
Engineer's Guide

SMART TRACTM FAULT MANAGER

MagneTek, Inc. - Drives and Systems Division

Contents

Fault Manager Driver Installation	1
Installing the Smart Trac Fault Manager Driver	1
The Smart Trac Fault Manager	1
Fault and Error Reporting	1
Fault Handling	1
Standard Faults	1
Establishing the Faults You Want to Report	1
Printing Fault Lists to a File	2
Adding or Changing Fault Codes	2
Defining Outputs	4
Configure the Fault Manager	6
Done with Fault Manager changes?	7
Linking the Fault Manager and the Digital Operator	7
Glossary of Terms	13
Index	15

THIS PAGE INTENTIONALLY LEFT BLANK

Fault Manager Driver Installation

Installing the Smart Trac Fault Manager Driver

1. Click **START, PROGRAMS, MAG-300, CONTROL MANAGER**. The Control Manager software loads.
2. Expand the **Project** folder tree and right click the **Drivers** folder. A selection box appears with **New...** highlighted.

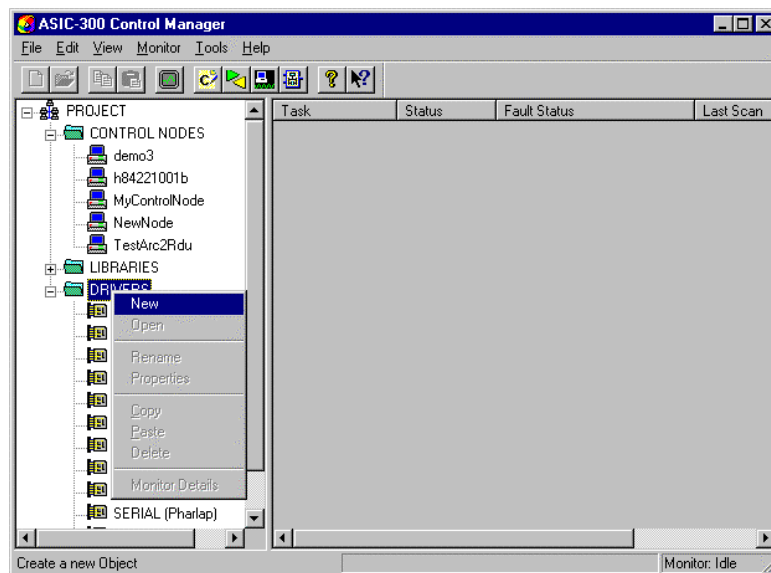


Figure 1. The New Device Driver Selection box.

3. Click the New selection box. The **Install Driver** dialog box appears.

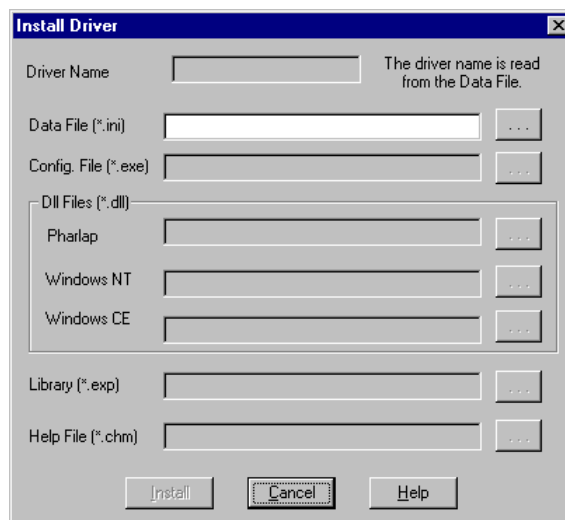


Figure 2. I/O Driver Install dialog box.

To view driver .dll files, you must select **View All Files** in Windows NT Explorer. If you have Windows NT without IE4.0 installed: from Explorer, click **View, Options**, click **View** tab. In **Hidden Files**, click **Show all files**. If you have IE4.0 installed: from Explorer, click **View, Folder Options**, click the **View** tab. In **Advanced Settings**, click **Show All Files** in the **Hidden files** folder.

