



SOFTWARE MANUAL

α PNEUALPHA & PNEUALPHA2

SIMPLE APPLICATION CONTROLLER

Foreword

- This manual contains text, diagrams and explanations which will guide the reader in the correct programming and operation of the PneuAlpha series controller.
- Before attempting to install or use the PneuAlpha series controller this manual should be read and understood.
- If in doubt at any stage of the installation of the PneuAlpha series controller always consult a professional electrical engineer who is qualified and trained to local and national standards that apply to the installation site.
- If in doubt about the operation or use of the PneuAlpha series controller please consult the nearest SMC distributor.
- This manual is subject to change without notice.

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ECC-PNAL-PCS/WIN-E

Software Manual

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Manual revision : F

Date : October 2003

FAX BACK

SMC Pneumatics has a world wide reputation for its efforts in continually developing and pushing back the frontiers of industrial automation. What is sometimes overlooked by the user is the care and attention to detail that is taken with the documentation. However, to continue this process of improvement, the comments of the SMC users are always welcomed. This page has been designed for you, the reader, to fill in your comments and fax them back to us. We look forward to hearing from you.

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Please tick the box of your choice

What condition did the manual arrive in? ☐ Good ☐ Minor damage ☐ Unusable

Will you be using a folder to store the manual? ☐ Yes ☐ No

What do you think to the manual presentation? ☐ Tidy ☐ Un-friendly

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Which explanation was most difficult to understand:
.....

Are there any diagrams which are not clear? ☐ Yes ☐ No

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Could you find the information you required easily using the index and/or the contents, if possible please identify your experience:
.....
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.....
.....
.....

Thank you for taking the time to fill out this questionnaire. We hope you found both the product and this manual easy to use.

Guidelines for the safety of the user and protection of ECC-PNAL-PCS/WIN-E

This manual provides information for the use of ECC-PNAL-PCS/WIN-E. The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;

- a) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with regards to automated equipment.
- b) Any commissioning or service engineer must be of a competent nature, trained and qualified to local and national standards required to fulfill that job. These engineers should also be trained in the use and maintenance of the completed product. This includes being completely familiar with all associated documentation for the said product. All maintenance should be carried out in accordance with established safety practices.
- c) All operators of the completed equipment should be trained to use that product in a safe and co-ordinated manner in compliance to established safety practices. The operators should also be familiar with documentation which is connected with the actual operation of the completed equipment.

Note : the term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

Notes on the symbology used in this manual

At various times through out this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of equipment. Whenever any of the following symbols are encountered its associated note must be read and understood. Each of the symbols used will now be listed with a brief description of its meaning.

Hardware warnings



- 1) Indicates that the identified danger **WILL** cause physical and property damage.



- 2) Indicates that the identified danger could **POSSIBLY** cause physical and property damage.



- 3) Indicates a point of further interest or further explanation.

Software warning



- 4) Indicates special care must be taken when using this element of software.



- 5) Indicates a special point of which the user of the associated software element should be aware.



- 6) Indicates a point of interest or further explanation.

- Under no circumstances will SMC be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
- All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. SMC will accept no responsibility for actual use of the product based on these illustrative examples.
- Owing to the very great variety in possible application of this equipment, you must satisfy yourself as to its suitability for your specific application.

Further Information Manual Lists

	Manual Name	Manual No.	Description
⊙	αPneuAlpha2 Hardware Manual (English only)	JY992D97301	This manual contains hardware explanations for wiring, installation and specification for αPneuAlpha2 series controllers.
⊙	αPneuAlpha2 Programming Manual <English only>	JY992D97101	This manual contains instruction explanations for the αPneuAlpha2 Series controllers.
⊙	αPneuAlpha Software Manual <This manual>	JY992D74001	This manual contains explanations of operation for ECC-PNAL-PCS/WIN-E Programming Software.
○	αPneuAlpha2 Series Communication User's Manual <English only>	JY992D97701	This manual contains explanations for the setup, messaging, diagnostics, bit assignments, etc. for communications using the αPneuAlpha2 series controller.
□	αPneuAlpha2 Series Instruction Manual	JY992D97501	This manual contains hardware explanations of installation for αPneuAlpha2 Series controller.
□	ECC-PNAL2-4EX, ECC-PNAL2-4EX-A2, ECC-PNAL2-4EYR, ECC-PNAL2-4EYT Instruction Manual	JY992D97401	This manual contains hardware explanations of installation for ECC-PNAL2-4EX, ECC-PNAL2-4EX-A2, ECC-PNAL2-4EYR and ECC-PNAL2-4EYT extension module.
□	ECC-PNAL2-EEPROM-2 Hardware Manual	JY992D96801	This manual contains hardware explanations of installation for ECC-PNAL2-EEPROM-2.
□	ECC-PNAL-232CAB Hardware Manual	JY992D76001	This manual contains hardware explanations of installation for ECC-PNAL-232CAB.
□	ECC-PNAL2-GSM-CAB Hardware Manual	JY992D97201	This manual contains hardware explanations of installation for ECC-PNAL2-GSM-CAB.
□	ECC-PNAL-ASI-BD, ECC-PNAL2-ASI-BD Hardware Manual	JY992D81401 JY992D81402	This manual contains hardware explanations for wiring, installation and specification, etc. for ECC-PNAL-ASI-BD and ECC-PNAL2-ASI-BD.

- ⊙ Refer to these manuals.
- Refer to this manual if necessary.
- Refer to the content of these manuals if necessary though it is included in αPneuAlpha2 Hardware Manual.

Definitions

The following terms will be used throughout this manual and the ECC-PNAL-PCS/WIN-E programming software.

Function Block Programming - The method by which the α PneuAlpha Simple Application Controller is programmed.

Function Blocks - the heart of the αPneuAlpha series. They process information received from inputs or other sources, manipulate the data, and control the system Outputs. There are 40 (αPneuAlpha series: 26, αPneuAlpha2 series: 40) function blocks that can be found in the Accessories Toolbar under the FUNC or LOGIC headings. The function blocks have been pre-programmed to perform specific actions and may have variable parameters that can be adjusted for specific programming needs.

Function Block Diagram base (FBD base) - All system program components (Inputs, Outputs, Function Blocks, Memory Bits, or Keys) are placed on the FBD base during programming.

Digital - A type of Input or Output that only recognizes an On or Off state. An On state can also be referred to as “High” or “1” while the Off state can be referred to as “Low” or “0”.

Analog - A type of input/output that measures a Voltage or Ampere value rather than an On/Off signal.

Abbreviations

The following definitions or abbreviations will be used throughout this manual.

- The ECC-PNAL-PCS/WIN-E software will be referred to as the ECC-PNAL-PCS/WIN-E or the programming software.
- The αPneuAlpha and αPneuAlpha2 Series Simple Application Controller may be referred to as the αPneuAlpha series or the controller.
- Function Blocks may be referred to as FB(s).
- Function Block Diagram may be referred to as FBD.
- Input/Output may be referred to as I/O.
- Personal Computer may be referred to as PC
- Microsoft Windows[®], Windows[®] 95, Windows[®] 98, Windows[®] Me, Windows NT[®] Workstation 4.0, Windows[®] 2000 and Windows[®] XP may be referred to generically as Windows.

Registration

- Microsoft Windows[®], Windows[®] 95, Windows[®] 98, Windows[®] Me, Windows NT[®] Workstation 4.0, Windows[®] 2000 and Windows[®] XP are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

1. Introduction

This section describes the major functions of the ECC-PNAL-PCS/WIN-E programming software (hereafter referred to the ECC-PNAL-PCS/WIN-E or programming software) and the outline of this manual.

The following Software Manual is written for ECC-PNAL-PCS/WIN-E version V2.20. Further version of ECC-PNAL-PCS/WIN-E may change without notice. Refer to the help file for ECC-PNAL-PCS/WIN-E's changes.

1.1 Outline

The software package ECC-PNAL-PCS/WIN-E is a programming tool designed to be used with the α PneuAlpha Series Simple Application Controllers (α PneuAlpha and αPneuAlpha2 series). The ECC-PNAL-PCS/WIN-E runs on Microsoft Windows® 95, Windows® 98, Windows® Me, Windows NT® Workstation 4.0, Windows® 2000 and Windows® XP (hereafter referred to collectively as Windows). The software has been designed to be both powerful and user friendly. While many of the software features can be learned intuitively, a detailed help file has been incorporated into the software to assist users in finding answers to their questions.

1.1.1 Major Features of the ECC-PNAL-PCS/WIN-E Software

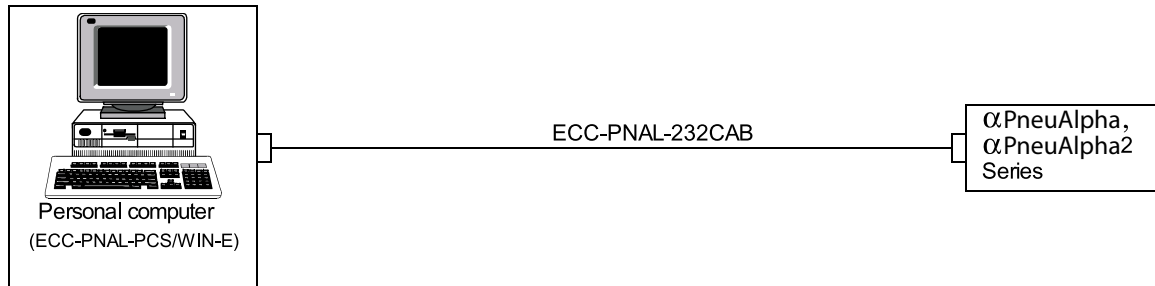
The ECC-PNAL-PCS/WIN-E is a powerful tool for programming the αPneuAlpha Series and αPneuAlpha2 Series Simple Application Controller (hereafter referred to the αPneuAlpha Series or controller) in Function Block style. The Visual Nature of the software helps the user to see and understand the relationships between all parts of the program. Powerful and easy to use, the ECC-PNAL-PCS/WIN-E has incorporated the following features for your convenience:

- **User-friendly Programming**
The program can be made the visually and easily.
The Software has been designed to operate in a user-friendly windows format.
- **Monitoring and force ON/OFF**
ReECC-PNAL-time monitoring ECC-PNAL-PCS/WIN-E allows bit device testing.
- **Simulation function**
When the simulation function is used, operation of the program can be tested off-line.
- **Remote maintenance function**
The software allows remote maintenance function to download, and to up-load and to monitor the program to the alpha series via telephone line.
- **Monitoring in System Sketch window**
The customer can make the monitor screen for the customer's system in the Monitoring in System Sketch Window.
- **User-define function block**
The user can create customize function block from the combination of the original function blocks.
- **Auto wizard function (Only supports ECC-PNAL-**M-* model)**
This function allows beginners to create function block program with the aid of a guidance window.

1.2 System Configuration

1.2.1 Direct Connection with ECC-PNAL-PCS/WIN-E

Figure 1.1: Direct Connection with ECC-PNAL-PCS/WIN-E



1.2.2 Remote Maintenance With ECC-PNAL-PCS/WIN-E

Figure 1.2: Remote Maintenance with ECC-PNAL-PCS/WIN-E

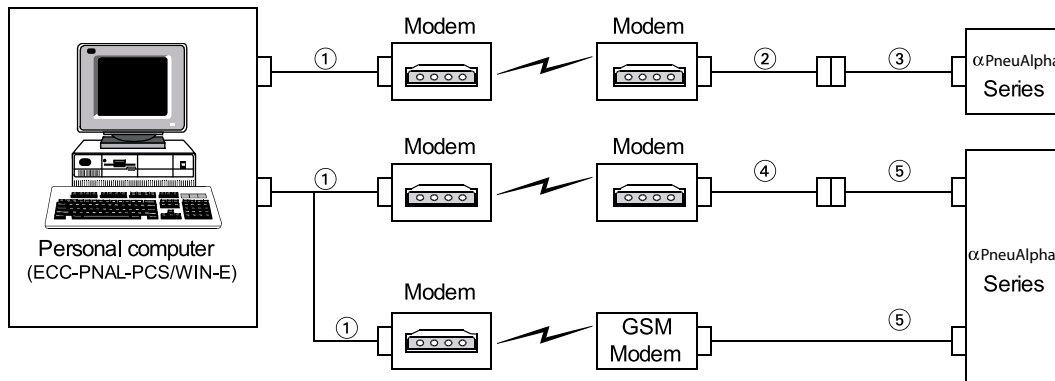


Table 1.1: Connecting by Modem

	Using Cable
1	RS-232C straight cable for the modem (specified by Modem manufacture)
2	User made RS-232C cable (Refer to Figure 11.2)
3	ECC-PNAL-232CAB
4	RS-232C straight cable for the modem (Refer to Figure 11.3)
5	ECC-PNAL2-GSM-CAB

1.3 Applicable Controllers

Table 1.2: Applicable Controllers

Model Name	ECC-PNAL-PCS/WIN-E Version (SW0D5F-ALVLS-E)
ECC-PNAL-6MR-A	Version V1.00 or later
ECC-PNAL-10M*-*	
ECC-PNAL-20M*-*	
ECC-PNAL2-14M*-*	Version V2.00 or later
ECC-PNAL2-20M*-*	

1.4 Version Up Lists

Table 1.3: History of ECC-PNAL-PCS/WIN-E (SW0D5F-ALVLS-E)

Version	Description
V1.00	Supported α PneuAlpha Series controllers with Windows [®] 95, Windows [®] 98 and Windows NT [®] workstation 4.0.
V1.30	Supported ECC-PNAL-ASI-BD AS-interface module.
V1.41	For Windows [®] Me and Windows [®] 2000.
V2.00	Supported α PneuAlpha2 Series controllers.
V2.10	<ul style="list-style-type: none">For Windows[®] XPUp to COM10 is available for COM port settingThe Import/Export function for User Function Block programming is added.

1.5 Product Configuration

Check the contents of the ECC-PNAL-PCS/WIN-E box against this list to confirm that the following accessories are supplied.

Table 1.4: Product Configuration

Items	Number	Description
Floppy Disk	3	SW0D5F-ALVLS-E 3.5 inch (1.44 MB) 1/3, 2/3, 3/3
Manual (this manual)	1	Manual number JY992D74001

MEMO

2. Installing and Starting ECC-PNAL-PCS/WIN-E

This section describes how to install the ECC-PNAL-PCS/WIN-E programming software package and to connect the α PneuAlpha Simple Application Controller to the Personal Computer. The Operation System requirements are outlined and the equipment necessary to make all proper connections are detailed.

2.1 System Requirements

The ECC-PNAL-PCS/WIN-E is designed to be installed on a computer that meets or exceeds the following specifications. Please check whether your personal computer meets these requirements prior to the software installation.



Table 2.1: Personal Computer Requirements

Item	Description
Operating System	Microsoft Windows [®] 95, Windows [®] 98, Windows [®] Me, Windows NT [®] workstation 4.0, Windows [®] 2000 and Windows [®] XP.
CPU	Pentium 133 MHz or more (recommended)
Hard Disk	10 MB of free capacity
Memory	32 MB or more (recommended)
Floppy Disk Drive	1.44 MB (Required for Setup)
Pointing Device	Mouse or other pointing device
Video	SVGA (800 x 600) 256 colors or more (recommended)
RS-232C Serial Interface	1 port or more The RS-232C serial interface must be assigned to a COM port (COM1 to COM10).

2.2 Installing ECC-PNAL-PCS/WIN-E



To install the ECC-PNAL-PCS/WIN-E component files from the 3 install disks. Note that this software cannot be run from the install (floppy) disk; this components must be installed onto hard-drive and subsequently run the software from the drive.



Note:

If the PC had been installed with ECC-PNAL-PCS/WIN-E, please uninstall it. If it is uninstalled before the install, the ECC-PNAL-PCS/WIN-E may not operate correctly. For uninstall, refer to section 2.3.

To install ECC-PNAL-PCS/WIN-E:

- 1) Restart Windows, and do not start-up any other applications.
- 2) Insert the SMC PneuAlpha disk into CD Rom drive.
- 3) Execute "setup.exe."
- 4) During the SMC SW0D5-ALVL-SML Setup dialog box, click "NEXT" whenever ready thus proceeding to the next panel.
- 5) If the destination folder need to be changed for the ECC-PNAL-PCS/WIN-E component files, click "Browse", and use the browser to locate the appropriate destination.
- 6) Click "NEXT".
- 7) If the Program folders need to be changed for the ECC-PNAL-PCS/WIN-E, enter the program folder name.
- 8) Click "NEXT" to begin the installation. When the process is complete, a message will follow indicating. He successful installation of the ECC-PNAL-PCS/WIN-E software.
- 9) Select "Yes, I want to restart my computer now", and Click "Finish" to restart your computer.

2.3 Uninstalling ECC-PNAL-PCS/WIN-E

It is possible to remove all of the ECC-PNAL-PCS/WIN-E component files installed on your system with the Install/Uninstall in the Control Panel.

To uninstall ECC-PNAL-PCS/WIN-E:

- 1) Click the "Start Menu", choose "Setting" > "Control Panel", and click it.
- 2) Double-click "Add/Remove Programs" icon.
- 3) Select "SW0D5-ALVL-SML" in the "Install/Uninstall" tab, and click "Add/Remove".
- 4) Click "Yes" to begin the uninstall of the ECC-PNAL-PCS/WIN-E component files. When the process is complete, a ECC-PNAL-PCS/WIN-E is successfully uninstalled from your personal computer.

2.4 Starting ECC-PNAL-PCS/WIN-E



This software cannot be run from the install (floppy) disk; this components must be installed onto hard-drive and subsequently run the software from the drive.

To start ECC-PNAL-PCS/WIN-E:

- Click the “Start Menu”, choose “Program” ⇒ “SMC PneuAlpha Controller”, and click the name of the program you want to start.
- It is possible to also double-click a program icon to begin start-up.

MEMO

3. Using the Help Files

The ECC-PNAL-PCS/WIN-E includes a powerful package of help files to guide the user through the programming options. Use the F1 key, or click the help icon, or use the Help pull down menu to access the help files.

3.1 The F1 Key

The F1 key will provide specific help on a highlighted object.

Click a system component on the FBD base to highlight it and press the F1 Key to bring up a dialog screen. To receive Help on a command, move to the command with the mouse until the instruction is highlighted. Use F1 to access the Help dialog box before using the command.

3.2 The Context Help



The Context Help command can provide help with Toolbars and associated commands. When choosing the Toolbar's Context Help button or pushing the "Shift" + "F1" key, the mouse pointer will change to an arrow and question mark. Then click on the item needing clarification in the application window. The Help topic will be shown for the item you clicked.

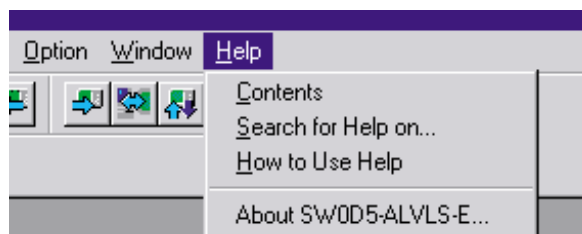


Context Help button

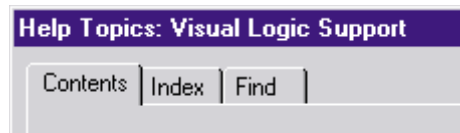
3.3 Help in Menu Bar

It is possible to also get Help by clicking "Contents" and "Search for Help on..." (Help menu).

Upon entering the Help menu the options list will be shown.



When "Search for Help On..." or "How to Use Help..." is chosen, three tabs will appear on top of the window. These tabs can be used in addition to the Help files available on the display.



3.3.1 The Contents Command or Tab

The contents menu allows the user to choose from the following categories or chapters. When an option is chosen, the main topics available for that category pop up on screen. Choose the desired topic to bring up a dialog box.

Words or phrases that are highlighted in green contain addition information in another dialog box. Click on the highlighted text to view its dialog box.



Introduction - Choose from a basic introduction, information on the FBD base, or the System Sketch Operations.

Menu Options - Choose to view detailed information upon each pull down menu available at the top of the screen.

Toolbars - Explains about the Standard, Drawing, Accessories, Controller, Image and User Function toolbar.

Functions and Signals - Learn about the functions and capabilities of the Inputs, Outputs, and Function Blocks available for programming with the ECC-PNAL-PCS/WIN-E.

Various Modes of Operation - Explains about the different modes of operation including the Programming mode, the Simulation Mode, and the Monitoring Mode.

Special Features - This section describes the various ways of Dragging and Dropping objects, and of Moving Objects with the arrow keys.

Sub FBD Window - The sub FBD window can include the part of the main FBD window or a part of another Sub FBD window. In the FBD window, the sub FBD window is shown by "User Func" icon. This User Func icon has some input pins and output pins according to the contents of its Sub FBD window.

Help Support - Provides information on using the Contents Help icon, F1 key, and help dialog boxes.

3.3.2 Search for Help On...

It is possible to search the informations and instruction for using ECC-PNAL-PCS/WIN-E or various pieces of reference information from the desired categories.

To search for Help:

- 1) Clicking “Search for Help On...” in the help menu to bring up the opening Help window.
- 2) Click on the desired category to bring up information and instructions for using ECC-PNAL-PCS/WIN-E or various pieces of reference information.

3.3.3 The Contents Tab

The contents menu allows the user to choose from the following categories or chapters. When an option is chosen, the main topics available for that category pop up on screen. Choose the desired topic to bring up a dialog box.



Introduction - Choose from a basic introduction, information on the FBD base, or the System Sketch Operations.

Menu Options - Choose to view detailed information upon each pull down menu available at the top of the screen.

Toolbars - Explains the Standard, Drawing, Accessories, Controller, Image and User Function toolbar.

Functions and Signals - Learn about the functions and capabilities of the Inputs, Outputs, and Function Blocks available for programming with the ECC-PNAL-PCS/WIN-E.

Various Modes of Operation - Explains about the different modes of operation including the Programming mode, the Simulation Mode, and the Monitoring Mode.

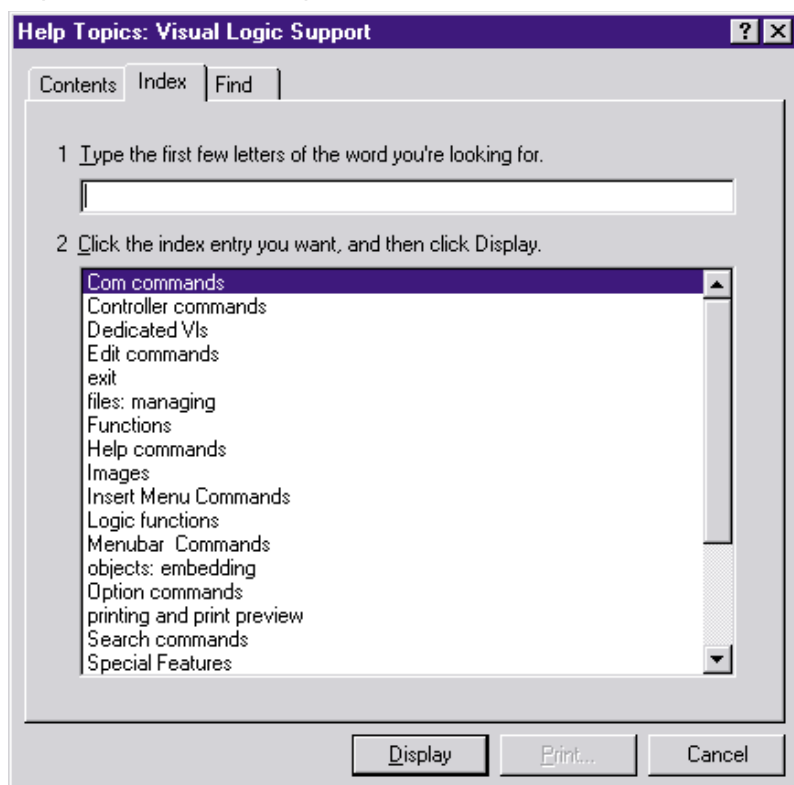
Special Features - This section describes the various ways of Dragging and Dropping objects, and of Moving Objects with the arrow keys.

Dedicated VIs - Explains about the dedicated ECC-PNAL-PCS/WIN-E. This dedicated VLS is meant for the customers who maintain the target machines.

Help Support - Provides information on using the Contents Help icon, F1 key, and help dialog boxes.

3.3.4 The Index Tab

The windows provides information on index topics. Type the first few letters of the required topic or scroll to the topic in the index list.



3.3.5 The Find Tab

The Find tab generates a list of key words on the ECC-PNAL-PCS/WIN-E and lets you search for help on those words. A matching words directory gives an option to narrow the number of matches found. A third directory lists the topics in which your word appears.



Find Setup Wizard

At first, the Find tab needs to be setup. Perform the setup in accordance with the Find Setup Wizard.

To setup Find tab:

- 1) Choose "Minimize database size (recommend)", and click "NEXT".
- 2) Click "Finish" to start creating the word list of ECC-PNAL-PCS/WIIN-E.

3.3.6 How to Use Help

Gives detailed information on "How to Use Help" and Customize the Help settings for the users convenience. Topics include finding, copying, viewing, and printing help files and manipulating the data in dialog boxes. Learn how to change the color or font size of a dialog box, add comments, or bookmark especially useful information.

3.3.7 About SW0D-ALVLS-E

Use this command to display the copyright notice and version number of your copy of ECC-PNAL-PCS/WIN-E (SW0D5F-ALVLS-SML).

