

Configuration Utility Manual

For Signal Interface Modules

Version 2.00

Microstar Laboratories, Inc.

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Contents

Configuration Utility for Signal Interface Modules.....	4
Hardware Setup.....	5
Common Parameters	6
Addresses.....	6
Module ID	7
Initialization	8
MSXB075 and MSXB076 – Isolated Analog Output Modules	9
Output Addresses	9
Update Address	9
Output Range and Initial Outputs	9
MSXB078 – Isolated Digital I/O Module.....	10
Input and Sampling Addresses	10
Output and Update Addresses	10
Initial Outputs.....	10
MSXB080 / MSXB081 / MSXB082 – Isolated Analog Input Module ...	11
Input Address	11
Sampling Address	11
Scan Reset Address.....	11
Sample Returns Input?.....	12
Channel List	12
Gain.....	12
Restore Factory Defaults	12
Save and Load	12
MSXB084 / MSXB085 / MSXB086 – Isolated Analog I/O Modules	13
Input Address	13
Sampling Address	13
Scan Reset Address.....	13
Sample Returns Input?.....	14
Output and Update Addresses for MSXB085	14
Channel List	14
Gains	14
Restore Factory Defaults	14
Save and Load	14
Initial Outputs for MSXB085	14
Appendix A. Previous Versions of Utility	15

Figures:

Figure 1. Example of the Select tab.....	6
Figure 2. Example of the Add tab.....	7
Figure 3. Initialize new modules	8
Figure 4. MSXB075	9
Figure 5. MSXB078	10
Figure 6. MSXB080	11
Figure 7. MSXB084 / MSXB085 / MSXB086.....	13

Configuration Utility for Signal Interface Modules

The utility is used to configure the signal interface modules from Microstar Laboratories. It is compatible with the following modules:

- MSXB075 and MSXB076 – Isolated Analog Output Expansion Modules
- MSXB078 – Isolated Digital I/O Expansion Module
- MSXB080, MSXB081, and MSXB082 – Isolated Analog Input Expansion Modules
- MSXB084, MSXB085, and MSXB086 – Isolated Analog I/O Expansion Modules

It can be used to change parameters such as module ID and address range. This manual will first discuss the parameters that are common to all signal interface modules and then the specifics for each module.

The utility is available for download at <http://www.mstarlabs.com>.

Hardware Setup

The configuration utility saves settings to the flash onboard of a signal interface module. The module(s) should be connected to a DAP board that has been installed with Accel32 or DAPcell Server.

Note: The signal interface modules should not be connected to or disconnected from a Data Acquisition Processor board or the backplane in an industrial enclosure while the Data Acquisition Processor or backplane is powered.

Common Parameters

When the utility starts, it displays two tabs – Select and Add. The Select tab, as shown in Figure 1, shows the DAP board(s) installed in the local PC and the signal interface module(s) connected to the DAP board(s). If DAPcell Network Server or Client is installed, click on Scan Network to detect for DAP board(s) and signal interface module(s) on the network.

Under the Select tab, the information of a module is shown under Description by selecting the module at the expanded tree structure. Click on the fields under Addresses to configure the module. Click on the Save button to save the configuration to the flash onboard of the module. The Options tab shows the optional parameters that can be configured for the particular signal interface module selected.

