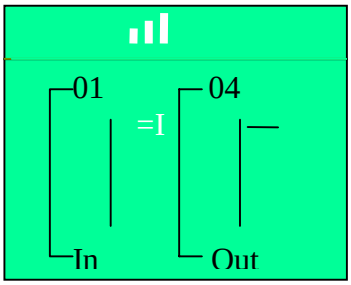


Fig. 2.11

➔The ESC key returns to the **Edit** menu which contains three options (figure 2.12) :

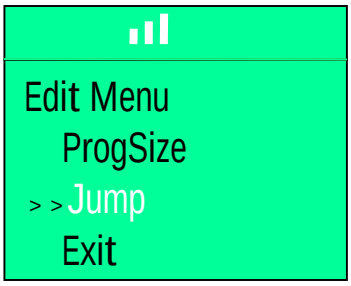


Fig. 2.12

-*ProgSize (figure 2.13)* : Views the module's memory capacity, that is the number of function blocks and the percentage of memory used.

-*Jump (figure 2.14)* : Use this option to arrive at a particular block. Internal bits (**M :SystemBit M01~M05**), inputs (**I :Input I01~I04 or I06 or I12**), outputs (**O :Output O01~O02 or O04 or O08**), front panel keys (**K :Key K01~K08**), and blocks (**B :Blocks created by the user**) can be accessed by the ◀ and ▶ keys. Keys 2 (+) and 3 (-) select a block for each category. Access to the block is confirmed with OK, ESC returns to the main menu.

-*Exit (figure 2.15)* : Quit the **Edit** mode to return to the main menu.

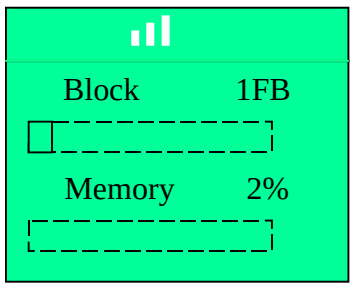


Fig. 2.13

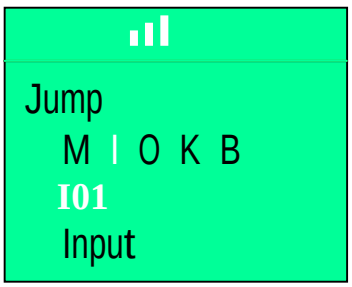


Fig. 2.14

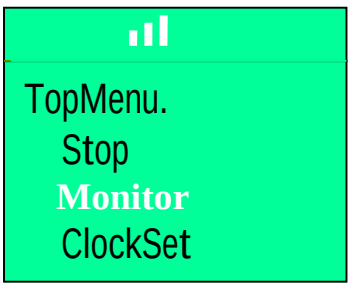


Fig. 2.15

In **Monitor** mode, it is possible to identify the status of a block (ON or OFF). When the output is ON, a solid vertical rectangle appears under the block number (figure 2.16).

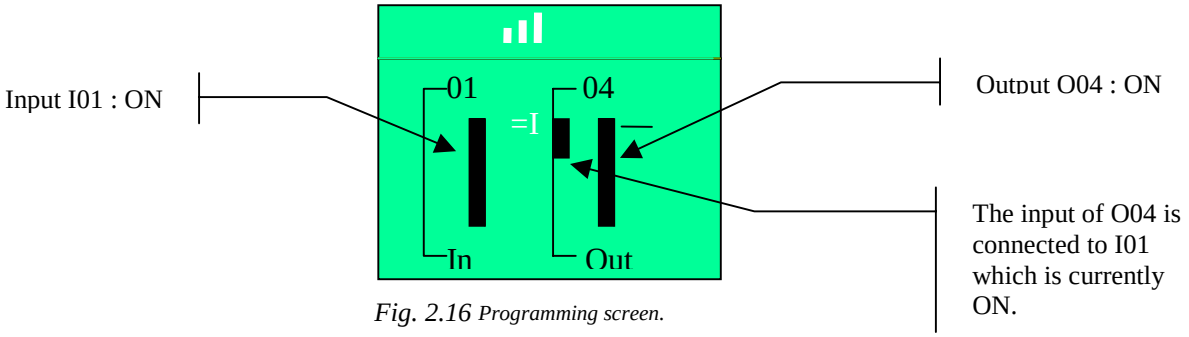


Fig. 2.16 Programming screen.

2.1.1.4/ **ProgEdit:**Programming a logic diagram.

➔Select the option as shown in figure 2.17.

Fig. 2.17

➔Press OK to access the corresponding menu.

➔It is now possible either to record a new program, or to modify an existing program.

Note : Details regarding connection and programming can be found in the description of application examples.

Iinside the **ProgEdit** mode, it is possible to access an **Edit Menu** submenu by using ESC to leave the programming screen (this will be explained later).

2.1.1.5/ **ProgClear:** Clears a program.

➔Position the option next to the prompt (figure 2.18).

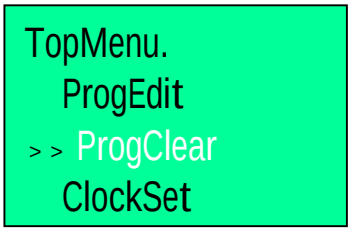


Fig. 2.18

➔Press OK to access the following panel.

➔Figure 2.19, it is possible to confirm deletion with OK, or to return to the main menu with ESC.

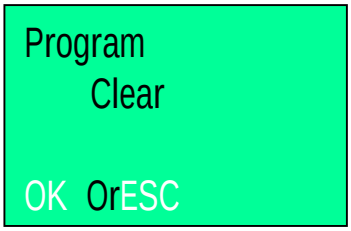


Fig. 2.19

2.1.1.6/ **LANGUAGE:**Selects the language.

➔From the main menu (figure 2.3), use keys 5 (▲) and 6 (▼) (figure 2.4) to scroll through the list of options.

➔Position the **LANGUAGE** option next to the prompt (figure 2.20)

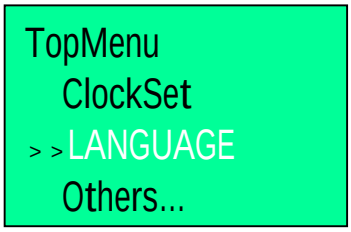


Fig. 2.20

➔Press key 4 (OK). The **LANGUAGE** menu then appears (figure 2.21).

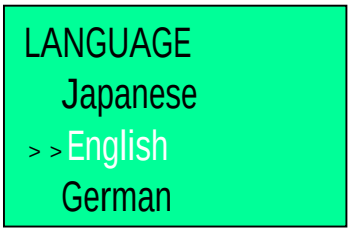


Fig. 2.21

Fig. 2.22

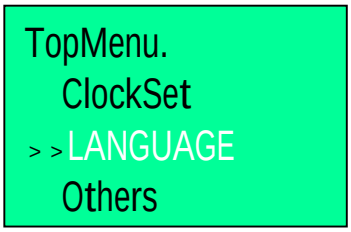


Fig. 2.23

➔Use keys 5 (▲) and 6 (▼) again to select a language (figure 2.22).

➔Press key 4 (OK) to confirm the selection.

➔Exit the menu using key 1 (ESC). Return to the main menu (figure 2.23).

2.1.1.7/ **ClockSet:**Sets the time and date:

➔From the main menu (figure 2.23), scroll through the list using keys 5 (▲) and 6 (▼) until the prompt is opposite the **ClockSet** option (figure 2.24).

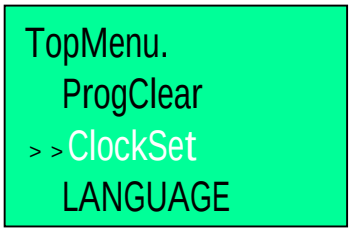


Fig. 2.24

➔Press key 4 (OK) to access the corresponding menu.

➔The screen in figure 2.25 shows the status of the time and date setting. There are three display modes for the date :

year/month/day ⇔ yyyy/mm/dd (figure 2.25)
day/month/year ⇔ dd/mm/yyyy (figure 2.26)
month/day/year ⇔ mm/dd/yyyy (figure 2.27)

Each mode is activated from line 2 (yyyy/mm/dd or dd/mm/yyyy or mm/dd/yyyy) by pressing either key 2 (+) or key 3 (-).