MEMO

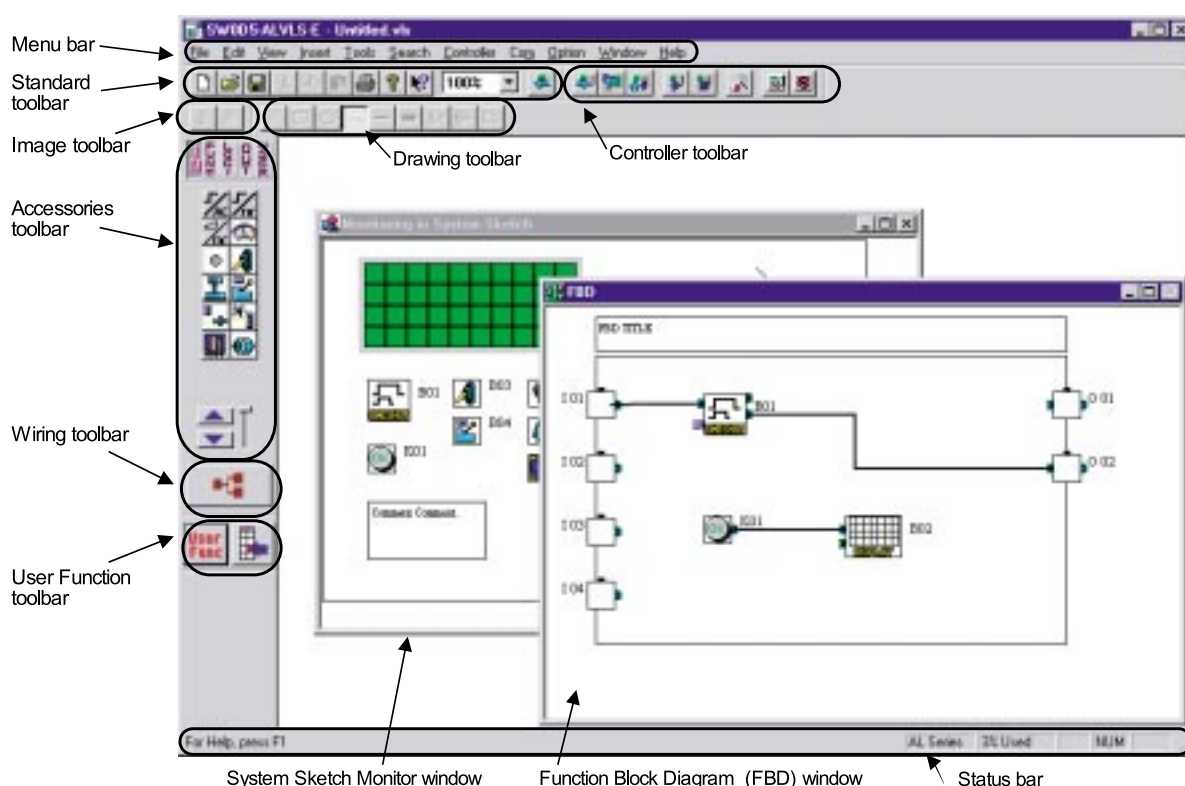
4. What You Should Know Before Starting to Program

This section describes the basic functions and background information necessary to operate the ECC-PNAL-PCS/WIN-E. Please read and understand this section prior to beginning your first program.

There are two screens that can be accessed from the ECC-PNAL-PCS/WIN-E, the Function Block Diagram base (FBD window) and the System Sketch Monitoring screen.

4.1 Screen Identification

The Toolbars have been labeled on the screen below for the user's reference. These Toolbars can be turned On or Off in the View menu. The Menu Bar runs across the top of the screen. The two main viewing screens will be discussed later in the chapter.



Menu bar - The “File”, “Edit”, “View”, “Insert”, “Tools”, “Search”, “Controller”, “Com”, “Option”, “Window”, and “Help” options are located in the menu bar. Further information can be found in the chapter 5 and Help on ECC-PNAL-PCS/WIN-E.

Standard toolbar - The Standard toolbar contains the “New”, “Open”, “Save”, “Cut”, “Paste”, “Print”, “About”, “Help”, “Zoom”, and “Read from Controller” buttons. Further information can be found in the Help on ECC-PNAL-PCS/WIN-E.

Image toolbar - The Image toolbar contains the “Import” and “Export” buttons within the Monitoring in System Sketch Window. The import button is used for inserting the previously exported image (*.img) file into the Monitoring in System Sketch Window. Further information can be found in Help on ECC-PNAL-PCS/WIN-E.

Drawing toolbar - The Drawing toolbar contains the “Line”, “Rectangle”, “Oval”, “Thin”, “Medium”, “Thick”, “Line Color”, Brush Color”, and “Align Drawing Objects” buttons. Further information can be found in the Help on ECC-PNAL-PCS/WIN-E.

Controller toolbar - The Controller toolbar contains the “Write to Controller”, “Verify Controller Data”, “Diagnosis of controller”, “Run Controller”, “Stop Controller”, “Auto FBD Wizard”, “Start/Stop Monitor”, and “Start / Stop Simulation” buttons. Further information can be found in chapter 8 ~ 10 and Help on ECC-PNAL-PCS/WIN-E.

Accessories toolbar - The Accessories toolbar contains the “Input Signals”, “Functions”, “Logic Functions”, “Output Signals”, and “User Functions” Accessory toolbar. Further information can be found in the Help on ECC-PNAL-PCS/WIN-E.

Table 4.1: Accessories toolbar

Toolbar	Description
Input Signals	Input signals accessory toolbar are icons for the input signal and system bit.
Functions	Functions accessory toolbar are icons for the function blocks.
Logic Functions	Logic functions accessory toolbar are icons for the logic function blocks.
Output Signals	Output signals accessory toolbar are icons for the Output signal and control bit.
User Functions	User functions accessory toolbar are icons for the registered user function.

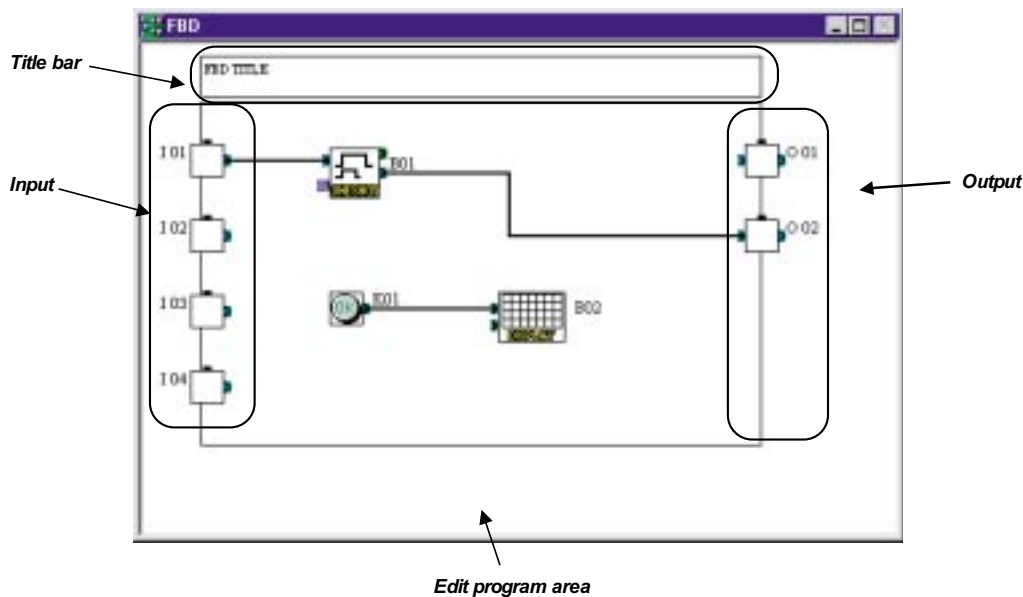
Wiring toolbar - The Wiring toolbar is only the “wiring” button. Further information can be found in chapter 6 and Help on ECC-PNAL-PCS/WIN-E.

User function toolbar - The User function toolbar are “User Func” and “User Func Registration” buttons. Further information can be found in the chapter 6 and the Help on ECC-PNAL-PCS/WIN-E.

Status bar - The Status bar is current status of the “used series”, “percentage of the used function block”, “caps lock key”, “num lock key”, and “scroll lock key”. Further information can be found in Help on ECC-PNAL-PCS/WIN-E.

4.2 The Function Block Diagram (FBD) Window

The Function Block Diagram (FBD) window is used to program the α PneuAlpha series controller. The FBD window consists of a large wiring area (lime green by default), a title box and input and output rectangles vertically along the right and left hand sides, respectively. Programming components are placed on the wiring area or in the rectangles, and connected by single wires to construct the program for the α PneuAlpha series. The FBD window is also known as FBD Wiring area.



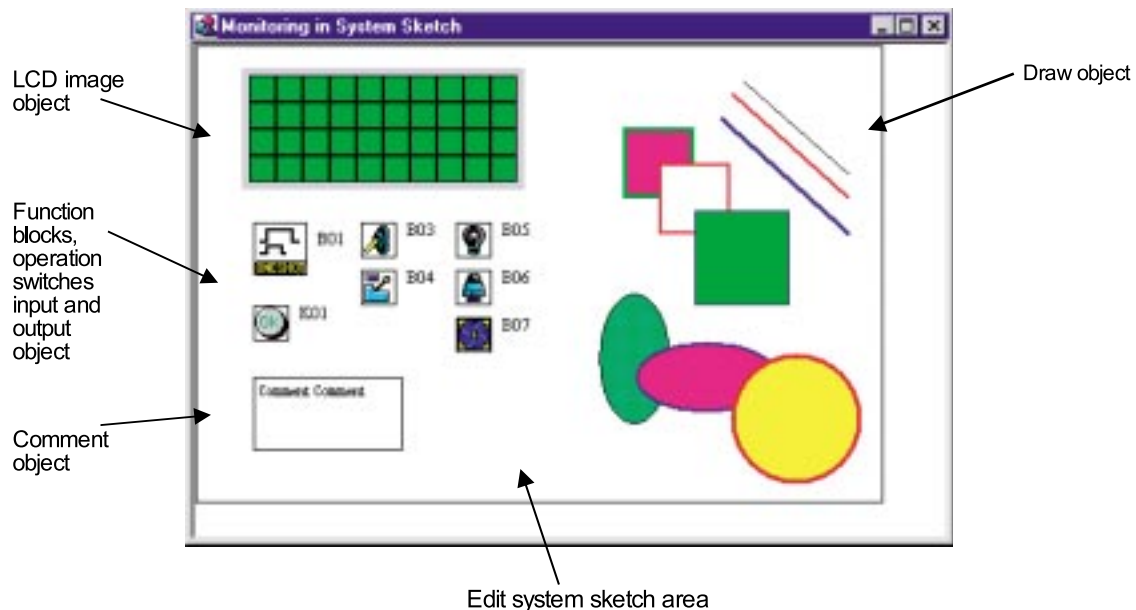
The user can perform the following ten operations using FBD window. Refer to Chapter 6 for more details. The size for edit program area can be changed by the operation of mouse.

- 1) Place the I/O signals and functions using the Accessories Toolbar.
- 2) Assign parameters to functions.
- 3) Wire the various program components together (with the help of Wiring Analyser).
- 4) Writes the Program logic and I/O device's information to the α PneuAlpha series.
- 5) Invoke Auto FBD Wizard to begin to program with guidance.
- 6) Test the program logic with Internal Devices (Input and Output signals placed in the FBD wiring area).
- 7) Simulate and check the programming logic off-line without connecting an α PneuAlpha series. The user can:
 - force input signals ON/OFF
 - change function parameters (timers, counters, analog data, etc.)
 - display comments or function values on screen
 - Monitor component status via changing wire colors (ex. Red Wire = OFF, Blue Wire = ON)
- 8) Read information from an α PneuAlpha series and recreate the Program on the FBD window.

- 9) Monitor an α PneuAlpha series on-line.
- 10) Print the FBD screen and component information shown on the FBD window.

4.3 The Monitoring in System Sketch Window

The Monitoring in System Sketch window is the customizing monitor window. The icons for I/O, the function blocks, the images, and the state of LCD, etc. can be displayed in this window. Further information can be found in chapter 7.



The following operations can be performed in System Sketch window. The size for the edit system sketch area can be changed by the operation of mouse.

- 1) Draw a diagram using the Drawing toolbar.
- 2) Place the I/O devices and Function Blocks to represent the α PneuAlpha series set-up.
- 3) Place OLE components in the System Sketch window.
- 4) Monitor/test an operational α PneuAlpha series.
- 5) Simulate and check the programming logic without connecting the actual α PneuAlpha series.
- 6) Print the System Sketch Monitor window and the component information contained in the window.
- 7) Import Bitmap Images.

4.4 The Programming Mode

This is the mode in which all programs are created and system components are added or deleted. Also known as the Drawing mode, all the toolbars and the menu options will be enabled for programming or drawing. The FBD window and System sketch windows will default to the Programming mode when files are created or opened. The indication title will be displayed as “FBD” in the FBD window and as “Monitor in System sketch” in the System sketch window.

4.4.1 The FBD Window in Programming Mode



As the name suggests, all the functions necessary to build a program can be accomplished in the programming mode. The user may add FBs or other signals, set or change parameters, move components, and perform wiring operations in the programming mode. (See Chapter 6 for more details.)

The Auto Wizard Function is also available in this mode. The main purpose of Auto FBD Wizard is to educate inexperienced users so that they can get acquainted with Signals, Function Blocks, Wiring and related programming items.

4.4.2 “Monitoring in System Sketch Window” in the Programming Mode

The user is allowed to add, modify, move, and resize the drawing objects in System sketch window. Use the Accessories Toolbar to add components as in the FBD window. Copy components to or from the FBD window. Select any component in the window by pressing the mouse left button and drag the object to the desired location. Double click on a Function Block to open the parameter setting dialog.

Objects can be drawn via the Drawing Tool bar with the Line, Oval, and Rectangle commands and/or import objects with the commands in the Insert Menu.

4.5 The Simulation Mode



The Simulation mode will mimic the conditions under which a program is run without physical connection to the hardware. This is a very powerful tool for debugging programs prior to writing the contents to an actual target α PneuAlpha series.

The information generated by the program will be continuously read from the Simulator. The On/Off status and current values of the Signals and Function Blocks will be updated by the ECC-PNAL-PCS/WIN-E or the user can input values for simulation purposes. The user can control the On/Off state of Inputs with the click of a mouse and can directly set analog values.

4.6 The Monitor Mode



The Monitor Mode can monitor and test the actual target α PneuAlpha series hardware which is connected to the PC through an ECC-PNAL-232CAB or modem. The information regarding the state and current value of Signals and Functions will be continuously read from the target α series and updated accordingly in the ECC-PNAL-PCS/WIN-E.

If the α PneuAlpha series contents are updated via the α PneuAlpha series operation keys, a message box will appear stating the α series contents are updated and monitoring will be stopped. The application will automatically switch to Program mode.

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5. Menu Bar Functions

This chapter gives a brief description of the available functions contained in the Pull Down menus.



5.1 File

New (Ctrl+N) - Creates a new file with windows in both the FBD and Monitoring in System Sketch window. When the FBD window and the system sketch monitor window have already been displayed, the dialog box to save the file under the display is viewed.

Open... (Ctrl+O) - Opens an existing file with windows in both the FBD and Monitoring in System Sketch window. When the FBD window and the system sketch monitor window have already been displayed, the dialog box to save the file under the display is viewed.

Close - Closes existing active documents in both the FBD and System Sketch window, and the dialog box to preserve the file under the display is viewed.

Save (Ctrl+S) - Saves (overwrites) the current file to its current name and directory. When creating new file, this process is same as "Save As..."

Save As... - Saves the current file under a new name and or directory. The first time a file is saved this command will come up so that the file can be named.

Print Setup... - Selects a printer and printer connection from the Print Setup Dialog Box that appears on the screen.

Print Preview - Views the active document as it would appear if printed. This command is disabled if either of the FBD or Monitoring in System Sketch window is minimized.

Export Registered User Func - The registered UserFunc data (User Function Block) is exported (stored) to a designated folder; Thus, registering the UserFunc data (User Function Block) is possible from one PC to another.

Import Registered User Func - The exported UserFunc data (User Function Block) is imported from a designated folder; Thus, registering/transferring the UserFunc data (User Function Block) is possible from one PC to another.

Print... (Ctrl+P) - A Print Dialog box appears onscreen to select options and Print data.

Recent File(Max.8) - Displays the history of the file opened in the past. The histories are displayed up to 8 for the one preserved as a file. Moreover, by selecting the arbitrary file from the displayed history, and selecting; The file that has been opened in the past can be opened again.

Exit - Ends the VLS session. When the displayed file was not saved, the dialog box to preserve the file under the display is viewed.

5.2 Edit

Undo (Ctrl+Z) - Cancels the Previous Instruction. There is only one level of Undo available.

Redo (Ctrl+Y) - Cancels the Previous Undo Instruction. There is only one level of Redo available.

Cut (Ctrl+N) - Removes the selected data from the Screen and place it to the Clipboard.

Copy (Ctrl+C) - Copy the selected data to the Clipboard.

Paste (Ctrl+V) - Adds the data from the Clipboard to the Program

Delete (Del) - Deletes the selected data from the program.

Select All (Ctrl+A) - Select All the function blocks on the screen.

Insert Func - Inserts a new function block on the FBD window or on the Monitoring in System Sketch Window. Select the function block to be inserted. Click the position where the function block to be placed on the FBD window or the Monitoring in System Sketch Window.

Change Func - Changes the function block placed by the FBD window or the Monitoring in System Sketch Window. Select the function block to be placed newly after the icon to be altered is clicked.

Insert Logic - Inserts a new logic block on the FBD window or on the Monitoring in System Sketch Window. Select the logic block to be inserted. Click the position where the logic block is to be placed on the FBD window or on the Monitoring in System Sketch Window.

Change Logic - Changes the logic block placed by the FBD window or the Monitoring in System Sketch Window. Select the logic block to be put newly after the icon to be changed is selected.

5.3 View

Close (Open) System Sketch - Closes the System Sketch Screen. If the screen is closed, the title will change to **Open System Sketch**.

Close (Open) FBD - Closes the Function Block Diagram base. If closed, the menu option will change to **Open FBD**.

Standard Toolbar - When the Check mark appears, the Standard Toolbar will be displayed onscreen.

Controller Toolbar - When the Check mark appears, the Controller Toolbar will be displayed onscreen.

Drawing Toolbar - When the Check mark appears, the Drawing Toolbar will be displayed onscreen.

Accessories Toolbar - When the Check mark appears, the Accessories Toolbar will be displayed Onscreen.

Wiring Toolbar - When the Check mark appears, the Wiring Toolbar will be displayed onscreen.

Image Toolbar - When the Check mark appears, the Image Toolbar will be displayed onscreen.

User Function Toolbar - When the Check mark appears, the User Function Toolbar will be displayed onscreen.

Status Bar - When the Check mark appears, the Status Bar will be displayed Onscreen.

Zoom - Choose from 200 (Ctrl+PageUp), 150, 100 (Ctrl+Home), 75, 50 (Ctrl+PageDown), 25, or 10% zoom factors.

5.4 Insert

LCD Image - Displays the same content as the liquid crystal display of the α PneuAlpha Series. The Monitoring in System Sketch Window can use the LCD image only by 1 point.

Comment - The FBD window and the Monitoring in System Sketch Window displays comment. The comment control statement is not limited to a number of strokes with this software.

Insert New Object... - Inserts the data made by other applications as a display panel item on the Monitoring in System Sketch Window.

Links... - This menu will be active when the selected object is the linked file. The object file must appear on the "Link" when inserting object via the "Insert New Object..." In this menu, the following is possible.

- Display the linked file information
- Update the linked file data
- Edit the linked file with the used source application. In this case, the application is opened.
When this object is double-clicked, the source application will be opened.
- Change the current file to other file.
- Break the link information. Therefore, the linked file is converted to ECC-PNAL-PCS/WIN-E data. In this case, the file cannot be edited with the source application.

Object - Opens the application in which the selected embedded or linked object was created thus editing is possible.

5.5 Tools

Start Auto FBD Wizard - Starts the auto FBD wizard function. However, this command supports only the αPneuAlpha series (Model: ECC-PNAL-**M*-*). When choosing αPneuAlpha2 series, this command does not support the Auto FBD Wizard.

RenumBer Signals - Updates the FB number of the icon placed on the FBD window and the Monitoring in System Sketch Window. When the function block is deleted after the program is constructed, the number of the icon becomes empty. The number allocated to the function block is updated when "Renumber Signals" is executed, and the number of the deleted icon is filled.

5.6 Search

By Comment - Searches for a Function Block by the attached comment. The comment does not have to be displayed nor is the search case sensitive. The text, however, must be an exact match. If a match is found, the block will be highlighted.

By SignAl Number - Search for the Function Block by the coded signal number. The alphanumeric sequence as it appears onscreen - one letter followed by two numbers. The letters are not case sensitive. Ex. - M01, i06, B12.

5.7 Controller

Write to Controller - Write the program from the ECC-PNAL-PCS/WIN-E to the memory of the α PneuAlpha series. The contents of the α PneuAlpha series memory will be completely overwritten.

Read from Controller - Uploads the contents of the α PneuAlpha series memory into the VLS program. The current program in VLS will be overwritten.

Verify Controller data with VLS - Verify the data in the FBD matches the data in the α PneuAlpha series memory.

Clear Controller Contents - Clears the memory of the α PneuAlpha series that is connected to the PC.

Diagnosis of Controller - Brings up a dialog box with the following information about the connected α PneuAlpha series:

Table 5.1: Diagnosis of Controller

Items	Description		α Pneu Alpha Series	α Pneu Alpha2 Series
Version	Version number; Ex. 1.60		✓	✓
Input Terminals	Number of input terminals		✓	✓
Analog Inputs	It is possible to use the number of analog inputs.		✓	✓
Output Terminals	Number of output terminals		✓	✓
Input Type	DC	DC input type	✓	✓
	AC	AC input type		
Error Code	See Note 1 (table 5.2)		✓	✓
Run Status	Running	α PneuAlpha series into Run mode	✓	✓
	Stopped	α PneuAlpha series into Stop mode		
Program write	Enable	It is possible to write program data from the ECC-PNAL-PCS/WIN-E.	✓	✓
	Disable	It is impossible to write program data from the ECC-PNAL-PCS/WIN-E.		
Clock Status	Going	Clock is going.	✓	✓
	Stopped	Clock stops. Set current time into the α PneuAlpha series. The clock will be going.		
User Memory	Used memory size / Total memory size		✓	✓
Used Blocks	Used function (logic) blocks / Maximum function (logic) blocks allowed		✓	✓
Max. Scan Time (ms)	Maximum 1 scan time		-	✓
Min. Scan Time (ms)	Minimum 1 scan time		-	✓
Current Scan Time (ms)	Current scan time		-	✓
Dedicated ComPort Error	See Note 2 (table 5.3)		-	✓

Table 5.1: Diagnosis of Controller

Items			Description	α Pneu Alpha Series	α Pneu Alpha2 Series
GSM	Status	Response from GSM modem	When the Check mark appears, there is response.	-	✓
		Initial successful	When the Check mark appears, initialization is successful.	-	✓
		Set PIN Code	When the Check mark appears, α PneuAlpha2 series has the correct pin code setting.	-	✓
		Network registration finished	When the Check mark appears, network registration is finished.	-	✓
		GSM CME Error	When the Check mark appears, GSM SME Error has occurred.	-	✓
		GSM CMS Error	When the Check mark appears, GSM SMS Error has occurred.	-	✓
		Remote Access successful	When the Check mark appears, remote access is successful	-	✓
		SMS is sending or retrying	When the Check mark appears, SMS is sending or retrying	-	✓
		SMS is waiting for sending	When the Check mark appears, SMS is waiting for sending status	-	✓
		SMS is failed in sending	When the Check mark appears, SMS has failed to send	-	✓
		SMS failed in sending due to wrong setting	When the Check mark appears, SMS failed in sending due to incorrect setting	-	✓
	CME Error		Please see manual for GSM modem.	-	✓
	CMS Error		Please see manual for GSM modem.	-	✓
	Signal Strength (%)		This status shows state of the radio wave on GSM network. See Note 3 (Table 5.4)	-	✓

Note 1; Error Codes for α PneuAlpha Series Main Module

The α PneuAlpha series returns from error condition when the power supply is reentered after the error causation is obviated.

Table 5.2: Error Codes for α PneuAlpha Series Main Module

Message	Description
No Error	Error has not occurred in the α PneuAlpha series.
EEPROM fail	Memory cassette is incorrect. Please check the memory cassette is correctly installed, into α PneuAlpha series.
Other Error	Program data is incorrect. The program included in the memory cassette has more points of input and/or output than is allowed in the α PneuAlpha series. Please check model type, and download program data into α PneuAlpha series. If the α PneuAlpha series has not recovered please consult a SMC Distributor.

Note 2; Dedicated ComPort Error

Please check the following points for Dedicated ComPort Error.

Table 5.3: Dedicated ComPort Error

Message	Description
No Errors	No error with communication via ECC-PNAL2-GSM-CAB.
Parity etc.	Parity, overrun or framing error occurred during communication via ECC-PNAL2-GSM-CAB. Checking Points: Check the connection, data format (Data bit, Parity, Stop bit and Baud rate) and communication timing during communication via ECC-PNAL2-GSM-CAB. If the connection, data format and communication timing are correct, thus possibility to have received the influence of the electrical noise may have caused the problem.
Time-out	Time-out error occurred during communication via ECC-PNAL2-GSM-CAB. Checking Points: Check the connection, data format (Data bit, Parity, Stop bit and Baud rate) and communication timing during communication via ECC-PNAL2-GSM-CAB.

Note 3; Signal Strength

This status shows the state of the radio wave on GSM network.

Table 5.4: Signal Strength

Value (%)	Reception Level of Radio Wave
0	-113dBm or less
3	-111dBm
6~96	-109 ~ -53dBm
100	-51dBm or more
0	Not received radio wave

Check Used Memory (Memory Configuration_Usage) - Check the amount of the following items in the displayed file.

Table 5.5: Check Used Memory (Memory Configuration_Usage)

Items	Description	α PneuAlpha Series	α PneuAlpha2 Series
Used Memory	Used memory / Total memory	✓	✓
Used Block(s)	Used function (logic) blocks / Maximum blocks allowed	✓	✓
Input Signal(s)	Number of input terminals	✓	✓
Communication Memory (byte(s))	Used memories for communication by dedicated protocol	-	✓

Simulation - The simulation mode will run the program in the ECC-PNAL-PCS/WIN-E without an α PneuAlpha series. This is very useful to check your program prior to transferring it to the actual system.

Drive Controller - Change the connected α PneuAlpha series into Run or Stop mode.

Monitor/Test - Monitor the status of the connected α PneuAlpha series from the ECC-PNAL-PCS/WIN-E.

5.8 Com

Configuration - Sets the Configuration of the communication port. The user can choose between a modem or a Com port to communicate with the αPneuAlpha series.

Connect Line - Dial a Telephone number by invoking the Ring Telephone dialog.

Disconnect Line - Disconnect an ongoing call. An active Modem line should be disconnected before it can be used again for communication.

5.9 Option

Select Controller Type - It is possible to change model type (series, I/O points) for programming. This menu is displayed in FBD window only.

Change Input/Output Pins... - It is possible to change number of I/O pins for the user function block. This menu is displayed in the Sub FBD window only.

User Defined Icons - Import your own user defined icons for the signal icon and the function icon (Technical, Fancy).

Function Icon Set - Select the icon set to be displayed on screen from the LCD Image, the system icon (Technical, Fancy) or user icon (Technical, Fancy).

Set Wire colour - Set the wire colour for the Edit and Simulation modes on the FBD window.

Set Base colour - Set base colour of the FBD (Function Block Diagram) or the Monitoring in System Sketch base.

