MITSUBISHI ELECTRIC

Programmable Controller

MELSEC-F

SOFTWARE MANUAL

FX-PCS-VPS/WIN-E

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FX-PCS-VPS/WIN-E

SOFTWARE MANUAL

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Registration

Guidelines for the safety of the user and protection of FX-PCS-VPS/WIN-E

This manual provides information for the use of FX-PCS-VPS/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 the 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 symbols 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.

1.   Introduction

This section describes the major functions of the FX-PCS-VPS/WIN-E software and the Outline of this manual. Make sure to read this section before using the software.

1.1   Outline

The software package FX-PCS-VPS/WIN-E is a programming tool designed to be used with the GM range of positioning units. The Visual Positioning Software (VPS) runs on Microsoft Windows Versions 95/98 and above and, Microsoft Windows NT Version 4.0 and above (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   List of Models Compatible with the VPS software

The FX-PCS-VPS/WIN-E software is compatible with all of the GM Series positioning units. Current models and last generation models include; FX-10GM, FX2N-10GM, FX-20GM and FX2N-20GM.

1.1.2   Product Configuration

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

CD-ROM SW0D5C-FXVPS-E

Manual (this manual) JY992D86801

1.1.3   Major Features of the FX-PCS-VPS/WIN-E Software

FX-PCS-VPS/WIN-E is a powerful tool for programming the GM series positioning units in an uncomplicated flow chart format. 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 VPS software has incorporated the following features for your convenience:

Normal Windows based software functions

Full range of pull down menus with premade icons

Mouse Access to Most Features

Icon or list code programming

Sketch or OLE file import facility

Real Time Monitor

1.2 Definitions

The following terms will be used throughout this manual and the FX-PCS-VPS/WIN-E software.

Flow Chart programming - The style of creating a positioning program for the GM units.

Flow Components - The elements required to construct a flow program. These are found in the Flow Accessories tool bar under the FLOW, CODE and FUNC headings. They may also be referred to as symbols or flow icons.

Flow & Monitoring Windows - The canvas for your master piece. 500 flow windows and 1 monitor window is provided for each project.

Workspace window - A quick and efficient way to navigate around your project.

1.3 Abbreviations

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

The FX-PCS-VPS/WIN-E software will be referred to as VPS software.

The FX(2N)-10GM & FX(2N)-20GM may be referred to as GM units or GM positioning units.

The FX(2N)-10GM may be referred to as 10GM

The FX(2N)-20GM may be referred to as 20GM

2. Installation

This section describes how to install the FX-PCS-VPS/WIN-E software package and to connect the GM units to a Personal computer. The Operation System requirements are outlined and the equipment necessary to make all proper connections are detailed.

2.1 Operating System Requirements

The FX-PCS-VPS/WIN-E software 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: Personal Computer Requirements

Item	Description
OS	**32 bit version** • Microsoft® Windows® 95 English version (Service Pack 1 or later) • Microsoft® Windows® 98 English version • Microsoft® Windows® Millennium Edition English version • Microsoft® WindowsNT® 4.0 Workstation English version (Service Pack 3 or later) • Microsoft® Windows® 2000 professional English version • Microsoft® Windows® XP English version (Home Edition or Professional) • Microsoft® Windows Vista® English version (Home Basic, Home Premium, Business, Ultimate or Enterprise)[1] • Microsoft® Windows® 7 English version (Ultimate, Enterprise, Professional, Home Premium or Starter)[2] • Microsoft® Windows® 8 English version (8, Pro, Enterprise)[2] • Microsoft® Windows® 8.1 English version (8.1, Pro, Enterprise)[2] • Microsoft® Windows® 10 English version (Home, Pro, Enterprise, Education)[2] **64 bit version** • Microsoft® Windows® 7 English version (Ultimate, Enterprise, Professional or Home Premium)[2] • Microsoft® Windows® 8 English version (8, Pro, Enterprise)[2] • Microsoft® Windows® 8.1 English version (8.1, Pro, Enterprise)[2] • Microsoft® Windows® 10 English version (Home, Pro, Enterprise, Education, IoT Enterprise)[2]
PC main body	• Microsoft® Windows® 95: CPU i486SX or better one • Microsoft® Windows® 98: CPU i486DX (66 MHz) or better one • Microsoft® Windows® Millennium Edition: CPU Pentium 150 MHz or better one • Microsoft® WindowsNT® 4.0: CPU i486 (25 MHz) or better one • Microsoft® Windows® 2000: CPU i486 (133 MHz) or better one • Microsoft® Windows® XP: Pentium 300MHz or better one • Microsoft® Windows Vista®: Pentium 1GHz or better one • Microsoft® Windows® 7: CPU Pentium 1GHz or better one • Microsoft® Windows® 8: CPU Pentium 1GHz or better one • Microsoft® Windows® 8.1: CPU Pentium 1GHz or better one • Microsoft® Windows® 10: CPU Pentium 1GHz or better one
Required memory	• Microsoft® Windows® 95: 32 MB or more • Microsoft® Windows® 98: 32 MB or more • Microsoft® Windows® Millennium Edition: 32 MB or more • Microsoft® WindowsNT® 4.0: 32 MB or more • Microsoft® Windows® 2000: 32 MB or more (64 MB or more is recommended.) • Microsoft® Windows® XP: 128MB or more • Microsoft® Windows Vista®: 1GB or more • Microsoft® Windows® 7: 1GB or more • Microsoft® Windows® 8: 1GB or more • Microsoft® Windows® 8.1: 1GB or more • Microsoft® Windows® 10: 1GB or more
Hard disk capacity	Free space of 10 MB or more
Disk drive	CD-ROM drive

Table: Personal Computer Requirements

Item	Description
Display	Video display adaptor whose resolution is SVGA (800 × 600)[*3] 256 colors or better.
Interface	RS-232C serial interface (COM1 to COM10 shall be able to be changed over.)
	Printer interface
Printer	Printer in accordance with the OS above
Others	Mouse or other pointing device

*1. This Operating System is supported in FX-PCS-VPS/WIN-E Ver.1.20 or later.

*2. This Operating System is supported in FX-PCS-VPS/WIN-E Ver.1.30 or later.

*3. When using Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8, Microsoft® Windows® 8.1 or Microsoft® Windows® 10, the recommended resolutions 1024 × 768 or more.

2.2   Installation

Insert the SW0D5C-FXVPS-E CD-ROM into the appropriate drive. Execute "setup.exe."

Perform installation in accordance with the Wizard. The procedure is equivalent to that for general Windows applications.

ⓘ **Caution; Assigning Vps document files to FX-PCS-VPS/WIN-E on Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8, Microsoft® Windows® 8.1 or Microsoft® Windows® 10**

After installation Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8, Microsoft® Windows® 8.1 or Microsoft® Windows® 10 has no application associated to Vps document files.
(Vps document files can not be opened by double click.)
To assign Vps document files to FX-PCS-VPS/WIN-E execute the following steps.

When starting through the Start menu, right-click on the "FXVPS-E" menu item and select "Run as administrator".