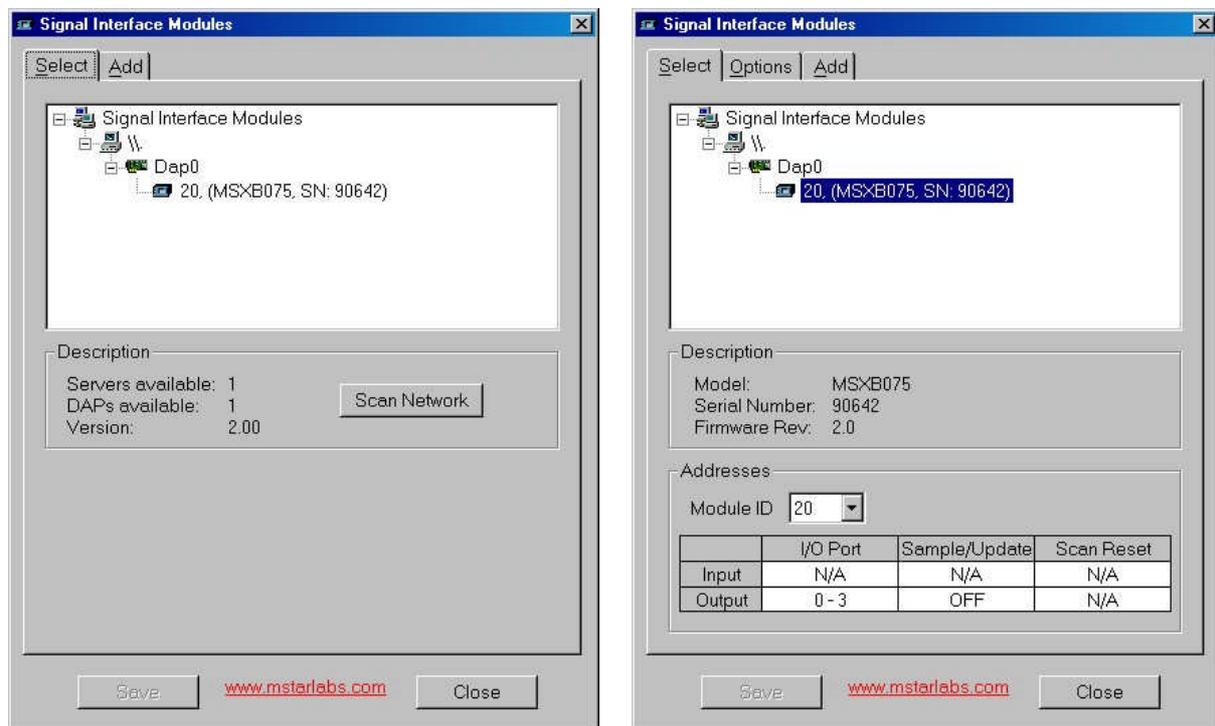


Figure 1. Example of the Select tab

Addresses

A signal interface module can have one or more addresses for its configuration. Not all addresses are applicable to a module. If a type of address is not applicable, it is marked as “N/A”. An address can also be turned off.

- I/O Port – A module has a unique address or a range of addresses for input or output, or both.
- Sample/Update – A sample address is for simultaneous sampling or an update address is for simultaneous output update.
- Scan Reset – A scan reset address is for resetting a channel list and simultaneous sampling, if channel list is supported.

Module ID

A signal interface module is identified by a unique module ID. A valid value is between 1 and 254. The module ID assigned at the factory is 255, which is invalid and not detected by the utility program. A new module needs to be initialized and assigned a valid module ID under the Add tab. Refer to the section on Initialization.