Date Format - Select one of the following formats in which the calendar date will be shown. mm/dd/yy, dd/mm/yy, yyyy/mm/dd.

Change Current Time - Change the current time in αPneuAlpha series.

GSM and Serial Communication... - Sets modem and GSM modem settings for remote maintenance and serial communications for the dedicated protocol.

Dedicated Communication... - Set station number and communication data for dedicated protocol communication.

Select Font - Changes font all windows.

Password - Enter Password for program protection.

Grid - Choose the Horizontal and Vertical Grid line spacing from 2 to 32.

Show Grid - Hide or Display the Grid lines on the FBD window.

5.10 Window

Cascade - Use this command to arrange multiple open windows in an overlapped fashion.

Tile - Use this command to vertically arrange multiple open windows in a non-overlapped fashion.

1 Monitoring in System Sketch - Open the Monitoring in System Sketch Window for monitoring/editing.

2 FBD - Open the Function Block Diagram base for monitoring or editing.

5.11 Help

Contents - Shows the Table of Contents of the Help Function. The user can click on the desired chapter and the help file will appear onscreen.

Search for Help on... - Displays the opening screen of the Help command. Choose from a list of instructions and reference information on the features of the ECC-PNAL-PCS/WIN-E.

How to Use Help - Provides information on how to use and customize the help function.

About VLS... - Provides the Version number and Copyright notice for the ECC-PNAL-PCS/WIN-E package.

MEMO

6. Function Block Diagram (FBD) Programming

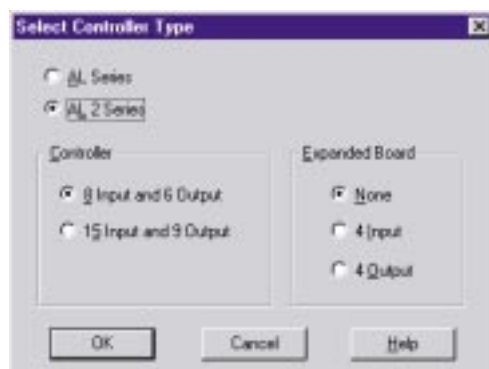
6.1 Opening a New File

When creating a new file, follow the instruction below.

Moreover, open an existing file with the “Open...” command under File or by clicking on the Open icon. A list of the current ECC-PNAL-PCS/WIN-E files contained in the “Prog” default folder will appear. Choose a file from this folder or browse and open a file in another location.

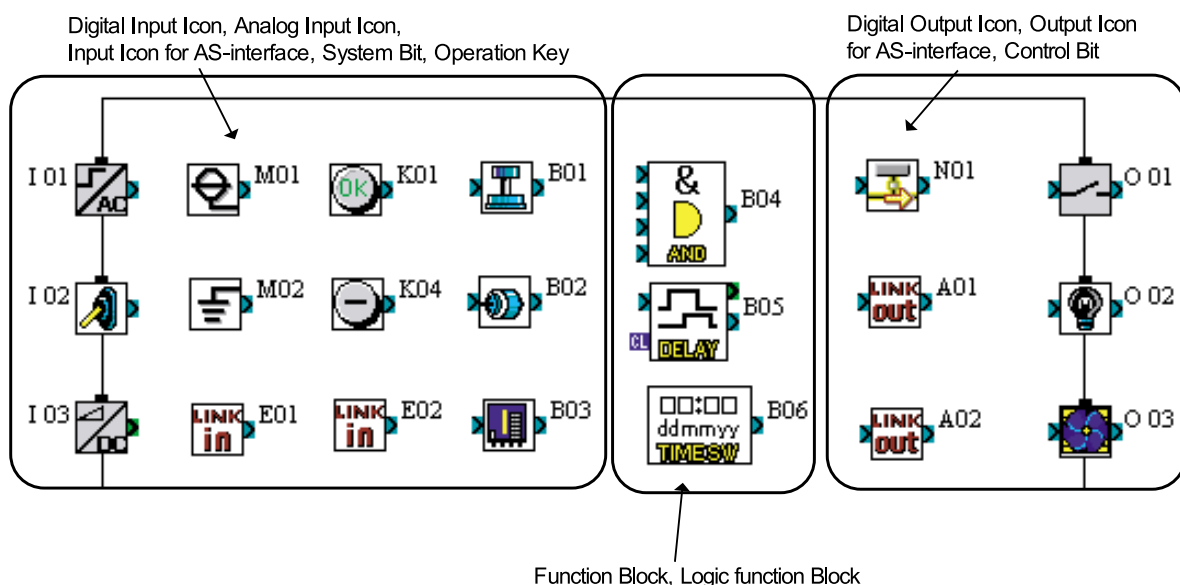
To open a New File:

- 1) Starting ECC-PNAL-PCS/WIN-E. (Refer to 2.4)
- 2) Click “New” button on Standard Toolbar, or Choose and click “File” then “New” in the Menu bar.
- 3) Choose the appropriate series name, and click it.
- 4) Choose I/O point, and click it.
- 5) Click “OK”



6.2 Component Items (Icons) of the Program

Programs for the αPneuAlpha series can be created and edited from the Program Edit Mode. Program Edit is the default mode for the ECC-PNAL-PCS/WIN-E. The αPneuAlpha series is programmed by placing items on the FBD Base and connecting the various components together with the wiring analyzer. There are 8 types of system components that can be placed on the FBD base. A short description of the function and placement locations possible for the various components follows;



6.2.1 FBD Base

The Function Block Diagram (FBD) base in the FBD Window provides the platform upon which the program for the αPneuAlpha series is constructed. The FBD base consists of a large wiring area (lime green by default), a title box and input / output rectangles vertically along the right and left hand sides, respectively. Programming components are placed on the wiring area or in the rectangles, and connected by wires to construct the program of the αPneuAlpha series.

6.2.2 Inputs

The types of input signals are the Digital Inputs, Analog Inputs and AS-interface bits. The icons can be found under the Input Signals Accessories Toolbar “IN” at the left of the FBD base.

- 1) The digital signals can be placed on the Input rectangles at the left of the FBD base or on the base itself. Each icon functions in the same way. The different icons have been developed to aid in the documentation and understanding of the program. Use an input icon that corresponds to the actual input device to be connected to the α series. The names of the signals will appear when the mouse arrow is placed on the icon.
- 2) The analog signals can be placed only in Input Rectangles I01 - I08.
- 3) Four AS-interface bits, E01 - E04, are available when using the following location. These inputs can be placed anywhere on the FBD base and will not be counted toward the number of system Inputs.

Table 6.1: Applicable AS-interface module

Series	Location
αPneuAlpha Series	ECC-PNAL-20M*-* model + ECC-PNAL-PCS/WIN-E Version V1.30 or later
αPneuAlpha2 Series	ECC-PNAL2-**M*-* model + ECC-PNAL-PCS/WIN-E Version V2.00 or later



6.2.3 Outputs

Output signals is the Digital Outputs and AS-interface bits. The icons can be found under the Output Signals Accessories Toolbar “Out” at the left of the FBD base.

- 1) The system outputs should be placed in the output rectangles on the right side of the FBD base. Outputs placed outside the rectangles will act as neutral blocks. The outputs blocks have one input pin and one output pin that can connect to other function blocks or outputs.
- 2) 4 AS-interface outputs, A01 - A04, are available when using the following location. These Outputs can be placed anywhere on the FBD base and will not count towards the number of system outputs.

Table 6.2: Applicable AS-interface module

Series	Location
αPneuAlpha Series	ECC-PNAL-20M*-* model + ECC-PNAL-PCS/WIN-E Version V1.30 or later
αPneuAlpha2 Series	ECC-PNAL2-**M*-* model + ECC-PNAL-PCS/WIN-E Version V2.00 or later



6.2.4 Operation Keys

There are eight signals that correspond to the front panel keys and these signals may be used as additional digital inputs. These are the ESC, OK, “+”, “-”, p, q, t and u keys. Press the front panel keys while the αPneuAlpha series is in Run mode to active the signals.

These keys may be placed only on the FBD Base and can be found in the Input Signals Accessories Toolbar “IN”. The names of the signals will appear when the mouse arrow is placed on the icon.



6.2.5 System Bits

These System bits act as digital inputs and can be placed on the FBD base. The system bits have the following set functions. These bits can also be found under the Input Signals Accessories Toolbar “IN”. The names of the signals will appear when the mouse arrow is placed on the icon.

Table 6.3: System Bits

System Bit	Description	αPneu Alpha Series	αPneu Alpha2 Series
M01	Always “ON”	✓	✓
M02	Always “OFF”	✓	✓
M03	Alternate - 0.5 seconds “ON”, 0.5 seconds “OFF”	✓	✓
M04	“ON” when Real Time Clock data error occurs	✓	✓
M05	“ON” when Summer time schedule is activated	✓	✓
M06	“ON” when communication Error of AS-interface occurs	✓	✓
M07	“ON” when communication Error by AS-interface power failure occurs	✓	✓
M08	“ON” when turn Stop mode turns to Run mode in the αPneuAlpha2 Series. The “ON” signal acts as a pulse output and then turns “OFF”.	-	✓
M09	“OFF” when turn Stop mode turns to Run mode in the αPneuAlpha2 Series. The “OFF” signal acts as a pulse output and then turns “ON”.	-	✓
M10	Reserved	-	✓
M11	Reserved	-	✓
M12	“ON” when CD (DCD) signal is turned “ON” (receiving CD signal from modem)	-	✓
M13	“ON” when it is possible to access the GSM network.	-	✓
M14	“ON” when the αPneuAlpha2 series is accessed via GSM.	-	✓



6.2.6 Control Bits

These Control bits act as digital outputs and can be placed on the FBD base. The control bits have the following set functions. These bits can also be found under the Output Signals Accessories Toolbar “OUT”. The names of the signals will appear when the mouse arrow is placed on the icon.

Table 6.4: Control Bits

Control Bit	Description	αPneu Alpha Series	αPneu Alpha2 Series
N01	ON: Disconnected to AS-interface network OFF: Connect to AS-interface network	✓	✓
N02*1	ON: The back light is “OFF” in LCD. OFF: The back light is controlled by the “Light Time” setting in Menu.	-	✓
N03*1	ON: The back light is “ON” in LCD. OFF: The back light is controlled by the “Light Time” setting in Menu.	-	✓
N04	ON: The user screen is controlled by the setting of “Display Manager” with ECC-PNAL-PCS/WIN-E. OFF: The user screen is controlled by user program.	-	✓

*1 When both N02 and N03 are ON and hence the back light is “ON” because N03 is given the priority.



6.2.7 Logic Function Blocks



The 6 Logic Function Blocks - AND, OR, NOT, XOR, NAND, NOR - can receive only digital inputs. These blocks turn their Output on depending on the ON/OFF conditions of their Inputs. The Logic Blocks can be found under the Logic Functions Accessories Toolbar “LOGI”. The names of the blocks will appear when the mouse arrow is placed on the icon. Further information about each block can be found in the programming manual and Help on ECC-PNAL-PCS/WIN-E.

Table 6.5: Logic Function Blocks

Logic Function Block	Description	αPneu Alpha Series	αPneu Alpha2 Series
AND	Output “ON” when all Inputs are “ON”, Unused inputs considered “ON”	✓	✓
OR	Output “ON” when at least one input “ON”, Unused inputs considered “OFF”	✓	✓
NOT	Inverts a signal; changes an “OFF” to an “ON” and vice versa	✓	✓
XOR	Exclusive OR; Output “ON” when only One of Two Inputs is “ON”	✓	✓
NAND	Not AND; Output “OFF” only when all Inputs “ON”, Unused inputs considered “ON”	✓	✓
NOR	Not OR; Output “OFF” when at least one Input is “ON”, Unused inputs considered “OFF”	✓	✓



6.2.8 Function Blocks



The kind of the supporting function blocks are different as shown in the table below according to the series.

The Function Blocks can be found under the Functions Accessories Toolbar "FUNC". The names of the blocks will appear when the mouse arrow is placed on the icon.

Further information about each block can be found in the programming manual and Help on ECC-PNAL-PCS/WIN-E.

Table 6.6: Function Blocks

Function Block		Description	αPneu Alpha Series	αPneu Alpha2 Series
Name	Symbol			
Boolean	BL	Logic equation using AND, OR, XOR, NOT	✓	✓
Set/Reset ^{*1}	SR	Latch a relay in SET or RESET position, give Set or Reset priority	✓	✓
Retentive Set/Reset ^{*1}	RSR	Latch a relay in SET or RESET position, give Set or Reset priority. The last output status is kept when the power supply is cycled OFF and ON. However, last output status is lost when the αPneuAlpha2 series is placed in the Stop mode.	-	✓
Delay	DL	Delay a signal on the Rising, Falling, or both Edges	✓	✓
One Shot	OS	Send a single pulse; Time or Input signal based, Reset pin available	✓	✓
Pulse	PL	Send a Pulse on the Rising, Falling, or both Edges	✓	✓
Alternate ^{*2}	AL	Output alternates turning ON or OFF with each input pulse	✓	✓
Retentive Alternate ^{*2}	RAL	Output alternates turning ON or OFF with each input pulse. The last output status is kept when the power supply is cycled OFF and ON. However, last output status is lost when the αPneuAlpha2 series is placed in the Stop mode.	-	✓
Counter	CN	Count upwards on pulses, can reset at a signal	✓	✓
Up/Down Counter	UD	Count upward or downward, Set a Preset Value for the Output to come ON	✓	✓
Flicker	FL	Send a pulse train; ON/OFF times, repetitions, duration, or continuous operation	✓	✓
Compare	CP	Compare two values for <,>,<=,>=,<> (Analog, Direct Set, or FB values)	✓	✓
Time Switch ^{*3}	TS	Use the RTC to turn output ON/OFF; Calendar or weekly schedule	✓	✓

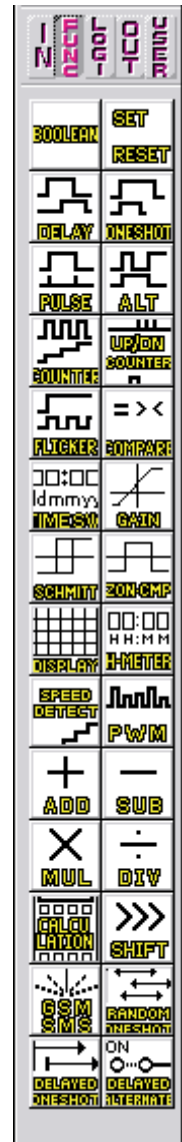


Table 6.6: Function Blocks

Function Block		Description	α Pneu Alpha Series	α Pneu Alpha2 Series
Name	Symbol			
Time Switch Maintenance ^{*3}	TSm	Use the RTC to turn output ON/OFF; Calendar or weekly schedule The schedule can be changed with "Setup TS" in the Top menu.	✓	✓
Offset Gain	OG	Manipulate Analog Values; $y = A/B \times x + C$; Set High and Low Limit Values	✓	✓
Schmitt trigger	ST	Turn an Input ON at the High Value and OFF at the Low Value (or vice versa)	✓	✓
Zone Compare	ZC	Compare a value to a range of values (Analog, Direct Set, or FB values)	✓	✓
Display	DP	Display User Screen (messages or data) on the LCD display	✓	✓
Hour Meter	HM	Records the accumulated time a signal has been ON	✓	✓
Speed Detect	SPD	The signal input frequency (On/Off) is measured for a set length of time. The frequency is compared to a value range and the Output is turned ON/OFF according to the result.	-	✓
Pulse Width Modulation	PWM	A continuous pulse train is output when this function block is driven. The characteristics of the pulse are defined as; Pulse duty (Direct set, Analog, FB values), cycle time.	-	✓
Addition	ADD	$y = A + B$	-	✓
Subtraction	SUB	$y = A - B$	-	✓
Multiplication	MUL	$y = A \times B$	-	✓
Division	DIV	$A \div B = q, r$ (quotient and remainder)	-	✓
Calculation	CAL	Equation using +, -, \times , \div , % and the selected data.	-	✓
Shift	SFT	Shift operation; When "SFT" signal is input, last "I" signal status is output. When using 8 bit shift operation, "Shift" function block should be continued 8 times.	-	✓
GSM SMS	SMS	The contents of an LCD screen is sent as an SMS message.	-	✓
Random One Shot	ROS	The random length single pulse is output.	-	✓
Delayed One Shot	DOS	After a delay time, send a single pulse	-	✓
Delayed Alternate	DAL	After a delay time, output alternates turning ON or OFF with each input pulse	-	✓

Table 6.6: Function Blocks

Function Block		Description	αPneu Alpha Series	αPneu Alpha2 Series
Name	Symbol			
Control Display	CDP	Control which Display screen appears on the LCD. This function block can only be set by "Display Manager" in the ECC-PNAL-PCS/WIN-E software. When control bit N04 is ON in αPneuAlpha2 series, it possible to control the displayed User Screen.	-	✓
Connect	_B	This CONNECT function block is an internal FB used to show the memory used by the system bits, the bits for AS-interface, and the operation keys. No function block appears on screen or shows as being used in the "Memory Configuration Usage" dialog box, the purpose is only to calculate the memory that is used by the bits listed above.	✓	✓

*1 When adding check mark on "Remember Output Signal after a Power Cut" check box, this icon is "Retentive Set/Reset (RSR)" in αPneuAlpha2 series.

Latch a relay in SET or RESET position, gives Set or Reset priority. The last output status is kept when the power supply is cycled "OFF" and "ON". However, last output status is lost when the αPneuAlpha2 series is placed in the Stop mode.

*2 When adding check mark on "Remember Output Signal after a Power Cut" check box, this icon is "Retentive Alternate (RAL)" in αPneuAlpha2 series.

Output alternates turning "ON" or "OFF" with each input pulse. The last output status is kept when the power supply is cycled "OFF" and "ON". However, last output status is lost when the αPneuAlpha2 series is placed in the Stop mode.

*3 When adding check mark on "Maintenance" check box, this icon is "Time Switch Maintenance (TSm)". Use the RTC to turn output ON/OFF; Calendar or weekly schedule. The schedule can be changed with "Setup TS" in the Top menu.

6.2.9 User Function Blocks

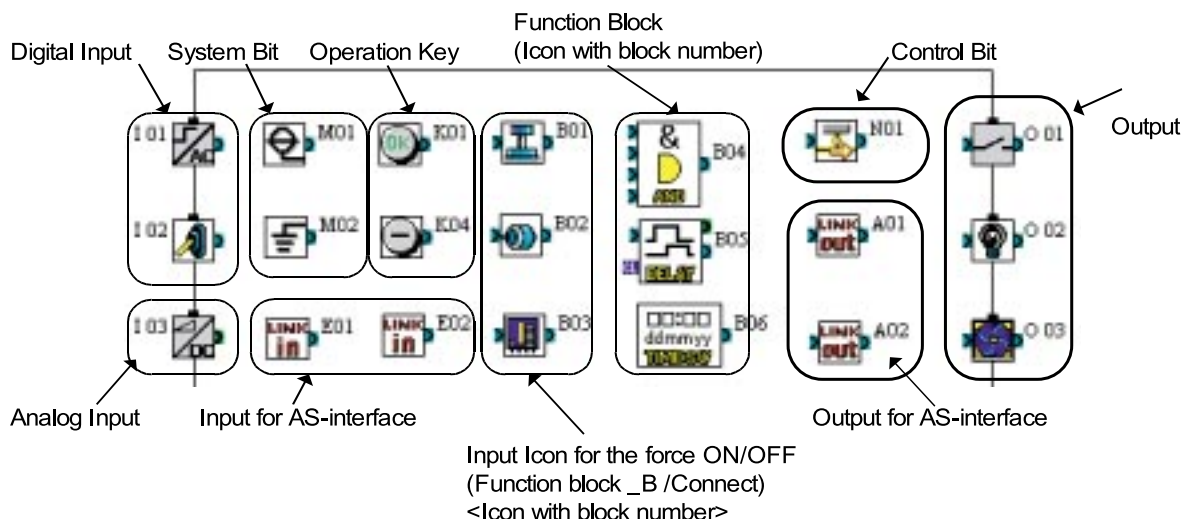
This user function block is registered function block created by the customers. The user function block can be composed from the Input pin(s), the output pin(s), the sub FBD base, system bits, control bits, logic function blocks, function blocks, and user function blocks. For registering the user function block, refer to section 6.7.

6.3 Arrangement of Icons and Resize FBD Base

The icon can be arranged, moved or deleted on the FBD base. An ERROR dialog box will appear to detail any errors in block placement.

6.3.1 Arrangement of Icons

The icon can be chosen from the Accessories Toolbar by clicking the icon, and arranged by releasing on the FBD base. Moreover, Function blocks and Logic function blocks can be arranged from “Insert FUNC” on the Edit Menu bar.



Note:

The icon with block number (B*: Ex. B01, B20) can be arranged up to the following numbers on the FBD base. If the icon's block number is already used on the “Monitor in System Sketch Window”, the number of maximum arrangement might decrease.

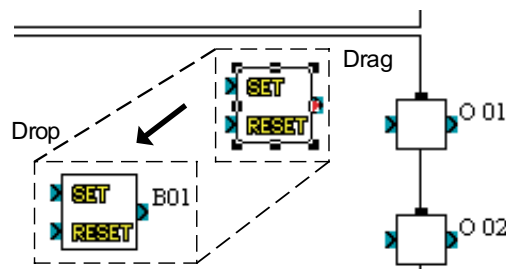
Table 6.7: Blocks Number of Maximum Arrangement

Series Name	Block Number Maximum Arrangement
αPneuAlpha series	Maximum 64 blocks (B01 ~ B64)
αPneuAlpha2 series	Maximum 200 blocks (B01 ~ B200)

6.3.2 Moving Icons

The icon can be moved after they have been placed on the FBD base by left clicking on the icon and dragging the icon with the left button depressed. When the left button is released, the icon will be dropped in the new position. Blocks can only be moved inside the FBD base. Wiring connections will move with the icon.

Illegal operations will be explained via a dialog box and the icon will be returned to its previous position.

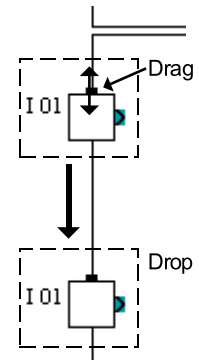


6.3.3 Deleting of Icon

The icon can be deleted after it has been chosen on the FBD base by left clicking on the icon and pushing “delete” button on the keyboard.

6.3.4 Moving Input and Output Rectangles

The input and output rectangles can be moved to the vertical direction by dragging a small rectangular head on the I/O rectangle.

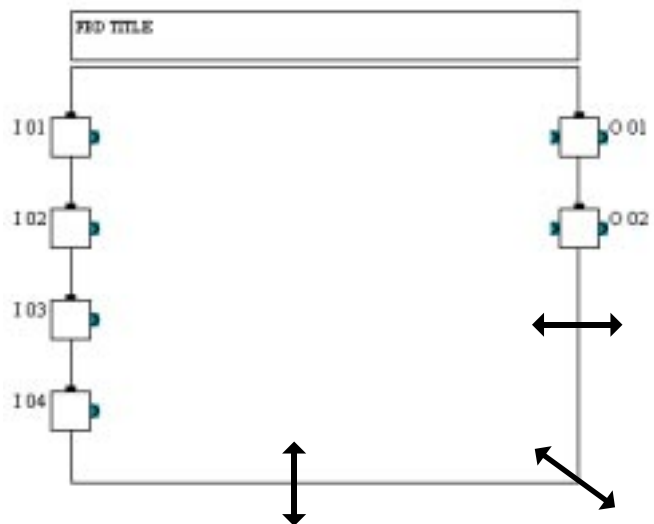


6.3.5 Resize FBD Base

When the FBD window is opened, FBD base has a pre-determined minimum size. The Base can be resized in width or height by dragging either the right or bottom edges respectively. By dragging the right-bottom corner of the base rectangle, the base height as well as width changes. The Base cannot be resized on the left and top edges.

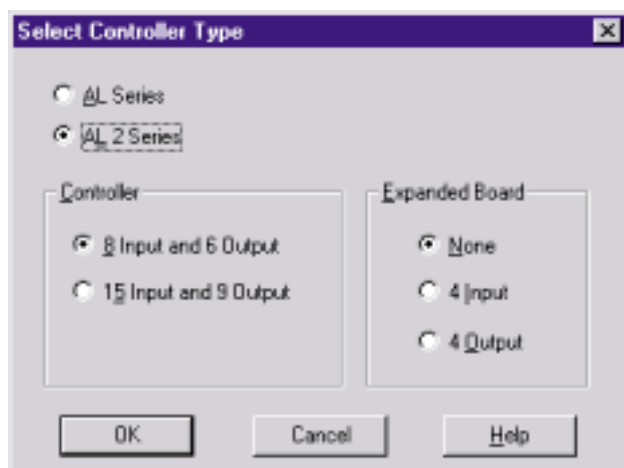
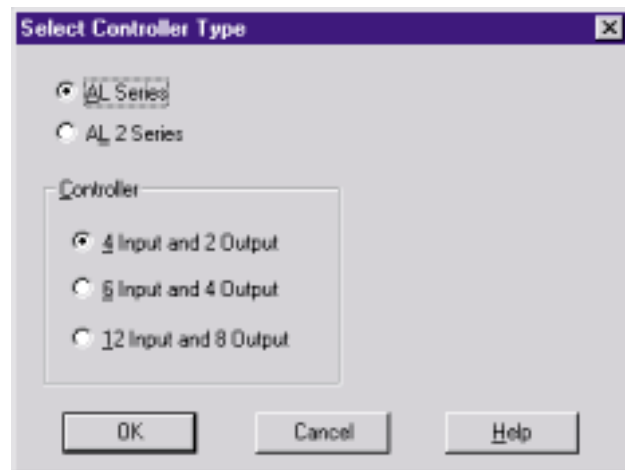
When the right edge of the base is changed, output rectangles, components, and wiring connected to the output rectangles moves with the base.

When the Base size is reduced, all the block items along with wiring present in that area are moved inward.



6.3.6 Select Controller Type

The I/O points and the series on the FBD base can be changed by the “Select Controller Type” window. This window can open from the “Select Controller Type” on the Option Menu. Moreover, It is possible to see this window when opening a new file.