4. Click the small box containing three dots (...) to the far right of the **Data File (*.ini)** box. This allows you to browse for the initialization file on your system (generally the driver will be installed from your CD_ROM). For our example, we assume the file is on a floppy in the A: drive. Find the file **FaultAI.ini** and **OPEN** it. Two more boxes, for entry of **Config.exe** and **Help.exe**, become active.
5. Click the small box containing three dots (...) to the far right of the **Config (*.exe)** box. Browse for the **FaultAIConfig.EXE** file. Press **TAB** or **ENTER**. More boxes will become active.
6. Click the small box containing three dots (...) to the far right of the **Dll files (*.dll), Pharlap** box. Browse for the **FaultAI.dll** file. Press **TAB** or **ENTER**.
7. Click the small box containing three dots (...) to the far right of the **Help (*.chm)** box. Browse for the **STFaultAIEM.CHM** file. Press **TAB** or **ENTER**. The screen should look like the following (if installing from the A:\ drive).

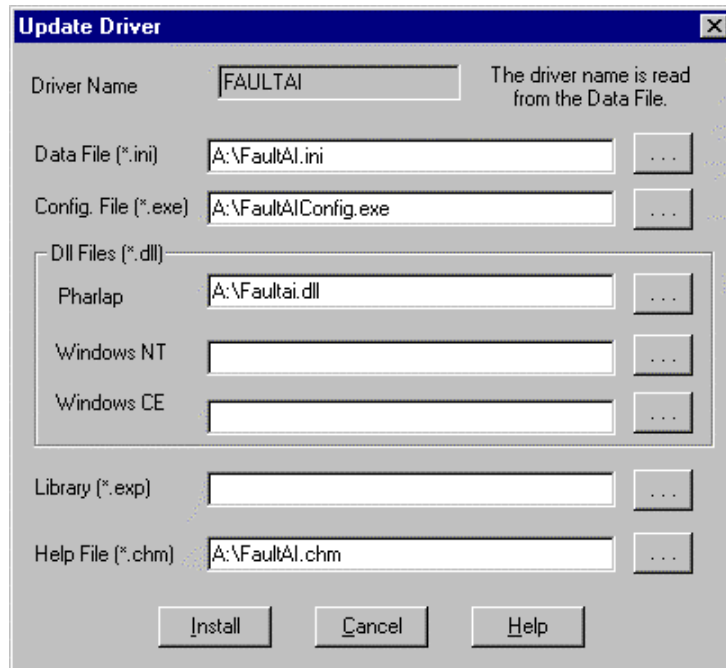


Figure 3 The completed example Fault Manager Driver Install screen

8. Click **INSTALL**. When finished, you are returned to Control Manager. The driver name should appear in its own folder within the **Drivers** folder.
9. The FaultAI card library is ready for use.

THIS PAGE INTENTIONALLY LEFT BLANK

The Smart Trac Fault Manager

Fault and Error Reporting

Fault Handling

Only those faults programmed into the Smart Trac AC1 can be reported. Certain faults are already programmed into the system as “standard” faults. Other faults require user programming.

When an established (programmed) fault is detected by the Smart Trac AC1, it is considered *active* and is displayed on the Smart Trac AC1 digital operator. The fault is reset when a key is pressed on the panel. Once reset, another fault may appear on the Smart Trac AC1 panel and the process is repeated.

A fault is considered *active* until it is reset. A queue of active faults is maintained by the Smart Trac AC1. If all faults have been reset and until a new fault is detected, the display will read “No Active Faults.”

Faults are time-stamped. You must decide whether a given fault should be kept in one or both of two lists: the twenty *Oldest Faults* or the twenty *Newest Faults*. At the time you establish the faults, you select in which of the two lists you’d like the fault to appear. Both history lists may be cleared.

Faults may result from a failure of system hardware or firmware, or from a program failure (of either Smart Trac software or the application program).

Standard Faults

An application programmer determines faults that cannot be changed by the user of a Smart Trac AC1. Those faults are considered important and must always be reported. See listings of standard faults in *the Smart Trac AC1 Engineer's Guide*.

Establishing the Faults You Want to Report

You decide which faults and errors are displayed and reported. As part of the initial configuration, you must program your Smart Trac AC1 with the desired faults and errors using the **Fault Manager**.

To access the **Fault Manager**:

1. Click **Start, Programs, MAG-300, Control Studio**. The **Open Node Dialog Box** appears.
2. Double click the node you want to configure, then double click the Interface Card **FAULTMGR**. The Fault Manager main screen appears.

