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ILX34-MBS

Quick Start Guide

March 10, 2014

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ILX34-MBS Quick Start Guide March 10, 2014

ProSoft Technology® Product Documentation

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1 Start Here

This Quick Start Guide will help you quickly set up and configure the ILX34-MBS module. You should be somewhat familiar with the following:

- Rockwell Automation® Studio 5000 Logix Designer v21 (for CompactLogix L1 processors) or Rockwell Automation® RSLogix™ 5000 version 16 or greater (for 1734 Point I/O adapters).
- Hardware Installation and Wiring

1.1 ILX34-MBS Overview

The ILX34-MBS module is an ideal solution for many distributed I/O applications where Modbus connectivity can be integrated into an Allen Bradley system. The ILX34-MBSxxx comes with an Add-On profile and is configured using Rockwell Automation Studio 5000 (CompactLogix L1) and RSLogix 5000 (Point I/O™ Controllers). The module works in both the 1734 Point I/O adapters and the CompactLogix L1 processors.

1.2 Package Content

The following components are included with your ILX34-MBS, and are all required for installation and configuration.

Important: Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	ILX34-MBS	ILX34-MBS	POINT I/O Adapter

1.3 System Requirements

The ILX34-MBS requires the following minimum hardware and software components:

- Rockwell Automation[®] processor, with compatible power supply
 - CompactLogix™ L1 Processors or 1734- Point I/O adapters,
- Rockwell Automation RSLogix 5000/Studio 5000 programming software
- Rockwell Automation RSLinx communication software version 2.54 or higher
- Pentium[®] II 450 MHz minimum. Pentium III 733 MHz (or better) recommended
- Supported operating systems:
 - Microsoft Windows[®] 7
 - Microsoft Windows Vista
 - Microsoft Windows XP Professional with Service Pack 1 or 2
 - Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
 - Microsoft Windows Server 2003

- 128 Mbytes of RAM minimum, 256 Mbytes of RAM recommended
- Microsoft Windows Explorer version 7
- 256-color VGA graphics adapter, 800 x 600 minimum resolution (True Color 1024 × 768 recommended)
- DVD drive

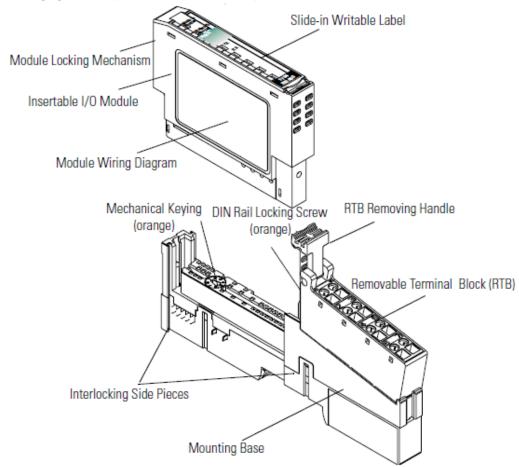
Note: The Hardware and Operating System requirements in this list are the minimum recommended to install and run software provided by ProSoft Technology. Other third party applications may have different minimum requirements. Refer to the documentation for any third party applications for system requirements.

2 Installing the Adapter

2.1 Installing the Mounting Base/Wiring Base Assembly

The wiring base assembly consists of a mounting base and a removable terminal block. You can install the assembly or just the mounting base. Perform the following to install the base/wiring base assembly:

- 1. Position the mounting base/wiring base assembly vertically above the installed units (adapter, power supply, or existing module).
- 2. Slide the mounting base down allowing the interlocking side pieces to engage the adjacent module or adapter.



3. Press firmly to seat the mounting base on the DIN Rail. The mounting base snaps into place.

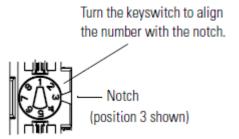
- 4. To remove the mounting base from the DIN rail, remove any installed module (and any module immediately to the right) and use a small blade screwdriver to rotate the DIN rail locking screw to a vertical position. This releases the locking mechanism. Lift straight up to remove the mounting base.
- 5. Repeat this procedure for the next mounting base assembly.