Start Menu

Right-click
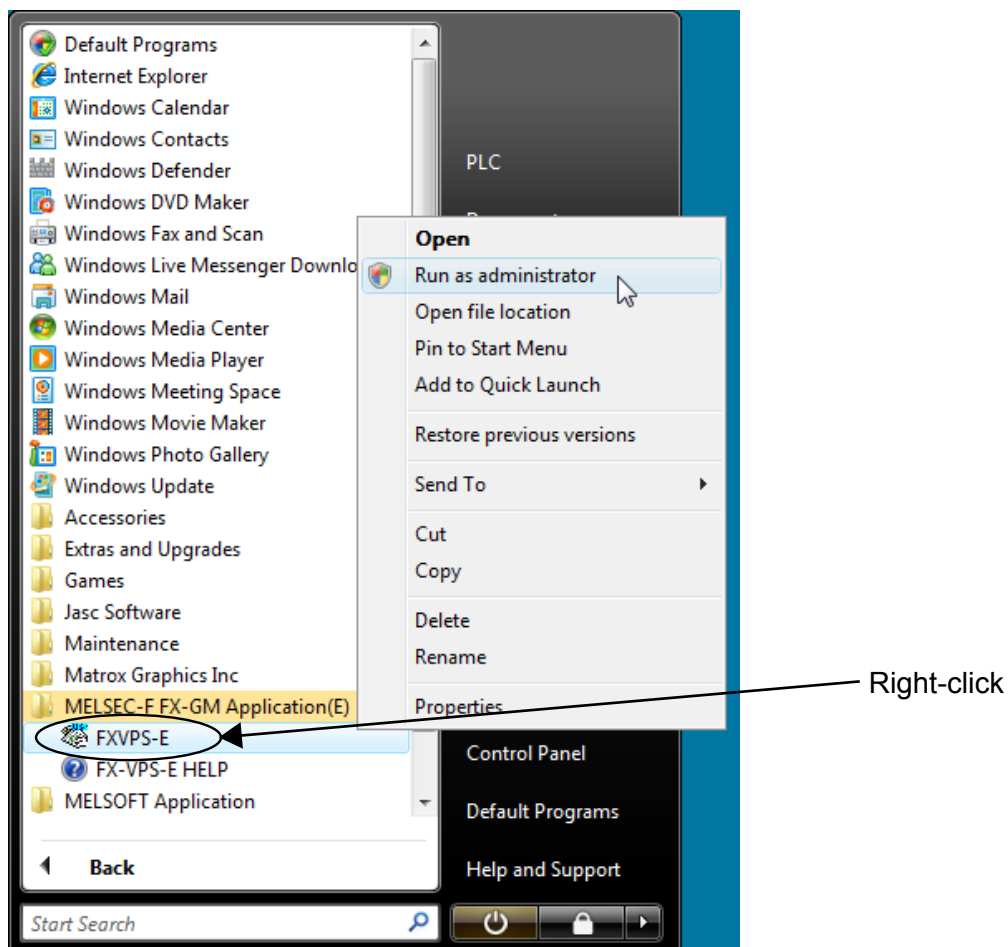
Note; When user account control is enabled in Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8, Microsoft® Windows® 8.1 or Microsoft® Windows® 10

The following dialog box appears when starting. Select "Allow."
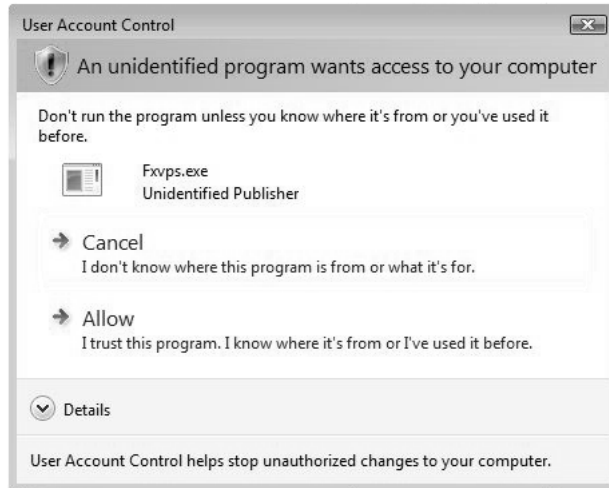
2.3 Uninstallation

To uninstall the FX-PCS-VPS/WIN-E software, click the [Install/Uninstall] option in the "My Computer:\Control Panel:\Add/Remove Programs".

Delete "Mitsubishi SW0D5*-FXVPS-E".

Note;

- Click "Add or Remove Programs" on the control panel in Microsoft® Windows® XP.

- Click "Programs" on the control panel in Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8, Microsoft® Windows® 8.1 or Microsoft® Windows® 10.

2.4   System Configuration

The system configuration for the Personal Computer and GM unit is diagrammed below. Please check for proper connections before transferring programs between the GM positioning unit and the Personal computer. The Communications port for program transfer between the personal computer and the GM positioning unit can be designated and verifed in the COM pull down Menu in the VPS software.
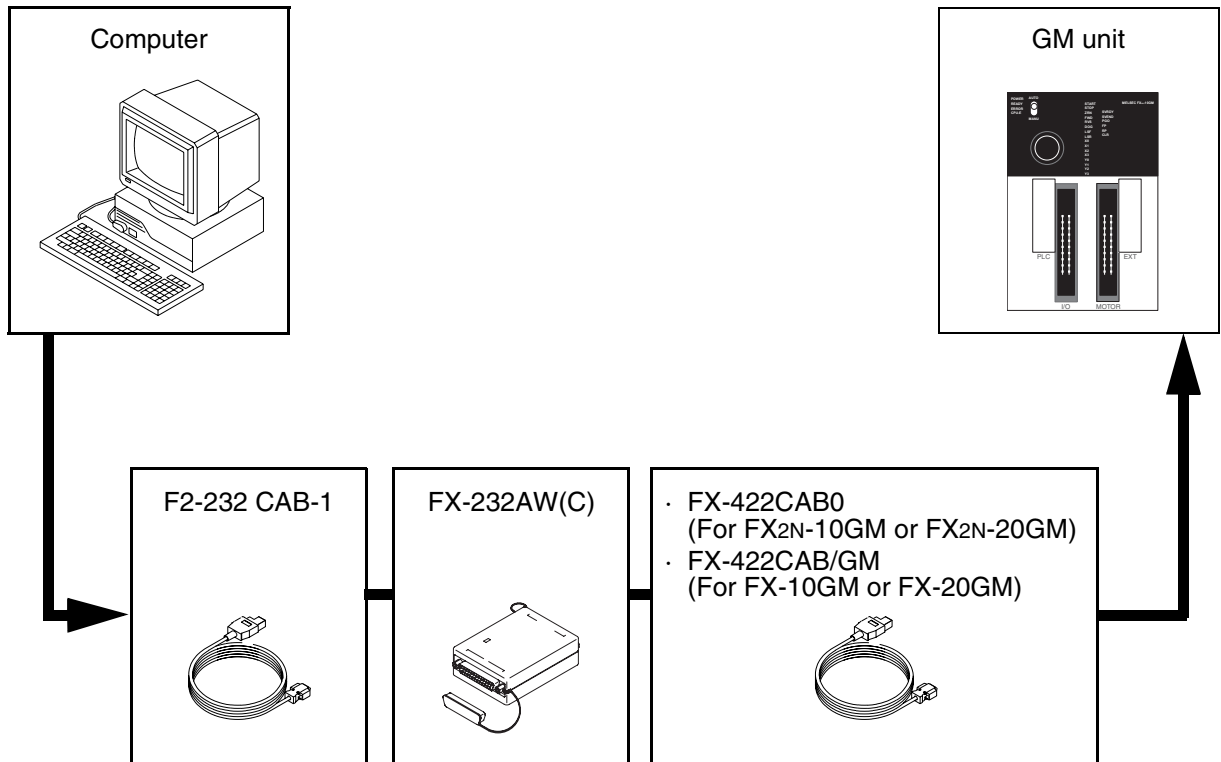
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3.   Using the Help Files

The VPS software includes a powerful package of help files to guide the user through the programming options. Use the F1 key, click the help icon, or use the Help pull down menu to access the help files.

> **Note; When using Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8 or Microsoft® Windows® 8.1**
>
> When Help is run using Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8 or Microsoft® Windows® 8.1, the following "Windows Help and Support" screen may appear, and the Help screen is not displayed.
> Perform the following procedure to install "WinHlp32.exe" which is needed to display the Help screen. (Note: The personal computer needs to be connected to the internet.)

1) Click the Help button.

2) The screen shown below opens. Click the displayed link.
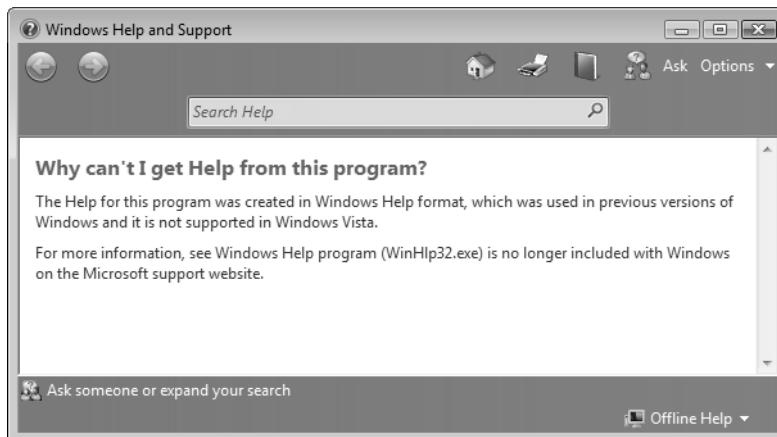
3) The Microsoft Support Knowledge Base page opens.
   (http://support.microsoft.com/kb/917607/en-us)

   Follow the instructions and download the Windows Help program for Microsoft® Windows Vista®, Microsoft® Windows® 7, Microsoft® Windows® 8 or Microsoft® Windows® 8.1 (WinHlp32.exe).

