

# GFK-1847

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## GE Fanuc Manual Series 90-30

Remote I/O Manager

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# ***GE Fanuc Automation***

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## ***Programmable Control Products***

### ***Remote I/O Manager***

#### ***User's Guide***

GFK-1847

July 2000

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This manual describes how to configure Remote I/O (RIO) racks using the Remote I/O Manager software tool.

## Content of This Manual

- Chapter 1.      Getting Started** Provides an overview of the Remote I/O Manager tool.
- Chapter 2      Configuring RIO Racks:** Describes how to access hardware configuration and how to configure NIUs and remote I/O racks.
- Chapter 3.      Communicating with the NIU:** Describes how to connect your computer to the NIU and gives the procedures for common online operations.
- Appendix A:    Menus and Toolbars:** Provides summary information about the menus and toolbars available in Remote I/O Manager.

## Related Publications

- GFK-1504      *VersaMax™ Modules, Power Supplies and Carriers*
- GFK-1503      *VersaMax™ PLC User's Manual*
- GFK-1670      *VersaPro™ User's Guide*

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# Chapter 1

## *Getting Started*

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### *Welcome to the Remote I/O Manager*

The Remote I/O Manager contains the configuration information for your VersaMax Remote I/O rack. It also provides tools to allow you to monitor power consumption and I/O mapping for modules added to your system.

The configuration information must match the physical hardware of your system. Typical steps in configuring your Remote I/O hardware include:

- Selecting and configuring an NIU
- Configuring modules and customizing parameters for your application
- Saving the hardware configuration and storing it to the NIU

Detailed information about configuring parameters for a specific module is available through the online help. To access this information, open the Parameter Editor window for the module (double-click the module), then select Module Help from the Help menu.

#### **Chapter Contents**

- Installing the RIO Manager
- Starting the RIO Manager
- Using the Hardware Configuration Toolbar
- Using the Parameter Editor
- Using Shortcut Keys
- Setting Options

## Installing the RIO Manager

### Note

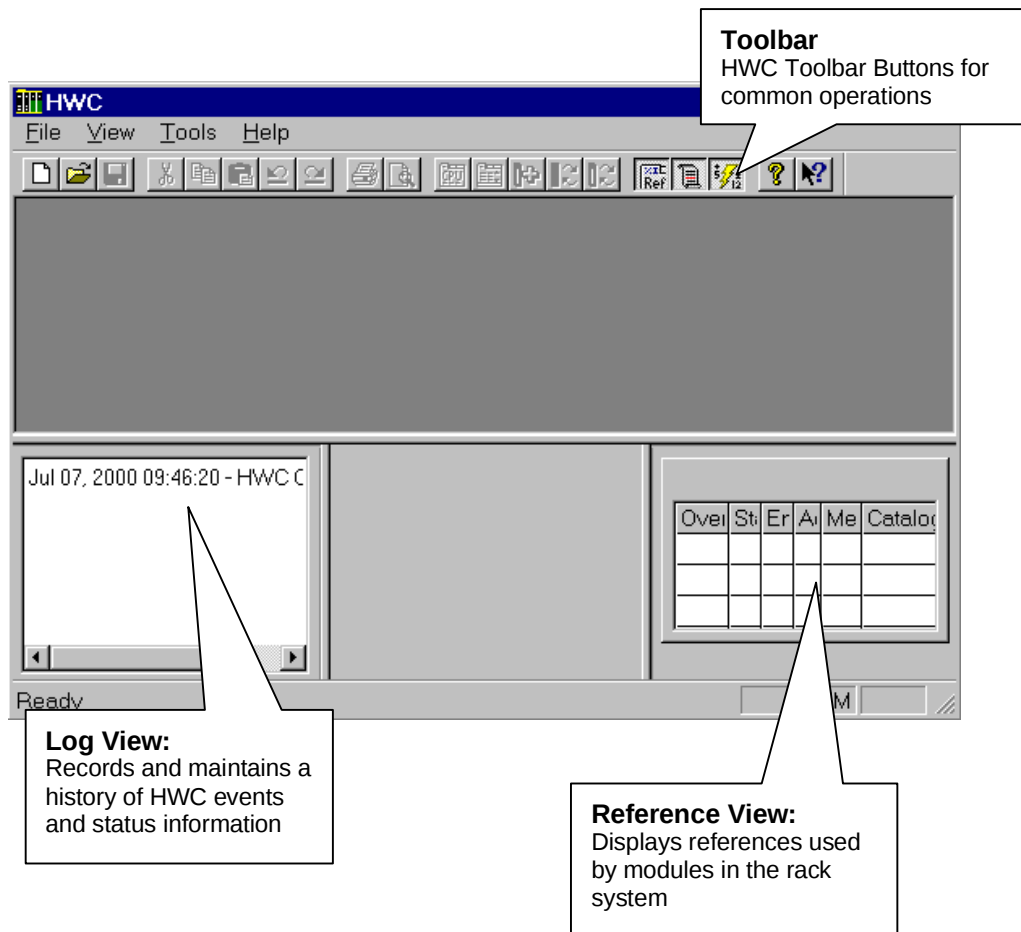
The RIO Manager must be installed on a hard drive in your computer. *Do not* attempt to install it on removable media such as Jaz® or Zip® drives.

1. It is recommended that you close all applications including virus checking, Internet Explorer, and HMI software that might be running in the background. You may need to check the task manager to determine if other applications are running.
2. Put the Remote I/O Manager CD in the CD-ROM Drive.
3. Select the CD drive from Windows Explorer.
4. Double click Setup.exe
5. Follow the user prompts to complete the installation. If you have a previous version of the RIO Manager or VersaPro installed, the installation tool will first uninstall the previous version. During this uninstall process, you may be asked whether you would like to remove shared files. It is recommended that you always answer “No to All” to ensure that no files are deleted that might be needed by another application.

## Starting the RIO Manager

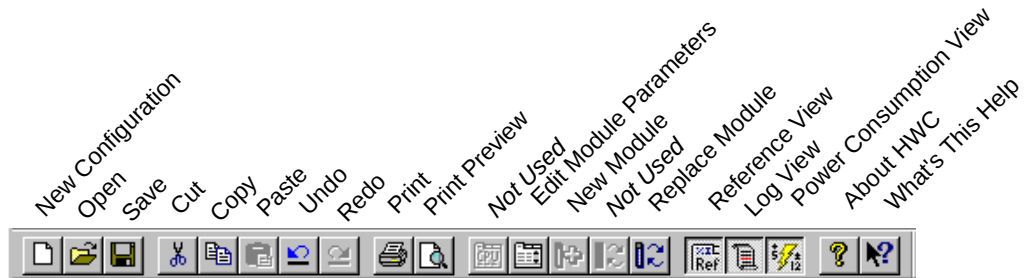
You can start the RIO manager by pressing CTRL + ALT + R. To access the RIO Manager from the Windows Start menu, choose Programs, GE Fanuc Software, VersaPro, Remote IO Manager.

If a shortcut was placed on your desktop, you can start the RIO Manager by double-clicking the shortcut icon . An empty HWC window appears.



## Using the Hardware Configuration Toolbar

To display the Hardware Configuration toolbar, go to the View menu and place a checkmark next to Toolbar.



## Using the Parameter Editor

To configure module parameters, you will use the Parameter Editor, which appears automatically when you insert or replace a module. To change parameters for a module, choose Configure Parameters from the context-sensitive menu (CSM), or choose Configure Parameters from the Edit, Module Operations submenu, or double click on the module.