2.2 Installing an I/O Module

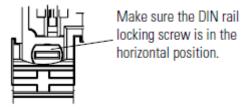
Make sure that the mounting base is correctly keyed before installing the module into the mounting base. In addition, make sure the mounting base locking screw is positioned horizontal referenced to the base.

Warning: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is non-hazardous before proceeding.

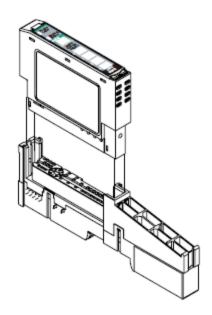
1. Using a small blade screwdriver, rotate the key switch on the mounting base clockwise until the number required for the type of module being installed aligns with the notch in the base.



2. Make certain the DIN-rail locking screw is in the horizontal position. You cannot insert the module if the locking mechanism is unlocked.



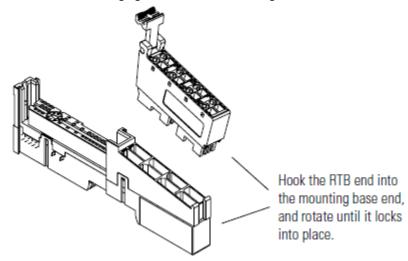
3. Insert the module straight down into the mounting base and press to secure. The module locks into place.



2.3 Installing the Removable Terminal Block

A removable terminal block is supplied with the mounting base assembly. To remove, pull up on the RTB handle. This allows the base to be removed and replaced as necessary without removing any of the wiring. Follow the instructions to reinsert the removable terminal block:

1. Insert the RTB end opposite the handle into the base unit. This end has a curved section that engages with the mounting base.



Warning: When you connect or disconnect the Removable Terminal Block (RTB) with the field side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is non-hazardous before proceeding.

- 2. Rotate the terminal block into the mounting base until it locks itself in place.
- 3. If an I/O module is installed, snap the RTB handle into place on the module.

2.4 Removing a Mounting Base

In order to remove a mounting base, you must remove any installed module, and remove the Removable Terminal Block (if wired).

- 1. Unlatch the RTB handle on the I/O module.
- 2. Pull on the RTB handle to remove the Removable Terminal Block.

Warning: When you connect or disconnect the Removable Terminal Block (RTB) with the field side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is non-hazardous before proceeding.

3. Press in on the module lock on the top of the module and pull up on the I/O module to remove from the base.

Warning: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in a hazardous location. Be sure that power is removed or the area is non-hazardous before proceeding.

- 4. Remove the module to the right of the base you are removing (The interlocking portion of the base sits under the adjacent module.).
- 5. Use a small blade screwdriver to rotate the orange DIN-rail locking screw on the mounting base to a vertical position. This releases the locking mechanism.
- 6. Lift the mounting base straight up and remove.

2.5 **Connecting Power**

Refer to the appropriate L1Y or Remote Adapter installation guides for adapter configuration instructions.

2.5.1 Module Terminations

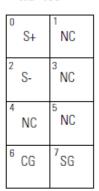
Module Terminations				
Terminal	RS-232	RS-485	RS-422	
0	Tx1	S+1	Tx+1	
1	Rx ²	NC	Rx+1	
2	NC	S-2	Tx-2	
3	NC	NC	Rx-2	
4	NC	NC	NC	
5	NC	NC	NC	
6	NC	CG	CG	
7	SG	SG	SC	

¹ S+ and Tx+ are transmit from the module

RS-232

0 Tx	Rx
NC NC	NC NC
4 NC	NC NC
6 NC	7SG

RS-485



RS-422

0 Tx+	1 Rx+
² Tx-	Rx-
4 NC	NC
⁶ CG	7SG

Rx, S-= Receive SG = Signal Ground

CG = Chassis Ground

Caution: Do not connect 120/240V AC power to this supply.

Warning: If you connect or disconnect wiring while the field-side power is on, an electrical arc can

occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

² S- and Rx- are receive into the module

3 Configuration

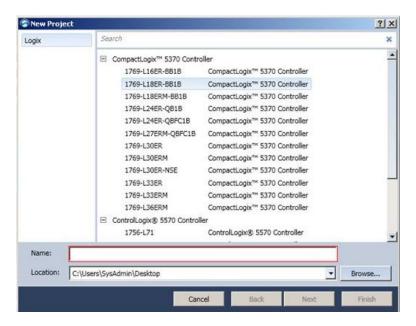
3.1 Studio 5000 Logix Designer Project

Note: If you are installing this module into a 1734-AENT, ADN, or ACNR, use RSLogix 5000 v16 or greater. The following example procedures are accomplished using Rockwell Automation's Studio 5000 Designer, but apply to RSLogix as well.

