InTouch® Compact Edition MELSE Configuration Guide

Invensys Systems, Inc.

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Contents

Welcome 5
Documentation Conventions 5
Technical Support 6

Chapter 1 About the MELSE Driver 7
About MELSE Driver 7
Device Specifications 7
Network Specifications 8

Chapter 2 Configuring the MELSE Driver 9
Selecting the PLC Driver 9
Configuring PLC-specific Settings 11
Configuring Advanced Settings 11
Configuring Time-out Settings 12
Configuring Protocol Settings 13
Configuring Hand Shake Settings 14
Configuring Buffer Length Settings 15
Disabling and Enabling DTR and IR Settings 16
Associating a PLC Driver with an Access Name 17

Chapter 3 Troubleshooting the MELSE Driver 19

Appendix A MELSE Driver Item References.....25

Supported Data Types and Value Ranges 26

MELSE Driver Item Reference for Q-Series.....27

Index 31

Welcome

This guide shows you how to configure the MELSE 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 MELSE Driver

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

About MELSE Driver

You can use the MELSE PLC driver to connect an InTouch Compact Edition application to Mitsubishi Ethernet PLCs using the Mitsubishi Q Series protocol.

Device Specifications

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

- Manufacturer: Mitsubishi
- Compatible equipment: QnA-Series and Q-Series PLCs

Note References in this documentation to the Q-Series also apply to the QnA-Series

Network Specifications

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

- Physical protocol: Ethernet
- Logic protocol: MELSEC

Chapter 2

Configuring the MELSE Driver

This section explains how to configure the MELSE driver by completing the following tasks:

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

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

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

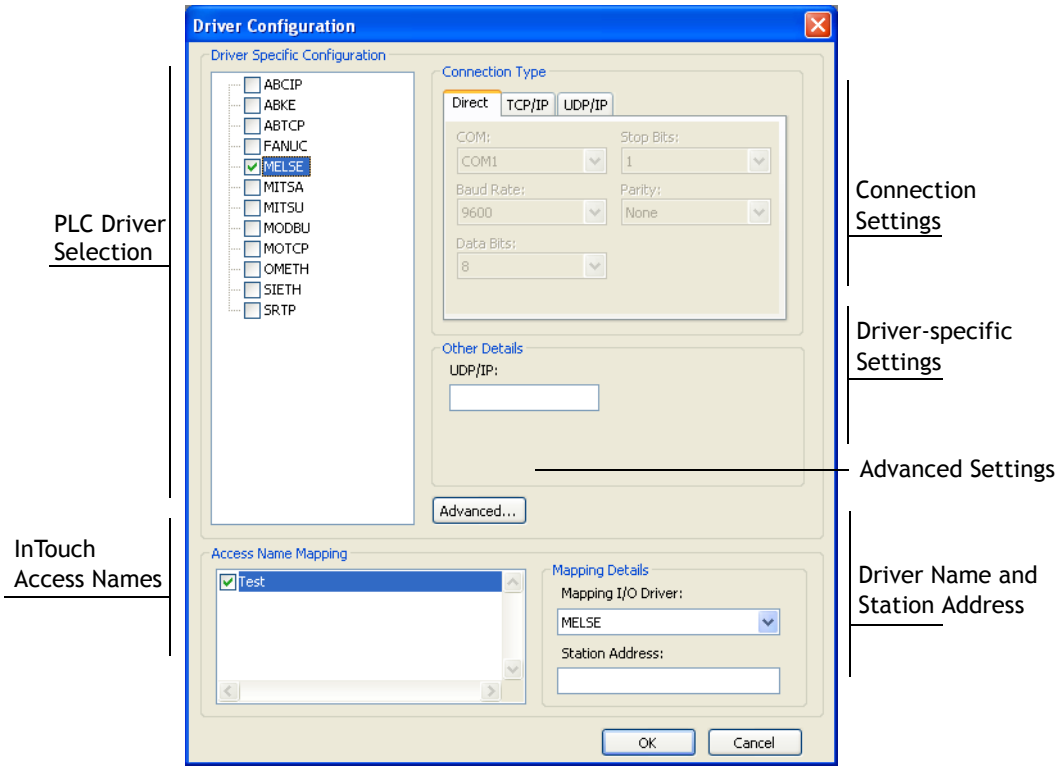
Note For each driver, you can configure only one set of driver parameters.

