InTouch® Compact Edition ABTCP Configuration Guide

Invensys Systems, Inc.

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Welcome

This guide shows you how to configure the ABTCP 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 ABTCP Driver

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

About ABTCP Driver

This section identifies all hardware and software components required to implement communication between the ABTCP driver and Allen-Bradley devices using the DF1 protocol.

Device Specifications

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

- Manufacturer: Allen-Bradley
- Compatible equipment: PLC5 series, PLC2 series, SLC500
- Programmer software: RSLogix5, RSLogix500, RSLinx

Network Specifications

To establish communication, your device network must meet the following specifications:

- Device communication port: Ethernet Port
- Physical protocol: Ethernet TCP/IP
- Logic protocol: DF1
- Device run-time software: None
- Specific PC Board: Any TCP/IP adapter (Ethernet card)

Chapter 2

Configuring the ABTCP Driver

This section explains how to configure the ABTCP 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 ABTCP 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.

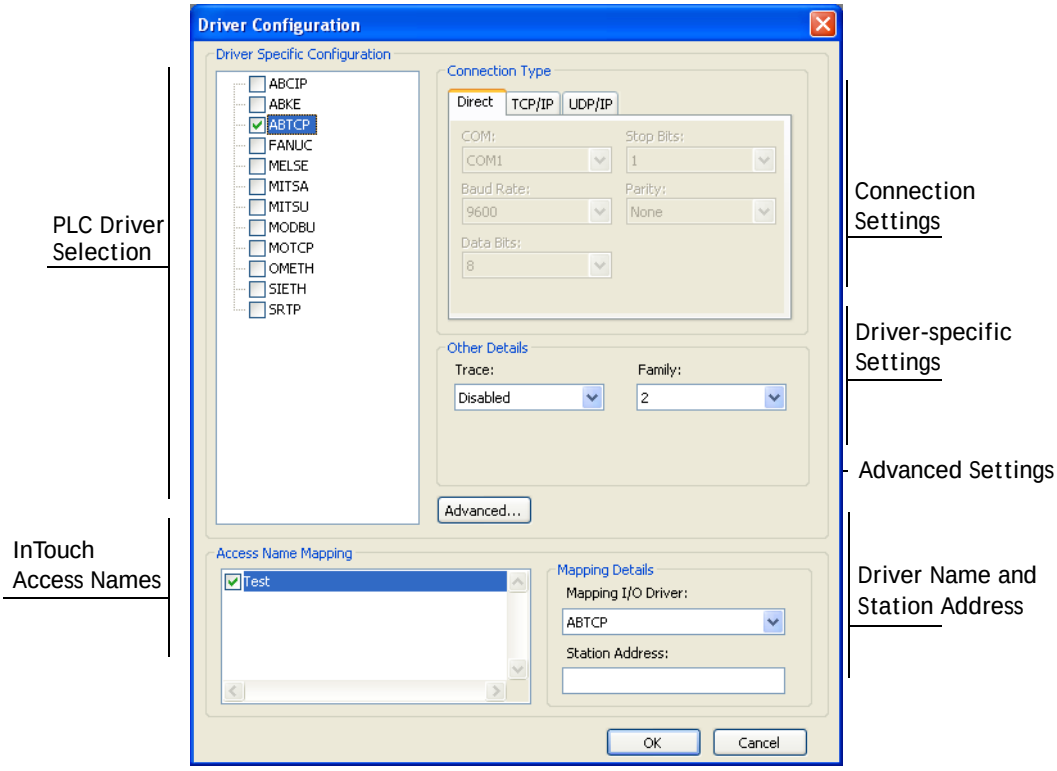
Note For each driver, you can configure only one set of driver parameters.

Selecting the PLC Driver

Before you configure the PLC driver, you need to select it in the **Driver Configuration** dialog box. You can use the Driver Configuration dialog box to configure more than one PLC driver. 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 shown in the left pane, select the check box next to the ABTCP driver.

   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 PLC-specific settings and other advanced settings on the right side of the panel.