You may need to install the FAULTAI driver from the CD-ROM. In this case, you would follow normal device driver installation procedures, similar to that described in "Fault Manager Driver Installation."

The **Fault Manager** screen contains three tabs: the **Fault Editor**; **Define Outputs**; and **Configure**.



Figure 4. Fault Manager opening screen.

The main menu always opens with the **Fault Editor** tab selected because you must define faults before you define outputs.

Printing Fault Lists to a File

You may print a list of information contained on any of the three tabs.

1. Click the **Fault Editor**, **Define Outputs** or **Configure** tab.
2. Click **Print to File**. A **SAVE AS** dialog box appears.
3. Enter a filename and path for the file (or Browse through the path to the file location you desire). Press **Enter** or click **OK**. A text file is generated and saved with all information contained on the selected tab.
4. Using a text editor or word processing program, open the file as saved.
5. Choose **File | Print** from the editor or word processor.

Adding or Changing Fault Codes

Use the **Fault Manager** to add or change fault code defaults. Certain faults are reserved by the system and may not be changed. See the list of "Standard Faults" in the *Smart Trac AC1 Technical Manual*.

Adding a Fault Code

1. Click **Add Fault**. The **Add Fault** dialog box appears. You are prompted for a **Fault Code**.

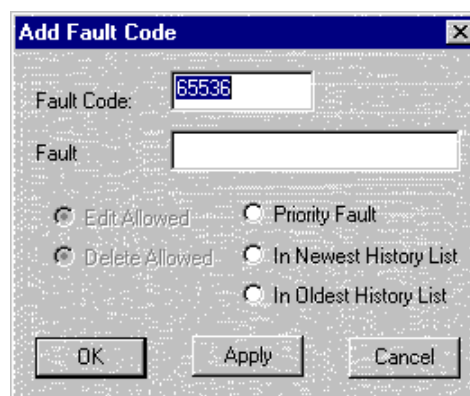


Figure 5. The Add Fault Code dialog box

Some properties may be grayed out. You are prevented from editing these properties.

*By clicking the **Cancel** button, you may back out of your entries and the **Add Fault** screen.*

Changing (Editing) Fault Codes

2. Enter a **Fault Code** and a **Fault Legend** of as many as 16 numbers.
3. Check or uncheck properties you'd like the fault to have. These may include **Priority Fault**, **In Newest History**, **In Oldest History**. See "Changing (Editing) Fault Codes."
4. Click **Apply** to accept your entries. The **Add Fault** screen remains displayed, ready for you to add another fault.
5. When done adding faults, click OK to save your entries and exit the **Add Fault** dialog box.

1. Click on a line to select (highlight) it. This allows the line to be edited if the **Edit Allowed** properties check box is checked.
 - If editing is allowed, the **Edit Fault** dialog box appears.
 - If editing is not allowed, a Fault Manager information box appears with the message "Fault Code Edit Property Not Set" (click OK to continue).

NOTE: If more than one line is selected, an information box appears indicating "Only one line may be edited at a time." (Click OK to continue.)

*Properties **Allow Edit** and **Allow Delete** will be displayed but grayed out. They cannot be changed.*

*By clicking the **Cancel** button, you may back out of your entries and the **Add Fault** screen.*

2. Enter a **Fault Legend**, the name of the fault being entered. You may enter a legend of up to 16 characters.
3. Check or uncheck properties of the fault, as you desire. These include **Priority Fault**, **In Newest History**, and **In Oldest History**.
4. Click Apply to accept your entries. The **Edit Fault** dialog box remains displayed, ready for you to edit another fault.
5. When done adding faults, click **OK** to save your entries and exit the **Edit Fault** dialog box.

Changing (Editing) Properties of a Fault

1. From the **Fault Manager** screen, click a line to be edited.
2. Click **Edit Properties**. The Properties Warning box appears.

