InTouch® Compact Edition SRTP Configuration Guide

Invensys Systems, Inc.

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Welcome

This guide shows you how to configure the SRTP 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 SRTP driver

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

About SRTP driver

The SRTP driver establishes communication between InTouch Compact Edition applications and RX3i, RX7i, and the GE FANUC Series 90 PLCs using Service Request Transfer Protocol (SRTP) over an Ethernet connection.

Device Specifications

The SRTP driver supports RX3i, RX7i, and the FANUC Series 90 PLCs that use an Ethernet interface.

Network Specifications

To communicate with the PLC, the InTouch Compact Edition device must be connected to the PLC with an Ethernet connection. Service Request Transfer Protocol (SRTP) is used as the logic protocol.

Chapter 2

Configuring the SRTP driver

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

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

You configure the SRTP 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.

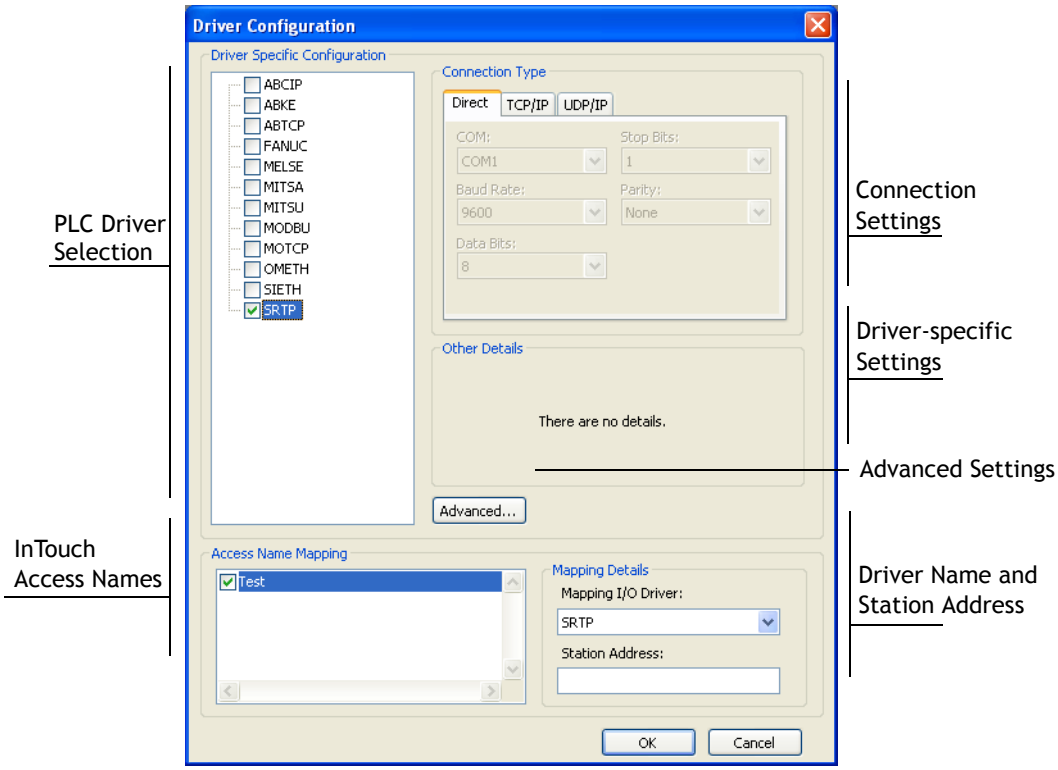
Note For each driver, you can configure only one set of driver parameters.

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 click **Special** on the menu bar, 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 16

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

Configuring Advanced Settings

This section explains how to configure advanced settings for the SRTP Driver. You can configure the following:

- Time-out settings
- Protocol retry setting
- 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.

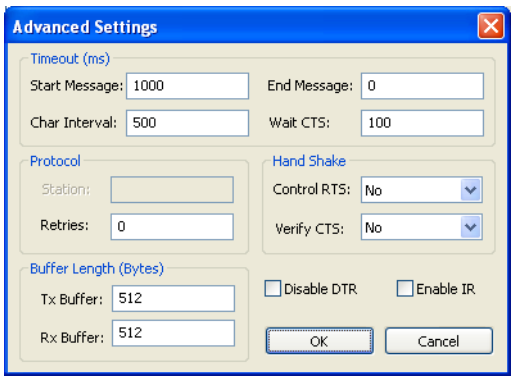
Configuring Time-out Setting

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**.