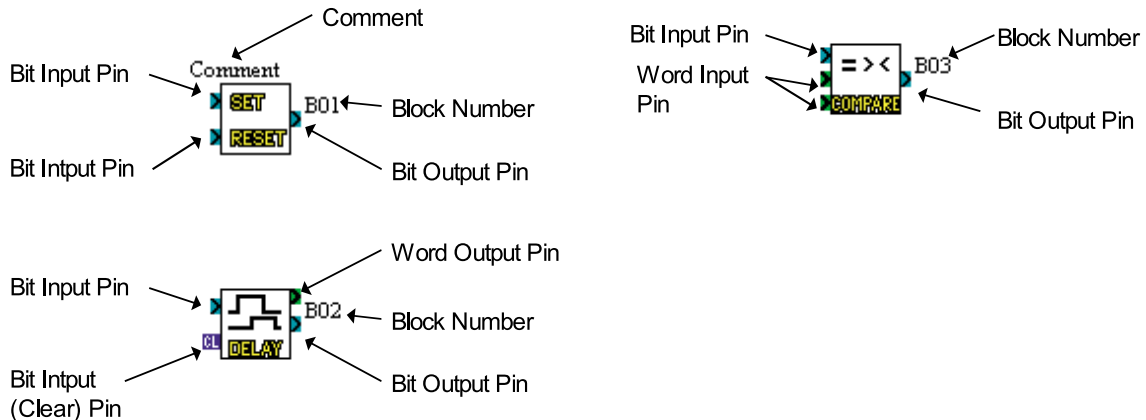


6.4 Connection (Wiring) between Icons

6.4.1 Input and Output Pins

The small rectangles present on left and right side of icon are known as pins. These pins are of 4 types, Bit Input (Clear) pin, Bit Output pin, Word Input pin and Word Output pin. Pins which are present on the left side of icon are known as INPUT pins. Pins which are present on the right side of icon are known as OUTPUT pins.

The pin is enclosed in a light green square on the ECC-PNAL-PCS/WIN-E display to differentiate it from a bit pin.



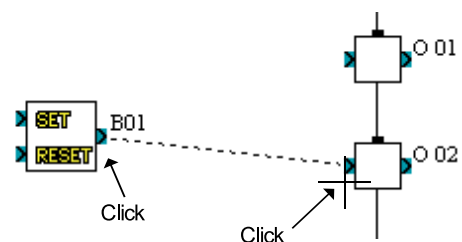
6.4.2 Connection (Wiring) between Icons

The wiring tool graphically represents, in the form of terminated lines, the connections made between the inputs, outputs, signals and functions present in the FBD window.

The Wiring tool can be invoked by clicking the Wiring Toolbar. Placed on the left hand side of the FBD windows.

To connect between icons:

- 1) Click the Wiring toolbar
- 2) Click the input or output pin on the icon to connect the wire
- 3) Click the output or input pin on the target icon to make a connection between the two entities.
- 4) If the pins have not physically connected, return to part 2).
- 5) The wiring toolbar will remain activated until the user clicks on any other toolbar or on vacant space within the FBD base.





Note:

Bit Output Pins are connected to Bit Input Pins and Similarly Word Output Pins are connected to Word Input Pins. However, Bit pins cannot be connected to word pins, but output pins can connect to multiple input pins.

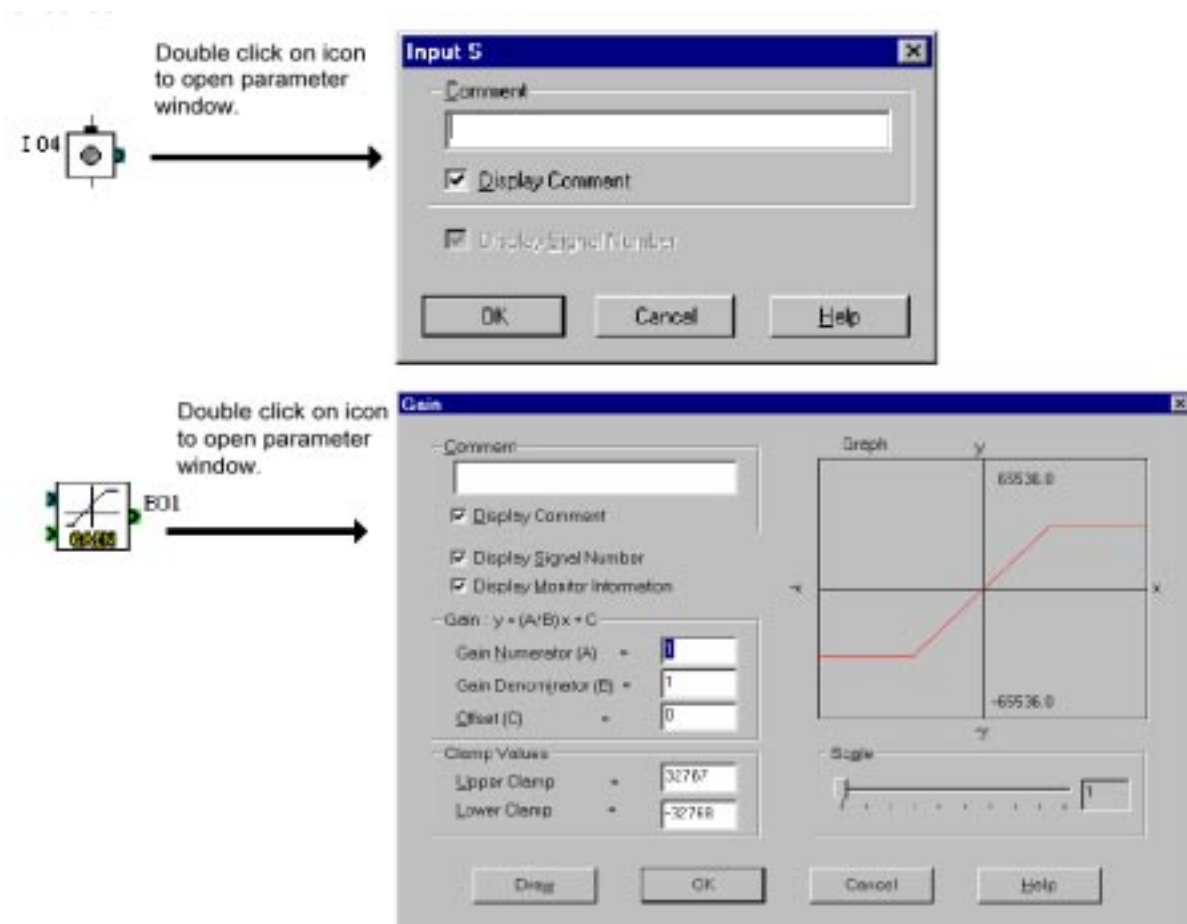
In the following cases an appropriate error message occurs:

- Input Pin cannot be connected to Input Pin.
- Output Pin cannot be connected to Output Pin.
- Bit Pin can not be connected to Word Pin.
- Input Pin can not have more than one wire connected to it.
- No pin is located in this position.

6.5 Setup Icons

The dialog box of all icons contains the comment box, the Display comment check box and the Display Signal Number box. This dialog box can be viewed by double clicking on the icon. The Display Comment box will display the comment only when checked.

Similarly, the Display Signal Number box will display the signal number next to the icon if checked.



6.5.1 Comments

The Comment Edit box is used to enter a comment which will be displayed on the top of the icon. This can be up to 256 characters but only 16 characters will be considered for display. However, when printing icon information, the comment over 16 characters will be printed, too.

6.5.2 Parameter of Function Blocks

Function block parameters can be viewed by double clicking on the Function Block. A dialog box will pop up that shows the parameters that can be adjusted and a comments section for producing easy documentation. Each Function Block has its own set of Parameters that may be set including the various Display Boxes shown at the right.

Further information about parameter of each function block can be found in the programming manual and "Help" on the ECC-PNAL-PCS/WIN-E.



Note:

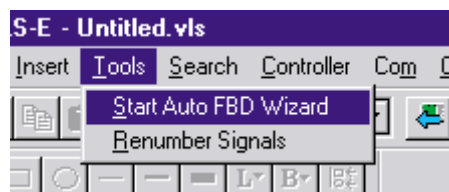
If using the slider portion of the parameter settings, the value can only be set from 0 - 100. If entering the digits in the box, the listed maximum tolerances can be entered.

6.6 Auto FBD Wizard (Only ECC-PNAL-**M*~*)

The program can be easily created using the Auto FBD Wizard according to the procedure of 8 clear steps. The user can proceed forwards and backwards along this line. Each step is accompanied by a guidance box that will bring up instructions in a dialog box. In the procedure of eight steps, the following 6 content is set.

However, this command supports only the α PneuAlpha series (Model: ECC-PNAL-**M*~*). When choosing α PneuAlpha2 series, this command does not support the Auto FBD Wizard.

Open the Auto FBD Wizard with the icon or the Start FBD Auto Wizard option from the Tools Menu.



- 1) Choose an output (Step 1)
- 2) Select up to 4 function blocks in the following lists to be used (Step 2, 3).
Use the boolean automatically if necessary.
 - Set/Reset function block
 - Delay function block
 - Alternate function block
 - Flicker function block
 - One Shot function block
 - Counter function block
 - Compare function block
- 3) The combination of the function blocks to be used is selected (Step 4).
- 4) Choose the Input Signal for bit Input Pin of the left most function block (Step 5, 6)
Select up to 4 signals for one Input Pin.
- 5) Set the parameters for the function block(s) and select the signal for the Clear Pin and Word Input Pin (Step 7)
- 6) Check operation (Step 8)



Note:

- Display the Help file concerning the Auto FBD wizard when Clicking the “Guidance” check box.
- To move back to previous menus, click “Back” button.
- To go to next menu, click “Next” button.
If the setting or selection do not finish in the menu (step), “NEXT” is disabled.

6.6.1 Choose an Output (Step 1)

Select one target output for the program to be created from Auto FBD Wizard. Click a target output terminal to select.

Click the “NEXT” button to proceed to the next step when selecting it.

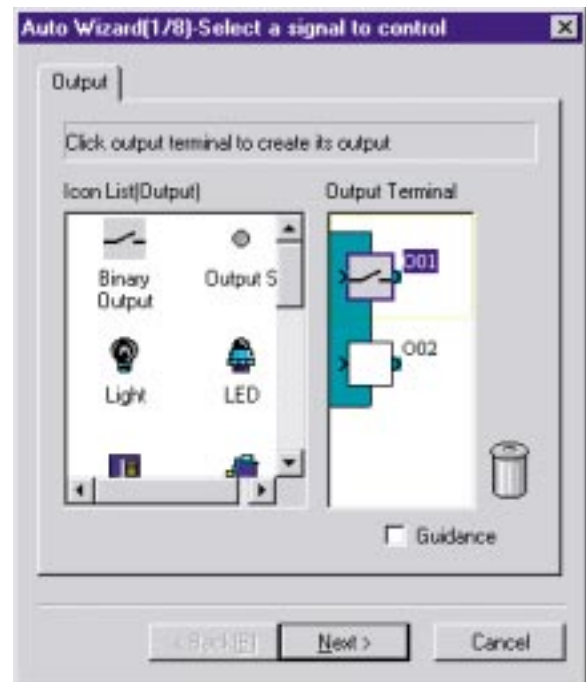
When the icon has already been put on the output terminal with the FBD base, the icon will be displayed in the output terminal.

To allocate the icon:

Click the icon from the output icon in the left of the screen list, and click the output terminal which needs to be allocated again.

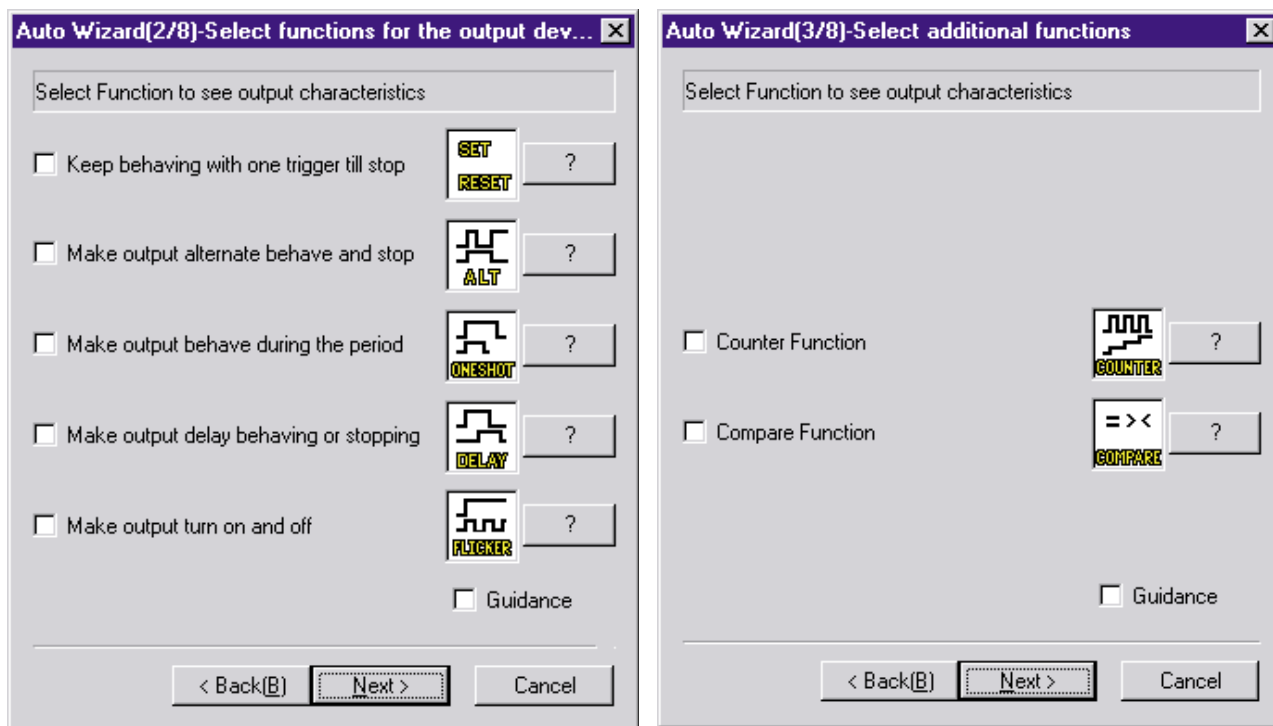
To delete the icon to be allocated:

Move the output icon to be deleted from the output terminal to the trash bin by drag & drop.



6.6.2 Choose Function Blocks (Step 2, 3)

A list of function blocks appears on the screen from which up to 4 total blocks can be chosen to place in the circuit with the output from the following dialog boxes. Click the check box in the function block to be used. The Blocks that can be selected are the Set/Reset, Alternate (ALT), One Shot, Delay, Flicker, Counter and the Compare functions. Click "NEXT" button to proceed.

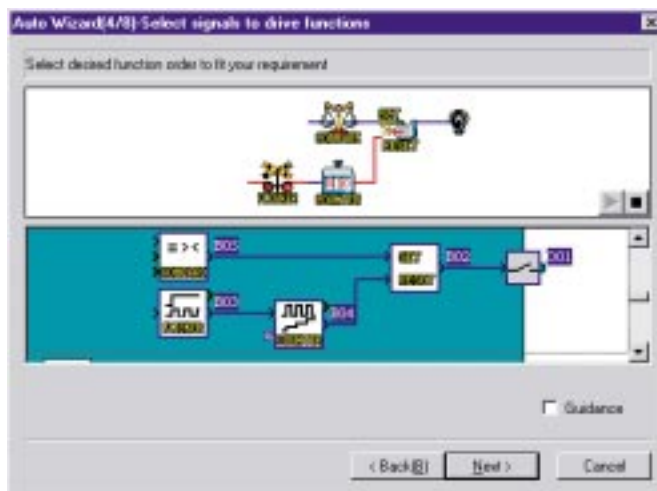


Note:

Choose the box with the "?" mark to find out more information on a particular function.

6.6.3 Select Signal Order (Step 4)

The Wizard will show the possible combinations of Functions Blocks. A pictorial representation will appear at the top of the screen and the function block icon connection will be shown below. Use the Up and Down arrow keys to scroll through the possible combinations. Depending upon the number and type of Function blocks chosen, dozens of possible combinations will show on screen. The first combination will be chosen as a default if no selection is made.



6.6.4 Adding a Logical Condition (Step 5)

Choose to have the output conditions driven by input signals or to have them continuously driven. Flicker or Compare function block comes left most, it is displayed as shown in the right figure.

Active depending on other signals: Using Flicker or compare function

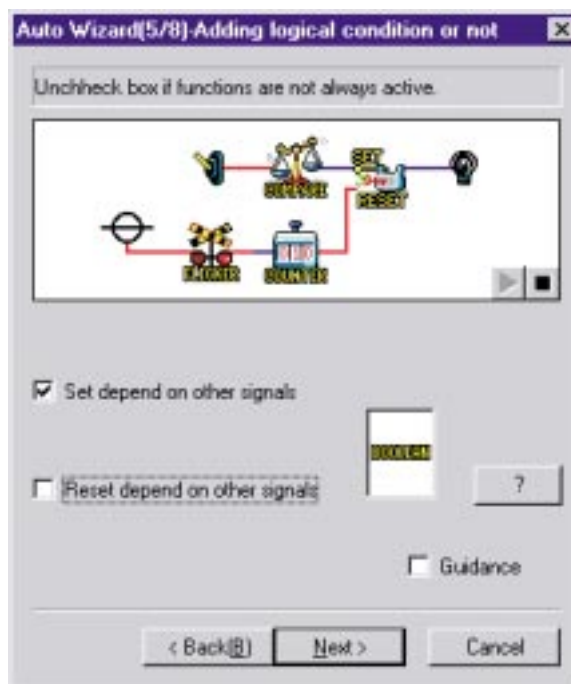
When adding, check this option, the input signal can be connected to left most Flicker or Compare function block.

Set depends on other signals: Using Set/Reset function, and Flicker or Compare function

When adding check this option, the input signal can be connected to left most Set/Reset function block connected to the set pin side of the Flicker or Compare function block.

Reset depends on other signals: Using Set/Reset function, and Flicker or Compare function

When adding check this option, the input signal can be connected to left most Set/Reset function block connected to the reset pin side of the Flicker or Compare function block.



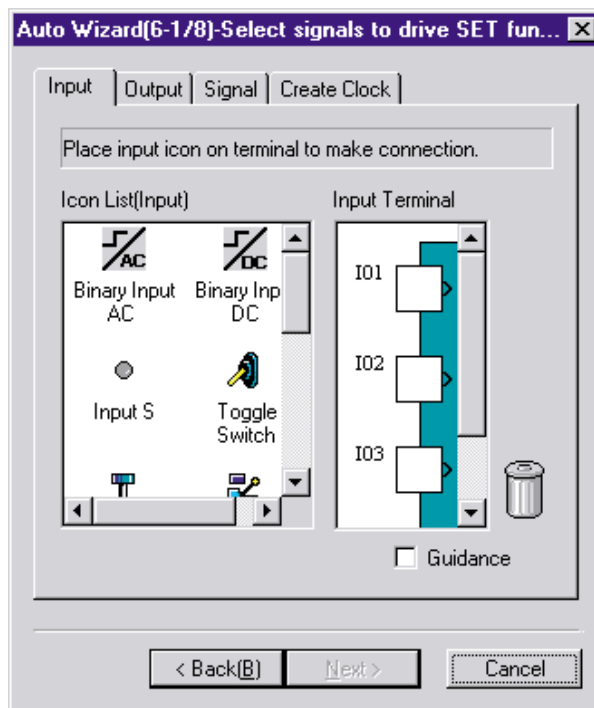
Note:

When the check mark has been added, the display is redundant, the Boolean function block is automatically added to the input pin of the left most function block.

6.6.5 Select Input Signals to Drive Functions (Step 6)

Choose up to 4 input signals which connects to the “Bit Input Pin” on the left most function block from the following.

- Input terminal (Input Tab)
- Output Terminal (Output Tab)
- Operation key (Signal Tab)
- System Bit (Signal Tab)
- Control Bit (Signal Tab)
- Function block (Signal Tab)
- Time Switch function block (Signal or Create Clock Tab)



Note:

- When selecting the Set/Reset function block on the step 2 and 3, the step 6 will be set twice (6-1 and 6-2). At first set for the “set depend on other signals”, at second set for the “Reset depends on other signals”.
- When no addition is intended check the “Active depend on other signals”, “Set depend on other signals” and “Reset depend on other signals” from step 5, then step 6 will not appear, thus the next step 7 appears.

1) Input Tab

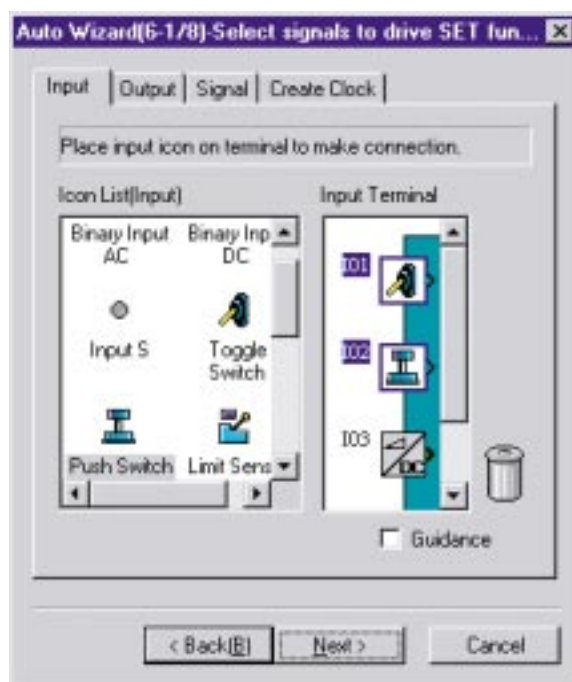
Click the target Input terminal to select. When the icon has already been put on the Input terminal with the FBD base, the icon will be displayed in the Input terminal as shown.

To allocate the icon:

Click the icon from the Input icon to select the appropriate device selection, and click the Input terminal which needs to be allocated again.

To delete the icon to be allocated:

Move the Input icon to be deleted from the Input terminal to the trash bin by drag & drop.



2) Output Tab

Click the target Output terminal to select the appropriate device.

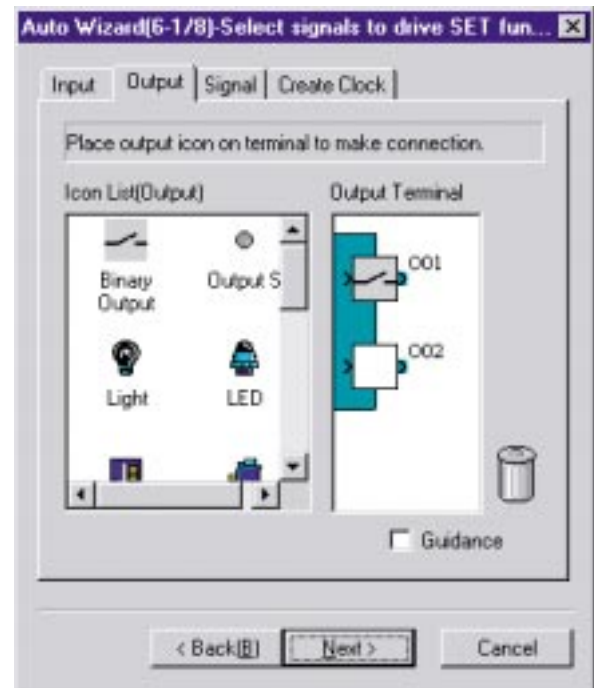
When the icon has already been put on the Output terminal with the FBD base, the icon will be displayed in the Output terminal as shown.

To allocate the icon:

Click the icon from the output icons in the left of the screen list, and click the output terminal which wants to be allocated again.

To delete the icon to be allocated:

Move the output icon to be deleted from the output terminal to the trash bin by drag & drop.



3) Signal Tab

Set internal signal(s) by the “New Signal” or “Start Select” from the following signals.

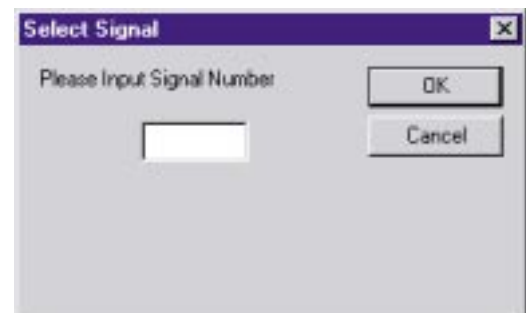
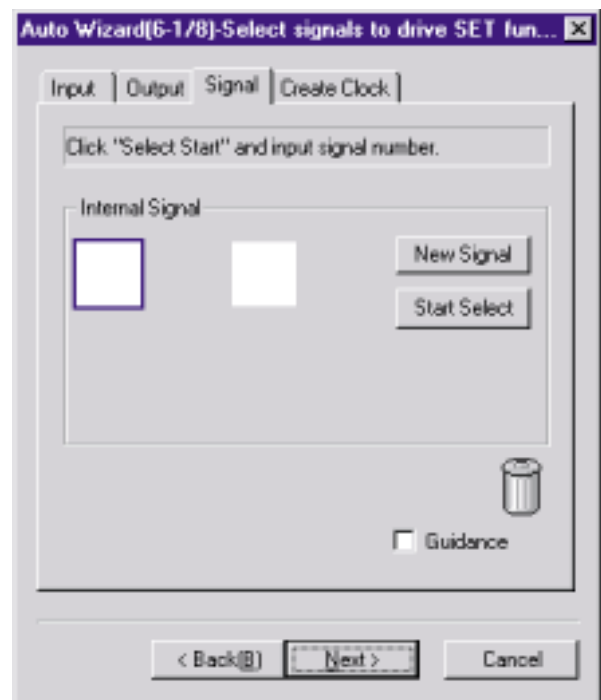
- Input signal with block number
(by New Signal button)
- Operation key
(by Start Select button)
- System bit (by Start Select button)
- Control bit (by Start Select button)
- Input and Output for AS-interface
(by Start Select button)
- Function block
(by Start Select button)

New Signal button:

Clicking this button a new input signal with appropriate block number will be add.

Start Select button:

Input signal number of the operation key, the system bit, the control bit, the input/output for AS-interface or the function block.