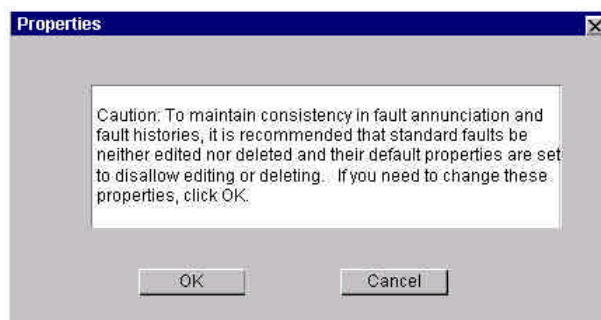


Figure 6. Properties Warning

3. Click **OK** if you wish to change properties for the selected line. The dialog box for the selected fault appears with **Priority Fault**, **In**

*By clicking the **Cancel** button, you may back out of your entries and the **Edit Properties** screen.*

Newest History, In Oldest History will be grayed out, indicating that they may not be edited.

4. Check or uncheck **Edit Allowed** and/or **Delete Allowed**, as desired.
5. Click **Apply** to accept your entries. The **Edit Properties** dialog box remains displayed, ready for you to edit another fault's properties.
6. When done editing properties, click OK to save your entries and exit the **Edit Properties** dialog box.

Deleting a Fault Code

1. From the **Fault Manager** screen, click a line or lines to be deleted. Those lines whose properties allow deletion will remain selected (highlighted).

NOTE: To delete more than one contiguous line, hold down the SHIFT key and click on the first line to be selected. Continue to hold down the SHIFT key and click on the last contiguous line to be selected. Release the keys. The first selected line, the last selected line and all lines in between will remain selected (highlighted).

To delete more than one line, one at a time, hold down the CTRL key and click each line to be deleted. To deselect a line, CTRL click a highlighted line.

2. Click **Delete**. The **Fault Manager** shows only lines not deleted.

Editing Legends for Fault Codes

The legends, or descriptive text for fault codes, may be edited only if the **Allow Edit** field is checked as a property of the fault.

1. From the **Fault Manager** screen, click a line to be edited. The line will be highlighted.
2. Edit the **Fault Legend**, as desired.
3. Click **Apply** to accept your changed legend.
4. Click **OK** to save the change and exit the dialog box.

Assigning Fault Priorities (In Newest History or In Oldest History)

Priorities of Fault Codes may be edited only if the **Allow Edit** field is checked as a property of the fault.

1. From the **Fault Manager** screen, click a line to be edited. The line will be highlighted.
2. Check or uncheck the **Priority Fault, In Newest History** or **In Oldest History** check boxes, as desired.
3. Click **Apply** to accept your changes.
4. Click **OK** to save the change and exit the dialog box.

Defining Outputs

Use the **Fault Manager** to define or modify outputs. Select the **Define Outputs** tab. The screen should appear as indicated below.

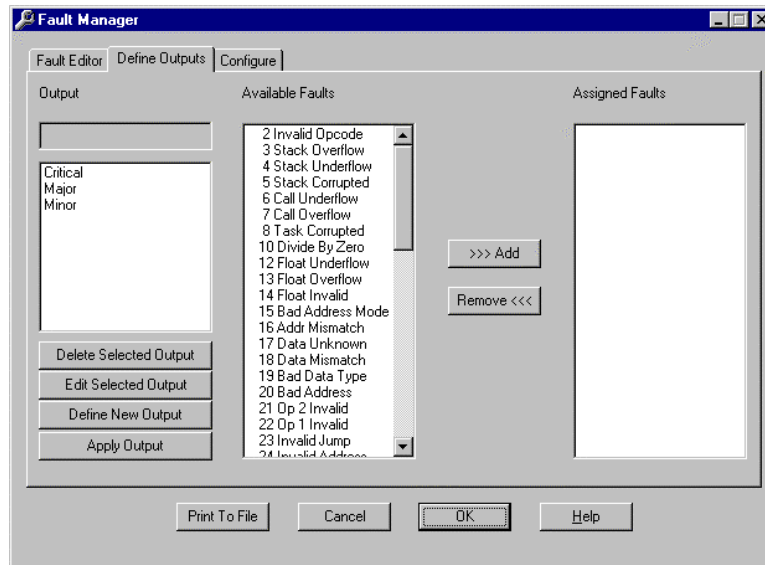


Figure 7. Define Outputs Menu

Adding an Output

Do not confuse the use of Critical, Major and Minor faults with Smart Trac Major and Minor Faults defined in the Appendices. Here, they are only names for collections of faults. You may create collections and name them as you wish.