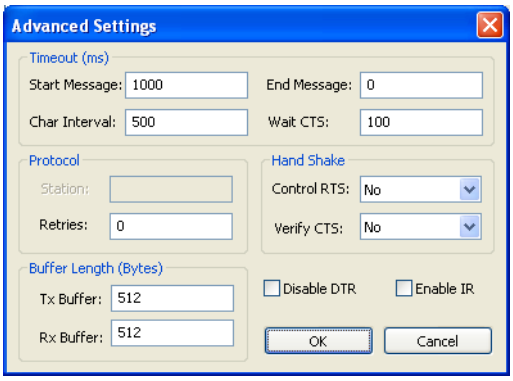
Configuring the Protocol Retry Settings

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 the protocol retry setting

1 In the **Driver Configuration** dialog box, select the SRTP Driver.

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



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

3 In the **Protocol** area, enter the number of retry attempts in the **Retries** box.

Configuring Hand Shake Settings

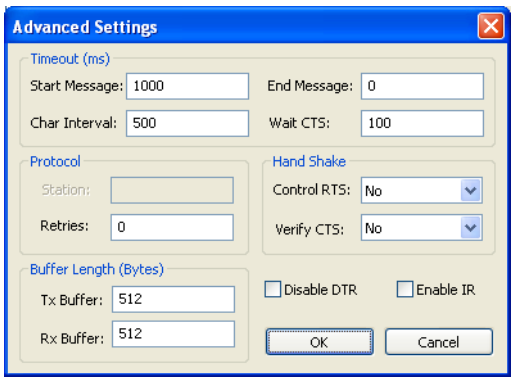
You can configure the following Hand Shake settings:

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

Configuring Buffer Length Settings

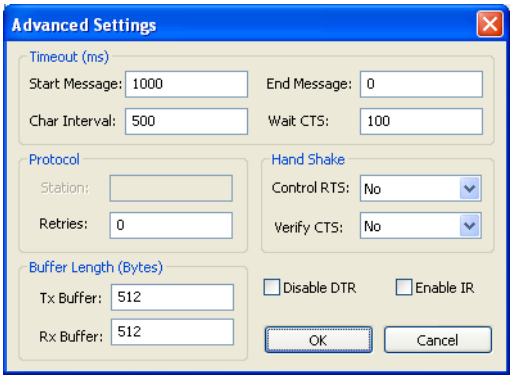
You can configure the following Buffer Length settings:

- 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 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

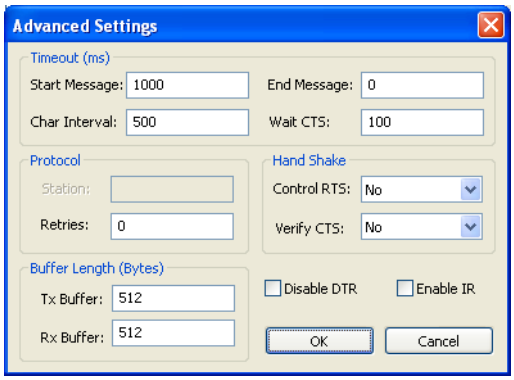
You can enable or disable the DTR and IR settings.

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 the DTR and IR Settings

1. In the **Driver 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**.

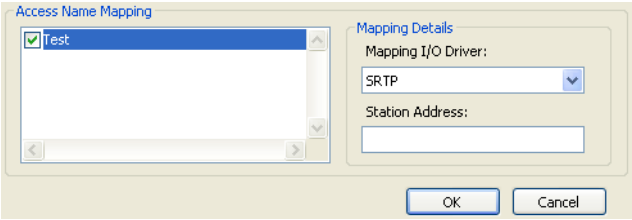
Associating a PLC Driver with an Access Name

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

To associate an 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. To do this, on the **Special** menu, click **Access Names.**

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.

   The station in the access name should comply with the following syntax:

   <IP Address>

   Where,

   IP Address is the PLC IP 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 SRTP 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 SRTP 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 required
1	Invalid or unsupported item name	Item name specified is either invalid or unsupported	Check your item names for unsupported or invalid items
2	Invalid or unsupported item name	Item name specified is either invalid or unsupported	Check your item names for unsupported or invalid items
3	Invalid station address	Station address specified for this driver is invalid	Check the I/O driver configuration and specify a valid station address
4	Invalid number of stop bits	The number of stop bits specified is invalid	Specify the correct number of stop bits
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
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 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 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
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

