InTouch® Compact Edition MITSU Configuration Guide

Invensys Systems, Inc.

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Welcome

This guide shows you how to configure the MITSU driver for InTouch Compact Edition.

This guide assumes you know how to use Microsoft Windows, including navigating menus, moving between applications and moving objects on the screen. If you need help with these tasks, see the Microsoft online help.

You can view this document online or you can print it, in part or entirely, by using the print feature in Adobe Acrobat Reader.

Documentation Conventions

This documentation uses the following conventions:

Convention	Used for
Initial Capitals	Paths and file names.
Bold	Menus, commands, dialog box names, and dialog box options.
`Monospace`	Code samples and display text.

Technical Support

Wonderware Technical Support offers a variety of support options to answer any questions on Wonderware products and their implementation.

Before you contact Technical Support, refer to the relevant section(s) in this documentation for a possible solution to the problem. If you need to contact Technical Support for help, have the following information ready:

- The type and version of the operating system you are using.
- Details of how to recreate the problem.
- The exact wording of the error messages you saw.
- Any relevant output listing from the Log Viewer or any other diagnostic applications.
- Details of what you did to try to solve the problem(s) and your results.
- If known, the Wonderware Technical Support case number assigned to your problem, if this is an ongoing problem.

Chapter 1

About the MITSU Driver

This section explains the concepts of the MITSU driver and identifies all hardware and software components required to implement communication between InTouch Compact Edition and compatible PLCs.

About MITSU Driver

You can use the MITSU PLC driver to establish communications between an InTouch Compact Edition application and a MITSU PLC.

Device Specifications

To establish communication with the MITSU driver, your target PLC must meet the following specifications:

- Manufacturer: Mitsubishi
- Compatible equipment: FX Series programmable controller with Monitor Interface FX-232AW
- Mitsubishi PLC programmer software: Melsec Medoc

Network Specifications

To communicate with the target device, the network must meet the following specifications:

- Physical protocol: RS232/422 serial or Ethernet TCP/IP
- Logic protocol: Host Protocol
- Specific interface: FX-232AW interface
- Cable wiring: Mitsubishi RS20P-CADP/RS422AW

Chapter 2

Configuring the MITSU Driver

This section explains how to configure the MITSU Driver by completing the following tasks:

- Select the PLC driver
- Configure the connection type
- Configure other PLC-specific settings
- Configure advanced settings
- Associate an InTouch Access Name with the configured driver

You configure the MITSU driver from the **Driver Configuration** dialog box. In a managed InTouch Compact Edition application, you access this dialog box from the WindowMaker **Special**, **InTouch compact Application**, **IO Driver Configuration** menu.

For more information about configuring connection settings, see the documentation of your PLC hardware manufacturer.

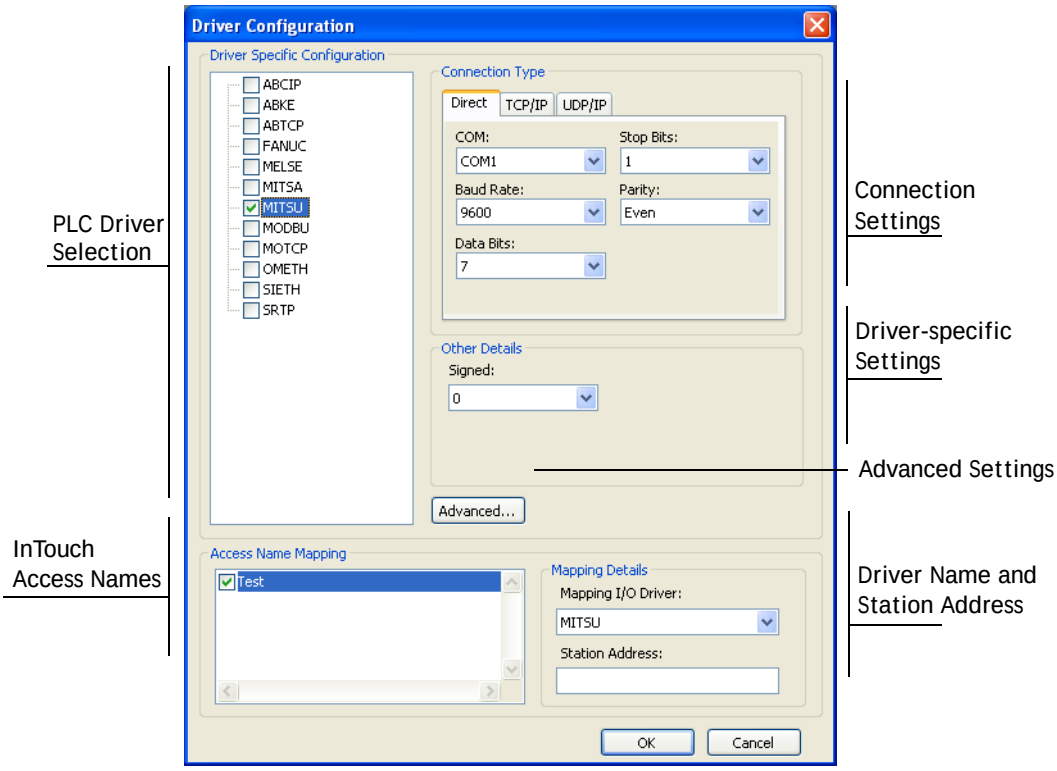
Note For each driver, you can configure only one set of parameters.

