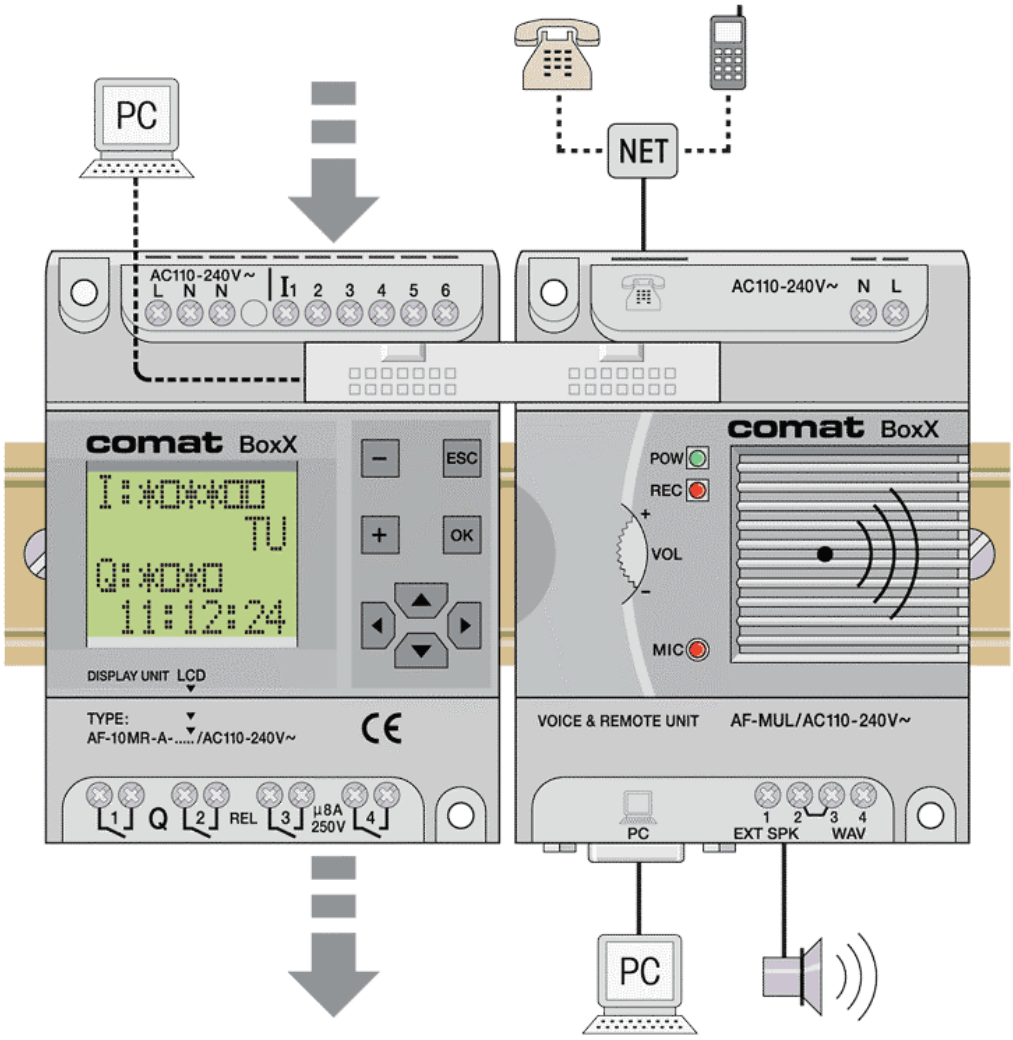
Programming Manual

Quick II



Comat AG Bernstrasse 4 CH-3076 Worb
www.comat.ch info@comat.ch
Tel. +41 (0)31 838 55 77
Fax +41 (0)31 838 55 99

Preface

Quick II is a programming software for a Comat BoxX controller. Quick II is required to carry out the programming and simulation of the Comat BoxX on a computer. It can implement the preparation of a control program (function diagram) for Comat BoxX.
It can also simulate the operation of the edited programme and display the operation in a clear manner. This feature enables the accuracy of the edited program to be confirmed. Quick II can execute both short-distance and remote communication of Comat BoxX, and write an edited program into the EEPROM of the Comat BoxX.

This issue replaces all previous issues.
Availability, errors and specifications subject to change without notice.

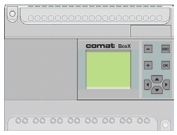


Table of contents

CHAPTER I 6

General 6
1.1 System Requirement 6
1.2 Installation of Quick II 6
1.3 Uninstallation 11
1.4 Start of the program 12
1.5 Language 13
1.6 Editing Window 13
1.7 Main functions 14

CHAPTER II 15

Programming rules 15
2.1 Programming rules 16
2.2 Intermediate replay 17

CHAPTER III 18

Operation instructions 18
3.1 Function instructions 18
3.1.1 Menu File 18
3.1.2 Menu Controller 19
3.1.3 Menu Communication 19
3.1.4 Menu View 20
3.1.5 Menu Options 22
3.1.6 Menu Help 23
3.1.7 Menu Edit 24
3.1.8 Menu Search 25
3.1.9 Menu Comat BoxX operation 25
3.1.10 Menu Window 26

CHAPTER IV 27

Quick II 27
4.1 Editing Window 27
4.1.1 Open a new file 27
4.1.2 Open an existing file 29
4.1.3 Size of schematic window 30
4.1.4 Inputs and Outputs 31
4.1.5 Save a file 32
4.1.6 Zoom 33
4.2 Edit Function Diagram Program 34
4.2.1 Place Blocks 34
4.2.2 Edit Block Properties 35
4.2.3 Link 36
4.2.4 Copy Function Blocks and Links 38

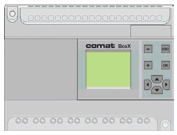
4.2.5 Move Block or Link 38
4.2.6 Delete Block or Link 39
4.3 Print 40
4.4 Simulation operation 42
4.5 BoxX settings (Option menu) 43
4.5.1 Modify BoxX date and time 43
4.5.2 Winter- / Summertime 44
4.5.3 Change BoxX address 44
4.5.4 Change BoxX Password 45
4.6 Read and write the program 46
4.6.1 Write program into BoxX 46
4.6.2 Read Program from Comat BoxX 48
4.7 Monitoring 48

CHAPTER V 49

General description of Function Blocks 49
5.1 General function block (GF) 50
5.1.1 AND 50
5.1.2 OR 51
5.1.3 NOT 53
5.1.4 NAND 53
5.1.5 NOR 54
5.1.6 XOR 54
5.2 Time-Function blocks 55
5.2.1 DPR (ON time delay) 56
5.2.2 DDR (Off time delay) 57
5.2.3 MPLR (Single-pulse time relay) 58
5.2.4 PLR (Pulse relay) 59
5.2.5 CPG (Clock on time generator) 60
5.2.6 RPR (Hold on time delay relay) 61
5.3 Set relay / Reset relay (RS) 62
5.4 Counter - Function blocks 63
5.4.1 UCN (Up-counter) 63
5.4.2 DCN (Down-counter) 64
5.5 Analogue input block 65
5.5.1 AN 65
5.6 Clock switch function block 66
5.6.1 CW 66
5.7 Audio / Tel.-Function Blocks 71
5.7.1 PLAY (It is necessary to connect AF-MUL to the Comat BoxX) 71
5.7.2 MR (It is necessary to connect AF-MUL to the Comat BoxX) 72
5.7.3 Tel (In combination with Voice & Remote Unit AF-MUL) 73

CHAPTER VI 75

Block Library 75
6.1 Block Library Operation 76
6.2 General Property 77
6.3 Blocks with timers 78



6.4 Properties of RS relay 79
6.5 Blocks with counters 80
6.6 Setup for Analogue Block AN 81
6.7 Properties of DW (Clock Switch Block) 82
6.8 Properties of Voice Broadcasting and Recording Blocks and of TEL Block 86
6.9 Animation Blocks 88

CHAPTER VII 89

Remote programming and monitoring via Modem 89
7.1 Remote programming and monitoring via Modem 89
7.2 Two connection methods for Comat BoxX remote programming and monitoring 90
7.2.1 Connect Modem with AF-C232 and AF-M232 cables 90
7.2.2 Connection between Comat BoxX and voice module AF-MUL via Modem 91

CHAPTER VIII 93

Programming operation on Comat BoxX panel 93
8.1 Edit a new program 93
8.2 Edit PRG (Edit function) 93
8.3 Edit an existing program (Edit a program) 94
8.4 Read program from Comat BoxX 94
8.5 Characters of the general function blocks 95
8.6 Function blocks with timing function 95
8.7 Set-/Resetrelay function block RS 96
8.8 Function blocks with counting function include 96
8.9 Set the analogue block (AN) 97
8.10 Parameters for the Clock Switch (CW) 98
8.11 Set the Telephone Block (TEL) 100
8.12 Insert Function Block (Insert FB) 101
8.13 Delete Function Block (Delete FB) 102
8.14 Delete Program (Clear Prg) 102
8.15 Programming over LCD display 103

Chapter I
General

1.1 System Requirement

Pentium II 266, Pentium III or Pentium IV processor-based personal computer
Windows 98/ME/2000/XP or Windows NT 4,0
64MB RAM Memory
100MB free storage capacity on the hard disk

1.2 Installation of Quick II

The installation of Quick II is very simple. A prompt dialogue box will appear automatically and you will complete the installation smoothly on the computer under it's guidance.
The main steps are as follows.

Fig. 1.1
Installationwindow

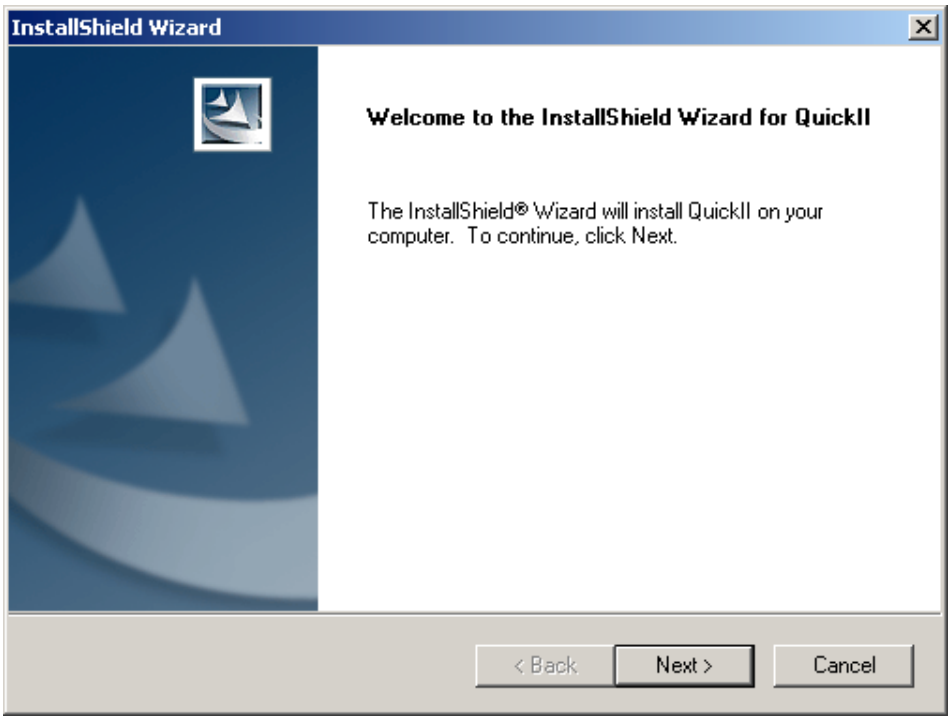


Fig. 1.2
Installation-
Guidance window

Click on the button <*Next*> to enter the next step of the installation guide.

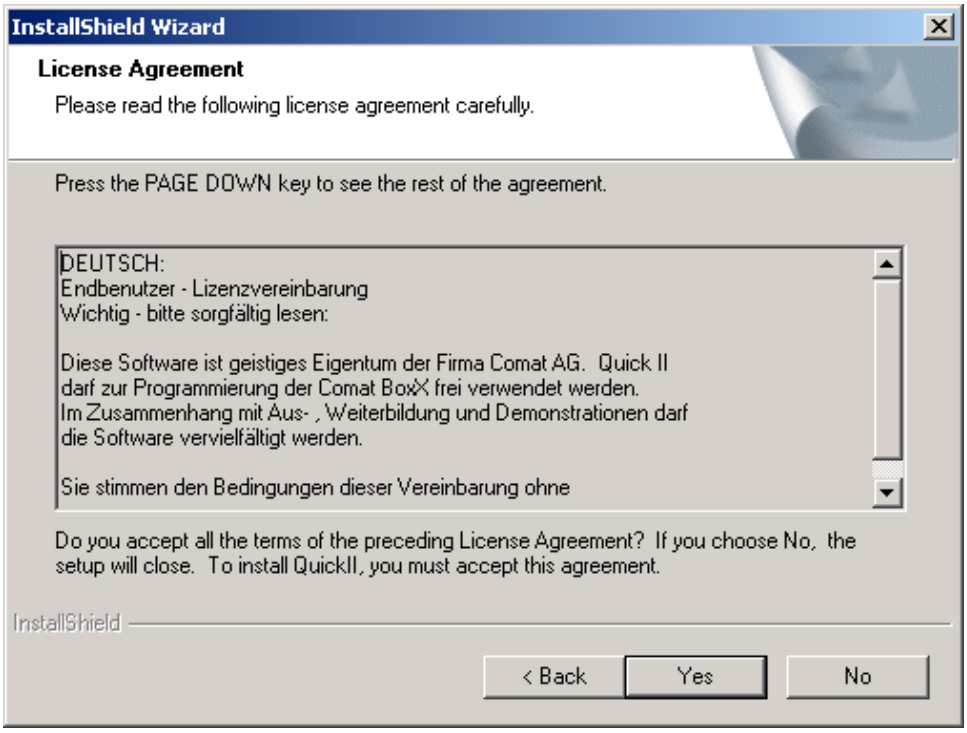


Fig. 1.3
Licence

The usual licence...click <*Yes*>.

The User Name and Computer Name will be displayed, as shown in Fig. 1.4, and you can modify them.

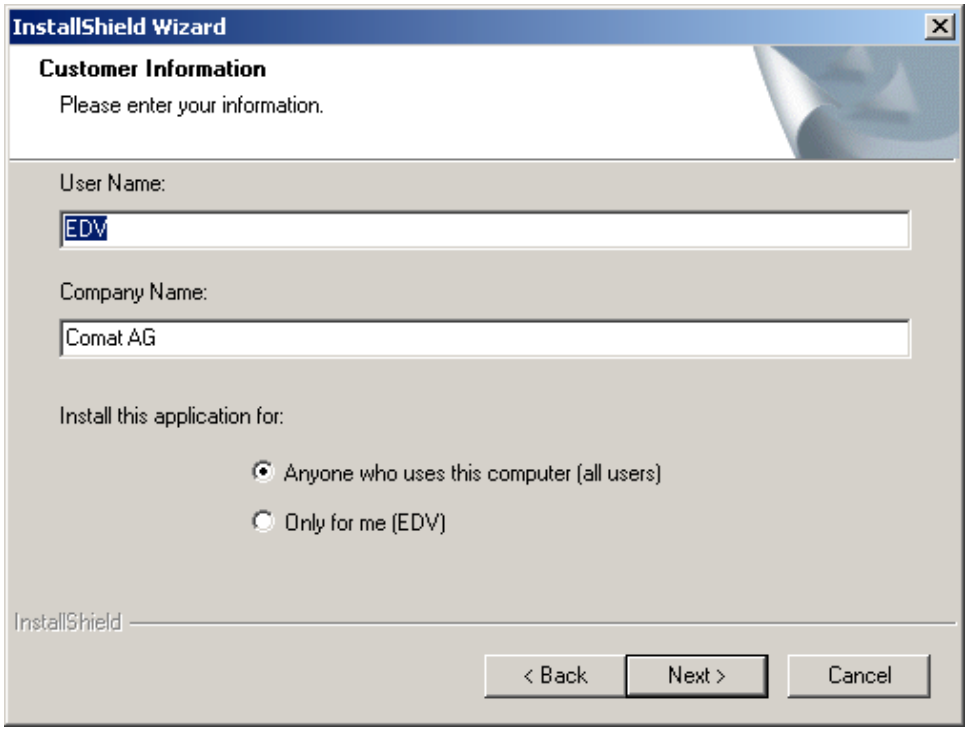


Fig. 1.4
User Name Setting Window

Click <*Next*> to enter the Set Installation Path Setting dialogue Box, as shown in Fig. 1.5.
Click <*Browse*>, and you can modify the current installation path (the original installation path is C:\Programm Files\Comat BoxX\Quick II) to your desired installation path.

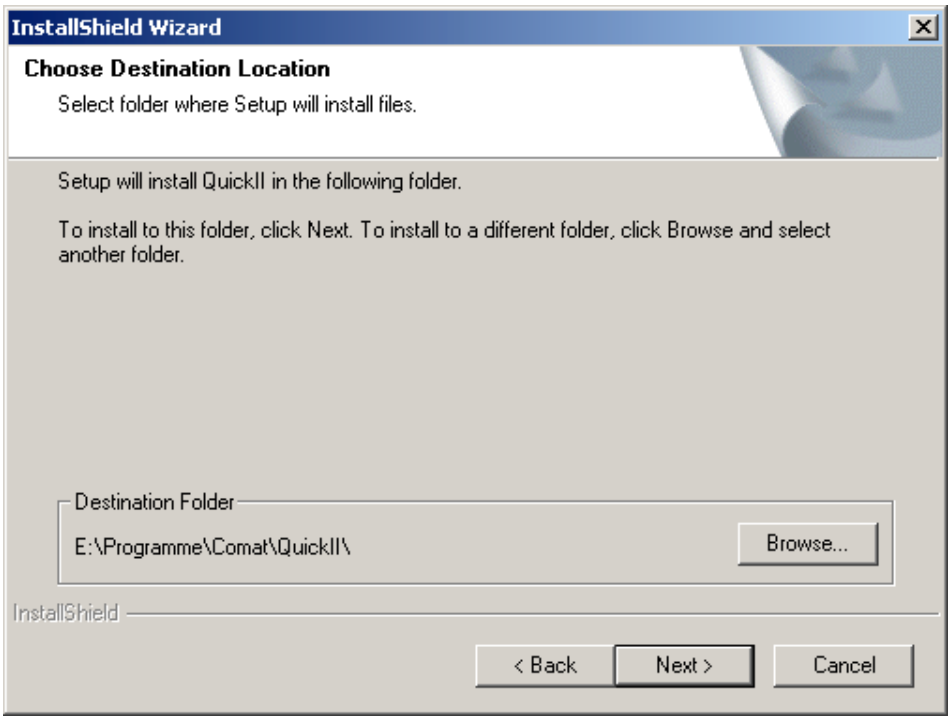


Fig. 1.5
Installation Path Selection window

Click <*Next*>, it will enter the next step of installation and enter the Setup Type window for selecting installation type,

If <*Typical*> option is selected, the Quick II normal program will be installed.
If <*Compact*> option is selected, the Quick II basic program will be installed.
If <*Custom*> option is selected, the user will be allowed to select the Quick II program components.

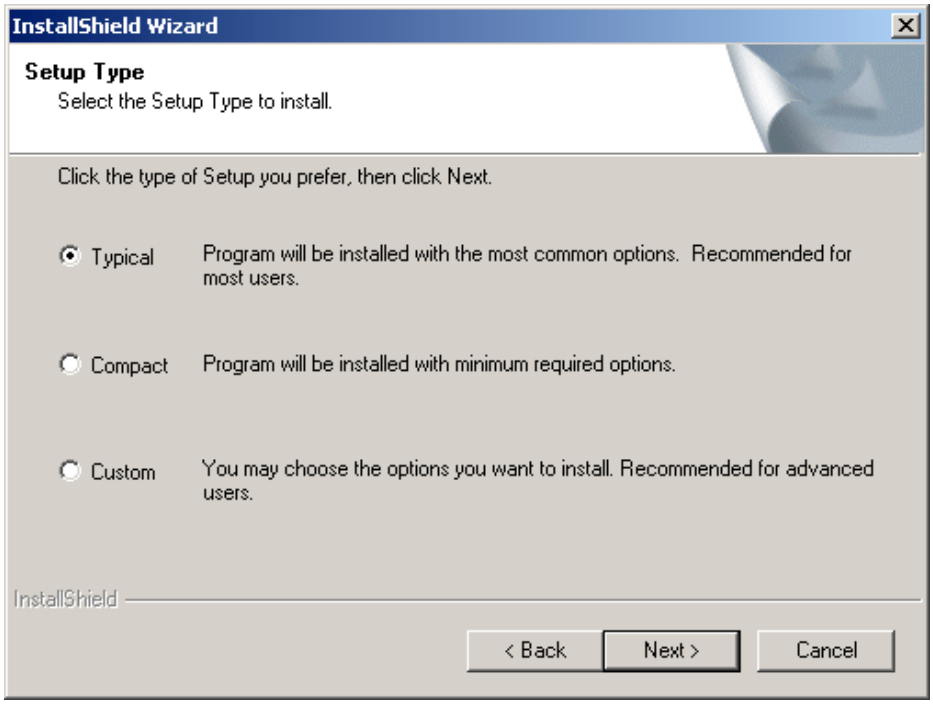
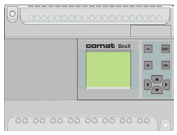


Fig. 1.6
Installation Type Selection window

Note:

Selection of <*Typical*> option is recommended. If <Custom> option is selected, it will enter Selection Components window, as shown in Fig. 1.7.



Set your desired program set name on the Set Up Program Set Name window as shown in Fig. 1.7 (the original name is Comat BoxX). When setup is completed click <*Next*> with the left mouse button, installation of the program components will start, as shown in Fig. 1.8.

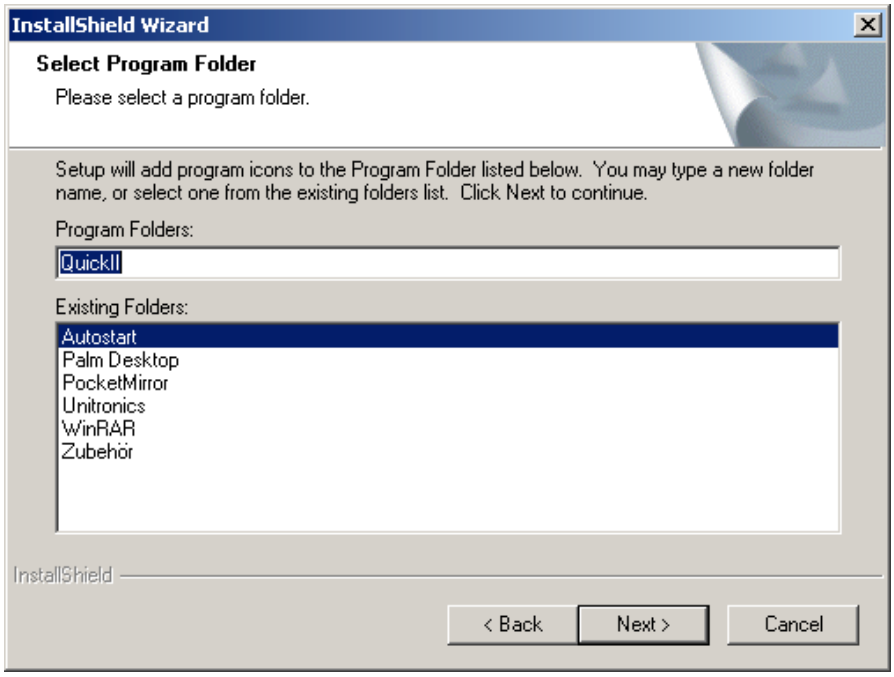


Fig. 1.7
Program Folder
Selection window

The installation program proceeds to the automated installation procedure. Please click the <*Cancel*> button if you want to terminate now.

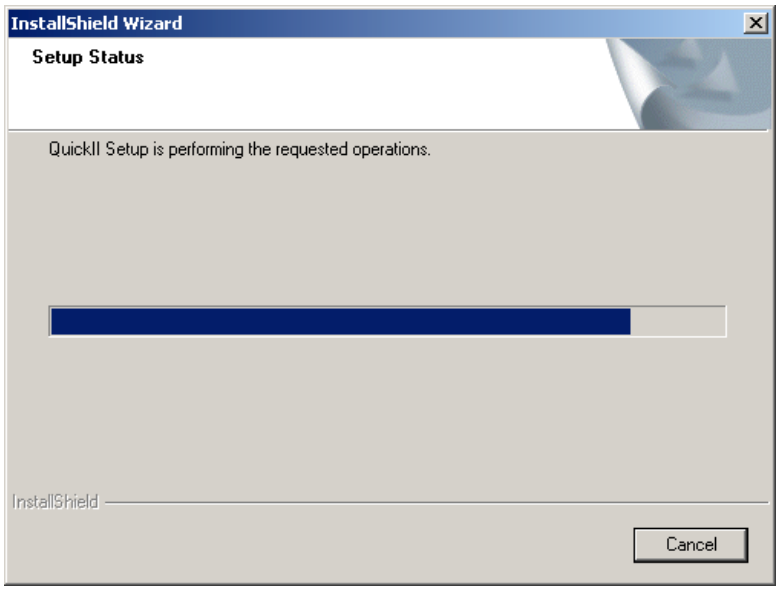


Fig. 1.8 Quick II Installation Window

When the automated installation process is completed, the Setup Finished Window appears, as shown in Fig. 1.9. Please click the <Finish> button to complete the installation process.

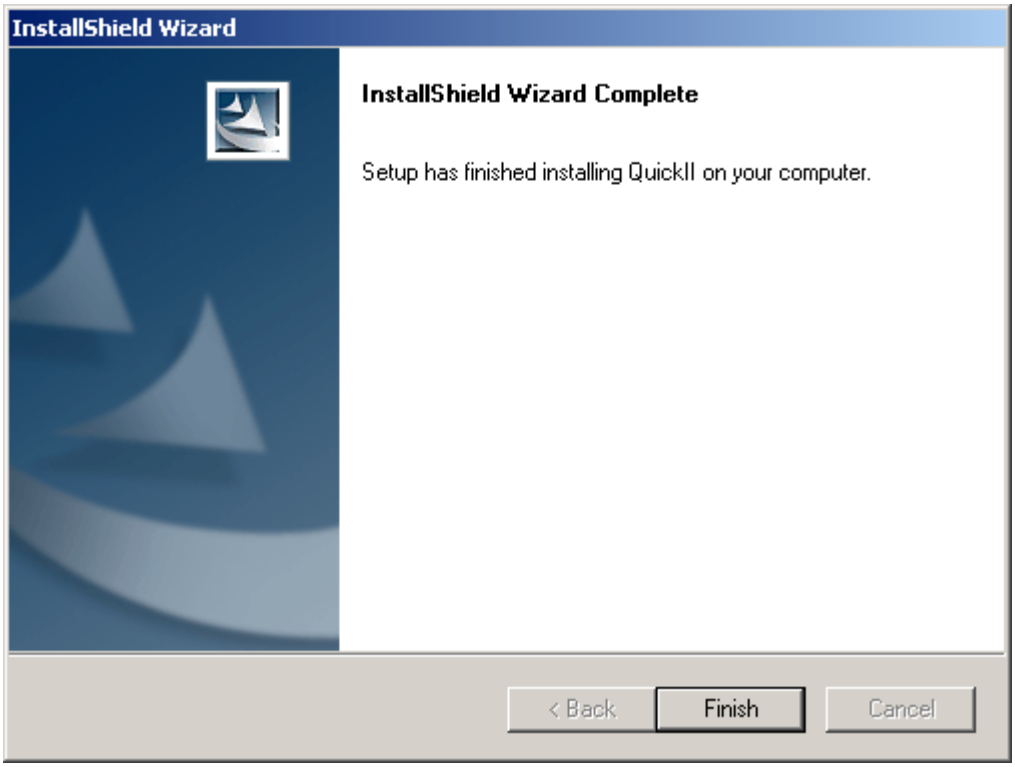
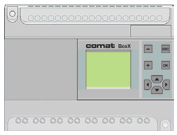


Fig. 1.9
Setup
Finished
window



1.3 Uninstallation

Under the Windows Window, click <*Start*> <*Program*> <*Comat BoxX*> and <*Uninstall Quick II*>

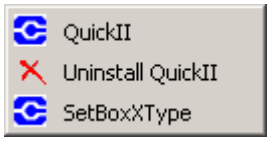


Fig. 1.10
Uninstall window

When a Remove Window, as shown in Fig. 1.11, appears, removal can be done. Click the <*Next*> button to complete the removal.