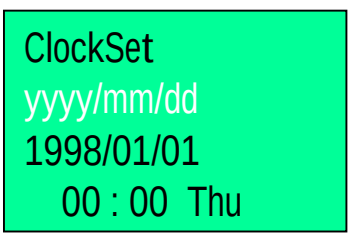


Fig. 2.25

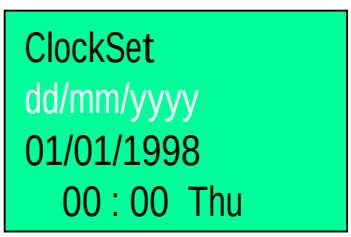


Fig. 2.26

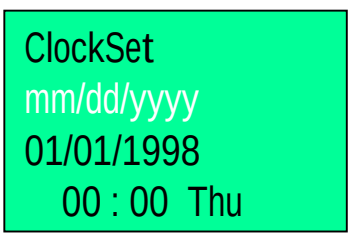


Fig. 2.27

➔Example : Today is 31 March 1999 at 10.17. We want to enter the date using the day/month/year mode. Programming is performed as follows (use keys 5 (▲),6 (▼),7 (▶),8 (◀) to navigate through the screen ; keys 2 (+) or 3 (-) to increment / decrement) :

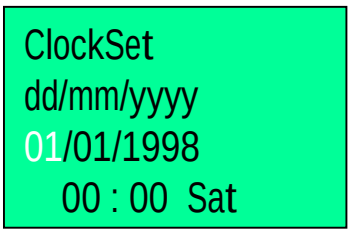


Fig. 2.28 Setting the day.

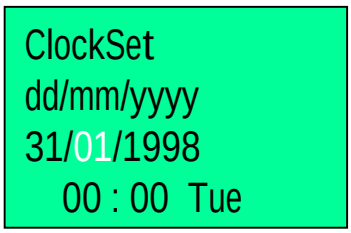


Fig. 2.29 Setting the month.

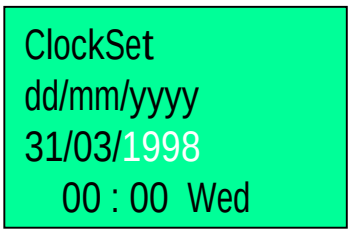


Fig. 2.30 Setting the year.

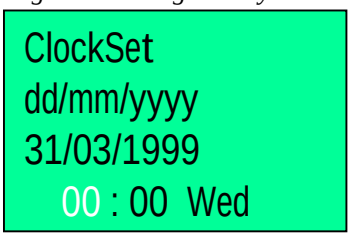


Fig. 2.31 Setting the time.

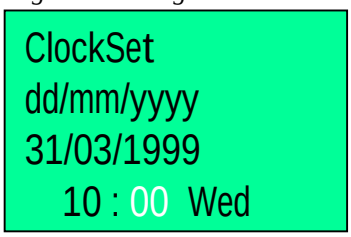


Fig. 2.32 Setting the time.

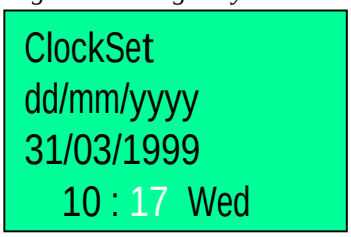


Fig. 2.33 Setting the time.

The OK key confirms the entry and returns to the main menu.

2.1.1.8/ **Others:**Accesses other options.

➔Press OK to access the following options : Version, Passwd (password), MenuKey (menu key), Summer (Summer time), InitModem (initialize modem).

2.1.2/ Submenu : Others.

2.1.2.1/ **Version:** Module version:

➔From the main menu, select the **Others** option (figure 2.34).

Fig. 2.34

➔Press OK to confirm the entry.

➔Using keys 5 (▲) and 6 (▼), position the **Version** option next to the prompt (figure 2.35).

➔Press OK to display the product version number (figure 2.36).

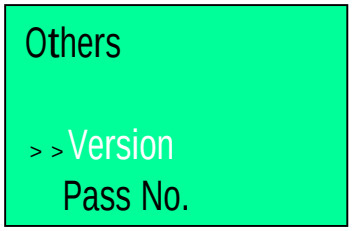


Fig. 2.35

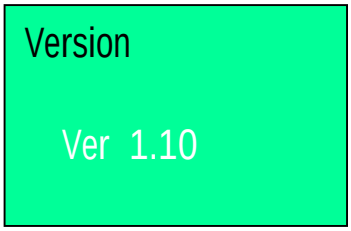


Fig. 2.36

➔ESC returns to the previous menu.

2.1.2.2/ **Pass No.:**Enters a password: When a program has been edited, the pass No. protects access. It can only therefore be changed if the pass No. is correctly entered.

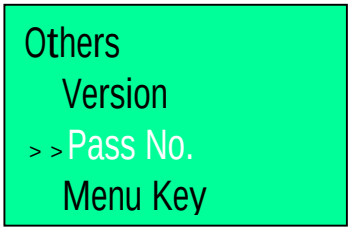


Fig. 2.37

➔From the **Others** menu (see figure 2.35), in the main menu, select the **Pass No.** option with keys 5 (▲) and 6 (▼) (figure 2.37).

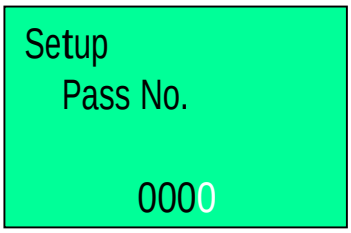


Fig. 2.38

➔Press OK to access this menu (figure 2.38).
➔The Pass No. contains 4 figures. Enter each one using keys 7 (▶) and 8 (◀) to select them, and keys 2 (+) or 3 (-) to increment/decrement.
➔Press OK to confirm the entry, or ESC to exit the menu without saving the code.
➔A symbol representing a key (🔑) is displayed at the top of the screen to confirm that it has been recorded.

Deleting a password: This is not possible unless a password has already been saved.
➔Return to the **Pass No.** menu. The display will be as in figure 2.39.

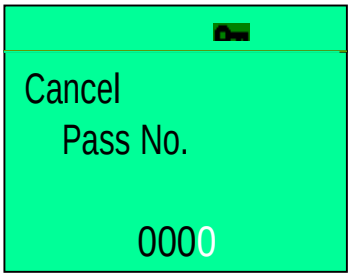


Fig. 2.39

➔Now simply retype the saved code and press OK to confirm cancellation.
➔If the code to be deleted is not correct, an error message (figure 2.40) will be displayed.

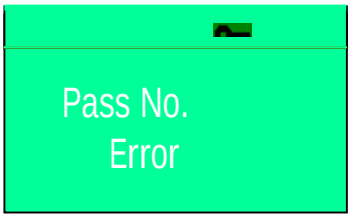


Fig. 2.40

➔Press either OK or ESC to return to the **Others** menu.

➔Repeat the process if the operation failed.

Note : -Deleting a program also deletes the secret code associated with it.
-A secret code can also be entered without having previously edited a program. In this case, this provides exclusive access to program editing.

2.1.2.3/ **Menu Key:**When the eight keys are used in the program, i.e. assigned to a particular function, it is possible to exit **RUN** mode, if desired.

➔From the **Others** menu, use keys 5 (▲) or 6 (▼) to position the **Menu Key** option next to the prompt (figure 2.41).

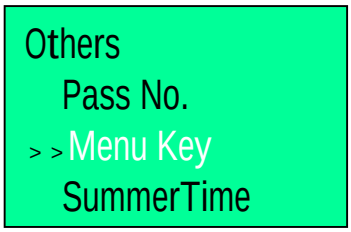


Fig. 2.41

➔Press OK to confirm.

➔The menu in figure 2.42 is displayed.

Fig. 2.42

➔Selecting **OK + ESC Key** stops a program even if all the keys on the panel are used for an action. While the program is running, press the OK and ESC keys simultaneously. Return to the main menu (figure 2.43).