Selecting the PLC Driver

Before you configure the PLC driver, you need to select it in the **Driver Configuration** dialog box. You can select more than one PLC driver to configure. All selected PLC drivers can be associated with InTouch Access Names.

To select the PLC driver

1. In WindowMaker click Special on the menu bar, point to **InTouch Compact Application,** and then click **IO Driver Configuration**. The **Driver Configuration** dialog box appears.



2. From the list in the left pane, select the check box next to the PLC driver you want to configure.

   The selected PLC driver appears in the **Mapping I/O Driver** list in the **Mapping Details** area of the **Driver Configuration** dialog box. You can associate it with an InTouch Access Name. For more information, refer to Associating a PLC Driver with an Access Name on page 23.

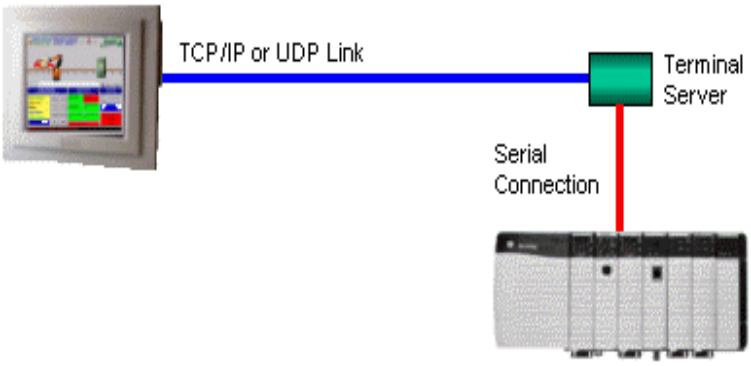
You can now configure the connection settings, advanced settings, and other PLC-specific settings on the right pane.

Configuring the Connection Type

You need to configure the connection type that the Wonderware Compact Panel uses to communicate with a PLC.

The serial driver allows the use of TCP/IP or UDP/IP encapsulation. The encapsulation mode provides communication with serial devices connected to terminal servers on Ethernet or wireless networks. A terminal server (for example, ADAM 4577) converts TCP/IP or UDP/IP messages on Ethernet or wireless networks to serial data. After the message is converted to a serial form, you can connect standard devices that support serial communications to the terminal server.

The following diagram provides an example of this solution.



Note See the manufacturer documentation to configure gateway for TCP/IP and UDP/IP mode.

You can configure one of the following connection types:

- Direct serial
- TCP/IP
- UDP/IP

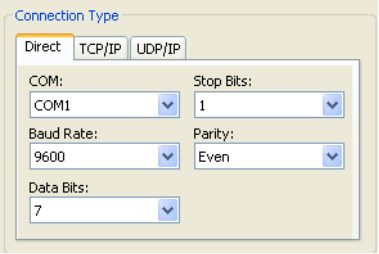
Configuring a Serial Connection

If the panel is directly connected to the PLC, you configure a serial connection. You can configure the following settings:

- COM port
- Stop bits
- Baud rate
- Parity
- Data bits

To configure a serial connection

1. In the **Driver Configuration** dialog box, select the driver you want to configure.
2. In the **Connection Type** area, click the **Direct** tab.



3. Assign values to the following settings:
   - In the **COM** list, select the serial communication port.
   - In the **Stop Bits** list, select the number of stop bits.
   - In the **Baud Rate** list, select the communication speed.
   - In the **Parity** list, select the parity.
   - In the **Data Bits** list, select the number of bits per character or code word.

Configuring a TCP/IP Connection

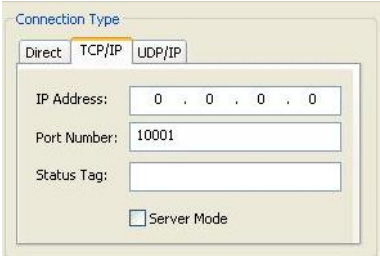
If the panel uses a TCP/IP connection to communicate with the PLC, you need to configure TCP/IP settings. You can configure the following settings:

- IP address
- Port number
- Status tag
- Server mode

Note When **Server mode** is enabled, the MITSU driver listens to the TCP/IP port specified instead of trying to establish a connection (the driver is a TCP/IP server). The remote PLC/Device is responsible for connecting to the Wonderware Compact Panel. After the TCP/IP connection has been made, all data is sent through it. When **Server mode** is enabled, the IP Address field is not used because the driver does not try to connect with the PLC.

To configure a TCP/IP connection

1. In the **Driver Configuration** dialog box, select the driver you want to configure.
2. In the **Connection Type** area, click the **TCP/IP** tab.



3. Configure the following settings:
   - In the **IP Address** box, type the IP address of the terminal server that supports serial connection.
   - In the **Port Number** box, type the port number assigned to the terminal server that supports serial connection.
   - In the **Status Tag** box, type the name of an InTouch discrete tag. The tag value is set to True if the TCP/IP connection is established, otherwise False.
   - Select **Server Mode**, if the remote PLC is responsible for connecting to the Wonderware Compact Panel.