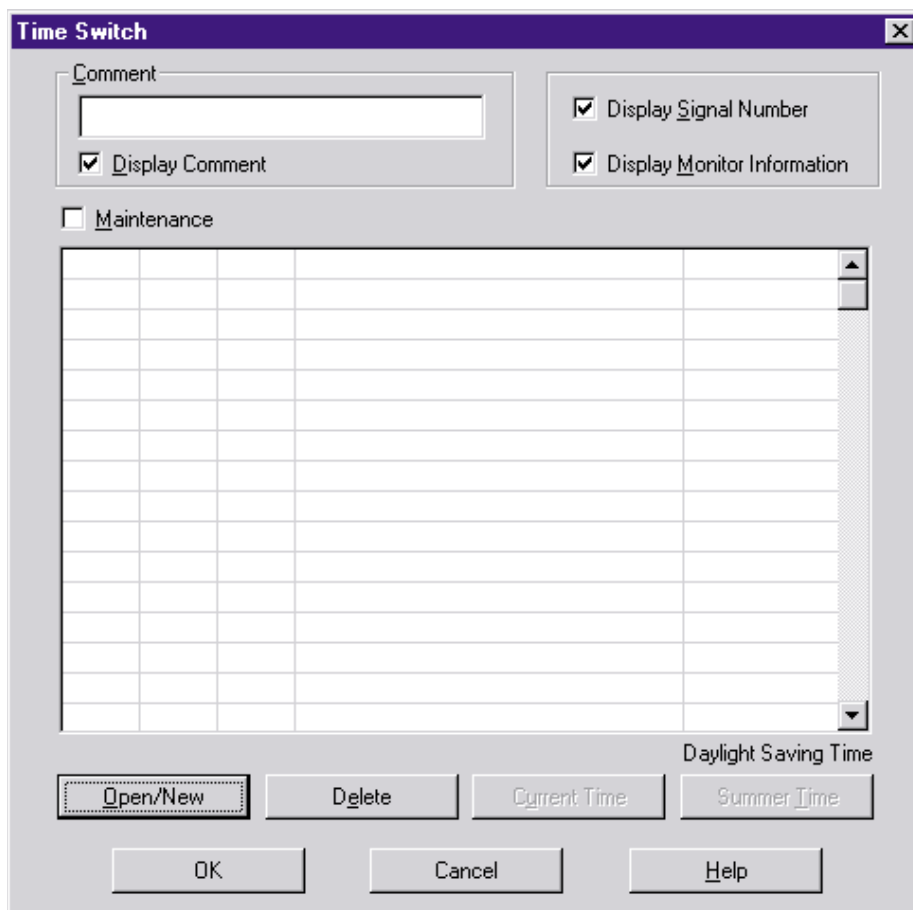
- 4) Create Clock
Add output signal for new Time Switch function block, and set parameter for this time Switch function block by the "Set New TimeSwitch" button

To add new Time Switch function block:

- a) Click the check box as shown "Create New TimeSwitch" to add the new Time Switch function block.



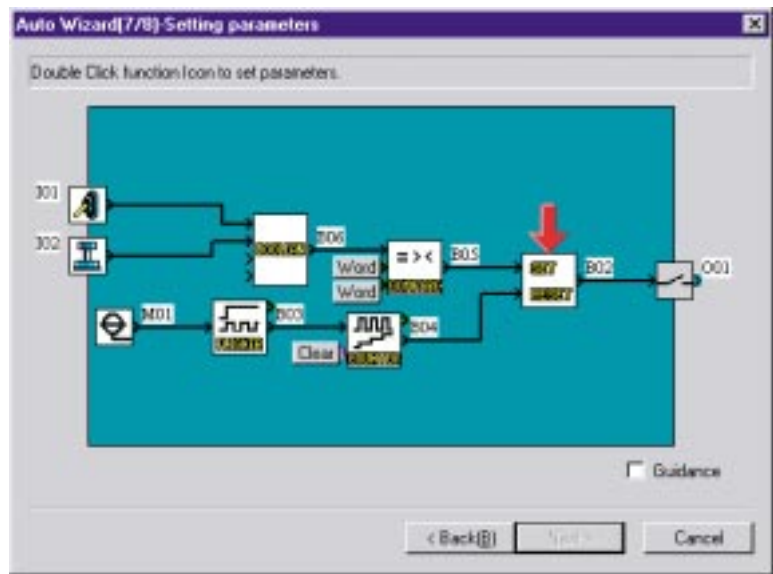
- b) Click the "Set New TimeSwitch" button to set parameter for the Time Switch function block. A setting operation is identical to the parameter of the Time Switch function block set on the FBD base. Further information about parameters of each function block can be found in the programming manual and "Help" on the ECC-PNAL-PCS/WIN-E.



6.6.6 Setting Parameters (Step 7)

Set parameters for the Function Blocks, word input signal and clear input signal in this screen. A red arrow will appear above the Function Block that should have parameters set. Double click on the Function Block to open the parameter dialog box and enter the parameters as required.

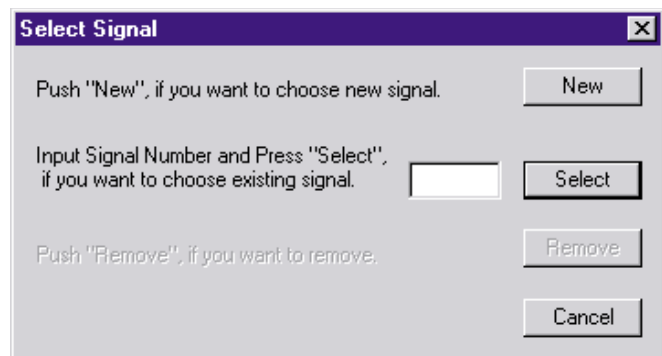
Further information about the parameters of each function block can be found in programming manual and the "Help" on the ECC-PNAL-PCS/WIN-E.



To set word and clear input pin:

Click the "Word" or "Clear" button on the Setting parameters window. When clicking "Word" button, do not appear "New" button.

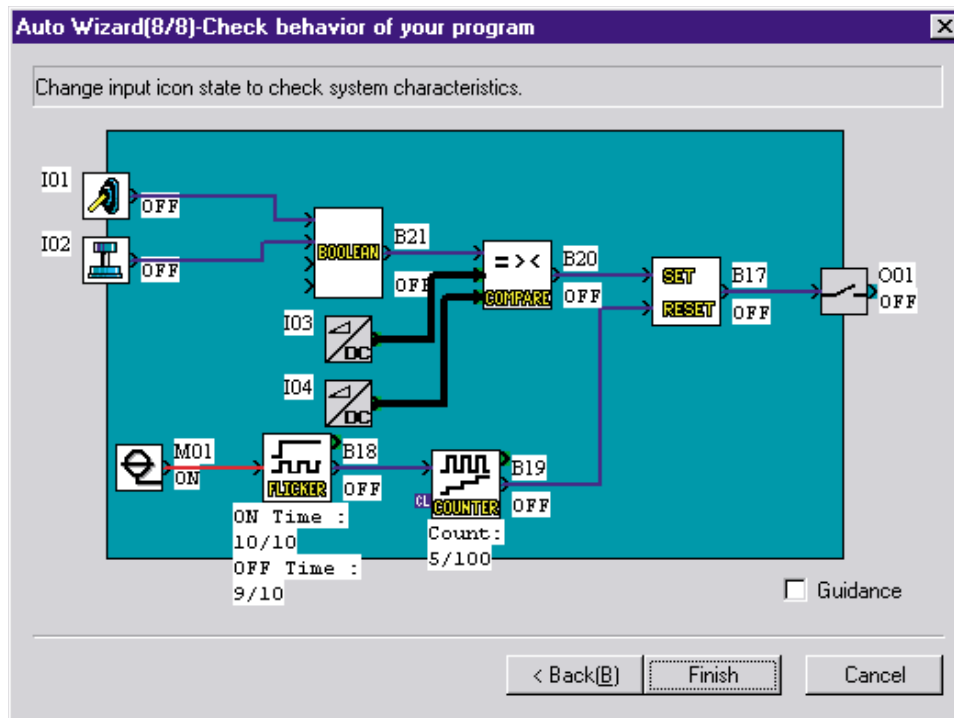
- When the input signal with block number needs to be used, click "New" button.
- When the following signal want to be used, enter signal number, and click the "Select" button.
- When deleting the set signal, click the "Remove" button to delete the set signal. If the signal has not already been set, this button will not be appeared.



6.6.7 Operation Check (Step 8)

Check the operation of the program by turning the Input Signals On and Off. When clicking the input icon or function block icon (without Boolean function block), the relevant icon' output signal is turned to the ON colour. In this case, the connection wire will be changed ON colour (default colour: Red).

When finished with the operation check, Click "Finish" button to place the completed circuit on the FBD base.

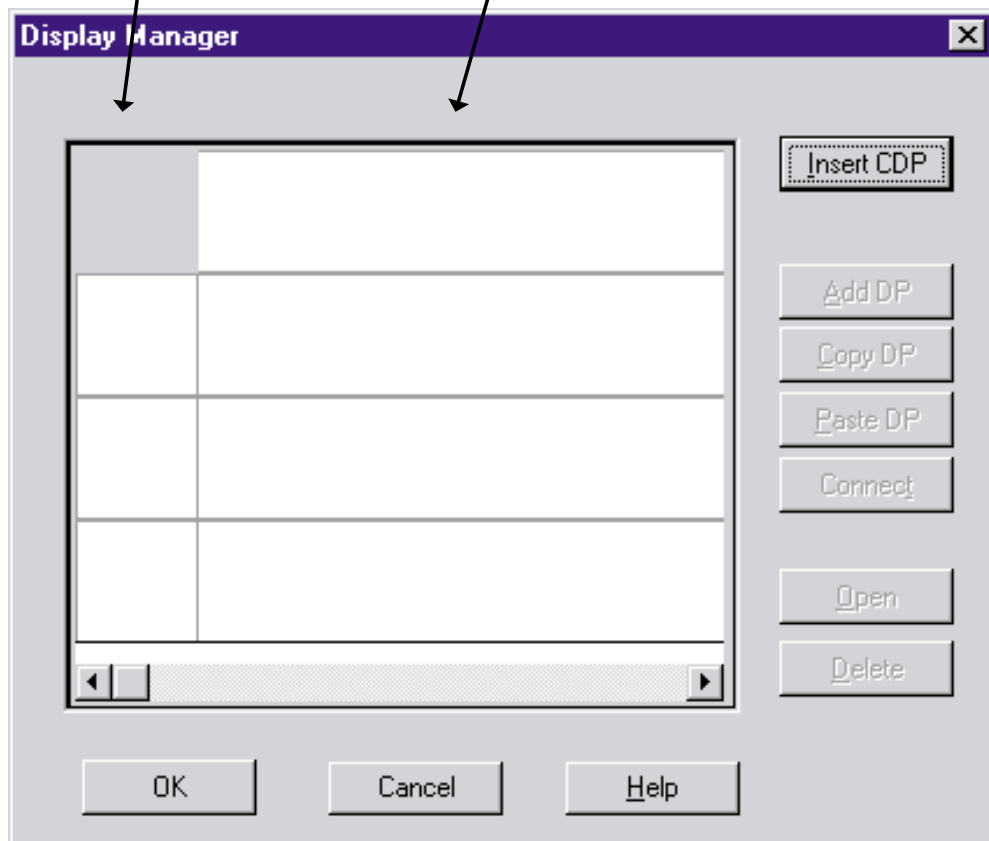


6.7 Display Manager

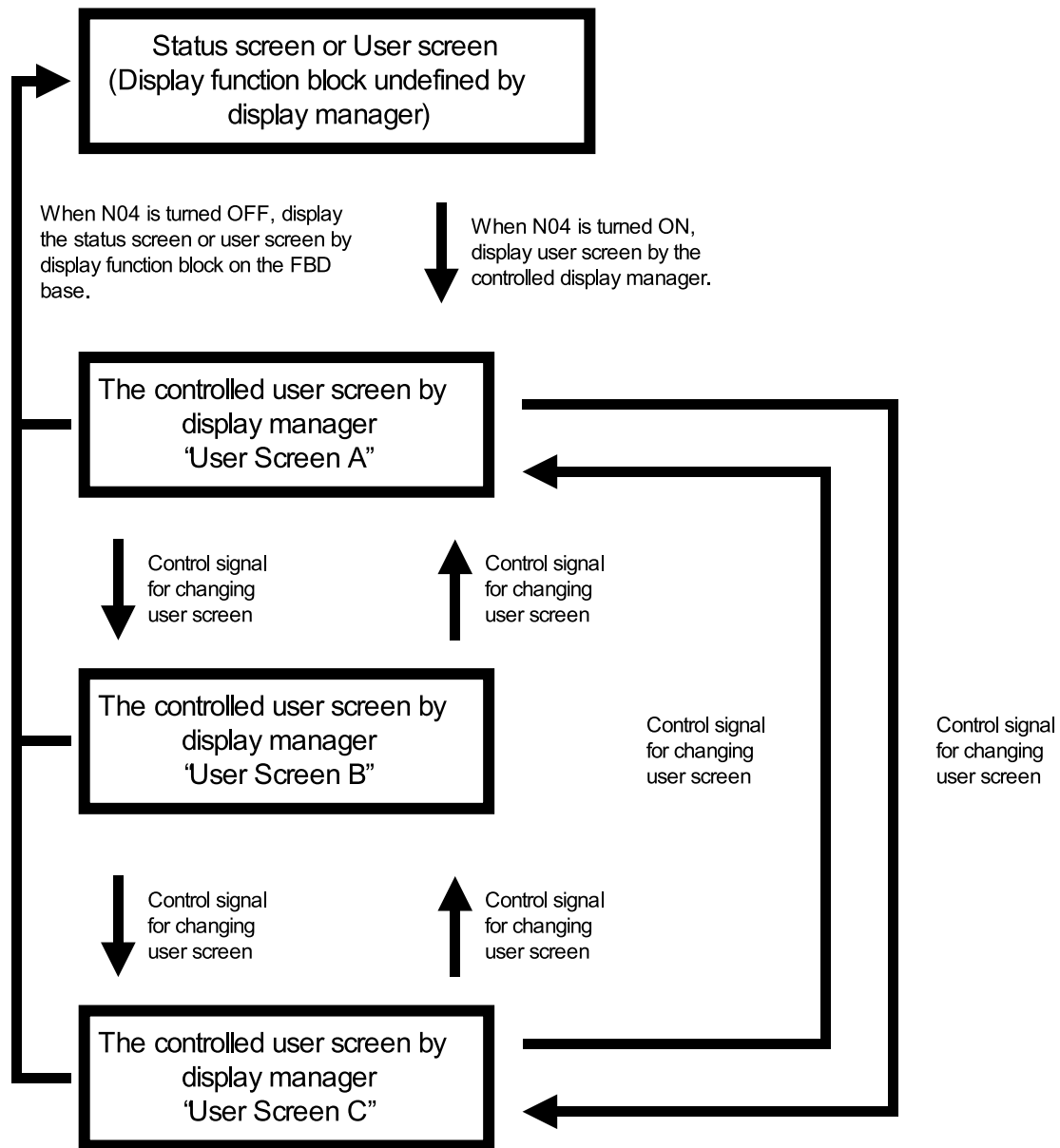
Display Manager controls the sequence of user screens to be displayed according to the signal that specifies each user screens. When N04 has been turned ON, Display Manager becomes effective. The user screen set with Display Manager is displayed on the αPneuAlpha2 series. The displayed user screen can be composed up to 10 Display function blocks. However, the Display Manager can only be set using the αPneuAlpha2 series.

Insert CDP function block area

Add DP function block area

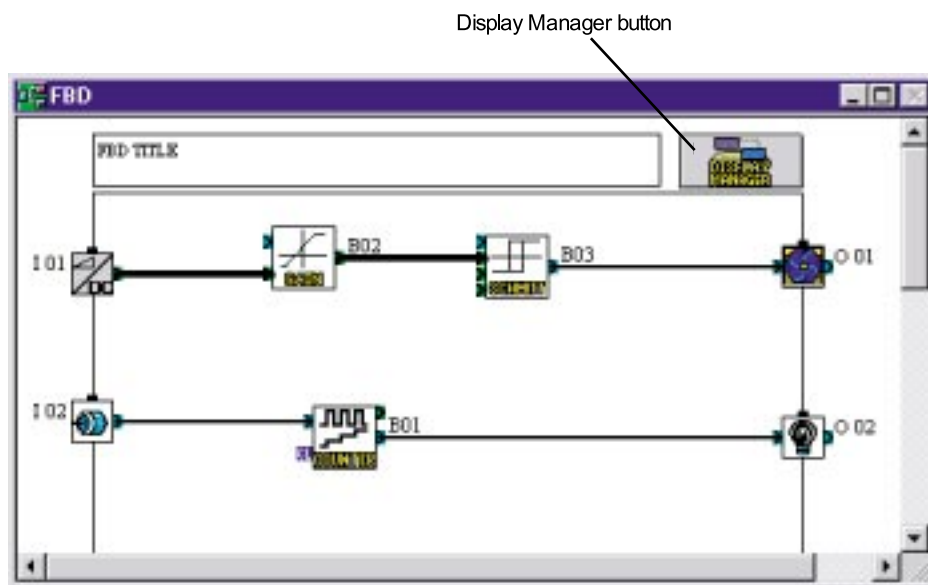


Operation Image:

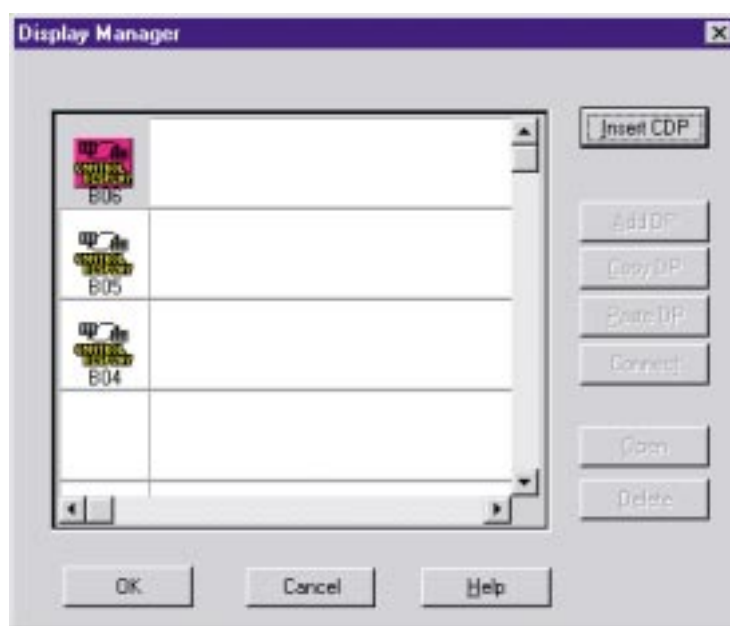


To Set Display Manager:

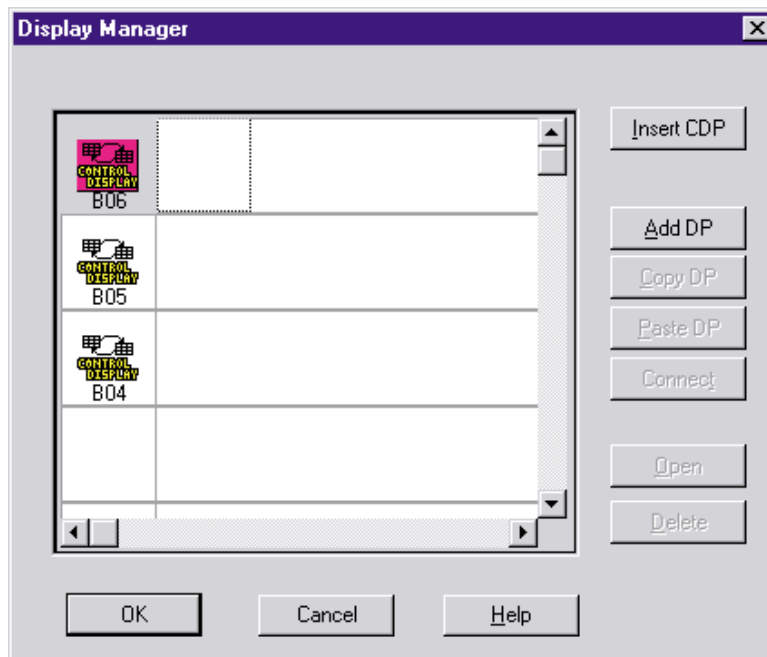
- 1) Double click the “Display Manager” button on the FBD base window.



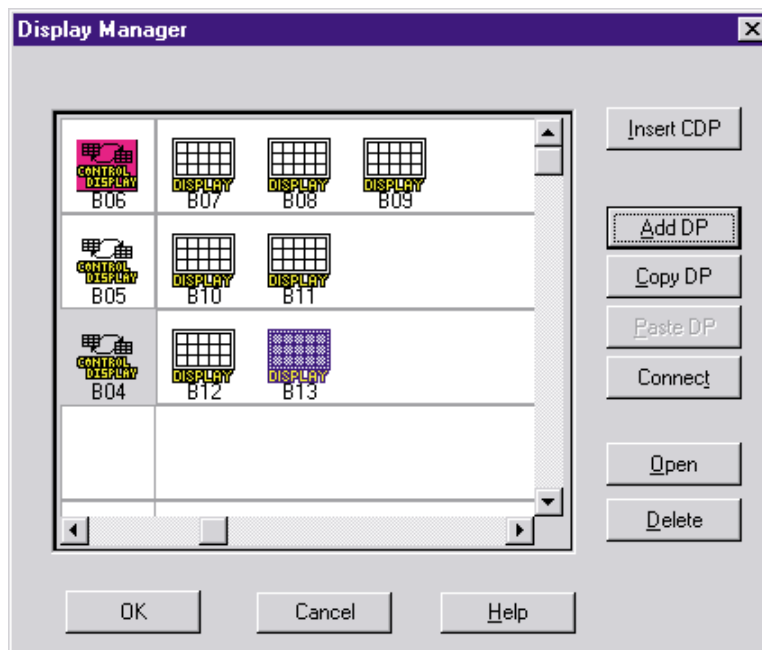
- 2) Click the “Insert CDP” button to Insert CDP function block for the control user screen function



- 3) Choose the “CDP (Control Display Function)” icon to add a DP (Display function block) for each user screen.

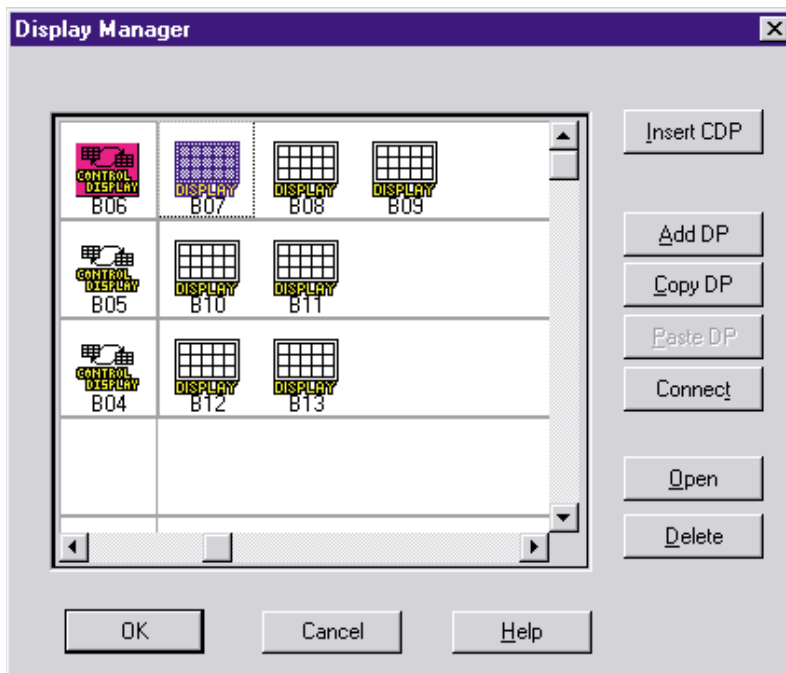


- 4) Click the “Add DP” button to add DP function block(s) for the CDP function block. It is possible to add a maximum of 10 DPs into 1 CDP.



- 5) Choose the “Display” icon for indication BF (Function Block) or Analog value, and click “Connect” button.

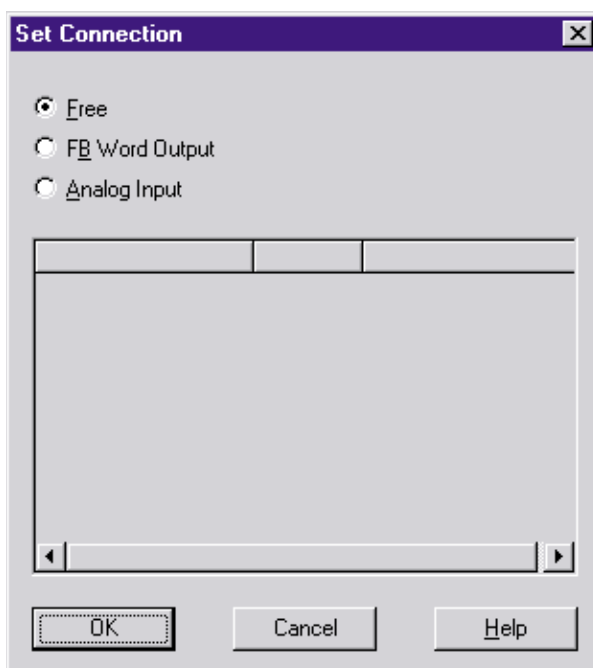
When not displaying them, please go to step 7)..



- 6) Click the “Connect” button to display the FB value or the Analog Input value

- **Free:** Displays the Text, Date or Time. (Default setting)
- **FB Word Output:** Displays FB value. Choose function blocks from list.
- **Analog Input:** Displays Analog Input value. Choose Analog Input port.

When completing connection, click the “OK” button.



- 7) Double-click the “Display” icon or click the “Open” button to set parameters. Further information about parameters of the Display function block can be found in the programming manual and “Help” on the ECC-PNAL-PCS/WIN-E.
On completion of the parameter settings, click the “OK” button.

Choosing “Free” on step 6).