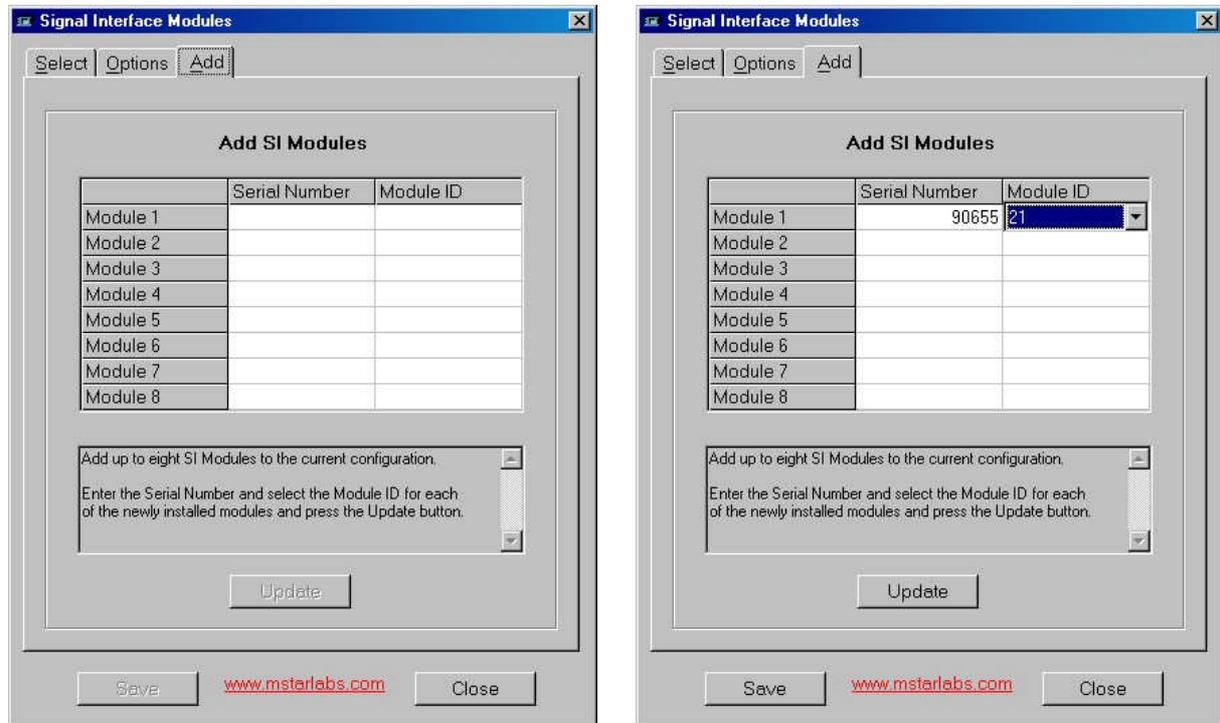


Figure 2. Example of the Add tab

Initialization

Multiple new modules can be connected to the DAP board and be initialized at the same time. Figure 3 shows an example on adding multiple modules. Follow the steps below to initialize a new module.