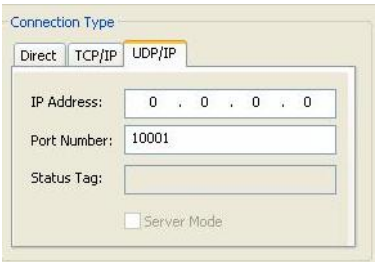
Configuring a UDP/IP Connection

If the Wonderware Compact Panel uses a UDP/IP connection to communicate with the PLC, you need to configure UDP/IP settings. You can configure the following settings:

- IP address
- Port number

To configure a UDP/IP connection

1. In the **Driver Configuration** dialog box, select the driver you want to configure.
2. In the **Connection Type** area, click the **UDP/IP** tab.



3 Configure the following settings:
   - In the **IP Address** box, type the IP address of the terminal server that supports serial connection.
   - In the **Port Number** box, type the port number assigned to the terminal server that supports serial connection.

Configuring PLC-specific Settings

This section shows how to configure settings that are specific to the MITSU Driver. You configure these settings in the **Other Details** area in the **Driver Configuration** dialog box.

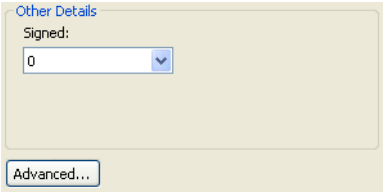
The following table lists the settings specific to the MITSU Driver:

Setting	Purpose
Signed	Formats addresses as either Signed (1) or Unsigned (0).

Note For more information about configuring MITSU Driver-specific settings, see the documentation of your PLC hardware manufacturer.

To configure the MITSU-specific settings

1 In the **Driver Configuration** dialog box, select the driver you want to configure.



2 In the **Other Details** area, set **Signed** to either 0 to 1.

3 Click **OK.**

Configuring Advanced Settings for Serial Connection

This section explains how to configure advanced settings for a MITSU driver using serial connection. You can configure the following parameters for a MITSU driver:

- Time-out settings
- Protocol settings
- Hand Shake settings
- Buffer Length settings
- Enabling IR or Disabling DTR

Depending on the PLC driver you select, one or more of these settings might be disabled

Note For more information about configuring advanced settings, see the documentation of your PLC hardware manufacturer.

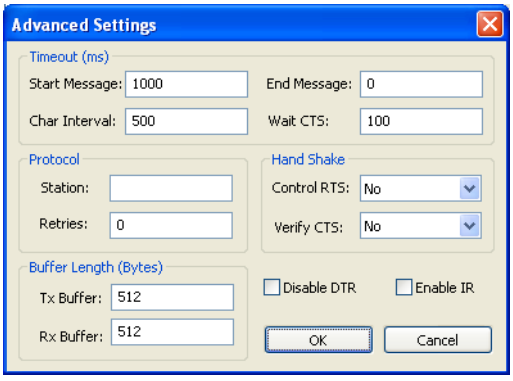
Configuring Time-out Settings

You can configure the following time-out settings:

- Start Message
- End Message
- Interval between characters
- Clear to Send wait

To configure time-out settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced**. The **Advanced Settings** dialog box appears.



3 In the **Timeout** area, assign values to the following settings:
   - **Start Message** - Time-out period in milliseconds for the message to start.
   - **End Message** - Time-out period in milliseconds for the message to end.
   - **Char Interval** - Time-out period in milliseconds between each character.
   - **Wait CTS** - Time-out period in milliseconds for the Clear to Send wait.

4 Click **OK**.

Configuring Protocol Settings

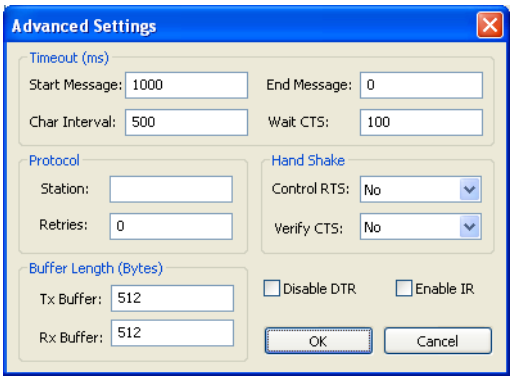
You can configure the following protocol settings:

- Station slave address
- Number of retries

To configure Protocol settings

1 In the **Driver Specifc Configuration** dialog box, select the driver you want to configure.

2 Click **Advanced**. The **Advanced Settings** dialog box appears.



3 In the **Protocol** area, assign values to the following settings:
   - **Station** - Specify the slave network address.
   - **Retries** - Specify how many times the driver attempts to execute the same communication command before reporting a communication error.