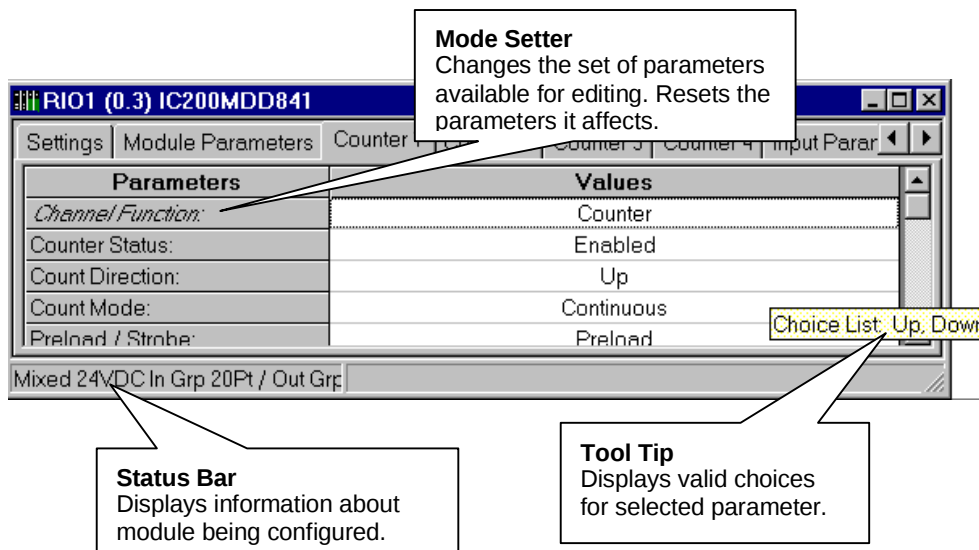
**Note:** The context-sensitive (pop-up) menu is accessed by clicking the secondary mouse button on an object.

The Parameter Editor provides an extended set of Windows-compatible editing facilities to make configuring your system less labor intensive.

- Parameters are displayed in an edit window that can be resized, maximized, and minimized.
- You can open multiple parameter views at the same time. This feature allows you to view the parameter set of one module while editing another, and you can easily copy and paste a single parameter value between module views.
- The Edit Window can be displayed in Tabbed mode (default) or Spreadsheet Mode (allows all parameter groups to be displayed and edited in a single, scrollable view). To change the display, select Parameter Edit from the View menu.
- The Title Bar of the window uniquely identifies the associated module with the rack system name, the module rack/slot address, and the module catalog number.

**Note:** Some of the more complex modules contain key parameters known as *Mode Setters*.

All parameters, including Mode Setters, that affect other parameters are listed in *italics*. To obtain an explanation of parameter relationships for these parameters, press **F1** in the Editor window and select the parameter name from the Help index. Or, right click the parameter and select What's This from the CSM.



Sample Parameter Editor Window

## Editing Tips

Valid values for each parameter are displayed in a tool tip that appears when you hover the mouse cursor over the parameter cell. To edit parameter values:

- Type directly into the selected cell in a manner similar to typing into a spreadsheet cell, or use the Data Entry Tool. To open the Data Entry Tool, right click in the parameter cell and choose Data Entry Tool from the CSM, press the F2 key, or double click.
- If the valid values consists of a list of choices with unique initial letters, select a value by simply typing its first letter in the cell.

You can save time when entering the same value for multiple parameters (of the same type) by **Copying and Pasting** or **dragging and dropping** one parameter value into other parameter value cells. Copy/Paste and drag/drop can be used within the same module view or between module views.

Drag/drop works with the keyboard as follows:

- To copy the data from the source cell to the drop cell, do not press any key, or press the **Ctrl** key while dragging.
- To move the data from the source cell to the drop cell, press the **Shift** key while dragging.
- To copy the data from the source cell to all cells between the source and drop cell (including the drop cell), press the **Alt** key while dragging. This assumes that drag and drop is occurring on the same Edit window and the source and drop cells are in the same column. This feature allows you to quickly fill an entire range of cells with identical information.

**Note:** Parameter values that have been changed since the start of the editing session are shown in **bold**.

## Undoing Changes

- To reset a single parameter to the Start of Edit Session value or to Factory Original (default) setting, right click on the parameter and choose Reset Parameter from the CSM.
- To reset all the parameters on a tab, right click anywhere in the tab, and choose Reset Tab from the CSM.
- To Undo changes, choose Undo from the Edit menu, or click the Undo button on the Editor toolbar.

The Editor supports from 1 to 32 levels of Undo/Redo (default is 10). You can set the levels of Undo/Redo by choosing Options from the Tools menu.

**Note:** You cannot Undo changes that result from changing a Mode Setter parameter.

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## Error Notification

Erroneous values are displayed in the Error Color (red by default) and an explanatory ToolTip is provided for the error.

To see the ToolTip for an erroneous setting in the Parameter Editor, hover the mouse cursor over the parameter cell.

### To change error notification colors

1. Select Options from the Tools menu.
2. In the Options dialog box, choose the General tab.
3. In the Colors list, choose the condition for which you want to set the color.
4. Click the Choose button. The Windows color selection dialog box will open.
5. Select a color, click OK in the color selection dialog box, then click OK in the Options dialog box.

## Correcting Errors

To automatically correct an erroneous value, right click on the value and select Auto Correct from the CSM. If you attempt to close a configuration that contains an error, the Parameter Error List dialog box will appear. To automatically correct all errors listed in this dialog box, click the Auto Correct button.

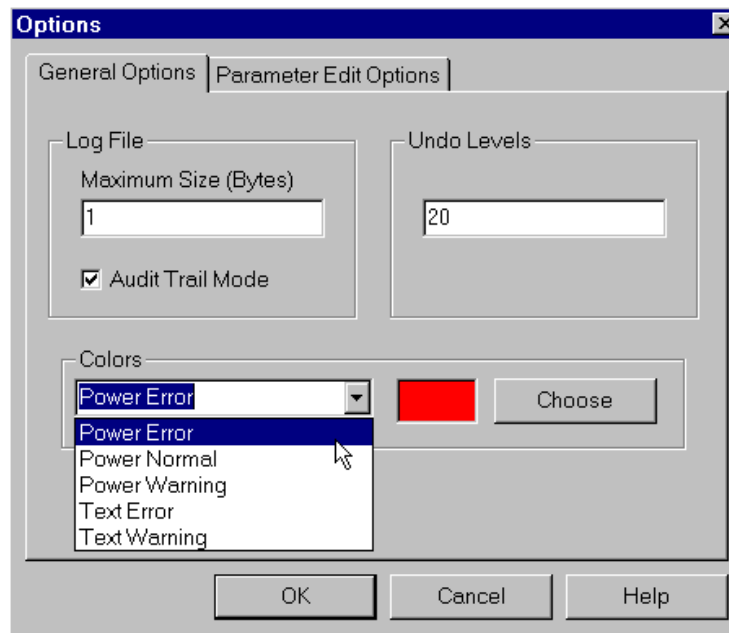
## Using Shortcut Keys for RIO Manager

You can edit information in Hardware Configuration through menu bar selections, the CSM, or short-cut key sequences.