Display (of B06)

B07 | B08 | B09

Comment

☒ Display Comment

☒ Display Signal Number

User Option

☒ String

☐ Date

☐ Time

☒ Special Key

Security Level:

Starting position of Text

X =

Y =

Length =

String Property

☒ Fixed

☐ Flicker Period: x 100ms

☐ Scroll Interval: x 100ms

Choosing “FB Word Output” on step 6)

Display (of B06)

B07 B08 B09

Comment

☒ Display Comment

☒ Display Signal Number

Starting position of Text

X = 1

Y = 1

User Option

☒ Special Key Password

Security Level: 0

☐ Graph

Min: 1 Max: 1 Length: 1

Display Ratio

☒ 1/1

☐ 1/10

☐ 1/100

☐ 1/1000

Gain

GainAnalogVal

OK

Cancel

Help

Warning : Message is overlapped

Choosing “Analog Input” on step 6)

Display (of B06)

B07 B08 B09

Comment

☒ Display Comment

☒ Display Signal Number

Starting position of Text

X = 1

Y = 1

User Option

☒ Special Key Password

Security Level: 0

☐ Graph

Min: 1 Max: 1 Length: 1

Display Ratio

☒ 1/1

☐ 1/10

☐ 1/100

☐ 1/1000

4/DC

SigAnalogVal

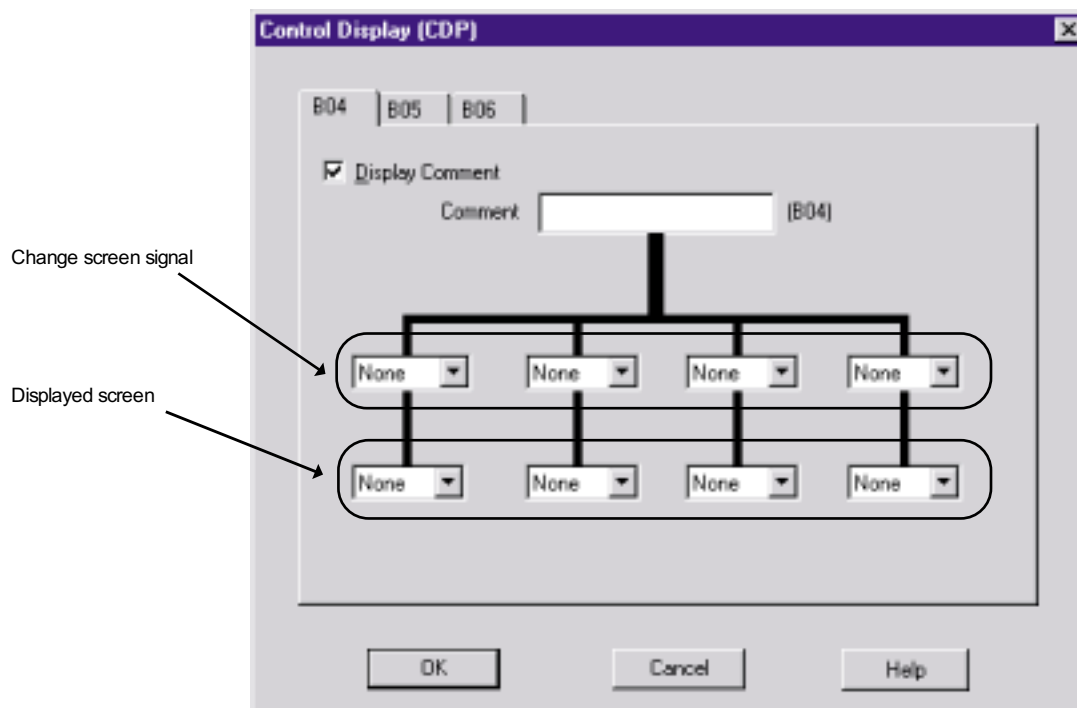
OK

Cancel

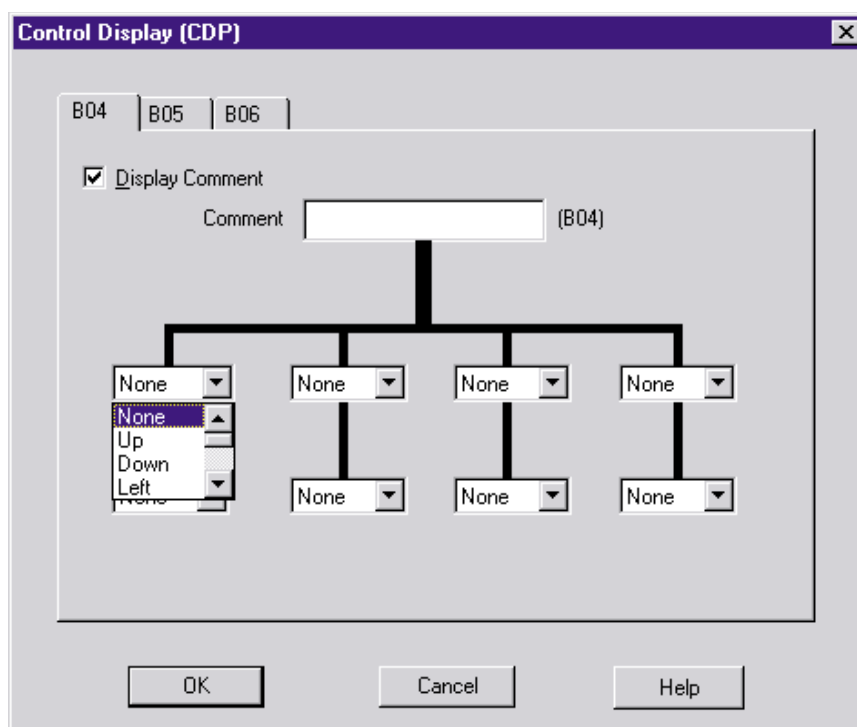
Help

Warning : Message is overlapped

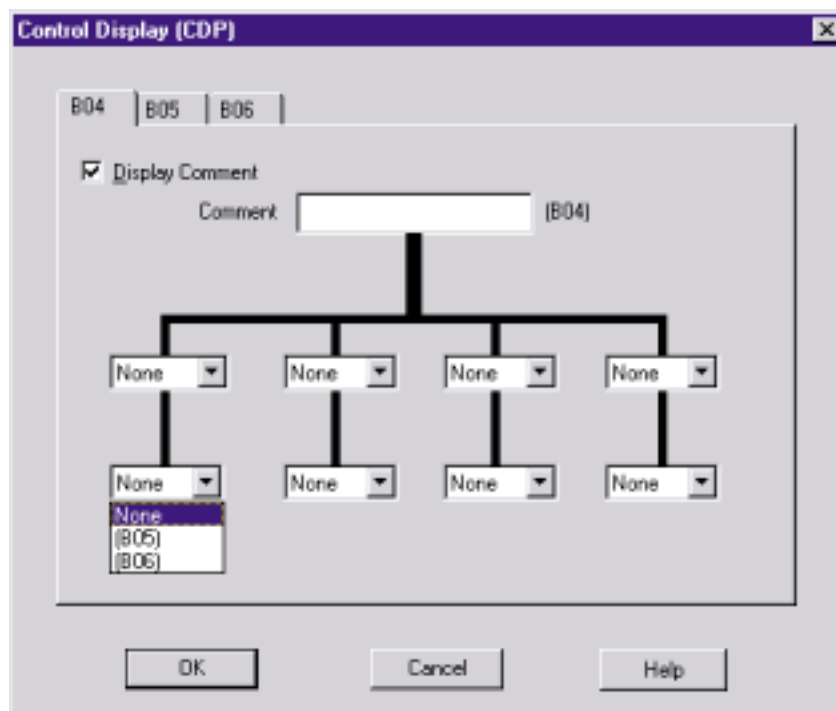
- 8) Double-click the “CDP” icon or click the “Open” button to set parameter.



- 9) Select the signal for changing user screens from the pull-down menu options.



- 10) Select the next displayed user screen from the pull-down menu options.
When completing the control key setting, click the “OK” button.



- 11) When completing the control key's setting, click the “OK” button.

6.8 Register the User Function Block

The User function block is a user-defined combination of ordinary functions saved for repeated use.



Note;

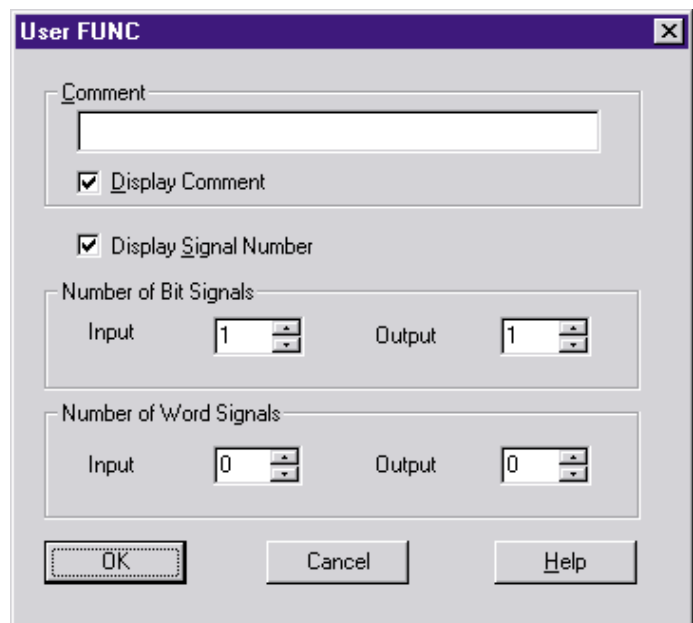
The system will use the original function block when reading the program from the α series with ECC-PNAL-PCS/WIN-E to which this user function block is not registered and display the program.

To register the user function block:

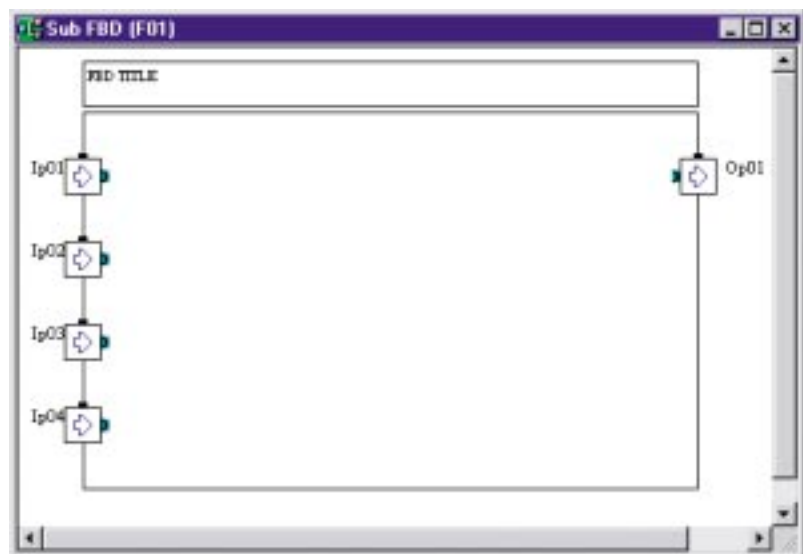
- 1) Click "User func" button on the User function toolbar, and click on the FBD base.



- 2) Set parameter for the sub FBD base.



- 3) Arrange Icon for user function block.
- 4) Connect each icon.
- 5) Set the parameters for the function blocks.



- 6) Click “UserFunc Registration” button to register the User Function Block.



- 7) Set the OFF and ON images.

Registering ON/OFF images

Table 6.8: ON/OFF Image Specifications

	Specifications
File Type	Bitmap file
Size	36 × 36 pixels
colour	16 colour or 256 colour

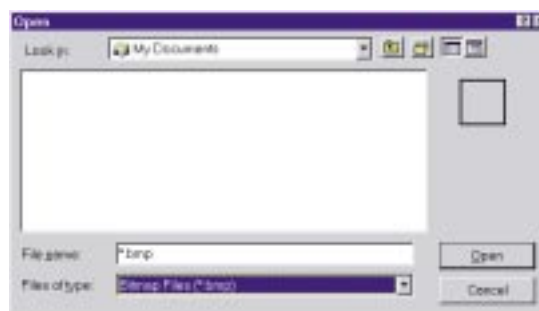
- a) Click the “Browse...” button to register each image.



- b) Choose the ON or OFF image from the Open window. Then, click the “Open” button to register the ON or OFF image.

When registering the bitmap image (*.bmp) for the ON or OFF icons, the ECC-PNAL-PCS/WIN-E generates the *_ON.bmp or *_OFF.bmp image for the registered user function block.

“*” is the name of the registered User Function Block.



- 8) Click the “OK” button to finish the registration of the User Function Block.
When registering the user function block, the *.ruf, *_ON.bmp and *_OFF.bmp files should be stored in the following folder.

Table 6.9: Generation Files for User Function Block

File name	Stored Folder	Description
*.ruf	“Installed application folder”\Library\UserFunc (E.g. C:\Program Files\Alvls\Library\UserFunc)	The Information file for the User Function Block.
*_ON.bmp	“Installed application folder”\Library\Bitmap (E.g. C:\Program Files\Alvls\Library\Bitmap)	The ON image icon for the User Function Block.
*_OFF.bmp	“Installed application folder”\Library\Bitmap (E.g. C:\Program Files\Alvls\Library\Bitmap)	The OFF image icon for the User Function Block.

“*” is the name of the registered User Function Block.

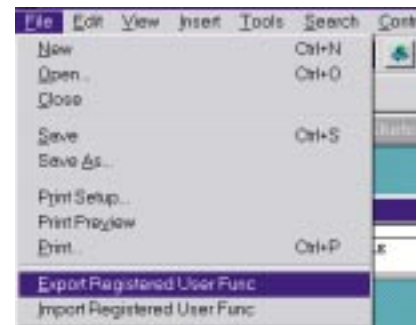
6.8.1 Export Registered User Function Block

The registered UserFunc data (User Function Block) is exported (stored) to a designated folder; Thus, registering the UserFunc data (User Function Block) is possible from one PC to another.

- 1) Click the icon of the UserFunc to Export.



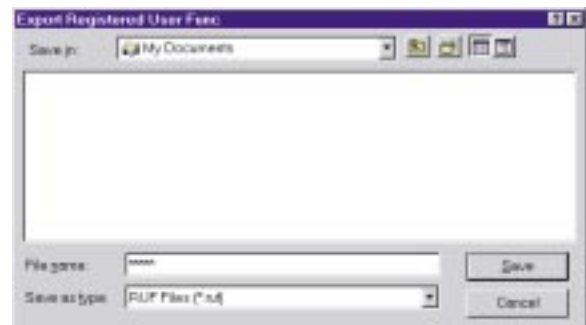
- 2) Select "Export Registered User Func" from the File menu.



- 3) In the "Export Registered User Func" dialog box, choose the folder that saves the exported file and enter the UserFunc name then click the "Save" button.

The *.ruf, *_ON.bmp and *_OFF.bmp files should be stored together in the chosen folder.

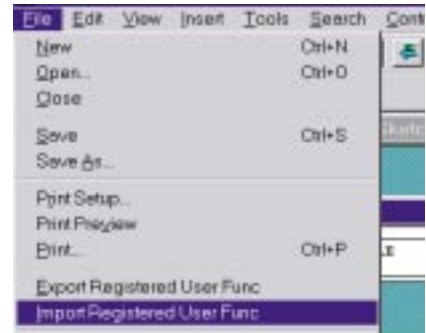
"*" is the name of the registered User Function Block.



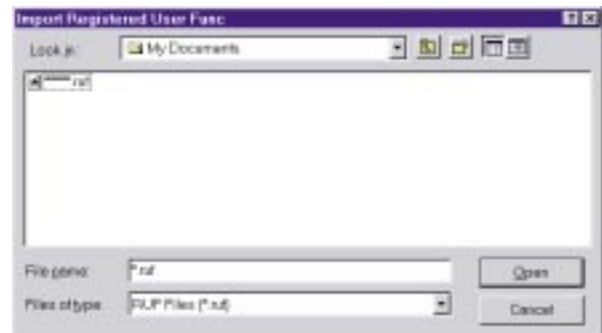
6.8.2 Import Registered User Function Block

The exported UserFunc data (User Function Block) is imported from a designated folder; Thus, registering/transferring the UserFunc data (User Function Block) is possible from OnePC to another.

- 1) Select "Import Registered User Func" from the File Menu.



- 2) The "Import Registered User Func" dialog box will be displayed. In the "Import Registered User Func" dialog box, specify any folder, which holds the data to Import, and enter (select) the name of the Imported data*¹, then click the "Open" button.



¹ The Imported data (.ruf, *_ON.bmp and *_OFF.bmp files) must be stored in the same folder.

"*" is the name of the registered User Function Block.

6.9 Change FBD Base colours and Icons

6.9.1 Change FBD Base colours

The FBD base colour can be changed via the "Set Base colour" command in the Option Menu. Further information can be found in Help on ECC-PNAL-PCS/WIN-E.

6.9.2 Customize Icons

The signal registered by the user and the image for the function block icon can be used. The icon can be registered in "User Defined Icons" in the Option Menu. The customer can choose registered icon by "Function Icon Set" in the Option Menu. Further information can be found in Help on ECC-PNAL-PCS/WIN-E.



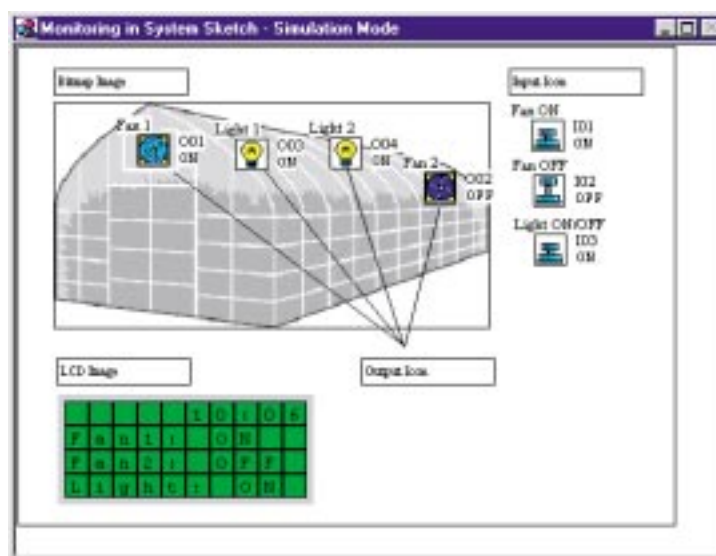
Note:

- Unregistered function blocks use system icon with ECC-PNAL-PCS/WIN-E.
- Unregistered user defined icons in ECC-PNAL-PCS/WIN-E reading from α PneuAlpha series controller shall display system icons.

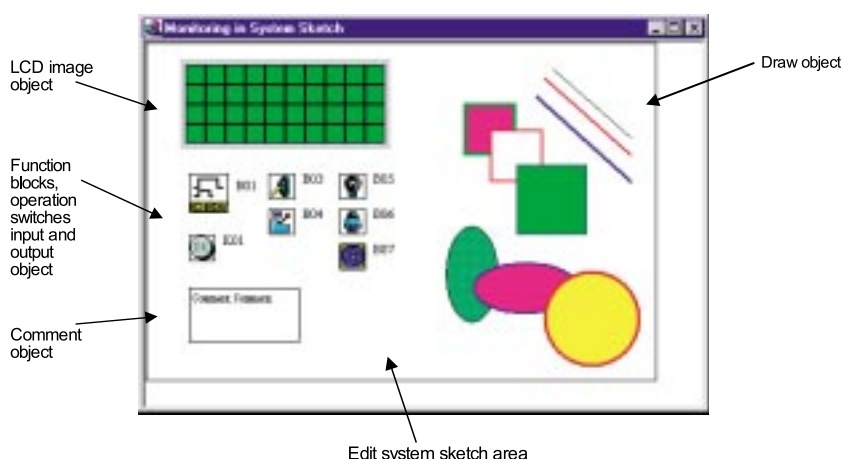
MEMO

7. Monitoring in System Sketch Window

The Monitoring in System sketch window allows for user-defined customization as shown in the window.



- Icons of I/O signal and function block, etc. used for FBD window. If unused the icons in the FBD window are arranged. States of the icons will be displayed regardless of the operation of the FBD program.
- Comment
- Importing file (OLE)
- Figure drawn by figure toolbar
- LCD image of alpha series main unit



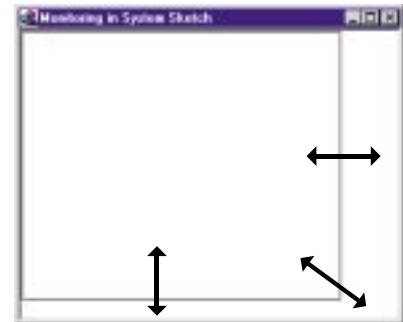
Note:

When this window is active, the following toolbar and functions are applicable.

- Functions within the Toolbar that became active.
 - Image and Drawing Toolbar
 - “LCD Image” and “Insert New Object...” in the Tools menu.
- Function within the Toolbar that become inactive.
 - Wiring and User Function Toolbar
 - “Auto FBD Wizard” in the Tools menu
 - “Select controller Type...” in the Option menu

7.1 Monitoring in System sketch Base Resize

When the monitoring in system sketch window is active, the base has a minimum size. The Base can be resized in width or height by dragging either the right or bottom edges respectively. By dragging the right-bottom corner of the base rectangle, the base height as well as width changes. The Base cannot be resized on the left and top edges.



7.2 Change Base colour and Icons

7.2.1 Changing the Base colour

The base colour can be changed via the "Set Base colour" command in the Option Menu. Further information can be found in Help on ECC-PNAL-PCS/WIN-E. (Default colour: lime green)

7.2.2 Customize Icons

The signal registered by the user and the image for the function block icon can be used. The icon can be registered in "User Defined Icons" in the Option Menu. The customer can choose registered icon by "Function Icon Set" in the Option Menu. Further information can be found in Help on ECC-PNAL-PCS/WIN-E.W

7.3 Drawing Lines, Ovals, and Rectangles

Lines can be drawn by clicking on the line icon and then moving the mouse accordingly. Click the mouse button to start the line and release the button when the desired end point is reached.



Ovals and Rectangles can be drawn in the same manner by choosing the appropriate icons.

7.3.1 Moving and Resizing Lines, Ovals, and Rectangles

The objects can be moved within the System Sketch base size limit by clicking on them and dragging them to the new position. Resizing can be done by pressing the left mouse button on any of the edges and dragging the mouse. The mouse cursor changes to double headed arrow when it is moved over the edges indicating the direction in which Resizing can be done.

The objects can be Resized within the boundaries of the System Sketch base only.

The Cut, Copy, and Paste options can be performed on objects within the System Sketch window.

7.3.2 Changing colours

To change the colour of an existing line, select the line with the left mouse button. Click on the Line colour Icon and choose the new colour for the line. This Line will be drawn in this colour.

This colour will appear as the outline Line colour for Ovals and Rectangles. The fill colour for the Rectangle and the Oval can be changed by clicking on the Brush colour icon and choosing a new colour.

7.3.3 Changing the Line Width

An existing Line width can be changed by selecting the Line in the System Sketch Window and clicking the desired line width - thin, medium, or thick. The line width for Ovals and Rectangles is changed in the same manner. This will now be the active Line width for all the drawing tools.

7.4 LCD Display Image

The LCD Display can be inserted into the System Sketch Window by either using the insert window or during Simulation or Monitoring.

To Insert LCD Display Image:

There must be an existing Display function block in the FBD base for the Insert LCD command to be activated in the Insert Menu. Click on the command to insert the LCD screen onto the System Sketch Window. If it is already present in System sketch window, an error dialog box will appear.



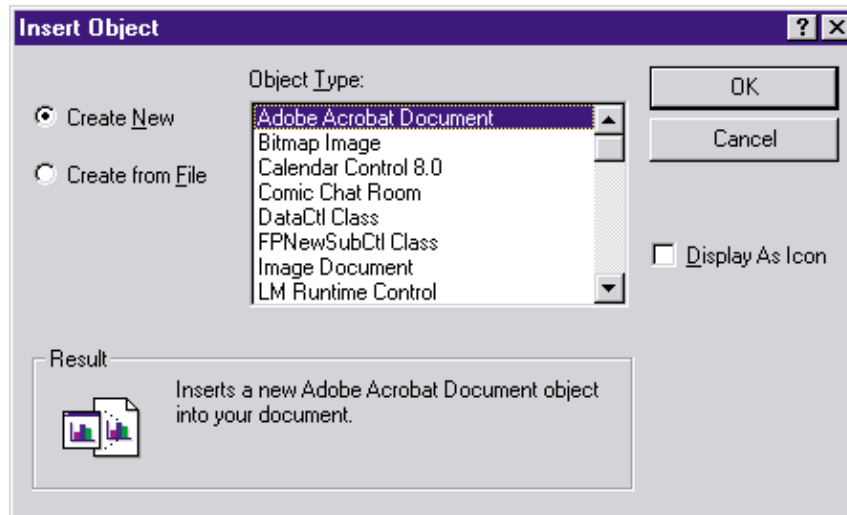
Simulation and Monitor Mode:

A Display function block will cause a dialog box to appear upon entering Simulation or Monitor Mode. This box will give a prompt for whether to add the Display to the System Sketch Window base. Check yes to automatically add the LCD Display.

7.5 Adding an OLE File

An OLE object can be inserted into the System Sketch Window. We can edit this object by double clicking on it. The object can be moved within the System Sketch base, and can be resized within the limits of the System Sketch base size. The OLE Object can be inserted using Insert New Object dialog box.

Select the type of information to be inserted into System Sketch Window. Some common object types include Graphs, Document, and Bitmaps Image, etc..



7.6 Adding a Signal or Function Block

Signals and Functions Blocks can be copied from the FBD base area or added with the Accessories Toolbar and placed on the System Sketch Window. Analog Signals and Function Blocks must be copied from the FBD base.

If a Function Block is copied from the FBD Base, its number is copied and the parameters will be displayed in the Simulation or Monitor Mode. Wiring connections cannot be copied to the Monitoring in System Sketch Window.

Items placed in the Monitoring in System Sketch Window using the Accessories Toolbar will have new function block numbers assigned to them but these numbers will not affect the number of function blocks that can be placed in the program. Function Blocks can be copied to the FBD base and then incorporated into the program.

Move items with the mouse to any area inside the System Sketch base window.

8. Simulation Mode

Simulation mode allows the user to run the system program Offline. Changes to Function Block parameters can be made during the simulation process, analog values can be input as necessary, and the input signals themselves can be turned ON/OFF.

This is a powerful tool to debug new programs or to check updates to current programs.



Note; Inactive Functions during Simulation Mode

The Edit, Insert, and Tools Menu will be deactivated along with the Accessories, Wiring, and Drawing Toolbars. No program editing in regards to adding, deleting, wiring, or moving any system components can occur while in Simulation Mode.

8.1 Display of the Signal Icon, Wire and Function Block

8.1.1 Input and Output Icons

The input and output icons will all be labeled with their number (I01, O02, M03, K04, E01, A01, etc.) and ON/OFF status.

8.1.2 Wire

The digital wire connections will change colour so that outputs pins that are On will become red and output pins that are Off will become blue. (These colours can be changed in the Options menu when in the Programming Mode).

8.1.3 Function Block

The function block will all be labeled with their number (B01, B02, B03, etc.), ON/OFF status, timer values, counter values, priority settings, and other parameter values. At a glance, all the important information about each component is displayed.

8.2 Start the Simulation Mode

When the program is ready to be tested, enter the Simulation mode by clicking on the Simulation icon in Controller Toolbar or by using the Simulation Start option in the "Controller" Menu. The FBD Window or the Monitoring in System Sketch Window can be viewed as required.

8.3 Turn Signals ON/OFF (Force ON/OFF)

The following icon can be turned ON/OFF by a single clicking on the icon.