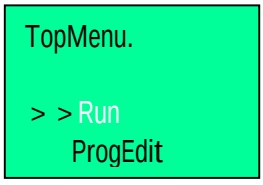


Fig. 2.46

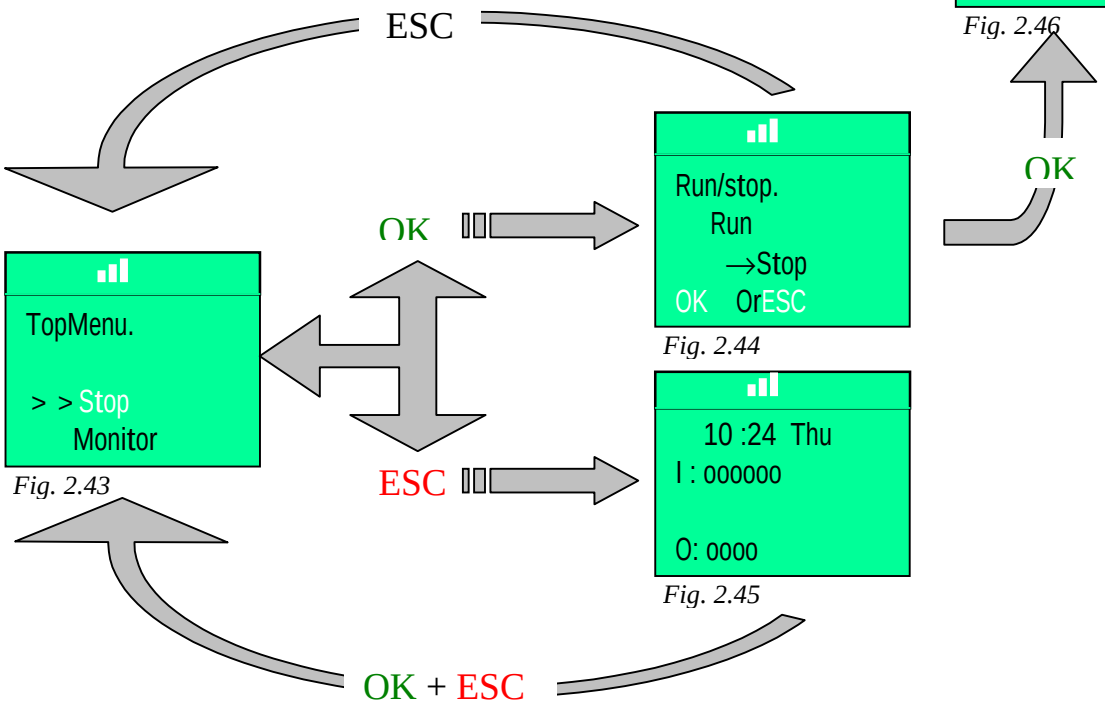


Fig. 2.44

Fig. 2.43

Fig. 2.45

➔Press OK to access the following menu (figure 2.44), or ESC to return to the I/O display mode (figure 2.45).

➔From the menu shown in figure 2.44, it is possible either to return to the main menu by pressing ESC, or to stop the program definitively (figure 2.46).

➔Selecting the **Not Use** option (figure 2.47), no longer enables the program to be stopped, even if all the keys are used.

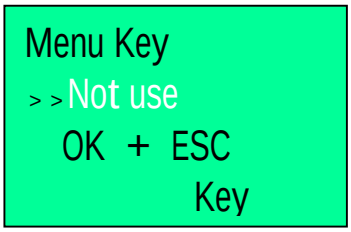


Fig. 2.47

➔To stop the program running, it is necessary to : -switch the module off;
-press OK and ESC simultaneously;
-switch the module back on by holding down both keys for approximately 2 seconds.
➔The screen in figure 2.48 is then displayed for several seconds.
➔Press OK to stop the program and return to the main menu.

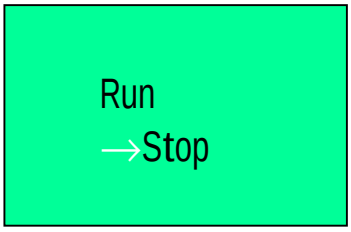


Fig. 2.48

2.1.2.4/ **SummerTime:** Select the type of parameter-setting for Summer time.

This menu contains 6 options: **Cancel**, **ManualOn**, **Date Type**, **UK Type**, **US Type**.
When Summer time is active, an "**s**" appears on the screen next to the time in I/O display mode, as shown in figure 2.49.

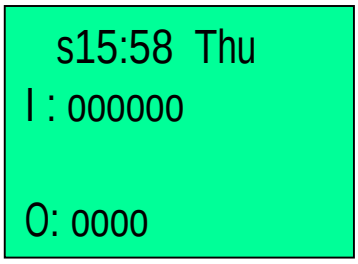


Fig. 2.49

Cancel (figure 2.50): Deactivates Summer time. The "**s**" disappears.

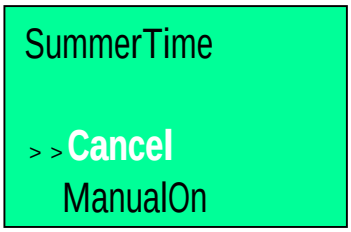


Fig. 2.50

MA man (figure 2.51): Sets Summer time. The "**s**" appears in I/O display mode if it is the time of year to change the hour.

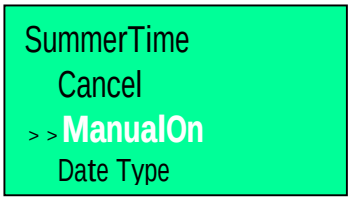


Fig. 2.51

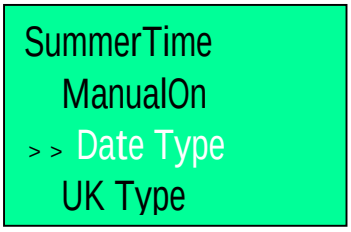


Fig. 2.52

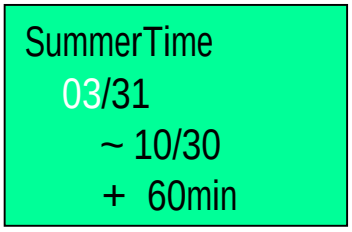


Fig. 2.53

Typ. Date (figure 2.52): Updates the start and end dates of Summer time, as well as the number of minutes to add to the current time (figure 2.53). Line 2 is the start date of Summer time. Line 3 is the end date of Summer time.

The ▲ ▼ ▶ ◀ keys navigate around the screen with the "+" and "-" incrementing or decrementing each number. OK confirms the entry, ESC returns to the previous menu without creating any modifications.

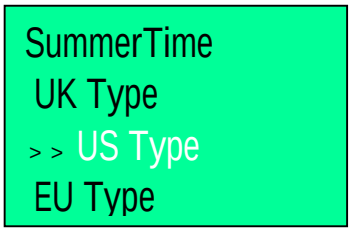


Fig. 2.54

UK type, US type, EU type (figure 2.54) : Three types of Summer time are pre-programmed. Select one of them by placing the required type next to the prompt using the ▲ and ▼ keys.

The recorded dates are as follows :

UK type : Last Sunday of March to the first Sunday of November.
US type : First Sunday of April to the last Sunday of October.
EU type : Last Sunday of March to the fourth Sunday of October.

2.1.2.5/ **ModemInit**:Sets the modem parameters.

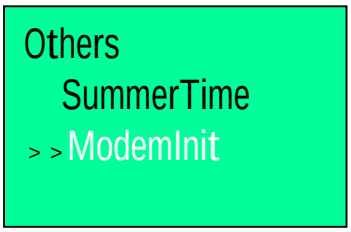


Fig. 2.55

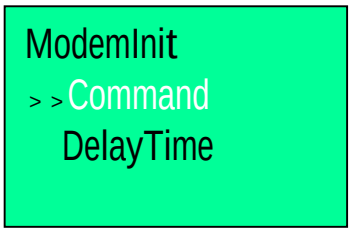


Fig. 2.56

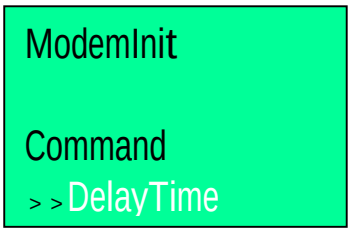


Fig. 2.57

2.1.2.6/ **ProgTran:**:This option can only be accessed when the EEPROM memory cartridge is inserted in the module.

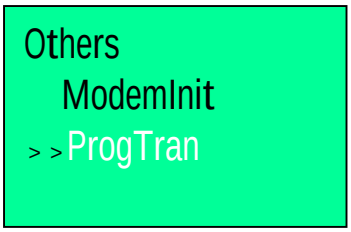


Fig. 2.58

2.1.3/ The program editing menu : Edit Menu.

This mode operates from the **ProgEdit** option in the main menu. To access the edit menu, the programming screen must first be exited (figure 2.59).

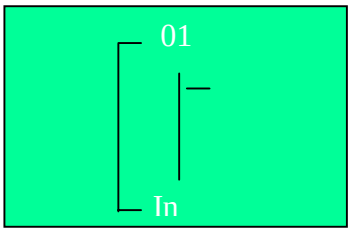


Fig. 2.59 Programming screen.

Press ESC to go to this mode.

2.1.3.1/ **ProgSize :**Memory used. (see paragraph 2.1.1.3).

2.1.3.2/ **Jump :**Access to a block. (see paragraph 2.1.1.3).

2.1.3.3/ **New FB :**Continue programming from a new block.

➔Select option as shown in figure 2.60.