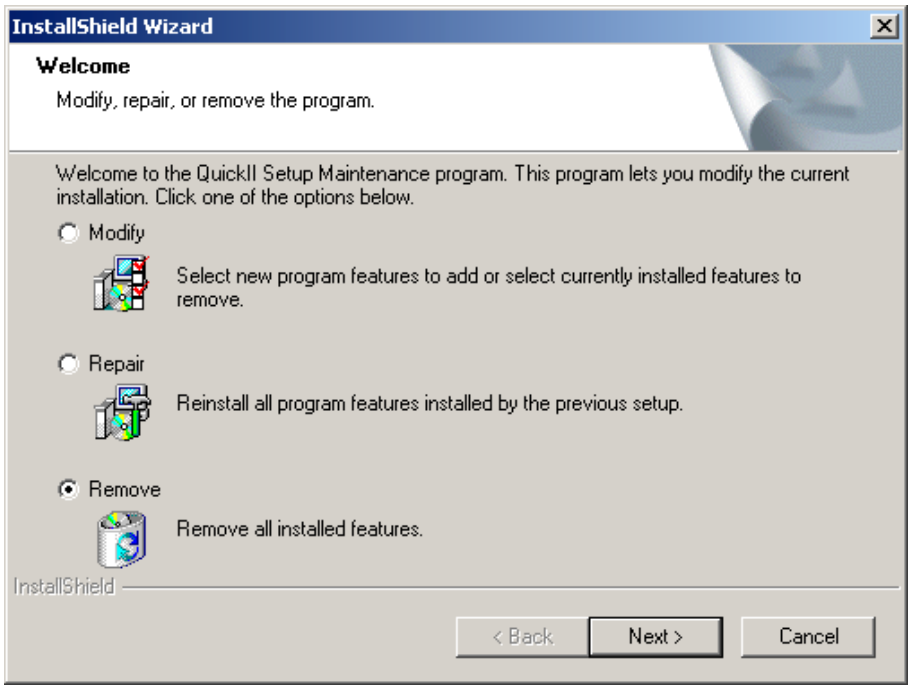


Fig. 1.11
Remove window of Quick II

After successful uninstallation of Quick II click <*Finish*>.

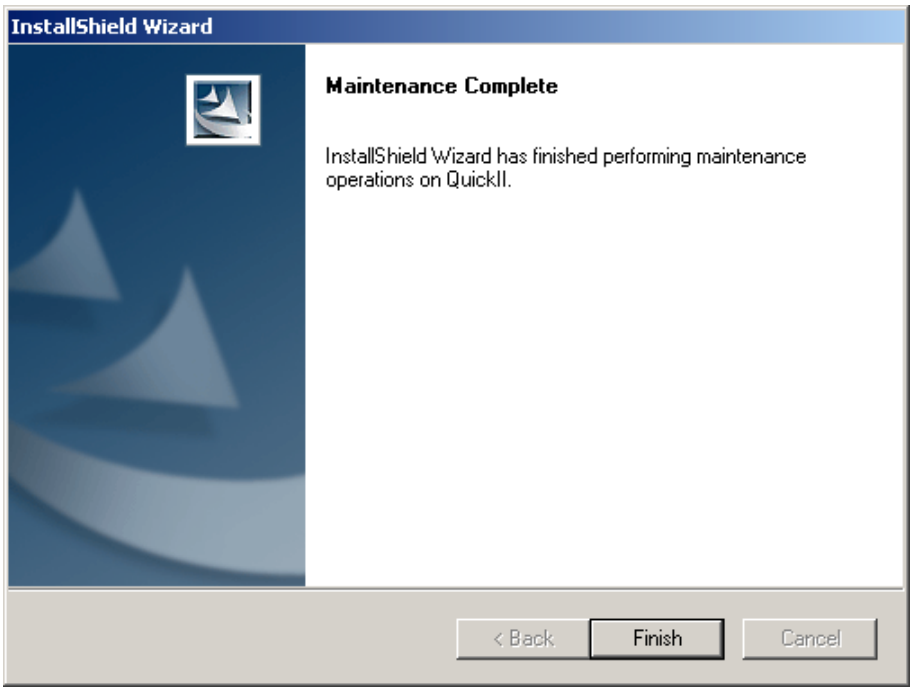


Fig. 1.12
Complete

1.4 Start of the program

The operating interface of Quick II is friendly and all of it's operations can be completed by clicking the mouse. By clicking <*Start*> <*Programs*> <*Quick II*> in the Windows operating window Fig. 1.12, you can enter the main interface of Quick II, as shown in Fig. 1.13:

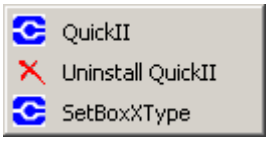


Fig. 1.13
Set up Quick II

After starting Quick II the following window of the main interface appears.

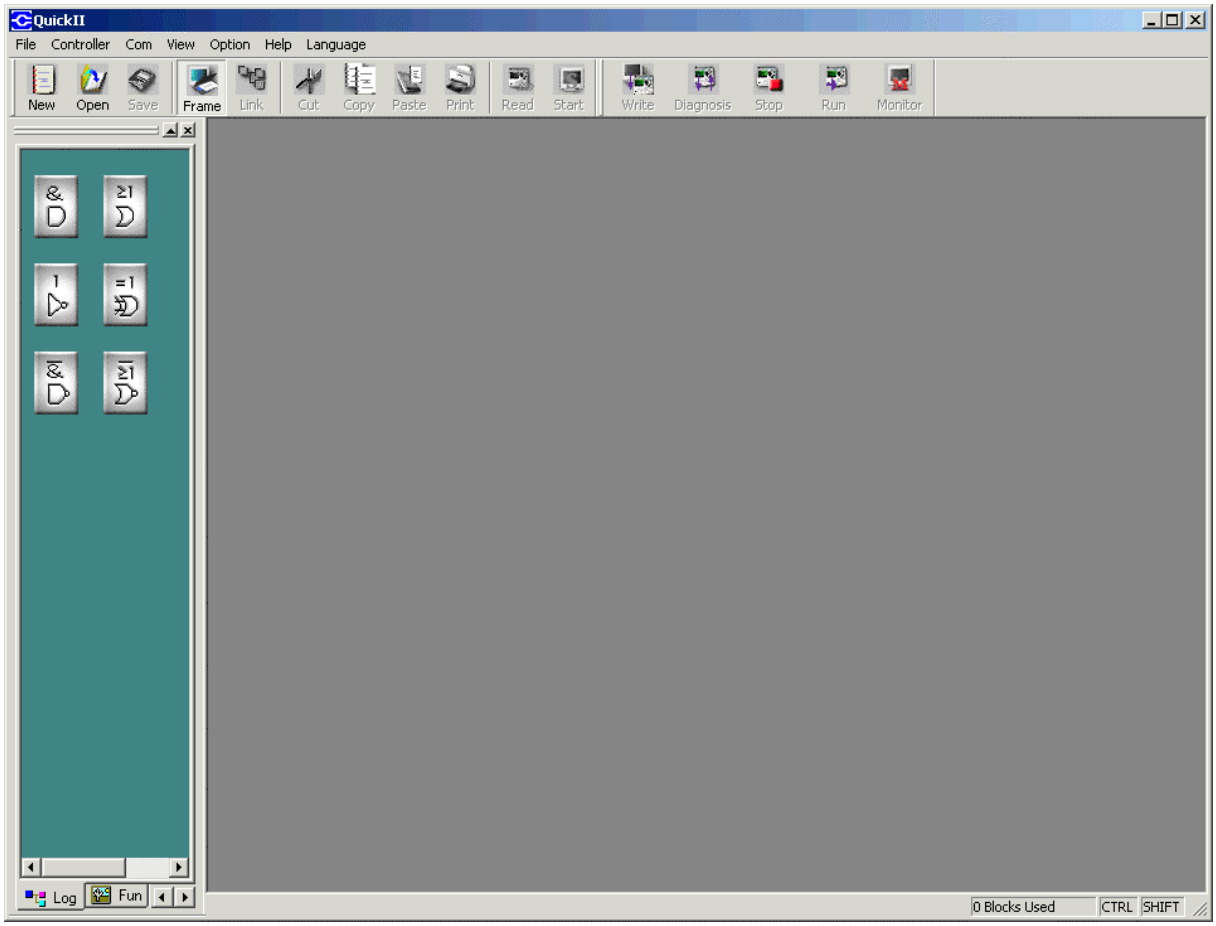
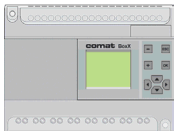


Fig. 1.14 Main Interface of Quick II

For Quick II, the operating methods of pull-down Instruction Tools and Quick buttons are adopted. All function blocks are directly distributed in the window. Using a mouse with Windows operation, you can perform; creating and editing, simulation running and monitoring of a Comat BoxX program quickly.



1.5 Language

TBD

1.6 Editing Window

As you click the <*New*> button by using the mouse and the Logical Diagram Edit Window will appear.

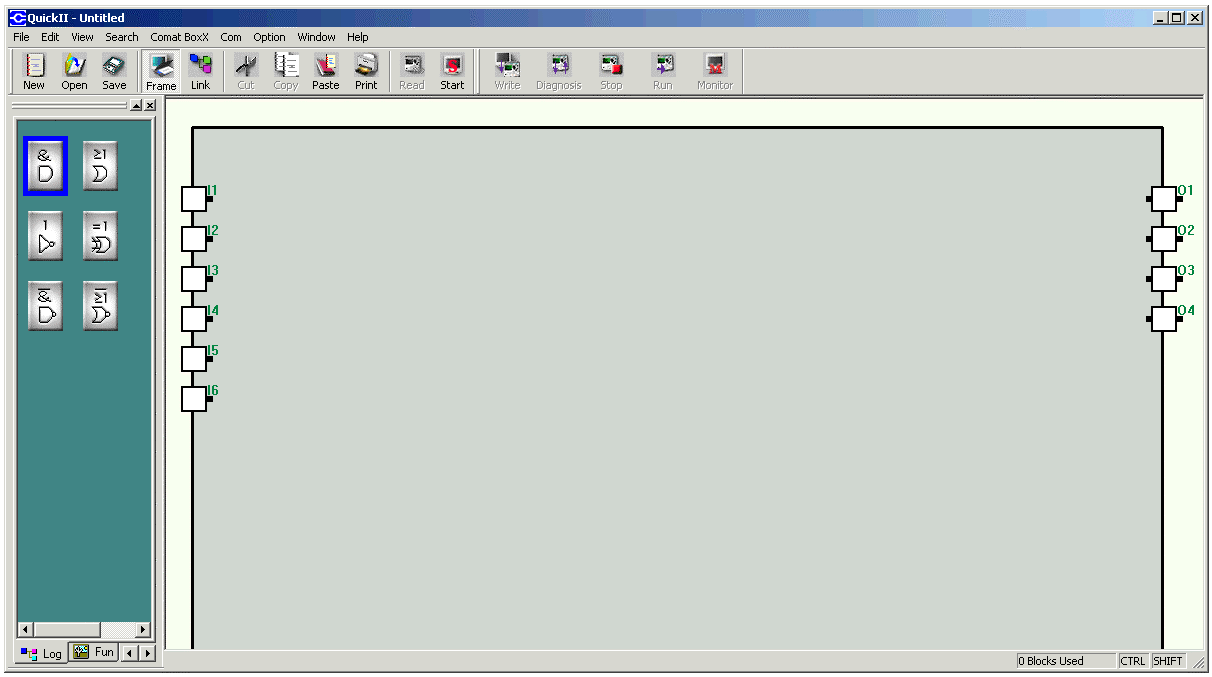


Fig. 1.16 Comat BoxX Logical Diagram Editing Window

Comat BoxX Logical Diagram Editing window is as shown in Fig. 2.3.
In this Editing Window, you can click the desired block in the block library on the left to draw the Logical Function Diagram and set the block property.
After the function diagram is completed, simulation can be run in this window and the program can be downloaded to Comat BoxX.

1.7 Main functions

Editing function

The first function of Quick II is programming for Comat BoxX on a computer. Through the Logical Function Editing window of Quick II, you can edit your desired Comat BoxX programs using various function blocks of Comat BoxX.

Simulation operation function

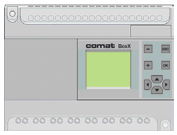
After the program is edited, you can view the program operation result on the computer and conveniently check if the said program meets your controls requirements. Here Quick II provides you with a completely new off-line test function, through which you can debug the program without installing the Comat BoxX on site. With this function, many inconvenience of the on-line test can be avoided.

Real-time monitoring

Quick II has a Real-Time Monitoring window, through which you can view the process of the control system and the running conditions of all Comat BoxX and conduct control of remote Comat BoxX, only by connecting the Comat BoxX communication port to the PC.

Communication with Comat BoxX

1. Local Comat BoxX Communication:
   Through use of an RS-232 communication port, communication between the Comat BoxX and a computer can be realised, allowing for easily downloading programs from computer to Comat BoxX and uploading programs from Comat BoxX to computer. Monitoring of operation conditions and controlling of Comat BoxX can also be carried out.
2. Remote Comat BoxX Communication:
   In certain applications several sets of equipments may be located at disparate distances and far from each other. When frequent or urgent modification are needed, caused by unexpected events, during Comat BoxX operation, the problems can be easily solved by just connecting Comat BoxX to the telephone line through a modem.



Chapter II

Programming rules

Edit Comat BoxX function program

During editing of Comat BoxX function program, special attention must be paid to some programming rules, the application of the intermediate relays and how to use Comat BoxX's operation key panel with LCD.

4.The outputs of the function blocks can not be connected together.

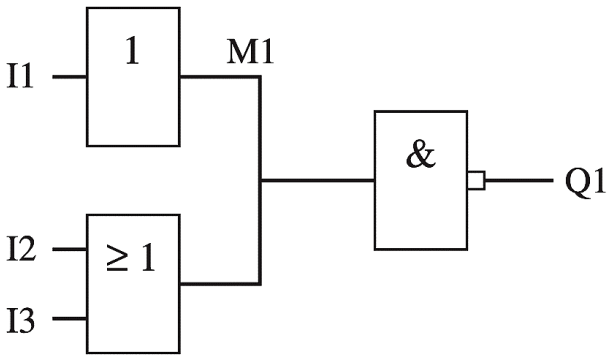


Fig. 2.1 This way of connection is not allowed.

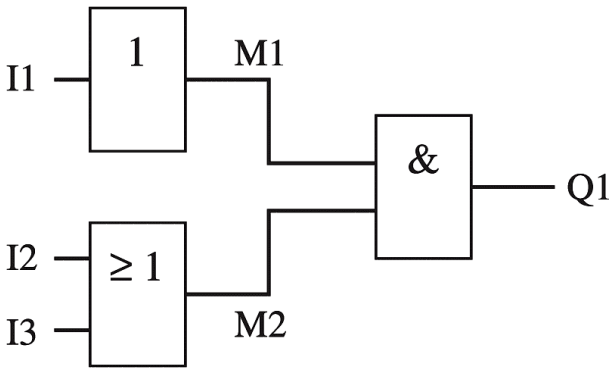


Fig. 2.2 Correct connection of the outputs.

2.1 Programming rules

Rule 1:
Before the beginning of programming your circuit, the complete circuit diagram shall be designed on a drawing with the necessary intermediate relays (M) marked.
The Comat BoxX circuit diagram may be drawn directly with Quick II.
Subsequently the arrangement of the blocks can be executed with the respective function keys on the LCD panel according to rules 2 and 3.

Rule 2:
The wiring of circuit is always from input to output. The block sequence number of the cause block must be smaller than the block number of the result block. The block numbers which have nothing to do with each other are irrelevant.

Example:

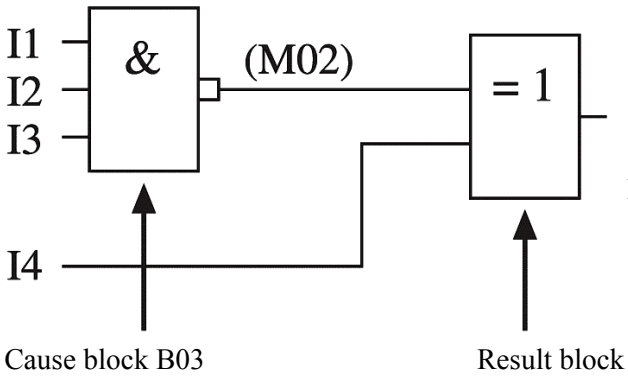


Fig. 2.3

Rule 3:
In a program path, an output may be connected to the lead input (for number transfer), but the block with a smaller sequence number shall be used as the lead input (cause block). The block with a greater sequence number shall be the result block. Please adjust the block sequence numbers accordingly.

Rule 4:
One output may be connected to multiple inputs, but multiple outputs may not be connected to an input.

Rule 5:
At power-on and initialisation of Comat BoxX (at the instant of power-on), the intermediate relay (M) and output port (Q) are all in logical 0 status. Their later status will be determined by the program.

Rule 6:
It is not allowed to connect two outputs together (only allowed for CW blocks).

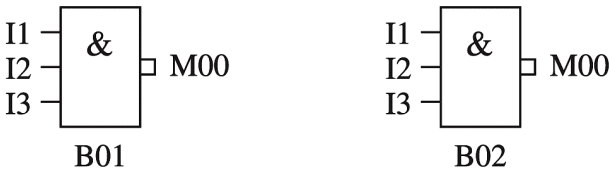
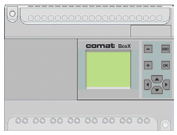


Fig. 2.4



2.2 Intermediate replay

The intermediate relay is a very important bridge in Comat BoxX programming. The intermediate relay of Comat BoxX is similar to that in a relay control system. They can store some intermediate status and then transfer it to a block, requiring this status for input.

Using of intermediate relays has two advantages:

1. The output terminal of the previous block can be used as the input signal for different additional blocks.
2. When a block is inserted or deleted, the original logical relation can be retained.

No intermediate relay is provided for other products of the same category.
The basic functions of the intermediate relay are as shown in figure 2.5.

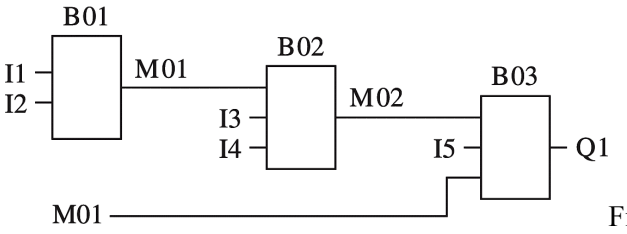


Fig. 2.5

Note:

In the diagram, the output status of B01 may not only be used directly as the input of B02 block, but also be stored by M01 and then used as input of B03.

Chapter III

Operation instructions

3.1 Function instructions

When Quick II is used to edit Comat BoxX programs, some basic operations including file management, opening and closing of the Tool Bar and Status Bar access to Help information are completed by using pull-down menu under File, Controller, Communication, View, Option and Help. The Instruction Function list of Quick II is characterised by its flexibility and variation according to the main selection.
It can be changed according to the current operation for convenience of your specific operations.

3.1.1 Menu File

The instruction is mainly used for file management, including creation, opening, saving and printing of files.

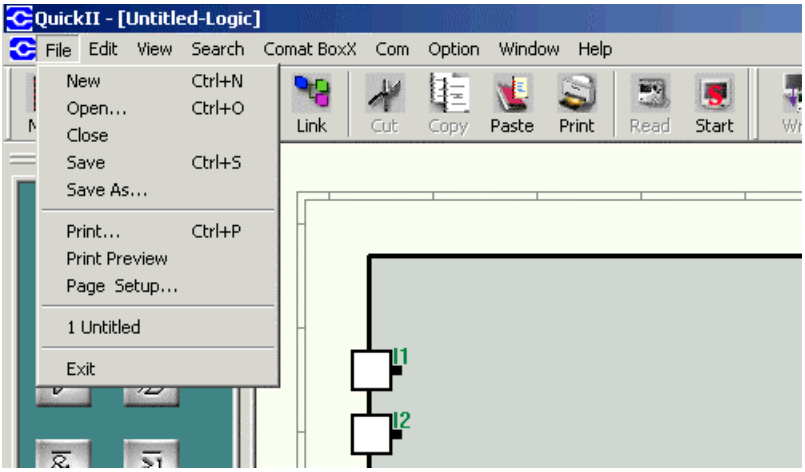


Fig. 3.1 File Instructions Menu

The file instruction menu contains following entries:

Instruction name:	**Function:**
New	Open a new file
Open...	Open an old file
Close	Close the current active Window
Save	Save a file
Save As...	Save current file to a new path & a new file name
Print...	Print a file
Print Preview	Preview the file printing result
Page Setup...	Setup printing format
Exit	Exit Quick II

3.1.2 Menu Controller

With this function it is possible to read a program from the Comat BoxX into the Quick II programming software for editing and simulation on the PC.

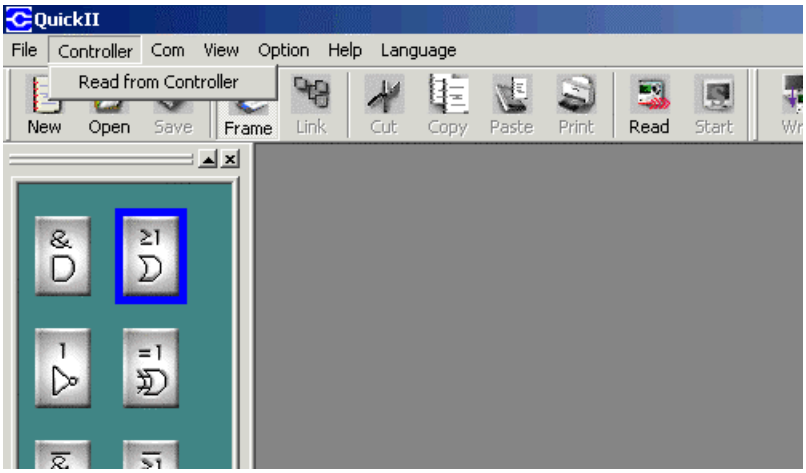


Fig. 3.2 Controller Instruction Menu

3.1.3 Menu Communication

The configuration function is used to select the communication port to set up a connection between the computer and the BoxX.

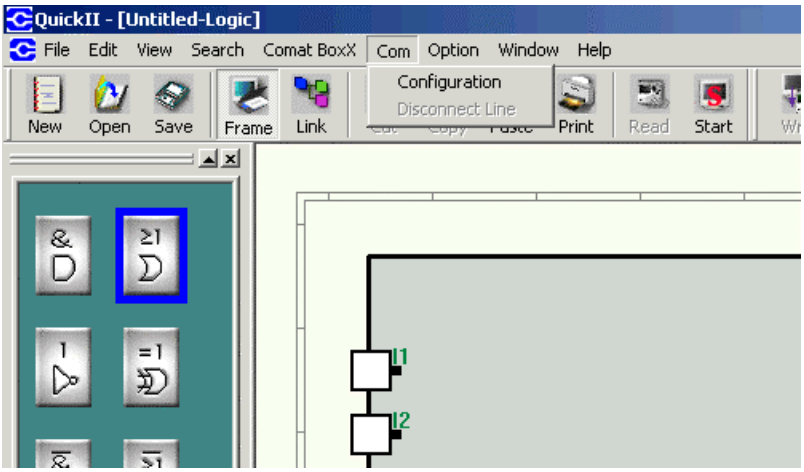


Fig. 3.3 Communication Instruction Menu

Instruction name:	**Function:**
Configuration	Selection of communication port for connection between PC and BoxX.
Disconnect Line	When it is not necessary for Comat BoxX to communicate with the computer, click this option to interrupt.

3.1.4 Menu View

Under the menu „View" you select or hide the different Toolbars and adjust with „Zoom" the displayed screen size.

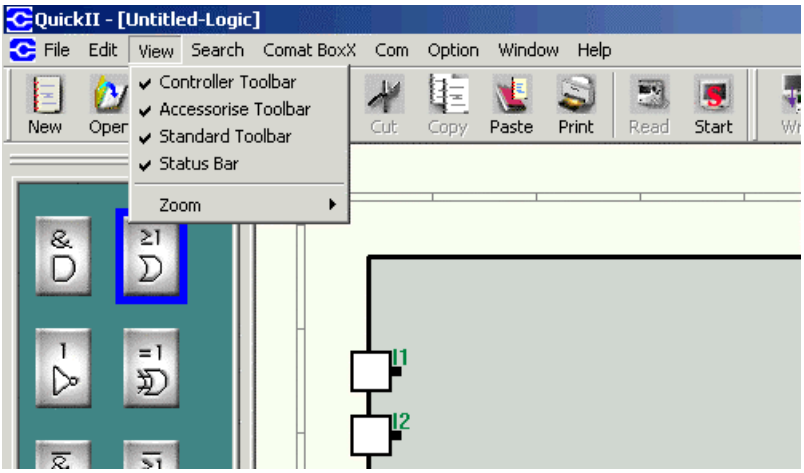


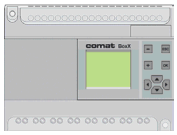
Fig. 3.4 Display Instruction Menu

Instruction name:	Function:
Controller Toolbar	Select Controller Toolbar
Accessorise Toolbar	Select Block Library
Standard Toolbar	Select Standard Toolbar
Status Bar	Select Status Bar
Zoom	Enlarge or reduce window between 150% - 50%

The following icons can be displayed with Toolbar in the edit window.

Controller Toolbar

Symbol	Function	Symbol	Function
	Write: Write program to Comat BoxX		*Run:* Run Comat BoxX
	Diagnosis: Diagnose Comat BoxX, System Information		*Monitor:* Monitor Comat BoxX running status
	Stop: Stop running Comat BoxX		



Accessories Toolbar
Is used to open the Function Block library.

Standard Toolbar

Symbol	Function	Symbol	Function
	*New:* New file		*Copy:* Copy blocks or connections
	*Open:* Open existing file		*Paste:* Paste blocks or connections
	*Save:* Save active file		*Print:* Print file
	*Frame:* Show blocks		*Read:* Read program from EEPROM
	*Link:* Connection of blocks		*Start:* Start simulation
	*Cut:* Cut blocks or connections		

Status Bar
To display status and information messages on the status bar at the bottom of the window.

Fig. 3.5

Zoom
Please select zooming of window between 50 to 150%.