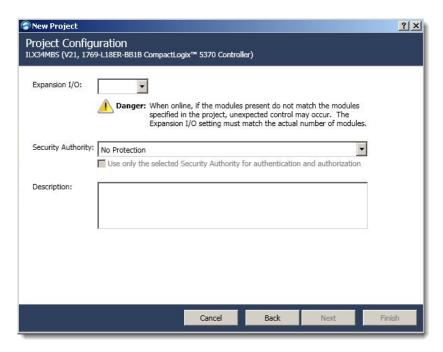
- 1. Open Studio 5000 and click Create New Project.
- 2. Expand **CompactLogix 5370 Controller**. Select the appropriate processor from the list:
 - 1769-L16ER-BB1B
 - 1769-L18ER-BB1B
 - 1769-L18ERM-BB1B

Note: If you are using a Point I/O adapter, you must configure the module using RSLogix 5000 version 16 or greater. That procedure is described later in this section.

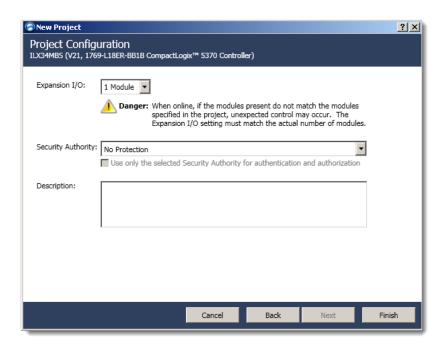
3. Select the appropriate PLC and type in a **Name** for the *Project*.



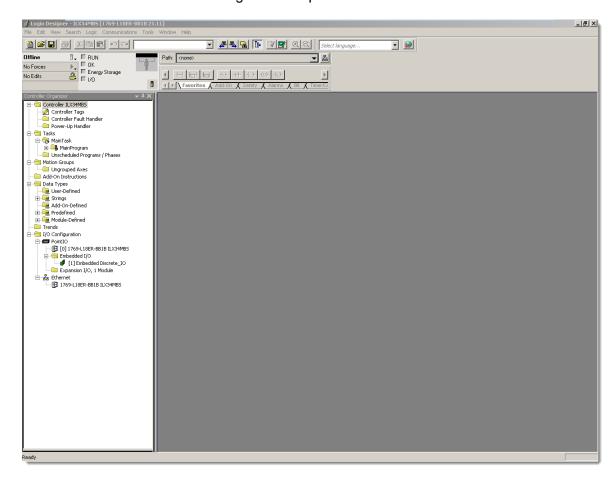
4. Click **Next**. The *Project Configuration* dialog opens.



 Select the Expansion I/O module number. If the modules present do not match the modules specified in the Project, unexpected control may occur. The Expansion I/O setting must match the actual number of modules.