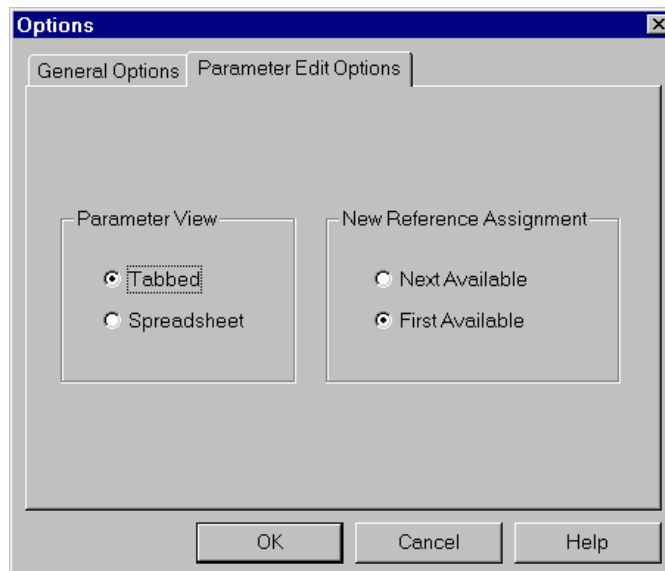
- To start the RIO Manager, press CTRL + ALT + R.
- To edit modules using the menu bar, click the module or slot you want to configure, go to the Edit menu, and select the appropriate action.
- To edit modules using the right mouse button, click the module or slot you want to configure, click the right mouse button, and select the appropriate action.
- To edit modules using standard cut, copy, and paste functions, highlight the module and use the Edit menu options or CTRL key shortcuts.
- To copy a module, click the module you want to copy and press CTRL+C. To paste the module, click the new slot and press CTRL + V.
- To cut a module (which allows you to paste it in another slot), click the module and press CTRL+X. To delete a module, click the module, and select Delete from the Edit Menu or press the Delete key.
- To Undo a previous operation, press CTRL + Z.
- You can use drag and drop to move modules between slots. To use drag and drop, highlight the module you want to move, click and hold the left-mouse button, and drag the module to the new slot.
- To close a window, press CTRL + F4.
- To Close HWC, press ALT + F4.

## Setting Options

To set HWC options, go to the Tools menu and select Options. To adjust the size and content of the HWC System Log, enable Audit Trail Mode, set the number of Undo Levels, and set Error and Warning colors, select the General Options tab.



To change the format of the Parameter Editor window and the mode for assigning the next reference, select the Parameter Edit Options tab.



## Chapter 2

# Configuring Remote I/O Racks

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A VersaMax Remote I/O (RIO) rack consists of a network interface unit (NIU) and supported I/O modules. Three types of NIUs are available: Genius (GNIU), Profibus (PNIU), and Ethernet (ENIU). All VersaMax I/O modules are supported in the Remote I/O rack except IC200BEM002 and IC200BEM103.

The Hardware Configuration (HWC) tool is used to configure the RIO rack system. The RIO rack system is built by selecting carriers into which I/O and power supply modules are added.

The default configuration consists of a power supply (PWR001) and an NIU (GBI001 or the NIU that was saved last time HWC was run). The default VersaMax rack system has a main rack. Multiple power supplies are supported on the main rack, as required by the modules you need to add into your rack system. The RIO supports two types of expansion networks: Local Single Rack and Multiple Remote Rack. The Multiple Remote Rack configuration allows up to seven expansion racks. Multiple power supplies can be used in expansion racks.

In the physical hardware, field wiring is connected to the module carriers instead of the modules. HWC displays module wiring in the Module Parameters. If you move a module between carriers, be sure to update the wiring information accordingly.

### Chapter Contents

- Configuring the Rack System
- Hardware Configuration Reference View
- Hardware Configuration Log View
- Printing Hardware Configuration

## *Configuring the Rack System*

### **Configuring an NIU**

The default NIU is IC200EBI001.

- To replace the NIU:
  1. Click the secondary mouse button and choose Replace NIU from the CSM.
  2. Select an NIU from the Module Catalog. The Parameter Editor window for the selected NIU will appear.
  3. Review and modify NIU parameters in the Parameter Editor.
  4. When you are finished editing the NIU parameters, click the window close button  to close the Parameter Editor window.
- To view or change NIU parameters:
  1. Click the secondary mouse button and choose Configure NIU Parameters from the CSM. The Parameter Editor window for the NIU will appear.
  2. Review and modify NIU parameters in the Parameter Editor.
  3. When you are finished editing the NIU parameters, click the window close button  to close the Parameter Editor window.

### **Rack/Module Operations**

In addition to configuring the NIU, the VersaMax rack configuration is completed through the following rack/module operations, as required:

- Changing/Configuring the Power Supply
- Adding Module Carriers
- Adding Power Supply Booster Bases
- Configuring a Power Supply for a Booster Base
- Adding/Configuring Modules
- Deleting Carriers
- Clearing the Rack
- Configuring VersaMax Expansion Networks

## Changing/Configuring the Power Supply

The default power supply is the IC200PWR001. To change the default power supply:

1. Click the power supply slot, click the secondary mouse button and select Replace Module. Select the new power supply from the Module Catalog.
2. The Parameter Editor window for the power supply will appear.
3. When you are finished reviewing the power supply parameters, click the window close button  to close the Parameter Editor window.

## Adding Module Carriers

Carriers must be configured to house module in the VersaMax PLC. Perform these steps to configure module carriers.

1. To add a carrier to the right of configured modules, click the right mouse button and choose Add Base/Carrier. The Module Catalog for Carriers will appear.

To insert a carrier between two configured modules, highlight the module which will be to the right of the new carrier, click the right mouse button and choose Insert Base/Carrier. The Module Catalog for Carriers will appear.

**Note:** You must click the right mouse button over a module or carrier in the rack configuration to view configuration choices from the right mouse button.

2. Click the catalog number and description of the carrier you want to add, then click the OK button.

## Adding Power Supply Booster Bases

Power Supply boosters may be added into the system configuration to power modules downstream from the booster. Perform these steps to add a power supply booster base:

1. To add a Power Supply Booster Base to the right of configured modules, click the right mouse button and choose Add Base/Carrier. The Module Catalog will display.

To insert a Power Supply Booster base between two configured modules, highlight the module which will be to the right of the new base, click the right mouse button and choose Insert Base/Carrier. The Module Catalog will display.

2. Click the Power Supply Booster Bases tab. Click the catalog number to select the base, then click the OK button.
3. To configure the power supply, click the right mouse button and choose Add Module. Select the Power Supply from the list and click OK.

## Configuring a Power Supply for a Booster Base

Power Supplies can be added throughout your VersaMax system. To add or replace a configured power supply on a Booster Base:

1. Double-click the empty booster base. For booster bases with configured power supplies, click the right mouse button and select Replace Module. The Power Supply Module Catalog dialog box will appear.
2. Click the catalog number of the power supply you want to configure, then click the OK button. The Parameter Editor will appear.
3. You can view information about the power supply. Click OK to complete power supply configuration.

## Adding/Configuring Modules

Once a carrier is configured, the module may be added to the system:

1. Highlight the carrier which will house the module.
2. Double-click on the empty carrier or click the right mouse button and choose Add Module. (If you are replacing a previously configured module, click the right mouse button and choose Replace Module.)
3. Click the tab describing the I/O module type you need (Discrete Input, Discrete Output, Analog Input, Analog Output, etc.).
4. Click the catalog number and description of the module in your system, then click the OK button.