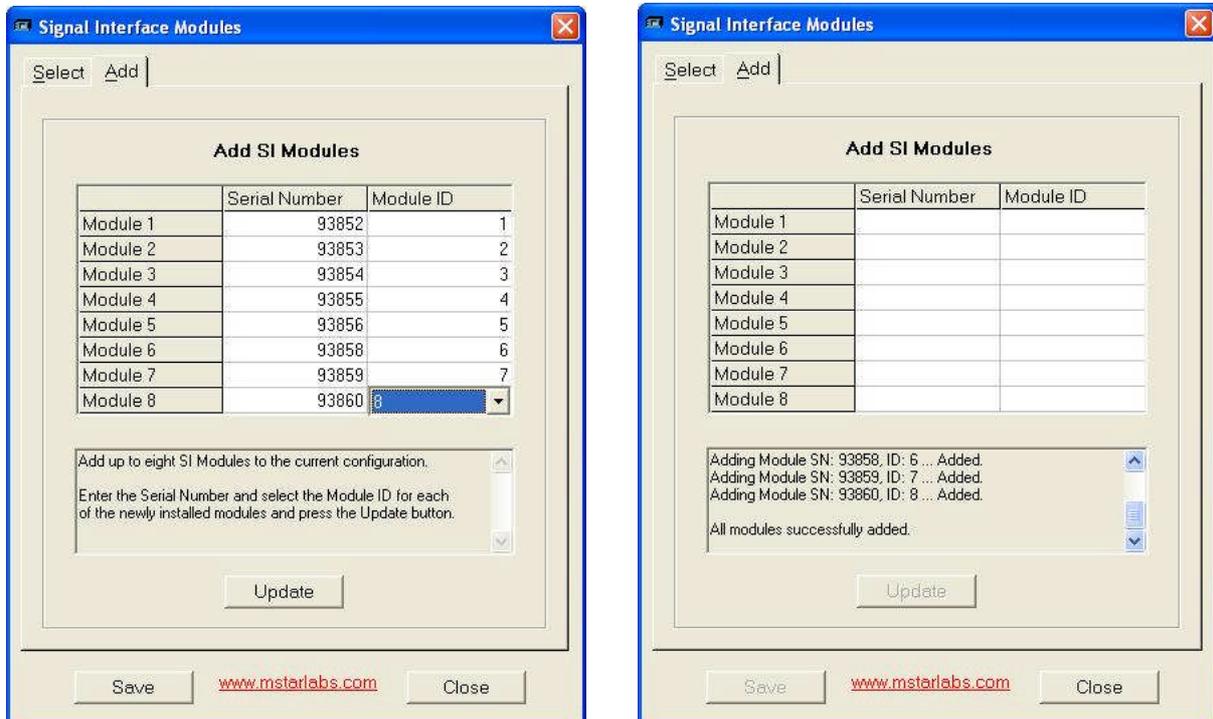


Figure 3. Initialize new modules

1. Click on the box under Serial Number for Module 1. Enter the serial number of the module.
2. Select a module ID in the drop-down list. Only the unused module IDs are available in the list.
3. Repeat steps #1 and #2 for the next new module, if any.
4. Click on Update. The utility adds the module(s) and shows whether each has been added successfully. If there are more than eight modules in the system, repeat steps #1 and #2 again.
5. Go back to the Select tab. The initialized module(s) should now be visible.

After a module is initialized and detected, its module ID can be changed under the Select tab. It can be set back to 255 to disable the module. That might be appropriate when the module needs to be removed and connected to another DAP board with other signal interface modules already installed. Disabling the module avoids any ID conflict with the other modules. It will need to be initialized after it is connected to the new DAP board.

MSXB075 and MSXB076 – Isolated Analog Output Modules

The MSXB075 module supports four voltage outputs and the MSXB076 supports eight. Figure 4 shows the default addresses for the MSXB075 and the options available. The addresses and options for the MSXB076 are very similar. Refer to the MSXB075/076 manual for more information on the hardware and software configuration.