Assigning Faults to Outputs

1. Click **Define New Output**. The **Output** edit box and **Assigned Faults** scroll box become empty and ready for data to be entered. The **Available Faults** scroll box displays all of the available faults.
2. Enter an output name in the **Output** edit box. Standard (default) outputs include Critical, Major and Minor faults. You may assign faults to the output (refer to "Assigning Faults to Outputs").
3. Click **Apply Output**. The newly defined output will appear in the **Output** box.

You may assign faults to outputs before the **Apply Output** button is clicked while defining a new output or when in **Edit Selected Output** mode.

1. In the Output box, find the **Output** to which you want to assign a fault. Click it. It will be highlighted and appear in the **Output** edit box.
2. Scroll the **Available Faults** box until the fault you want to assign appears in the box. Click it. It will be highlighted.

NOTE: You may use SHIFT-Click to select more than one contiguous fault or CTRL-Click to select more than one non-contiguous fault.

3. Click **>>>Add**. The fault will move from the **Available Faults** box to the **Assigned Faults** box.

NOTE: You may continue to assign faults to outputs by repeating the process.

4. Click **Apply Output** to save the assignments.

Removing an Output Fault

Removing faults from outputs may be done when defining a new output before the **Apply Output** button is clicked or when in **Edit Selected Output** mode.

1. Scroll the **Output** box until you find the output from which you want to remove a fault. Click it. It will be highlighted and appear in the **Output** edit box.
2. Scroll the **Assigned Faults** box until the fault you want to remove appears in the box. Click it. It will be highlighted.

3. **NOTE:** You may use SHIFT-Click to select more than one contiguous fault or CTRL-Click to select more than one non-contiguous fault.

4. Click **Remove<<<**. The fault will move from the **Assigned Faults** box to the **Available Faults** box.

NOTE: You may continue to assign faults to outputs by repeating the process.

Editing an Output

3. Click **Apply Output** to save the assignments.

You may change the name of an output or reassign faults using the **Edit Selected Output** option of the **Define Outputs** tab.

1. Scroll the **Output** box until you find the output you wish to edit. Click it. It will be highlighted and appear in the **Output** edit box.

NOTE: You may edit only one output at a time.

2. Click **Edit Selected Output**.
3. To change the name of the output, highlight the name in the **Output** edit box and enter the new name.
4. To change faults assigned to the output, select the fault or faults you wish to remove or add in either the **Available Faults** or the **Assigned Faults** box. Click **>>>Add** or **<<<Remove** (refer to "Assigning Faults to Outputs" or "Removing an Output Fault").
5. Click **Apply Output**. The selected output will appear on the **Define Outputs** screen as modified.

Deleting an Output

Deleting outputs is done from the **Define Outputs** dialog box.

1. Scroll the **Output** box until you find the output you wish to delete. Click it. It will be highlighted and appear in the **Output** edit box.

NOTE: You may use SHIFT-Click to select more than one contiguous output or CTRL-Click to select more than one non-contiguous output.

2. Click **Delete Selected Output**. The selected outputs will be removed from the **Output** scroll bar and the outputs are deleted from the software driver.

Configure the Fault Manager

You may change configure the Fault Manager's scan rate and the number of faults in the newest and oldest fault lists.

1. Click the **Configure** tab. The **Configure** screen appears.

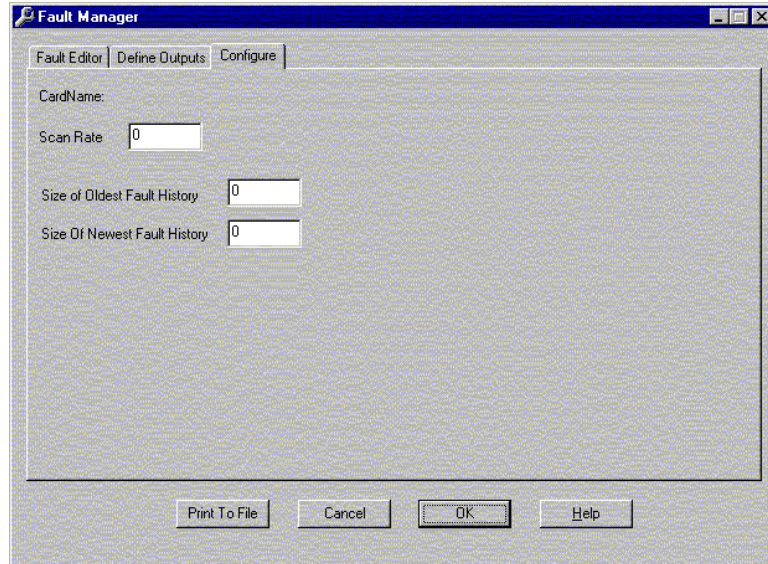


Figure 8 Fault Manager Configure dialog box.