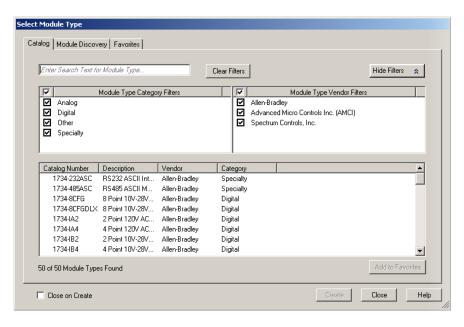


6. Click **Finish**. The following window opens:

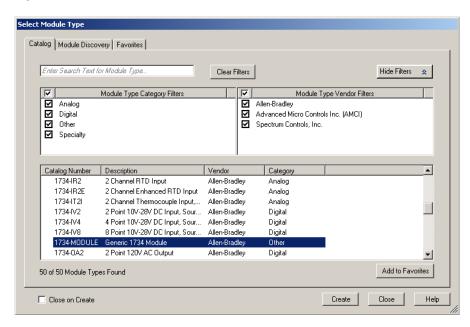


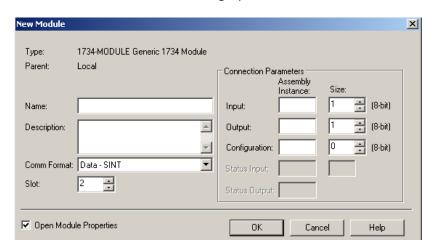
3.1.1 Create Module I/O Configuration

1. In the *I/O Configuration* folder, right-click on **Expansion I/O** and select **New Module**. The *Select Module Type* dialog opens.



Locate 1734-MODULE (Generic 1734 Module) by scrolling the list or using the Search filter.



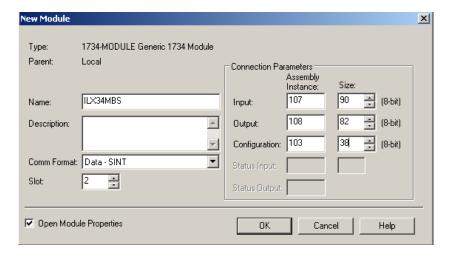


3. Click Create. The New Module dialog opens.

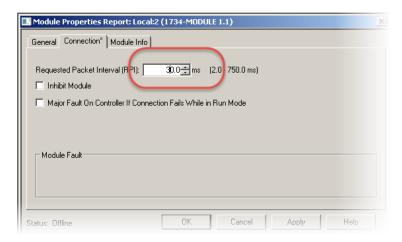
- 4. Enter a **Name** for the module.
- 5. Enter Connection Parameters. The Connection Parameters section is dependent on the application that you are using. There are three different sizes allowed by the module.

Register/Discrete Max Size per Modbus Message	Input Assy Instance	Input Size	Output Assy Instance	Output Size	Configuration Assy Instance	Configuration Size
8/128	101	34	102	26	103	38
24/384	105	66	106	58	103	38
36/576	107	90	108	82	103	38

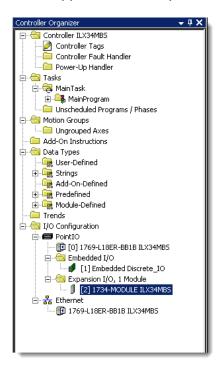
6. Ensure that the **Comm Format** is set to **Data-SINT** and that the **Slot** field matches the slot number that the module will reside in.



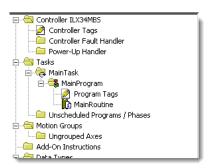
- 7. Click **OK**. The *Module Properties Report* dialog opens.
- 8. Set the RPI time to a value larger than 30ms.



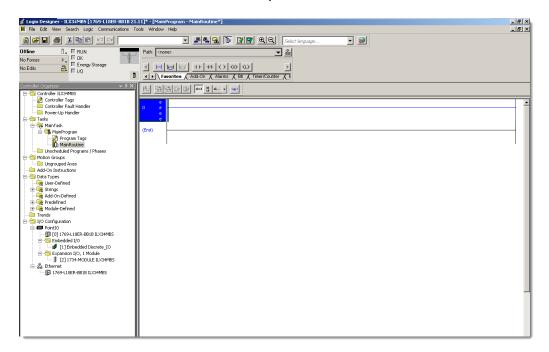
- 9. Click Apply.
- 10. Click **OK**. The module now appears under *Expansion Module* in the tree.