Configuring PLC-specific Settings

This section explains how to configure settings that are specific to the ABTCP 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 ABTCP driver:

Setting	Purpose
Trace	When **Trace** is enabled, the LogWin module collects more detailed communication information. If you are generating a log file for technical support, then set **Trace** to Enabled.
Family	Name of the Allen-Bradley PLC family supported by the ABTCP driver. The ABTCP driver only supports the PLC2, PLC5 or SLC500 families of Allen-Bradley PLCs.

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

To configure the ABTCP-specific settings

1. In the **Driver Configuration** dialog box, select the ABTCP driver.

2. In the **Other Details** area, assign values to the following settings:
   - **Trace**

     Valid values are Disabled or Enabled. The default is Disabled.
   - **Family**

     Select the Allen-Bradley PLC family that connects to the ABTCP driver. The default PLC family is PLC2.

     PLC2: Driver uses “unprotected read/write” command (in the DF1 protocol) to communicate with the PLC2 family.

PLC5: Driver uses "typed read/write" command (in the DF1 protocol) to communicate with the PLC5 family or compatible. The address for all data types is decimal.

SLC500: Driver uses protected typed logical read/write command (in the DF1 protocol) to communicate with the SLC500 family.

Note ABTCP driver does not support communication with more than one PLCs from different models. For example, user cannot have ABTCP communication to PLC500 and SLC500 PLCs together.

Configuring Advanced Settings

This section explains how to configure advanced settings for an ABTCP driver. 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.

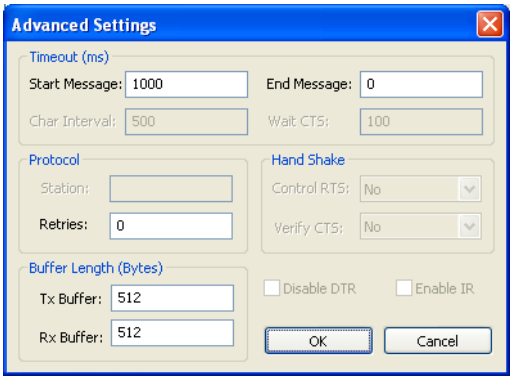
Configuring Time-out Settings

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.



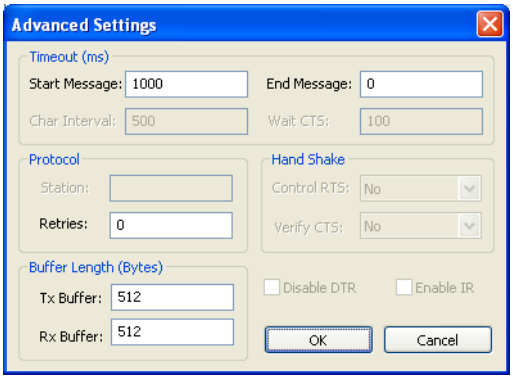
3. In the **Timeout** area, assign values to the following settings:
   - **Start Message** - Time-out period in milliseconds for the message to start.
   - **End Message** - Time-out period in milliseconds for the message to end.
4. Click **OK**.

Configuring Protocol Settings

You can configure the 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 Buffer Length Settings

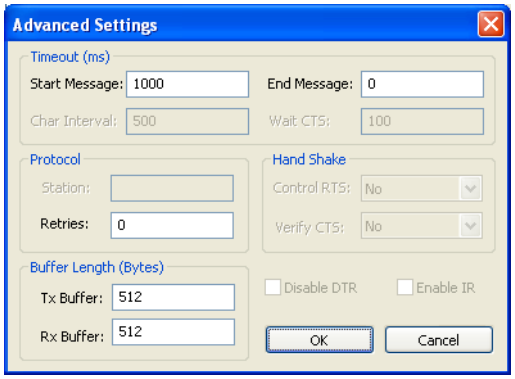
You can configure the following Buffer Length settings:

- 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**.