2. Click and drag the cursor over **Scan Rate**, **Size of Oldest Fault History**, or **Size of Newest Fault History** to change that value.

NOTE: You may click **HELP** for a more detailed explanation of each value.

3. Enter the new value.
4. Click **OK** to save the change(s).

**Done with Fault
Manager changes?**

When done making changes, Click OK to save all changes, exit the Fault Manager configure screen and return to the Control Manager.

Linking the Fault Manager and the Digital Operator

You must create a program to associate output from the Fault Manager with the input of the Digital Operator. In a nutshell, you create symbols for the inputs to the Digital Operator and outputs from the Fault Manager, then create a function block to link the two. An example is used to explain this process. The example assumes previous creation of an interface card name of *OperCard* for the Digital Operator driver. We will add *FromFM...* (inputs to the Digital Operator from the Fault Manager) and *ToOper...* (outputs of the Digital Operator) symbols.

To create the symbols:

1. Load **Control Manager** (**Start, Programs, MAG-300, Control Manager**).
2. Double click **Symbols** under a desired node. The **Symbol Editor** dialog box appears.

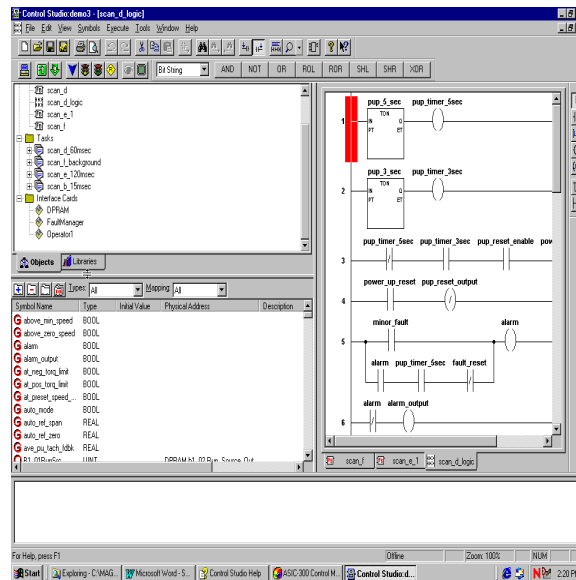


Figure 9. The Control Studio showing the Symbol Editor area

3. Drag and drop the right border of the Symbol Editor area so that you can view the fields Type, Initial Value, Physical Address and Description.

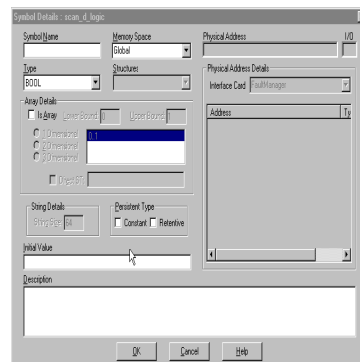



Figure 10. The SymbolDetails dialog box

4. Select **I/O** from the **Mapping** drop-down selection list.
5. Select *OperCard* (or other name) from the **Interface Card** drop-down selection box.
6. Click the blue plus (+) sign .
7. The **Symbol Details** dialog box appears for the task selected by clicking one of the Task tabs.
8. Type a name of your choice in the box after **Symbol Name**. In the figure, we used *ToOperOpResponse*
9. Select **I/O** from the **Memory Space** drop-down selection list.
10. In the **Physical Address Details** area, select **Operator** from the drop-down **Interface Card** selection list. Symbolic names for all available physical addresses appear in the box below the **Interface Card** selection list.