4) Install the downloaded file.

> **Note; When using Microsoft® Windows® 10**
>
> The Help screen is not displayed using Microsoft® Windows® 10. Refer to this manual for the operation and specifications.

3.1   The F1 Key

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

Click a system component in the flow window 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 in blue. Type F1 to access the Help dialog box before using the command.

3.2   The Context Help

The Context Help command can provide help with Tool Bars and associated commands. When you choose the Toolbar's Context Help button, the mouse pointer will change to an arrow and question mark. Then click on the item needing clarification in one of the VPS windows. The Help topic will be shown for the item you clicked.

Key operation : Shift+F1

3.3   The Help Pull Down Menu

The Help pull down menu provides answers in a variety of ways. Upon entering the Help menu the options list will be shown.
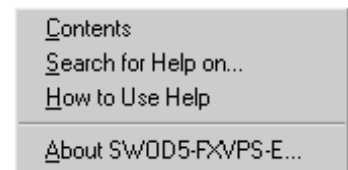
When "Contents", "Search for Help On…", or "How to Use Help…" is chosen, three tabs will appear on top of the window. These tabs can be used in addition to the Help files available on the display.
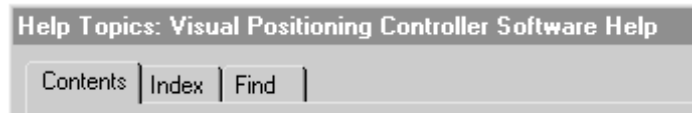
3.3.1   The Contents Command or Tab

The contents menu allows the user to choose from the following categories or chapters

Introduction - Choose from a basic introduction, information on the monitoring window or the flowchart window.

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

Tool bars - View information about each available tool bar and the individual icons incorporated.

Symbols - Learn about the functions and capabilities of the Flow components available for programming with the VPS software.

Monitoring objects - Learn about the components available for use in the Monitoring window.

Parameters - This explains the structure of each of the parameters and the variable elements incorporated.

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

Special Features - This section describes the various convenient features of the VPS software, including Program in text, Drag and Drop and Aligning components.

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

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.

3.3.2 The Index Tab

The Index tab displays information about topics displayed in the index. Type the first few letters of the required topic or scroll to the topic in the index list.

3.3.3 The Find Tab

The Find Tab generates a list of key VPS words 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.

3.3.4 Search for Help On ...

Click on the "Search for Help On" option to bring up the opening Help window. Click on the desired category to bring up information and instructions for using VPS or various pieces of reference information.

3.3.5 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.

3.3.6 About VPS

Use this command to display the copyright notice and version number of your copy of VPS.

4. What You Should Know Before Starting to Program

This section describes the basic functions and background information necessary to the proper operation of the VPS software. Please read and understand this section prior to beginning your first program.

There are two screens that can be accessed from the VPS software, the Flow Chart window and the 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.
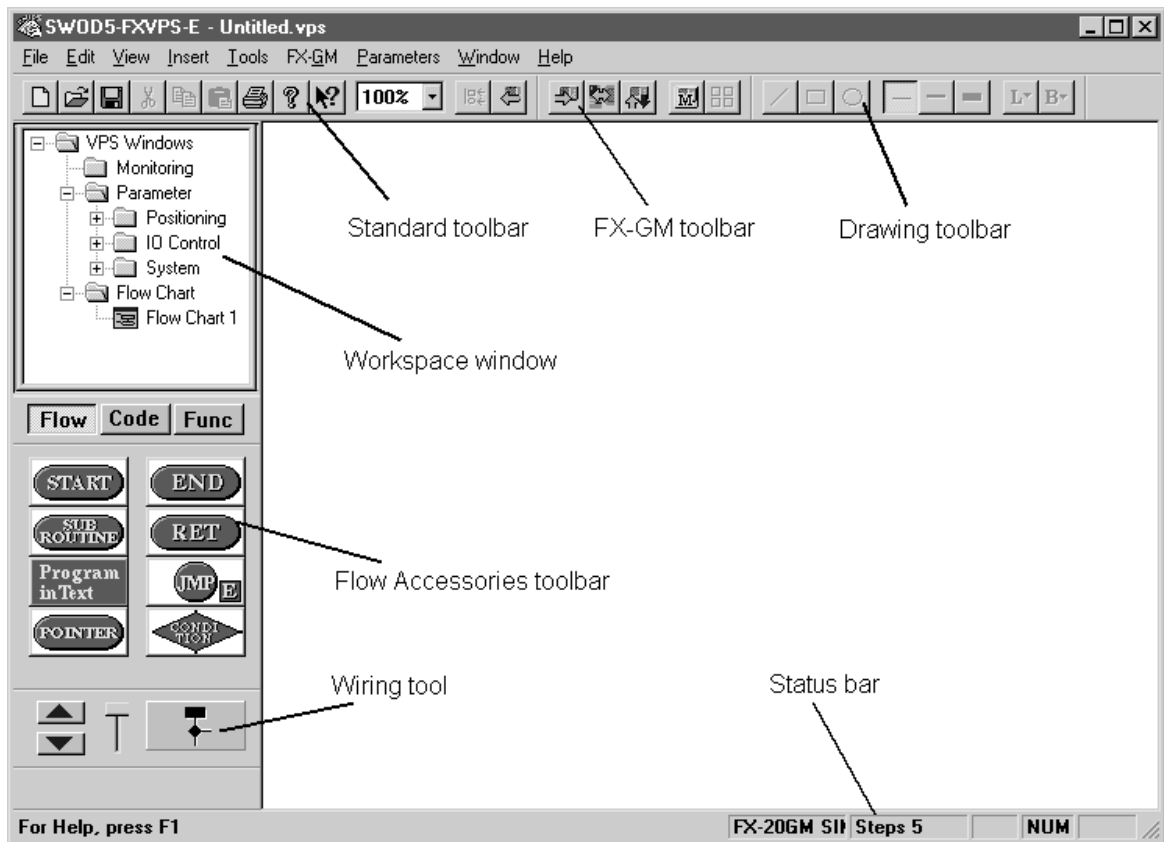
4.2   The Flow Chart Window

The Flow Chart Window provides the canvas on which the positioning program is constructed. The window consists of a large wiring area (grey by default), a title box and Start and End symbol flow components. Additional flow components are placed in the window, between the Start and End symbols and then connected by wires to construct the positioning program.
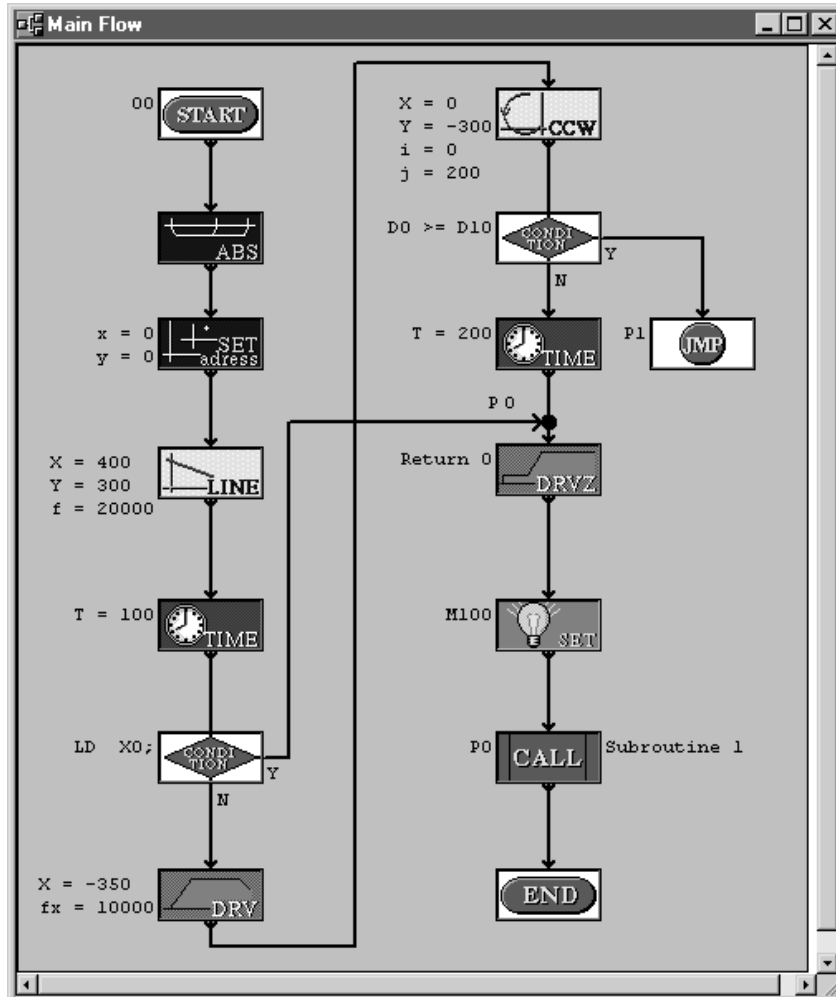
The user can perform the following operations in the Flow Chart window. Refer to Chapter Six for more details.