3.1.5 Menu Options

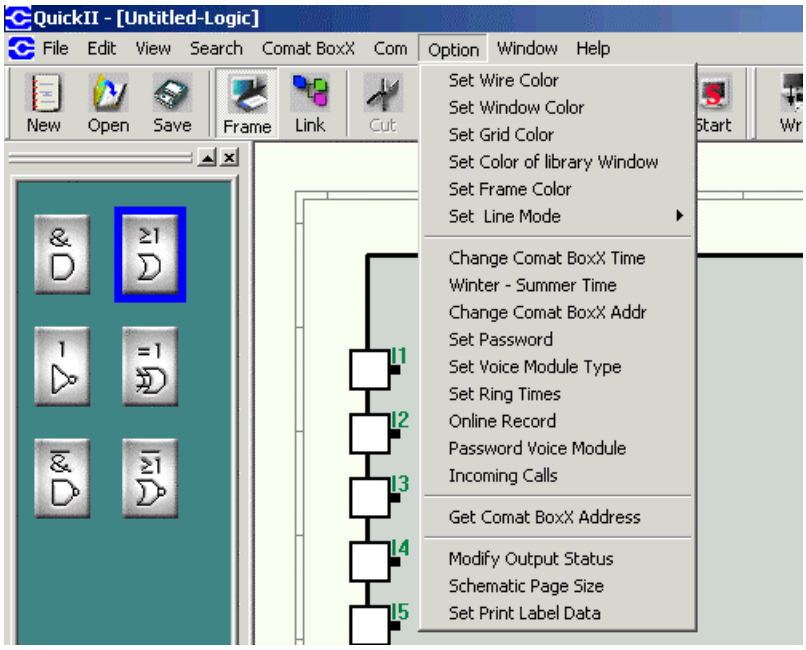
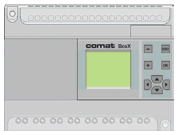


Fig. 3.6 Options Instruction Menu

Instruction name:	**Function:**
Set Wire Color	Select color of link
Set Window Color	Select color of active schematic window
Set Grid Color	Selection for grid color
Set Color of library Window	Select color of Function Block library window
Set Frame Color	Select color of window frame
Set Line Mode	Select automatic or manual connection of link line
Change Comat BoxX Time	Modify current time of BoxX
Winter – Summer Time	Set automatic switch over of summer/winter time
Change Comat BoxX Addr	Setup address of Comat BoxX
Set Password	Change password
Set Voice Module Type	Select MUL recording time
Set Ring Times	Setting of ring repetition before answering
Online Record	Copy WAV files
Password Voice Module	Password for MUL outgoing calls
Incoming Calls	Ignore incoming calls
Get Comat BoxX Address	Reading of Comat BoxX address
Modify Output Status	Set the outputs to normal open or normal closed (NO or NC)



Schematic Page Size	Sets Schematic Window size
Set Print Label Data	Schematic labelling

Note:

All functions of the Voice Module AF-MUL are explained in the „*Voice Module AF-MUL User Manual*".

3.1.6 Menu Help

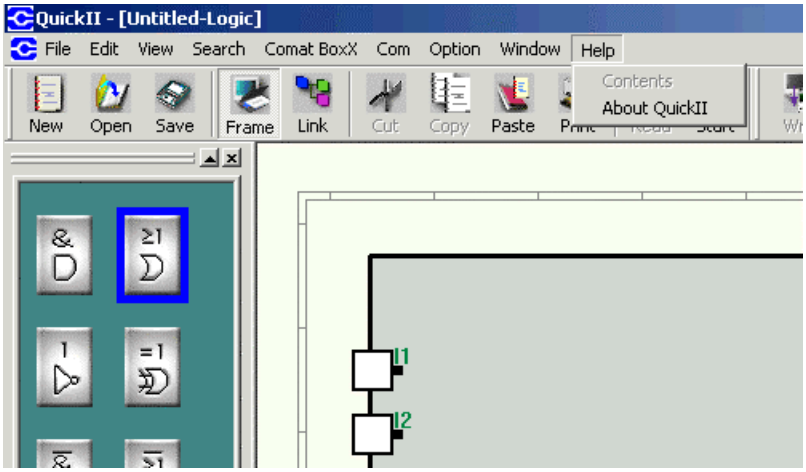


Fig. 3.7 Help Instruction Menu

Instruction name:	**Function:**
Contents	Contents and details of help
About Quick II	Display of Quick II software version number

3.1.7 Menu Edit

The menu Edit contents all functions to edit the function blocks.

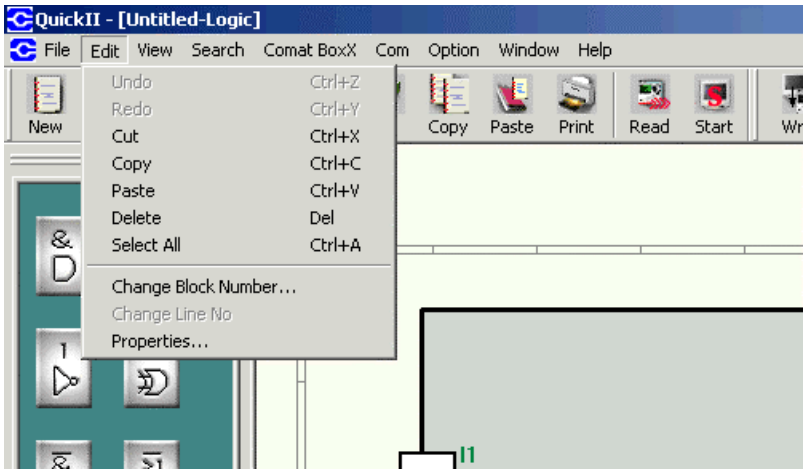


Fig. 3.8 Edit Instruction Menu

Instruction name:	**Function:**
Undo	Not available
Redo	Not available
Cut	Cut the contents in the area highlighted with the cursor
Copy	Copy the contents highlighted with the cursor
Paste	Paste the contents cut or copied
Delete	Delete Function Blocks or links
Select all	Select all the contents in the current window
Change Block Number...	Edit number of Function Block
Change Line No	Edit line number
Properties...	Display and Edit properties of Function Blocks and Insert comments

3.1.8 Menu Search

This function allows searching of Function Blocks either by comments previously added to the particular Function Block or by Function Block number.

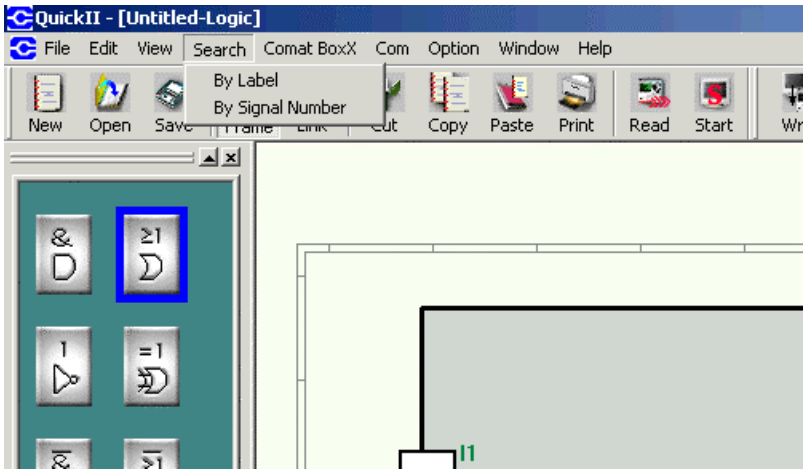


Fig. 3.9 Search Instruction Menu

Instruction name:	Function:
By Label	Find according to the comments for the blocks
By Signal Number	Find according to the block number

3.1.9 Menu Comat BoxX operation

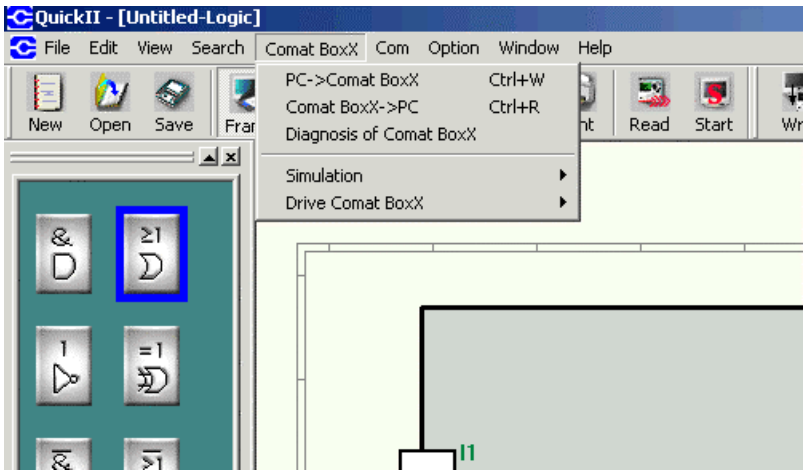


Fig. 3.10 Comat BoxX Menu

Instruction name:	Function:
PC -> Comat BoxX	Write the program edited on the computer to Comat BoxX
Comat BoxX -> PC	Read the program existing in Comat BoxX to the computer
Diagnosis of Comat BoxX	Shows Comat BoxX diagnosis parameter
Simulation	Start/Stop program simulation on the PC
Drive Comat BoxX	Start/Stop Comat BoxX

3.1.10 Menu Window

This instruction is mainly used for arranging of multiple opened windows. When more than two windows are opened, they can be arranged with this instruction.

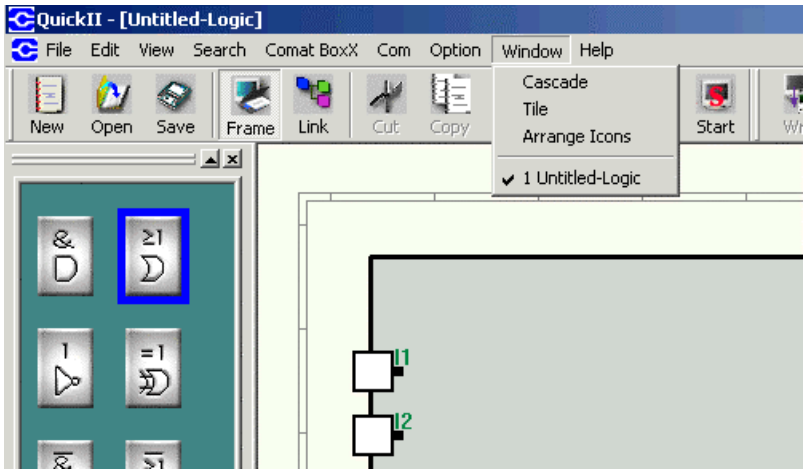
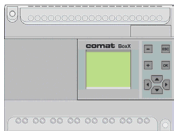


Fig. 3.11 Windows Instruction Menu

Instruction name:	**Function:**
Cascade	Windows arranged to overlap
Tile	Split windows
Arrange Icons	Arrange icons at the window bottom
1 Untitled-Logic	Opened active window



Chapter IV

Quick II

This chapter introduces you to how to use Quick II to edit the Logical Function Diagram Program and draw the Field Environment Control Diagram, how to use it to simulate operation of the edited program and how to make the computer communicate with Comat BoxX so as to complete the writing of the program to Comat BoxX.

4.1 Editing Window

4.1.1 Open a new file

To open a new file, click the <*New*> option under the Function List file or the icon in the Tool Bar with left mouse button, as shown in Fig. 4.1.

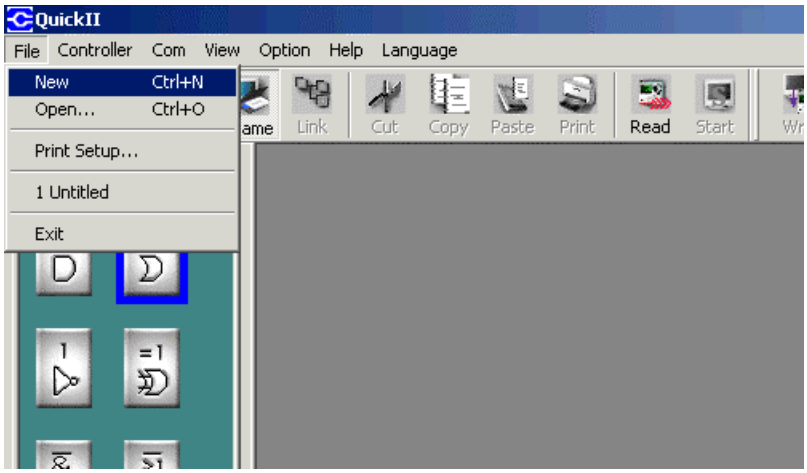


Fig. 4.1
Open a new file

1. Controller type options are provided in the left box and you can select your desired Comat BoxX type by clicking it with the left mouse button:
   6 inputs and 4 outputs (AF-10....)
   12 inputs and 8 outputs (AF-20....)
   On this moment let the simulation type on <*Standard*>.

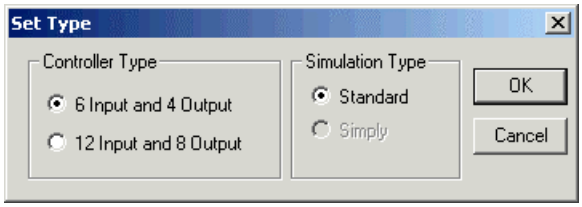


Fig. 4.2
Options Box for
Contoller Type

If you want to name your file before you start to program, click the <OK> button and save it. Otherwise click the <Cancel> button.

A new file appears (Fig. 4.3).
On the left side are the inputs, on the right side the outputs.

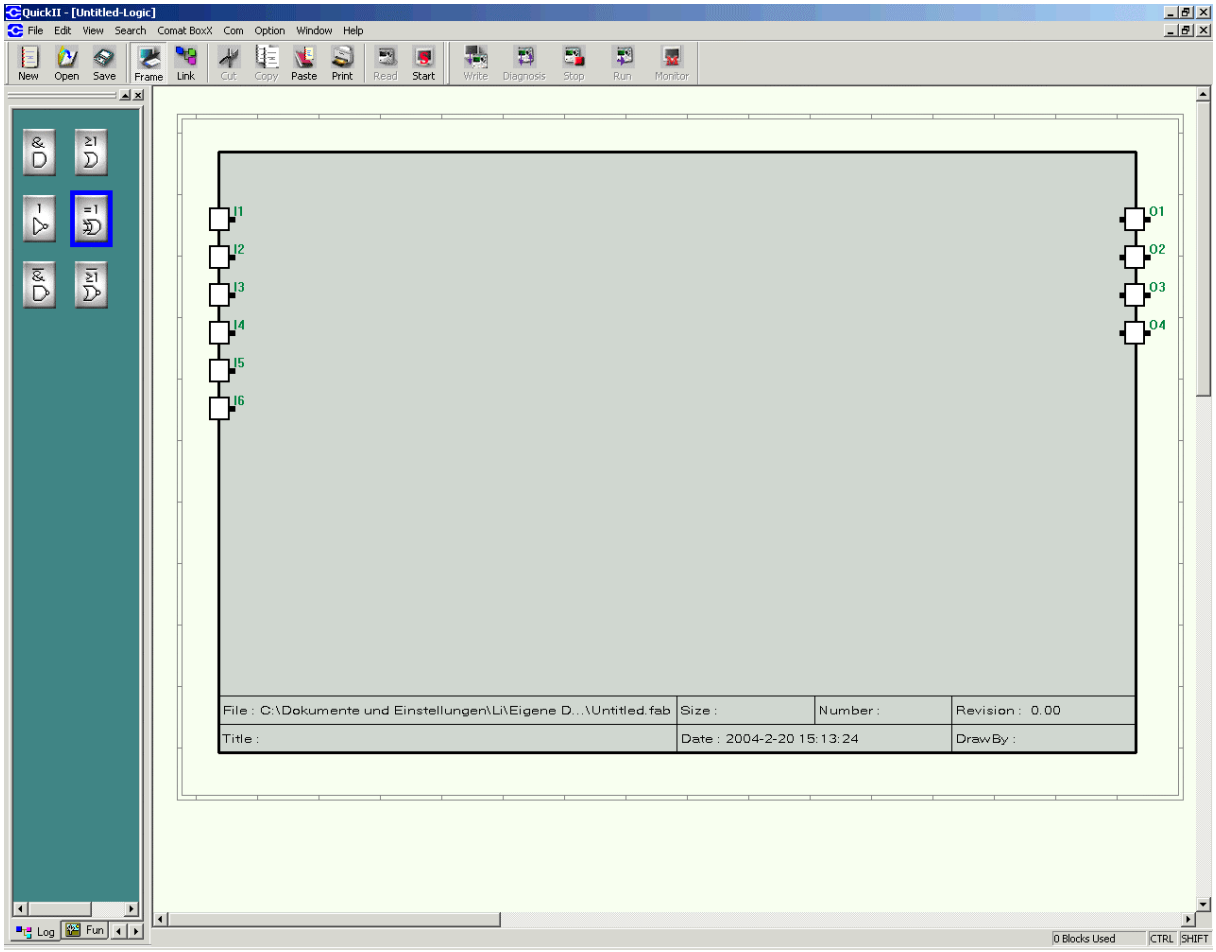


Fig. 4.3 Edit Window for new file

BoxX / Type	**Inputs**		**Outputs**
AF-10....	I1 – I6		Q1 – Q4
AF-20....	I1 – I12		Q1 – Q8

4.1.2 Open an existing file

To open a file, click the <*Open*> option under the Function List or the respective icon on the Toolbar with the left mouse button.

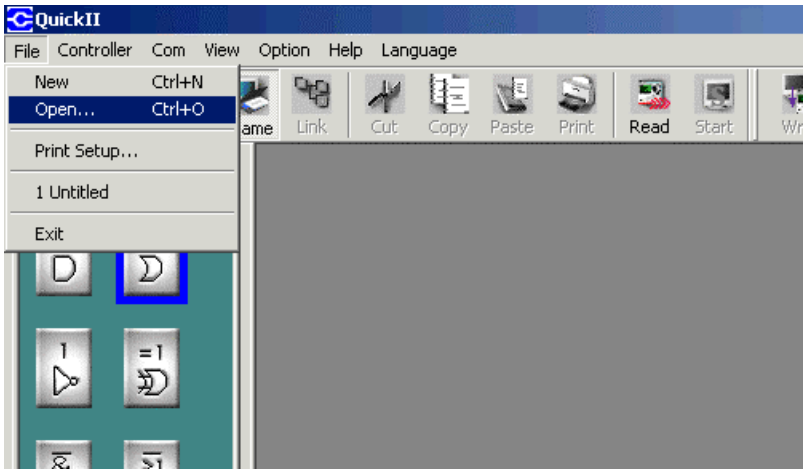


Fig. 4.4
Open an existing file

Click to open the dialogue box.

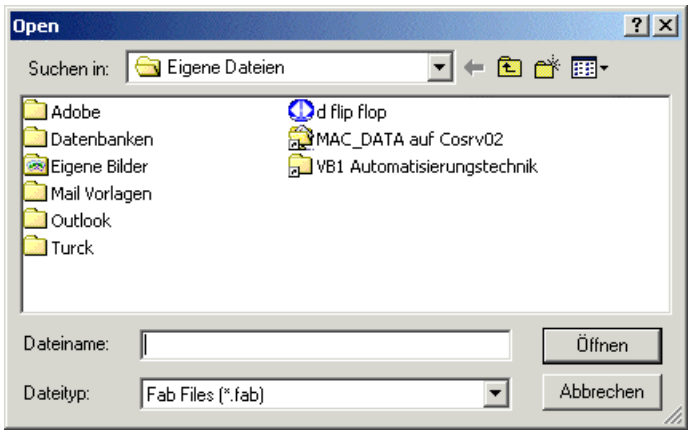


Fig. 4.5
Open an existing file
Field Dialogue Box

4.1.3 Size of schematic window

To set the size of the active schematic window, select <*Schematic Page Size*> in the Option menu.

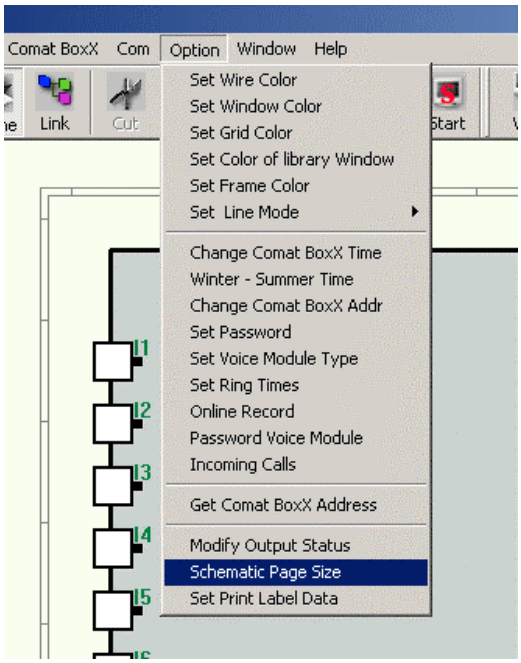


Fig. 4.6
Schematic Page Size

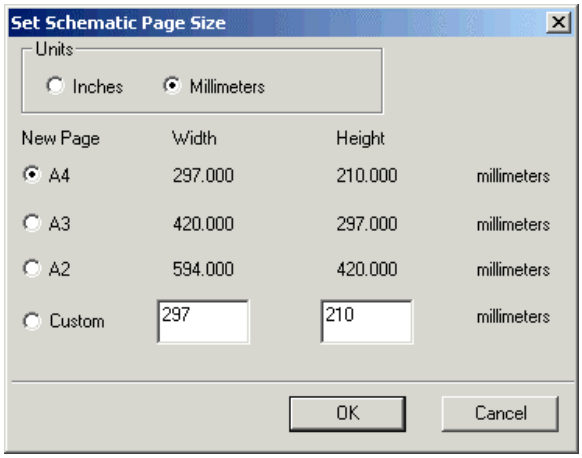
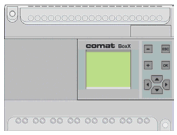


Fig. 4.7
Select file

You may use this window to set the window size according your specific requirement.
The right and bottom edge limits are indepently set with the custom function.



4.1.4 Inputs and Outputs

On the left side of the schematic window are the Input squares I1 – I6 resp. I1 – I12.
The output terminals Q1 – Q4 resp. Q1 – Q8 are located on the right hand side of the schematic window.

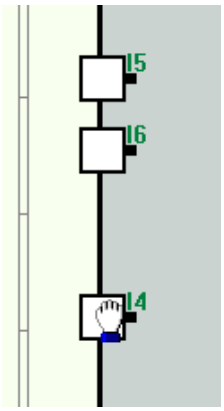


Fig. 4.8
Drag Inputs and Outputs

The positions of the In- and Output terminals can be shifted along the border lines.
Click the respective square with the left mouse button and drag the square along the line with the mouse to the desired position.

4.1.5 Save a file

Click <*Save*> or <*Save as*> under the Function List with the left mouse button or click the respective Icon on the Toolbar.
A dialogue box appears, in which you can set the path and file name for save.

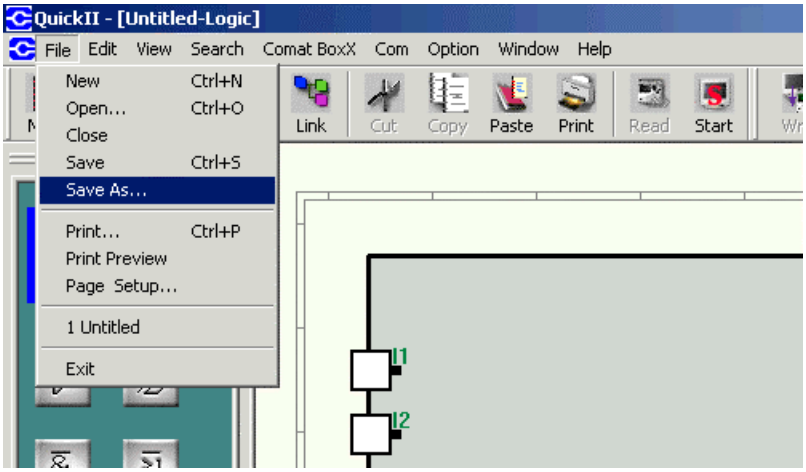


Fig. 4.9
Save file

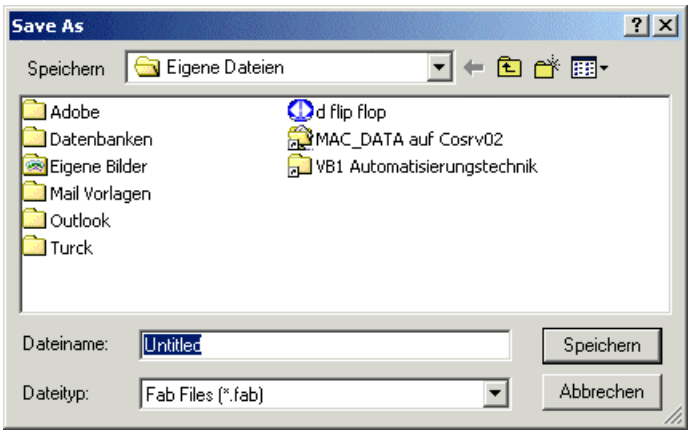


Fig. 4.10
Dialogue Box for filename

4.1.6 Zoom

The zooming function allows enlarging or reducing of the schematic window.
The following functions are available.

150%

100% (standard setting)

75%

50%

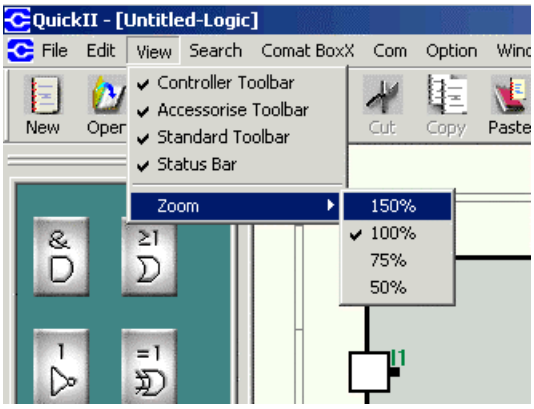


Fig. 4.11
Zoom

4.2 Edit Function Diagram Program

4.2.1 Place Blocks

The desired block can be directly selected from the Block Library on the left of the Edit window and dropped in the Edit in box with the mouse.

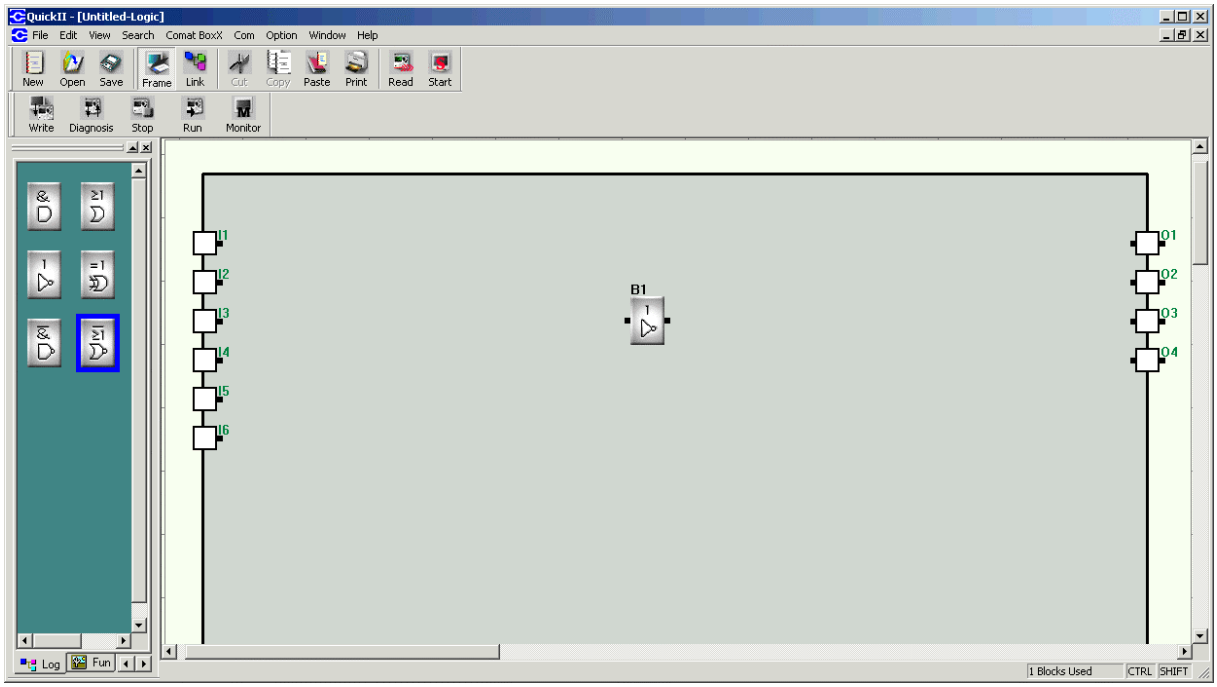
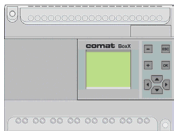


Fig. 4.12 Placing Function Blocks

Operating procedure:

1. Select the corresponding block group. To select basic Blocks, click the <*Log*> button with the left mouse button; to select the Special Block, click <*Fun*> button with the left mouse button.
2. Select your desired block by clicking it with the mouse.
3. Move the cursor to the proper position in the Function Diagram Editing window and click the left mouse button, thus the block is placed.
4. Place all required blocks by repeating the above mentioned steps.