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 on the **Special** menu, point to **InTouch Compact Edition 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 17.

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

Configuring PLC-specific Settings

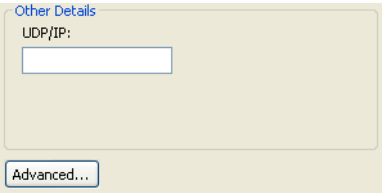
This section shows how to configure settings that are specific to the MELSE Driver. You configure UDP/IP settings in the **Other Details** area in the **Driver Configuration** dialog box.

- **UDP/IP setting**: Ethernet protocol used for communication

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

To configure MELSE-specific settings

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



2. In the **Other Details** area, assign a value to the UDP/IP setting:
   - **UDP/IP** - Ethernet Protocol used for communication.

Configuring Advanced Settings

This section explains how to configure advanced settings for a MELSE driver. You can configure the following settings:

- Time-out settings
- Protocol settings
- Hand Shake settings
- Buffer Length settings
- Setting DTR and IR

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.

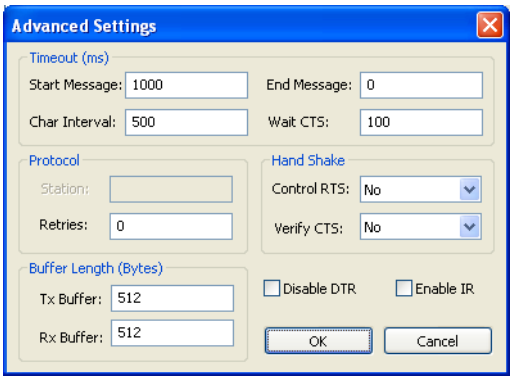
Configuring Time-out Settings

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.



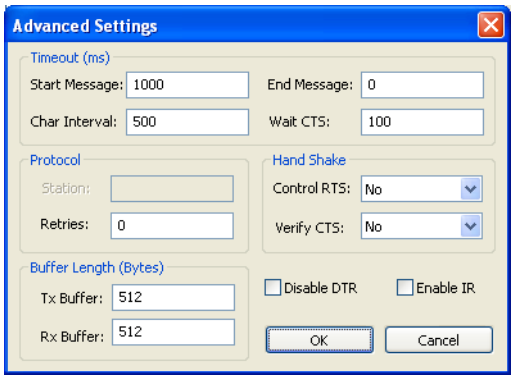
3. In the **Timeout** area, assign values to the following settings:
   - **Start Message** - Time-out period in milliseconds for the message to start.
   - **End Message** - Time-out period in milliseconds for the message to end.
   - **Char Interval** - Time-out period in milliseconds between each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

Configuring Protocol Settings

You can configure the number of attempts to retry a communication command after a previous failure. This setting specifies how many times the driver attempts to execute the same communication command before reporting a communication error.

To configure Protocol retry setting

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, enter the number of retry attempts in the **Retries** box.
4. Click **OK**.