- Place flow components from the Flow Accessories tool bar.

- Configure each aspect of the flow program.

- Set individual function parameters.

- Create ladder program exerts for use in SW0PC-FXGP/WIN-E software.

- Wire flow components together.

- Read data from a GM unit.

- Write data to a GM unit.

- Print the flow chart program shown on the screen.

4.3   The Monitoring Window

The Monitoring window can be used in the same way as a Human Machine Interface screen. It is possible to view the status data of various devices in the positioning controller. This window is independent, and does not depend upon the information present in the Flow Chart window..
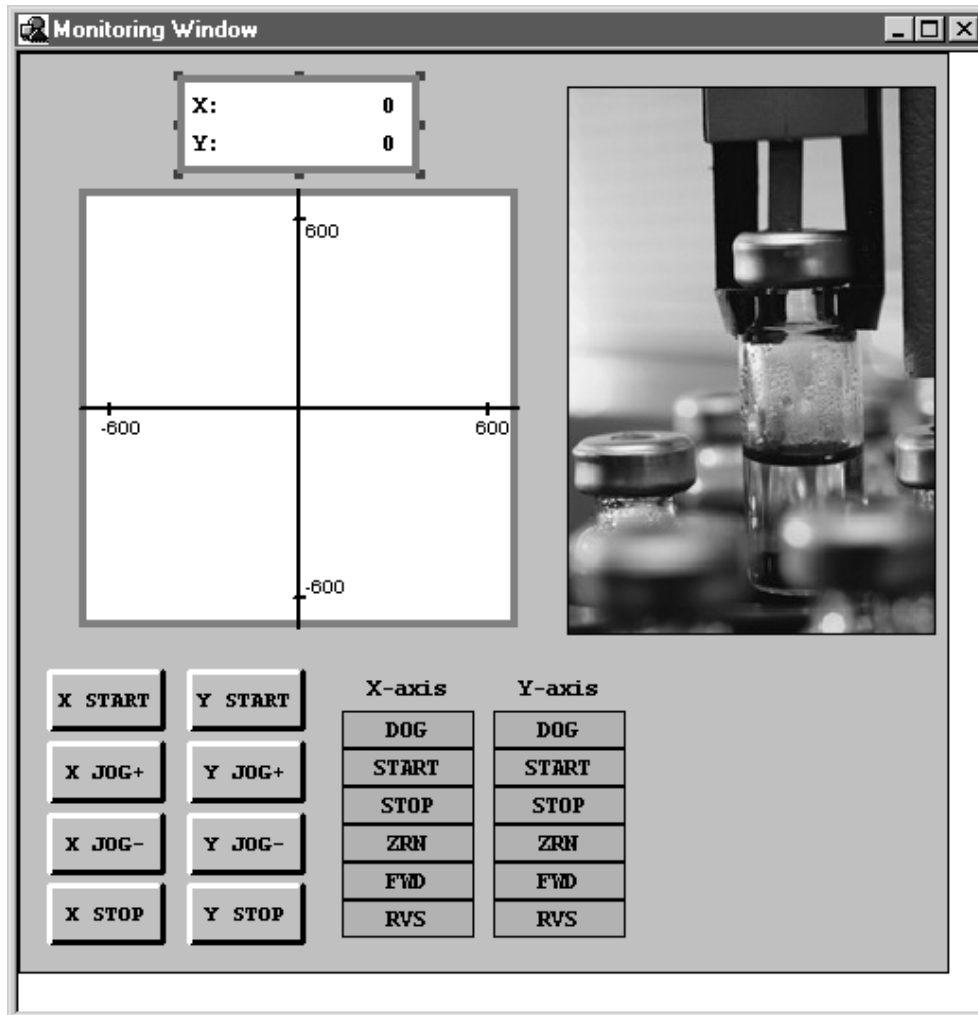
The following operations can be performed in the Monitoring window.

    1)Monitor the status and contents of many devices simultaneously.

    2)View the current position of both the X & Y axis in numeric and plotted format.

    3)Monitor the status of the GM unit positioning controller.

    4)Observe program information, such as error codes etc.

    5)Manually control the flow program.

    6)Draw diagrams using the drawing toolbar.

    7)Place OLE object on the screen

    8)Print the contents of the screen.

Please refer to Chapter 8 for more information.

4.4   The Programming Mode

This is also known as Drawing mode. In this mode, all the toolbars and the menu options will be enabled. The Monitoring and Flow Chart windows will be in Programming mode by default when ever both the documents are newly created or opened. The indication will be displayed as "Monitor Window" and "Flow Chart #"on the title bar of the Monitoring and Flow Chart windows respectively.

4.4.1   The Flow Chart window in Programming Mode

The user is able to add, change parameters, move and connect the flow icons in the Flow Chart window. Any flow icon in the window can be selected by pointing at it with the mouse and pressing the left mouse key. The selected flow icon can then be moved or deleted. Double clicking on a flow icon present in the window, will open the parameter setting dialog box. Using the wiring button, flow icons can be connected to form a positioning program.

4.4.2   The Monitoring window in Programming Mode

The user is able to add, modify, move and re-size the drawing objects in the Monitoring window. Any component in the window can be selected by pointing at it with the mouse and pressing the left mouse key. By dragging the handles, drawing objects can be moved and resized. Double click on any icon in this window will not have any affect.

4.5   The Monitoring Mode

The Monitoring Mode can monitor and test the actual target controller hardware which is connected to the PC through an RS232 interface. The information regarding state and current value of Signals and Functions will be continuously read from the target controller and updated accordingly in the VPS software.

It is possible to start/stop Monitoring and switch to Program Mode either by clicking the Monitoring button present in the FX-GM tool bar or by selecting the FX-GM toolbar item, Monitoring Start/Stop.

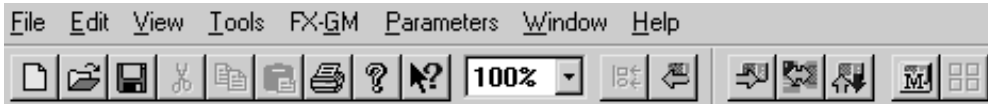Please refer to Chapter 8 for more information.

4.6   Cable Connection

FX-PCS-KIT-GM-EE is used to connect the GM units and the PC.

5.   Menu Bar Functions

This chapter gives a brief description of the functions available in the Pull Down menus available on the top edit bar.

File   Edit   View   Tools   FX-GM   Parameters   Window   Help

5.1   File

New (Ctrl+N) - Creates a new file with default name 'Untitled.VPS'. This new file has one blank monitoring window and one flow chart window (with Start & End icons). Any file currently open will be closed with an option to save.

Open (Ctrl+O) - Open an existing file. Only the monitoring window will be shown, the Flow chart window(s) can be accessed through the workspace window. Any file currently open will be closed with an option to save.

Close - Closes existing active documents in both the flow chart and monitoring windows with an option to save any changes.

Save (Ctrl+S) - Saves the open file to its current name and directory.

Save As - Save the open 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.

Import Text - Creates a visual file from a text based program. If text files are imported to an existing openVPS program, the new converted data will be added to the current program.

Export Text - Generate an equivalent texual program for the current program graphically depicted by all flow chart windows. The new program is saved as a '.txt' file.

Print Setup - Select a printer and printer connection from the Print Setup Dialog Box that pops up on the screen.

Print Preview - View the active document as it would appear if printed.

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

1-8 "Latest Files" - Use the numbers and filenames listed to Open the last eight documents that have been closed.

Exit - End the VPS session. A prompt will appear to save open documents.

5.2   Edit

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

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

Cut (Ctrl+N) - Remove 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) - Add the data from the Clipboard to the Program

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

Select All (Ctrl+A) - Select All items of the active screen.

5.3   View

Standard <u>T</u>oolbar - When the Check mark appears, the Standard Toolbar will be displayed onscreen.

FX-<u>G</u>M Toolbar - When the Check mark appears, the Controller Toolbar will be displayed onscreen.