4.2.2 Edit Block Properties

Different blocks have different properties, which may be set according to the control requirements.

Select a function block in the Function Diagram Editing window and click the right mouse button. An Edit Function List appears, as shown in Fig. 4.13. Then select Properties in the function list. Or you may double click the said function block directly with the left mouse button.

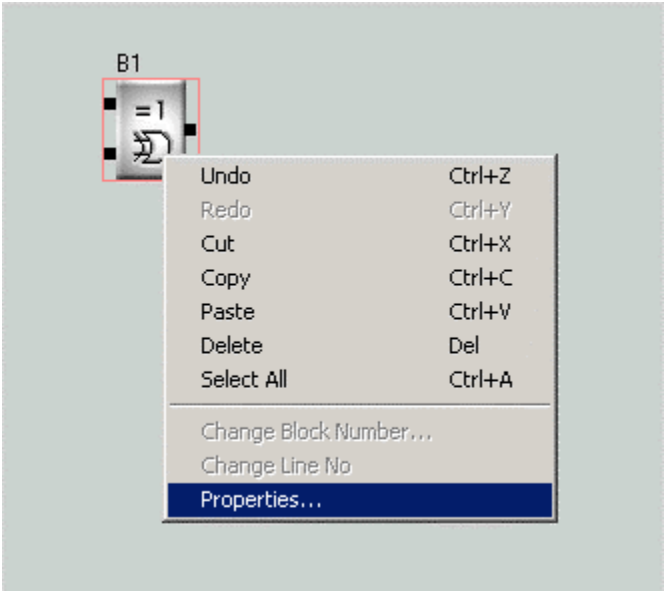


Fig. 4.13
Operation Menu of Blocks

A Setup Properties dialogue box appears, as shown in Fig. 4.14.
Set the attributes according to your requirements.

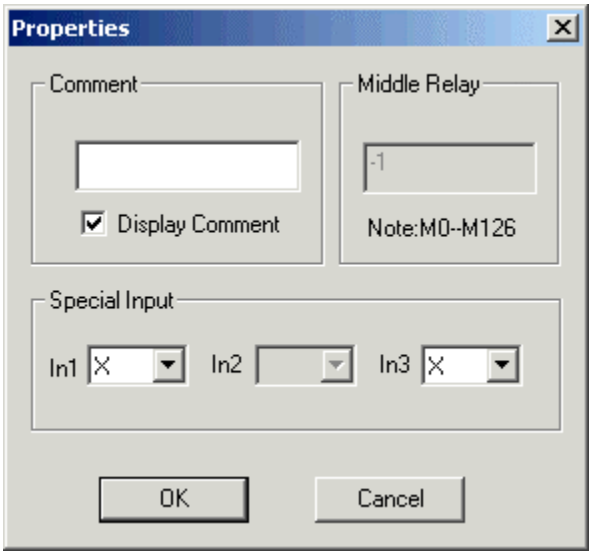


Fig 4.14
Dialogue Box for
Setting Block Attributes

Set the properties of all blocks and click the <OK> button to complete the setup. Remember that each function block, depending on the properties, can have a different dialogue box.

The properties of the different function blocks are nearer described in chapter 5.

4.2.3 Link

After the blocks required for plotting the whole Function Diagram are placed and their properties are setup, it is necessary to establish links according to the logical control relations so as to make a complete function diagram. This software provides two link modes, direct link and indirect link.

Click the button <*Link*> with the mouse and the cursor changes to the shape of a pen, i.e. into the link status.

Now you have two possibilities to go on:

1. **Direct link**
   As the cursor is moved to the I/O ports of the blocks, its shape will change into a reticule (+), indicating that an end point can be determined through clicking of the left mouse button. Now click the output ports (or input ports) of a block requiring link with the left mouse button, move to the input ports (or output ports) of the next block and click, thus the link is automatically established by the system.
   When the shape of the mouse changes into a reticule (+), click the left button on it.
   This method is suitable for the case in which the program is simple and the number of blocks is small.

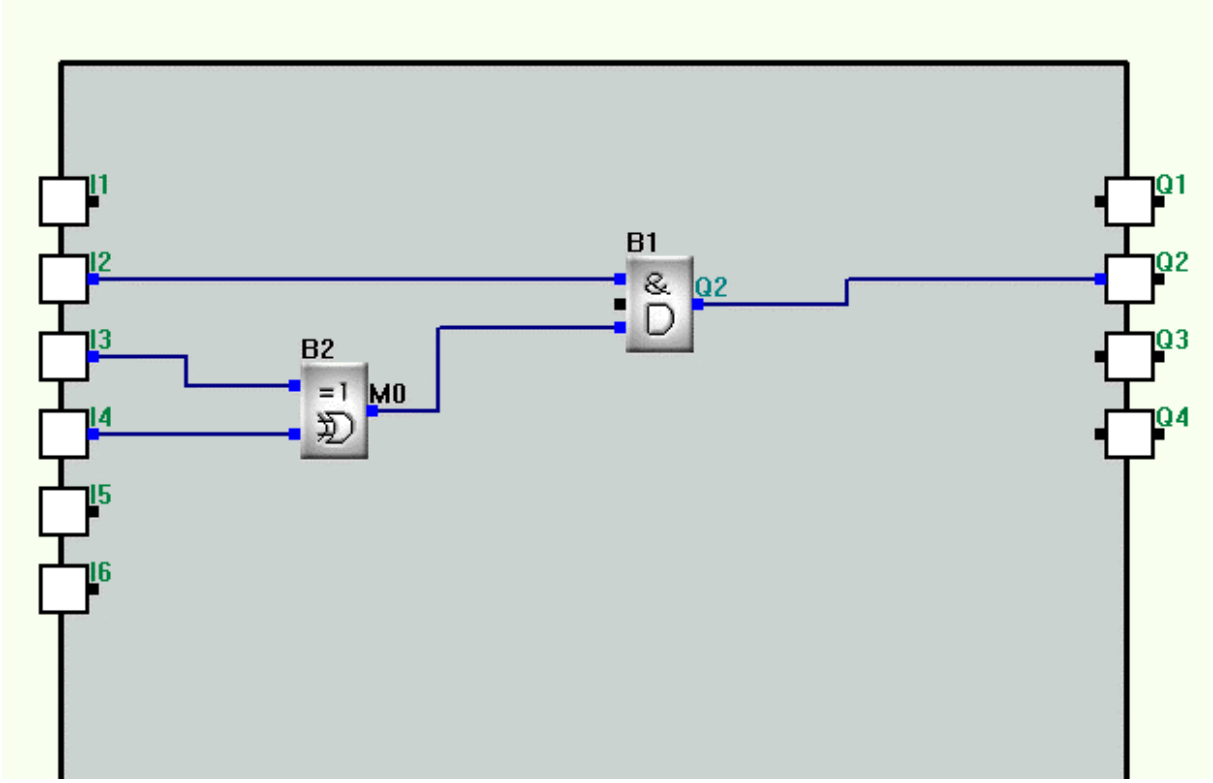
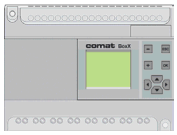


Fig. 4.15 Direct Link



2. **Indirect link**
   Move the cursor to the start point of the connect line (it means that any input or output of a block), its shape will change into a reticule (+), click the left button of the mouse, and move the cursor to another point in the schematic window and click the left button again. At the ends of the lines, there will appear mark numbers, such as L5, L6 and so on, as shown in Fig. 4.16.

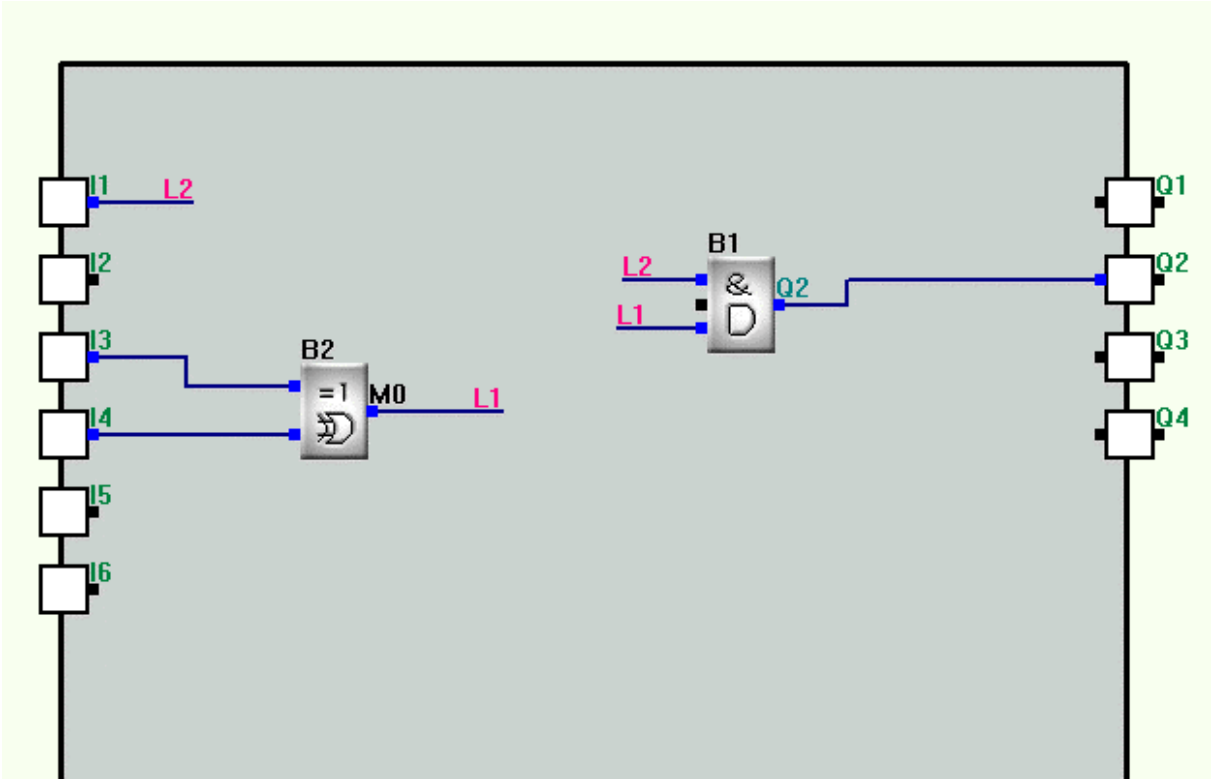


Fig. 4.16 Indirect Link

Line ends with the same line number form an indirect link.
The line numbers therefore have to be correct and may be modified according to the requested connections.

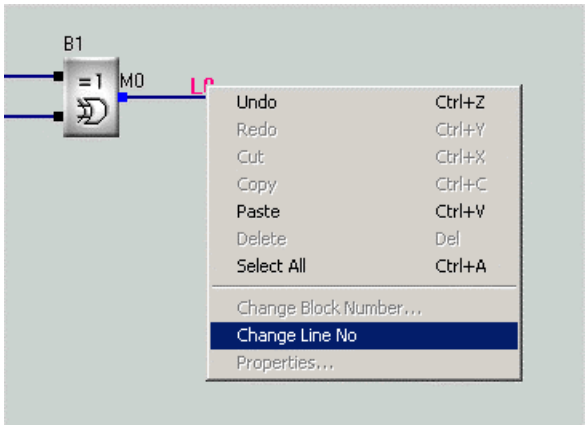


Fig. 4.17
Change Line No

To change the line number, click the respective line end with the right mouse button and select <*Change Line No*> in the dialogue box.

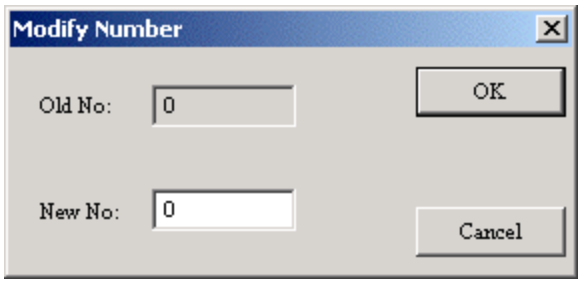


Fig. 4.18
Modify number

4.2.4 Copy Function Blocks and Links

You may copy Function Blocks including their links and insert the entire circuit on an other position in the schematic window.

Procedure:

1. Click with the left mouse button the top left edge of the circuit you like to copy and pull the window frame over the entire circuit.
2. Release the mouse button and point the cursor at position in the schematic window.
3. Click paste to insert the entire window.

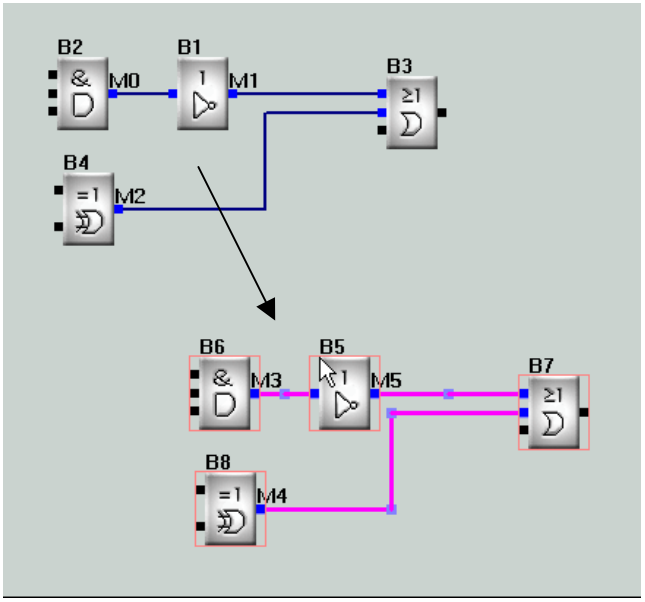
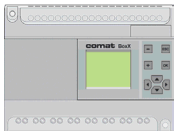


Fig. 4.19
Copy of Function Block

4.2.5 Move Block or Link

In case that there are a lot of links and blocks in your Function Diagram the diagram may be difficult to read due to so many crisscrossing lines, you can move some of the links or blocks to make the diagram tidy and easier to read.
Operating method:

1. Click the link or block to be moved with the mouse to turn it red.
2. Put the cursor on the link or block to be moved and drag it to the required position;
3. Click the left mouse button to complete the move.
4. Move all of the links and blocks that need to be moved with the same method to make the whole function diagram tidy



4.2.6 Delete Block or Link

When you want to delete unnecessary blocks or wrong links, the operation steps are as follows:

1. Select the link or block to be deleted with the mouse.
2. Press <*Delete*> key on the keyboard, or click the right mouse button and select the <*Delete*> option, thus the link or block is deleted.

4.3 Print

Print file

Operating methods for files printing:
Click the <*Print*> option under the File Menu or the Print icon with the left mouse button.

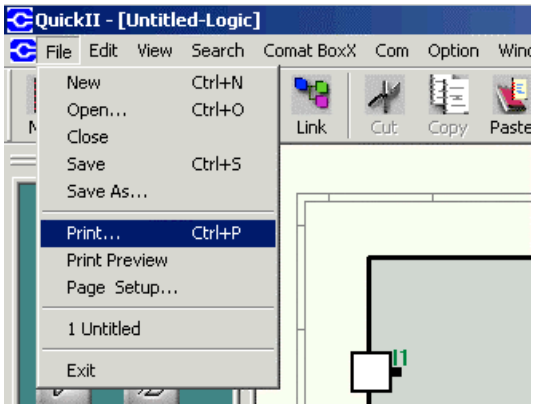


Fig. 4.20
Print file

The following window will appear.

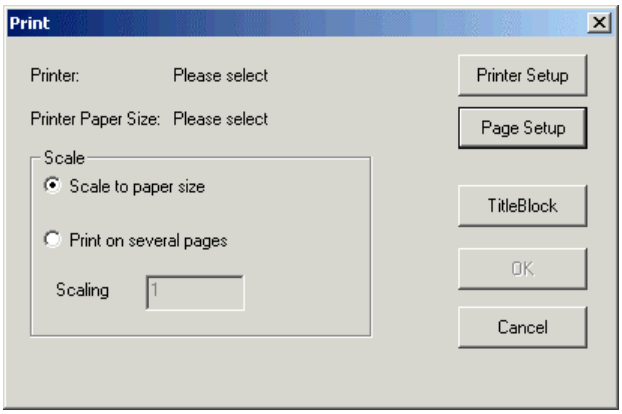
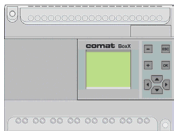


Fig. 4.21
Print settings

You can choose between two different printing methods:

- **Scaling according to page size**
  This function allows scaling of the print out according to the selected paper size.
- **Printing on several pages**
  In this printing method you are able to choose any scaling size.
  Scaling = 1: The dimension of printed the Function Blocks is more or less equal to the size in the schematic window.
  Scaling < 1: Everything is printed in reduced size.
  Scaling > 1: Everything is printed in enlarger size.



Please set all other necessary parameters before printing.
This are: - Printer selection
- Page size

The following window appears after all printing options are set.

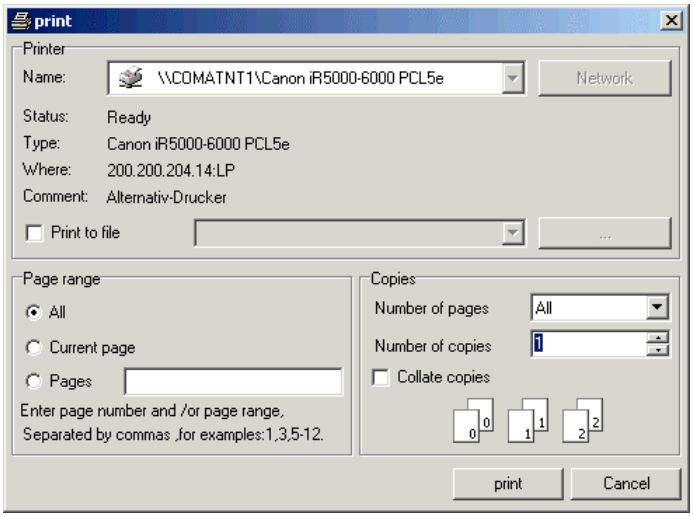


Fig. 4.22
Printing

Click <*Print*> to start printing.

Note:
You will receive best printing results with paper size **A4 landscape**.

4.4 Simulation operation

Quick II has an Simulation function. When programming is completed, the Simulation function may be activated for checking if the program meets your control requirements.
The operating method is as follows:

To activate Simulation, Click the <*Simulation*> option under <*Instruction Comat BoxX*> <*Operation*> Menu and then Start with the left mouse button, as shown in Fig. 4.23, or directly click the icon in the Tool Bar. Now you can see the result of program running through the input and output status in the frame.

Please observe your programs running carefully.

Click the <*Stop*>button again to terminate the Simulation function.

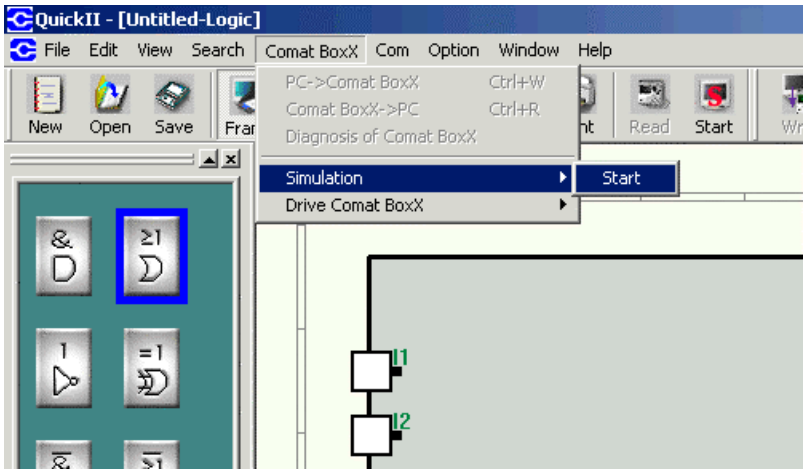
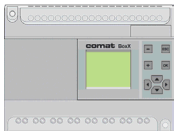


Fig. 4.23
Simulation

In the above Simulation mode, you can see the ON or OFF status of all inputs and outputs, as well as the input status and the current status of timing and counting of all blocks. Click the input square to set input signals and watch the square to turn red as it is activated. You can easily judge through this Simulation function if the edited program meets the control requirements.



4.5 BoxX settings (Option menu)

4.5.1 Modify BoxX date and time

The correct date and time is set in the following window.

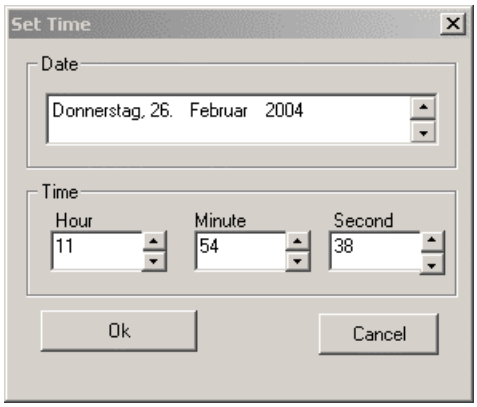


Fig. 4.24
Setting date and time

Click OK to confirm your setting.

Note:

Please note that this function is only active after the Comat BoxX and the PC are linked together via the com port and after completion of communication set up. (Refer to chapter 4.6).

4.5.2 Winter- / Summertime

The following window allows activation of automatic summer- / wintertime adjustment.
The respective dates and time are pre-programmed in the BoxX.
Please select the first year in which the automatic time adjust is required and then select the last active year of the automatic time adjustment. (Max. 30 years)

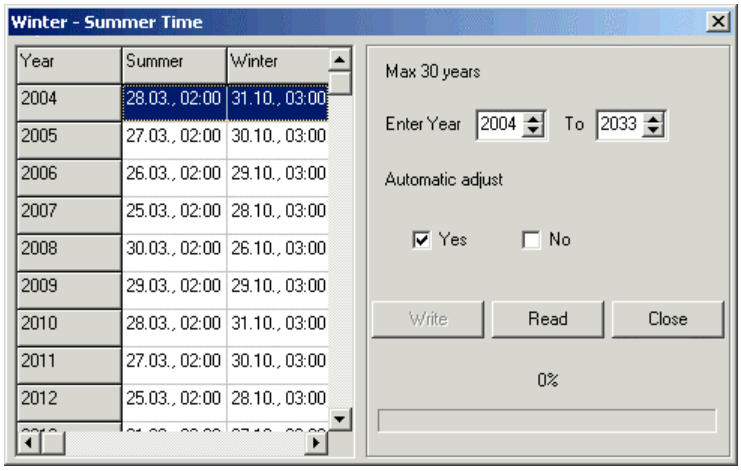


Fig. 4.25
Winter- / Summertime

Note:

The time span for the automatic time adjust is max. 30 years.

Please Note:

This function is only active after the communication between the BoxX and the PC is set up.

4.5.3 Change BoxX address

The following window shows how to modify the BoxX address.

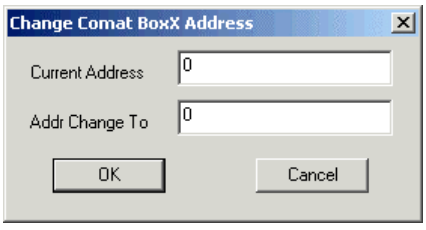
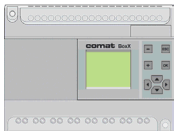


Fig. 4.26
Modify address

Note:

Please note that this function is only active after the BoxX and the PC are linked together via the com port and after completion of communication set up. (Refer to chapter 4.6).



4.5.4 Change BoxX Password

Password modifications are made in the following window.

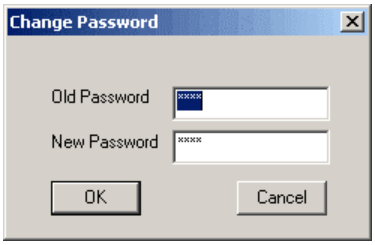


Fig. 4.27
Modify password

Enter old password first and then enter the new password.
Save with OK.

Note:

The password consists of a 4 digit number.
For password 1 = 0001.
For password 23 = 0023.

Please note that the password for the Voice Module AF-MUL is identical to the password of the controller.

Note:

Please note that this function is only active after the Comat BoxX and the PC are linked together via the com port and after completion of communication set up. (Refer to chapter 4.6).

4.6 Read and write the program

4.6.1 Write program into BoxX

When the program is edited and has been proved through the simulation test to meet your control requirements, the Com. port of the computer can be connected with Comat BoxX directly through the programming interface or through a modem and the interface. In this way, remote and local communication between the computer and Comat BoxX will be realised so that programs can be uploaded to and downloaded from Comat BoxX.

Operating method is as follows:

Click <*Configuration*> option under the Communication Instructions Menu with the left mouse button, as shown in Fig. 4.24.

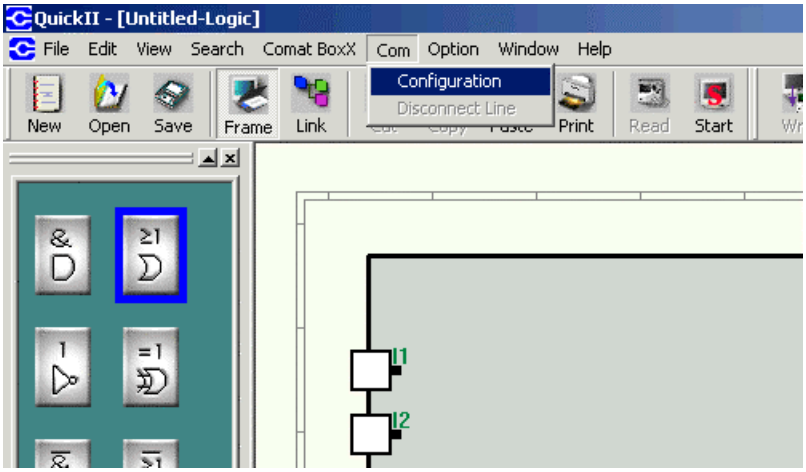


Fig. 4.28
Comat BoxX
Communication
Connection Window

The following dialogue box appears:

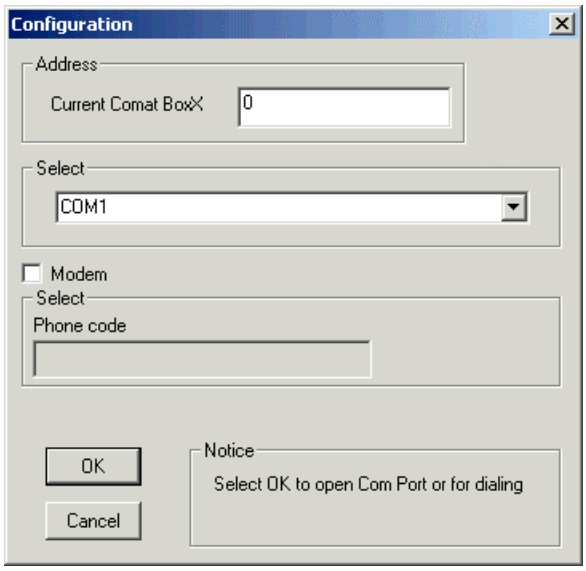


Fig. 4.29
Communication
Configuration

Enter the Comat BoxX adress.