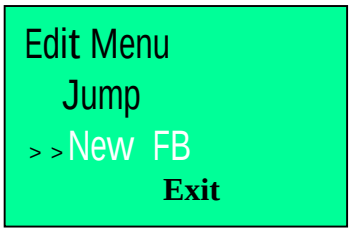


Fig. 2.60

➔Press OK.

➔All the functions pre-programmed in the **FB Select** mode are available. Either select one of them using the ▲,▼ keys, and OK to confirm ; or cancel this option by pressing ESC.

2.1.3.4/ **Exit :**Return to the main menu.

2.1.3.5/ **Mnemonic :**Gives a linear outline of the logic diagram.

Return to the programming screen by pressing OK or ESC.

2.1.4/ Menu relating to function blocks.

This menu (figure 2.62) can only be accessed from the programming screen, by positioning the cursor on a block (figure 2.61) and pressing OK.

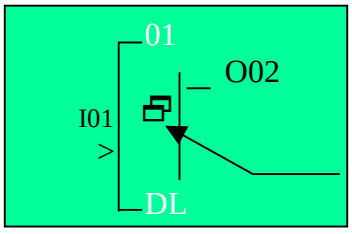


Fig. 2.61 Programming screen.

Block number.

Indicator identifying a function whose parameters can be set.

Name of function block.

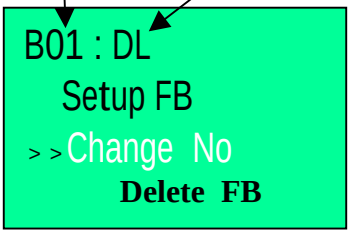


Fig. 2.62

2.1.4.1/ **Setup FB:**Parameters specific to the selected function block.

This option will only appear in the menu if the block has a parameter-setting indicator (figure 2.61). Refer to the section which explains this function to see which parameters may be modified.

➔Press ESC to cancel, or OK to confirm the entry.

2.1.4.2/ **Change No :**Assigns a different block number.

When a block number has not already been used, it is possible to assign it to another block by using this option.

➔Select the **Change No** option then press OK.

➔The screen in figure 2.63 will be displayed.

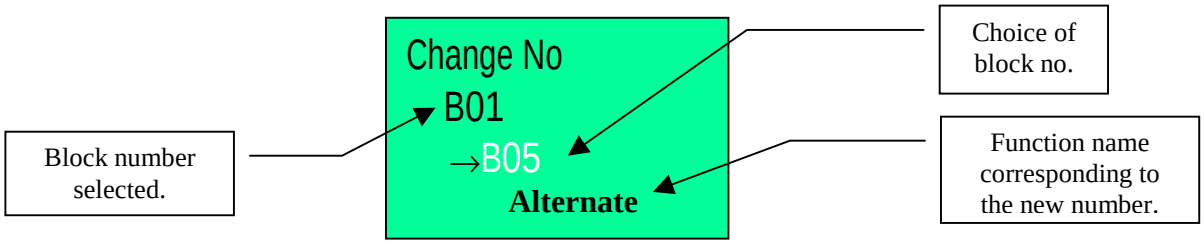


Fig. 2.63

➔Keys ▲, ▼, or "+","-", enable the new number to be selected.

Note : A new block number is free if **Not Exist** appears at the bottom of the screen.

➔OK confirms the selection.

2.1.4.3/ **Delete FB :**Deletes a block.

This option deletes the block selected in the programming screen.

The menu appears as shown in figure 2.64.

Fig. 2.64

➔Press OK to confirm deletion, or ESC to cancel the operation.

Note : Deleting a block also deletes all the connections to this block.

2.2/ Example 1 : Temporary/permanent lighting.

The example shown could apply to lighting a stairwell.

Operation :	➔The light switches on for 1 minute when the pushbutton is pressed. ➔The light stays on continuously when the pushbutton is pressed for at least 2 seconds. ➔The light goes out when the pushbutton is pressed for 2 seconds during continuous lighting.

I/O table :

INPUT	
I1	Pushbutton

OUTPUT	
O1	Light

For this example, select a module with 4 inputs and 2 outputs.

The corresponding logic diagram is shown in figure 2.65.

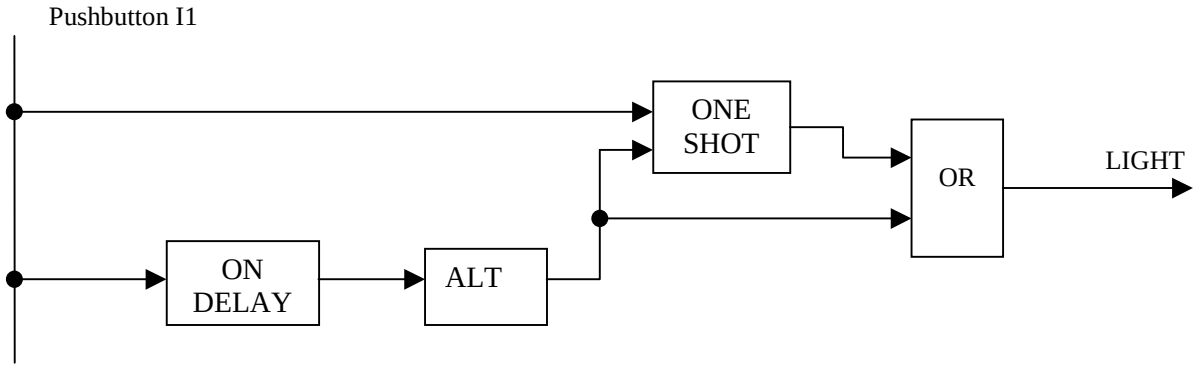


Fig. 2.65 Logic diagram for lighting a stairwell.

The main points in this example are :

-time delay (**DELAY** function),
-time-delayed impulse signal (**ONE SHOT** function),
-bistable signal (**ALTERNATE** function).

2.2.1/ Editing the program.

➔From the main menu, select the P**rogEdit** option.
➔The display suggests starting the program with input **I01** (figure 2.66).

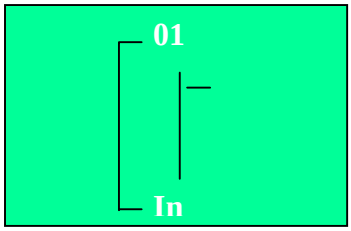
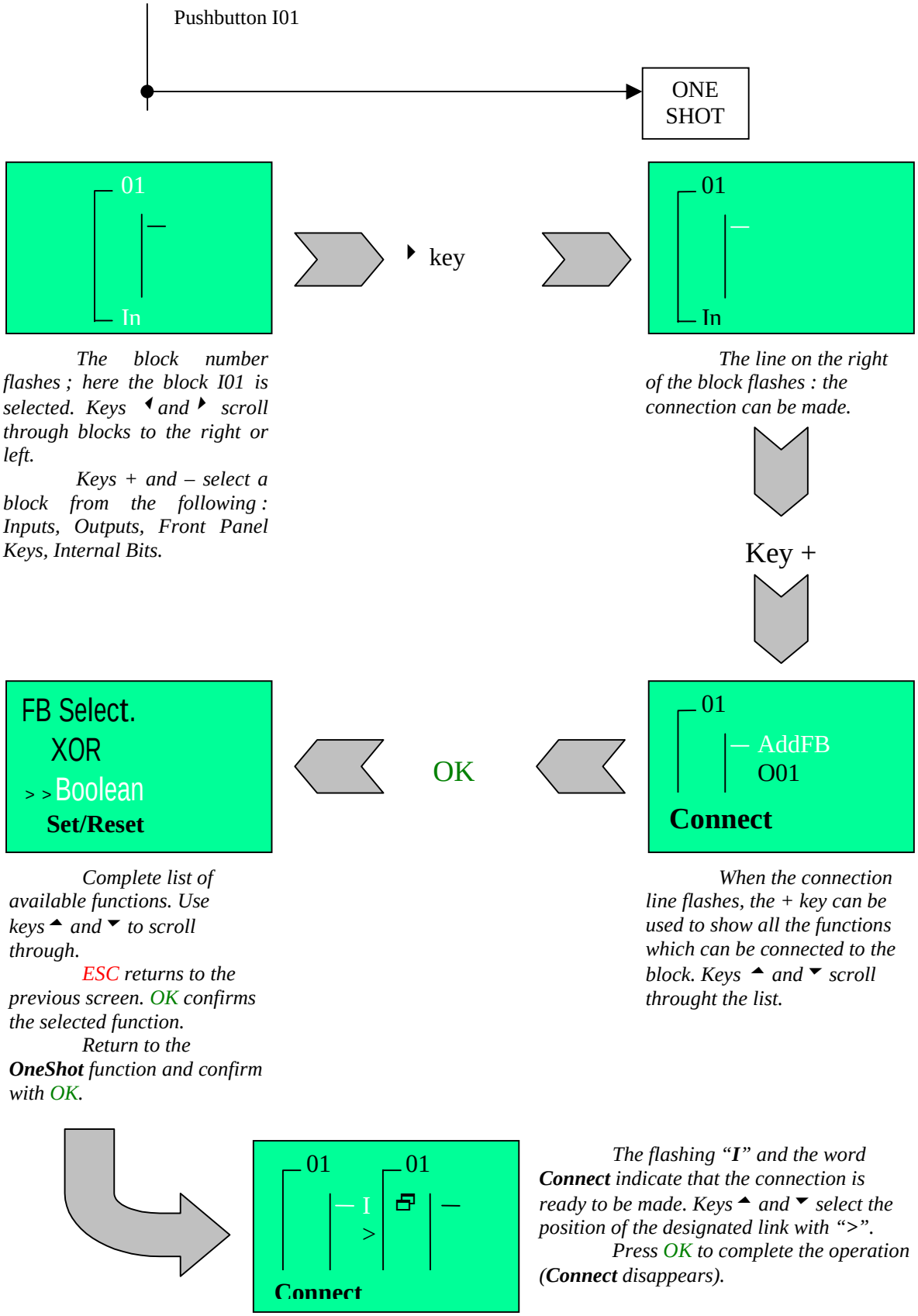