4 Click **OK**.

Configuring Handshake Settings

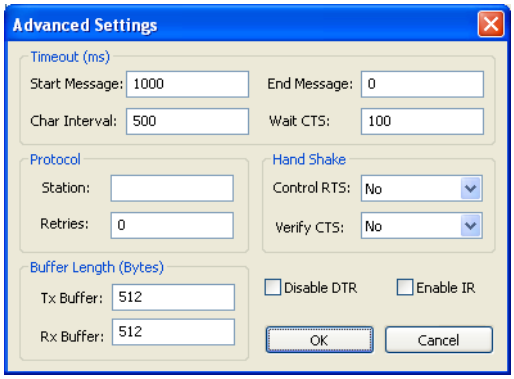
You can configure the following Hand Shake settings:

- Request to Send control
- Clear to Send verification

Hand Shake settings determine how the PLC driver communicates with the PLC over a communication channel after the physical establishment of the channel and before the normal information transfer.

To configure Hand Shake settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced**. The **Advanced Settings** dialog box appears.



3. In the **Hand Shake** area, assign values to the following settings:
   - **Control RTS** - Specify whether to use the Request to Send control.The following options are available:

     No: Do not set the RTS (Request to Send) Hand Shake signal. Important: If you are using Windows 95/98 or Windows CE with the correct RS232/RS485 adapter (i.e. without RTS control), then you must select this option.

     Yes: Set the RTS (Request to Send) Hand Shake signal before communication. Important: If you are using Windows NT and the Cutler-Hammer RS232/RS485 adapter, then you must select this option.

     Yes+echo: Set the RTS (Request to Send) Hand Shake signal before communication, and echo the signal received from the target device.

     The default value is No.

- **Verify CTS** - Specify whether to use the Clear to Send type of verification.

  The default value is No.

4 Click **OK**.

Configuring Buffer Length Settings

You can configure the following Buffer Length settings:

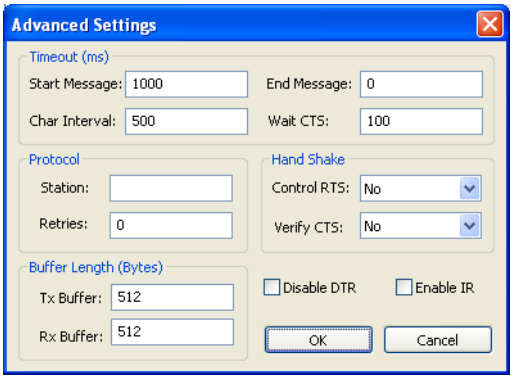
- Transmission Buffer (Tx) Length
- Reception Buffer (Rx) Length

The Buffer Length settings determine the number of bytes allocated from memory as a temporary buffer. The driver stores data in the temporary buffer while communicating with the PLC.

To configure Buffer Length settings

1 In the **Driver Specific Configuration** dialog box, select the driver you want to configure.

2 Click **Advanced**. The **Advanced Settings** dialog box appears.



3 In the **Buffer Length (Bytes)** area, assign values to the following settings:

- **Tx Buffer** - Transmission buffer size in bytes.
- **Rx Buffer** - Reception buffer size in bytes.

4 Click **OK**.

Disabling and Enabling DTR and IR Settings

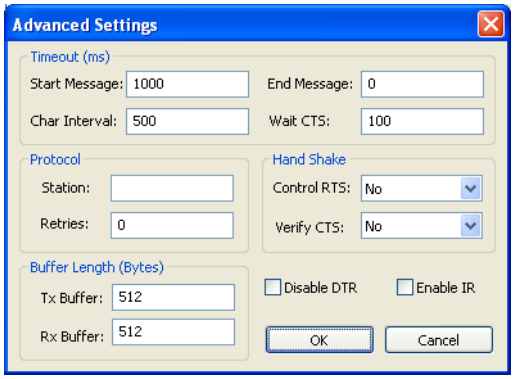
You can enable or disable the DTR and IR settings.

Setting DTR (Data Terminal Ready) means that the panel sends an additional signal to the PLC to indicate that the panel is ready to receive data.

Setting IR means that an infrared interface is used instead of a standard serial port to communicate with the device.

To enable or disable DTR and IR Settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced**. The **Advanced Settings** dialog box appears.



3. Assign values to the following settings:
   - Select or clear the **Disable DTR** check box.
   - Select or clear the **Enable IR** check box.
4. Click **OK**.

Configuring Advanced Settings for TCP/IP or UPDP/IP Connection

This section shows you how to configure advanced settings for a MITSU driver using TCP/IP or a UDP/IP connection. You can configure the following:

- Time-out settings
- Protocol settings
- Buffer Length settings

Depending on the PLC driver you select, one or more of these settings might be disabled

Note For more information about configuring advanced settings, see the documentation of your PLC hardware manufacturer.

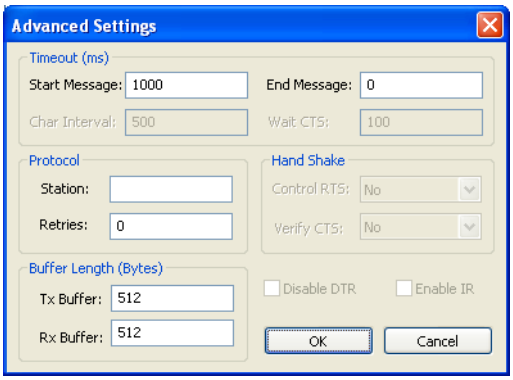
Configuring Time-out Settings

You can configure the following time-out settings:

- Start Message
- End Message

To configure time-out settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced**. The **Advanced Settings** dialog box appears.