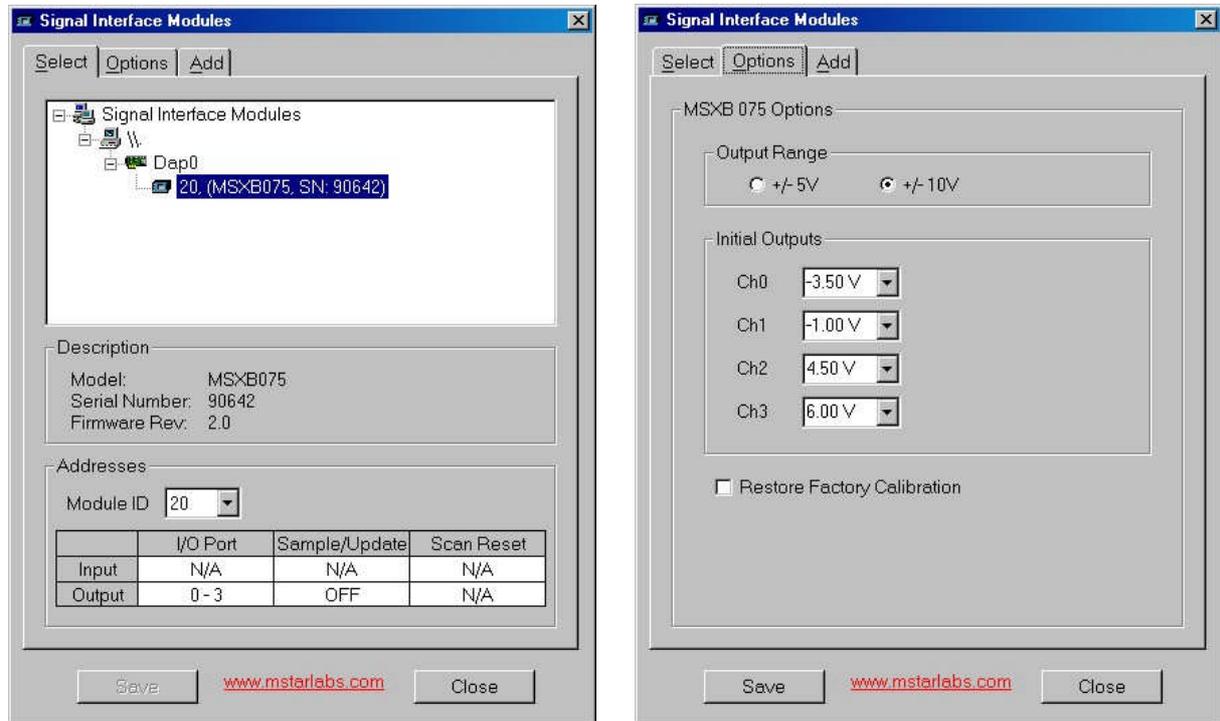


Figure 4. MSXB075

Output Addresses

The MSXB075 and MSXB076 uses four and eight digital ports for the output address range, respectively. The default range is 0-3 for the MSXB075 and 0-7 for the MSXB076.

Update Address

An update address between 0 and 62 is used for simultaneous update. The default is OFF.

Output Range and Initial Outputs

Under the Options tab, the utility allows the selection of an output range and initial outputs. The MSXB075 and MSXB076 support an output range of +/-5V or +/-10V, with the default at +/-10V. If the +/-5V range is selected, the resolution is reduced to 15-bit. The utility also provides an option to set the initial outputs in voltages. After power up or a hardware reset, the outputs of the analog output expansion module(s) can come up to a known state specified under Initial Outputs.

MSXB078 – Isolated Digital I/O Module

The MSXB078 module has 16 isolated digital inputs and 16 isolated digital outputs. Refer to the MSXB078 manual for more information on the hardware and software configuration.