<u>D</u>rawing Toolbar - When the Check mark appears, the Drawing Toolbar will be displayed onscreen.

<u>A</u>ccessories Toolbar - When the Check mark appears, the Accessories Toolbar will be displayed Onscreen.

<u>S</u>tatus Bar - When the Check mark appears, the Status Bar will be displayed Onscreen.

<u>Z</u>oom - Choose from 200, 150, 100, 75, 50, 25, or 10% zoom factor

5.4   Insert

The Insert menu is only shown when the monitoring window is active.

C<u>u</u>rrent Position - Inserts an object that shows the current position of both the X & Y axes.

<u>P</u>lotting - Inserts a graph that traces the movement as well as current position of both X and Y axes.

<u>D</u>evice Status - Inserts an object, which shows the current status and contents of all selected devices. Any number of device status objects can be inserted in the Monitoring window.

<u>M</u>anual Operation - Inserts pre-defined objects, which enable the user to execute commands such as, Start, Stop, Zero return, Jog etc. manually.

Manual Input <u>S</u>tatus - Inserts an object that shows the current status of all manual Input Operations.

FX-<u>G</u>M Status - Inserts an object that can be used to monitor the FX-GM status.

P<u>r</u>ogram Information - Inserts an object that shows information about the currently executing program.

Insert <u>N</u>ew Object - Insert a Display, OLE, or file into the Monitoring window.

Lin<u>k</u>s... - Edit links between the VPS file and other documents.

<u>O</u>bject - Opens the application in which the selected embedded or linked object was created so that you can edit it.

5.5   Tools

Search by <u>C</u>omment - Search for a Flow icon 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 symbol will be highlighted.

Search by <u>N</u>umber - Search for a pointer by its number. If a match is found the pointer will be highlighted and the pointer flow chart shown.

Used <u>M</u>emory - Shows the Total memory available in the connected Positioning Controller and the amount of memory used by the current program.

Change <u>B</u>ase Color - To change the colour of the base rectangle of the Monitor window and/or Flow-chart windows.

5.6 FX-GM

Write to Controller - Write the program in the VPS software to the memory of the GM unit. The contents of the GM units memory will be overwritten.

Read from Controller - Transfer the contents of the GM units memory into the VPS program. The current program in VPS will be overwritten.

Verify Controller data with VPS - Verify that the data in the Flow window matches the data in the GM positioning unit.

Initialise FX-GM contents - Writes an empty program to the controller, i.e. Initialises all the parameters to their default values and writes them to the Controller.

Diagnosis of Controller - Brings up a dialog box with the following information about the connected positioning controller:

- Memory capacity

- Model name

- Version number

- Memory cassette

Close control of Program in text - Select whether the program in text instructions should always be shown when in Monitor mode or not.

Monitor - Start and Stop monitoring between the connected GM positioning unit and the VPS software. Re-align all of the windows when in the Monitoring mode, and Tune the systems response time.

COM Port - Enables Users to choose desired Communication port for connecting the Positioning Controller. This command can also be used to test the COM port.

5.7   **Parameters**

Positioning - To view or modify the Positioning parameters:

> Units - The units of measurement for position and speed, also other information such as pulse rate and feed rate for the drive unit.

> Speed - The various speeds and acceleration/deceleration times when positioning operations are performed.

> Machine Zero - The parameters related to Machine Zero Return operation, such as speed, signal count etc.

> Settings - Other independent parameters relating to positioning, such as pulse format, rotation direction, servo ready check, top mode etc.

I/O Control - To view or modify the I/O Control parameters:

> Program Number - Parameters relating with the program number to be executed.

> M Code - M code related parameters such as output and input numbers.

> Manual Pulse Generator - Parameters such as pulse multiplying and division factors.

> Absolute Position - Absolute position detection parameters.

> Others - Parameters relating to single step operation.

System - To view or modify the System parameters (System, Subtask).

Show All - Shows a table of all parameters and their values for both X & Y axes. This information is sorted by Parameter number.

Initialize - Initialises all the parameters to their default values.

5.8   **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.

Close All - Close all open Windows.

5.9   **Help**

When Help is run using Microsoft$^®$ Windows Vista$^®$, Microsoft$^®$ Windows$^®$ 7, Microsoft$^®$ Windows$^®$ 8 or Microsoft$^®$ Windows$^®$ 8.1, refer to the Chapter 3.

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 VPS software.

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

About VPS... - Gives the Version number and Copyright notice for the VPS package.

6. Flow Chart Programming

6.1 Starting the Software & Opening a File

The VPS software can be accessed by using Windows Explorer, My Computer or the Start Menu. In any of these, navigate to the VPS icon or the VPS.exe file. When the software is loaded, begin a new program by either clicking the New option under File Menu or by clicking on the New file icon. Select the appropriate positioning controller and configuration from the box appearing onscreen.

Open an existing file with the "Open..." command under File or by clicking on the Open icon. A list of the current VPS files contained in the Prog default folder will appear. Choose a file from this folder or browse and open a file in another location.

6.1.1 Flow Window Resize

When a Flow chart window is opened, it has a default set size. The wiring area can be re-sized in width or height by dragging either the right or bottom edges respectively. By dragging the right-bottom corner of the wiring area, the area height as well as width changes. The wiring area cannot be re-sized on the left and top edges.

A wiring area can only be reduced to the minimum area available for the flow components already on the screen. The Base size can be increased to a scroll bar position limit of 30,000.

6.1.2 Wiring area base Colour

The wiring area base color can be changed in the "Change Base Color" command in the Tools Menu. Choose from 48 colors available on the palette or define your own.

6.2   Programming Mode - Beginning to Program

Programs for the GM series of positioning controller can be created and edited from the Pro-
gramming Mode. This mode is the default mode for the VPS software. The GM positioning
units are programmed by placing Symbols on the Wiring area in the Flow chart window and
connecting them together in a logical order with the wiring tool. There are three types of Flow
component Symbols that can be placed on the wiring area.

6.2.1   Flow Symbols

The flow set of symbols provide the backbone to any flow chart.
Included are the START and END commands of a project, Jump
to and start a POINTER program, CALL and start a SUB
ROUTINE then RETURN to the original flow chart and, set a
CONDITION in the flow chart.

Also available is a Program in Text option. This Flow component
symbol allows programs to be created in a text format. When this
symbol is selected and placed in the Flow window a dialog
appears. Any number of instructions can be entered through this
dialog box. A Syntax check is done for all the instructions. Along
the top of the box are some toolbar buttons for editing purposes,
they include cut/copy/paste, undo/redo and an OK button for
checking.

Additional to the Flow symbols is a node, this used when a
pointer jumps to another section in the same program, and not a
seperate program. Nodes are added to the Flow chart during the
wiring process.

Please see the Help File for a detailed description of each Symbol.

6.2.2   Code Symbols

The Code set of symbols mainly provide the motion and the
variables associated with it for the Flow chart.

The set comprises of twelve components, these are; DRV,
DRVZ, LINE, CIR, INC/ABS, TIME, SET address, CHK, DRV
Ret, INTERRUPT, CORRECT and M Code.

As with all of the Flow component symbols, when the mouse
arrow is placed over it, the name of the operation will appear.

Please see the Help File for a detailed description of each
Symbol.
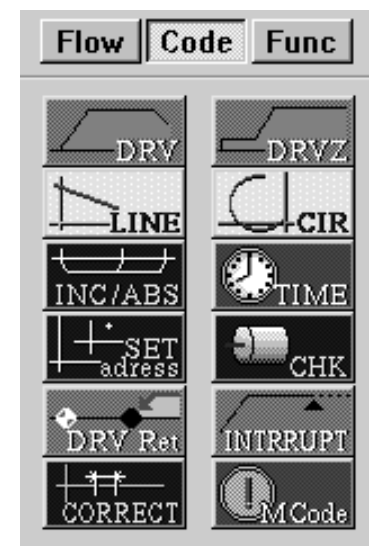
6.2.3 Func Symbols

The FUNC set of symbols mainly provide internal commands for the selected GM poisiioning controller. There are nine Symbols they are; RPT/RPTE, MOV, BCD/BIN, + - x /, Logic commands, X-ABS/Y-ABS, EXT, SEGL and SET. The full names of the signals will appear when the mouse arrow is placed on the SYMBOL.

Please see the Help File for a detailed description of each Symbol.

6.2.4 Placing the Flow component symbols in the Flow window

To place the Flow components in the Flow window, left click once on the symbol and move the mouse to the desired location in the wiring area for the symbol to be placed. The arrow should turn into a crosshair when pulled over the wiring area border. Left click to install the icon.

