Preface

This manual is supplementary to the C-Package Operation Manual, which contains all the necessary information for using the Editor. Additional features and configurations are described specifically for the GLC DeviceNet Master Module.

Information about the Editor program and system software that is downloaded to the unit is included here. Details about the hardware can be read in the GLC DeviceNet Master Module User Manual.

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DeviceNet Systems

DeviceNet communication is organized around connections. A connection is usually made between a master (or client) device that is configured to connect to a slave (or server) device. The GLC DeviceNet Master Module connects to DeviceNet as a master, and acts as the client in the communication connection with one or more slave devices.

▼ *Reference* ◣ *For details, refer to the DeviceNet Specifications available from the Open DeviceNet Vendor Association (ODVA).*

Typically, a system requires that the master be configured to recognize the slaves it will communicate with. The master then polls, or contacts, these slaves, using various communication methods. Although a separate software tool is often used, C-Package 02 Editor includes an integrated method of performing this configuration.

▼ *Reference* ◣ *For configuration procedures, see the* Configuration *section.*

COMMUNICATION TYPES

- Polling
- Change of State (COS)
- Bit Strobed
- Cyclic

Getting Started

Installing the GLC DeviceNet Master Software Add-On Kit

After installing the C-Package Editor onto your system, you can install the add-on kit for the GLC DeviceNet Master Module. To install the Add-On Kit, open the root folder in the DeviceNet Master Resource CD, then double-click the Startup.exe icon. Follow the directions to install all required files into the same directory as the C-Package 02 Editor.

Note: The add-on kit will install over C-Package Editor versions 01 or 02, which must be purchased separately.

Running the Editor

Running the Editor after installing the DeviceNet Add-On Kit is the same procedure as for the normal operation of that program. Double-click the desktop icon, or click the Project Manager from the Start menu's Programs submenu.
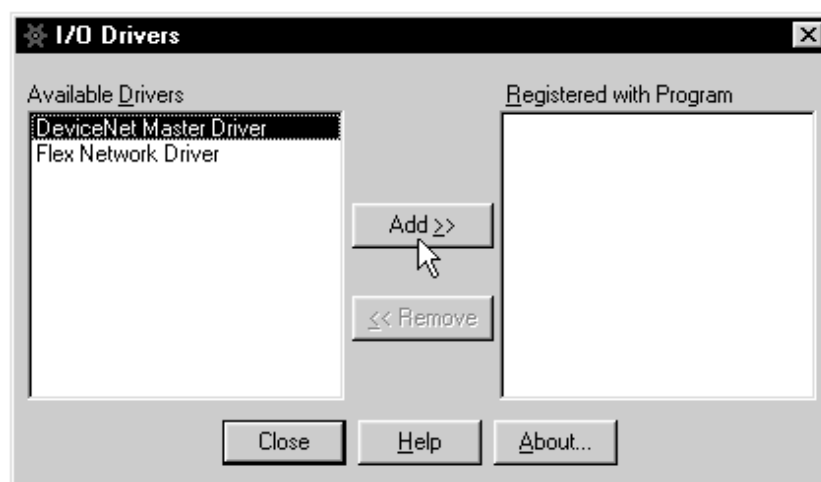
The Logic Editor operates the same as it does without the add-on, until you open the Data menu's Configure I/O dialog box.
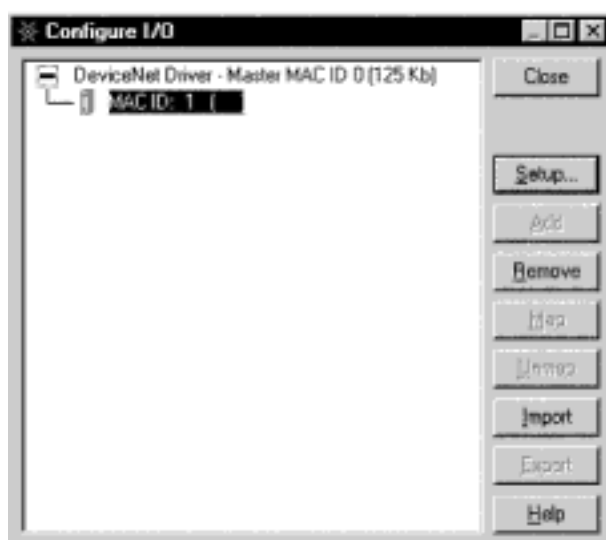
The following Configure I/O dialog box includes buttons to let you configure the GLC DeviceNet Master Module itself, and to add and configure slave devices in the network.