## Configuring Module Parameters

To configure the module's parameters:

1. When you add or replace a module, the Parameter Editor appears. You can also access this window by double-clicking the module slot from the Rack window.
2. Within the Parameter Editor, click the tab pertaining to the parameters you want to view or modify (where applicable).
3. Click in the Values fields you want to edit. (See "Editing Tips" in chapter 1.)
4. When you have finished configuring module parameters, click the window close button .

## Deleting Rack Modules

Deleting a module removes it from the rack. If you save the Hardware Configuration after deleting the module, the configuration information about the deleted module will be lost.

Perform these steps to delete a module:

1. Select the module you want to delete.
2. Press the Delete key or click the right mouse button and choose Delete Module.

## Deleting Carriers

You must use the menu bar or right mouse operations to delete a carrier. Perform these steps to delete a carrier:

1. Highlight the empty carrier you want to delete.
2. Click the right mouse button and choose Delete Carrier.

## Clearing the Rack

Clearing the rack removes all modules (except the power supply and NIU). If you save the Hardware Configuration after clearing the rack, the configuration information about the deleted modules will be lost.

Perform these steps to clear the rack configuration:

1. Click anywhere in the Rack.
2. Click the right mouse button and choose Clear Rack.
3. A confirmation dialog box will appear. To confirm the clear rack operation, click the Yes button.

---

## Configuring VersaMax Expansion Networks

There are three types of configurations in the VersaMax rack system. To change the rack configuration, select the type you want from the CSM or from the Edit, Expansion Rack System submenu.

### None

Includes only the Main VersaMax rack (no Expansion). Systems created using VersaPro 1.0 have this type of configuration. This is the default VersaMax System, which is created when you select New from the File menu.

### Local Single Rack

Includes the Main VersaMax I/O station and one Expansion rack. The Main VersaMax rack does not contain a Transmitter. The Expansion rack contains a non-isolated Power Supply and Receiver Integrated Unit (IC200ERM002). The power supply is not configured unless the Receiver unit is active. The default power supply in the expansion rack will be the same as the main rack's power supply. Replacing the main rack's primary power supply will not affect the expansion rack's primary power supply.

### Multiple Remote Rack

Allows you to configure up to seven Expansion racks (seven Rack tabs are always shown). The Main VersaMax rack contains a Transmitter (IC200ETM001). The Non Isolated Receiver (IC200ERM002), which is configured by default, can be replaced by an Isolated Receiver (IC200ERM001).

**Notes:** The Transmitter and Receiver modules cannot be added from the module catalog. The only way to add these modules to a rack configuration is to choose the appropriate configuration type. Also, you cannot delete them from a rack configuration except by changing the rack configuration type.

If a single-ended receiver is configured and an expansion transmitter is present, a fatal "expansion transmitter mismatch" fault will be generated. This fault will also be generated if a differential (transmitter and receivers) is configured and no expansion transmitter is physically present. In these cases, no faults will be generated for individual modules in the expansion racks. The NIU detects the presence or absence of receiver modules connected through the expansion bus and compares the physical configuration with the programmed configuration. It will generate a "Loss of rack" alarm for missing receivers and an "Addition of or extra rack" alarm for extra receivers.

## Switching Between VersaMax Rack Systems

You can switch from one VersaMax rack system type to another. This allows single rack systems created in VersaPro versions earlier than 1.10 to be upgraded to Local Single Rack and Multiple Remote Rack systems. Switching rack system types has the following effects:

When you switch configurations, a message is displayed which gives you the option of carrying out the parameter changes of the existing NIU/modules to the new rack configuration.

To change rack system type, choose Expansion Rack System from the CSM or the Edit menu. Select an expansion rack type from the submenu.

| Changing VersaMax Rack Systems            |                      |                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| From                                      | To                   | Results                                                                                                                                                                                                                                                                                                                                |
| None                                      | Local Single Rack    | A new expansion rack appears.                                                                                                                                                                                                                                                                                                          |
| None                                      | Multiple Remote Rack | Seven new expansion racks appear in the rack system.                                                                                                                                                                                                                                                                                   |
| Multiple Remote Rack or Local Single Rack | None                 | A message is displayed to warn about the loss of rack(s) and modules in it and the fact that these operations cannot be undone. If you click OK, the standard rack will be displayed.                                                                                                                                                  |
| Multiple Remote Rack                      | Local Single Rack    | A message is displayed to warn about the loss of rack(s) and modules in it and the fact that these operations cannot be undone. If you click OK, a rack system containing Main and Rack 1 tabs will be displayed. If there is an isolated receiver in the first expansion rack, it is replaced with the default non isolated receiver. |

## Related Parameters for Multiple Remote Rack Systems

On the Settings tab for NIU parameters, the Expansion Bus Speed parameter appears if Multiple Remote Rack is selected and if there is an isolated receiver present in any one of the expansion racks. Values are Extended Distance (default) and Normal. For Normal distance, the maximum allowable cable length is 15m (250ft) and the baud rate may vary between 250KHz, 1MHz, 3MHz, or 5MHz. For Extended Distance, the maximum allowable distance is 250m (820ft) and baud rate is fixed at 250KHz.

Each expansion rack has one Power Supply and Non Isolated Receiver Unit. The isolated receiver can be replaced with the non-isolated receiver and vice versa. (see “Expansion Rack Operations”).

**Note:** When a module is auto-configured and the Expansion Bus Speed setting changes as a result, an "Expansion bus speed change" fault will be generated. You should correct the Expansion Bus Speed setting.

## Expansion Rack Operations

The catalog ID and description for the Power Supply And Receiver-Integrated unit is shown on the status bar. When you select the integrated unit, the receiver information is shown as a part of the status bar.

### Selecting an Expansion Receiver

By default, the Expansion Receiver type is None. A power supply is not configured for the Expansion Rack until an Expansion Receiver is configured. There are three ways you can configure an Expansion Receiver:

- By adding any base unit in the expansion rack. A Non-Isolated Receiver Unit will be configured by default.
- By right-clicking on the rack and selecting a Receiver Unit from the Expansion Receiver submenu.
- By choosing a Receiver Unit from the Edit submenu, Expansion Receiver.  
To deactivate the unit, select None from the Expansion Receiver submenu. (This option is not available if the rack configuration contains one or more Carrier/Base units.

### Changing Receiver Type for Expansion Racks in Multiple Rack Systems

The Power Supply And Receiver-Integrated unit consists of IC200PWR001 and IC200ERM002 (non-isolated receiver) by default. For expansion racks in Multiple Remote Rack systems, an isolated receiver (IC200ERM001) can be selected. To change the receiver, choose Expansion Receiver from the Edit menu or the CSM.

---

### **Viewing Power Consumption Values**

To view the parameters for the power supply, double click on the Power Supply and Receiver-Integrated unit. Power values for the receiver are shown in the parameter dialog of the receiver and the value is non-editable. Receiver power is included as part of the total power consumption of the main power supply.

To view the parameters for the receiver, choose Configure Receiver Parameters from the CSM or from the Edit, Rack Operations menu.

### **Clearing the Rack for Multiple Remote Rack Systems**

When you select this option with focus on the Main rack, the transmitter will not be cleared. If you select this option with focus on expansion rack, it clears all the modules except the Power Supply And Receiver-Integrated unit.

### **Configuring Receiver Parameters**

This option displays the Receiver parameters for the selected Expansion rack. (The Receiver units have no configurable parameters.)