Fig. 2.66.

2.2.1.1/ Connections between blocks.

➔Connect the **ONE SHOT** block to the input **I01** (pushbutton) :



The block number flashes ; here the block I01 is selected. Keys ◂ and ▸ scroll through blocks to the right or left.

Keys + and – select a block from the following : Inputs, Outputs, Front Panel Keys, Internal Bits.

The line on the right of the block flashes : the connection can be made.

When the connection line flashes, the + key can be used to show all the functions which can be connected to the block. Keys ▲ and ▼ scroll throught the list.

Complete list of available functions. Use keys ▲ and ▼ to scroll through.

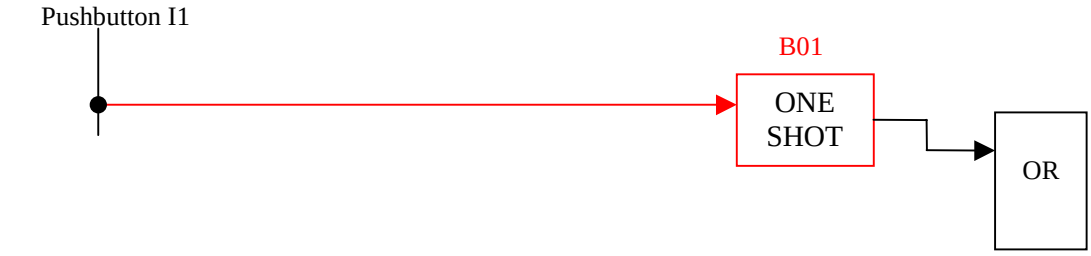
ESC returns to the previous screen. OK confirms the selected function.

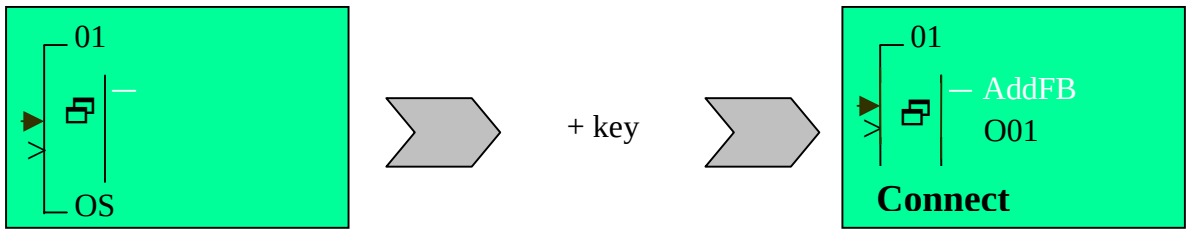
*Return to the **OneShot** function and confirm with OK.*

*The flashing "**I**" and the word **Connect** indicate that the connection is ready to be made. Keys ▲ and ▼ select the position of the designated link with ">".*

*Press OK to complete the operation (**Connect** disappears).*

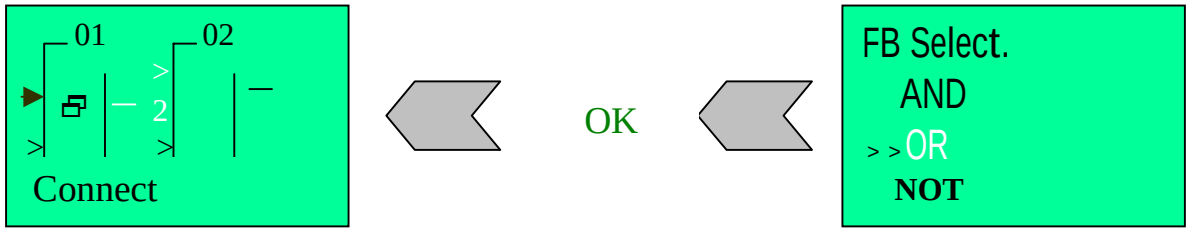
The **ONE SHOT** block is now connected. It is numbered **B01** by default since it is the first block inserted in the program.
➔Connect this block to the **OR** logic block in the same way as before.





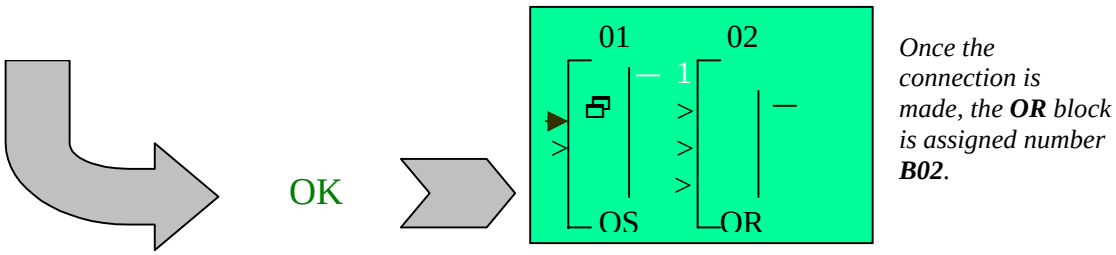
*To make a connection after **ONE SHOT,** position the cursor on the connection line (which should then flash) using the ◂ and ▸ keys.*

*Call up the list of functions using the **AddFB** option to find the **OR** logic function.*



Input pins (4 for logic functions) are selected using the ▲ and ▼ keys.
Make the connection to pin 1, for example.

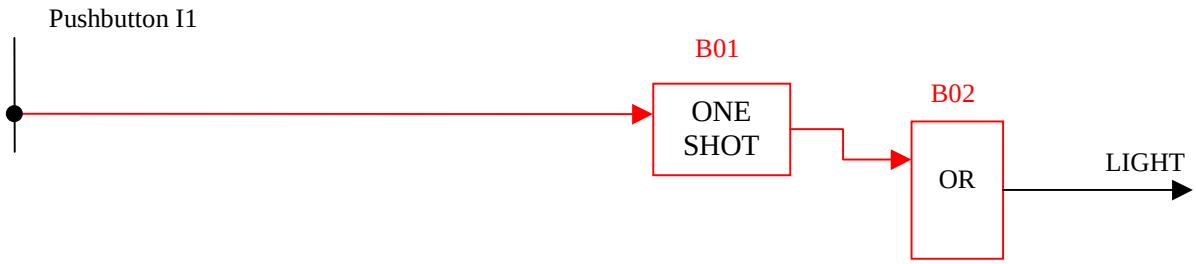
*Use the ▲ and ▼ keys to access the **OR** function.*

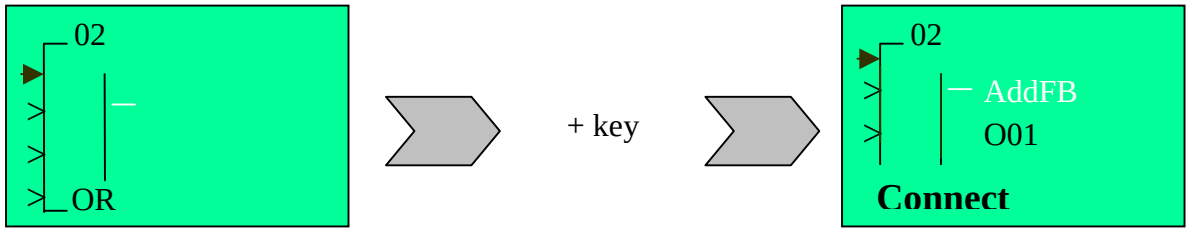


*Once the connection is made, the **OR** block is assigned number **B02**.*

Note : A black triangle on a block input indicates a connection has already been made.