Configuring Hand Shake Settings

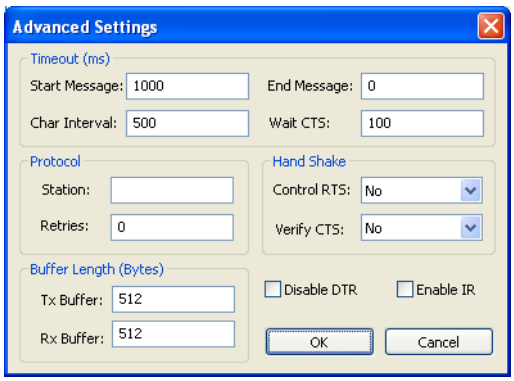
You can configure the following Hand Shake settings:

- 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:

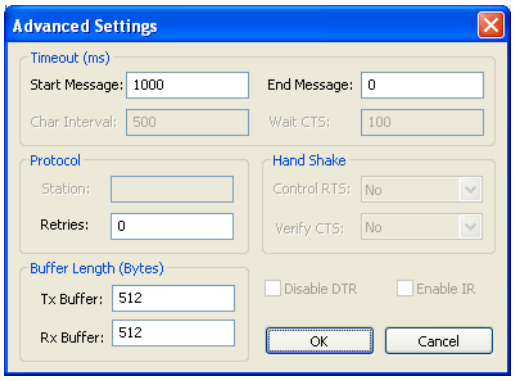
- Transmission Buffer (Tx) Length
- Reception Buffer (Rx) Length

The Buffer Length settings determine the number of bytes allocated as temporary memory. The driver uses temporary memory to communicate 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

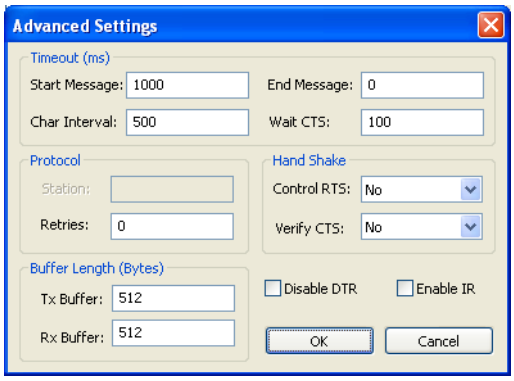
You can enable or disable the DTR and IR settings.

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**.

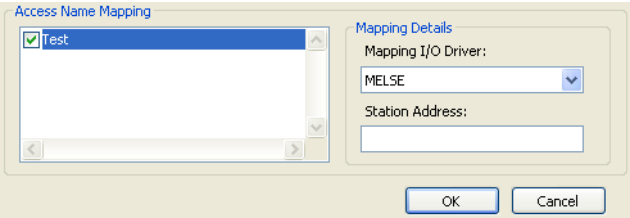
Associating a PLC Driver with an Access Name

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

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.



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 with the PLC driver.
4. In the **Mapping I/O Driver** list, select the configured driver.
5. In the **Station Address** box, type the Station Address with the following syntax:

   IP_Address:*Port_Number*

   where:

   - IP_Address: The IP address of the PLC.
   - Port_Number: The port number to establish communication with the PLC.

   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 MELSE 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 MELSE common 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	Error connect	IP Address or port number is invalid	Check the IP address or the port number
2	Invalid read	The device sent an invalid message	Check if the registry and address configured exist in the PLC
3	Invalid block size	Internal error	Contact Technical Support and send your published application
4	Invalid write	It is not possible to write a single bit. Please review your item name	You specified a bit number for an item name that does not support bit writing
5	Invalid parity	The parity specified is invalid	Specify the correct parity
6	Invalid irq	Internal error	Contact Technical Support and send your published application

Error Code	Description	Possible Causes	Procedure to Solve
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
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 and send your published application
11	Tx buffer full	Internal error	Contact Technical Support and send your published application
12	Rx buffer empty	Internal error	Contact Technical Support and send your published application
13	Rx buffer full	Internal error	Contact Technical Support and send your published application
14	Time out waiting CTS	CTS signal was not received, could not send request	• Check the cable • Check 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 • Make sure that the I/O server settings match the PLC configuration