## Configuring VersaMax Modular Rack Systems

A VersaMax modular rack system containing a CPU can be opened in the RIO Manager. You can modify the CPU parameters and I/O module configuration. You cannot replace the CPU with a different CPU or connect to the CPU for load/store/verify operations. However, you can replace the CPU with an NIU, converting the configuration to an RIO rack.

### Configuring the CPU

This operation can only be performed on an existing VersaMax rack configuration that contains a CPU.

1. Open a VersaMax rack configuration that contains a CPU.
2. Click the secondary mouse button and choose Configure CPU Parameters from the CSM (or, from the Edit menu, choose Rack Operations, Configure CPU Parameters). The Parameter Editor window for the CPU will appear.
3. Review and modify CPU parameters in the Parameter Editor.
4. When you are finished editing the CPU parameters, click the window close button  to close the Parameter Editor window.

### Defining Ethernet Global Data Exchanges

This operation can only be performed on an existing VersaMax rack configuration that contains a VersaMax CPUE05.

Ethernet Global Data (EGD) allows one device (the producer) to transfer (exchange) data to one or more other devices (the consumers) at a regularly scheduled transfer rate. A maximum of 64 exchanges can be defined for a CPUE05 system. This number can be divided up into any combination of produced and consumed exchanges.

#### Caution

**EGD exchanges are designed for simple, efficient communication of sampled data between devices. They are not intended for event notification where the possible loss of a sample of data would be significant. For event notification, it is recommended that a Service Request Transfer Protocol (S RTP) connected service be used.**

The exchange of data is uniquely defined through a combination of the Producer ID (identification number) and the Exchange ID:

- Each device exchanging EGD on the network must be assigned its own unique Producer ID. This Producer ID uniquely identifies the source device of Ethernet Global data on the network. The Producer ID number is in dotted-decimal format (like an IP Address). For example, 3.0.0.1 is a valid Producer ID.
- An Exchange ID is a unique number that identifies a particular variable or group of variables to be transferred.

Producing devices and consuming devices operate completely asynchronously to each other. Therefore, for each device, both the data that the device produces and the data that the device consumes must be separately defined.

You need to specify the operating characteristics and data to be exchanged for each exchange your PLC will produce or consume. Note the following exchange limitations:

- Up to 100 variables can be configured per exchange. The CPUE05 is restricted to a total of 1200 variables across all EGD exchanges.
- The total size of a single exchange cannot exceed 1400 bytes. The total size is defined to be the sum of the data type lengths of all of the variables within the list. The exchange size is displayed in the Ethernet Global Data dialog box.

To define an EGD exchange:

1. In Hardware Configuration, go to the Edit menu, choose Rack Operations, and select Ethernet Global Data (or click the right mouse button and choose Ethernet Global Data from the pop-up menu).
2. In the Ethernet Global Data dialog box, click the Produced Exchanges tab to define exchanges produced by your PLC or click the Consumed Exchanges tab to define exchanges consumed by your PLC.

For further details about configuring EGD exchanges, refer to the Remote I/O Manager online help and the *VersaMax PLC User's Manual*, GFK-1503

## Replacing the CPU with an NIU

You cannot undo this operation. (To keep the CPU configuration, you can close the configuration without saving or save the configuration with a new name.)

1. Open a VersaMax rack configuration that contains a CPU.
2. Click the secondary mouse button and choose Replace CPU from the CSM (or, from the Edit menu, choose Rack Operations, Replace CPU). The Module Catalog listing NIUs will appear.
3. Select an NIU and click OK. The Parameter Editor window for the NIU will appear.
4. Review and edit the NIU parameters as required for your application. When you are finished editing the NIU parameters, click the window close button  to close the Parameter Editor window.

## Hardware Configuration Reference View

HWC Reference View provides information about references allocated when modules are added to the rack system. This view is updated each time an I/O or specialty module is added to or deleted from the system.

The Reference View is a dockable view, which means that you can select it with your mouse and move it anywhere in the HWC main window. You can control display of the reference view. To display or hide the reference view, select the View menu and click Reference View.

The reference view maintains a separate tab for each reference type used in HWC (%I, %Q, %AI, %AQ, %G, %M, %R, ...). To view reference information for a specific reference type, click the tab that corresponds to that reference type.

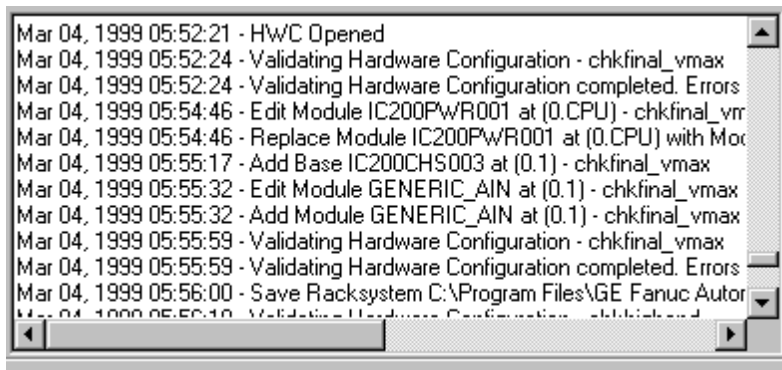
| %AI                                      | %AQ   | %G   | %I   | %M       | %Q          | %R | %S | %SA | %SB | %SC | %T |
|------------------------------------------|-------|------|------|----------|-------------|----|----|-----|-----|-----|----|
| Overlap                                  | Start | End  | Addr | Mem Type | Catalog #   |    |    |     |     |     |    |
|                                          | 0001  | 0080 | 0.1  | Consumed | IC693CPU364 |    |    |     |     |     |    |
|                                          | 0081  | 0144 | 0.2  | Consumed | IC693DSM302 |    |    |     |     |     |    |
|                                          | 0145  | 0208 | 0.3  | Consumed | IC693DSM302 |    |    |     |     |     |    |
|                                          | 0209  | 0272 | 0.4  | Consumed | IC693DSM302 |    |    |     |     |     |    |
|                                          |       |      |      |          |             |    |    |     |     |     |    |
| Total %I: 0272 Highest: 0272 Limit: 2048 |       |      |      |          |             |    |    |     |     |     |    |

Each row provides reference point assignments for a specific module. The columns are configured as follows:

- **Overlap:** By default, non-fatal overlaps are identified in blue text and fatal overlaps are identified in red text.
- **Start:** Displays the starting reference point assignment for the module.
- **End:** Displays the ending reference point assignment for the module.
- **Addr:** Displays the module's Rack/Slot address in the form R.S where:
  - ☐ R is the relative rack number (0 indicates first, or main, rack)
  - ☐ S is the relative slot number within the assigned rack (0 indicates the leftmost slot)
- **Mem Type:** Identifies whether the module produces or consumes data in the allocated memory area.
- **Catalog #:** Displays the module's catalog number.

## Hardware Configuration Log View

HWC offers a logging facility which records and maintains a history of HWC events and status information. The data is saved in a separate log file on the PC hard disk, and may be accessed through multiple edit sessions. The default size of the log file default is 1MB. If the log data exceeds this size, the oldest log information is overwritten with new log data.



HWC provides two modes for recording log data:

- **Exception Only Mode:** Only warnings and exception conditions are recorded in the log.
- **Audit Trail Mode (default mode):** Informational messages (such as module deletes, adds, etc.) are recorded in the log, in addition to warnings and exception conditions.