Error Code	Description	Possible Causes	Procedure to Solve
20	Invalid command	Received answer with invalid command code	Check the connection to be sure the device communicates using the SRTP protocol
21	Invalid block size	Internal error when generating the protocol block sizes	Contact Technical Support and send your published application
22	Failed to allocate memory	Insufficient memory for driver buffers	• Check the I/O driver configuration advanced settings and try to reduce the buffer size • Increase the computer or HMI memory
23	Invalid answer	Problem with communication medium	Check all cables, hubs, and routers
24	Invalid unsolicited message	Received an unsolicited message, not supported by the driver	Check all devices connected on the network to ensure there are no devices sending messages using a different protocol from the same port
25	Error connecting	Cannot establish a TCP/IP connection to the device	• Check the device to be sure it is connected to the network • Check the IP address specified in the configuration dialog station field to be sure it matches the device's IP address
26	Time out waiting to start message	• Disconnected cables • PLC is turned off, in stop mode or in error mode • Wrong station number • Wrong RTS/CTS control settings	• Check cable wiring • Check the PLC state – it must be RUN • Check the station number • Check the I/O driver configuration

Error Code	Description	Possible Causes	Procedure to Solve
27	Time out between rx char	• PLC in stop mode or in error mode • Wrong station number • Wrong parity • Wrong RTS/CTS configuration settings	• Check cable wiring • Check the PLC state – it must be RUN • Check the station number • Check the I/O driver configuration
32	Time out waiting for a tx 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
33	Invalid driver configuration file	Internal error	Contact Technical Support and send your published application
34	Invalid or 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
36	Invalid or unsupported item name	Item name specified is either invalid or unsupported	Check your item names for unsupported or invalid items
37	Invalid or 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

Appendix

SRTP Driver Item References

The SRTP driver uses an item-naming convention based on single-letter data-type identifiers used in programming the GE Fanuc PLCs.

The tables in this section describe the item naming conventions of the SRTP driver. The ranges specified in these tables vary according to the type of controller used.

If you advise an out-of-range variable for an item, all items in the same packet return bad quality.

The SRTP driver supports float values with 4 bytes with 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.

If an “OUT OF RANGE” item is used in the InTouch Compact Application, 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 in items (with/without suffixes) can return unpredictable results. You should ensure that valid values are written for each data type. For example, -32768 to 32767 is the range for the short type of data.

Suffixes to Explicitly Control Data Type

This section describes the single-letter suffixes used to explicitly control data type. The following conditions apply to these suffixes:

- Each suffix applied must be preceded by a space.
- The following sections summarize the suffix group, suffix, restrictions, description, and result for the suffixes.

F Suffix

You can interpret a pair of analog or block registers as a floating point number by adding a blank space and an F to the item name for the lower-numbered register of the pair. For example, R1001 F.

This notation causes the server to treat R1001 and R1002 as floating point with 7-digit precision.

Supported base items are: %AI, %AO or %AQ, %R.

L Suffix

You can interpret a pair of analog registers as a long integer or double-precision integer by adding a blank space and an L after the item name.

Supported base items are: %AI, %AO or %AQ, %R.

B or BCD Suffix

You can interpret a register as a BCD (Binary Coded Decimal) by adding a blank space and BCD following the item name. For example, R4087 (BCD) or R4087 B or R4087 BCD.

This converts the register contents to BCD.

Supported base items are: %AI, %AO or %AQ, %R.

The SRTP driver supports valid BCD values from 0 to 9999. Invalid BCD values (for example, 1010 in binary base) will result in an invalid value.

Supported Data Types and Value Ranges

The following table lists all the data types and its value ranges supported by the SRTP driver.

Data Type	Minimum	Maximum
Long (32-bit signed)	-2147483648	2147483647
Short	-32768	32767
BCD (16-bit BCD)	0	9999

Base Item Names

This section describes the base item names and the conditions applicable to them:

- Item names must begin with base name strings and optionally preceded by "%."
- Item names are not case-sensitive.

The following table summarizes the base name, description, data type, read/write designation, and offset for base item names.

Base Name	Description	Data Type	Access	Offset
I*n*	Discrete inputs	Boolean	Read/write	*n* = 1-32768
O*n* or Q*n*	Discrete outputs	Boolean	Read/write	*n* = 1-32768
T*n*	Discrete temporary	Boolean	Read/write	*n* = 1-1024
M*n*	Discrete internal	Boolean	Read/write	*n* = 1-32768
G*n*	Genius global data	Boolean	Read/write	*n* = 1-7680
R*n*	PLC register	Short or forced by suffix	Read/write	*n* = 1-32640
R*n*:*b* Similarly for data types %AI, %AO or %AQ	PLC register bit	Boolean	Read-only	*b* = 0-15
AI*n*	Analog inputs	Short or forced by suffix	Read/write	*n* = 1-32640
AO*n* or AQ*n*	Analog outputs	Short or forced by suffix	Read/write	*n* = 1-32640

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