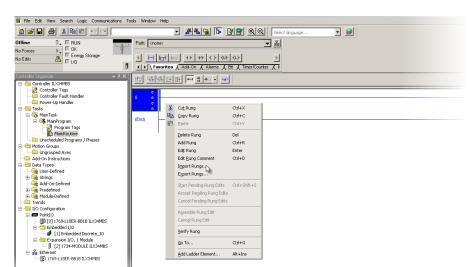


11. Under Tasks, expand Main Task > Main Program.



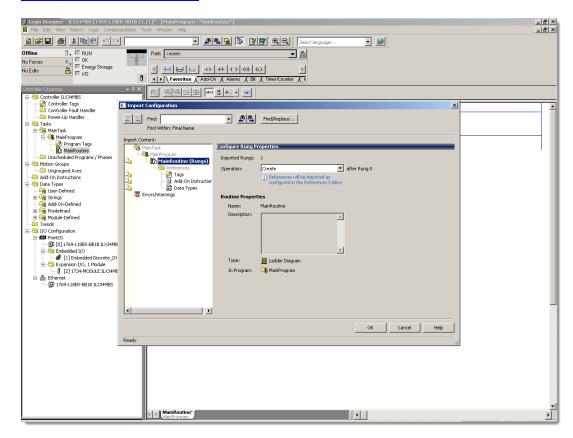
12. Double-click on the Main Routine to open it.



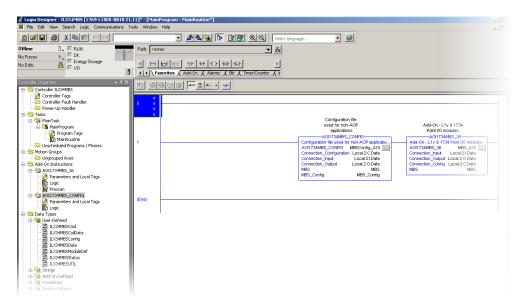


13. Right-click anywhere in the ladder and select Import Rungs...

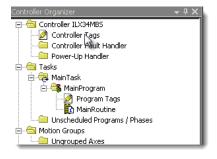
14. Navigate to the location of the Add-On rung and click **Import**. The *Import Configuration* page opens. You can obtain the Add-On rung from http://psft.com/ilx34-mbs/dll.

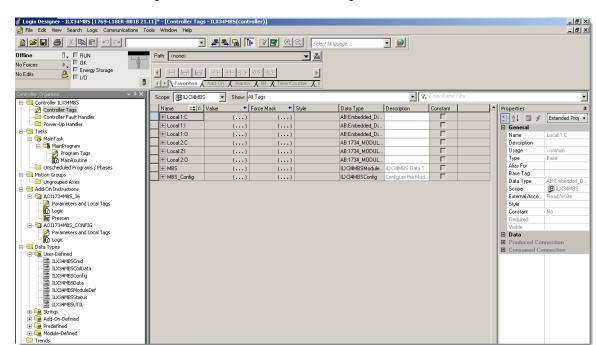


15. Click **OK**. The Add-On rung appears in the Main Routine.



16. Double-click **Controller Tags** from the *Controller Organizer*.

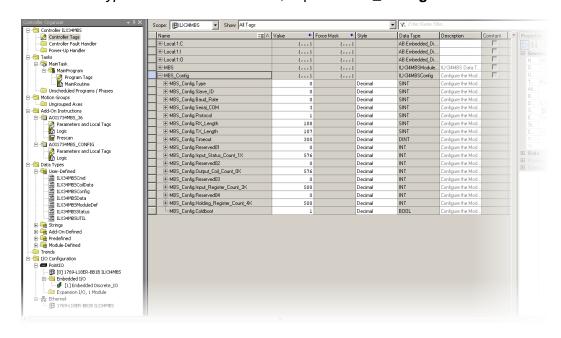




17. The Controller Tags are now available for editing.

3.1.2 Configure Controller Tags

1. In the Data Types > User Defined folder, expand MBS_Config UDT.



Serial Port

Set the following parameters to configure the Serial Port.

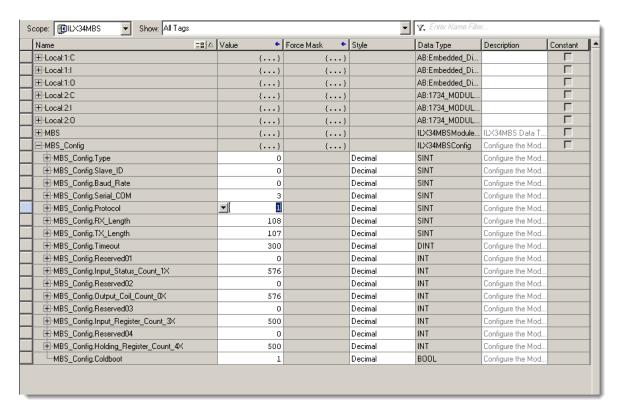
Controller Tag	Description
MBS_Config.Baud Rate	0=19200
	2=2400
	3=4800
	4=9600
	5=38400
MBS_Config.Serial Comm	0=7N2
	1=7E1
	2=8N1
	5=8E1
	6=801
MBS_Config.Protocol	0=ASCII
	1=RTU

Master Configuration

The following parameters must be set to use the module as a Master.