To change the setting for the log file, select the Tools menu and choose Options. The Options dialog box will display, allowing you to set Audit Trail Mode and adjust the default log file size.

The Log View is a dockable view, which means that you can select it with your mouse and move it anywhere in the HWC main window. You can control display of the log view. To display or hide the log view, select the View menu and click Log View.

## Power Consumption View

The Power View displays current power consumption statistics for the power supply that is providing power to the currently selected module. These statistics are provided to assist you in monitoring the power requirements of the I/O modules you are configuring in the individual racks.

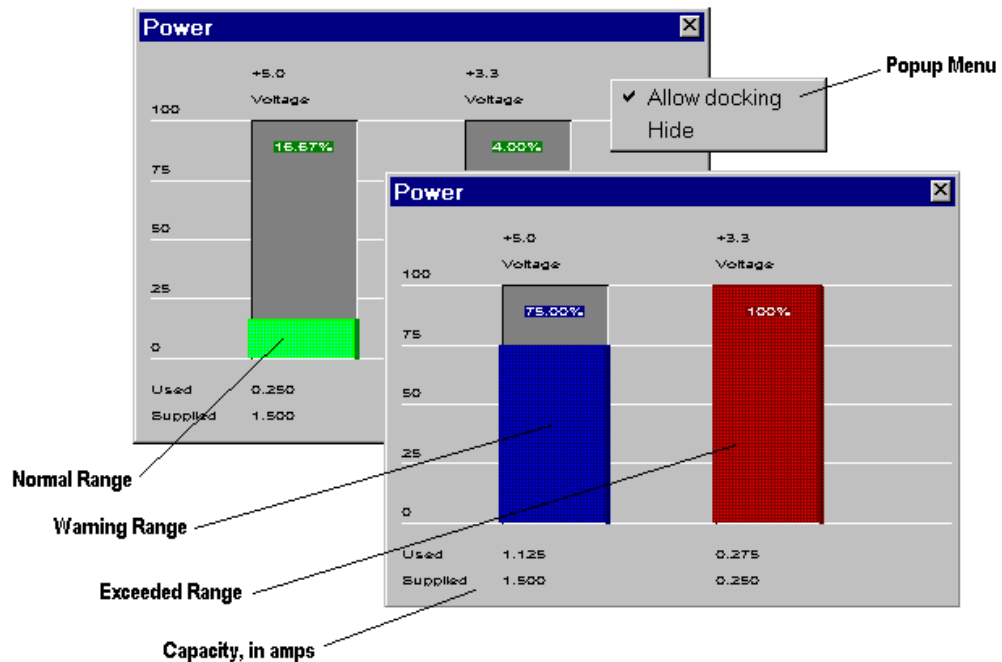
To enable or disable docking, choose Dock from the popup menu. To change the color scheme, see Error Notification.

The following power consumption statistics are displayed:

- The bar graphs show the percentage of power used for each voltage.
- Used and Supplied power statistics are shown in Amps.

## Power Consumption Limit Calculations

The Power view displays graphs showing amount of consumption for the various voltages produced by the power supply. The VersaMax power supplies are current limited, and therefore display units are Amps.



VersaMax Power View

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## Components of the Power Consumption View

### Power Supply Whose Statistics are Displayed

This is always the most immediate leftmost power supply to the selected module. Because a VersaMax rack supports multiple Power Supplies, the power supply can be in any slot and is the first one encountered traveling left from the selected module.

### Normal Range

Power Consumption percentage bars representing less than 75% consumption are displayed in the Power Normal color (default is green).

### Warning Range

Power Consumption percentage bars representing more than 75% to 100% consumption are displayed in the Power Warning color (default is yellow).

### Exceeded Range

Power Consumption percentage bars representing greater than 100% consumption are displayed in the Power Error color (default is red). Note that if consumption is exceeded, the label at the bottom of the graph displays the actual amount used, but the percentage bar does not show greater than 100%.

**Note:** To change the normal, warning, and error colors in the Power View display, choose Options from the Tools menu.

## *Printing Hardware Configuration*

You can print your Rack configuration by going to the File menu and choosing Print. To set print options, click the Range button in the Print dialog box. The following print options are available:

- You can choose to print hardware configuration information for the entire rack, or for a range of modules (selected by rack:slot).
- You can select to print an overview and/or details for the configuration:
  - ☐ **Overview:** Prints the Rack as shown on the screen.
  - ☐ **Detail:** Prints the parameter information for each module in the Rack.
  - ☐ **Ethernet Global Data:** Prints a listing of produced and consumed exchanges (only available for racks containing a CPUE05 configured for EGD).
  - ☐ **Reference Details:** Prints a table showing start and end memory locations, rack slot addresses, and other reference data.
  - ☐ **Name Resolution:** Not used.

If you want to change your target printer or paper size or orientation, click the Setup button in the Print dialog box.

# Chapter 3

## *Communicating with the NIU*

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This chapter describes how to connect to the NIU and load, store, and verify RIO configurations.

For Genius and Profibus NIUs, the Load, Store, and Verify operations require cable IC200CBL002, which is used to connect a COM port on your PC to the serial port on the left side of the VersaMax NIU.

For Ethernet NIUs, these operations use an Ethernet connection.

### **Chapter Contents**

- Communications Setup
- Storing RIO Configuration
- Loading RIO Configuration
- Verifying RIO Configuration
- Clearing the RIO Configuration

### **Communications Setup**

To define communications parameters for the rack system, select Communications Setup from the Tools menu. The main screen of the Communication Configuration Utility will appear. (If a password has been defined for the Communication Configuration Utility, the Password dialog box will appear. Enter your password and press OK to continue.)

When configuring a Device in the CCU for use with a GNIU or PNIU, you should assign a Name and default Port. Port Type should be set to SNP\_SERIAL. All other fields should be left at their default values.

When configuring a Device for use with an ENIU, you should assign a Name, default Port, and IP address. Port Type should be set to TCPIP\_ETH.

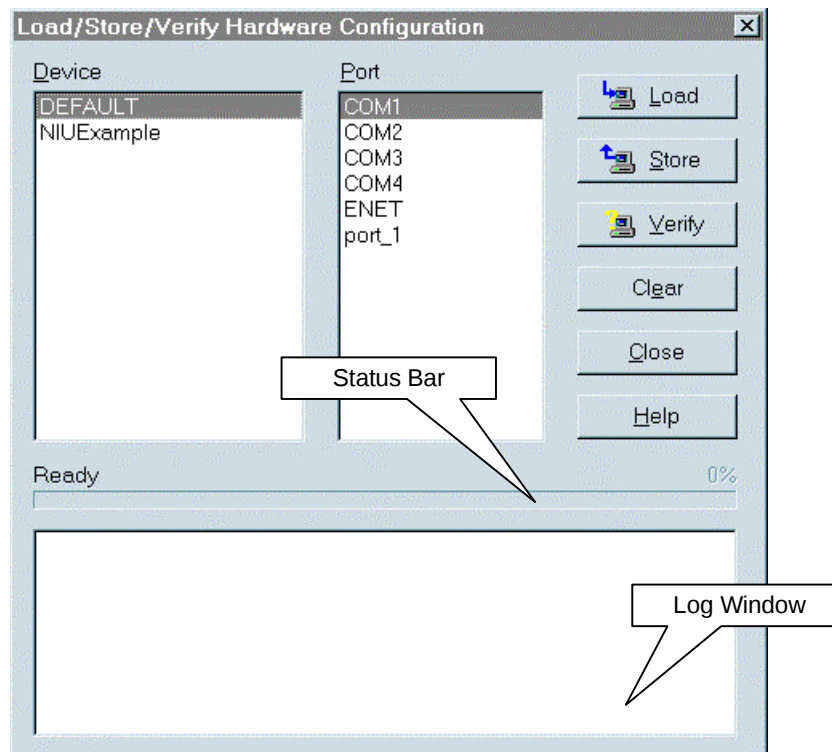
## Storing RIO Configuration

To transfer the configuration data to the associated Rack System:

1. Choose Load/Store/Verify in the Tools menu.

If the configuration has not been saved, the message, “Please save this rack system first,” will appear, followed by the “Save As” dialog box. You must save the rack system once before the Load/Store/Verify dialog box can be opened. After you have saved the rack system once, auto-saves will be performed when this command is invoked.