3. In the **Timeout** area, assign values to the following settings:
   - **Start Message** - Time-out period in milliseconds for the message to start.
   - **End Message** - Time-out period in milliseconds for the message to end.
4. Click **OK**.

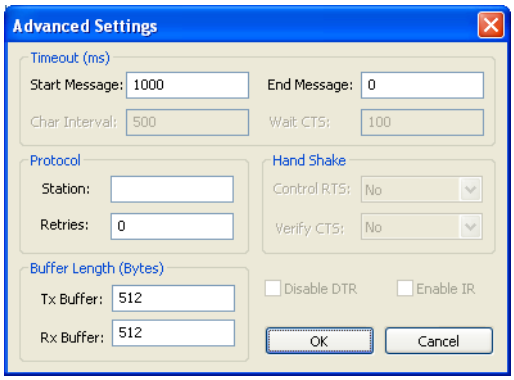
Configuring Protocol Settings

You can configure the following protocol settings:

- Station slave address
- Number of retries

To configure Protocol settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced.** The **Advanced Settings** dialog box appears.



3. In the **Protocol** area, assign values to the following settings:
   - **Station** - Specify the slave network address.
   - **Retries** - Specify how many times the driver attempts to execute the same communication command before reporting a communication error.
4. Click **OK**.

Configuring Buffer Length Settings

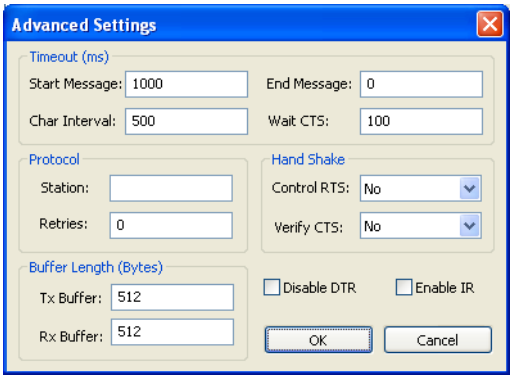
You can configure the following Buffer Length settings:

- Transmission Buffer (Tx) Length
- Reception Buffer (Rx) Length

The Buffer Length settings determine the number of bytes allocated from memory as a temporary buffer. The driver stores data in the temporary buffer while communicating with the PLC.

To configure Buffer Length settings

1. In the **Driver Specific Configuration** dialog box, select the driver you want to configure.
2. Click **Advanced**. The **Advanced Settings** dialog box appears.



3. In the **Buffer Length (Bytes)** area, assign values to the following settings:
   - **Tx Buffer** - Transmission buffer size in bytes.
   - **Rx Buffer** - Reception buffer size in bytes.
4. Click **OK**.

Associating a PLC Driver with an Access Name

After configuring the PLC driver, you need to associate it with an existing InTouch Access Name. For more information about creating an InTouch Access Name, see the *InTouch HMI Data Management Guide*.

When you associate an PLC driver with an Access Name, you need to also specify a Station Address. The Station Address is used by the MITSU driver to specify slave network addresses of PLCs.

Specify the station address using the following syntax:

<PLC Model>:<ID>

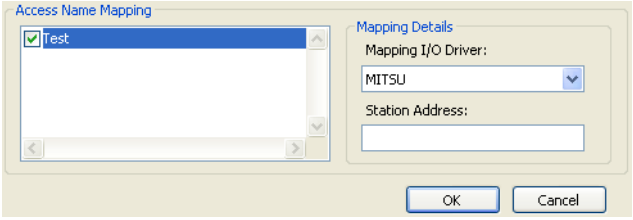
Where:

The PLC Model can be FX, FX0, FX0N, FX0S, FX1N, FX1S, FX2N and FX2NC.

If PLC is not specified, the IO Server assumes the FX model.

To associate a PLC driver with an Access Name

1. Open the **Driver Configuration** dialog box.
2. In the **Access Name Mapping** area, locate the InTouch Access Name you want to associate with the PLC driver.



Note If no Access Names appear in the list, you need to define an Access Name in WindowMaker first.

3. Select the Access Name you want to associate.
4. In the **Mapping I/O Driver** list, select the configured driver.
5. In the **Station Address** box, type the station address.

   When you move the mouse pointer over the Station Address box, a tooltip shows the required syntax for a station address.
6. Click **OK**.

Chapter 3

Troubleshooting the MITSU Driver

You can detect communication errors between an InTouch Compact Edition application and the PLC by using the following item names:

Item name	Purpose
SysReadStatus	Receives error code for a failed read operation from the PLC
SysWriteStatus	Receives error code for a failed write operation to the PLC
SysReadCompleted	Indicates if the read operation from the PLC completes (TRUE) or not (FALSE)
SysWriteCompleted	Indicates if the write operation to the PLC completes (TRUE) or not (FALSE)

Note You can associate only one InTouch tag with each item name.

To troubleshoot communication problems

1. In WindowMaker, configure a set of I/O tags to associate with the error item names:
   - An I/O discrete tag to point at the item name SysReadCompleted.
   - An I/O discrete tag to point at the item name SysWriteCompleted.
   - An I/O integer tag to point at the item name SysReadStatus.