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 also specify a Station Address.The Station Address is used by the InTouch Compact Edition driver to specify slave network addresses of PLCs.

The station address must comply with the following syntax:

<IP Address>:[Port Number]
where:

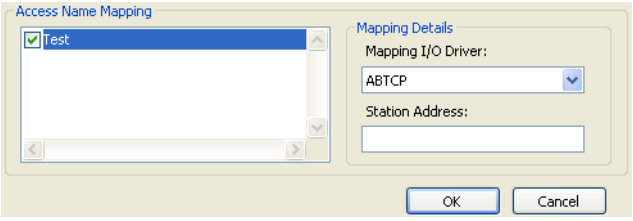
IP Address is the PLC's IP address.

Port Number is the port number used to communicate with the PLC. If the port number is omitted from the station address, a default value of 2222 is used.

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

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 from the InTouch HMI.

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 ABTCP 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 ABTCP 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	Protocol error	• Wrong Family type specified for the family field on the communication parameters dialog • Wrong cable or CPU in fault mode	• Check PLC family specified in family field • Check CPU mode • Check cable
2	Block size error	Internal error	Contact Technical Support and send your published application
3	Invalid family	Wrong family specified in the family field	Type the correct PLC family
4	Invalid number of stop bits	The number of stop specified is invalid	Specify the correct number of stop
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 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	Sequence error of message	Protocol error	Check CPU status (high probability of a CPU error)
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 for 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 Make sure that the I/O Server settings match the PLC Configuration
16	Illegal Command or Format	You are using an invalid item name for the PLC family selected or the item name specified is unsupported by the PLC	Check the item names specified
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

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 • 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
20	Invalid/Unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
30	Invalid/Unsupported item name	Item name specified is either invalid or unsupported	Check item names for unsupported or invalid items
32	Host has problem and will not communicate	Verification errors within the host PLC processor	Check entire Time out and PLC configuration
33	Invalid Time out configuration file	Internal error	Please 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	Please 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	Station specified for this Time out is invalid	Check the I/O Time out configuration and specify a valid station address

Error Code	Description	Possible Causes	Procedure to Solve
39	Invalid block size	Internal error when generating the protocol block sizes	Contact Technical Support and send your published application
40	Remote node host is missing disconnected or shutdown	• PLC is not connected • The node configuration is invalid or in a shutdown process	• Check the PLC state to ensure the processor is not at fault • Check to see if the cables are connected correctly
64	Host could not complete function due to hardware fault	Local PLC backplane error(either memory parity or Time out/ disconnected) and PLC aborted the message execution	• Check parity configuration for both PLC and I/O Time out configuration dialog • Verify that cables are connected properly
80	Address problem or memory protect rungs	Attempt to access an illegal address in the PLC processor has aborted message execution	• Check that you configured the Family on I/O Time out configuration dialog • Check PLC address
90	Error Commit	Studio cannot connect to remote device using TCP/IP	• Verify IP address • Use PINg command with IP address to verify network communication
96	Function not allowed due to command protection selection	Execution of a command at the PLC processor disabled by a switch option	Check the PLC to see if a command protection is specified. If so, disable it
112	Processor is in Program mode	PLC is in Program or remote program mode or the 1771-KA is the download mode	Switch PLC mode to RUN

Error Code	Description	Possible Causes	Procedure to Solve
128	Compatibility mode file missing or communication zone problem	Execution of protected commands at the PLC processor inhibited because PROG light is ON	• Check to see if the PLC is on PROG mode. If so, change to RUN mode • Compare existing files to configured files
144	Remote node cannot buffer command	Driver error: Invalid Command	Contact Technical Support and send your published application
150	Send File Number error	Studio system is sending a message and the PLC does not respond The PLC responds that there is no file specified Incorrectly specified Station	Verify that required file exists Check the I/O Time out configuration and specify a valid Station Address
176	Remote node problem due to download	PLC is under downloading action or last download generated problem	Try downloading PLC Program again
330	Error connecting	Studio cannot connect to remote device using TCP/IP	+++
65535	Error sending DF1 message	Disconnected cables PLC turned off, in Stop or Error mode Wrong Station number Wrong RTS/CTS control setting	Check cable wiring Check PLC state. It must be in RUN state Verify that required file exists Check the I/O Time out configuration and specify a valid Station Address Check the I/O Time out configuration