An ERROR dialog box will appear to detail any errors in component placement.

6.2.5 Moving Flow component symbols

Flow component symbols can be moved after they have been placed in the wiring area by left clicking on the symbol and dragging it with the left button depressed. When the left button is released, the symbol will be dropped in the new position. Blocks can only be moved inside the wiring area. Wiring connections will move with the component.

Flow component symbols can be aligned for clear presentation by using the Align tool on the Standard tool bar. Components can be aligned by the left, right, top or bottom sides.

Illegal operations will be explained via a dialog box and the component will be returned to its previous position.
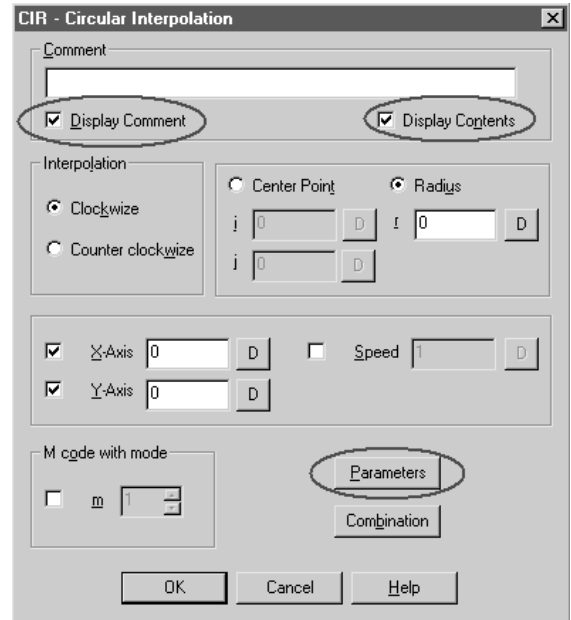
6.3   Setting Flow components

Flow components can be 'set up' by double clicking the symbol. A dialog box will pop up that shows the aspects to be set or edited and a comments section for easy documentation.

6.3.1   Comments

Each Flow component symbol can have a comment assigned to it. This comment will be shown on the right hand side of the symbol, if the 'Display Comment' check box is activated. Comments can be a maximum of sixteen characters in length, this includes spaces.

There is also a check box to determine if the contents of the component is shown. If this is activated the flow component properties are shown on its left.


6.3.2   Parameters

Positioning parameters for all applicable flow components can be viewed and edited by clicking on the 'Parameters' button, here it is possible to scroll through the windows for Units, Settings, Speed and Machine Zero.

Please see Chapter 7 for parameter setting.

6.3.3   M Code FXPLC instruction dialog

This dialog box is used to view constructed Ladder diagram for device status indication, which can be copied onto the Clip board and pasted into SW0PC-FXGP/WIN-E software.

It Provides Ladder Diagram for:

M-CODE SAVE DEVICE.

AUXILIARY EQUIPMENT DRIVE DEVICE.

M CODE ON AND M CODE OFF.
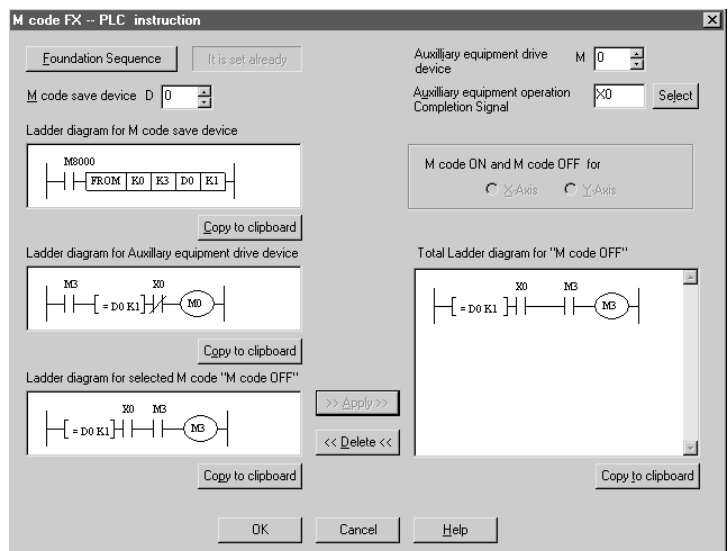
6.4   The Wiring Tool

The wiring tool graphically represents, in the form of terminated lines, the program flow between the component symbols presented in the Flow chart window.

6.4.1   Input and Output Pins

The small icons present on top and bottom side of component symbol are known as pins. Those which are present on the top side of symbol are known as INPUT pins. Those which are present on the bottom side of symbol are known as OUTPUT pins.

Wiring can be done from any symbol output to any other symbol input or to a Node and vice versa.

Please see the help file for detailed wiring rules.

6.4.2   Connecting Flow component symbols

Wiring tool can be invoked by clicking the Wiring Toolbar. The controller supports up to 999 wires in FBD window. The user can draw wires using the following steps:

1. Press the Left mouse button at the pin position at which wiring should start.

2. Drag the mouse keeping the Left mouse button pressed to the destination pin.

3. Release the Left mouse button.

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.

Input Pin can not have more than one wire connected to it.

No pin is located in this position.

Wiring will be activated until the user presses the left mouse button on any other tool bar or on some vacant space in the wiring area. The user can move wires with the mouse by clicking and dragging them to a new location.

MEMO

7.   Parameter Setting

Parameters for the GM positioning units can be viewed set through the work space window. There are three categories of parameters they are, Positioning, I/O control and System.

The Positioning parameters can also be viewed and set by double clicking each Flow component symbol from the Code symbol set and selecting 'Parameters' in the pop up dialog box.

7.1   Positioning Parameters

There are four aspects involved in the positioning control. For more detailed information please see the Help files.

7.1.1   Units

The units of measurement for position and speed and other information such as pulse rate and feed rate for the drive unit
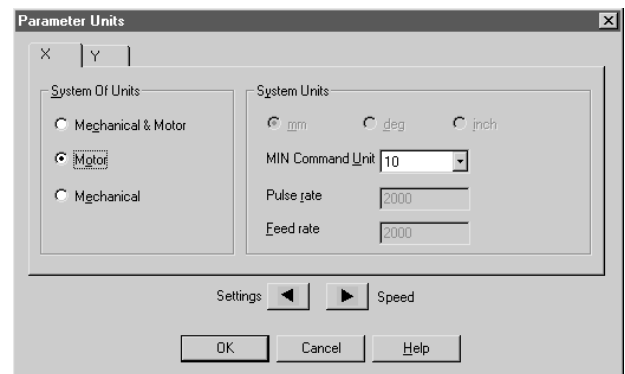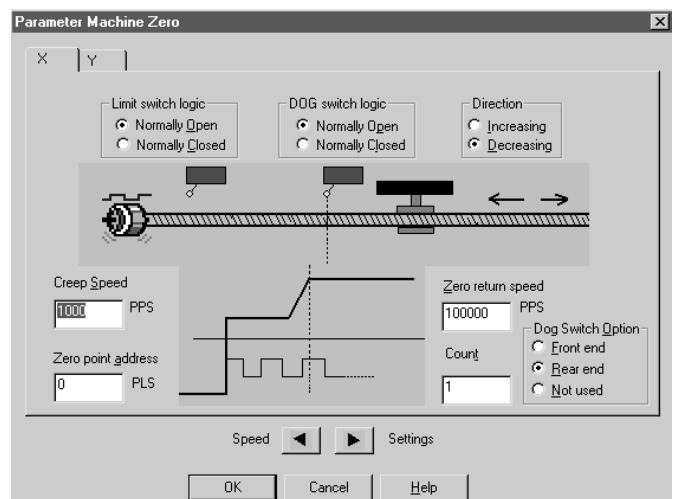
7.1.2   Speed