Controller Tag	Description
MBS_Config.Type	Set this to "0" for Master
MBS_Config.Timeout	Timeout in centiseconds. The time that
	the master waits for a response from
	the Slave.

The following example shows the module configured as a *Master, 19200 baud, 8N1 (8 Data bits, No Parity, and 1 Stop Bit) Framing, RTU mode with a three second timeout.*



Slave Configuration

Controller Tag	Description
MBS_Config.Type	Set this to "1" for Slave.
MBS_Config.Slave ID	1-255. Set this to the desired Slave ID
	that the Master is attempting to access.

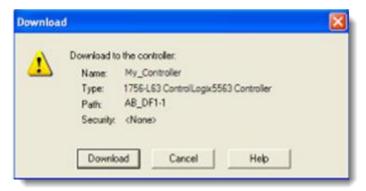
The Count parameters determine that maximum address that the Master can access for the ILX34-MBS. The default values represent the max addresses allowed for the provided Add-On instruction. Valid ranges are: 00001 – 00576, 10001 – 10576, 30001 – 30501 and 40001 – 40501...

MBS.Config.Coldboot - If parameters change after initial configuration, use the Coldboot bit to initiate the changes.

3.2 Downloading the Sample Program to the Processor

Warning: The key switch on the front of the ControlLogix processor must be in the REM or Prog position.

- 1. If you are not already online with the processor, open the *Communications* menu, and choose **Download**. You do not have to download through the processor's serial port. You may download through any network connection.
- When communication is established, Studio 5000 (or RSLogix 5000) opens a configuration dialog box. Click the **Download** button to transfer the sample program to the processor.



- 3. Studio 5000 (or RSLogix 5000) compiles the program and transfers it to the processor. This process may take a few minutes.
- 4. When the download completes, the configuration program opens another Confirmation dialog box. If the key switch is in the REM position, click **OK** to switch the processor from PROGRAM mode to RUN mode.



Warning: If you receive an error message during these steps, refer to the Rockwell Automation documentation to interpret and correct the error.

3.3 Master Command Structure

⊟-MBS.MASTERCMD[0]	{}
⊞-MBS.MASTERCMD[0].Enable	0
⊞-MBS.MASTERCMD[0].Node	0
⊞-MBS.MASTERCMD[0].Function	0
	0
⊞-MBS.MASTERCMD[0].Count	0
	0
⊞-MBS.MASTERCMD[0].PollInterval	0
⊞-MBS.MASTERCMD[0].Swap	0
MBS.MASTERCMD[0].Trigger	0

Controller Tag	Description
MBS.MASTERCMD[x].Enable	0=Disable
	1=Enable the Command: Polling and
	Trigger allowed.
	2=Enable the Command: Only Trigger
MDC MACTEDOMDE AND do	allowed.
MBS.MASTERCMD[x].Node	Node address of the target device on
MDC MACTEDOMDIAL Function	the network (1-255).
MBS.MASTERCMD[x].Function	Function code for the command. 1, 2,
	3, 4, 5, 6, 15 and 16 allowed for Master and Slave. 8 allowed for Slave only.
MBS.MASTERCMD[x].DeviceAddress	Address in remote device associated
IVIDO.IVIAO I EITOIVID[X].DEVICEAUGIESS	with the command (0-65535).
MBS.MASTERCMD[x].Count	Number of points associated with the
WIDO.WING TERROWD[X].COURT	command.
MBS.MASTERCMD[x].InternalAddress	PLC Tag Internal address associated
	with the command.
MBS.MASTERCMD[x].PollInterval	Minimum number of milliseconds
	between issuance of command (0-2,
	147, 483, 647ms).
MBS.MASTERCMD[x].Swap	0=None. No change is made in byte
	ordering.
	1=Words – The words are swapped.
	2=Words & Bytes – The words are
	swapped, and then the bytes in each
	word are swapped.
	3=Bytes – The bytes in each word are
	swapped.
	The words should be swapped only when using an even number of words.
MBS.MASTERCMD[x].Trigger	1=Trigger the message. Can be
INDO.INIAOTEROIND[x]. HIggel	triggered anytime the command is
	enabled.
	J