Error Code	Description	Possible Causes	Procedure to Solve
-15	Time out waiting to start a message	• Disconnected cables • PLC turned off, in Stop or Error mode • Wrong Station number • Wrong RTS/CTS control setting	• Check cable wiring • Check PLC state. It must be in RUN state • Verify that required file exists • Check the I/O Time out configuration and specify a valid station address • Check the I/O Time out configuration
-17	Time out between rx char	• PlC in Stop or Error mode • Wrong Station number • Wrong parity • Wrong RTS/CTS configuration setting	• Check cable wiring • Check PLC state. It must be in RUN state • Check the I/O Time out configuration and specify a valid station address

Appendix

ABTCP Item References

The following tables lists the item names supported by the ABTCP driver by Allen-Bradley families. The ABTCP driver supports item names only from the PLC2, PLC5 and SLC500 families of Allen Bradley PLC's.

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.

Invalid values in items (with/without suffixes) can return unpredictable values 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 ABTCP 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 will result in an invalid value written to the tag. Furthermore, values with more than 7 digits of precision will be rounded on the seventh digit.

The ABTCP does not support bits in Timer (T), Counter (C) and Control (R).

The timer, counter, and control file types are read-only when specified without a dotfield value. For example, T4:1, C5:2, and R6:3.

Note The ABTCP I/O driver does not support DBCS, only ANSI characters. An ASCII item only supports a range of ASCII items.

Supported PLC5 Item Names

X	File Type	Default File#	.Fields	Supported by InTouch Compact Edition
O	Output	0		Yes
I	Input	1		Yes (Read-only)
S	Status	2		Yes
B	Binary	3		Yes
T	Timer	4	.PRE .ACC .EN .TT .DN	Yes
C	Counter	5	.PRE .ACC .CU .CD .DN .OV .UN	Yes
R	Control	6	.LEN .POS .EN .EU .DN .EM .ER .UL .IN .FD	Yes
N	Integer	7		Yes
F	Floating point	8		Yes
A	ASCII	None		Yes
D	BCD	None		No
ST	ASCII string	None		Yes
PD	PID	None	.ADRF .ADRE .BIAS .CA .CL .CT .DB .DO .DVDB .DVN .DVNA .DVP .DVPA .EN .ERR .EWD .INI .KD .KI .KP .MAXI .MAXO .MAXS .MINI .MINO .MINS .MO .OLH .OLL .OUT .PE .PV .PVDB .PVH .PVHA .PVL .PVLA .PVT .SO .SP .SPOR .SWM .TIE .UDP	No
SC	SFC status	None	.DN .ER .FS .LS .OV .PRE .SA .TIM	No
BT	Block transfer (Read-only)	None	.EN .ST .DN .ER .CO .EW .NR .RW .TO .RLEN .DLEN .FILE .ELEM	No

Note The output and input file types work only when the format is <FileType>:<Slot Number>.<Octet Number>/[Bit].

Supported SLC500 Item Names

X	File Type	Default File#	.Fields	Supported by InTouch Compact Edition
O	Output	0		Yes
I	Input	1		Yes (Read-only)
S	Status	2		Yes
B	Binary	3		Yes
T	Timer	4	.PRE .ACC .EN .TT .DN	Yes
C	Counter	5	.PRE .ACC .CU .CD .DN .OV .UN .UA	Yes
R	Control	6	.LEN .POS .EN .DN .ER .UL .IN .FD	Yes
N	Integer	7		Yes
F	Floating point	8		Yes
A	ASCII	None		Yes
ST	ASCII string	None		Yes

Note The output and input file types work only when the format is <FileType>:<Slot Number>.<Octet Number>/[Bit].

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