- An I/O integer tag to point at the item name SysWriteStatus.

2. Configure animation display links for the I/O tags, such as:
   - Fill color animations for the I/O tags associated with the SysReadCompleted and SysWriteCompleted items.
   - Analog value display links for the I/O tags associated with the SysReadStatus and SysWriteStatus items.
3. At run time, if a read or write error occurs between the InTouch Compact Edition and the PLC, the fill color animation indicates a problem. The value next to the fill color animation shows the error code.

Find the MITSU error codes in the following table. The table also includes typical problems associated with an error code and possible solutions.

Error Code	Description	Possible Causes	Procedure to Solve
0	OK	Communication without problems	None
1	Invalid or unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
2	Invalid or unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
3	Invalid number of bits	The number of bits specified is invalid	Specify the correct number of bits
4	Invalid number of stop bits	The number of stop specified is invalid	Specify the correct number of stop
5	Invalid parity	The parity number specified is invalid	Specify the correct parity number
6	Invalid irq	Internal error	Contact Technical Support for more information on this item
7	Serial port already in use	Some other program is using the selected serial port	Choose another serial port or close the program using the current one

Error Code	Description	Possible Causes	Procedure to Solve
8	Invalid buffer size	Buffer received has an invalid size	Check if the equipment that you are communicating with supports the same protocol as the I/O Server
9	Out of memory	There is not enough memory for the I/O Server	Check the amount of RAM memory available for your system
10	Tx buffer empty	Internal error	Contact Technical Support for more information on this item
11	Tx buffer full	Internal error	Contact Technical Support for more information on this item
12	Rx buffer empty	Internal error	Contact Technical Support for more information on this item
13	Rx buffer full	Internal error	Contact Technical Support for more information on this item
14	Time out waiting CTS	CTS signal was not received, could not send request	Check the cable and also if the communication line is busy
15	Time out waiting to start a message	Response was not received from the device	Check the cable connection and also make sure that the I/O Server settings match the PLC configuration
16	Time out waiting for a message to finish	Started receiving a response but the communication was suspended	Check the cable connection and also make sure that the I/O Server settings match the PLC configuration
17	Time out between rx char	Response was not received from the device	Check the cable connection and also make sure that the I/O Server settings match the PLC configuration

Error Code	Description	Possible Causes	Procedure to Solve
18	Time out between tx char	Started receiving a response but the communication was suspended	Check the cable connection and also make sure that the I/O Server settings match the PLC configuration
19	No carrier detected	Started receiving a response but the communication was suspended	Check the cable connection and also make sure that the I/O Server settings match the PLC configuration
21	Block size error	Internal error	Contact Technical Support for more information on this item
31	Received NACK answer	Item not supported by the PLC model	Enter with a supported item name
32	Invalid CheckSum	I/O driver configuration specified does not match the PLC configuration or the PLC in use is not supported	Check the configuration. Check the I/O driver configuration Verify enabled command to the respective operand
33	Invalid driver configuration file	Internal error	Contact Technical Support and send your published application
34	Invalid/unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
35	Driver API not initialized	Internal error	Contact Technical Support and send your published application
36	Invalid/unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
37	Invalid/unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
38	Invalid station address	Station address specified for this driver is invalid	Check the I/O driver configuration and specify a valid station address

Error Code	Description	Possible Causes	Procedure to Solve
39	Invalid block size	Internal error when generating protocol block sizes	Contact your Technical Support and send your published application
-15	Time out start message	• Disconnected cables • PLC is turned off in stop or error mode • Wrong station number • Wrong RTS/CTS control settings	• Check the cable wiring • Check the PLC state – it must be RUN • Check the station number • Check the I/O driver configuration
-17	Time out between rx char	• PLC in stop mode or in error mode • Wrong station number • Wrong parity • Wrong RTS/CTS configuration settings	• Check the cable wiring • Check the PLC state – it must be RUN • Check the station number • Check the I/O driver configuration

Appendix

MITSU Driver Item References

This section lists all item names supported for the following Mitsubishi FX Serial models:

- Model FX
- Model FX0
- Model FX0N
- Model FX0S
- Model FX1N
- Model FX1S
- Model FX2N
- Model FX2NC

If an “OUT OF RANGE” item is used in the InTouch Compact Application then, the quality for that item is shown as 0 or BAD. It is also possible that the quality of one or more valid items goes to 0 or BAD due to an “OUT OF RANGE” item being used.

Make sure that the item name is within the PLC range. If a value assigned to an item name is out of range, it might write to other memory areas in the PLC.

Invalid values in items (with/without suffixes) can return unpredictable results. You should ensure that valid values are written for each data type. For example, 0 to 65535 is the valid value range for 'word' type of data.

Supported Data Types and Value Ranges

The following table lists all the data types supported by the MITSU driver.