3.4 Data Handling

⊟-MBS.DATA	{}	{}		ILX34MBSData
⊞-MBS.DATA.InputBit	{}	{}	Decimal	BOOL[576]
⊞-MBS.DATA.InputRegister	{}	{}	Decimal	INT[500]
⊞-MBS.DATA.OutputBit	{}	{}	Decimal	BOOL[576]
±-MBS.DATA.OutputRegister	{}	{}	Decimal	INT[500]

These are the PLC data tags that are use for the Master and Slave. For the Master, the following tags represent the internal addresses used by the Master commands. For the Slave, the following tags represent the addresses accessed by a remote Master.

Controller Tag	Description
MBS.DATA.InputBit	Incoming discreet data for address ranges 0x and 1x from other devices.
	Functions 5 and 15 when device is
	configured as a Slave. Functions and 1 and 2 when configured as a Master.
MBS.DATA.InputRegister	Incoming register data for address ranges 3x and 4x from other devices. Functions 6 and 16 when device is configured as a Slave. Functions and 3
MBS.DATA.OutputBit	and 4 when configured as a Master. Outgoing discreet data for address
WBO.BATA.OutputBit	ranges 0x and 1x from other devices.
	Functions 1 and 2 when device is
	configured as a Slave. Functions and 5
	and 15 when configured as a Master.
MBS.DATA.OutputRegister	Outgoing register data for address
	ranges 3x and 4x from other devices.
	Functions 3 and 4 when device is
	configured as a Slave. Functions and 6
	and 16 when configured as a Master.

3.5 Module Status

⊟-MBS.STATUS	{}
⊞-MBS.STATUS.Module	0
⊞-MBS.STATUS.RXCnt	0
⊞-MBS.STATUS.TXCnt	0
⊞-MBS.STATUS.ErrorCnt	0
— MBS.STATUS.CmdError	{}
⊞-MBS.STATUS.CmdError[0]	0
⊞-MBS.STATUS.CmdError[1]	0
⊞-MBS.STATUS.CmdError[2]	0
⊞-MBS.STATUS.CmdError[3]	0
→ MBS.STATUS.CmdError[4]	0
⊞-MBS.STATUS.CmdError[5]	0
⊞-MBS.STATUS.CmdError[6]	0
⊞-MBS.STATUS.CmdError[7]	0
→ MBS.STATUS.CmdError[8]	0
→ MBS.STATUS.CmdError[9]	0
→ MBS.STATUS.CmdError[10]	0
⊕-MBS.STATUS.CmdError[11]	0

Controller Tag	Description
MBS.STATUS.Module	Module Status
	1=Ready for Command
	2=Processing Command
	3=Waiting for Response
	4=Processing Response
MBS.STATUS.RXCnt	Number of messages received
MBS.STATUS.TXCnt	Number of messages transmitted
MBS.STATUS.ErrorCnt	Number of errors
MBS.STATUS.CmdError [x]	The error represented for
	MBS.MASTERCMD[x].
	1= Invalid Function
	2=Invalid Address
	3=Invalid Data
	20=Checksum Error
	21=Modbus Invalid Message
	22=Modbus Timeout
	26=Float Word Swap Uneven Word
	Count
	209=Parity Error

4 General Features & Specifications

- Add-On instruction creates UDTs, providing logical definitions for I/O, status, and control data
- Diagnostic data available in RSLogix 5000/Studio 5000 controller tags, allowing decisions to be made based upon node health
- Module configuration is backed up in the CompactLogix project (ACD file)
- Serial port enable/disabled through ladder logic
- Supports up to 1000 words of data
- Supports up to 30 Modbus commands and up to 36 words per command
- The Serial Port can be configured as a Modbus Master or Modbus Slave device
- Suitable for SCADA and field device interface applications