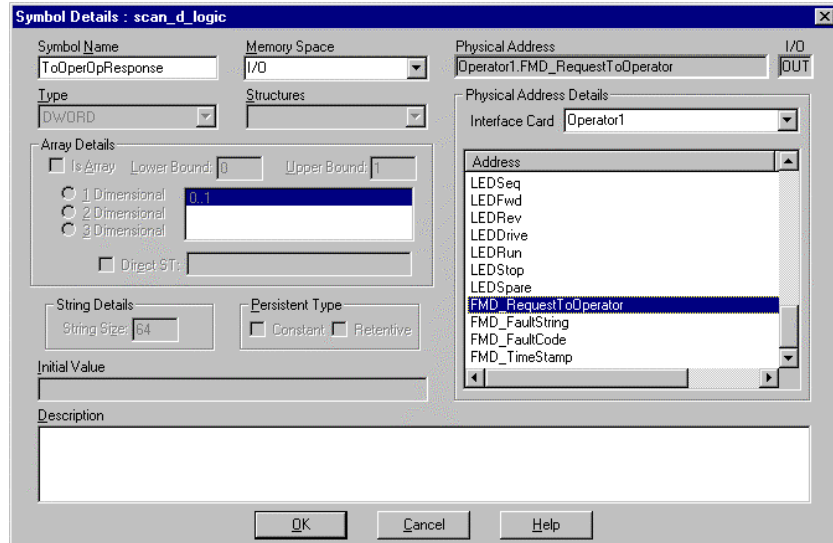


Figure 11. Assigning a Physical Address to a Symbol Name

11. Select a Physical Address (symbolically named) from the **Physical Address Details address/type/I/O** box by clicking on it to highlight it. In this case, we chose the *FMD_RequestToOperator* physical address. This links the physical address with a symbol to be used in a function block diagram.
12. Click **OK** to accept your name, your choices and add the symbol.
13. Continue to add symbols (steps 3 through 8) until you complete adding all those you need for your function block. Close the **Symbol Editor** when done.

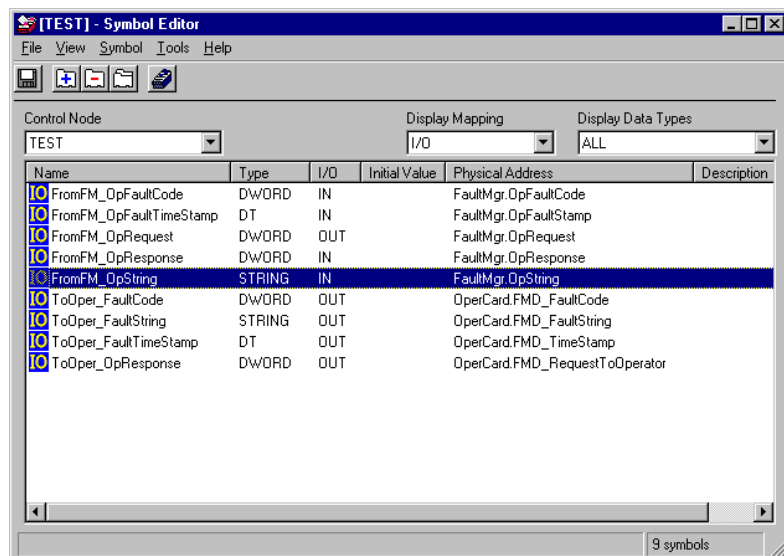


Figure 12. All Symbols needed for function block are added

Next, you create the function block to associate inputs to the Digital Operator from the Fault Manager (the *FromFM_* symbols) with the outputs of the Digital Operator (the *ToOper_* symbols).

14. Open the **Function Block Editor** by right-clicking **Programs** under a desired node name and selecting **New Program Unit...** or clicking **Object, New, Program Unit**. The **New Program** dialog box appears.

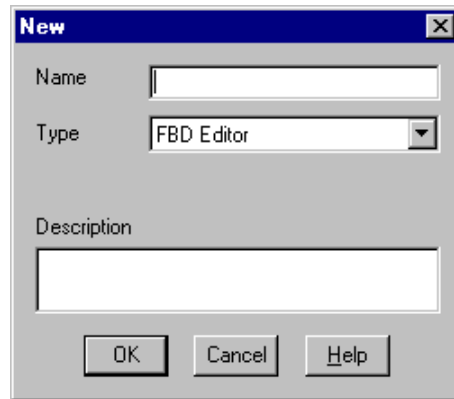


Figure 13. Selecting FBD Editor from the New program dialog box

15. Select **FBD Editor** from the drop-down selection list and enter a program name. In this case, we chose *FaultOperatorLink* as the name for our new program in the form of a function block diagram.
16. Click **OK**.
17. Click on the **Global** tab at the bottom of the **Function Block Editor**. The symbols you just added should be listed.
18. By dragging and dropping, add the *FromFM_* symbols and *ToOper_* symbols to the function block editor screen and connect them using the Connector icon. Your function block diagram should eventually look like the one below:

If you're unsure how to use the Function Block Editor, consult the online help available from the Editor's toolbar.