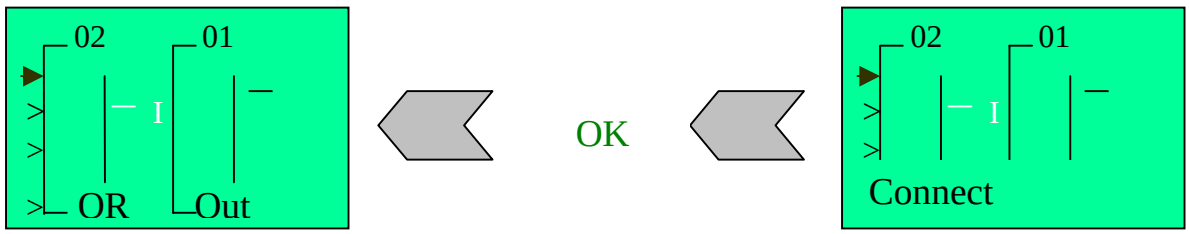
➔Connect output **O01** to the **OR** function which has just been incorporated in the program.





*Keys ◂ and ▸ move block **B02** up to the connection line which should then flash.*

*Output **O1** should now be selected using the ▴ and ▾ keys.*



The connection has been made.

*Block **O01** is now ready to be connected.*

➔Return to input **I01**, and continue programming from this block using the **Jump** function.

1-Press ESC to exit the programming screen and access the **Edit Menu** (figure 2.67).

Fig. 2.67

2-The ▲ and ▼ keys can be used to reach the **Jump** option. Press OK when this has been done. (Refer to paragraph 2.1.1.3 to see this menu).

3-Move to the letter **I** (**Input**) using the ◄ and ► keys (figure 2.68).

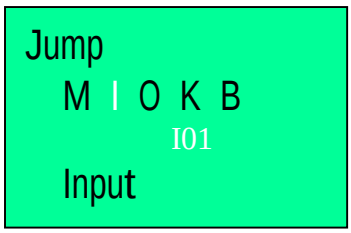


Fig. 2.68

4-Use the "+" or "-" keys to display input **I01**.

5-Press OK.

The screen in figure 2.69 will appear and block I01 will flash.

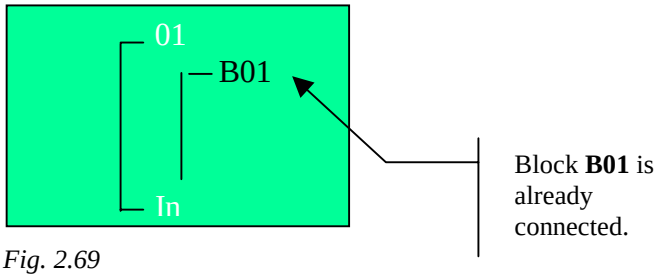


Fig. 2.69

6-Move the block using the ◄ or ► keys so that the connection line of block **I01** flashes (figure 2.70).

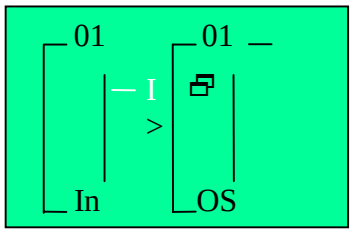
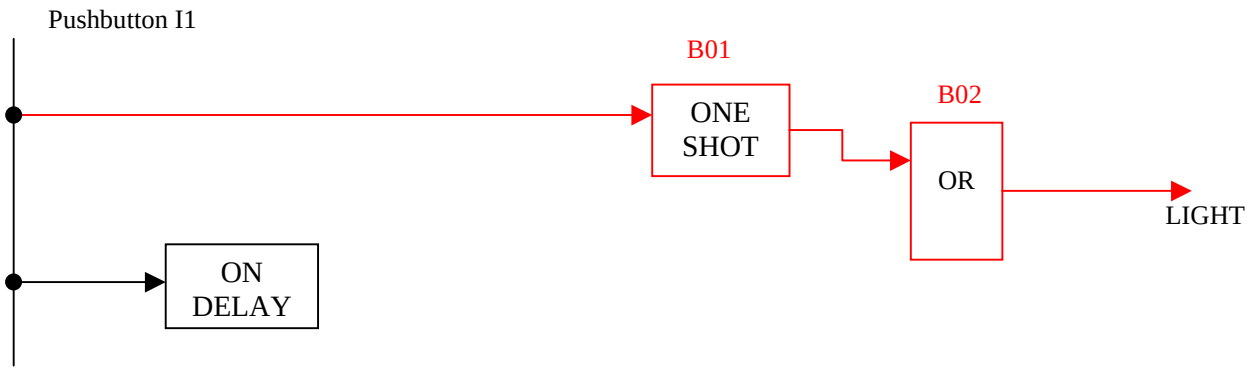
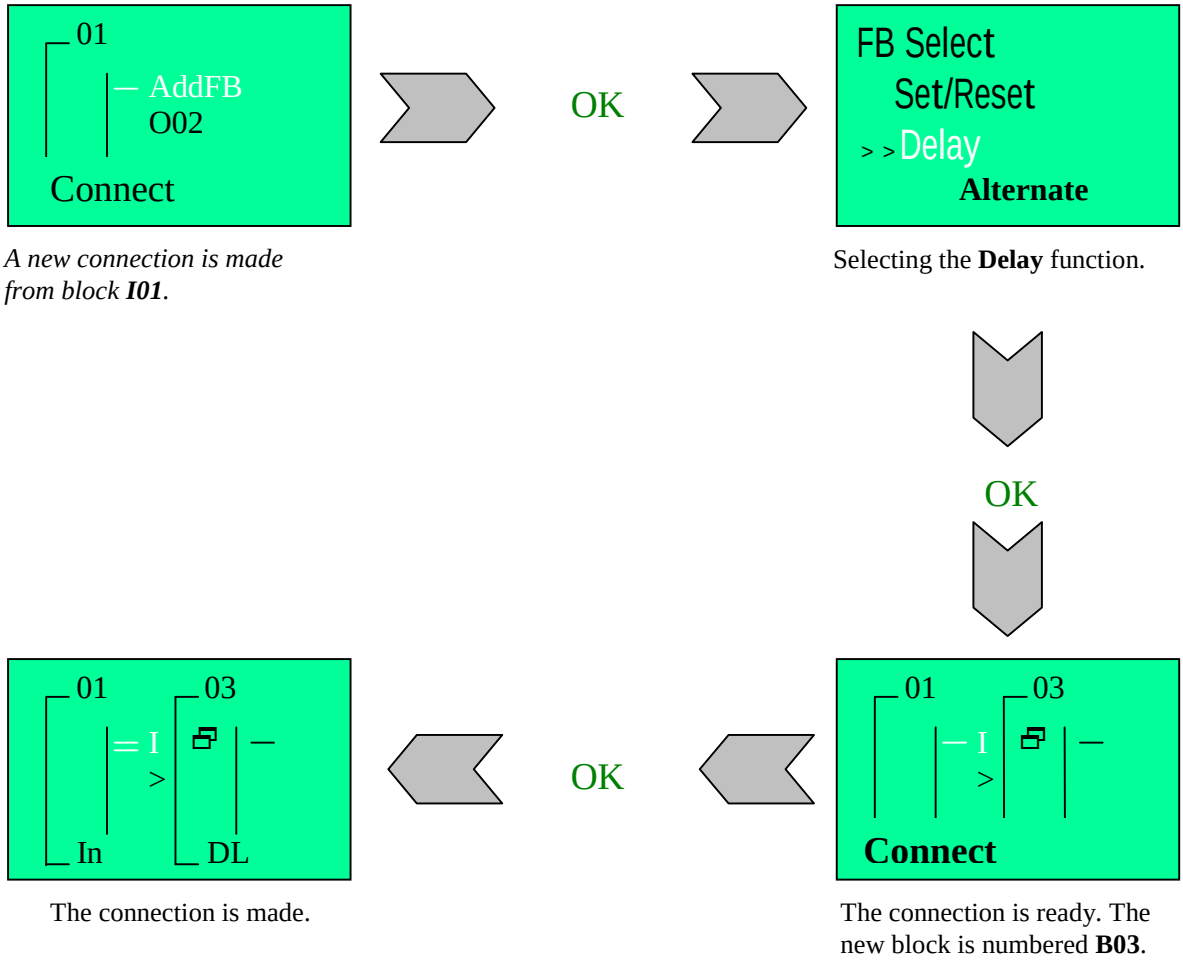


Fig. 2.70

7-Press the "+" key to make a new connection.