4.1 General Specifications – Modbus Master/Slave

Specification	Description
Configuration Environment	RSLogix 5000/Studio 5000
Communication parameters	Baud Rate: 110 to 38.4K baud
	Stop Bits: 1 or 2
	Data Size: 7 or 8 bits
	Parity: None, Even, Odd
Modbus Modes	RTU mode (binary) with CRC-16
	ASCII mode with LRC error checking
Node Address	1 to 247
Modbus Function Codes Supported	1: Read Coil Status
	2: Read Input Status
	3: Read Holding Registers
	4: Read Input Registers
	5: Force (Write) Single Coil
	6: Preset (Write) Single Holding Register
	8: Diagnostics (Slave Only, Responds to Sub function 00)
	15: Force(Write) Multiple Coils
	16: Preset (Write) Multiple Holding Registers

4.2 Hardware Specifications

Specification	Description
Pointbus current	75mA @ 5V DC
Number of Inputs	1 Full duplex
Module Location	1734-TB or -TBS wiring base assembly (not included)
LED Indicators	1 green/red module status indicator
	1 green/red network status indicator
	2 greed TXD, RXD status indicators
Operating Temperature	-4°F to +131°F (-20°C to +55°C)
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Relative Humidity	5% to 95% RH with no condensation
Dimensions	2.21 x 0.47 x 2.97 in
$(H \times W \times D)$	56 x 12 x 75.5 mm
Shock	30g Peak Acceleration (Operational)
	50g Peak acceleration (Non-operational)
Vibration	Tested 5g @ 10-500Hz
ESD immunity	6kV contact discharges
	8kV air discharges

4.3 Agency Approvals

Agency	Applicable Standard(s)
UL/cUL	Class 1, Div. 2 Groups A, B, C, D
ATEX	Category 3, Zone 2
CE Mark	
CB Safety	

5 Support, Service & Warranty

Contacting Technical Support

ProSoft Technology, Inc. (ProSoft) is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

- Product Version Number
- System architecture
- Network details

If the issue is hardware related, we will also need information regarding:

- Module configuration and associated ladder files, if any
- Module operation and any unusual behavior
- Configuration/Debug status information
- LED patterns
- Details about the serial, Ethernet or fieldbus devices interfaced to the module, if any.

Note: For technical support calls within the United States, an after-hours answering system allows 24-hour/7-days-a-week pager access to one of our qualified Technical and/or Application Support Engineers. Detailed contact information for all our worldwide locations is available on the following page.

Internet	Web Site: www.prosoft-technology.com/support
	E-mail address: support@prosoft-technology.com
Asia Pacific	Tel: +603.7724.2080, E-mail: asiapc@prosoft-technology.com
(location in Malaysia)	Languages spoken include: Chinese, English
Asia Pacific	Tel: +86.21.5187.7337 x888, E-mail: asiapc@prosoft-technology.com
(location in China)	Languages spoken include: Chinese, English
Europe	Tel: +33 (0) 5.34.36.87.20,
(location in Toulouse,	E-mail: support.EMEA@prosoft-technology.com
France)	Languages spoken include: French, English
Europe	Tel: +971-4-214-6911,
(location in Dubai, UAE)	E-mail: mea@prosoft-technology.com
	Languages spoken include: English, Hindi
North America	Tel: +1.661.716.5100,
(location in California)	E-mail: support@prosoft-technology.com
	Languages spoken include: English, Spanish
Latin America	Tel: +1-281-2989109,
(Oficina Regional)	E-Mail: latinam@prosoft-technology.com
	Languages spoken include: Spanish, English
Latin America	Tel: +52-222-3-99-6565,
(location in Puebla, Mexico)	E-mail: soporte@prosoft-technology.com
	Languages spoken include: Spanish
Brasil	Tel: +55-11-5083-3776,
(location in Sao Paulo)	E-mail: brasil@prosoft-technology.com
	Languages spoken include: Portuguese, English

5.1 Warranty Information

For complete details regarding ProSoft Technology's TERMS & CONDITIONS OF SALE, WARRANTY, SUPPORT, SERVICE AND RETURN MATERIAL AUTHORIZATION INSTRUCTIONS please see the documents on the Product DVD or go to www.prosoft-technology/warranty

Documentation is subject to change without notice.