Data Type	Minimum	Maximum
Short	-32768	32767
Word (16 bit string)	0	65535
Boolean	0	1
DWord (32-bit unsigned)	0	4294967000
Long	-2147483648	2147483647

MITSU Driver Item Reference for Model FX

The following table lists all item names supported for the model FX.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=000 to 377 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=000 to 377 (Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=0000 to 1535	Boolean		Read/write	Yes
Special internal. relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=000 to 999	Boolean		Read/write	Yes
Timer contacts	TSn	n=000 to 255	Boolean		Read-only	Yes
Counter contacts	CSn	n=000 to 255	Boolean		Read-only	Yes
Timer reset	TRn	n=000 to 255	Boolean		Read/write	Yes
Counter reset	CRn	n=000 to 255	Boolean		Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Timer value	Tn	n=000 to 255	Word	Short	Read/write	Yes
Counter value	Cn	n=00 to 255	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=200 to 255	DWord	Long	Read/write	Yes
Data registers	Dn	n=000 to 7999	Short	Long	Read/write	Yes
		n=000 to 7998		Long, DWord, float	Read/write	Yes
Data registers string access LoHi byte ordering	DSHd.l	d = 0000 to 7998 l = 2 to 64* *String length must be an even number.	String		Read/write	No
Data registers string access LoHi byte ordering	DSLd.l	d = 0000 to 7998 l = 2 to 64*	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX0

The following table lists all item names supported for the model FX0.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=000 to 017 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=000 to 015 (Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=0000 to 0511	Boolean		Read/Write	Yes
Special internal relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=00 to 63	Boolean		Read/write	Yes
Timer contacts	TSn	n=00 to 55	Boolean		Read-only	Yes
Counter contacts	CSn	n=000 to 015	Boolean		Read-only	Yes
		n=235 to 254				
Timer reset	TRn	n=00 to 55	Boolean		Read/write	Yes
Counter reset	CRn	n=00 to 15	Boolean		Read/write	Yes
		n=235 to 254				
Timer value	Tn	n=00 to 55	Word	Short	Read/write	Yes
Counter value	Cn	n=00 to 15	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=235 to 255	DWord	Long	Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers	Dn	n=00 to 31	Short	Word	Read/write	Yes
		n=00 to 30		Long, DWord, float	Read/write	Yes
Data registers string access LoHi byte Orderin g	DSHd.1	d = 00 to 30 l = 2 to 62* *String length must be an even number.	String		Read/write	No
Data registers string access LoHi byte ordering	DSLd.l	d = 00 to 30 l = 2 to 62* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8069	Short	Word	Read/write	Yes
		n=8000 to 8086		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX0N

The following table lists all item names supported for the model FX0N.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=000 to 377 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=000 to 377 (Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=0000 to 0511	Boolean		Read/write	Yes
Special internal relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=000 to 127	Boolean		Read/write	Yes
Timer contacts	TSn	n=00 to 63	Boolean		Read-only	Yes
Counter contacts	CSn	n=00 to 31	Boolean		Read-only	Yes
		n=235 to 254				
Timer reset	TRn	n=00 to 63	Boolean		Read/write	Yes
Counter reset	CRn	n=00 to 31	Boolean		Read/write	Yes
		n=235 to 254				
Timer value	Tn	n=00 to 63	Word	Short	Read/write	
Counter value	Cn	n=00 to 31	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=235 to 255	DWord	Long	Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers	Dn	n=000 to 255	Short	Word	Read/write	Yes
		n=000 TO 254		Long, DWord, float	Read/write	Yes
Data registers string access LoHi byte ordering	DSHd.1	d = 000 to 254 l = 2 to 64* *String length must be an even number.	String		Read/write	No
Data registers string access LoHi byte ordering	DSLd.l	d = 000 to 254 l = 2 to 64* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX0S

The following table lists all item names supported for the model FX0S.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=00 to 17 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=00 to 15(Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=000 to 511	Boolean		Read/write	Yes
Special internal relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=00 to 63	Boolean		Read/write	Yes
Timer contacts	TSn	n=00 to 55	Boolean		Read-only	Yes
Counter contacts	CSn	n=00 to 15	Boolean		Read-only	Yes
		n=235 to 254				
Timer reset	TRn	n=00 to 55	Boolean		Read/write	Yes
Counter reset	CRn	n=00 to 15	Boolean		Read/write	Yes
		n=235 to 254				
Timer value	Tn	n=00 to 55	Word	Short	Read/write	Yes
Counter value	Cn	n=00 to 15	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=235 to 255	DWord	Long	Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers	Dn	n=00 to 31	Short	Word	Read/write	Yes
		n=00 to 30		Long, DWord, float	Read/write	Yes
Data registers string access LoHi byte ordering	DSHd.1	d = 00 to 30 l = 2 to 62* *String length must be an even number.	String		Read/write	No
Data registers string access LoHi byte ordering	DSLd.l	d = 00 to 30 l = 2 to 62* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX1N

The following table lists all item names supported for the model FX1N.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=00 to 177 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=00 to 177 (Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=000 to 511	Boolean		Read/write	Yes
Special internal relays	Mn	n=512 to 1535	Boolean		Read/write	No
States	Sn	n=000 to 999	Boolean		Read/write	Yes
Timer contacts	TSn	n=00 to 255	Boolean		Read-only	Yes
Counter contacts	CSn	n=00 to 255	Boolean		Read-only	Yes
Timer reset	TRn	n=00 to 255	Boolean		Read/write	Yes
Counter reset	CRn	n=000 to 255	Boolean		Read/write	Yes
Timer value	Tn	n=00 to 255	Word	Short	Read/write	Yes
Counter value	Cn	n=000 to 199	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=200 to 255	DWord	Long	Read/write	Yes
Data registers	Dn	n=0000 to 7999	Short	Word	Read/write	Yes
		n=0000 to 7998		Long, DWord, float	Read/write	