2. In the Load/Store/Verify Hardware Configuration dialog box select a Device and a Port.



3. Click the Store button. The programming software will automatically connect to the NIU, perform the store, and disconnect from the NIU. The status of the operation will be displayed in the Log window.

**Note:** If you attempt to store a hardware configuration to an NIU that does not match the type selected in the configuration, an error message will appear and the operation will be stopped.

---

## Loading RIO Configuration

To load configuration data from the Rack System:

1. Choose Load/Store/Verify in the Tools menu.
2. In the Load/Store/Verify Hardware Configuration dialog box select a Device and a Port.
3. Click the Load button. The programming software will automatically connect to the NIU.

**Note:** If you attempt to load a hardware configuration from an NIU that does not match the type selected in the configuration, an error message will appear and the operation will be stopped.

### VersaMax Modules with Shared IDs

When the configuration is loaded from a rack system, HWC uses the hardware module ID to determine the correct module catalog number and description. However, some VersaMax modules share the same module IDs. When a VersaMax rack system containing these modules is auto configured and the configuration is loaded an incorrect catalog number and description may be displayed. You will need to select the correct module from the modules catalog and store it to the rack system. After storing the configuration, you will be able to load the configuration properly.

The following modules share hardware module IDs:

IC200MDL650 loads as IC200MDL636  
IC200MDL750 loads as IC200MDL742  
IC200MDL331 loads as IC200MDL329  
IC200MDD844 loads as IC200MDD842  
IC200MDL141 loads as IC200MDL140

## Verifying RIO Configuration

To verify the rack configuration:

1. In the Load/Store/Verify Hardware Configuration dialog box select a Device and a Port.
2. Click the Verify button. The programming software will automatically connect to the NIU, perform the verification, and disconnect from the NIU. The Log window will display the results of the operation.

## Clearing RIO Configuration

This procedure clears the configuration and forces an autoconfiguration. If you clear the NIU and then do a load from the NIU, you will be loading a default configuration that will overwrite your existing configuration.

1. In the Load/Store/Verify Hardware Configuration dialog box select a Device and a Port.
2. Click the Clear button. The programming software will automatically connect to the NIU, clear the configuration, disconnect and display the results in the Log Window.

# Appendix A

## Menus and Toolbars

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This appendix shows the menu bars and toolbars used in the Remote I/O Manager.

### File Menu

The File menu offers the following commands:

| Option                               | Action                                                                                                                      |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| New (Ctrl + N)                       | Creates a new Hardware Configuration Folder.                                                                                |
| Open (Ctrl + O)                      | Opens an existing Hardware Configuration Folder.                                                                            |
| Close                                | Closes an opened Hardware Configuration Folder.                                                                             |
| Import Stand-Alone HWC File          | Imports an existing HWC Hardware Configuration Folder (.hwcfg) into the current Rack System Edit window.                    |
| Import Hardware Configuration Folder | Imports an IOCFG.CFG file, that was produced by either LM90 or CC90, into a designated new HWC Hardware Folder.             |
| Restore EGD and Name Resolution      | Not used.                                                                                                                   |
| Save (Ctrl + S)                      | Saves an opened document using the same file name.                                                                          |
| Save As                              | Saves an opened document to a specified file name.                                                                          |
| Convert To                           | Not used.                                                                                                                   |
| Print (Ctrl + P)                     | Prints all or portions of the current Rack System Hardware Configuration.                                                   |
| Print Preview                        | Displays all, or portions, of the current Rack System Hardware Configuration on the screen as it would appear when printed. |
| Print Setup                          | Selects a printer and printer connection.                                                                                   |
| Exit                                 | Exits HWC.                                                                                                                  |

## Edit Menu

| Option                | Action                                                                                                   |
|-----------------------|----------------------------------------------------------------------------------------------------------|
| Undo (Ctrl + Z)       | Reverse previous Module operation. Up to 16 levels of Undo are supported.                                |
| Redo (Ctrl + Y)       | Reverses previous Undo operation. Up to 16 levels of Redo are supported                                  |
| Cut (Ctrl + X)        | Deletes the selected Module from the Rack System and moves it to the clipboard.                          |
| Delete (Del)          | Deletes the currently selected Module from the Rack System and reverts it to a blank slot                |
| Copy (Ctrl + C)       | Copies selected Module from the Rack System to the clipboard.                                            |
| Paste (Ctrl + V)      | Pastes the previously cut or copied Module from the clipboard into the selected slot of the Rack System. |
| Expansion Rack System | Sub-menu of edit operations that are specific to VersaMax Rack Systems.                                  |
| Expansion Receiver    | Sub-menu of edit operations that are specific to VersaMax Expansion Rack Systems.                        |
| Rack Operations       | Sub-menu of edit operations that are specific to the Rack System.                                        |
| Module Operations     | Sub-menu of edit operations that are specific to the selected Module.                                    |

## Edit menu, Expansion Rack System Sub-menu

The Expansion Rack System sub-menu of the Edit menu allows you to select the type of VersaMax system. You can switch from one VersaMax system type to another, however resulting changes to the configuration cannot be undone.

| Option               | Action                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None                 | This is the default VersaMax system, which is created when you select New from the File menu. It includes only the Main VersaMax I/O station (no Expansion).                                                                                                                                                                                                                 |
| Local Single Rack    | Includes the Main VersaMax I/O station and one Expansion I/O Station (Rack). The Main VersaMax system does not contain a Transmitter. The Expansion I/O Station contains a Non Isolated Receiver and Power Supply Integrated Unit (IC200ERM002).                                                                                                                             |
| Multiple Remote Rack | Allows you to configure up to seven Expansion I/O Stations (seven Rack tabs are always shown). The Main VersaMax rack contains a Transmitter (IC200ETM001). Each Expansion I/O Station contains a Power Supply and Receiver Integrated Unit. The Non Isolated Receiver (IC200ERM002), which is configured by default, can be replaced by an Isolated Receiver (IC200ERM001). |

**Note:** The Transmitter module cannot be selected from the module catalog. The only way to add this module to a rack configuration is to choose the appropriate configuration type. Also, you cannot delete a Transmitter module from a rack configuration except by changing the rack configuration type.