Note:

The factory preset adress is 0001.

a) Select COM port

b) For download, select modem mode by clicking <*Modem*> with the mouse and select the telephone number for dial-up.

c) For local writing, select <*Serial Port*> and then the Serial Port selection by clicking the mouse to prepare the com port.

d) Click the <*OK*> button to complete the setup.

e) If the communication link is still not established, a Prompt window will pop up for you to select another modem or communication port.

Click <PC -> Comat BoxX> option under the Comat BoxX Operation Menu with the mouse, as shown in Fig. 4.26.
The program is now transfered to the BoxX.

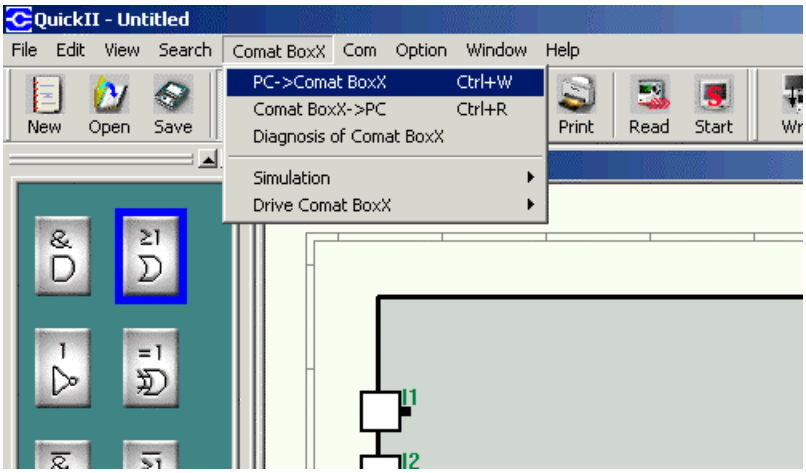


Fig. 4.30
Transfer the program

Fig. 4.31
Password Confirm

Note:

1) The communication setup must be completed before communication can be established between the computer and Comat BoxX so as to complete the upload/download of the program.

2) During download from computer to Comat BoxX, if <*Run After Write*> is selected, Comat BoxX will run the program, after download, at once. If the option of running after writing is not selected, or when the power supply to hardware is lost and then reconnected, click <*Run*> under <*Comat BoxX*>, and Comat BoxX will start the program execution.

4.6.2 Read Program from Comat BoxX

To test or modify a program saved in the BoxX, the program can be read into a empty schematic window from the BoxX to the PC. For that purpose select <*Comat BoxX*> and then the function <*Comat BoxX -> PC*>.

Note:

Make sure that the communication link between the BoxX and the PC is established before. (Refer to Fig. 4.25).

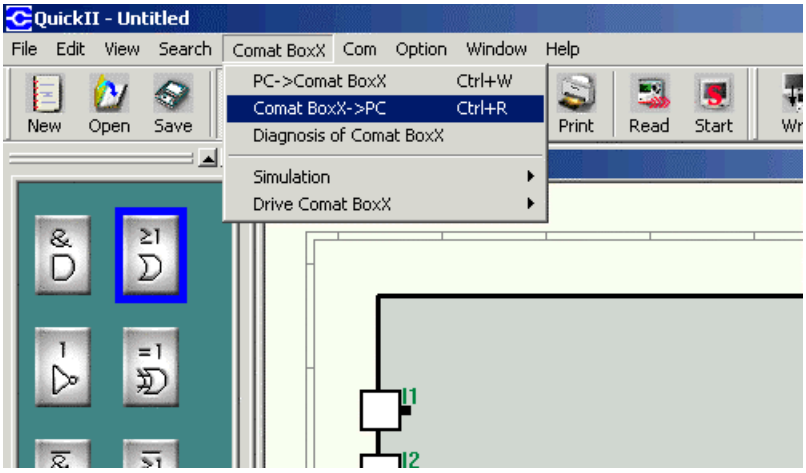
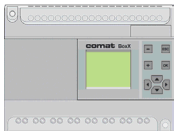


Fig. 4.32
Read Program

4.7 Monitoring

Quick II allows not only to simulate a program but also to monitor the running program on the Comat BoxX.
Click the <*Monitoring*> icon to supervise the program.



Chapter V

General description of Function Blocks

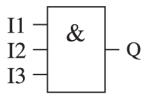
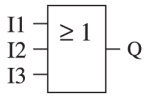
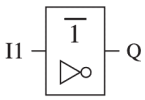
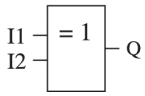
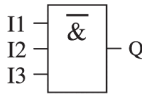
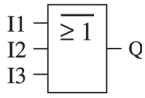
Comat BoxX adopts the function block programming method. 20 function blocks are configured in total, and each block can achieve a specific control function independently, e.g. time-delay ON, time-delay OFF, setting switch time, counter function, etc.
As several blocks are linked up in a specific way, relatively complicated control functions can be realised. This method is simpler than conventional PLC programming.

The following types of Comat BoxX Function Blocks are available for options:
Inputs I1 – I6 resp. I1 – I12
Outputs Q1 – Q4 resp. Q1 – Q8
Intermediate Relay M00 – M126
ON status HI (High = „1“)
OFF status LO (Low = „0“)
No connection X
Phone keys P0 – P9 (Tone signal)

5.1 General function block (GF)

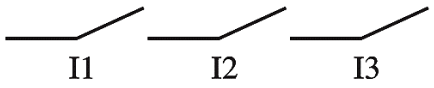
There are 6 general function blocks in total as listed in the following table:

Overview of general Function Blocks

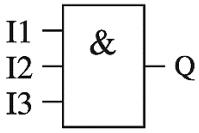
Line diagram	Comat BoxX Function block	Function
Series connection of NO contacts		AND
Parallel connection of NO contacts		OR
Phase inverter		NOT
Dual connection contacts (two CO contacts in serial connection)		XOR
Parallel connection of NC contacts		NAND
Serial connection of NC contacts		NOR

5.1.1 AND

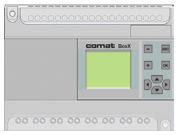
Serial connection of certain number of NO contacts is shown in the line diagram as follows:



The symbol of AND is shown as function block below:



This function block is called AND, because only when all of I1, I2 and I3 are all status „1“, the status of output Q will be „1“ (i.e. the output is closed).



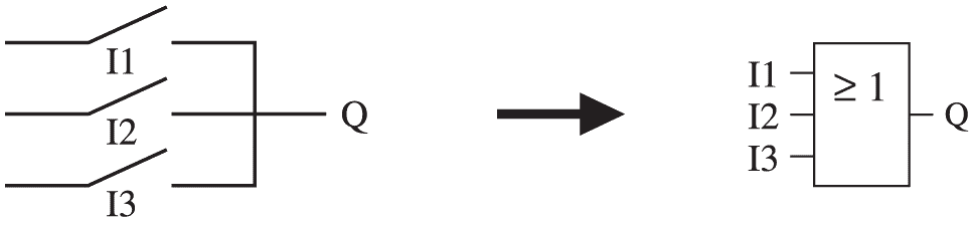
Logical frame of AND:

I1	I2	I3	Q
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

5.1.2 OR

Parallel connection of a certain number of NO contacts, is shown in the electrical line diagram as follows:

The symbol of OR is shown as function block below:

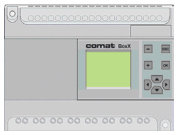


This function block is called OR, because the status for at least one of inputs I1 or I2 or I3 is „1“ (i.e. close), then output Q is „1“.

Logical frame of OR:

I1	I2	I3	Q
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1

1	0	1	1
1	1	0	1
1	1	1	1



5.1.3 NOT

The phase inverter is indicated in the line diagram as follows:

The symbol of NOT is shown as function block below:

This function block is called NOT. The output Q is always inverse from input I1.
I1 = „1“ → Q = „0“; I1 = „0“ → Q = „1“

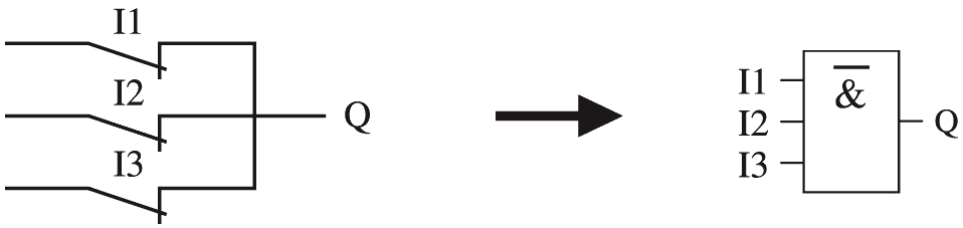
Logical frame of NOT:

I1	Q
0	1
1	0

5.1.4 NAND

Parallel connection of a certain number of NC contacts, which is shown in the electrical line diagram as follows:

The symbol of NAND is shown as function block below:



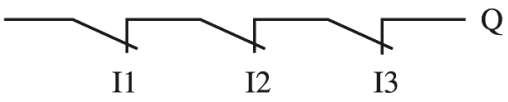
This function block is called NAND, because only when all the inputs I1, I2 and I3 are all in status „1“ (i.e. close), its output Q is in status „0“.

Logical frame of NAND:

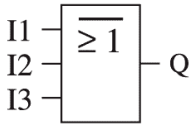
I1	I2	I3	Q
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

5.1.5 NOR

Parallel connection of a certain number of NC contacts, which is shown in the line diagram as follows:



The symbol of NOR is shown as function block below:



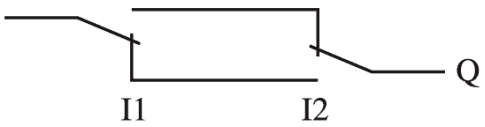
Only when all the input of NOR function blocks are at a low potential (status 0), the output will be closed (status 1). If any input is at high potential (status 1), the output will be open (status 0).

Logical frame of NOR:

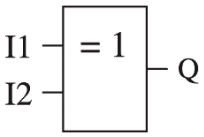
I1	I2	I3	Q
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

5.1.6 XOR

As shown in the line diagram, the two commutator contacts for XOR are connected in serial as follows:



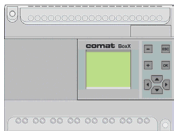
The symbol of XOR is shown as function block below:



This function block is called XOR. The output Q is „1“ if either I1 = “1” or I2 = “1”.

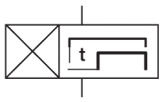
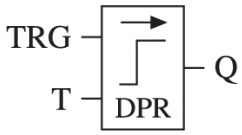
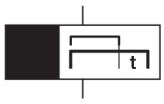
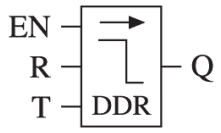
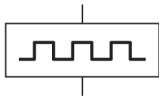
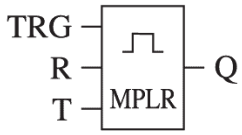
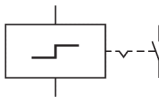
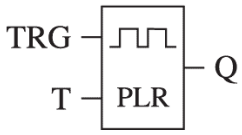
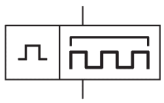
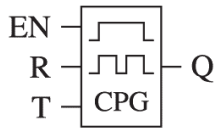
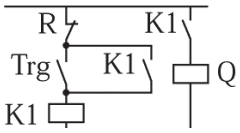
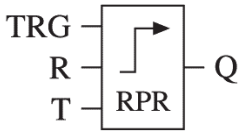
Logical frame of XOR:

I1	I2	Q
0	0	0
0	1	1
1	0	1
1	1	0

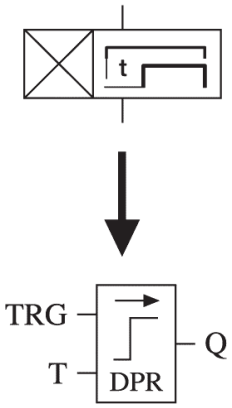


5.2 Time-Function blocks

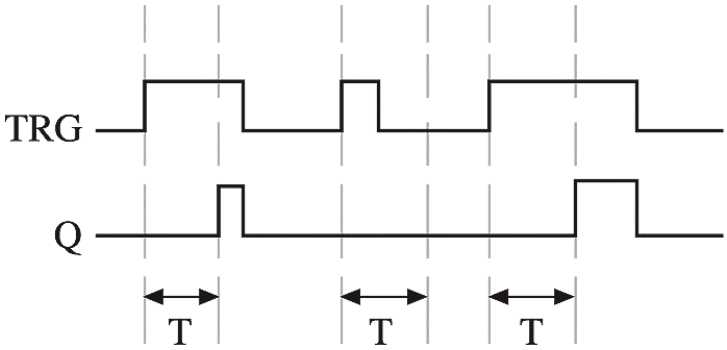
Overview of Time-Function Blocks

Function	Representation	Function block
DPR (ON time delay)		
DDR (OFF time delay)		
MPLR (Single pulse time relay)		
PLR (Pulse relay)		
CPG (Clock pulse generator)		
RPR (Hold ON time delay relay)		

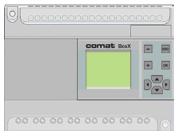
5.2.1 DPR (ON time delay)

Comat BoxX Symbol	Signal	Description
	Input TRG	The time delay T is started with TRG input. Q remains „1“ as long as TRG is „1“. TRG = „0“ - „Q“ = „0“.
	Parameter T	T is the on delay set time.
	Output Q	Q remains „1“ as long as TRG remains „1“.

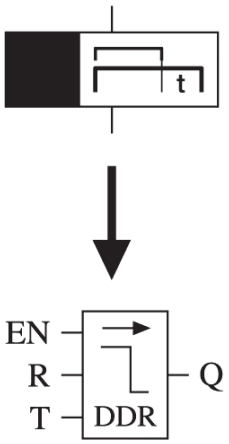
Time Sequence Frame:



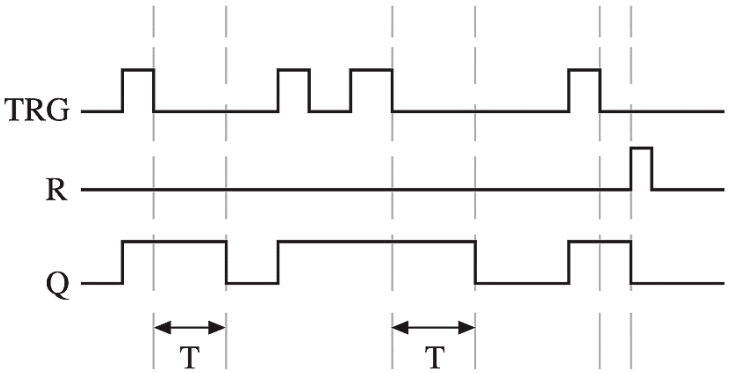
Description:
When the status of TRG input changes from „0“ to „1“, the time-delay timer starts elapsing. If input TRG holds status „1“ for a sufficiently long time, the output will be changed to „1“ after the time T has elapsed. There is a time delay between TRG „1“ and the output „Q“ turning ON („1“).
When the input TRG is status „0“, the output will reset to status „0“.
This function is applicable to remove vibrations of switches, delay start-up of motor, delay turning-on of lights, etc.
The assignment range for T is 0.01 – 99.99, and the time units can be set respectively to hour (H), minute (M) and second (S). The time accuracy is 5ms.



5.2.2 DDR (Off time delay)

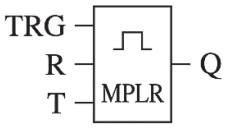
Comat BoxX Symbol	Signal	Description
	Input EN (TRG)	With TRG status „1“, Q becomes „1“ immediately. Descending edge of TRG starts the time delay T.
	Input R	Input R (Reset) sets Q to „0“ immediately also if time T has not elapsed. R has priority over TRG.
	Parameter T	T is the off-delay set time.
	Output Q	With TRG „1“, output Q becomes „1“. Q remains in status „1“ for the time T after TRG is „0“.

Time Sequence Frame:

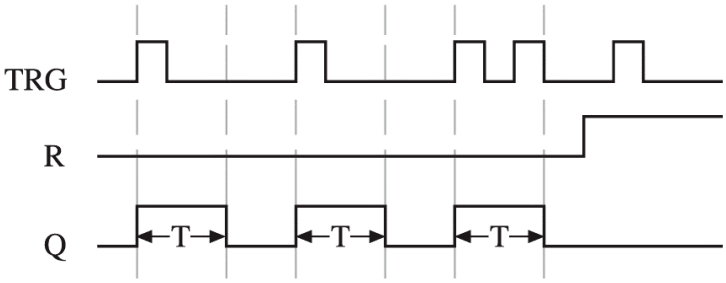


Description:
When Input TRG is status „1“, Output Q is changed at once to status „1“. When Input TRG changes from „1“ to „0“ (with descending edge), the time delay function is activated and Output Q remains status „1“. When the set time T has elapsed, Output Q becomes „0“ and the timer is reset.
If Input TRG changes from status „1“ to status „0“ again, the timer is activated again. Before the set time T is up, the timer and output can be reset via R (Reset) input.
This function is applicable to staircase lighting, control of barriers in car parks, control of a water throttling valve, etc.
The assignment range of T is 0.01 – 99.99, and the time units can be set respectively to hour (H), minute (M) and second (S). The time accuracy is 5ms.

5.2.3 MPLR (Single-pulse time relay)

Comat BoxX Symbol	Signal	Description
	Input TRG	The leading edge of Input TRG activates the single pulse relay. Output Q becomes „1“ for the time T.
	Input R	Reset the single-pulse time relay. When R is „1“, Output Q becomes „0“. Reset R = „1“ reset Output Q to „0“. R has priority over TRG.
	Parameter T	The assignment of the pulse duration setting is 0.01 – 99.99 (second, minute, hour). The time accuracy is 5ms.
	Output Q	Every time TRG changes from „0“ to „1“, Output is „1“ for the duration T.

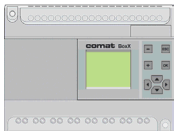
Time Sequence Frame:



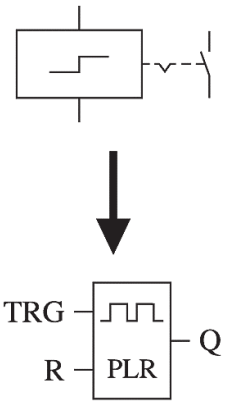
Note:

When Q is „1“, TRG pulse has no effect on Output Q.

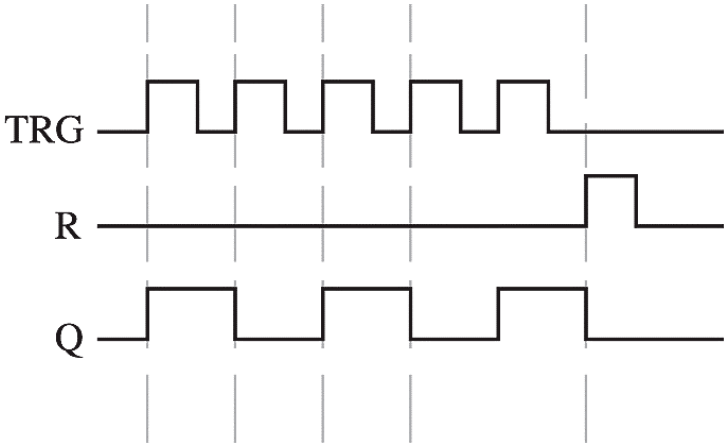
This function is applicable to increase pulse durations.



5.2.4 PLR (Pulse relay)

Comat BoxX Symbol	Signal	Description
	Input TRG	Each trigger input (TRG) steps output ON and OFF.
	Input R	Output Q is reset with R (Reset input). R has a priority over TRG.
	Output Q	Every time TRG changes from „0“ to „1“, the status of Q is changed. (i.e. from status „0“ to status „1“ or vice versa).

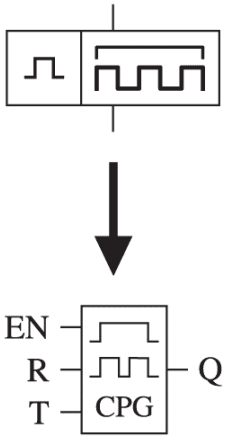
Time Sequence Frame:



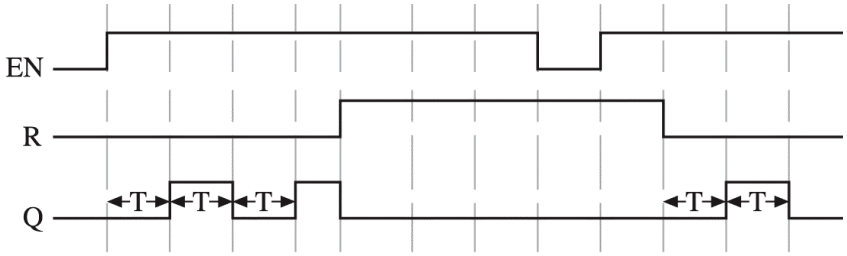
Description:
Every time the trigger input TRG changes from status „0“ to status „1“, the status of Output Q will switch from „0“ to „1“ or from „1“ to „0“.
Reset Q to status „0“ with Input R.
After power interruption the output Q is always „0“.

This function is applicable to lighting of corridors and staircases, and for the start/ stop of a motor with a single pushbutton, etc.

5.2.5 CPG (Clock on time generator)

Comat BoxX Symbol	Signal	Description
	Input TRG	Makes clock pulse generator ON and OFF with Input EN (Enable).
	Input R	Sets Output Q to „0“. Input R (Reset).
	Parameter T	T is the time length of output ON and OFF (pulse and pause).
	Output Q	Every time EN changes from „0“ to „1“, the timer is started.. When Time T has elapsed, the output Q becomes „1“. If EN is hold on „1“, timing cycle is started again. When time T is elapsed again, the output becomes again „0“. The cycle operation is repeated in this way until EN is „0“ which sets Output Q to „0“.

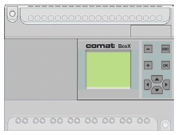
Time Sequence Frame:



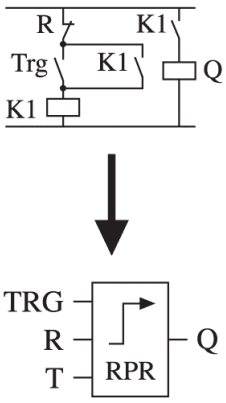
Note:

Use Parameter T to set ON/OFF time. The assignment range of T is 0.01 – 99.99. The time units can be set to hour (H), minute (M) and second (S). The time accuracy is 5ms.
Input EN (Enable) enables clock pulse generator to work. Output Q of clock pulse generator will flip-flop the status every time when the time T is elapsed. Cycle operation is continued in this way until Input EN (Enable) is „0“.
The clock pulse generator stops operation and Output Q becomes „0“.

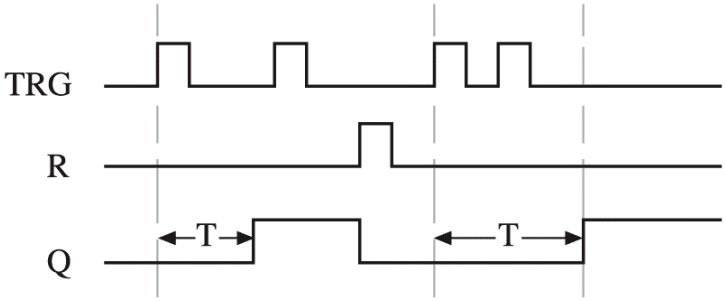
This function is applicable to generated automatic pulses and to switch ON/OFF automatically (time T dependent).



5.2.6 RPR (Hold on time delay relay)

Comat BoxX Symbol	Signal	Description
	Input TRG	Timer for ON time delay is started with input TRG (Trigger).
	Input R	Timer for ON time delay is reset to „0“ via input R. The priority of R is higher than that of TRG.
	Parameter T	After TRG is trigged and the time T elapses, the output is ON.
	Output Q	After time delay T has elapsed, the output Q = „1“, Q becomes „0“ when R = „1“.

Time Sequence Frame:

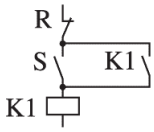
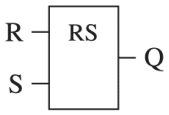


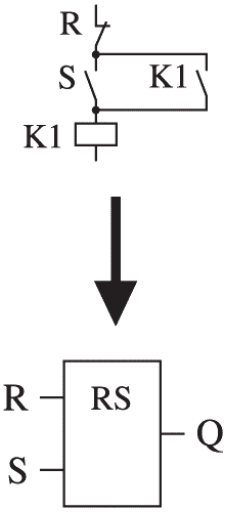
Note:

If the status of input TRG changes from „0“ to „1“, the timer will be activated.
When time T is up, output Q becomes „1“. Next input TRG has no effect on output Q.
Only when input R becomes „1“ again, output Q and timer T will be reset to „0“.

This function is applicable for cases where time-delay ON and hold ON status are required.
The assignment range for T is 0.01 – 99.99, and the time units can be set to hour (H), minute (M) and second (S). The time accuracy is 5ms.

5.3 Set relay / Reset relay (RS)

Function	Representation	Function block
RS (Set relay / Reset relay)		

Comat BoxX Symbol	Signal	Description
	Input S	Output Q is set to „1“ by Input S (1 pulse is sufficient). S port can receive two-tone signal input such as P0 – P9 phone signals.
	Input R	Output Q is set to „0“ by Input R (Reset). If S and R are „1“ at the same time, the Output Q is „0“. R has priority over S.
	Output Q	When S is „1“, Q is ON („1“) and held ON, and will not be reset until Input R is set („1“).

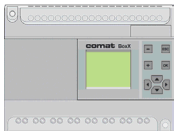
Switch characteristics
RS relay is a simple trigger. The output value depends on the input status and the original output status.

The following list of true values is used to describe the logic relations:

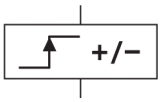
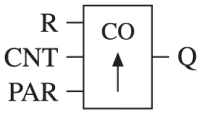
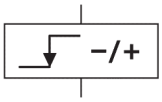
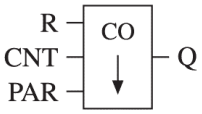
S	R	Q	Remark
0	0		Status remains to the original value
0	1	0	Reset
1	0	1	Set
1	1	0	Reset having priority over Set

Note:

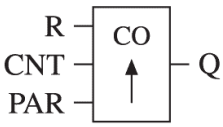
P0 – P9 represent the 0 – 9 buttons of a telephone. RS block can receive two-tone telephone signals (Mobile phone) and can be used for remote controlling the Comat BoxX (* key + number).