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers string access LoHi byte ordering	DSHd.1	d = 0000 to 7998 l = 2 to 64* *String length must be an even number.	String		Read/write	No
Data registers string access LoHi byte ordering	DSLd.l	d = 000 to 7998 l = 2 to 64* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX1S

The following table lists all item names supported for the model FX1S.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=00 to 17 (Octal)	Boolean		Read-only	Yes
outputs	Yn	n=00 to 15 (Octal)	Boolean		Read/write	Yes
Internal relays	Mn	n=000 to 511	Boolean		Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Special internal relay	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=000 to 127	Boolean		Read/write	Yes
Timer contacts	TSn	n=00 to 63	Boolean		Read-only	Yes
Counter contacts	CSn	n=00 to 31	Boolean		Read-only	Yes
		n=235 to 254				
Timer reset	TRn	n=00 to 63	Boolean		Read/write	Yes
Counter reset	CRn	n=00 to 31	Boolean		Read/write	Yes
		n=235 to 254				Yes
Timer value	Tn	n=00 to 63	Word	Short	Read/write	Yes
Counter value	Cn	n=00 to 31	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=235 to 255	DWord	Long	Read/write	Yes
Data registers	Dn	n=000 to 255	Short	Word	Read/write	Yes
		n=000 to 254		Long, DWord, float	Read/write	Yes
Data registers string access LoHi byte ordering	DSHd.1	d = 000 to 254 l = 2 to 64* *String length must be an even number.	String		Read/write	No

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers string access LoHi byte ordering	DSLd.l	d = 000 to 254 l = 2 to 64* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		Yes

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX2N

The following table lists all item names supported for the model FX2N.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=000 to 377 (Octal)	Boolean		Read-only	Yes
Outputs	Yn	n=000 to 377 (Octal)	Boolean		Read/Write	Yes
Internal relays	Mn	n=0000 to 1023	Boolean		Read/write	Yes
Special internal relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes
States	Sn	n=000 to 999	Boolean		Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Timer contacts	TSn	n=000 to 255	Boolean		Read-only	Yes
Counter contacts	CSn	n=000 to 255	Boolean		Read-only	Yes
Timer reset	TRn	n=000 to 255	Boolean		Read/write	Yes
Counter reset	CRn	n=000 to 255	Boolean		Read/write	Yes
Timer value	Tn	n=000 to 255	Word	Short	Read/write	Yes
Counter value	Cn	n=000 to 199	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=200 to 255	DWord	Long	Read/write	Yes
Data registers	Dn	n=000 to 7999	Short	Word	Read/write	Yes
		n=000 to 7998		Long, DWord, float	Read/write	
Data registers string access LoHi byte ordering	DSHd.1	d = 0000 to 7998 l = 2 to 64* *String length must be an even number.	String		Read/write	No

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Data registers string access LoHi byte ordering	DSLd.l	d = 0000 to 7998 l = 2 to 64* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

MITSU Driver Item Reference for Model FX2NC

The following table lists all item names supported for the model FX2NC.

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch COmpact Edition
Inputs	Xn	n=000 to 377 (Octal)	Boolean		Read-only	
Outputs	Yn	n=000 to 377 (Octal)	Boolean		Read/write	
Internal Relays	Mn	n=0000 to 3071	Boolean		Read/write	Yes
Special Int. Relays	Mn	n=8000 to 8255	Boolean		Read/write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch COmpact Edition
States	Sn	n=000 to 999	Boolean		Read/write	Yes
Timer Contacts	TSn	n=000 to 255	Boolean		Read-only	Yes
Counter Contacts	CSn	n=000 to 255	Boolean		Read-only	Yes
Timer Reset	TRn	n=000 to 255	Boolean		Read/write	Yes
Counter reset	CRn	n=000 to 255	Boolean		Read/write	Yes
Timer value	Tn	n=000 to 255	Word	Short	Read/write	Yes
Counter value	Cn	n=000 to 199	Word	Short	Read/write	Yes
32-bit counter value	Cn	n=200 to 255	DWord	Long	Read/write	Yes
Data registers	Dn	n=000 to 7999	Short	Word	Read/write	Yes
		n=000 to 7998		Long, DWord, float	Read/write	
Data registers string access LoHi byte ordering	DSHd.1	d = 0000 to 7998 l = 2 to 64* *String length must be an even number.	String		Read/write	No

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch COmpact Edition
Data registers string access LoHi byte ordering	DSLd.l	d = 0000 to 7998 l = 2 to 64* *String length must be an even number	String		Read/write	Yes
Special data registers	Dn	n=8000 to 8255	Short	Word	Read/write	Yes
		n=8000 to 8254		Long, DWord, float		

Note The item range depends on the PLC model used and the memory supported by that model.

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