Adding an **ON DELAY** function block.





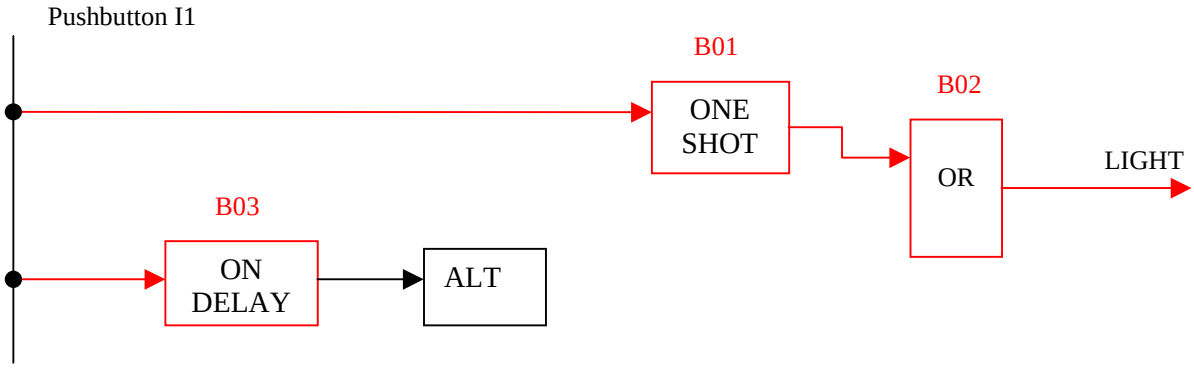
*A new connection is made from block **I01**.*

Selecting the **Delay** function.

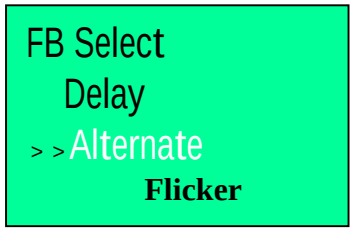
The connection is made.

The connection is ready. The new block is numbered **B03**.

➔Add a new function : **Alternate**.

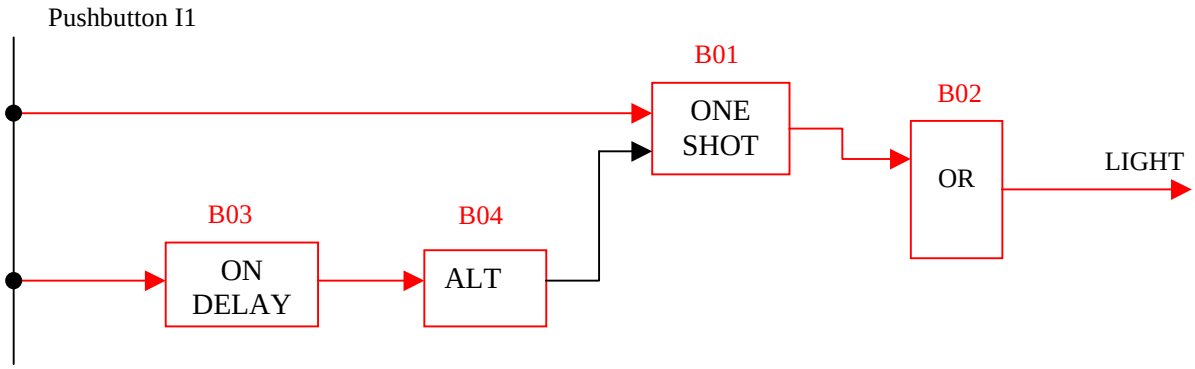


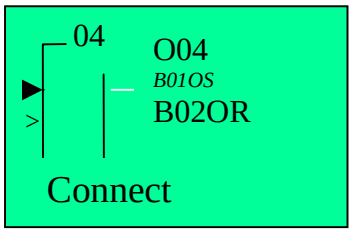
The steps to be followed are exactly the same as before, except that the **Alternate** function block will be selected. The new block that is created will have the number **B04**.



Selecting the **Alternate** function

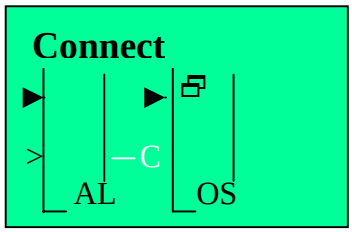
➔The remaining connections are to be made on the existing blocks, i.e. the **One Shot** and **OR** functions.





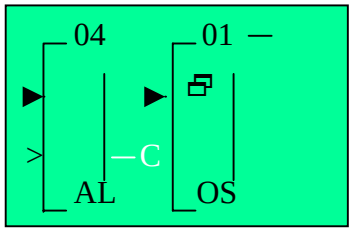
*Use the ▲ and ▼ keys to access the **B01OS** block (block 1 One Shot).*

OK



Connection is made to the inhibit pin of the **One Shot** function block (marked "C").

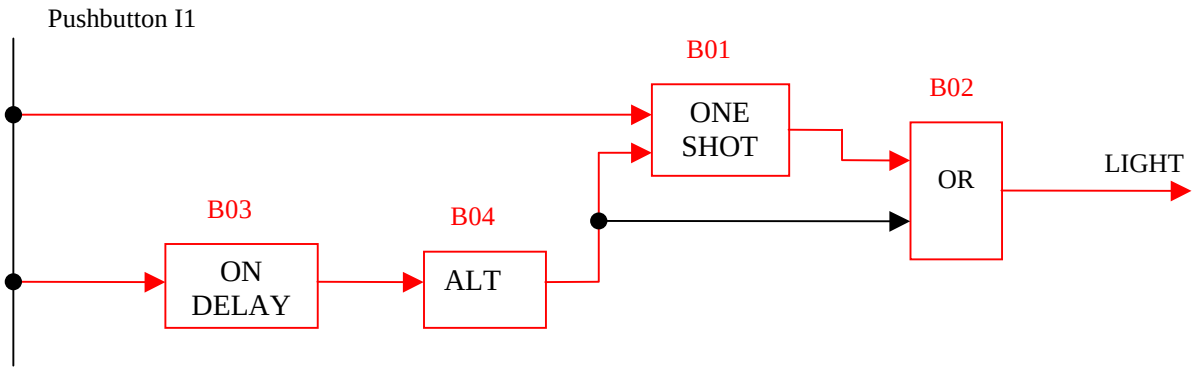
OK



The connections are complete.

➔Make the last connection between blocks **B04** and **B02**.

To do this, use the ◄ and ► keys to reposition the cursor on block **B04**, or use the **Jump** command and call block **B04**.



The connection procedure is exactly the same as before. Simply select block **B02OR** using the ▲ and ▼ keys then select, using the same keys, the three pins that are still available on the **OR** block.

Confirm the selection by pressing OK.

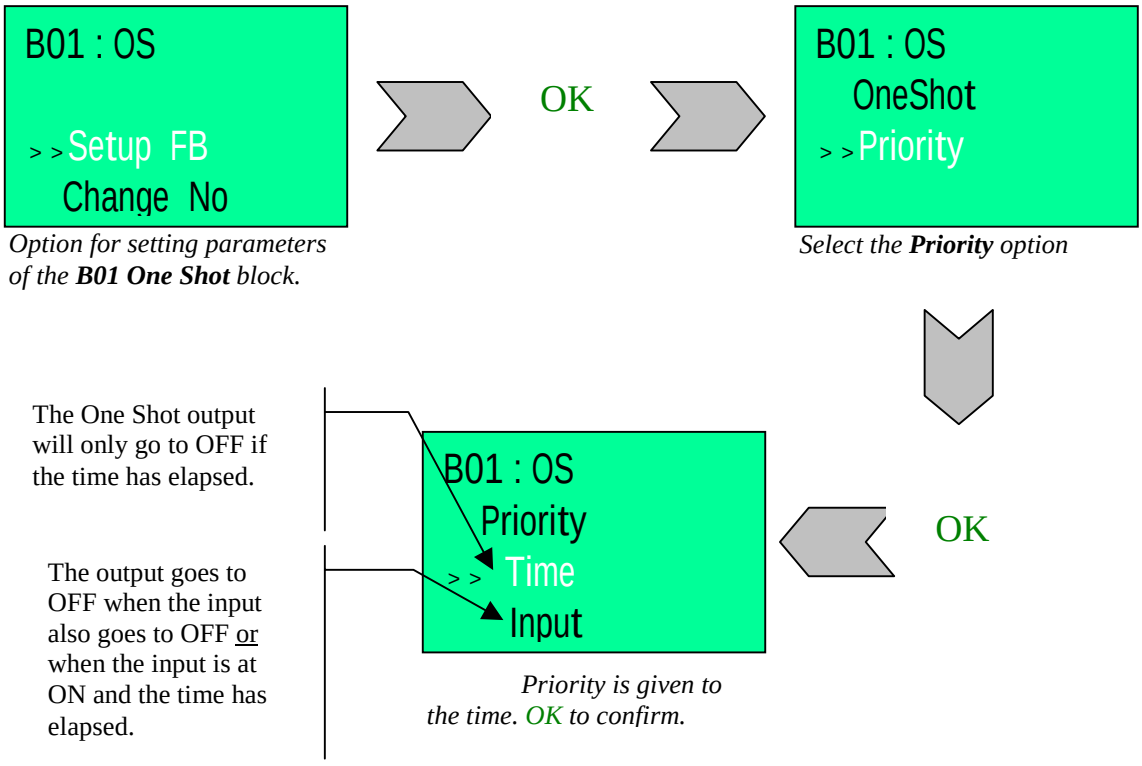
2.2.2/ Setting the function parameters.