Table 8.1: Turn Signal ON/OFF

Items	Destination
Inputs	All input terminals (I1 ~ I15, EI1 ~ EI4), Inputs for AS-interface (E01 ~ E04)
Outputs	All output terminals (O1 ~ O9, EO1 ~ EO4), Outputs for AS-interface (A01 ~ A04) - See Note
Operation Keys	All operation keys (K01 ~ K08)
System Bits	M06, M07, and M12 ~ M14
Control Bits	All control bits (N01 ~ N04) - See Note
Output Signal of Function Block	All function blocks - See Note



Note;

The outputs, control bits and all function blocks can be turned ON/OFF, but the output of icon may be affected by the ON/OFF state of the input pins. Some icons will remember their output states until they are reset.

8.4 Change Function Block Parameters

Function Block parameters can be changed by double clicking on the function block. Change the parameters as desired and click the OK box to accept. The new values will be shown on screen and any change to the program settings will be performed. The TimeSw cannot be edited during the Simulation mode.

8.5 Exiting the Simulation Mode

To exit the Simulation mode, press the Simulation icon with the mouse left button or use the Simulation Stop Command in the "Controller" menu.

9. Read/Write Program From/To Controller

This chapter explains read/write the program from/to the αPneuAlpha series controller. For remote maintenance Set the modem accordingly. Refer to Chapter 11 for line connection.

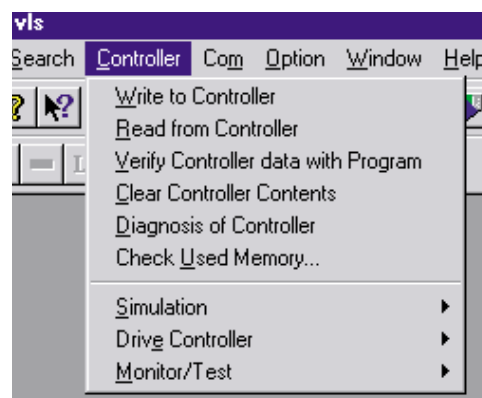


Note: Relocation file

This file has format as any other “.vls” file, containing information about FBD and System Sketch Windows including position information. Data which is written to Controller contains only FBD information excluding position information. This file is created, after data has been successfully written to the Controller, in the Relocation directory so that it can be used while “Read from Controller” is executed.

9.1 Write Program to Controller

- 1) Click “Write to Controller” in the Controller menu.



- 2) Unclick the “Create Relocation file” option if not required.
- 3) Check the “Run and Start Monitoring” option if the user requires the a series controller to incite operation.
- 4) Click “OK” button to begin writing program to the αPneuAlpha series controller.

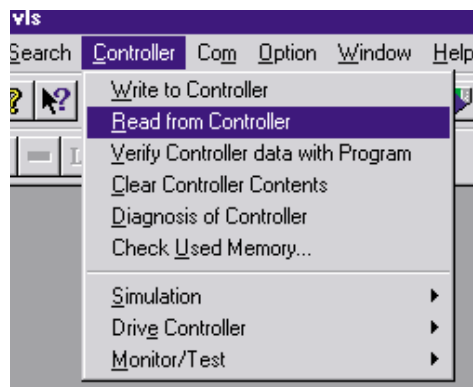


Note:

When writing program to a series, it should be in the “Stop status”.

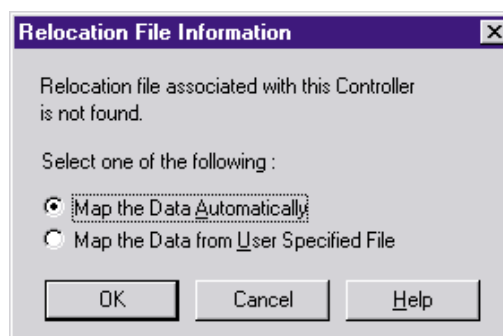
9.2 Read Program from Controller

- 1) Click "Read from Controller" in the Controller menu.



- 2) Click either of the radio buttons.
When the relocation file for this program is found in the relocation directory, this window will not be opened, and reading the program will be executed.

- **Map the Data Automatically;**
Arrange the icon suitably without using the relocation file.
- **Map the Data from User Specified File;**



Use the relocation file of the specified program file and arrange the icon.

- 3) Click "OK" button to begin reading program from the α PneuAlpha series.



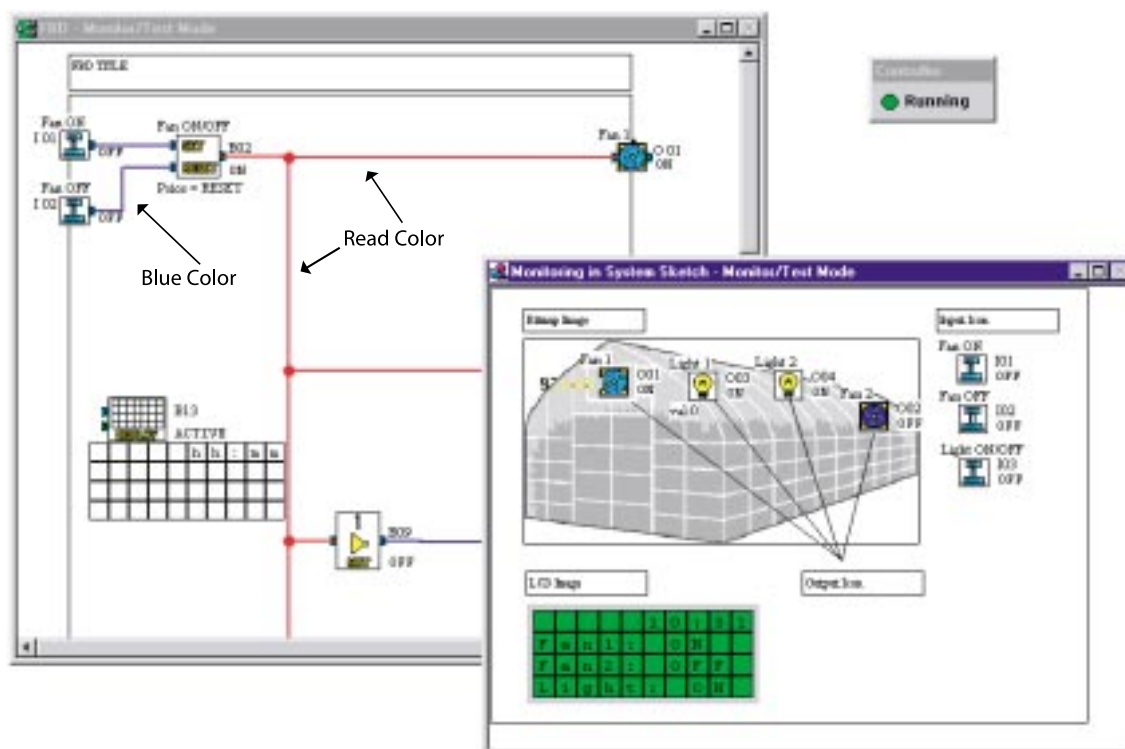
Note: Relocation file

This file has format as any other ".vls" file, containing information about FBD and System sketch windows including position information. Data which is written to Controller contains only FBD information excluding position information. This file is created, after data has been successfully written to the Controller, in the Relocation directory. Thus, it can be used while "Read from Controller" is executed.

10. Monitoring

The Monitor Mode can be used to monitor the current conditions of an αPneuAlpha series that is running a program. The αPneuAlpha series must be communicated to the ECC-PNAL-PCS/WIN-E via the ECC-PNAL-232CAB or modem or, when Monitor Mode is started an error dialog box will appear.

The αPneuAlpha series status (Running or Stopped) will be monitored continuously and will be displayed as shown.



Note;

The contents of the ECC-PNAL-PCS/WIN-E memory and the αPneuAlpha series memory must be the same before monitoring can take place. The ECC-PNAL-PCS/WIN-E package will read the contents of the αPneuAlpha series continuously and update the information accordingly. Changes made to program parameters will be transferred to the αPneuAlpha series and will affect the operation of the equipment.



Note; Inactive Functions during Monitor Mode

The Edit, Insert, and Tools Menu will be deactivated along with the Accessories, Wiring, and Drawing Toolbars. No program editing in regards to adding, deleting, wiring, or moving any system components can take place while in Monitor Mode.

10.1 Display of the Signal Icon, Wire and Function Block

10.1.1 Input and Output Icons

The input and output icons will all be labeled with their number (I01, O02, M03, K04, E01, A01, etc.) and ON/OFF status.

10.1.2 Wire

The digital wire connections will change colour so that outputs pins that are On will become red and output pins that are Off will become blue. (These colours can be changed in the Options menu when in the Programming Mode).

10.1.3 Function Block

The function block will all be labeled with their number (B01, B02, B03, etc.), ON/OFF status, timer values, counter values, Priority Settings, and other parameter values. At a glance, all the important information about each component is displayed.

10.2 Start the Monitor Mode

Enter the Monitor Mode by clicking on the Monitor Icon or by using the Monitor Start command in the Controller Menu.

10.3 Turn Signals ON/OFF (Force ON/OFF)

The following icon can be turned ON/OFF by a single clicking on the icon.



Caution; Force Signal ON/OFF

Take care in checking the safety consideration of the system when forcing ON/OFF as the result could cause serious damage to the machine and person.

Table 10.1: Turn Signal ON/OFF

Items	Run Mode	Stop Mode
Inputs (I1 ~ I15, EI1 ~ EI4)	Note 1	Note 1
Outputs (O1 ~ O9, EO1 ~ EO4)	☒ Note 2	✓
Inputs for AS-interface (E01 ~ E04)	Note 1	Note 1
Outputs for AS-interface (A01 ~ A04)	☒ Note 2	✓
Operation Keys (K01 ~ K08)	Note 1	Note 1
Control Bits (N01 ~ N04)	☒ Note 2	✓
Output Signal of Function Block	Note 3	☒ Note 4

Note 1;

The Inputs terminal, AS-interface's input bits and operation keys can be turned ON/OFF, but the icon state is affected by the ON/OFF state of the hardware, hence changing the ON/OFF status of the signal is impractical.

Note 2;

The outputs terminal and AS-interface's output bits cannot be turned ON/OFF because the output is affected by the ON/OFF state on the program.

Note 3;

All function blocks can be turned ON/OFF in Run mode, but the output of function block might be affected by the ON/OFF state on the program, hence changing the ON/OFF status of the signal is impractical.

Note 4;

All function blocks cannot be turned ON/OFF.

10.4 Change Function Block Parameters

Function Block parameters can be changed by double clicking on the function block. Change the parameters as desired and click the OK box to accept. The new values will be shown on screen and any change to the program settings will be performed. The TimeSw cannot be edited during the Monitor mode.



Caution; Change Function Block Parameters

Take care in checking the safety consideration of the system when forcing ON/OFF as the result could cause serious damage to the machine and person.

10.5 Exiting the Monitor Mode

The customer can stop the Monitoring and switch to Program Mode either by clicking the Monitoring button present in the Controller toolbar or by selecting the Monitor/Test Stop command in the “Controller” Menu.



Note;

If, during the course of monitoring the αPneuAlpha series, the contents are updated using the front panel keys a message box will appear stating that αPneuAlpha series contents are updated and monitoring will be stopped. The application will automatically switch to Program mode.

11. Remote Maintenance

The αPneuAlpha series can communicate via modems to a PC using ECC-PNAL-PCS/WIN-E. The user can Upload or Download Programs, monitor counter values or function block times, change parameter settings, or write new data to the αPneuAlpha series. All communications are initiated from ECC-PNAL-PCS/WIN-E so that the user controls the information flow from the PC. The αPneuAlpha series cannot initiate error messages or send messages to external devices.

The αPneuAlpha series will initiate its modem upon startup therefore receive or transmit data as requested from ECC-PNAL-PCS/WIN-E.

11.1 System Configuration

Figure 11.1: Remote Maintenance with ECC-PNAL-PCS/WIN-E

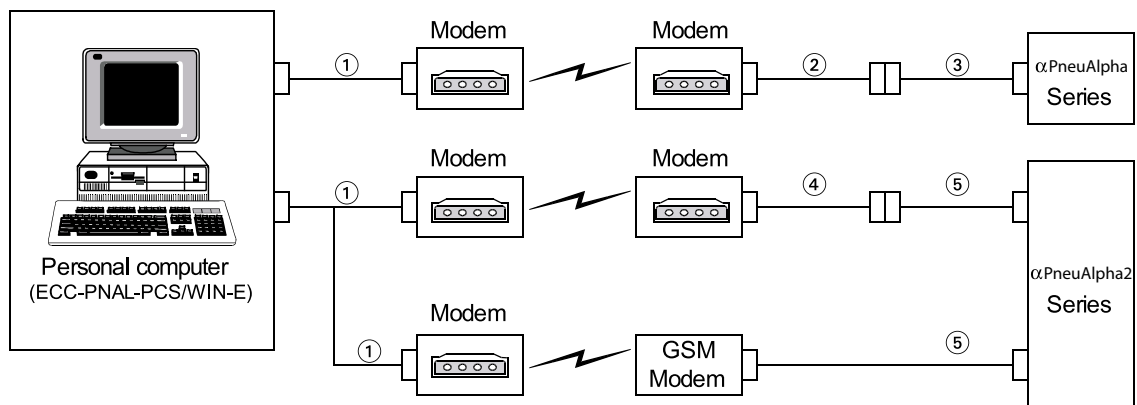


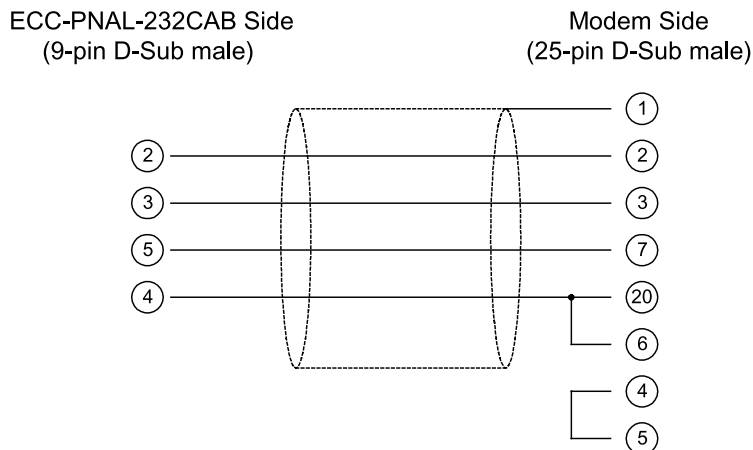
Table 11.1: Cable List of Remote Maintenance with ECC-PNAL-PCS/WIN-E

	Using Cable
1	RS-232C straight cable for the modem (specified by Modem manufacture)
2	User made RS-232C cable (Refer to Figure 11.2)
3	ECC-PNAL-232CAB
4	RS-232C straight cable for the modem (Refer to Figure 11.3)
5	ECC-PNAL-GSM-CAB

11.2 Cable Reference

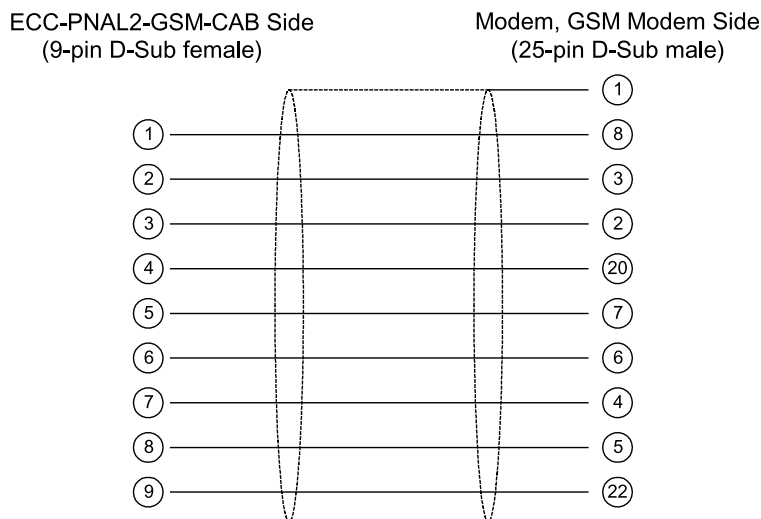
11.2.1 User made RS-232C Cable Between Modem and ECC-PNAL-232CAB (Model Type: ECC-PNAL-**M*-.*)

Figure 11.2: RS-232C Cable Between Modem and ECC-PNAL-232CAB (Model Type: ECC-PNAL-M*-.*)**



11.2.2 RS-232C Straight Cable Between Modem (GSM Modem) and ECC-PNAL2-GSM-CAB (Model Type: ECC-PNAL2-**M*-.*)

Figure 11.3: RS-232C Straight Cable Reference Between GSM Modem and ECC-PNAL2-GSM-CAB (Model Type: ECC-PNAL2-M*-.*)**



11.3 Recommended Modems

The following modems have been successfully tested.

Table 11.2: Tested Modems

Modem Type	Maker Name	Model Name
Modem	3com	SP560V-P
	OMRON	ME3314
	AIWA	PV-AF3360
GSM modem	Siemens	M20T

11.4 Modem Initialization at the Controller side

The α PneuAlpha series must be initialized with the modem's AT command that can be entered from the α PneuAlpha series front panel or transferred from ECC-PNAL-PCS/WIN-E. The ECC-PNAL-PCS/WIN-E provides three preprogrammed commands for commonly used modems or the user may enter the command according to the modems specifications.

11.4.1 Modem Setting

1) Personal Computer side

Install the file for the correct settings of the attachment in the modem.

2) Setting of α PneuAlpha series' modem

The modem on the α PneuAlpha series side is set by the ModemInit command of the main unit.

a) The modem command (AT command)

Use the AT command to initialize the modem. Confirm details of the AT command in the manual of the modem to be used. AT commands have been prepared for select modems in the table 9.4 (modem) and 9.5 (GSM modem) below.

Table 11.3: Tested Modems

Maker name	Model name	Modem command (AT command)
3com	SP560V-P	ATE0Q1&B1&D0H0&I0&R1&S0S0=2S15=8&W
OMRON	ME3314	ATE0S0=2Q1&D0S15=8&R1&H0&W
AIWA	PV-AF3360	ATE0S0=2Q1&D0&M5\Q0\J0&W
Siemens	M20T	ATE0S0=2&S0;+IFC=0,0;+CMEE=1;+IPR=9600&W

Further information on the method to initialize a modem of the α PneuAlpha2 series side can be found in the α PneuAlpha or α PneuAlpha2 Programming Manual. Initialize a modem by using the ECC-PNAL-PCS/WIN-E, refer to section 11.4.2 and 11.4.3.

When modems not listed in the table above are used, set the AT command to meet the following requirements.

Table 11.4: AT Command for Modems (Other GSM Modem)

Setting Item	Set content	Example Setting		
		SP560V-P	ME3314	PV-AF3360
Setting of command echo	None	E0	E0	E0
Call frequency of auto-answering	Twice	S0=2	S0=2	S0=2
Displayed result code	None	Q1	Q1	Q1
DTR control	Always on	&D0	&D0	&D0
DSR control	Always on	&S0		
Communicate mode	V.42bis mode	S15=8	S15=8	&M5
Speed of terminal fixed dimension	Fixed	&B1	\J0	
Terminal flow control scheme	None	-&R1	\Q0	
Flow control of transmission data	None	&H0	&H0	-
Flow control of received data (software)	None	&I0		
Flow control of received data (RTS control)	None	&R1		
Writing in nonvolatile memory	Write in the nonvolatile memory.	&W	&W	&W

Table 11.5: AT Command for GSM Modem

Setting Item	Set content	Example Setting
		M20T
Enable command echo	Echo mode OFF	E0
Set number of ring before automatically answering the call	Enable automatic answering on the ring twice	S0=2
Set circuit data set ready (DSR) function mode	DSR always ON	&S0
Set TE-TA local data flow control	<ul style="list-style-type: none"> Specifies the method which will be used by TE when data is received from TA: None Specifies the method which will be used by TA when data is received from TE: None 	+IFC=0,0
Report mobile equipment error	Enable result code and use numeric value	+CMEE=1
Set fixed local rate	Baud Rate: 9600 bps	+IPR=9600
Set circuit data carrier detect (DCD) function mode ^{*1}	DCD line is ON only in the presence of Data Carrier	&C1
Select bearer service type ^{*1}	9600 bps (V.32), asynchronous modem, non-transparent	+CBST=7,0,1
Store current parameter to use defined profile	The user profile is stored in non-volatile memory	&W

^{*1} For a Siemens M20T case, these settings are not necessary because they are default settings. When using other GSM Modems, these settings are necessary.

b) Timing related modem initialization

The α series allows synchronized start-up from the main unit using delayed modem commands. The delay can range from 0 - 10 seconds. This command can be useful to ensure the AT command is correctly transmitted when the α PneuAlpha1 series start up is faster than the modem start up.

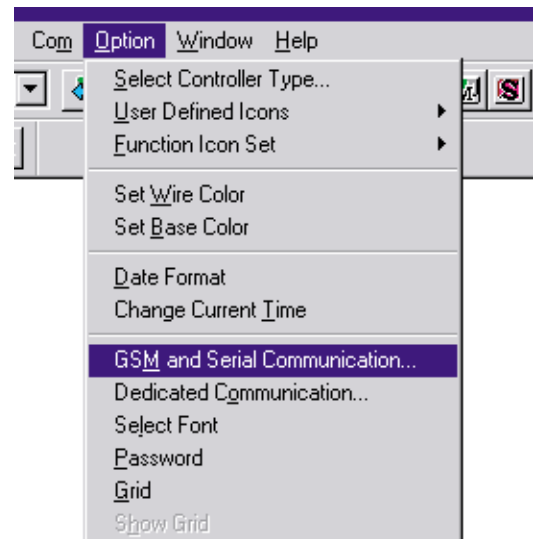
Further information for the modem operation can be found in the α PneuAlpha and α PneuAlpha1 Programming Manual.

11.4.2 Set the Modem Initialization

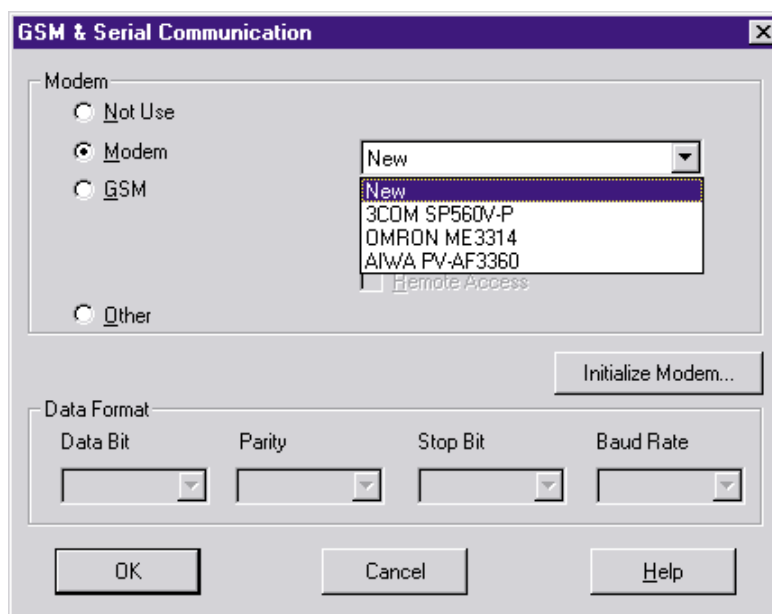
Set it according to the following procedures when setting the modem on the α PneuAlpha or α PneuAlpha1 series side.

To set the modem initialization on the α series side:

- 1) Click "Option" in the Menu bar, and choose "GSM and Serial Communication...".



- 2) Click "Modem" (radio button), and choose the appropriate modem on the pull down menu.



- 3) Using other modems, choose “New” on the pull down menu.
- 4) Click “Initialize Modem”.

Input the AT command for new modems into the Initialize Command.

When choosing the following modem, the initialize commands already have default settings.

However, it is possible to add some AT command.

Further information about AT commands can be found in the modem manufacturer’s manual.

Table 11.6: Preprogrammed Modem

Maker name	Model Name
3com	SP560V-P
OMRON	ME3314
AIWA	PV-AF3360

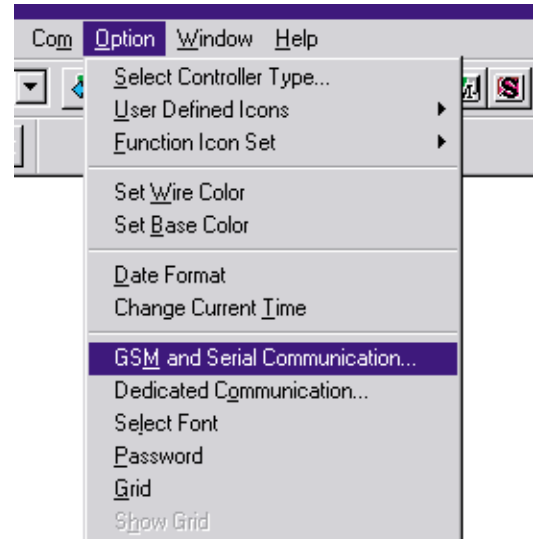
- 5) Set “Power On Delay” to 0 ~ 10s.
- 6) Click “OK”.
- 7) Click “OK” to complete the GSM & Serial Communication on the GSM & Serial Communication window.

11.4.3 Set the GSM Modem Initialization

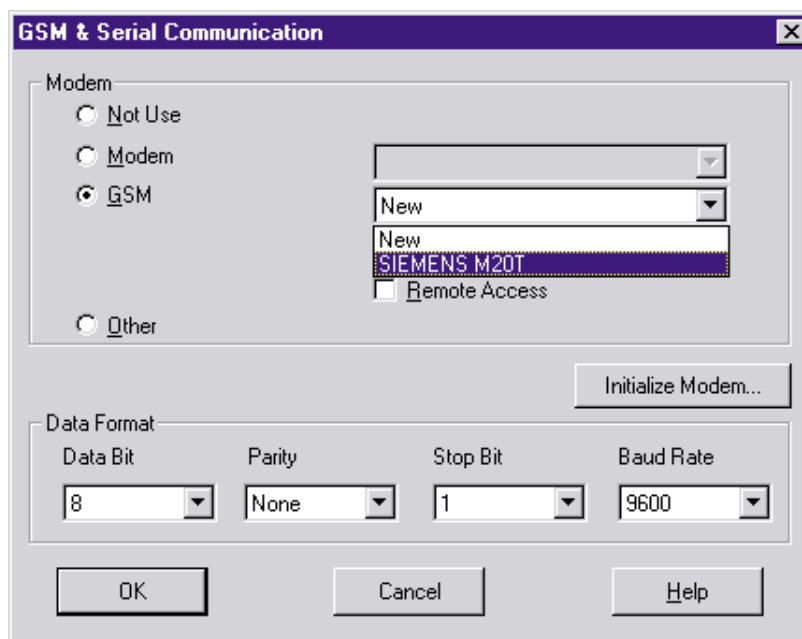
Set it according to the following procedures when setting the GSM modem on the αPneuAlpha2 series side. This setting is for αPneuAlpha2 series. When using αPneuAlpha series (Model: ECC-PNAL-**M*-*), this setting does not appear.