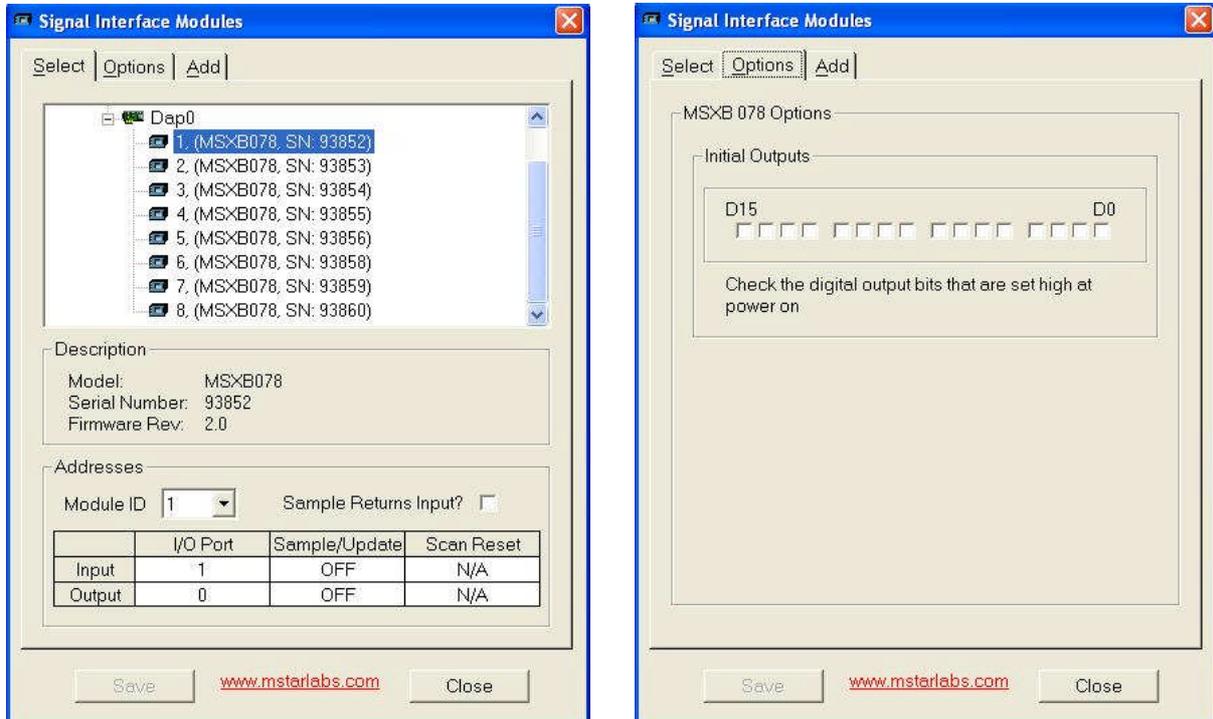


Figure 5. MSXB078

Input and Sampling Addresses

Each MSXB078 should have a unique input address between 0 and 7. If the MSXB078 is used in a system with analog input board(s) connected to the same DAP board, do not use address 0. In addition to an input address, a MSXB078 also has a sampling address between 0 and 7 for simultaneous sampling with other module(s) in the system.

If more than eight signal interface modules (MSXB078 or other models) are connected to a DAP board, the input addressing of the module(s) not used for digital inputs must be disabled.

Output and Update Addresses

A MSXB078 should have a unique output address and an update address between 0 and 62. The update address is for simultaneous updates with other module(s).

Initial Outputs

After power up or a hardware reset, the outputs of a MSXB078 can come up to a known state specified for the Initial Outputs.

MSXB080 / MSXB081 / MSXB082 – Isolated Analog Input Module

The MSXB080 and MSXB082 modules have eight and four voltage inputs, respectively, and the MSXB81 has eight current inputs. Refer to the MSXB080 / MSXB081 / MSXB082 manual for more information on the hardware and software configuration.