As soon as the program is complete, you must enter, inside the function blocks whose parameters can be set (those which have the 🗗 marker), the information necessary for correct operation at the Millennium.

The only functions for which this is necessary are the **One Shot** and **Delay** functions.

➔The time delay intended for temporary lighting corresponds to the **One Shot** block (**B01**). The duration is set for 1 minute.

1-From the programming screen, return to the **Edit** menu using the ESC key.
2-Using the **Jump** command, call block **B01**.
3-Press OK.
4-Now follow the instructions as shown in the following diagram :

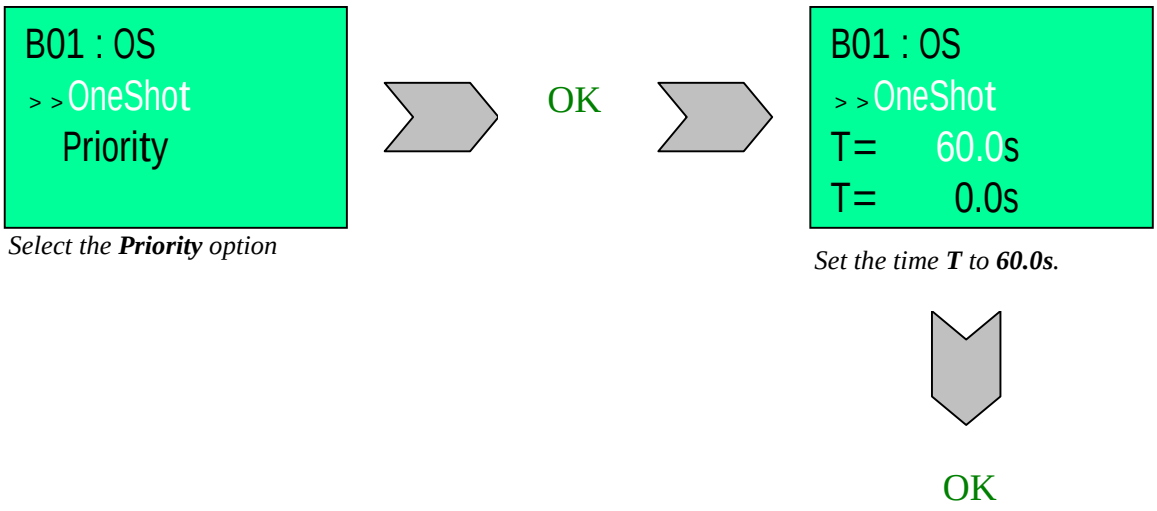


*Option for setting parameters of the **B01 One Shot** block.*

*Select the **Priority** option*

Priority is given to the time. OK to confirm.

5-Return to the parameter-setting menu and select the **OneShot** option.

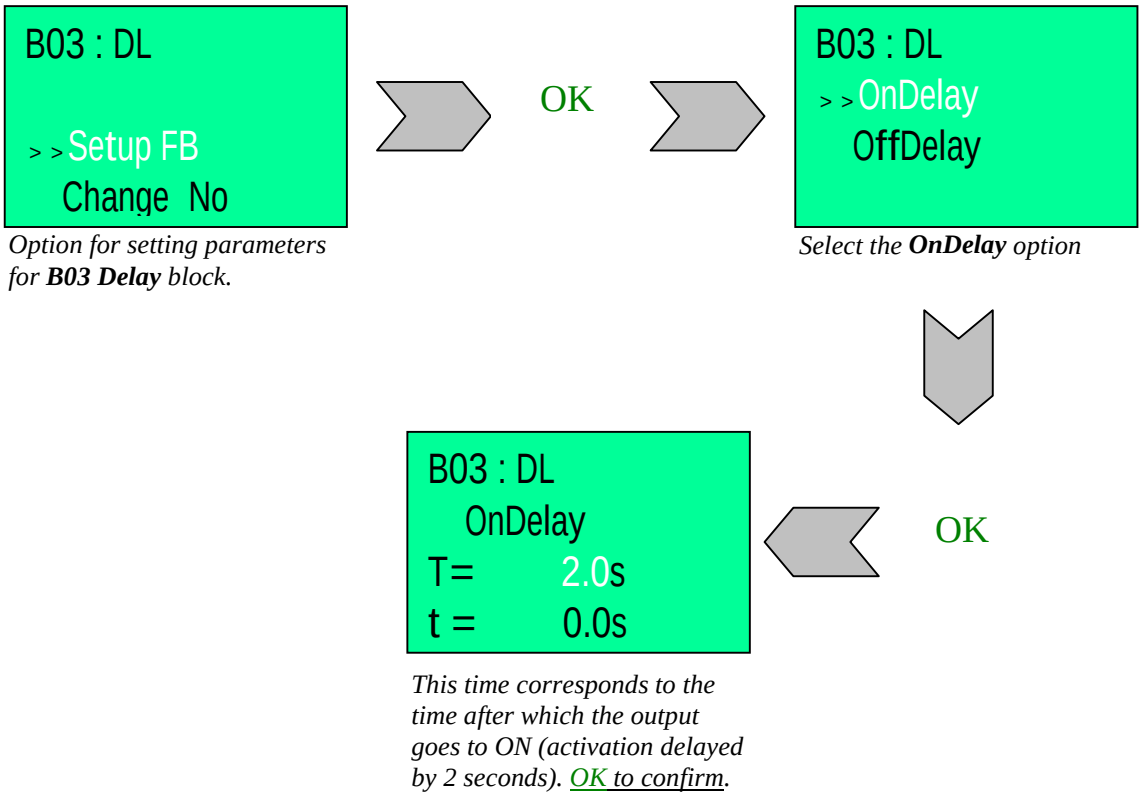


*Select the **Priority** option*

*Set the time **T** to **60.0s**.*

➔Setting the parameters for the **Delay** block (**B03DL**) which activates continuous lighting.

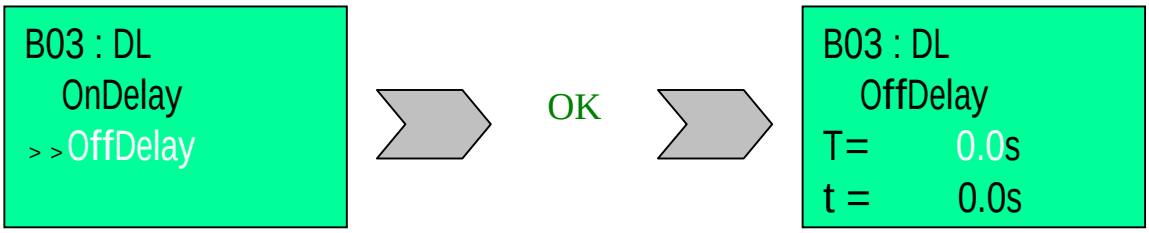
1-Press ESC to return to the **Edit** menu.
2-Using the **Jump** command, call block **B03**.
3-Once in program edit mode, press OK.
4-Now follow the instructions as shown in the following diagram :



*Option for setting parameters for **B03 Delay** block.*

*Select the **OnDelay** option*

This time corresponds to the time after which the output goes to ON (activation delayed by 2 seconds). OK to confirm.



*Select the **OffDelay** option*

This time corresponds to the time which should elapse before the block output goes to OFF (deactivation delayed by 0 seconds). OK to confirm.

5-Return to the **Edit** menu by pressing ESC.
6-Select the **Exit** option using the ▲ and ▼ keys.

The program is ready to be executed.