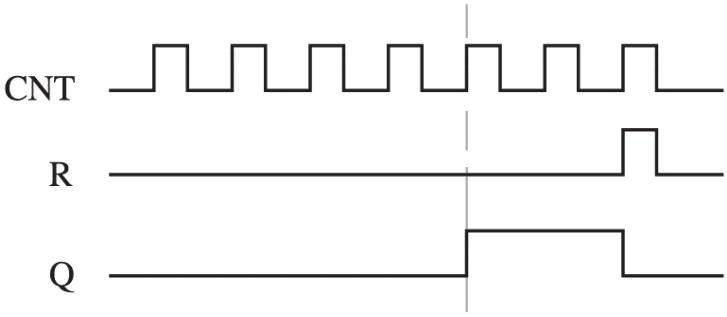
5.4 Counter - Function blocks

Function	Representation	Function block
UCN (Up-counter)		
DCN (Down-counter)		

5.4.1 UCN (Up-counter)

Comat BoxX Symbol	Signal	Description
	Input R	Input R has priority over other inputs. With R, the counter is reset to „0“ and output Q is reset simultaneously.
	Input CNT	When CNT counting is on, the counter only counts the leading edge (the status changes from „0“ to „1“), i.e. every leading edge of the pulse increased the counter by „1“.
	Parameter PAR	When the internal counting value is greater or equal to parameter PAR, output Q is „1“. The assignment of counter is 0 ~ 999999.
	Output Q	When the counting value (PAR) has been reached, output Q is ON „1“.

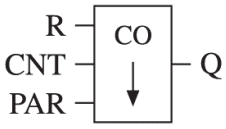
Time Sequence Frame:



Note:

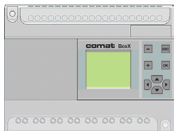
This function is applicable for counting.

5.4.2 DCN (Down-counter)

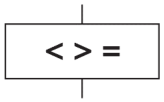
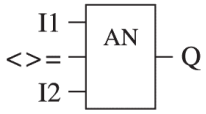
Comat BoxX Symbol	Signal	Description
	Input R	R has a priority over other inputs, with R the counter is reset to „0“ and output Q is reset simultaneously to „0“.
	Input CNT	When CNT counting is on, the counter only counts the front edge of the trigger (the status changes from „0“ to „1“), every leading edge of the pulse decreases the counter by „1“.
	Parameter PAR	When the internal parameter is decreased to „0“, Output Q is „1“. The assignment of counter is 0 – 999999.
	Output Q	When the counting value is „0“, Output Q is ON „1“.

Note:

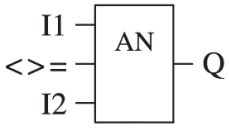
This function is applicable for counting.



5.5 Analogue input block

Function	Representation	Function block
AN (Analogue input block)		

5.5.1 AN

Comat BoxX Symbol	Signal	Description
	Input I1	Analogue input 1: 0-10V. Inputs I1-I12.
	Input < > =	Function selection: < =; > =; >; <; =; !=.
	Input I2	Analogue input2: 0-10V. Inputs I1-I12.
	Output Q	Output Q is „1” if the compared condition is true (< =; > =; >; <; =). The range is Q1 – Q8; M00 – M126.

 **Note:**

Only AF-10MR-D; AF-10MT-D; AF-10MT-GD; AF-20MR-D; AF-20MT-D; AF-20MT-GD, type Comat BoxXs have this function (analogue inputs).

This function is used in the input block for analogue signals.

The AN Function block is used for the comparison between input signal 1 and input signal 3.

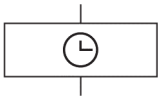
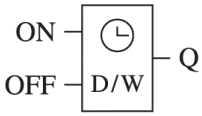
Example 1: **Example 2:**
Input 1 = I1 Input 1 = I1
Input 3 = 050 Input 3 = I2
Input 2 = > Input 2 = <
Output Q = Q1 Output Q = Q2

Result: **Result:**
When input I1 > 5V then Q1 is ON When input I1 < I2 then Q2 is ON
When input I1 < 5V then Q1 is OFF When input I1 > I2 then Q2 is OFF

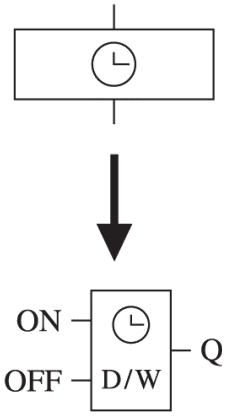
 **Note:**

Input of the analogue value with 3 digits, the decimal has to be placed between the 2nd and the 3rd digit.
Example: 5.5 corresponds to 055.

5.6 Clock switch function block

Function	Representation	Function block
CW (Clock switch)		

5.6.1 CW

Comat BoxX Symbol	Signal	Description
	ON / OFF	ON (T1) is the switch-on time. OFF (T2) is the switch-off time.
	Parameter D / W	Options for date system of week system. D = date system W = week system
	Output Q	If one of the parameterised time intervals is ON, the output is ON.

Note:

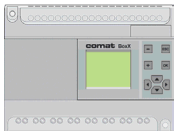
1. When the date system is selected (D).
Up to 127 time intervals can be set. These switches must be put in order according to the time sequence, e.g.

Example:

ON:	May 1st, 2002 08:00	
OFF:	May 1st, 2002 09:00	
ON:	Aug. 2nd, 2002 10:00	Correct
OFF:	Aug. 2nd, 2002 19:00	

ON:	May 1st, 2002 19:00	
OFF:	May 1st, 2002 18:00	
ON:	Aug. 2nd, 2002 08:00	Wrong
OFF:	Aug. 2nd, 2002 05:00	

If two time-points (ON and OFF) are set, the output is ON in between set time interval.
The OFF time sets the output OFF.



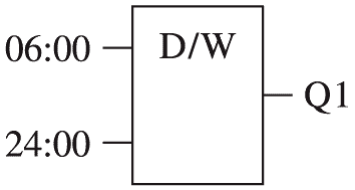
2. Range of T1 and T2
You can set T1, T2 anytime from 00:00:00 to 23:59:59.
If you set T1 or T2 at 24:00:00, it means that there is no time set to elapse.

There is no switching time set if range of T1 and T2 is set to 24:00.
There is no ON time defined if T1 is set to 24:00. Additional time functions can be programmed with flags and logic interlocks.

Example:

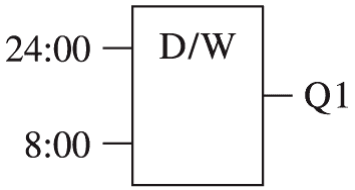
ON Monday 06:00
OFF Tuesday 08:00

Step 1: Select MO (Monday)



ON 06:00.
No switching off until 24:00.

Step 2: Select TU (Tuesday)



ON 24:00 Monday.
Switches OFF Tuesday 08:00.

Note:

Q1 switch is ON from 06:00 on Monday until at 08:00 on Tuesday.
By using Quick II Software, the setting can be made as follows:

Example:
ON MO 06:00 Monday
OFF TU 08:00 Tuesday

If two setting points for ON and OFF are programmed, the output is in ON status during the set time interval between ON and OFF. The output is in OFF status after the set time has elapsed.

3. Examples of switching

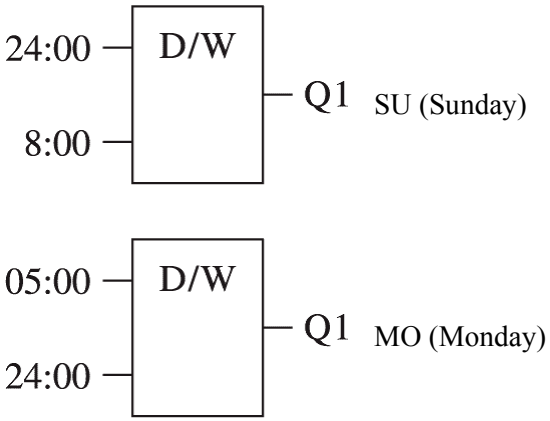
Setting condition	Time	Output status
Only ON time (ON) is programmed	Before reaching the set time	Keeping the original status
	At / when reaching the set time	ON
Only OFF time (OFF) is programmed	Before reaching the set time	Keeping the original status
	At / when reaching the set time	OFF

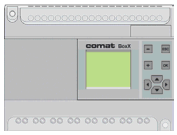
4. Week timing system (W)
The interval from Monday to Sunday is defined as a circle (MO is the starting point and SU is the end point). It is not allowed to set the start point after the end point in a time interval.
It is OK to use a sequence of MO, TU, WE, TH, FR, SA, SU.

A time interval from Sunday to Monday can be programmed as follows:

Example:
ON Sunday 08:00
OFF Monday 05:00

Programming:





Weekdays
Monday: MO
Tuesday: TU
Wednesday: WE
Thursday: TH
Friday: FR
Saturday: SA
Sunday: SU

Examples:
MO-SU: Every day from Monday to Sunday
MO-TH: Every day from Monday to Thursday
MO-FR: Every day from Monday to Friday
MO-SA: Every day from Monday to Saturday
FR-SU: Every day from Friday to Sunday
SA-SU: Every day from Saturday to Sunday

Please note:
In the case only OFF time is set without ON time (for example to be OFF at 05:00 every day from Monday to Thursday), Comat BoxX can turn OFF the output at 05:00 every day from MO – TH. ON time may depend on other factors (the original status will be maintained for Friday, Saturday and Sunday).

5. When ever the date or the week system are selected, the time intervals should always be arranged in chronological order.

Example:

ON:	May 1st, 2002 09:00	
OFF:	May 1st, 2002 11:00	
ON:	May 1st, 2002 12:00	Correct
OFF:	May 1st, 2002 17:00	

ON:	May 1st, 2002 09:00	
OFF:	May 1st, 2002 11:00	
ON:	May 1st, 2002 08:00	Wrong
OFF:	May 1st, 2002 08:30	

6. Week system setting has priority over date system setting
The setting
MO – TH (Monday to Thursday)
ON 08:00
OFF 09:00
has priority and ignores other eventual date settings. FR, SA and SU will maintain the former status.

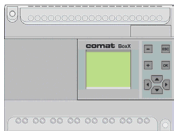
7. Programming with LCD panel
When the week system (W) is selected, only the setting for T1 and T2 is required.

Function D is in this case meaningless and remains “20000000”.
T1 is always ON.
T2 is always OFF.
If the date function has been selected, a date input is required.

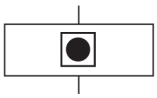
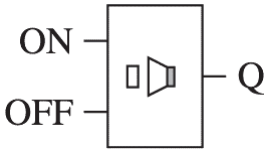
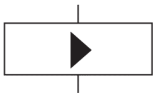
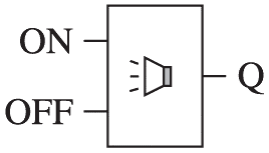
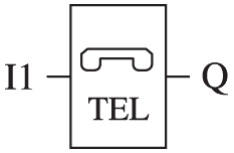
8. Clock hold circuit
In case of a power failure or a power cut, the internal clock continues to run.
The clock internal memory remains for approx 100 hours at 25°C ambient temperature.

9. Conflict between time intervals:
By using the time intervals to set the ON / OFF time, the clock will switch the output ON at the set ON time unless it has already been ON.
The OFF output will be switched OFF at the selected OFF time unless it has already been OFF.

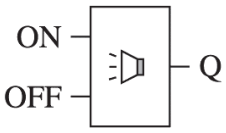
10. Accuracy of Real Time clock (RT clock)
The accuracy of RT clock is 1sec/day.
Shorter time function can be realised by using a function block.



5.7 Audio / Tel.-Function Blocks

Function	Representation	Function block
MR (Recording Block)		
PLAY (Message playing block)		
TEL (Telephone dialling block)		

5.7.1 PLAY (It is necessary to connect AF-MUL to the Comat BoxX)

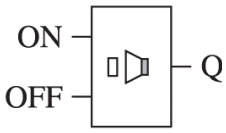
Comat BoxX Symbol	Signal	Description
	ON	When ON is „1“, Output Q is „1“, i.e. the voice section is turned on for broadcasting. The option range for its input is I1 – I12, Q1 – Q8, HI, LO, M00 – M126, X.
	OFF	When OFF is „1“, Output Q is „0“, i.e. the voice section is turned off. The option range of its input is I1 – I12, Q1 – Q8, HI, LO, M00 – M126, X.
	Output Q	The option range of output is 01 – 98, and there are 98 voice sections in total.

This function is applicable where voice prompt is required.

Example:
Set up Comat BoxX together with the Voice & Remote unit AF-MUL, use the connector bridge AF-BC delivered with the AF-MUL.
Connect to power supply.

Application:
To broadcast messages over the phone line or over loud speakers.

5.7.2 MR (It is necessary to connect AF-MUL to the Comat BoxX)

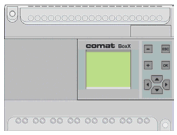
Comat BoxX Symbol	Signal	Description
	ON	When ON = „1“ record the voice sections. The option range of this input is: I1 – I12; Q1 – Q8; HI; LO; M00 – M126; X.
	OFF	When OFF = „1“ recording is completed. The option range of this input is: I1 – I12; Q1 – Q8; HI; LO; M00 – M126; X.
	Output Q	The options for the output port are 01 – 98. Please note that when the output is selected as 99, it does not represent to record to 99th voice sections but to clear all the voice sections.

Note:

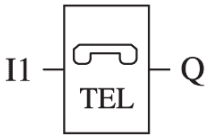
Please refer to “Voice Module AF-MUL User Manual” to chapter 6 to learn how to record your voice. When making a recording it should be performed in an order of 01 - 98 with no interruption in the process, i.e. it is not allowed to record the third section before the first section is recorded. Please refer to chapter 6.4 in “Voice Module AF-MUL User Manual”.

Voice messages are automatically stored in the recorded sequence.

Recording:
Impulse on I1 = The first recording starts with recording number 00
Impulse on I2 = The first recording is completed and will be played
Impulse on I1 = The second recording starts with recording number 01
Impulse on I2 = The second recording is completed and will be played



5.7.3 Tel (In combination with Voice & Remote Unit AF-MUL)

Comat BoxX Symbol	Signal	Description
	Input	Following Inputs can be selected: Input I1 up to I12 Output Q1 up to Q8 Status = High (H =“1“) Status = Low (L =“0“) Intermediate relay M00 up to M126 Telephone keys P0 up to P9
	Output	When Q is „1“, the programmed telephone number of this port will be dialled. If the input has been „1“ all the time, dialling will be repeated every 30 seconds. When the input is „0“, dialling stops. The output port accepts telephone numbers of max. 25 digits.

Note:

The function of the telephone block is for dialling out, receiving calls, receiving control signals or send out voice messages (alarms). (*key + number).
This block is used together with the locking-up relay (RS relay) function block.

Connections:

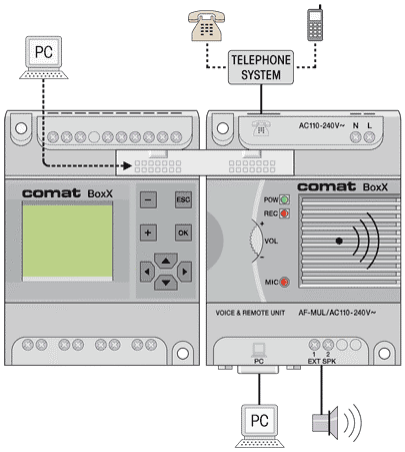


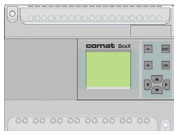
Fig. 5.1

This control requires two-tone telephone signals (P0 – P9) to drive the RS relay.
The periphery devices are driven by the output of the RS relay.
When Comat BoxX receives P0 – P9 signals of an incoming call, it is possible to control the Comat BoxX from a remote location.

Example:

1. Use an external telephone to dial the phone number of the connected telephone line.
   The system answers and requests a password.
2. Enter the correct password by using P0 – P9 dialling keys.
   Please note: Press * key before the actual password
3. The system now accepts control signals from your P0 - P9 phone keys.
   The Comat BoxX confirms execution of the required task with a pre-recorded voice.
   Of course it is necessary to program the RS with the function and related signals for the key P0 – P9 beforehand as well as to record the voice sentence.

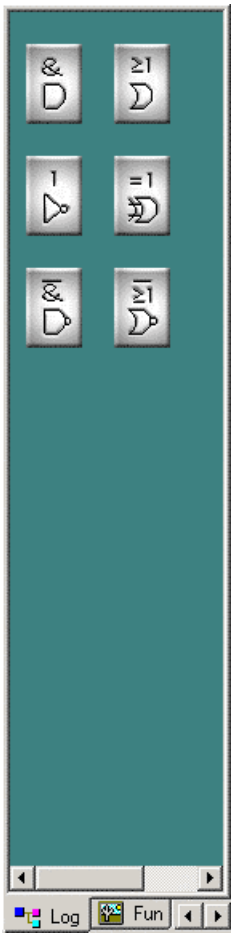
Telephone alarm:
Dialling of a preset number is started automatically when the input signal of this block is „1“.



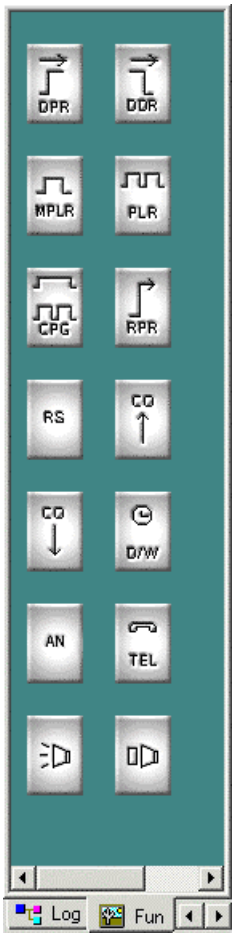
Chapter VI

Block Library

Function blocks:

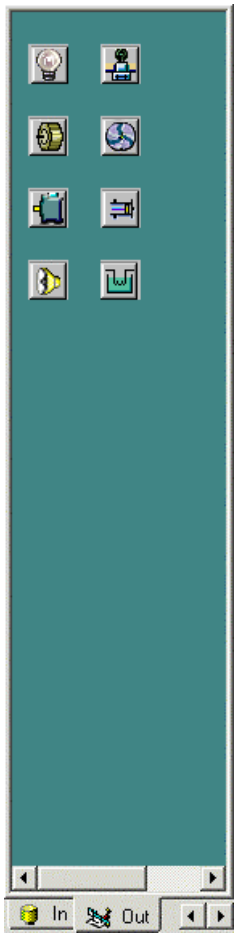


Logical
Function Blocks



Function
Function Blocks

Input
Symbols



Output
Symbols

The blocks are classified into four types: Logical Block, Function Block, Input Block and Output Block. The Input and Output blocks are only used to graphically represent the input and output ends of Comat BoxX, without any actual functions. The key parts are the Logical Block and Function Block, the combination of which realises several types of Comat BoxX control.

6.1 Block Library Operation

1. Click <*LOG*>, <*FUN*>, <*IN*>, <*OUT*> buttons used for selecting block types that will be displayed in the Block Library Frame.
2. Move the cursor to the desired block and select it by clicking on it.

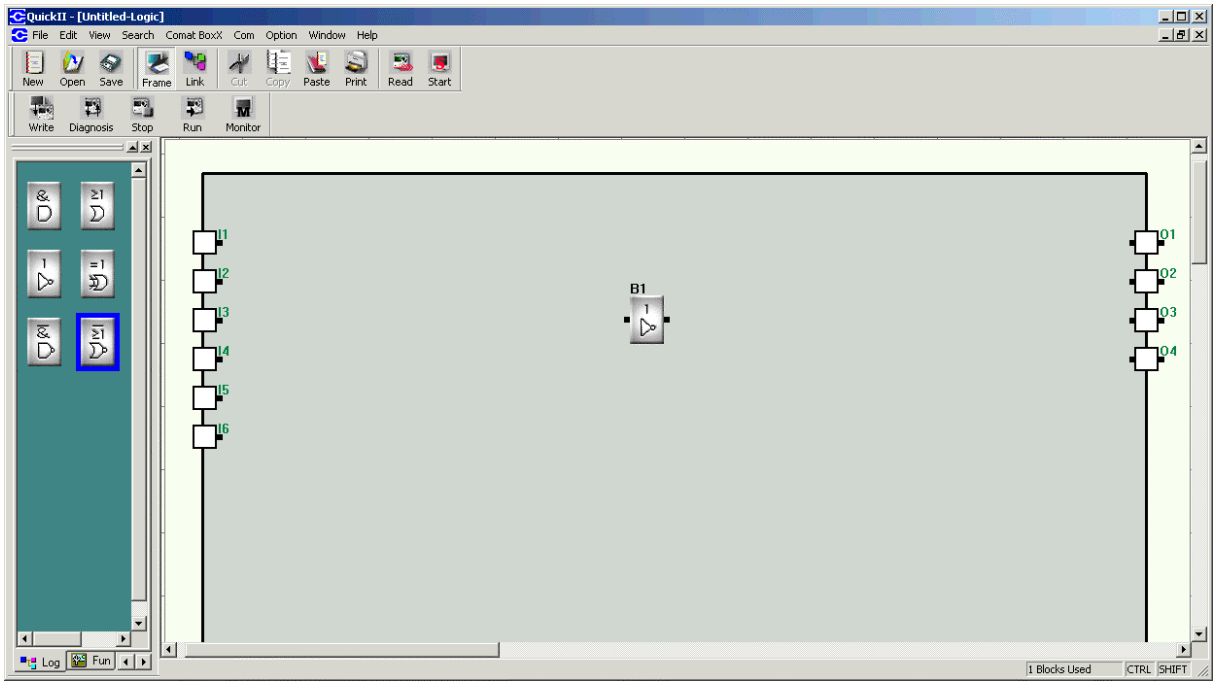
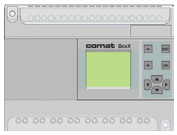


Fig. 6.1 Place Blocks in working window

3. Click the corresponding Editing Function Block in the Edit Window and the selected block will be placed in the Logical Function Diagram.

It is necessary to setup the properties of the blocks in the plotting of logical diagrams. The block properties are divided into General property and Special property.



6.2 General Property

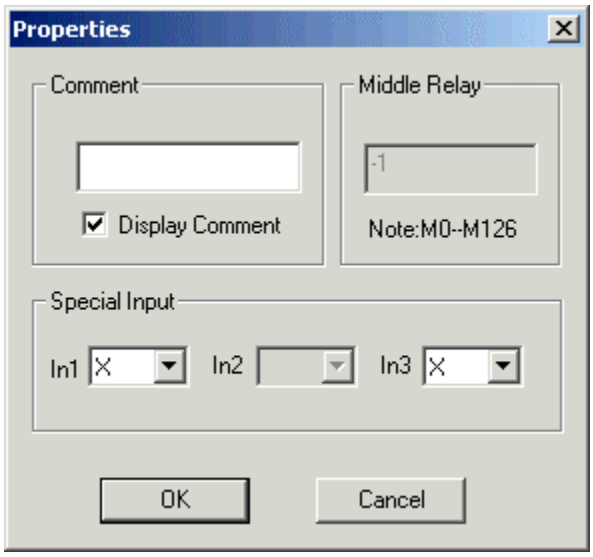


Fig. 6.2
Setup of General Property

The settings of General property mainly include:

a) Comment:
For filling of a comment string, no more than 20 characters.

b) Middle Relay:
For setting of the Intermediate Relay connected with the current block. If the Intermediate Relay is set up, the other blocks can no longer use this Intermediate Relay, which means that usage of a Middle Relay is unique. The parameter values of the Middle Relay range from 0 – 126, totally amounting to 127.

c) Special Input:
X: Represents empty. When the input is X, this terminal allows connection with a lead from another block.

HI: Represents high potential. When the input is HI, no lead from any other block can be connected to this terminal and its status is always at high level.

LO: Represents low potential. When the input is LO, this terminal allows connection with no lead from any other block and its status is always at low level.

6.3 Blocks with timers

All of the blocks with timers, such as MPLR, DPR, DDR, CPG, RPR have timing function:

MPLR Simple pulse
DPR On delay
DDR Off delay
RPR On delay resetable
CPG Clock generator

Their Block Properties Setup Dialogue Box is as shown in Fig. 6.3.

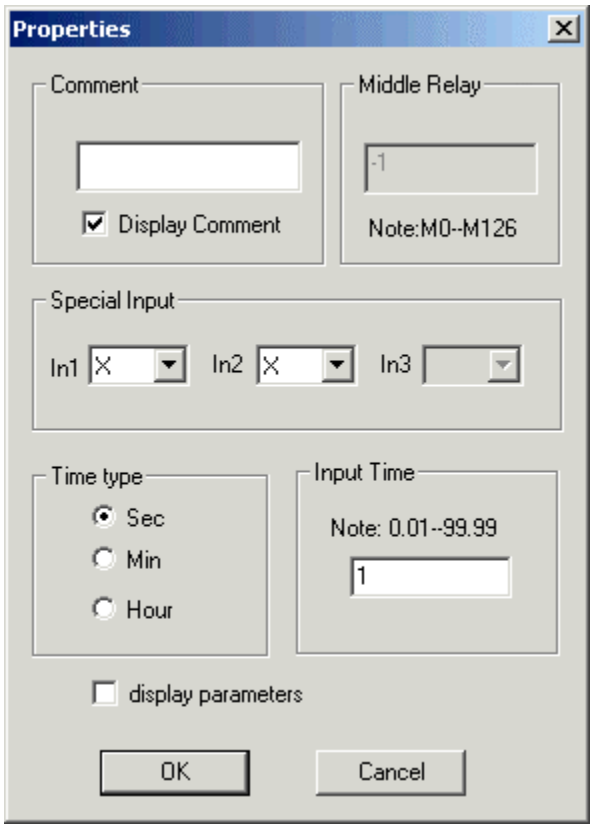
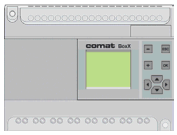


Fig. 6.3
Setting properties for blocks with Timers

Time type: Three units, namely second, minute and hour, are available for selection.
Input time: Input the value for timing, and the time can be accurate to 0.01 second.
The properties of General Blocks shall be referred to for other settings.



6.4 Properties of RS relay

The dialogue box of RS relay properties setting is as shown in Fig. 6.4.

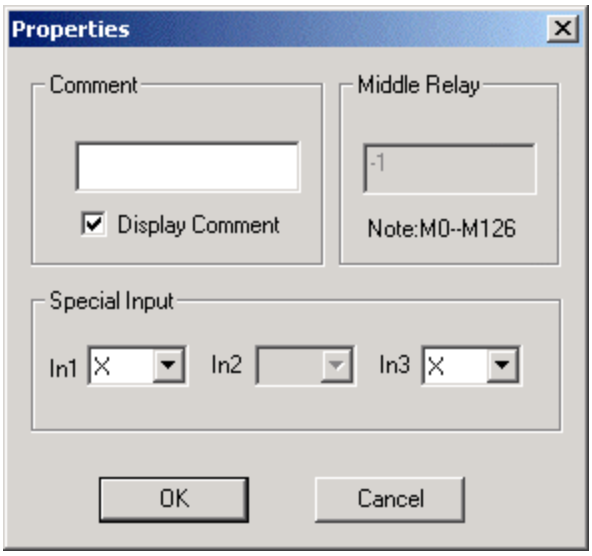


Fig. 6.4
Setting Properties for RS Relay

Special input: Please refer to general properties for X, HI and LO. P0 – P9 indicate the tone dial impulse input of 0 – 9 digit buttons on the telephone set.
Please refer to general properties for other settings.

6.5 Blocks with counters

Blocks with counters include UCN (up counter) and DCN (down counter), whose Properties Setup Dialogue Box is as shown in Fig. 6.5.

Number of counts: Setup of the number of the counters, in the range of 1 – 999999.
The properties of General Blocks shall be referred to for other settings.