Click the Driver button to open the I/O Drivers dialog box, then select the DeviceNet Master Driver (see below). Click Add.
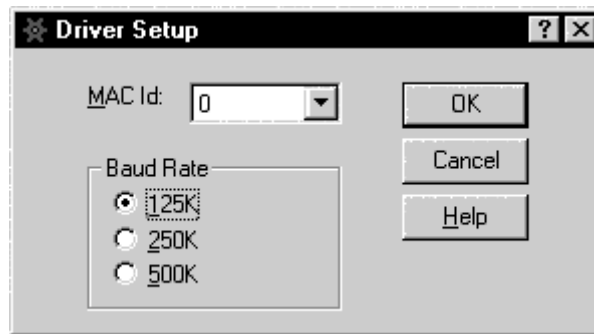

The Configure I/O dialog box appears, with the newly added DeviceNet Master driver.

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Configuration

Configuring the GLC DeviceNet Parameters

In the Configure I/O dialog box, click the DeviceNet Driver's node at the top of the tree display, then click Setup. When the following Driver Setup dialog box appears, you can then configure the GLC unit's MAC ID and Baud Rate. Because the GLC is not a Slave Device, no other parameters need configuring, and no Electronic Data Sheet (EDS) file is required.

This is the only method to configure the master's baud rate and Mac ID. Upon downloading to the unit, this change is in effect immediately since the GLC is reset at this time. Use caution when changing the baud rate of your network. Ensure all slaves are ready to communicate at the new rate before downloading a new configuration into the GLC.

Configuring Slaves

As a master on the DeviceNet Network, the GLC unit must be configured to recognize all slaves that will participate in communications. The GLC will then start up and interact with these slaves. This configuration is performed in the C-Package Logic Editor and then downloaded to the GLC unit with the project's ladder logic file.

To configure the GLC unit, the Editor requires information about each slave device — particularly the number of terminals it supplies for communication, and the communication method used to access them. Make sure that the EDS file for each slave is stored in the EDS file folder, which is installed in C:\Program Files\Pro-face\ EDSFiles\DeviceNet.

Note:
- If the desired vendor is not listed, you may have to add an EDS file to the EDS folder.
- The EDS file folder holds EDS files for configuring slaves with both LT products and GLC products.
- You must restart the Ladder Logic Editor to register any recently added EDS files in the Configure I/O dialog box.

The information can then be called up in the Editor's I/O Unit Setup dialog box. The manufacturer's name appears in the Vendor list at the top of the I/O Unit Setup dialog box.

▼Reference▲ *For more information about Electronic Data Sheet (EDS) files, refer to the* DeviceNet Specification.

Use the following procedure to configure a slave:

1. In the Configure I/O dialog box, click to select the DeviceNet Driver node, then click Add to add a new, unnamed slave to the tree display.

2. Click to select this new slave, then click Setup to open the I/O Unit Setup dialog box.

3. From the Vendor list, click the manufacturer's name .

   If the vendor has multiple device types, they will appear in the Device list. You can now select the desired device from this list.

4. Select the MAC ID and enter a description, if required (39 characters max.).

5. If required, you may also select other communication methods such as Cyclic or Bit Strobe. The number of bytes and their mapping into terminals may be different for each type of communication.

   ▼ Reference ◣ *For details, refer to the* DeviceNet Specification.

6. In the I/O Information area:

   a. Enter the number of bytes and the number of terminals they will represent.

   b. Set the mapping as either Discrete or Word.

   • If set as Discrete mapping, each byte can represent up to eight terminals, with each terminal a single discrete bit in that byte.

   • If set as Word mapping, two bytes will be required to represent each 16-bit word.

   Note: Do NOT configure more than 48 terminals in any slave node.

7. Variables can now be mapped, or assigned, to the slave.

   ▼ Reference ◣ *See the* Mapping Variables *section for details.*

When all the mapping and Ladder Logic is complete, the entire configuration and project information will be downloaded to the GLC unit.

When an EDS file is not available, you can still enter the configuration data directly into the dialog box. You can also update or modify the defaults provided by an EDS file. All such information is stored in the project file, and even when the EDS file is removed, the project can still configure the GLC for DeviceNet communication.

OTHER SETTINGS

In the I/O Unit Setup dialog, you can also set up the following data if desired.

UCMM Group

If the device is a UCMM device, you will be able to connect to it only as a UCMM connection. Set the UCMM Group with the dropdown list box. If you are uncertain which group your device supports, choose Group 3.