## Edit menu, Expansion Receiver Sub-menu

The Expansion Receiver sub-menu of the Edit menu allows you to select the receiver for a VersaMax Local Single Rack or Multiple Remote Rack system.

| Option                     | Action                                                                                                                                                                                         |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None                       | Deactivates the Receiver. This is the default selection if no carrier/base is configured. This option is not available if there is at least one carrier/base configured in the expansion rack. |
| Non-Isolated Receiver Unit | Selects the Non Isolated Receiver and Power Supply Integrated Unit (IC200ERM002). This is the only receiver type allowed for Local Single Rack systems.                                        |
| Isolated Receiver Unit     | Selects the Non Isolated Receiver (IC200ERM002). This option is available only for Multiple Remote Rack systems.                                                                               |

## Edit menu, Rack Operations Sub-menu

| Option                        | Action                                                                                                                                                                                                                                    |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Change Rack Type              | Not used.                                                                                                                                                                                                                                 |
| Clear Rack                    | Deletes all modules, excluding the Power Supply and CPU/NIU, for the selected Rack.                                                                                                                                                       |
| Configure CPU Parameters      | Displays the Module Parameter Dialog, which allows editing of the configuration parameters for the Rack System CPU.                                                                                                                       |
| Replace CPU                   | Displays the Module Selection Dialog, which allows you to replace a CPU with an NIU.                                                                                                                                                      |
| Configure NIU Parameters      | Displays the Module Parameter Dialog, which allows editing of the configuration parameters for the Rack System NIU.                                                                                                                       |
| Replace NIU                   | Displays the Module Selection Dialog, which allows for the selection of an NIU.                                                                                                                                                           |
| Name Resolution and Routing   | Not used.                                                                                                                                                                                                                                 |
| Ethernet Global Data          | Not used.                                                                                                                                                                                                                                 |
| Add Base/Carrier              | Displays the VersaMax Add Base/Carrier Dialog, and extends the selected rack with the selected Base/Carrier.                                                                                                                              |
| Delete Base/Carrier           | Deletes the currently selected Base/Carrier in a VersaMax rack                                                                                                                                                                            |
| Insert Base/Carrier           | Displays the VersaMax Insert Base/Carrier Dialog, and inserts the selected Base/Carrier in front of the selected slot of the VersaMax rack.                                                                                               |
| Replace Base/Carrier          | Displays the VersaMax Replace Base/Carrier Dialog, and replaces the selected Base/Carrier in the selected slot of the VersaMax rack                                                                                                       |
| Configure Receiver Parameters | Displays the power consumption tab for the VersaMax expansion rack receiver, which has no configurable parameters. This menu item is available only when the receiver unit, located in the first slot of the expansion rack, is selected. |

## Edit menu, Module Operations Sub-menu

| Option                          | Action                                                                                                                                                                                 |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configure Parameters (Ctrl + E) | Displays the Module Parameter Dialog, which allows for the editing of the configuration parameters for the selected Module.                                                            |
| Add Module                      | Displays the Module Selection Dialog, which allows for the selection and configuration of a new Module in the selected empty rack slot (or Carrier/Base in a VersaMax modular system). |
| Replace Module                  | Displays the Module Selection Dialog, which allows for the selection and configuration of a replacement Module for the selected Module.                                                |
| Delete Module                   | Deletes the selected Module from the Rack system.                                                                                                                                      |

## Parameter Menu

| Option               | Action                                                                                                                               |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Data Entry Tool (F2) | Opens the Data Entry Tool for a selected, editable parameter.                                                                        |
| Reset Parameter      | Resets a single parameter to the Start of Edit Session value or to the Factory Original Value                                        |
| Reset Tab            | Resets all the parameters on the tab to the Start of Edit Session value or to the Factory Original value.                            |
| Cancel Edit Session  | Closes the active parameter edit window without saving changes.                                                                      |
| Insert               | Inserts a row with default values above the selected row in certain tabs, such as the Profibus Slave Information tab.                |
| Delete               | Deletes the selected row in certain tabs such as the Profibus Slave Information tab and adds a default row to the end of the matrix. |

## View Menu

| Option            | Action                                                                                                                                                                   |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toolbar           | Shows or hides the toolbar.                                                                                                                                              |
| Status Bar        | Shows or hides the status bar.                                                                                                                                           |
| Log View          | Shows or hides the on-line HWC Log View.                                                                                                                                 |
| Reference View    | Shows or hides the on-line Rack System Reference View                                                                                                                    |
| Power Consumption | Shows or hides the Power View window.                                                                                                                                    |
| Parameter Edit    | Displays a sub-menu that allows you to change the Parameter Editor display format. These options are available only when a Parameter Editor window for a module is open. |

## View Menu, Parameter Edit Sub-menu

**Note:** These settings are not saved when you close the Parameter Editor. To set the default display mode for the Parameter Editor, go to the Tools menu, choose Options and select the Parameter Edit tab in the Options dialog box.

| Option        | Action                                                                                                                                                                                                                        |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Singlerow Tab | Displays the Parameter Editor window in a tabbed format. If you resize the window so that it is too narrow to display all the tabs, a scroll bar is provided to access tabs that are not visible.                             |
| Multirow Tab  | Displays the Parameter Editor window in a tabbed format. If you resize the window so that it is too narrow to display the tabs in a single row, the tabs will be stacked.                                                     |
| Spreadsheet   | Displays the Parameter Editor window in a spreadsheet format. Tab headings are displayed in bold, underlined text.                                                                                                            |
| Error Status  | Displays the Parameter Editor Error List, which identifies parameter errors and allows you to correct them before closing the window. This option is available only when the current Parameter Editor window contains errors. |

## Tools Menu

| Option                           | Action                                                                                                                                         |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Hardware Configuration Data View | Displays the PLC Configuration Data in a tabbed dialog, allowing for both text and binary formatted presentation of the contained information. |
| Options                          | Displays an Options dialog, which allows you to adjust certain application behavior such as Log size and Parameter Editor view.                |
| Communications Setup             | Opens the CCU. Allows you to define communications parameters.                                                                                 |
| Load/Store/Verify                | If an NIU is configured in the rack system, allows you to load, store, verify, or clear the hardware configuration.                            |

## Window Menu

| Option           | Action                                     |
|------------------|--------------------------------------------|
| Cascade          | Arranges windows in an overlapped fashion. |
| Tile             | Arranges windows in non-overlapped tiles.  |
| Arrange Icons    | Arranges icons of closed windows.          |
| Window 1, 2, ... | Goes to specified window.                  |

## Help Menu

| Option          | Action                                                                                                                                         |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Contents        | Displays a structured Help Table of Contents from which you can get help.                                                                      |
| Help Index      | Offers you an index to topics on which you can get help.                                                                                       |
| Module Help     | Provides parameter-specific help for the selected Parameter Editor window.                                                                     |
| How to Use Help | Enumerates the different types of Help available in HWC and describes how each can be applied to assist you in learning and using the program. |
| About HWC       | Displays the version number of this application.                                                                                               |

## HWC Toolbar

| Button                                                                            | Function                                                                                                                                              |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Not used.                                                                                                                                             |
|  | Opens Parameter Editor window for selected module.                                                                                                    |
|  | Opens the Module Catalog, from which you can select a module to be configured.                                                                        |
|  | Not used.                                                                                                                                             |
|  | Opens the Module Catalog, from which you can select a module to be configured in place of the selected module.                                        |
|  | Displays or hides the Reference View, which lists references configured for the rack system.                                                          |
|  | Displays or hides the Log View, which displays a history of significant events and status relative to your hardware configuration editing activities. |
|  | Displays or hides the Power View, which shows the power consumed by the modules in the system.                                                        |

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