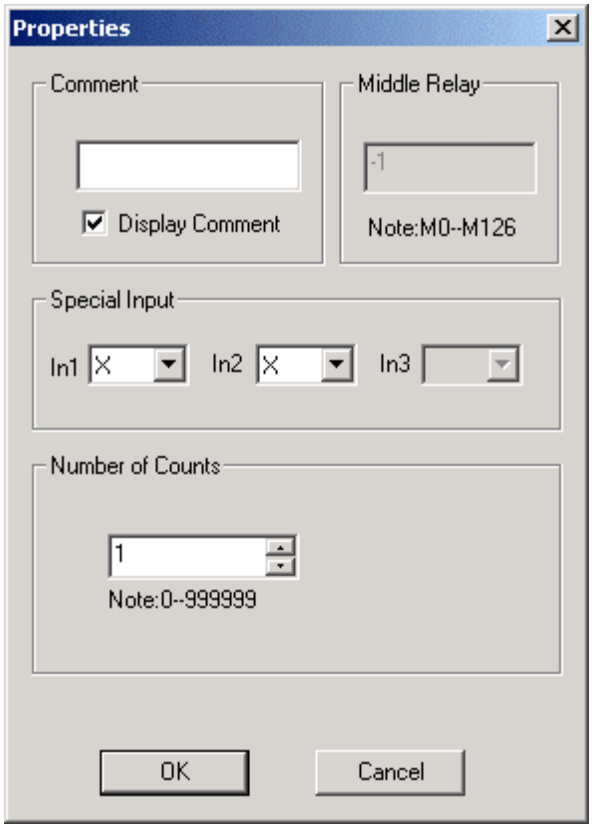
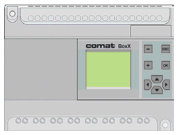


Fig. 6.5
Setting Properties for
Blocks with Counters



6.6 Setup for Analogue Block AN

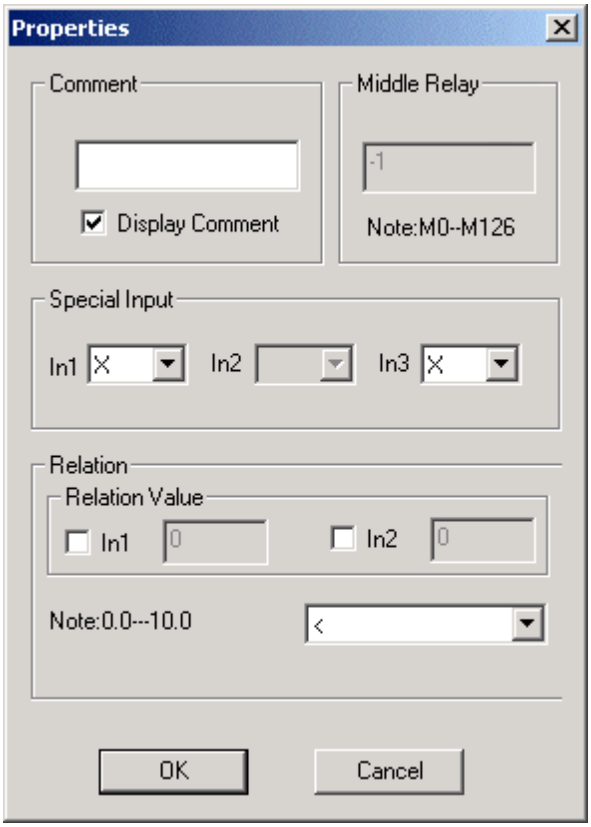


Fig. 6.6
Setup of Property of
Analogue Block

I. Comment:
Users can add letters of explanation in this bar.

II. Special input: HI, LO, X, LM.
If X has been selected, this said port can be connected to Input port.
If LM has been selected, it means that this said port can be set to a fixed digital value.

III. Relation Value:
The range of LM is 0.0 – 10.0.

IV. Relation:
It provides this "<, >, =, >=, <=, !=" 6 options.
This comparison block is for the comparison between input I1 and input I3.

For Example:
When "<" has been selected, if input I1 < input I3, then Q = "1". If input I1 > input I3, then Q = "0".

6.7 **Properties of DW** (Clock Switch Block)

The Setup dialogue box is as shown in Fig. 6.7.
Clock setup: In this setting, the status of output can be regularly changed.
Two options, date style and week style, are provided to meet the particular requirements of users.

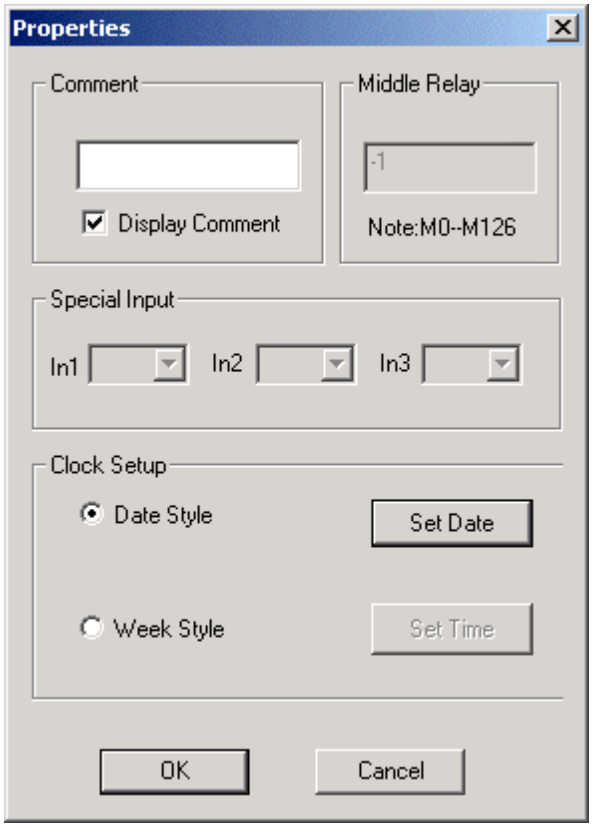
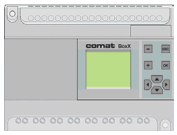


Fig. 6.7
Setting DW Clock Switch
Block Properties



Week style:

If Week style is selected, and the Set Time bottom is clicked, the frame of setting time will be on and you can set up to 127 intervals for the time switch. Please note that you should set the time according to a time sequence.
You can set a time point for DW block in Quick II very easily (see the Fig. 6.8).

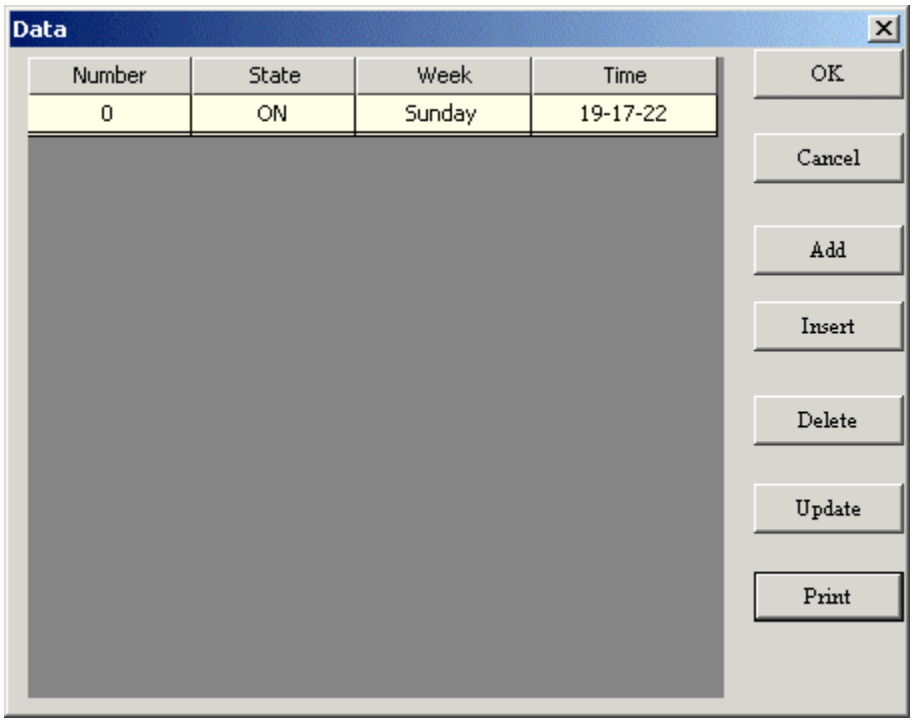


Fig. 6.8
Setting Clock Mode

There are some items such as Number, State, Week and Time.

Time setting operations:

Cancel: Leave the setting clock mode and returns to the properties.

Add: To add a time, please click <*Add*> button and a dialogue box will appear, as shown in Fig. 6.8.
Select the switch state ON/OFF and set the switch time. Then click <*OK*>button and a time record is added.
They must be set in a time sequence.

Insert: To insert a time in the existing time setting combination, please click <*Insert*> button and a dialogue box will appear, as shown in Fig. 6.9.
Select the switch status ON/OFF and set the switch time.
Then click the <*OK*> button and a time record is inserted.

Delete: To delete a time, put the cursor on the said time record and click the <*Delete*> button.
When the Confirm Delete frame appears, click <*OK*> to delete the said time record.

Update: To update a time, put the cursor on the said time record and click the <*Update* > button.
As a time setting frame similar to that shown in Fig. 6.9 appears, reset the time, click <*OK*> and the said time record is updated.

Print: To print your set time on paper, click the <*Print*> button with the mouse.

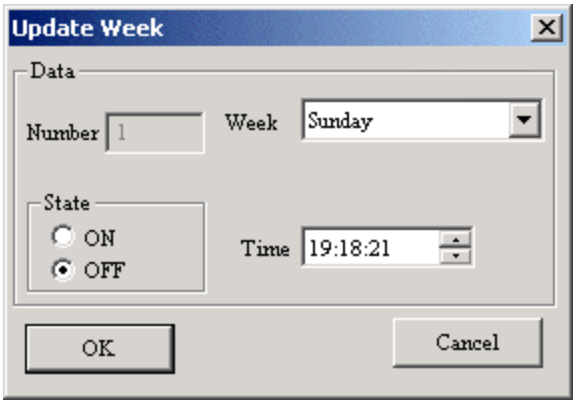


Fig. 6.9
Setting Time

Date style:
If <*Date Style*> is selected, click the <*Setup Date*> button.
As the Setup Date frame appears, the date and time can be set, as shown in Fig. 6.10.

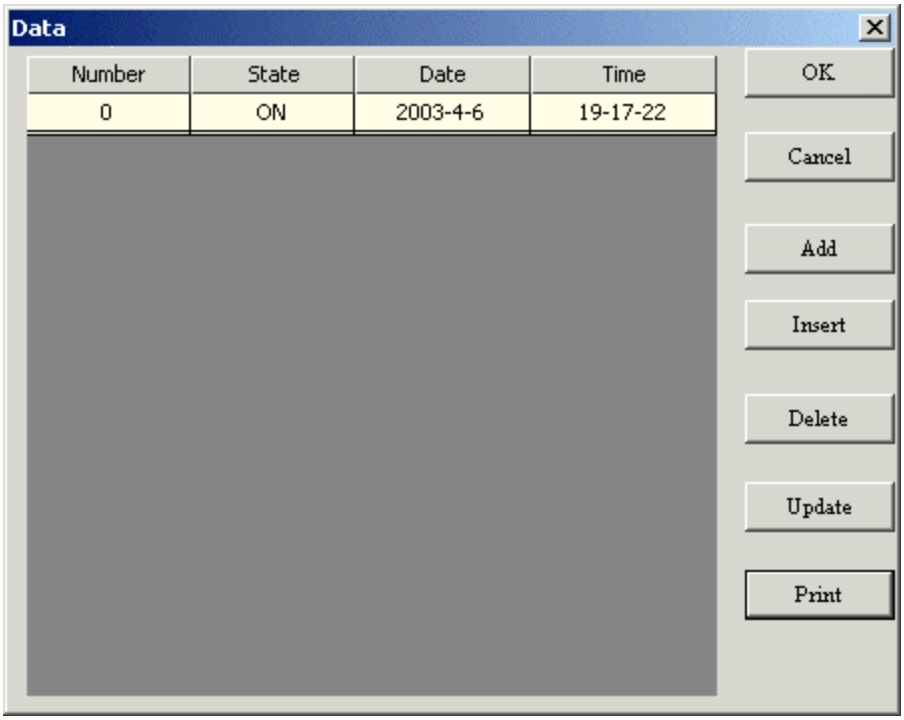
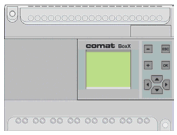


Fig. 6.10
Setting Block Property
for DW Clock

You can key in a new time or make changes through the keyboard in this box. Number, State, Date and Time item are set in the Setup Time box shown in Fig. 6.10.



The time setting operation are as follows:

Cancel: Leave the setting clock mode and returns to the properties.

Add: To add a time, please click the <*Add*> button and a dialogue box will appear, as shown in Fig. 6.11.
Select the switch state ON/OFF and set the date and time of switch.
Then click the <*OK*> button and a time record is added.
It should be pointed out that Quick II provides you with the best date setting method. You will have a permanent calendar chart appear, as shown in Fig. 6.11, only by clicking once the Page Down arrow on the right of the Date Box. You may select whatever date you want to set on this permanent calendar and click <*OK*> to complete setting of the date. Therefore Comat BoxX can realise real-time control without any limitation.

Insert: To insert a time in the existing time setup combination please put the cursor on the said time, click the <*Insert*> button and a dialogue box will appear, as shown in Fig. 6.11.
Select the switch status ON/OFF and set the time and date of switch.
Then click the <*OK*> button to finish the setup.

Delete: To delete a time, put the cursor on the said time record and click the <*Delete*> button. As the Confirm Delete frame appears, click <*OK*> to delete the time record.

Update: To update a time, put the cursor on the said time record and click the <*Update* > button. As a time setting frame, similar to that shown in Fig. 6.11, appears; reset the state, date and time, then click <*OK*> and the said time record is updated.

Print: To print your set time on paper, click the <*Print*> button with the mouse.

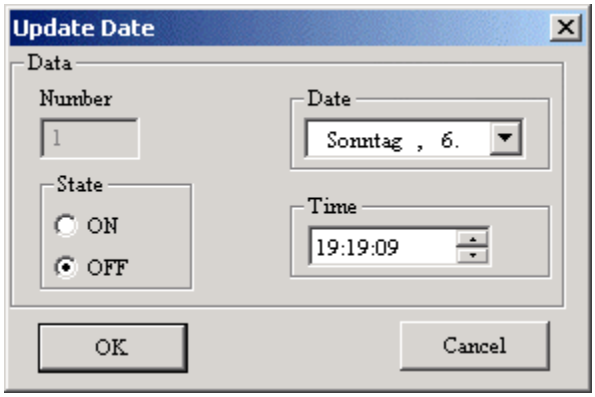


Fig.6.11
Add a Time Record

Notes:

1) The time is arranged in an order from earlier to later and the time sequence shall be considered for adding or modifying any time record, for example: AM9:00, AM11:00, PM3:00, PM6:00, etc.
2) In the case of multiple records, the said block will be divided into multiple blocks when it is written to Comat BoxX and you can view the number of blocks used by the current program in the State Bar of the Function Graph Edit Window.
3) If the first time is set ON and the second time is set OFF, the two times share one common block, if two consecutive times are both set to ON or OFF, each of them should occupy a separate block.

6.8 Properties of Voice Broadcasting and Recording Blocks and of TEL Block

The Setup Properties dialogue box of Voice Broadcasting Block and of TEL Block and Voice Record in a Block is as shown in Fig. 6.12. Setting Output: Set the ports for voice broadcasting and recording. The port here is a memory space oriented at voice storage. There are 1 – 98 such ports in total. In addition, there is a No. 99 port (for record block), whose function is to clear all of the voice contents in No. 0 – 98 ports, so please be careful when using it.

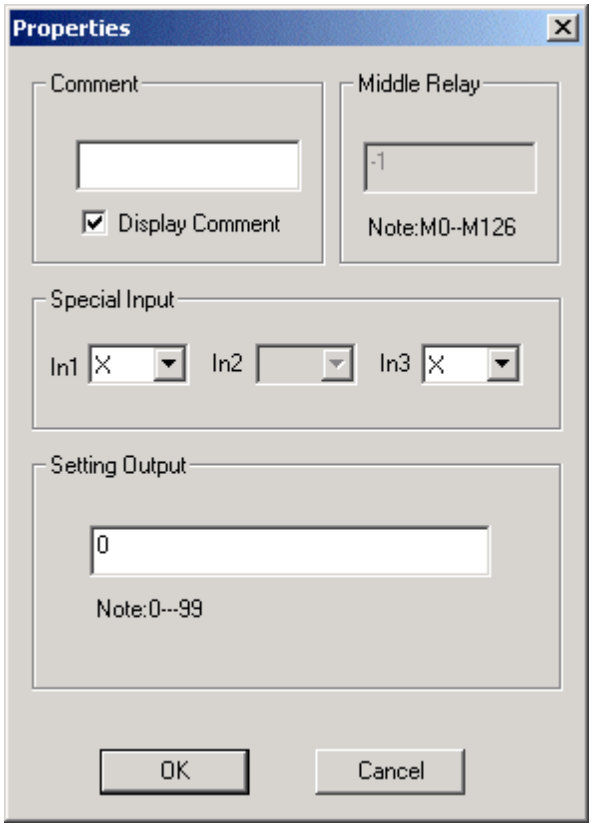
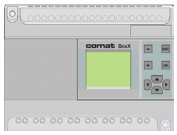


Fig. 6.12
Setup the Properties of Voice broadcasting and Recording Blocks



Property of TEL Block

The dialogue box is as shown in Fig. 6.13.
Phone code: Telephone number used for dial-up is keyed in here.
The * and # functions of the telephone are not supported. The length of the telephone number shall not be longer than 25 digits.
Please refer to general properties for other settings.

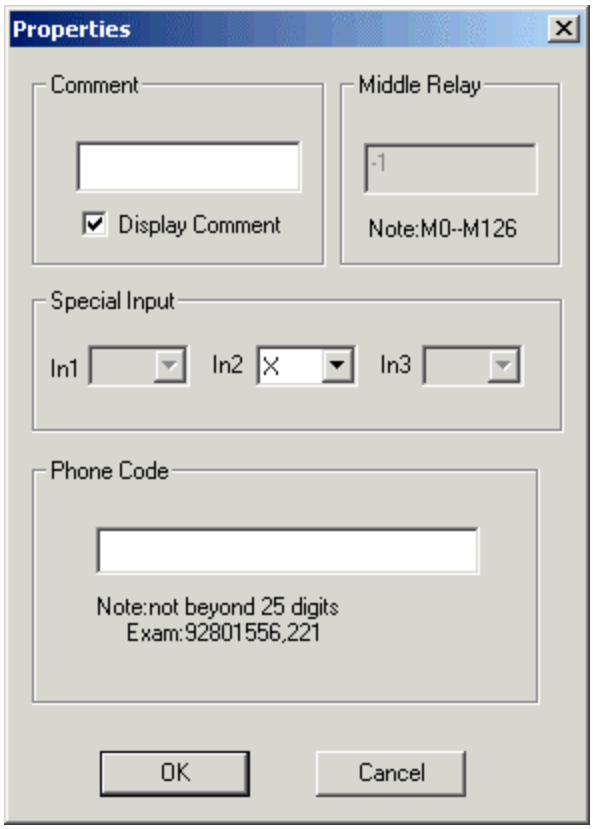


Fig. 6.13
Setting TEL Block Property

6.9 Animation Blocks

The graphs in the In Library and Out Library are only for you to select the input and output devices corresponding to the actual equipment, as shown in Fig. 6.14, so that the simulation run will have a realistic presentation, without any actual logical operation function.

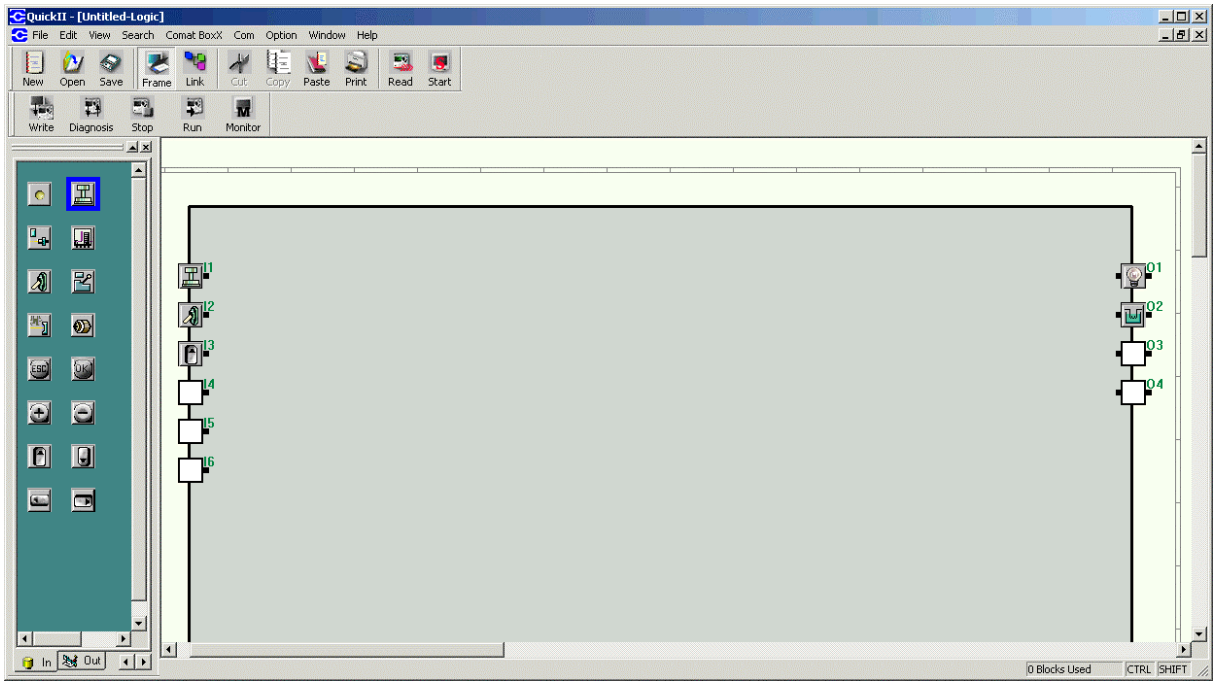
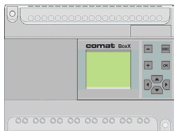


Fig. 6.14 Animation Blocks

Note:

The graphs in the In Library can only be placed in the Input Ports but not in the Output Ports; and vice versa, the graphs in the Out Library cannot be place in the Input Ports.



Chapter VII

Remote programming and monitoring via Modem

7.1 Remote programming and monitoring via Modem

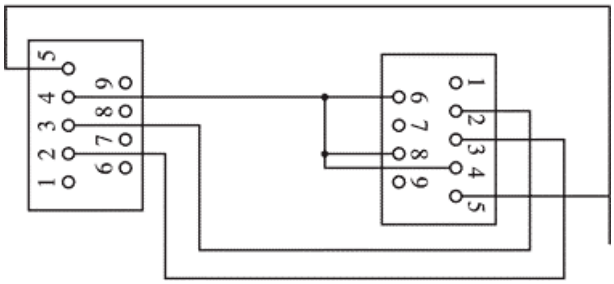
Comat BoxX can realise remote programming and monitoring function through a modem. It is therefore possible to monitor or modify the program also from a remote location.

Connect Comat BoxX with the connection cable AF-C232 and AF-M232 to a modem as shown in Fig. 7.2.
The modem is automatically initialised after power on. Should the modem not initialise automatically, press OK in the modem menu for initialisation.

Connect the modem to a PC and use Quick II or SCADA to program the connected telephone number.

The cable connection diagram of the AF-M232 is as follows:

Connection to Comat BoxX	Connection to Modem



The figure above shows the internal wiring on AF-M232.

Note:

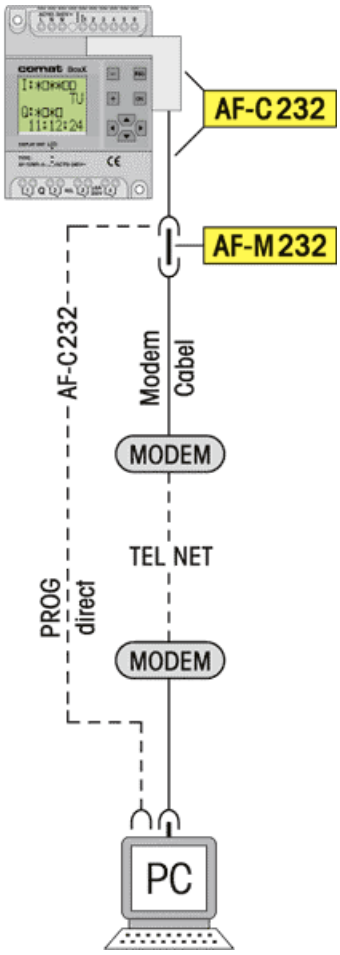
AF-M232 is a standard DB9-DB9 connection.

7.2 Two connection methods for Comat BoxX remote programming and monitoring

7.2.1 Connect Modem with AF-C232 and AF-M232 cables

The connection diagram is as follows:

Connection of Comat BoxX with PC via telephone network:

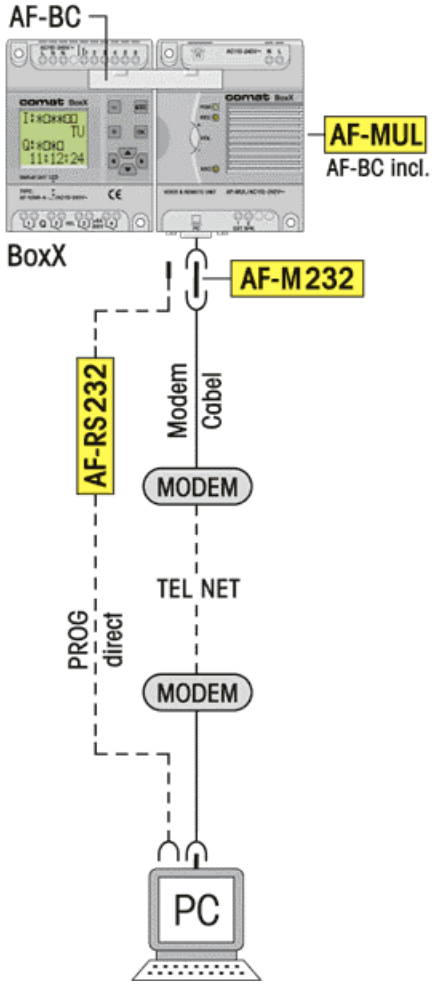


7.2.2 Connection between Comat BoxX and voice module AF-MUL via Modem

Connect Comat BoxX and AF-MUL with the special connection bridge AF-BC (enclosed with the AF-MUL voice module).
Connect the power supply of AF-MUL and Comat BoxX first and plug the telephone line into the "TEL" socket.

Use cable AF-RS232 or Modem cable (enclosed with modem) and adapter AF-M232.

Comat BoxX connection via AF-MUL with telephone network:



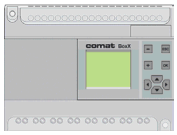
7.2.3 Modem Settings

In order to allow data transmissions, the modem has to be configured first.
The configuration is done by setting the AT instruction codes.
This is a example of AT settings for a modem type U.S Robotics:

ATZ	Modem Reset
AT&H0	Stop FLOW Control
AT&D1	No DTR Signal
AT&N6 AT&U6	Baud Rate 9600
ATS0=2	Modem answers incoming call after two ring signals
AT&W	Save Modem settings

Important!

Please connect Modem to BoxX after the BoxX is powered. (BoxX must be ON when Modem is connected)
In case that the BoxX is being restarted during operation or after power interruption, the Modem settings have to be repeated.



Chapter VIII

Programming operation on Comat BoxX panel

8.1 Edit a new program

When this function is selected, Comat BoxX will enter into the Edition Function, selecting as shown in figure 8.1.
Use ▼ and ▲ keys to move the arrow „>“ on the left and press OK key to select the functions.