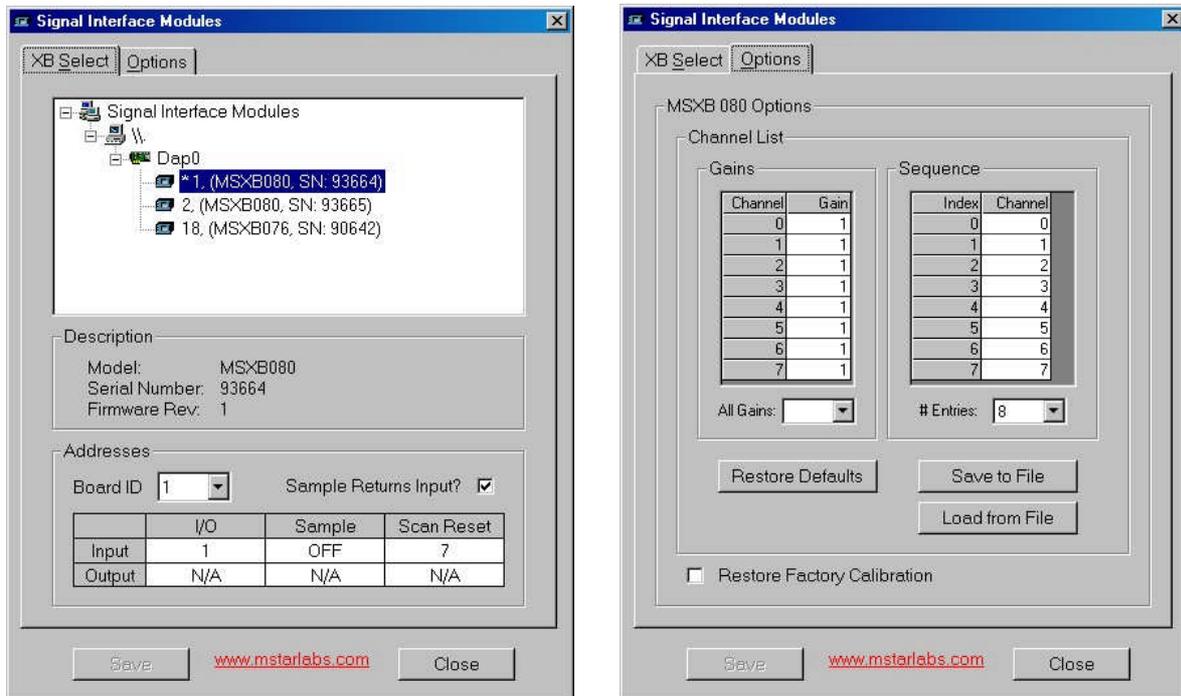


Figure 6. MSXB080

Input Address

Each analog input module should have a unique input address between 0 and 7. Reading the input address returns a data value of a channel on the channel list in sequence. The default value is 1 (i.e. B1).

Sampling Address

A module can have a sampling address between 0 and 7 for latching the data values from the previous clock and starting an acquisition cycle. The sampling address is similar to the scan address, except that it does not reset the channel list. The default value is OFF. For most applications, the sampling address should be OFF.

Scan Reset Address

The scan address should be between 0 and 7. Reading the scan address latches the values taken at the last read of the scan address, starts an acquisition cycle, and resets the channel list. The default value is 7. For system with one analog input module, the scan address must be different from the input address. With more than one module, the scan address should be the same as one of the input addresses.

Sample Returns Input?

One analog input module connected to the DAP board must be selected to return an input channel upon the sampling or scan reset address. For the module that is selected, it returns a value for the first channel on its channel list when the scan address is read. Subsequent reads of the input address return the values for the rest of the channels on the channel list.

Channel List

A channel list is the list of selected inputs in the sequence in which they are read by a DAP board. A read operation of the input address of an analog input module returns a value from one input in the channel list in sequence. The configuration utility allows the selection of only the inputs that should be returned to the PC. A channel can be sampled more than once in the channel list.

Gain

The MSXB080 and MSXB082 support one gain for all eight channels. The valid gains are 1, 2, 5, and 10, with the unity gain as the default. The gains are specified at the configuration utility. Each channel in the channel list can only have one gain.

The MSXB081 has a gain of 10 for all channels.

Restore Factory Defaults

The factory defaults for gains and channel list can be restored by the Restore Defaults button. The Restore Factory Calibration loads the original calibration coefficients

Save and Load

The gains and channel list can be saved to a file or be loaded from a file.

MSXB084 / MSXB085 / MSXB086 – Isolated Analog I/O Modules

Each isolated analog I/O module has 16 isolated analog inputs, where the MSXB084 and MSXB085 support voltage inputs and the MSXB086 current inputs. The MSXB085 also has two isolated analog outputs. For more information on the hardware and software configuration, refer to the MSXB084 manual.