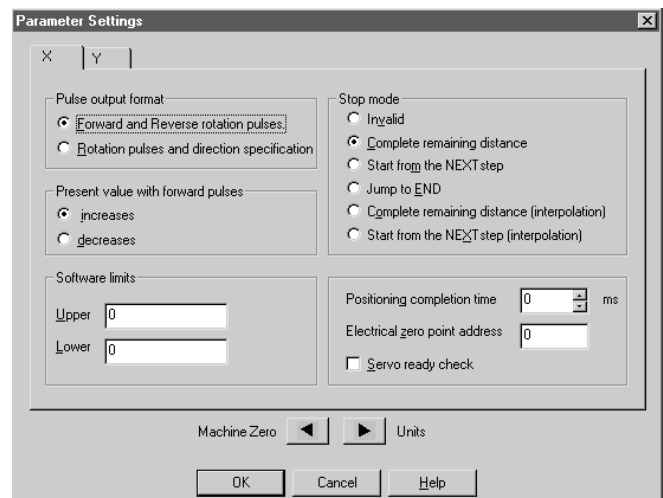The various speeds and acceleration/deceleration timewhen positioning operations are performed.
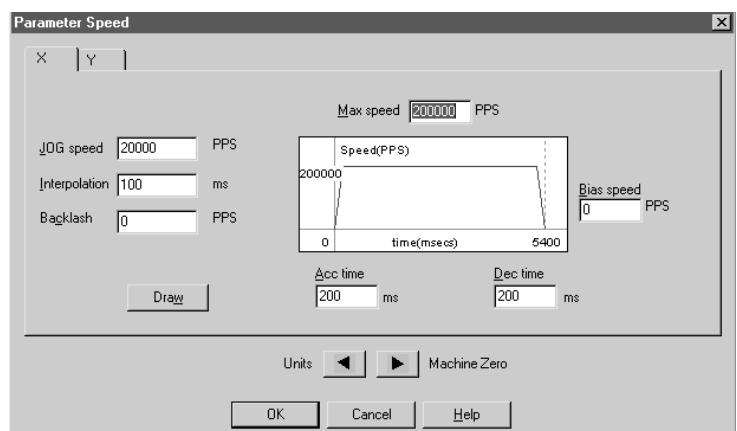
7.1.3   Machine Zero

The parameters related to Machine Zero Return operation such as speed, signal count etc.

7.1.4   Settings

Other independent parameters relating to positioning such as pulse format, rotation direction, servo ready check , top mode etc.
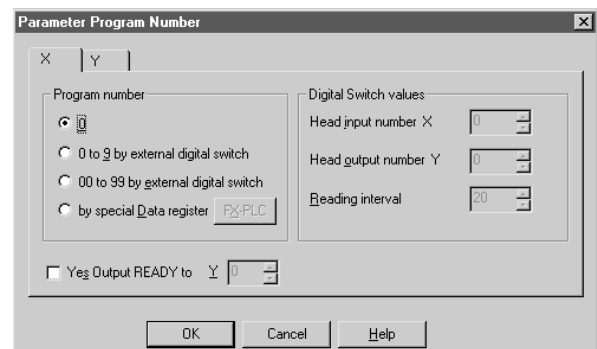
7.2   I/O Control

There are five aspects involved in the I/O control. For more detailed information, please refer to the Help files.
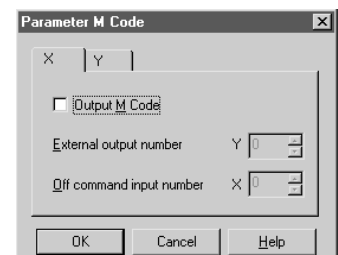
7.2.1   Program Number

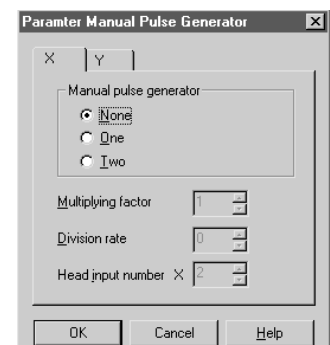Parameters relating to specification of the program number to be executed

7.2.2   M code

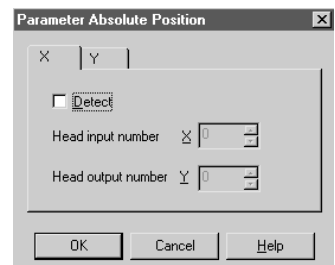M code related parameters such as M code output and input numbers

7.2.3   Manual Pulse Generator

The manual pulse generator parameters such as pulse multiplying factor, the division factor etc.
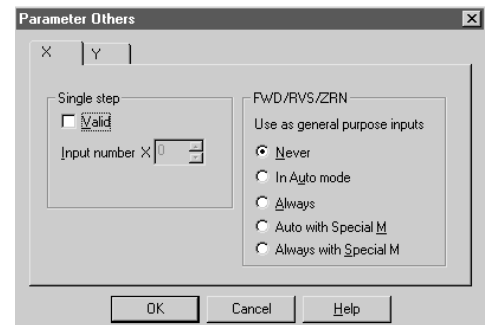
7.2.4   Absolute Position

Absolute position detection
parameters

7.2.5   Others
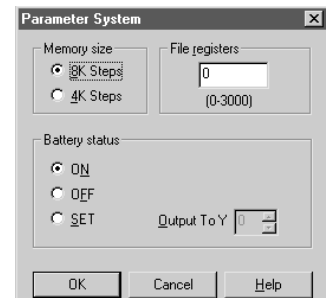
Parameters relating to single step
operation

7.3   System Parameters

There are two aspects involved in the overall system setting. For more detailed information
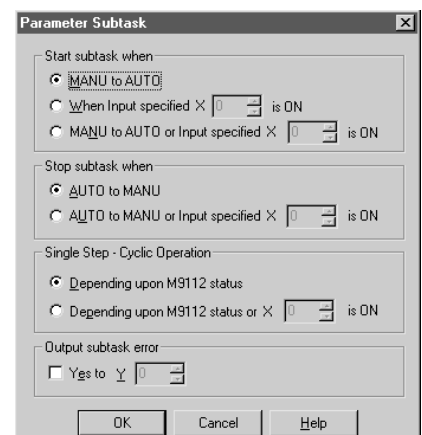please see the Help files

7.3.1   System

The basic system parameters relating
to the positioning controller such as
program size, file registers and battery
status

7.3.2   Sub-Task

The subtask related parameters such
as subtask START/STOP, error etc.

MEMO

8.   The Monitoring Window

The Monitoring Window provides a visual display interface for the Real time execution of each Flow Chart component . The Monitoring Window graphically represents important information regarding the status of various devices in the GM Positioning controller. As it is an independent window it does not depend upon the information present in the Flow Chart Window, and therefore provides total monitoring capabilities.

8.1   Components of the Monitoring window

The Monitoring window has a default rectangle known as the Monitoring window base rectangle. All the components should be placed only within the Monitoring window base rectangle.

8.1.1   Monitoring window Base Resize

The Monitoring Window opens to a minimum default 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 left and top edges.

Components present in the Monitoring Window are not moved when base is resized. Hence the Base can be re-sized only till the edge of right most or bottom most component. Base size can be increased to a scroll bar position limit of 30,000.

8.1.2   Changing the Base Color

Choose a new Base Color from the shades available in the Change Base Color command in the Tools Menu.

8.1.3   Drawing Lines, Ovals, and Rectangles

Lines can be drawn by clicking on the line icon and then moving the mouse to place for the line to start. 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.

Drawing object will be placed on top of each other as they are created, there is no option for changing the order.

8.1.4   Moving and Resizing Lines, Ovals, and Rectangles

The objects can be moved within the Monitoring Window 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 Monitoring window base only.

Cut, Copy, and Paste can be performed on these objects within the base rectangle.

8.1.5   Changing Colors

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

This color will appear as the Line color for the outside of Ovals and Rectangles. The inside color of the Rectangle and the Oval can be changed by clicking on the Brush Color icon and choosing a new color.

**8.1.6   Changing the Line Width**

An existing Line width can be changed by selecting the Line in the Monitoring 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.

8.2   Inserting a Monitor object

The Monitoring window can have the following Monitor objects.