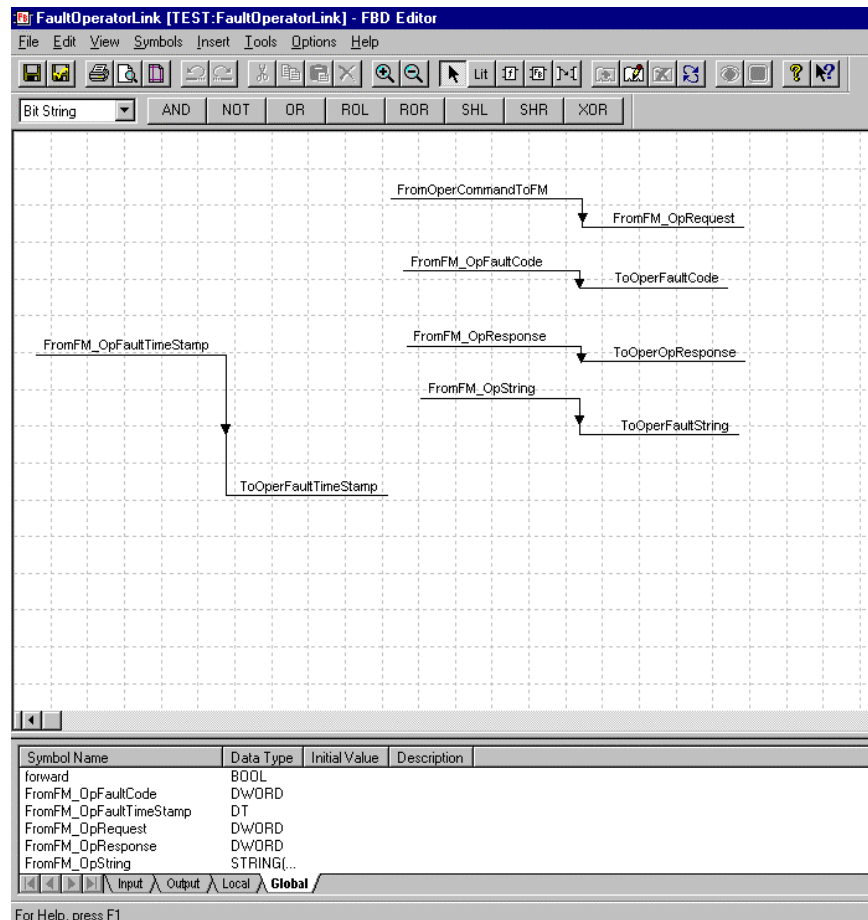


Figure 14. The completed FaultOperatorLink function block

- Click **File, Save and Validate**, and provide a *filename* to save and validate your function block. You now have a block to display faults from the fault manager on the Digital Operator, with a time stamp and a text string to display as the fault description.

THIS PAGE INTENTIONALLY LEFT BLANK

Glossary of Terms

contiguous	touching along a boundary or point, next or near
Critical Fault	A fault that halts execution of the Smart Trac AC1 program when encountered. The controlled node is not allowed to run until node power has been recycled.
Major Fault	A fault that halts execution of a task or node. Most major faults can be manually cleared and the task and node restarted. Execution of the program stops until major faults are cleared by a task's program or by the operator.
Minor Fault	A fault that is logged but does not halt the system. Minor faults can be cleared.

Index

C

Configure 1–2, 6–7
contiguous 4–6

I

Installing 1–2

L

legends 4

M

Mapping 8

P

Printing 2
Priorities 4
Properties 3–4

R

reset 1

SMART TRAC AC1 Fault Manager

Data subject to change without notice. Smart Trac is a trademark of MagneTek, Inc. MicroTrac is a registered trademark of MagneTek, Inc. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation

MagneTek
Drives and Systems
16555 West Ryerson Road
New Berlin, WI 53151
(800) 541-0939, (262) 782-0200, FAX (262) 782-3418