Expected Packet Rate (EPR)

Expected Packet Rate (EPR) can also be set in this dialog. The EPR is used to determine how often the device needs to be contacted by the master to maintain the connection with that device. Set a value between 0 and 65535 msec.

Production Inhibit Time

Production Inhibit Time is used to set devices using Change of State communication type to keep the number of messages within reason. Set the Production Inhibit Time to a value between 0 and 65535 msec. Make sure this value is less than that set for the EPR. This value is also used with polled slaves and bit-strobed slaves to determine how often to send commands out to them from the master.

Disable Module

Click the Disable Module checkbox to disable the device for trouble-shooting purposes. You will need to download again to the GLC for this change to take place. The GLC will not attempt to communicate with this slave. The values are maintained, so when you clear this checkbox, the previously set data will remain. Download once again and this slave will be configured in the master's scan list.

CONFIRMING CONFIGURATION SETTINGS

EDS files can contain data that is different than that supported by the physical configured device. To ensure that the master can communicate with the newly configured slave, it is sometimes necessary to use the offline screens of the GLC to scan the network and confirm that these data settings match those of the slave you are setting up in the editor.

> ▽Reference△ *Refer to the* GLC DeviceNet Master Module User Manual *for more details on the use of these offline screens.*

Run the network scan, and find the slave at the MacID you wish to confirm.

Confirm that the data in the details screen for that slave matches the data you have set in the I/O Unit Configuration dialog. Update any discrepancies in the dialog to match the real device.
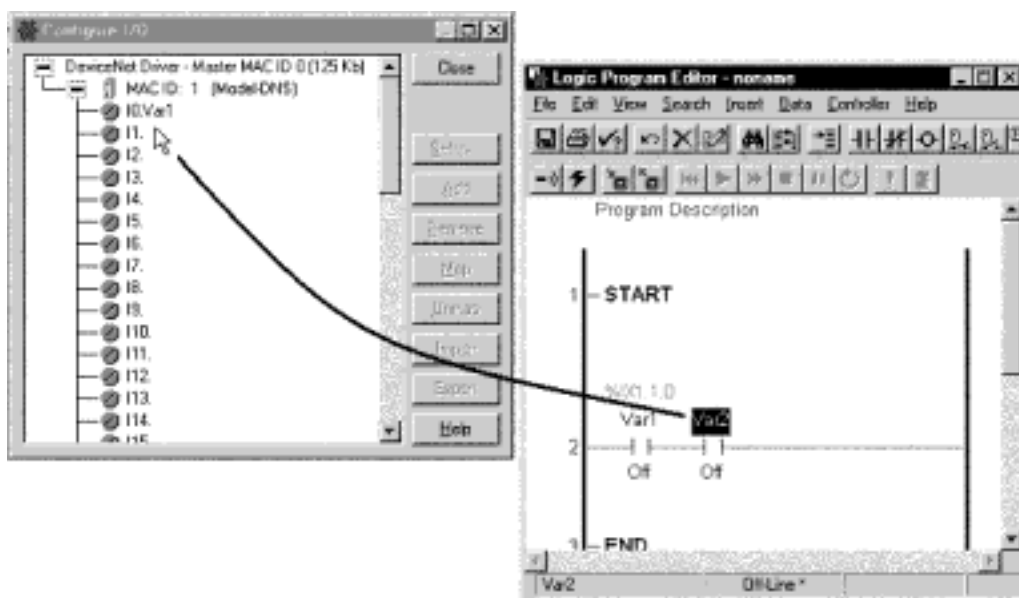
Mapping Variables

After a slave has been added and configured, variables can then be mapped to the terminals (I/O points) on the device. As each assignment is made, a variable name will appear beside its terminal in the tree display.

Internal memory points or variables are assigned to the DeviceNet data terminals much in the same way as for Flex Network variables. The following methods will map variables to the terminals:
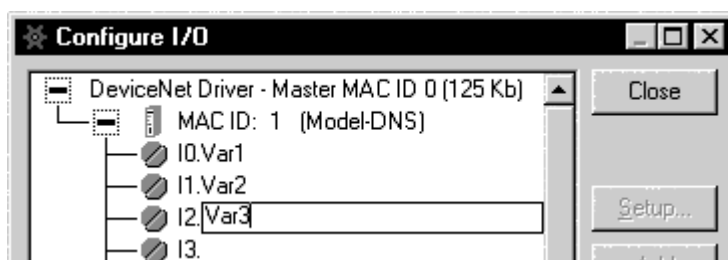
DRAG AND DROP

Drag the existing variable name from the Data List or any Ladder Logic Instruction to the terminal in the Configure I/O dialog box.