Error Code	Description	Possible Causes	Procedure to Solve
16	Time out waiting for message to finish	Started receiving a response but the communication was suspended	• Check the cable connection • 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 • Make sure that the I/O server settings match the PLC configuration
18	Time out between tx char	Started receiving a response but the communication was suspended	• Check the cable connection • 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 • Make sure that the I/O server settings match the PLC configuration
32	Time out waiting for a tx message to finish	Started receiving a response but the communication was suspended	• Check the cable connection • Make sure that the I/O server settings match the PLC configuration
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 your item names for unsupported or invalid items
35	Driver API not initialized	Internal error	Contact Technical Support and send your published application

Error Code	Description	Possible Causes	Procedure to Solve
36	Invalid/unsupported item name	Item name specified is either invalid or unsupported	Check your item names for unsupported or invalid items
37	Invalid/unsupported item name	Item name specified is either invalid or unsupported	Check your 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
39	Invalid block size	Internal error when generating the protocol block sizes	Contact Technical Support and send your published application
-15	Time out waiting to start a message	• Disconnected cables • PLC turned off or in Stop or error mode • Wrong station number • Wrong RTS/CTS control settings	• Check the cable wiring • Check the PLC State (it must be in RUN) • Check the station number • Check the right configuration • Check the I/O driver configuration
-17	Time out between rx characters	• PLC turned off or in Stop or error mode • Wrong station number • Wrong parity • Wrong RTS/CTS control settings	• Check the cable wiring • Check the PLC state (it must be in RUN) • Check the station number • Check the I/O driver configuration

Appendix

MELSE Driver Item References

This section lists all item names supported by a Q-series Mitsubishi PLC.

The following PLC suffixes are supported by the Wonderware Compact Panel:

- Short
- Word
- BCD
- Long
- DWord
- LBCD
- Float
- Boolean
- String Hilo

If an “OUT OF RANGE” item is used in the InTouch Compact Edition 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.

Invalid values assigned to 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.

The MELSE driver supports float values with 4 bytes up to 7 digits. Therefore, the valid range for float values is 3.4E +/- 38 (7 digits). Values outside this range result in an invalid value written to the tag. Furthermore, values with more than 7 digits of precision are rounded at the seventh digit.

Note The MELSE driver does not support DBCS, only ANSI characters.

Supported Data Types and Value Ranges

The table below shows the data types and the value ranges of the data types supported by the MELSE driver.

Data Type	Minimum	Maximum
Short	-32768	32767
Word (16-bit string)	0	65535
BCD	0	9999
Long	-2147483648	2147483647
DWord (32-bit unsigned)	0	4294967000
LBCD	0	99999999
Boolean	0	1

MELSE Driver Item Reference for Q-Series

The following table lists all item names supported for the Q-series Mitsubishi PLC:

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Inputs	Xn	n=0000 to 3FFF (Hex)	Boolean		Read/ write	Yes
Direct inputs	DXn	n=0000 to 3FFF (Hex)	Boolean		Read/ write	Yes
Outputs	Yn	n=0000 to 3FFF (Hex)	Boolean		Read/ write	Yes
Direct outputs	DYn	n=0000 to 3FFF (Hex)	Boolean		Read/ write	Yes
Link relays	Bn	n=0000 to 3FFF (Hex)	Boolean		Read/ write	Yes
Special Link relays	SBn	n=0000 to 07FF (Hex)	Boolean		Read/ write	Yes
Internal relays	Mn	n=0000 to 16383	Boolean		Read/ write	Yes
Special int. relays	SMn	n=0000 to 2047	Boolean		Read-only	Yes
Latch relays	Ln	n=0000 to 16383	Boolean		Read/ write	Yes
Annunciator relays	Fn	n=0000 to 2047	Boolean		Read/ write	Yes
Edge relays	Vn	n=0000 to 2047	Boolean		Read/ write	Yes
Step relays	Sn	n=0000 to 16383	Boolean		Read/ write	Yes
Timer contacts	TSn	n=0000 to 2047	Boolean		Read/ write	Yes
Timer coils	TCn	n=0000 to 2047	Boolean		Read/ write	Yes
Integrating timer contacts	SSn	n=0000 to 2047	Boolean		Read/ write	Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Integrating timer coils	SCn	n=0000 to 2047	Boolean		Read/ write	Yes
Counter contacts	CSn	n=0000 to 1023	Boolean		Read/ write	Yes
Counter coils	CCn	n=0000 to 1023	Boolean		Read/ write	Yes
Timer value	TNn	n=0000 to 2047	Short	Word, BCD	Read/ write	Yes
Integrating timer value	SNn	n=0000 to 2047	Short	Word	Read/ write	Yes
Counter value	CNn	n=0000 to 1023	Short	Word, BCD	Read/ write	Yes
Data registers	Dn	n=00000 to 12287	Short	Word, BCD	Read/ write	Yes
		n=00000 to 12286		Long, DWord, LBCD, float	Read/ write	Yes
Data register bit access	Dn	n=00000.00 to 12287.15			Read/ write	Yes
Data Register string access HiLo byte ordering	DSHn	n=00000.002 to 12286.002	String		Read/ write	Yes
		n=00000.128 to 12223.128				Yes
Data registers string access LoHi byte ordering	DSLn	n=00000.002 to 12286.002	String		Read/ write	No
		n=00000.128 to 12223.128				