Functions:
Edit Prg.: Input a function block (8.2)
Insert FB: Insert a function block into the existing program (8.12)
Delete FB: Delete a function block from the existing program (8.13)
Clear PRG: Delete program completely

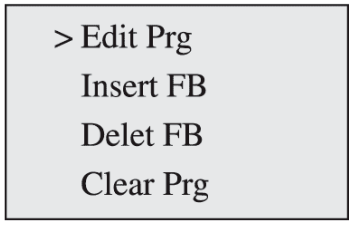


Fig. 8.1
Editor

8.2 Edit PRG (Edit function)

The Edit PRG Menu Frame is as shown in Fig. 8.2 and the function blocks are to be selected under this menu.

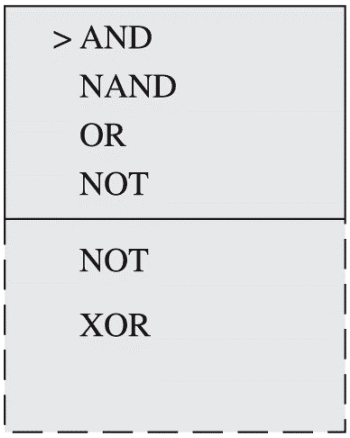


Fig. 8.2
Functions

Use ▼ and ▲ keys to move the arrow „>“ on the left to select the function blocks.
Press OK key to select a function block. Function Block setting Frame as shown in Fig. 8.2 will be displayed (please refer to Chapter V Specification of function Blocks).
This menu includes the following function blocks:
AND; NAND; OR; NOR; XOR; NOT; RS; UCN; DCN; PLR; MPLR; CPG; RPR; DPR; DDR; CW, TEL; PLAY; MR; AN (D type, with analogue input).

8.3 Edit an existing program (Edit a program)

Select <*FAB/Rom*> and then select <*Rom → FAB*> on the menu, as shown in Fig. 8.3.

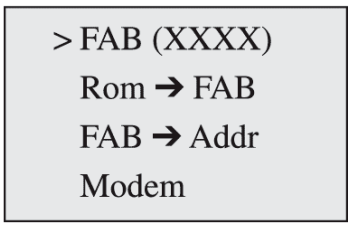


Fig. 8.3

Explanation:

Line 1:	FAB(XXXX)	Serial number of your Comat BoxX
Line 2:	Rom → FAB	Read the program from Comat BoxX
Line 3:	FAB → Addr	View or modify FAB address
Line 4:	Modem	Initialise Modem

8.4 Read program from Comat BoxX

1. Select <*FAB/Rom* > <*Rom → FAB*> and press OK.
   The following frame will be shown.

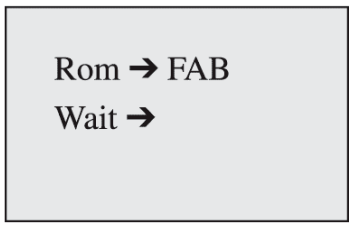
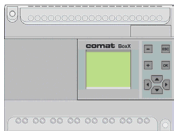


Fig. 8.4

2. Press ▶ in the state shown in Fig 8.4.
   The program will read block by block (in sequence as B01, B02...).

Note:

If the existing program has not been read in via Rom before your modification *(<FAB/Rom > <Rom→FAB>)*, the unit will set the block number B01 to the first function block you enter.



8.5 Characters of the general function blocks

When Input Function Blocks are selected, Comat BoxX will automatically help you to define in sequence the numbers of the blocks, beginning with „B“ and display the said numbers in the bottom right corner (e.g. B01), as shown in Fig. 8.5.

Select the input/output and parameter values to be set up for the function block and OK.

Move cursor to first input (top left) (Fig. 8.5).
Select input and output numbers I1 – I12; Q1 – Q8 and confirm with OK.
AF-10: I1 – I6 / Q1 – Q4
AF-20: I1 – I12 / Q1 – Q8
Operands are not required for H (high) „1“, L (low) „0“ and X (empty).
M means intermediate relays M00 – M99.

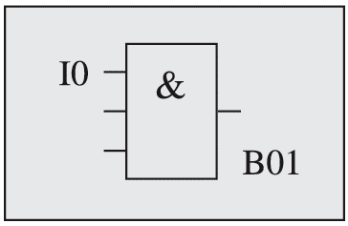


Fig. 8.5

Described above is the setup of basic function blocks. It is also necessary to explain setup of the operands for some special function blocks as follows. (8.6)

8.6 Function blocks with timing function

DPR: Delay Putting Relay
DDR: Delay Disconnection Relay
MPR: Mono Pulse Relay
PLR: Pulse Relay
CPG: Clock Pulse Generator
RPR: Retentive ON Relay
CW: Clock Switch

When parameter T is set, the following frame will be shown the LCD:

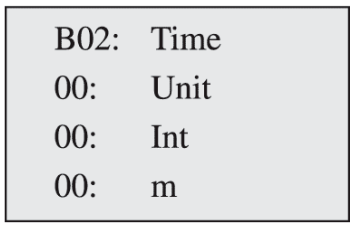


Fig. 8.6

Explanation:
Line 1: B02: Time Block number and timing mark
Line 2: 00: Unit Time units:
HOU = Hours;
MIN = Minutes;
SEC = Seconds
Line 3: 00: Int Setting number for time 00 – 99
Line 4: 00: m Setting decimal for time 00 – 99

8.7 Set-/Resetrelay function block RS

Please refer to chapter8.15 step 2

8.8 Function blocks with counting function include

UCN: Up Counter
DCN: Down Counter

When the PAR is set, the following frame will be shown on the LCD:

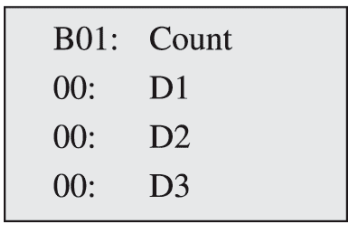


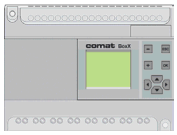
Fig. 8.7

Explanation:
Line 1: B01: Count Represents the block number and counter mark
Line 2: 00: D1 Represents the highest digit pair of the counting value
Line 3: 00: D2 Represents the second-highest digit pair
Line 4: 00: D3 Represents the lowest digit pair

You may set the parameters in turn, as required, by pressing ▼ and ▲ to move the cursor. Select the parameters and pressing − and + to change the value and confirm with OK.

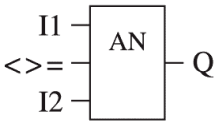
Example:
Input of number 96 78 43

D1 = 96
D2 = 78
D3 = 43



8.9 Set the analogue block (AN)

AN block is as follows:



The AN function block is used to recognise any analogue inputs.

With the AN function block the comparison between input I1 and input I3 will be evaluated.
The function is nearer described on chapter 5.5.

Explanation:
Input 1: Inputs I1-I6 (I1-I12 for AF20...); comparative input; 0-10V
Input 2: 5 comparision functions can be selected: < =; > =; >; <; =
Input 3: Inputs I1-I6 (I1-I12 for AF20...); comparative input; 0-10V

Shift the cursor with the keys on the LCD display and enter with the − and + keys the appropriate values and confirm with OK.

8.10 Parameters for the Clock Switch (CW)

If date system D is selected, the following will be displayed on the LCD.

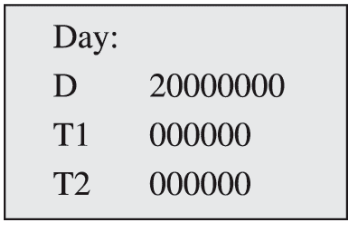


Fig. 8.8

Explanation:
Line 1: Day: Date system
Line 2: D: 20000000 Year; month; day
Line 3: T1: 000000 The output ON time (T1)
Line 4: T2: 000000 The output OFF time (T2)

You may set the parameters in turn, as required, by pressing ▼ and ▲ to move the cursor.
Select the parameters and pressing − and + to change the value and confirm with OK.
At this time, you can use +, − keys to select the type of weeks.

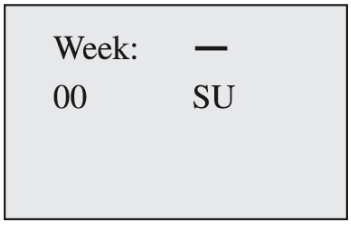
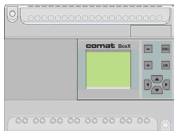


Fig. 8.9

You may set the parameters in turn, as required, by pressing ▼ and ▲ to move the cursor.
Select the parameters and pressing − and + to change the value and confirm with OK.

Explanation:

MO	Monday		
TU	Tuesday		
WE	Wednesday		
TH	Thursday		
FR	Friday		
SA	Saturday		
SU	Sunday		
MO-TH	Monday	to	Thursday
MO-SA	Monday	to	Saturday
MO-SU	Monday	to	Sunday
FR-SU	Friday	to	Sunday
SA-SU	Saturday	to	Sunday



After selecting the week system press the ESC key.
You will be able to select the timing and the following will be displayed on the LCD:

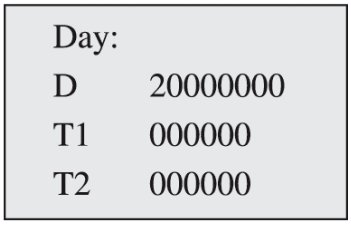


Fig. 8.10

Explanation:
Line 1: Week Week system
Line 2: D: 20000000 Year; Month; Day
Line 3: T1: 000000 The output ON time (T1)
Line 4: T2: 000000 The output OFF time (T2)

Note:
You only need set T1 and T2, when you select the week system the set data will be neglected by the system.

8.11 Set the Telephone Block (TEL)

When the Telephone Block is selected, the function block Fig. 8.11 will appear.

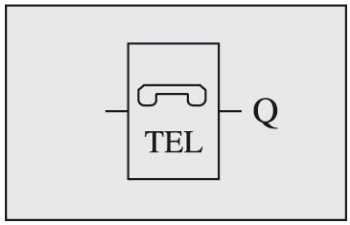


Fig. 8.11

Set the input on the left of the block first.
Move the cursor to the output on the right side. Use the keys [−], [+] and [▼], [▲].
Press [OK] key to confirm.

Then, the following will be shown on the LCD:

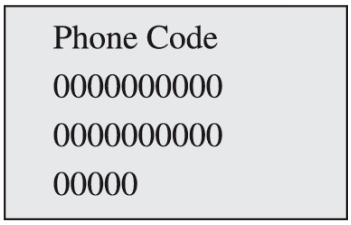
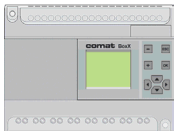


Fig. 8.12

Press [▶], [◀], [▼], [▲] keys to move the cursor and select the digit of the telephone number (max. 25 digits).
Press [−] and [+] keys, to change the digit value.
After the number is set, move the cursor to the last digit of the set number and [ESC] to exit.

Note:

When you complete the setting of the telephone number, a **„:“ must** be added at the end of the number.



8.12 **Insert Function Block** (Insert FB)

This function can be used to insert a function block into a scheduled block position.
The operating process is as follows:

1. Press OK at <*Insert FB*> in the <*Editor*> Frame. The inserting status is entered, as shown in Fig. 8.13

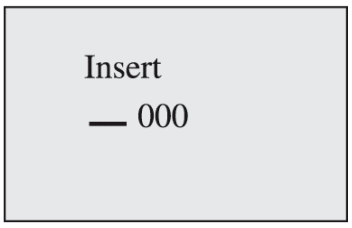


Fig. 8.13
Insert Function Block

2. Press − or + to select block number and then press OK to confirm.
   The range of inserted block number is from 001 to the maximum number of the current program.
   If the selected number is not inside this range, pressing OK will have no effect and the program will return to the original status to let you select a block number inside the correct range.
   Press ESC if you want to exit.
   If you are not sure about the maximum number in the program, use
   <*FAB/Rom* > <*Rom→FAB*> to read the program and to get the number.
3. Press OK key to confirm after the right number is entered.
   This will affect the operation and function block codes (e.g. AND, OR, NOT, RS, TEL, ...etc.) will appear for selection.

Note:

If you do not select exit, Comat BoxX will copy a function block (same block number as the previous). In Editing mode, exit is only possible after all inputs and outputs are set.
Unused inputs have to be configurated. (Select „X“ for unused inputs.)

8.13 **Delete Function Block** (Delete FB)

This function can be used to delete any function block. The operating process is as follows:

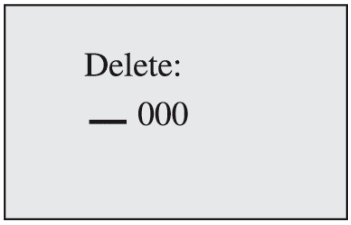


Fig. 8.14
Delete Function Block

1. Press OK at <*Delete FB*> in the <*Editor*> Frame.
   The deleting status is entered, as shown in Fig. 8.14.
2. Press − and + to select the block number, then press OK.
   The range of block number for Delete FB is from 001 to the maximum number of the current program.
   If the selected number is not in this range, OK is not accepted and it will return to the original status to let you select a block No. within the correct range.
   Press ESC to exit deleting operation.
   If the maximum number in the program is unknown, you can use <*FAB/Rom* > <*Rom →FAB*> to read the program and to get the number.

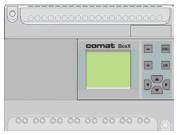
 **Note:**

The function block can only be deleted, if a valid number of the function block was entered.

8.14 **Delete Program** (Clear Prg)

This function can be used to delete all the existing programs in the Comat BoxX.

1. In the editor frame (Fig. 8.1), select <*Clear Prg*> and press OK key.
2. The above frame will last 2–3 seconds.
   After this time, you enter automatically into the edition-function selection frame.
   The old program has been cleared and you can now type in a new program.



8.15 Programming over LCD display

Take the stair lighting system for an example, with the following control requirements:

1. When the switch button is pressed, the light will be turned on and kept normally on.
2. When the sound sensing switch is on, the light will be turned on and kept on for 2 minutes.

The Function Block Diagram for the above example is as follows:

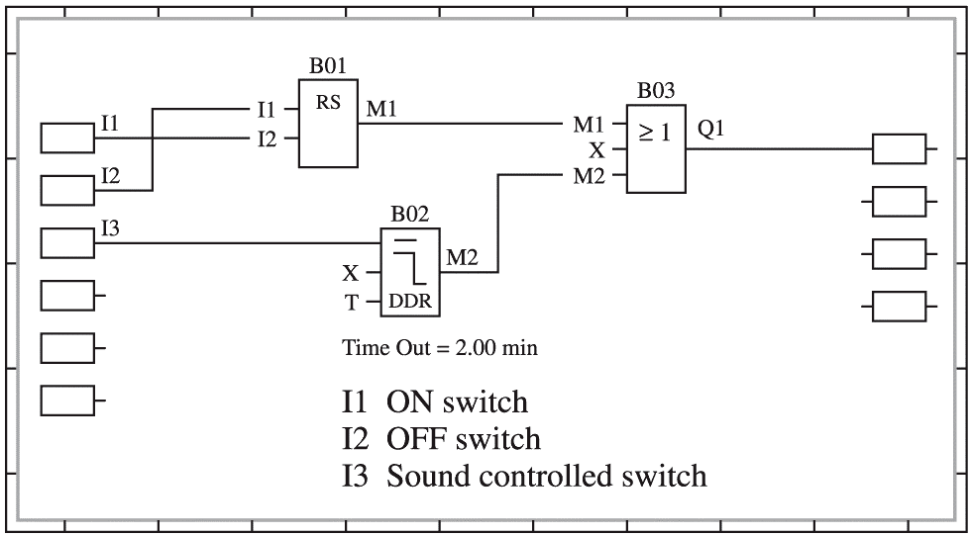


Fig. 8.15

Editing of the program function by LCD panel is executed as follows:
(In case a user program already exists in Comat BoxX)

Step 1:
Enter Comat BoxX Editor Frame.
2–3 seconds after switch-on, the following will appear on the on the LCD display.

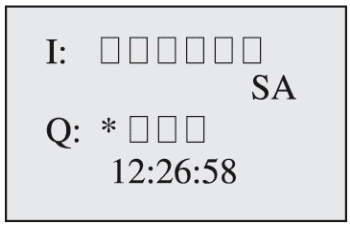


Fig. 8.16

Press ESC and OK simultaneously.
The Password Frame is shown (Fig. 8.17).
The cursor stays on the highest digit on the password.

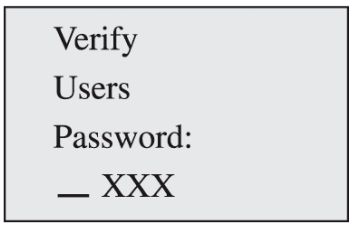


Fig. 8.17

Enter the password, for example 2165 (Password ex-factory is „0001“).
Press [+] twice and the first digit value of the password will change to „2“.
Press the right moving key [▶] and the cursor will move one digit to the right for the second digit of the password to be entered.
Press [+] once and the second digit of the password value will become „1“.
Press [▶] and the cursor will move one digit to the right for the third digit of the password to be entered.
Press [+] „6“ times and the third digit of the password value will become „6“.
Press [▶] and the cursor will move one digit to the right for the last digit of the password value to be entered.
Press [+] „5“ times and the last digit of the password value will become „5“.

After the password is entered completely, the following will be displayed on the LCD:

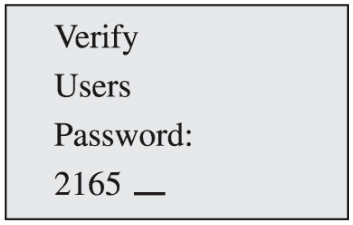


Fig. 8.18

Press [OK] and the following window will appear on the LCD:

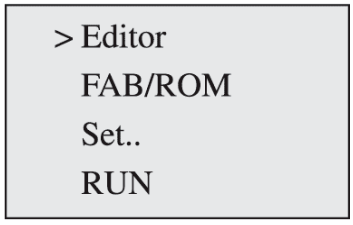


Fig. 8.19

Step 2:
Edit Frame Diagram
Press [OK] to select the Editor.
The following is displayed on the LCD:

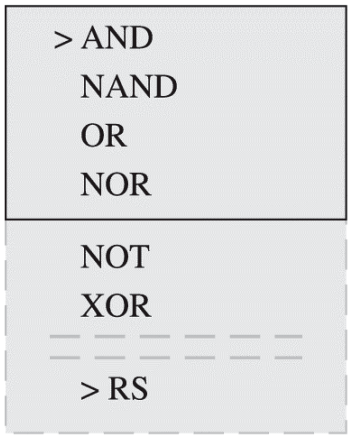
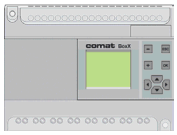


Fig. 8.20



Move the arrow to „RS relay“ with ▼ and press OK.
Function Block Set Status is now displayed with the cursor at the first input point „R“.
The LCD shows the following frame:

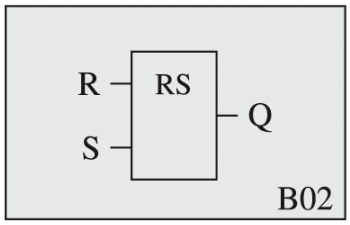


Fig. 8.21

Press OK if the cursor points on „R“ and you will see that „I“ appears instead of „R“.
The input „I“ now needs to be parameterised.
Use + and − keys to enter parameter 1.
Press OK when the correct parameter is displayed.
(The variation range of I is I1-I6 or I1-I12).

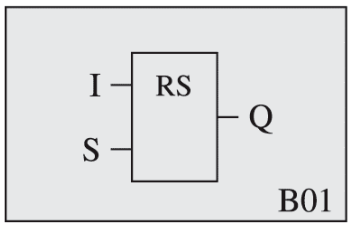


Fig. 8.22

Move the cursor with ▼ to the second input „S“.
Confirm with OK if the cursor points to „S“ and you will see that „I“ appears.
Select parameter 2 for this input.

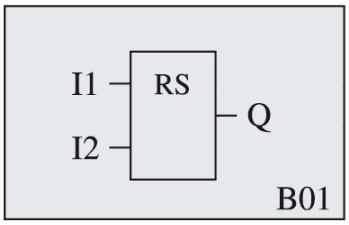


Fig. 8.23

Press ▶ to move the cursor to position „Q“ and press OK to set the output.
Selecting „M“ in the parameter list and set it to M01 with + or −.
Press OK again. The following will be displayed on LCD:

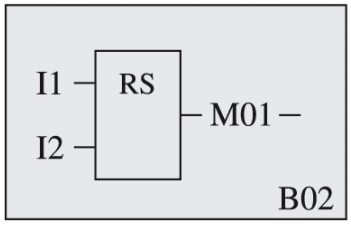


Fig. 8.24

All three points of the RS relay function block are set.
Press ESC to exit this function block and to confirm your settings.

Note:

It is not possible to exit or proceed to the next programming level with ESC or OK keys unless all the links of this block are set (including all I/O links).
Also unused inputs have to be set. Select „X“ for unused inputs.

Select and set the next function block.

Press ESC to return to the Function Block selection list NOW. Select the second function block. Use ▼ and ▲ to move the cursor.
Move the cursor to the position of DDR function block and press OK.
Set the parameters for the function block. The following frame will be shown on the LCD-display:

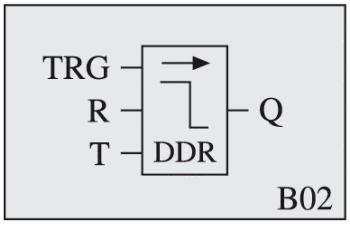


Fig. 8.25

Press OK to enter Set „TRG“ (trigger) input.
Select „I“ from the parameter list with ▼, ▲ keys and press OK.
Set „TRG“ to „I3“ with +, −. Press OK to confirm.
The following will be displayed on the LCD:

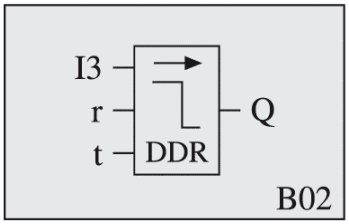


Fig. 8.26

Press ▼ to move the cursor to position „R“ and press OK to set the r-input parameter.
Press OK in the parameter list. Move with ▼ and ▲ to the parameter „X“.
„X“ is for an empty input. To set the parameter please press OK.

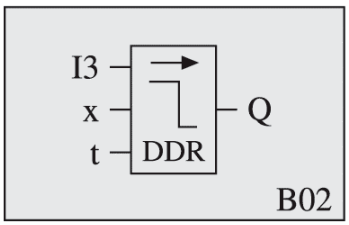


Fig. 8.27

Press ▼ to move the cursor to position „T“ and press OK to enter to set timer.
The following will be displayed on LCD:

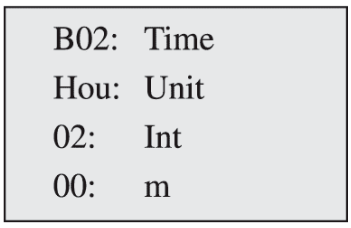
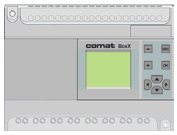


Fig. 8.28



Press OK to enter in to the Time Unit Selection Status.
The options can be changed with + and −.
When „min“ appears, press OK to set the time unit for minutes.
The following frame will be displayed on the LCD:

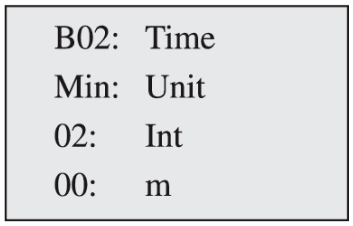


Fig. 8.29

Press ▼ to set the time integer digit „00:Int“. Use +, − to change the value. Set it as 02.
Press ▼ to set the time decimal digit „00:m“ and use +, − to change the value. Set it as 00.
The time is now set to 2 minutes.
Press OK and ESC to exit this function frame.

Press ▶ to move the cursor to position „Q“ then press OK.
Set „Q“ as „M02“ and then press OK again.
The following frame will be shown on the LCD:

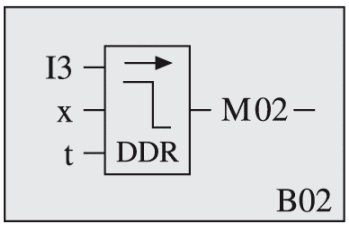


Fig. 8.30

Select and setup the third function block.
Press ESC to return to the function block selection list frame and select the third function block.
Move the cursor to position OR and press OK.
Set the parameters for the third function block.
The following will be displayed on the LCD:

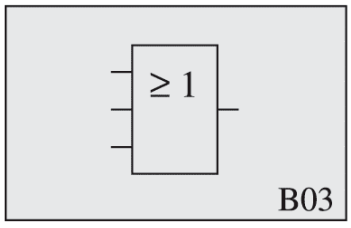


Fig. 8.31

Press OK to enter the first input parameter set status.
Select parameter „M“ with +, − and set the parameter value with ▼, ▲.
When „M01“ appears, press OK.
The first parameter is set to „M1“.
The following will be shown on the LCD:

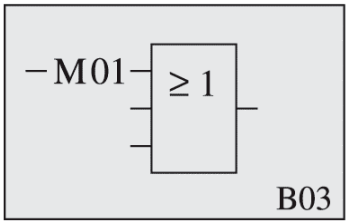


Fig. 8.32

Press ▼ to move the cursor to the second input parameter and press OK.
The second input parameter can now be set.
After selecting „X“ with ▼, ▲ pressing OK, the input is set to „X“.
The following will be displayed on the LCD:

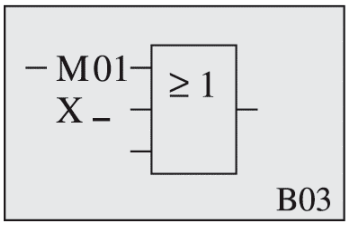


Fig. 8.33

Move the cursor to the third input and press OK.
After selecting „M“ in the parameter list, press OK and set the input to „M02“ with +, −.
The following frame will be on the LCD:

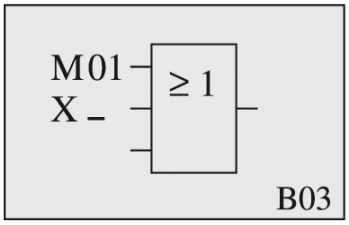


Fig. 8.34

Move the cursor to the output with ▶ and press OK.
After selecting „Q“ in the parameter list, press OK and set the output link as „Q1“ with + or −.
The following will be displayed on the LCD:

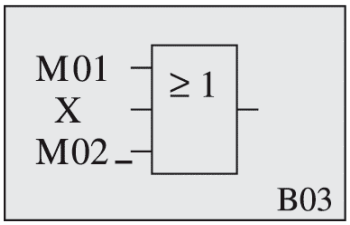


Fig. 8.35

Three function blocks required for editing of the function diagram are now selected and set.
The function diagram is now completely edited.

Step 3:
After programming, press ESC twice consecutively to return to the select function frame.
The following will be displayed on the LCD:

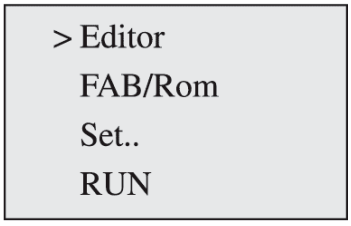
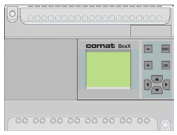


Fig. 8.36



Move the cursor to „RUN“ and press OK.

Fig. 8.37

The new program is now written into Comat BoxX.

Note:

How to read and modify the current program.
Press OK and ESC simultaneously to enter the password.
Press OK after the password is entered correctly.
Select <*FAB/Rom*> and press OK. Select <*ROM→FAB*>, then press OK.
Press ▶ or ◀ to select and read the function block and press OK to confirm.
The Function Block can now be modified.