Current Position

Plotting

Device Status Indication

Manual Operation

Manual Input Status

FX-GM Status

Program Information
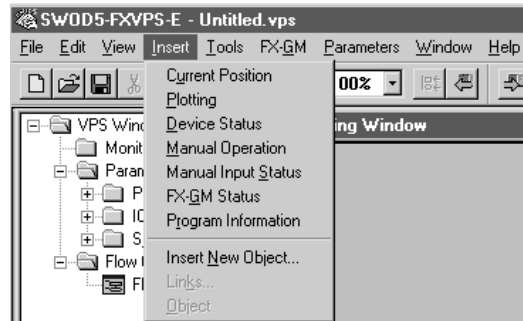
The objects are useful for obtaining various monitoring information and for test operation. These objects can be inserted into the Monitoring window using 'Insert Menu' options. These objects can be placed in the Monitoring window along with drawing and OLE objects. The Monitoring objects can be selected, deleted and moved but they can not be resized.
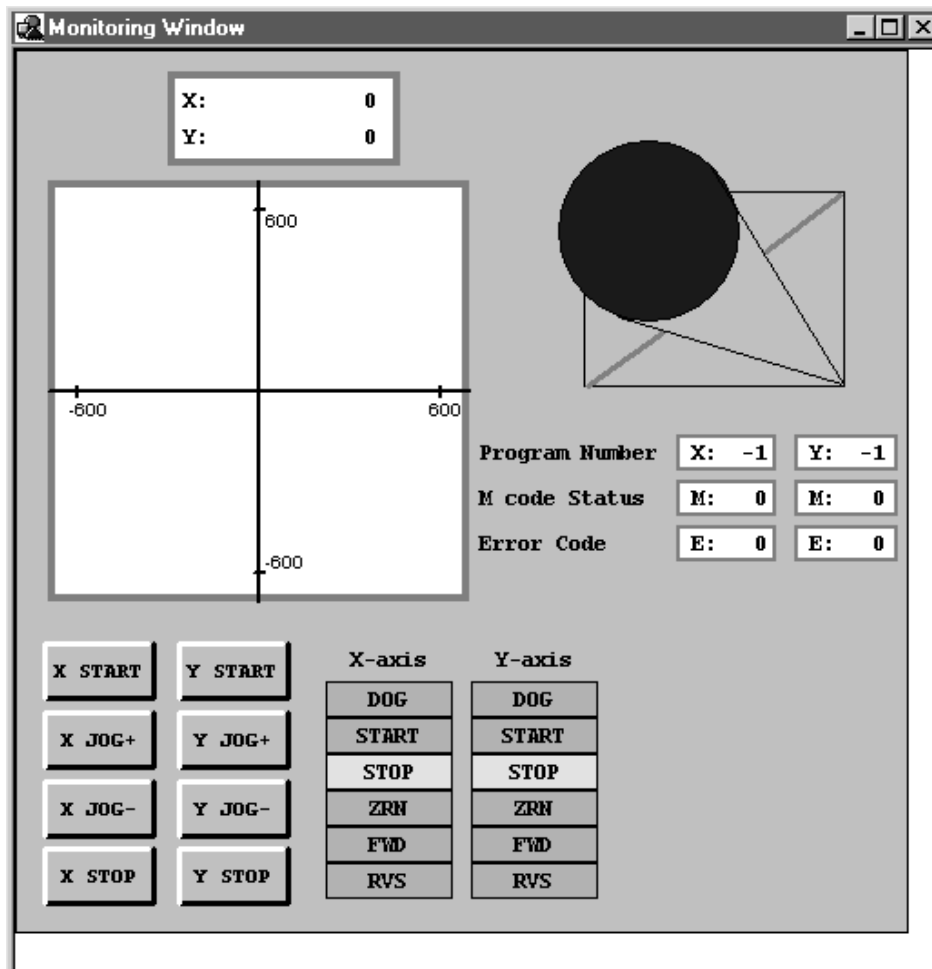
8.3 Adding an OLE File

An OLE object can be inserted into the Monitoring window. It can edited by double clicking on the object, this will open a suitable software tool of which the OLE is associated. The object can be moved within the Monitoring base, and can be Resized within the limits of the Monitoring 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, reports, spreadsheets, bitmaps, and equations.
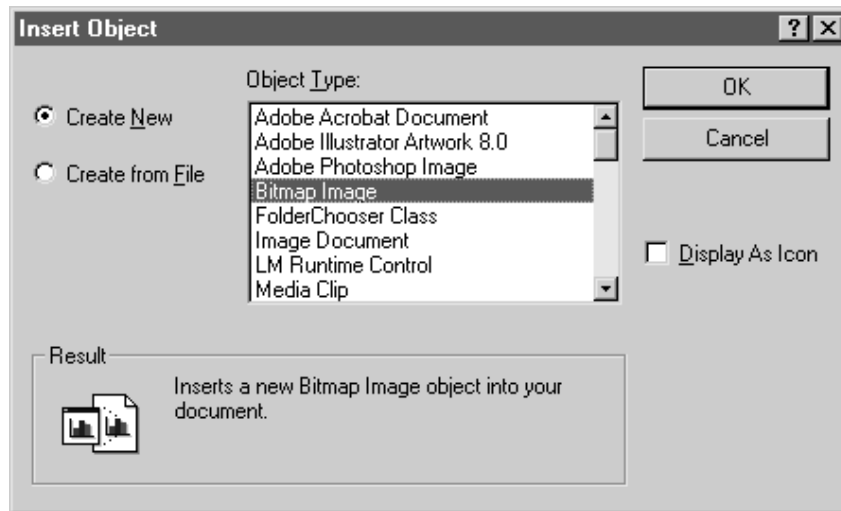
## 8.4 Adding Manual operation objects

Manual operation objects are used to execute/drive a particular operation in a GM positioning unit. The operation can be any one of the following for each of the axis (X-axis or Y-axis if FX-20GM is selected).

START

STOP

JOG+

JOG-

Zero Return

Feed

Error Reset

It is possible to place only one Manual operation object of the same type in the Monitoring window (i.e. one X-START, one X-STOP, etc.).

The items can be moved with the mouse to any area inside the Monitor window.

Please see the Help files for a more detailed description.
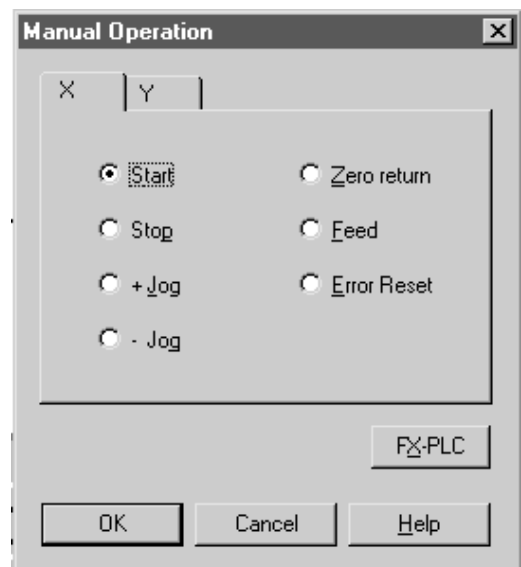
8.5 The Monitor Mode

The Monitor mode can be entered from the FX-GM Menu by choosing the Monitor command, or by selecting the controller menu Monitor Start icon.

In this mode, the actual target Controller hardware can be monitored and tested, when the GM positioning unit is connected to the personal computer via an RS232 interface.

The information will be continuously read from the target Controller hardware, the state and current values of the symbol icons which are being monitored will be updated accordingly.

During Monitoring, the status of the objects which are in the scrolling view of the Monitoring window are constantly updated.

In Monitoring mode, when Monitoring is started the Monitoring window and the flow chart window having the currently executed program number are tiled vertically.

In the flow chart window the symbol currently being executed is highlighted in red. When the execution advances to the next icon it will be highlighted, and so on. There will only be the one symbol highlighted at a time, thus showing the exact position in the Flow Chart. If the Flow Chart is written over many screens, the windows will automatically change so that the live symbol is always on display.

If any of the windows are resized the next window will open at the same position and as the same size of the previous window. The default sizes and positions of the windows can be reset by selecting 'Set Default Position' in the FX-GM / Monitor menu.

When the icon of 'Program in Text' is executed in monitoring mode, a modeless dialog will open with the program in text information, the line being currently executed will be highlighted. After execution of the symbol the dialog will be closed automatically.

All toolbars (Accessories toolbar, Drawing toolbar, Wiring Button) and some menu options (File, Edit, Insert, Tools) will be disabled during monitoring.

It is not possible to;

select, move, create or delete any object,

drag and drop the objects,

 Write to or Read from the GM positioning unit or Verify FX-GM Data,

source the Diagnostic data for the GM positioning unit,

Change any of the wiring in the Flow Chart Window,

To stop the Monitoring and switch to Program Mode either, click the Monitoring button present in the FX-GM tool bar or select the Controller menu, Monitoring Stop icon.

Note.

To assist in trouble shooting during program set up, the system response time can be tuned. It is possible to speed up the personal computers system response by slightly reducing the monitoring speed. This means that dialog boxes and menus will appear instantaniously when selected. This can be found in FX-GM / Monitor / Tune System Response. The default setting is 0, and has the effect of no reduction, to activate this function a figure between 0 and 99 must be input. The higher the number the greater the reduction.

This function may not be required on high specification personal computers.

MEMO

SOFTWARE MANUAL

FX-PCS-VPS/WIN-E

MITSUBISHI ELECTRIC CORPORATION

MODEL	FX-VPS/WIN-SW-E
MODEL CODE	09R609