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Special data registers	SDn	n=0000 to 2047	Short	Word, BCD	Read-only	Yes
		n=0000 to 2046		Long, DWord, LBCD, float		Yes
Data register bit access	SDn	n=0000.00 to 2047.15			Read-only	Yes
Link registers	Wn	n=0000 to 3FFF (Hex)	Short	Word, BCD	Read/ write	Yes
		n=0000 to 3FFE (Hex)		Long, DWord, LBCD, float		Yes
Link register bit access	Wn	n=0000.00 to 3FFF.15			Read/ write	Yes
Link register string access HiLo byte ordering	WSHn	n=0000.002 to 3FFE.002	String		Read/ write	Yes
		n=0000.128 to 3FBF.128				Yes
Link registers string access LoHi byte ordering	WSLn	n=0000.002 to 3FFE.002	String		Read/ write	No
		n=0000.128 to 3FBF.128				
Special link registers	SWn	n=0000 to 07FF (Hex)	Short	Word, BCD	Read/ write	Yes
		n=0000 to 07FE (Hex)		Long, DWord, LBCD, float		Yes

Device Type	Item Name	Range	Data Type	Supported Suffixes	Access	Supported by InTouch Compact Edition
Link register bit access	SWn	n=0000.00 to 07FF.15			Read/ write	Yes
File register	Rn	n=0000 to 32767	Short	Word, BCD	Read/ write	Yes
		n=0000 to 32766		Long, DWord, LBCD, float		Yes
File register bit access	Rn	n=00000.00 to 32767.15	Short	Word, BCD, boolean	Read/ write	Yes
File register strings access HiLo byte ordering	RSHn	n=0000.002 to 32766.002	String		Read/ write	Yes
		n=00000.128 to 32703.128				Yes
File registers string access LoHi byte ordering	RSLn	n=0000.002 to 32766.002	String		Read/ write	No
		n=0000.128 to 32703.128				
Index registers	Zn	n=00 to 15	Short	Word, BCD	Read/ write	Yes
		n=00 to 14		Long, DWord, LBCD, float		Yes
Index register bit access	Zn	n=00.00 to 15.15	Short	Word, BCD boolean	Read/ write	Yes
		n=00.00 to 14.31		Long, DWord, LBCD		Yes

Index

A

Access Name 17
advanced settings 9

B

Buffer Length settings 11

D

documentation conventions 5
DTR and IR settings 11

H

hand shake settings 11

M

MELSE driver
  description 7
  device specifications 7
  network specifications 8

P

PLC driver
  configuring PLC-specific settings 11
  selecting the PLC driver 10
protocol settings 11

T

Technical Support 6
time-out settings 11
troubleshooting
  communication problems 19
  configure animation display 20