When a terminal is mapped, you can also drag from the terminal to a Ladder Logic instruction. The name mapped on your terminal will be added to the Ladder Logic Instruction.

MAP THE TERMINAL

From the Configure I/O dialog box, click to select a terminal, then click Map. A text box opens beside the terminal. Type the name of the variable to associate with this terminal. If no variable with that name currently exists, the option to create a new variable with a suitable type will be provided, and it will be mapped to this terminal.

NAME THE TERMINAL

In the Configure I/O dialog box, double-click the terminal to open a text box. Type the name of the variable you wish to map to this terminal.

Note: A maximum of 1008 variables can be mapped to terminals in one project.

Downloading

You can transfer data to the unit using one of the following two methods.

• If you have created a new project in the Project Manager, click to select both the Ladder Logic and the Human Machine Interface (HMI) parts of the project in the Transfer Settings dialog box. Then click Send to download the files.

▽ Reference △ *For details, refer to the* C-Package 02 Editor Operation Manual.

• If you have already sent a project, and wish to send additional changes to the Ladder Logic or DeviceNet Configuration, click the Send icon in the Ladder Logic Editor, and the project will be directly downloaded to the unit.

Note: During DeviceNet Initialization, which lasts about 15 seconds after powering on, download attempts will not succeed. Wait until the ACT LED is Green, and then retry.

Offline Menus

The basic offline screens for the DeviceNet master are as follows:

• Network Scan
• Slave Details
• Change Slave MAC ID
• Change Slave Baud Rate
• Get Attribute
• Set Attribute
• DeviceNet Rev.

▽ Reference △ *For details about these screens, refer to the* GLC DeviceNet Master Module User Manual.

Troubleshooting

Following are some typical failures that may occur, and related countermeasures.

Unit does not start Ladder Logic (LED flashing Green, DeviceNet LEDs are OFF, no network activity):

- Make sure there is a ladder logic program loaded into the unit.
- Confirm that the Ladder Logic Engine is started.

Unit starts Ladder Logic, but does not communicate DeviceNet (DeviceNet LEDs are OFF, no network activity):

- Make sure there is one slave or more connected, and configured in the Configure I/O dialog box.
- Make sure the I/O is enabled in the project.
- Make sure there is appropriate network power provided to the DeviceNet Connector.

Unit starts, but cannot find slave (flashing Red MNS LED on GLC DeviceNet Master):

- Do a Network Scan, and confirm that ALL details in each slave match the project configuration in the I/O Configuration dialog box.
- Make sure there are no extra slaves configured in the project that do not exist physically on the network.
- Confirm wiring on all slaves connected, including termination resistors on the two ends of the trunk.

Bad Variable displays on the GLC unit:

- Confirm that the correct Ladder Logic Program has been downloaded for the project file.
- Confirm that the entire project has been downloaded since the last time you used new Ladder Logic Symbols in the HMI displays.

▼Reference◣ *For further troubleshooting information, refer to the* User Manual for your GLC model.

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Error Messages

When an internal DeviceNet processing error occurs, the code value is placed in the #IOStatus<1> variable and the #IOFault bit is set to one. Errors will appear in this system variable for as long as the error condition exists. Once the error condition has cleared, the code in #IOStatus<1> will be set to zero after 10 Ladder Logic scans.

Monitor this variable in online mode from the Logic Editor, or by placing a numeric display on the HMI. Use a ladder logic rung to transfer a transient error code value into an internal variable for viewing after the error has cleared. It is best to do so any time the code in #IOStatus<1> changes value.

865	DeviceNet initialization has failed
866	Trouble setting the DPRAM host state to "Run"
867	Trouble setting the DPRAM host state to "Stop"
868	Error starting the EC-1 DeviceNet watchdog timer
869	Error stopping the EC-1 DeviceNet watchdog timer
870	EC-1 DeviceNet watchdog timer failure
871	EC-1 DeviceNet handshake error: host bits 7, 6, 5 not set
872	Cannot get the DeviceNet task state information
873	A DeviceNet device is not configured, but should be
874	A device's explicit connection is not in an established state
875	I/O connection of a slave is not in established state
876	DeviceNet Diagnostic GlobalBits error
877	EC-1 Processor not operating
878	Fault code Value not zero
879	DeviceNet Bus Errors have occurred