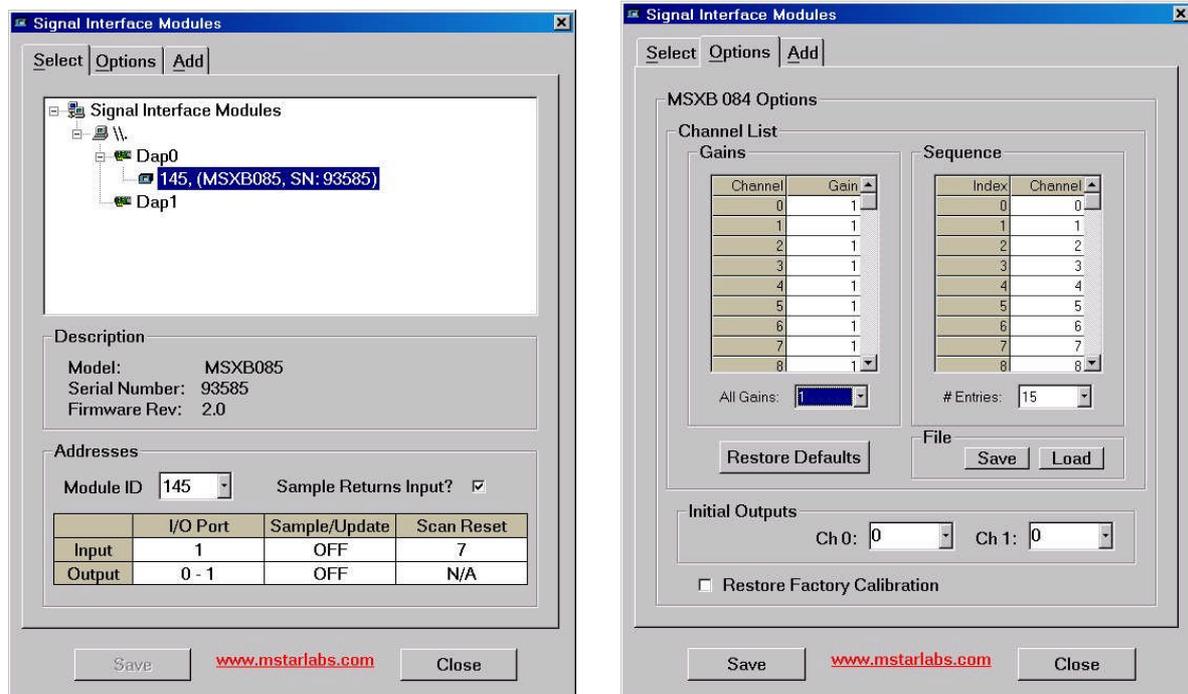


Figure 7. MSXB084 / MSXB085 / MSXB086

Input Address

Each module should have a unique input address between 0 and 7. Reading the input address returns a data value of a channel on the channel list in sequence. The default value is 1 (i.e. B1).

Sampling Address

The module can have a sampling address between 0 and 7 for latching the data values from the previous clock and starting an acquisition cycle. The sampling address is similar to the scan address, except that it does not reset the channel list. The default value is OFF. For most applications, the sampling address should be OFF.

Scan Reset Address

The scan address should be between 0 and 7. Reading the scan address latches the values taken at the last read of the scan address, starts an acquisition cycle, and resets the channel list. The default value is 7. For system with one MSXB084 (or MSXB085 or MSXB086) module, the scan address must be different from the input address. With more than one module, the scan address should be the same as one of the input addresses.

Sample Returns Input?

One module connected to the DAP board must be selected to return an input channel upon the sampling or scan reset address. For the module that is selected, it returns a value for the first channel on its channel list when the scan address is read. Subsequent reads of the input address return the values for the rest of the channels on the channel list.

Output and Update Addresses for MSXB085

A MSXB085 uses two ports for outputs. The output and update addresses must be between 0 and 62. The update address is for simultaneous updates with other module(s).

Channel List

A channel list is the list of selected inputs in the sequence in which they are read by a DAP board. A read operation of the input address of a module returns a value from one input in the channel list in sequence. The configuration utility allows the selection of only the inputs that should be returned to the PC. A channel can be sampled more than once in the channel list.

Gains

The module has a gain amplifier for each of the eight inputs; the gain is selectable per input. The valid gains are 1, 2, 5, and 10, with the unity gain as the default. The gains are specified at the configuration utility. Each channel in the channel list can only have one gain.

Restore Factory Defaults

The factory defaults for gains and channel list can be restored by the Restore Defaults button. The Restore Factory Calibration loads the original calibration coefficients

Save and Load

The gains and channel list can be saved to a file or be loaded from a file.

Initial Outputs for MSXB085

The MSXB085 module has an option to set the initial outputs in voltages. After power up or a hardware reset, the outputs of the module can come up to a known state specified under Initial Outputs.

Appendix A. Previous Versions of Utility

Version 1.00 of the configuration utility supports the following modules and the write-protect header. Modules that were programmed with the previous version of VHDL require version 1.00 of the utility program.

- MSXB075 and MSXB076 – Isolated Analog Output Expansion Modules
- MSXB078 – Isolated Digital I/O Expansion Module
- MSXB080 – Isolated Analog Input Expansion Modules
- MSXB084 and MSXB085 – Isolated Analog I/O Expansion Modules