To set the GSM modem initialization on the αPneuAlpha series side:

- 1) Click "Option" in the Menu bar, and choose "GSM and Serial Communication...".



- 2) Click the "GSM" (radio button).



3) Using other modems, choose “New” on the pull down menu.

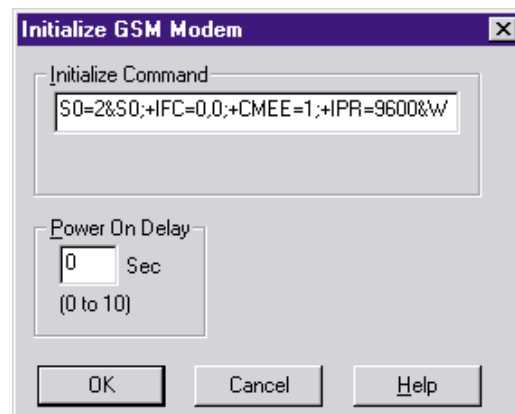
4) Click “Initialize Modem”.

This initialize command already has a default setting.

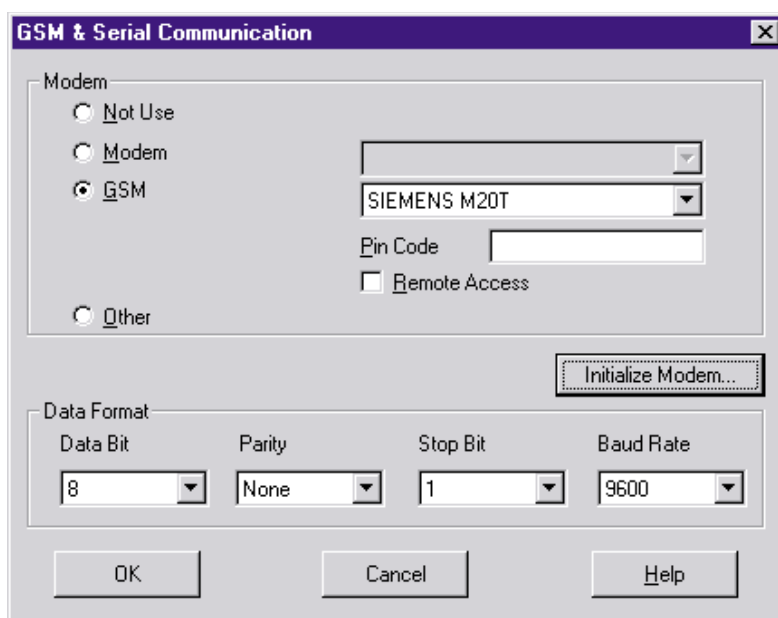
However, it is possible to add AT commands. Further information about AT commands can be found in the GSM modem manufacturer’s manual.

5) Set “Power On Delay” to 0 ~ 10s.

6) Click “OK”



7) Set “Pin Code” for using GSM modem on the αPneuAlpha2 series side.



8) Click “Remote Access” to access using ECC-PNAL-PCS/WIN-E.

9) Set “Data Bit, Parity, Stop Bit and Baud Rate” into the Data Format. When using the Siemens M20T, do not change default setting.

Table 11.7: Default Setting of Data Format

Items	Default Setting
Data Bit	8 bit
Parity	None (None parity)
Stop Bit	1 bit
Baud Rate	9600bps

10) Click “OK” to complete this setting.

11.5 PC to Modem Configuration Check

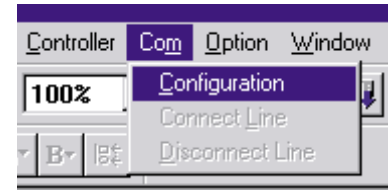
The modem setup can be checked in the “Com/Configuration/Test” function.

When checking the PC to modem the configuration file for the modem is installed to your PC, and the modem should connect to PC. When the connected modem cannot be used for PC, this test cannot be executed.

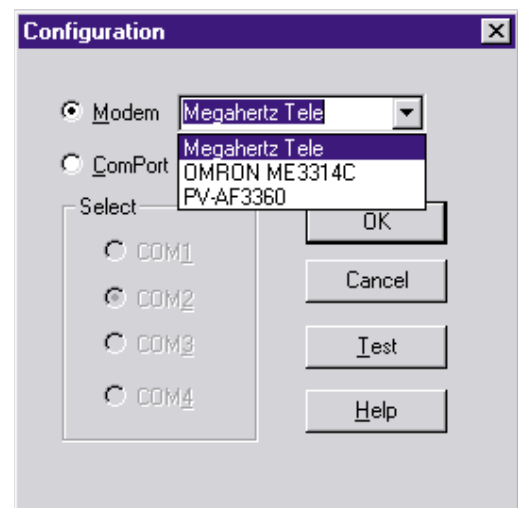
Further information about the installation of the modem can be found in the manufacture's for the modem manual.

To test configuration modem on the PC side:

- 1) Click “Com” on the Menu Bar, and choose “Configuration”.



- 2) Click “Modem”, and choose the connected modem to PC on the pull down menu.
- 3) Click “Test” to execute this test.



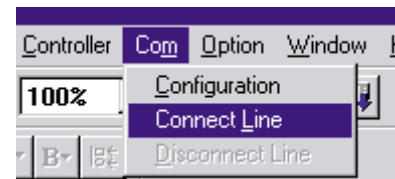
11.6 Connecting the Modem Telephone Line

This section explains about the connection destination via the telephone line.

When connecting to the αPneuAlpha series by telephone line, connect on the Ring Telephone window. Moreover, when executing to connection to the telephone line, the αPneuAlpha series is already started up. The αPneuAlpha series automatically initializes its modem on power-up when modem initialization was set in the parameters. Further information about modem initialization on the αPneuAlpha series side can be found in section 11.4, the αPneuAlpha and αPneuAlpha2 series programming manual.

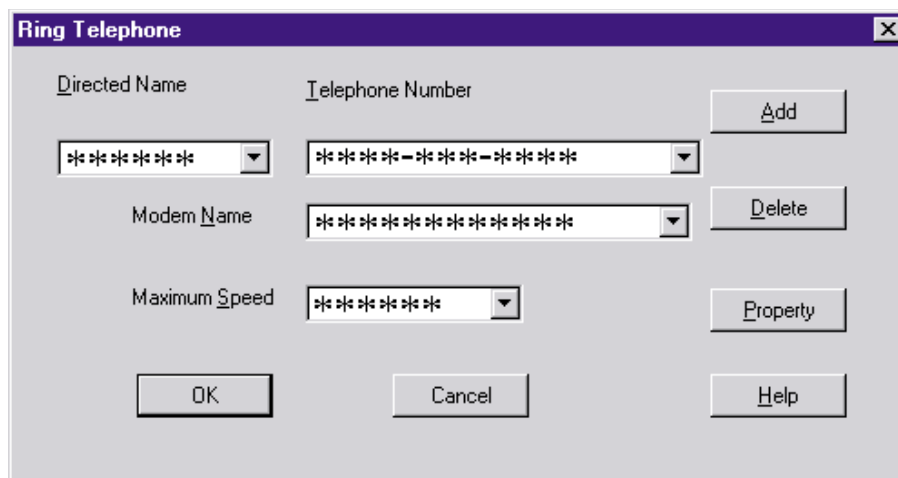
To connect the modem by telephone line:

- 1) Click "Com" on the Menu Bar, and choose "Connect Line".

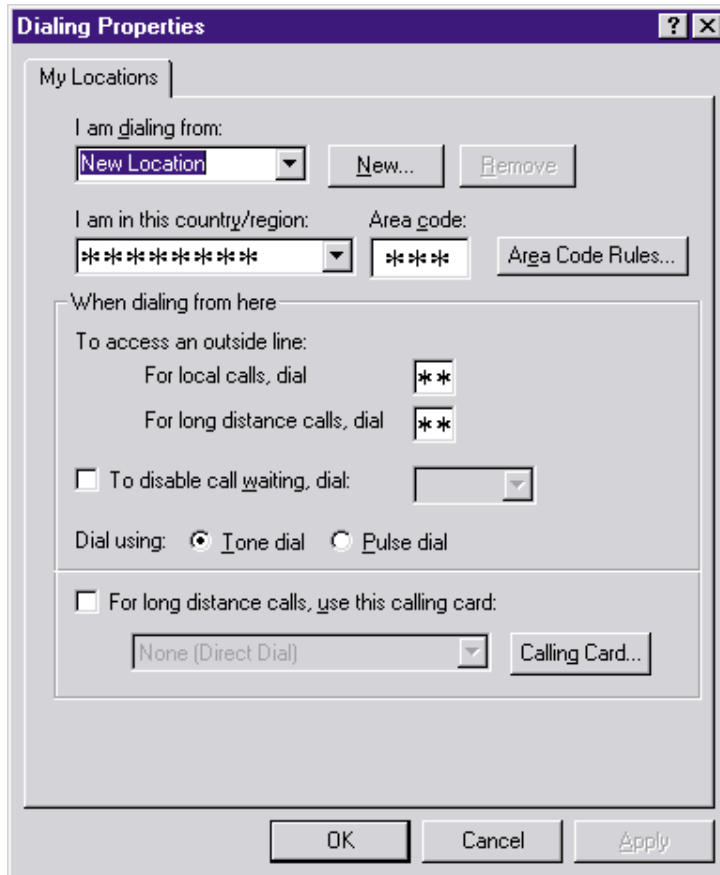


- 2) Input the Directed Name, Telephone Number, Modem Name, and Maximum Speed on the Ring Telephone dialog box.

Further information concerning ring telephone settings can be found in Help of ECC-PNAL-PCS/WIN-E.

A screenshot of the 'Ring Telephone' dialog box. It has a title bar with a close button. Inside, there are four input fields, each with a dropdown menu showing asterisks: 'Directed Name', 'Telephone Number', 'Modem Name', and 'Maximum Speed'. To the right of each field is a button: 'Add' for Directed Name, 'Delete' for Telephone Number, 'Property' for Modem Name, and 'Property' for Maximum Speed. At the bottom are three buttons: 'OK', 'Cancel', and 'Help'.

- 3) Click “Property” to set or choose the Dialing Properties in windows, and set each item in the Dialing Properties dialog box.



- 4) Click “OK” to complete this setting.
- 5) Click “OK” to connect by telephone line on the Ring Telephone dialog box. When the process is complete, a message tells you that ECC-PNAL-PCS/WIN-E has connected via telephone line.

11.7 Data Transfer

After the modem line has been successfully established, data can be transferred between ECC-PNAL-PCS/WIN-E and the αPneuAlpha series. Commands from the “Controller” pull down menu or Icons from the “Controller Toolbar” can be used to Upload/Download programs, verify or clear the controller’s memory, run “Diagnosis of Controller”, Check the Used Memory, Start/Stop, and Monitor Test Results.

When the αPneuAlpha series is running, the αPneuAlpha series program cannot be changed.

11.8 Disconnecting the Telephone Line

Return to the “Com” pull down menu and choose “Disconnect Line” to end modem communication.

MEMO

12. Setting for Computer Link

The αPneuAlpha2 Series controller can communicate with a personal computer and data link using dedicated protocol. The personal computer acts as the host station, and the αPneuAlpha2 series Controller acts as a local station. Therefore, all communications start from the computer side, and communication cannot start from αPneuAlpha2 series side.

The αPneuAlpha2 Series acts according to the request by the computer (send data, write and change status of Run/Stop, etc.).

This chapter explains the method of setting the computer link on the αPneuAlpha2 Series side with ECC-PNAL-PCS/WIN-E. Further information for the computer link command, data format, and communication frame, etc. can be found in αPneuAlpha2 Series Communication Manual.

12.1 Setting for the Computer Link

The computer link setting is set from 2 dialog boxes. Follow the computer link setting.



Note:

To set the computer link effectively; Write setting data in the αPneuAlpha2 series without fail, and turn the power supply of the αPneuAlpha2 series when the setting is completed. If the power supply is not turned OFF to ON, the αPneuAlpha2 series will not effect this setting.

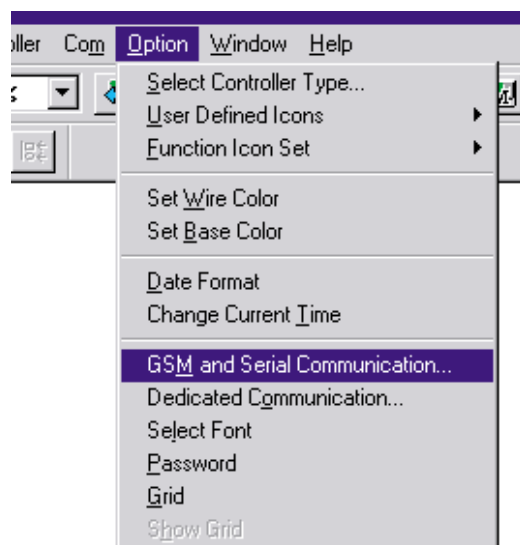


Note:

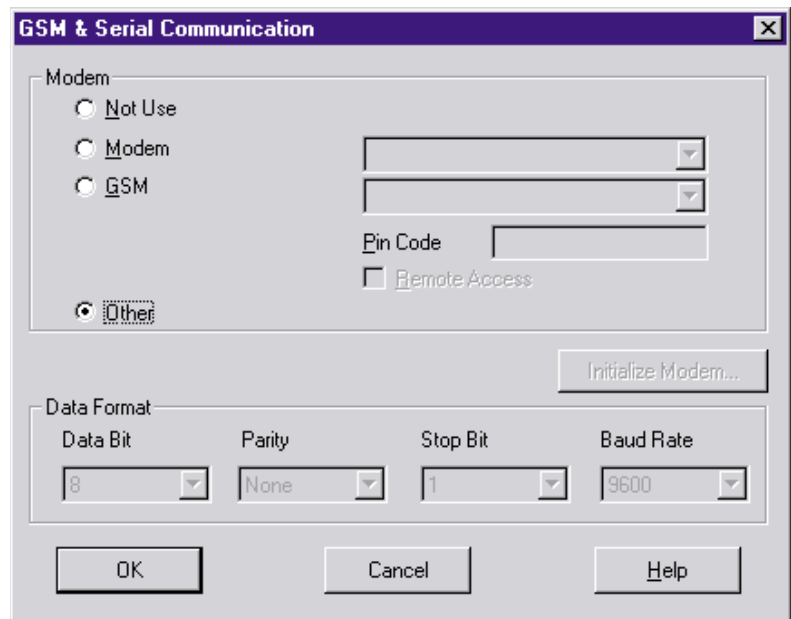
- When communicating the contact state and parameter data of a function block via computer link, operate 6) ~ 8). Moreover, function blocks must be on the FBD window.
- When communicating only hardware state (input terminal, output terminal, system bit and control bit, etc.), do not need to operate 6) ~ 8).

To set the computer link;

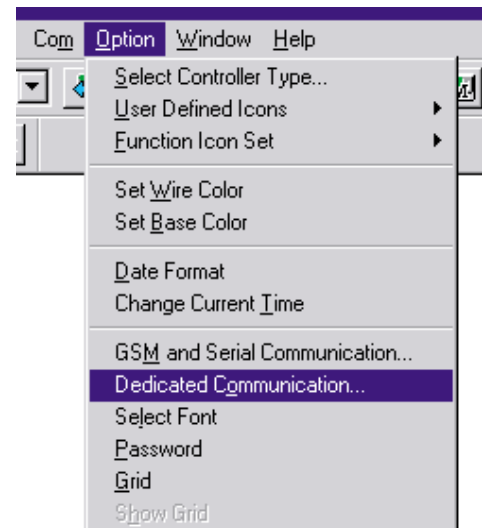
- 1) Click "Option" on the Menu Bar, and choose "GSM and Serial Communication..."



- 2) Click “Others” radio button.
- 3) Click “OK” button to complete the GSM & Serial Communication Window.



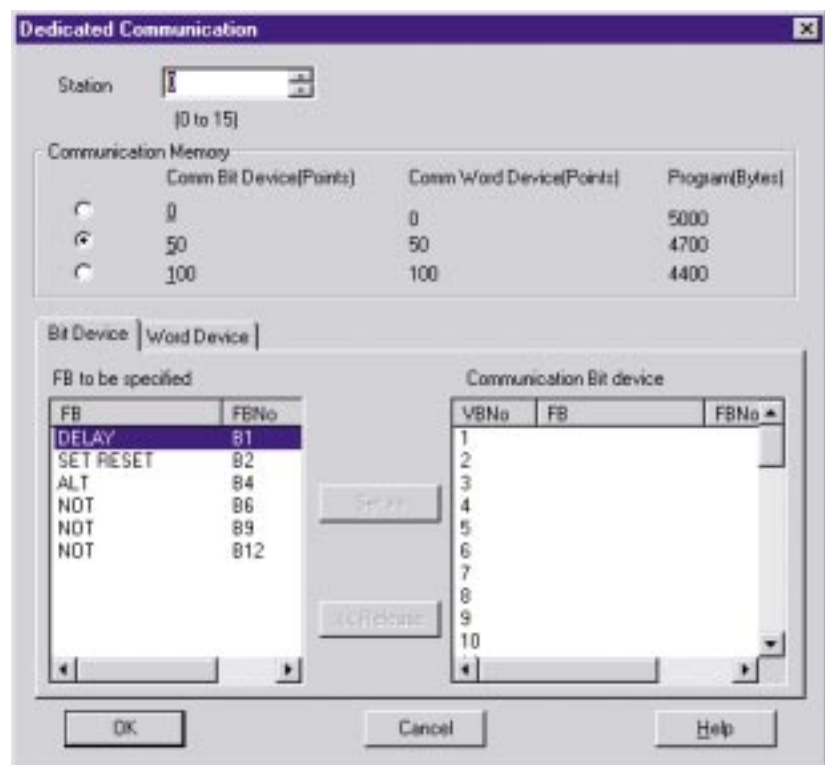
- 4) Click “Option” on the Menu Bar, and choose “Dedicated Communication...”



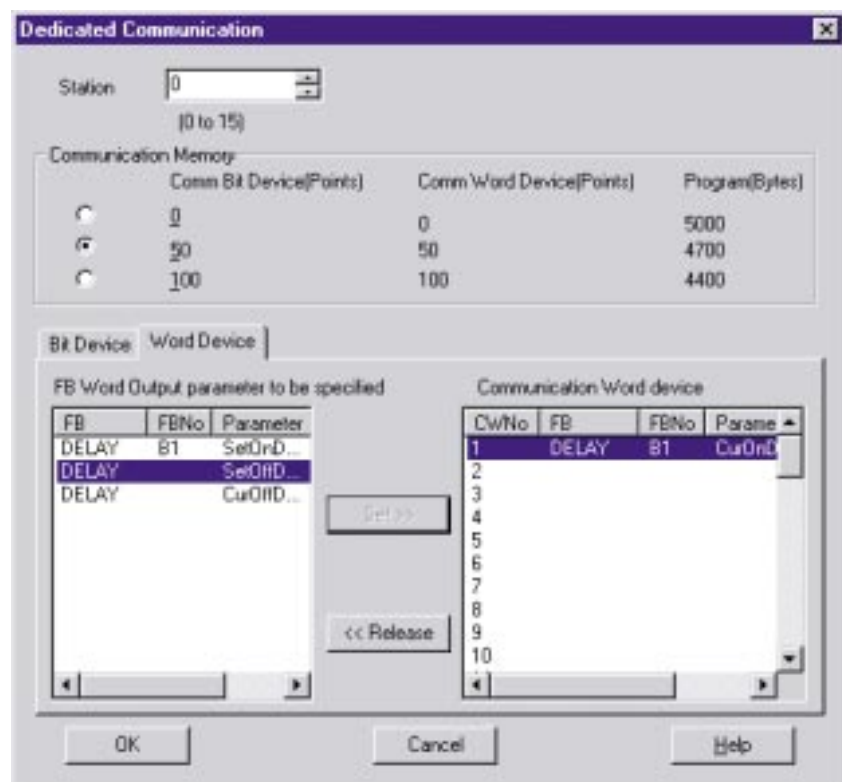
- 5) Set station number.
- 6) Choose number of the communication data for computer link from the Communication Memory.
- 7) Select the Communication Bit device in Bit Device Tab.

To set bit device:

- a) Choose the bit device in the “FB to be specified”.
- b) Choose the VB Number in the “Communication Bit device”.
- c) Click the Set button
- d) If completing the setting for bit device(s), continue a) ~ c).
- e) Click the Word Device Tab.



- 8) Select the Communication Word device in Word Device Tab.
- a) Choose the word device in the “FB Word Output parameter to be specified”.
- b) Choose the VB Number in the “Communication Word device”.
- c) Click the Set button
- d) If completing the setting for word device(s), continue a) ~ c).



- 9) Click "OK" button to complete Dedicated Communication Window.
- 10) Write data to the αPneuAlpha2 series, and the power supply of αPneuAlpha2 series needs to be turned OFF to ON to support computer link.

13. Information about AS-interface Programming

AS-interface modules are available for the following module and can be programmed with the ECC-PNAL-PCS/WIN-E. The following special symbols apply only to the AS-interface network. Further information about AS-interface programming can be found in α PneuAlpha and α PneuAlpha2 series Programming Manuals, and ECC-PNAL2-ASI-BD Hardware Manual.

Table 13.1: Applicable α PneuAlpha series

Series	Model Type
α PneuAlpha series	ECC-PNAL-20M*-*
α PneuAlpha2 series	ECC-PNAL2-14M*-* , ECC-PNAL2-24M*-*

13.1 AS-interface Input Icon and System Bit Icon

There is an AS-interface icon available in the Input Signal Accessory Toolbar (“In” Menu).

Table 13.2: AS-interface Input Icon

Icon on Accessory Toolbar	Icon on FBD	System Bit or Input Number	Description
		M6	“ON” when communication Error for AS-interface occurs
		M7	“ON” when communication Error by AS-interface power failure occurs
		E01 ~ E04	Input device from AS-interface master module

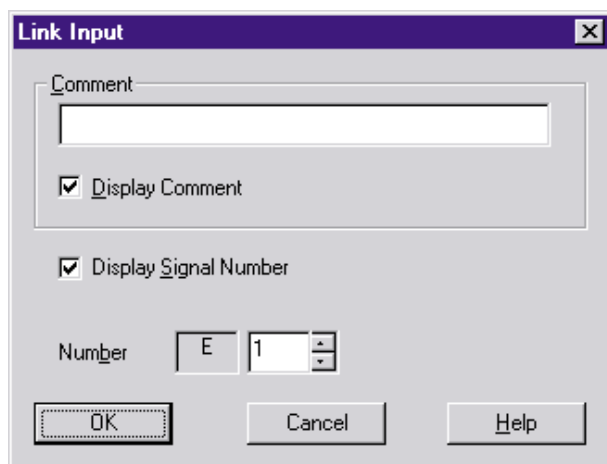


13.1.1 AS-interface Input Icon

There is an AS-interface icon available in the Input Signal Accessory Toolbar (“In” Menu). A total of 4 AS-interface “Link In” inputs (E01 ~ E04) can be added to the FBD base. The AS-interface inputs do not count towards the number of αPneuAlpha series Inputs available.

To arrange input for AS-interface Network:

- 1) Click “Link in” icon in the Input Signal Accessory Toolbar (In menu), and click on the FBD window to arrange AS-interface input icon.
- 2) Set number of input for AS-interface network.



- 3) Click “OK”





13.1.2 ASI System Bits Icon

The M6 and M7 are system bits dedicated strictly to the AS-interface network. These system bit for the AS-interface Network line is connected to the AL/ECC-PNAL2-ASI-BD for both Power and communication purposes.

13.2 AS-interface Output Icons and Control Bit Icon

There is an AS-interface icon available in the Output Signal Accessory Toolbar ("Out" Menu).

Table 13.3: AS-interface Output Icon

Icon on Accessory Toolbar	Icon on FBD	System Bit or Input Number	Description
		N1	ON: Connect to AS-interface network OFF: Unconnected to AS-interface network
		A01 ~ A04	output device from AS-interface master module.

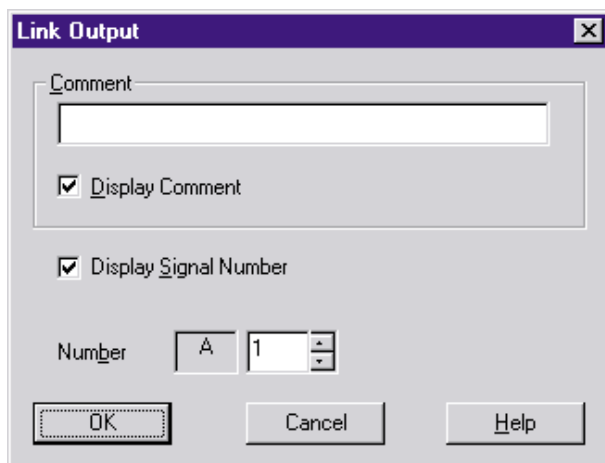


13.2.1 AS-interface Output Icon

There is an AS-interface icon available in the Output Signal Accessory Toolbar ("Out" Menu). A total of 4 AS-interface "Link Out" outputs A01 ~ A04) can be added to the FBD base. The AS-interface Outputs do not count towards the number of α-PneuAlpha series Outputs available.

To arrange input for AS-interface Network:

- 1) Click "Link out" icon in the Input Signal Accessory Toolbar ("Out" menu), and click on the FBD window to arrange AS-interface output icon.
- 2) Set number of output for AS-interface network.



- 3) Click "OK"

13.2.2 Active/Passive State

The αPneuAlpha series can be switched from an Active to a Passive state on the AS-interface network by changing the state on the N01 Control Icon. In the Active State, N01=0, communication is possible over the network. This icon can be found in the “Out” Menu next to the AS-interface “Link Out” icon.

When multiple αPneuAlpha series are added to a network, each slave must be given an address. In order to address the slaves from the Master station, only one unaddressed slave can be active at any one time. Once a slave has an address, another passive slave can be turned to an active state to receive its address.

Please refer to the αPneuAlpha and αPneuAlpha2 series Programming Manuals, the ECC-PNAL2-ASI-BD Hardware Manual and the manual for the AS-interface Network Master Controller.



SMC Pneumatics (UK) Limited, Vincent Avenue, Crownhill, Milton Keynes, Bucks. MK8 0AN
