InTouch® Compact Edition SIETH Configuration Guide

Invensys Systems, Inc.

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Invensys Systems, Inc.
26561 Rancho Parkway South
Lake Forest, CA 92630 U.S.A.
(949) 727-3200

http://www.wonderware.com

For comments or suggestions about the product documentation, send an e-mail message to productdocs@wonderware.com.

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Welcome

This guide shows you how to configure the SIETH 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 SIETH Driver

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

About SIETH Driver

The SIETH driver enables communications between an InTouch Compact Edition application and Siemens S7 PLCs over an Industrial Ethernet connection.

Device Specifications

The SIETH driver supports any Siemens S7-300/400 PLC that uses an Industrial Ethernet interface.

Network Specifications

To communicate with the PLC, the InTouch Compact Edition device must be connected to the PLC by an Ethernet connection using TCP/IP as the physical protocol. S7 Messaging on Industrial Ethernet is used as the logic protocol.

Chapter 2

Configuring the SIETH Driver

This section explains how to configure the SIETH 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 SIETH Driver from the **Driver Configuration** dialog box. In a managed InTouch compact 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.

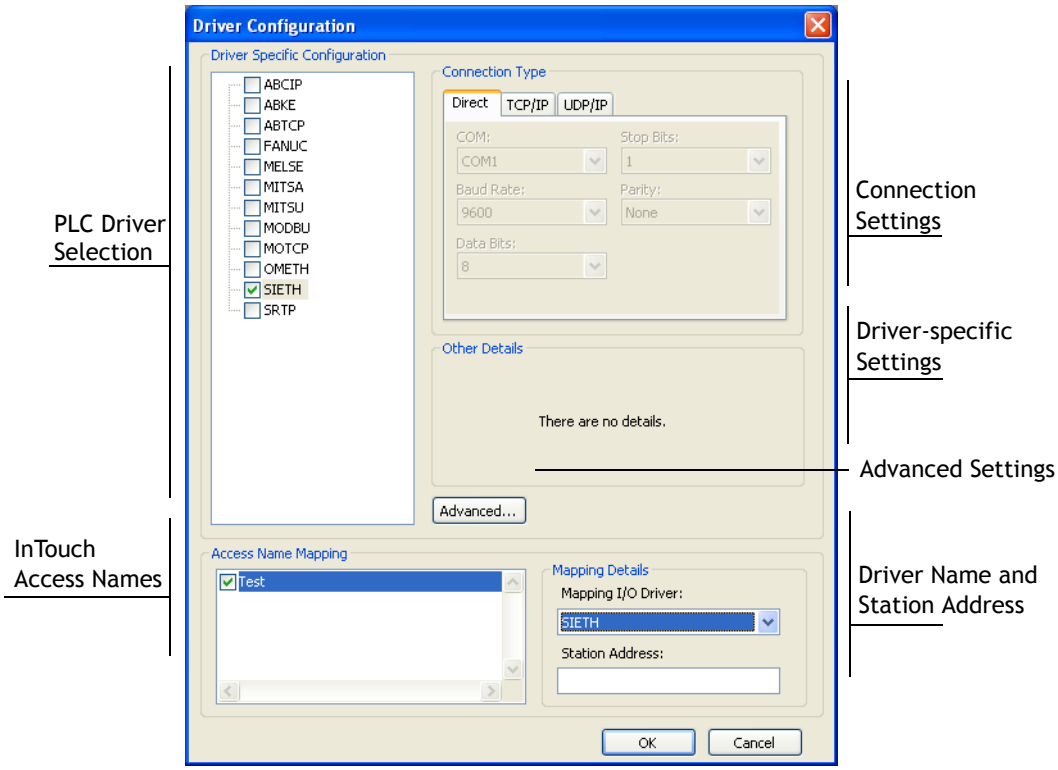
Note For each PLC type, you can configure only one set of driver parameters.

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 SIETH 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.

Configuring Advanced Settings

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

- Time-out settings
- Protocol retry setting
- Hand Shake setting
- Buffer Length settings
- Enabling / Disabling IR/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.

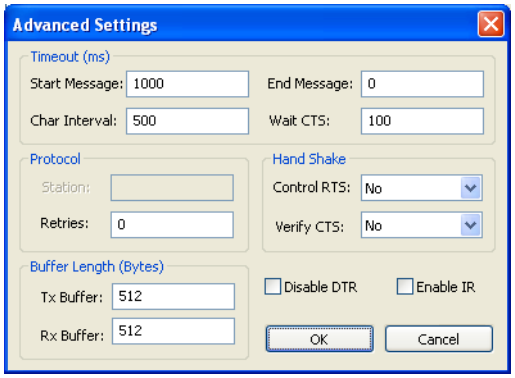
Configuring Time-Out Settings

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**.

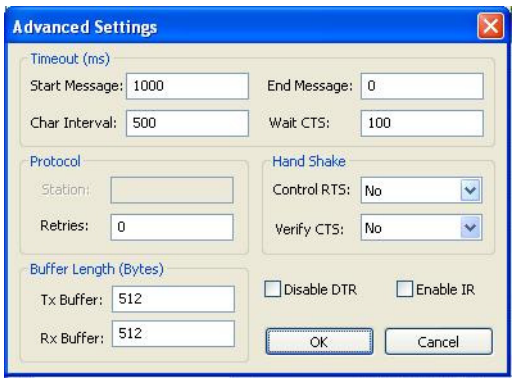
Configuring the Protocol Retry Settings

You can configure the number of retries for communications. 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 driver you want to configure.

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



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

Configuring Hand Shake Settings

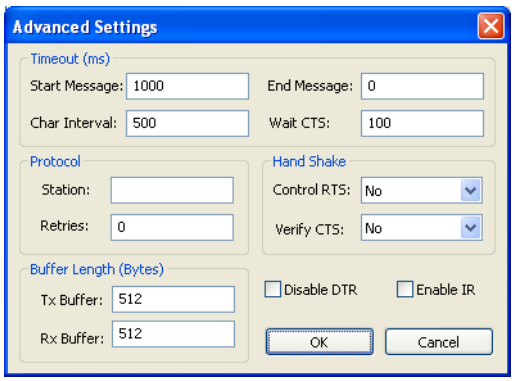
You can configure the following Hand Shake settings:

- 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 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:

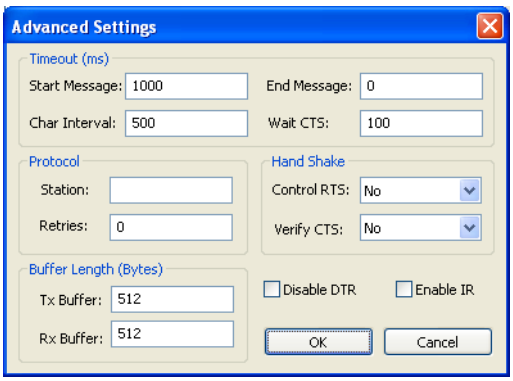
- Transmission Buffer (Tx) Length
- Reception Buffer (Rx) Length

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

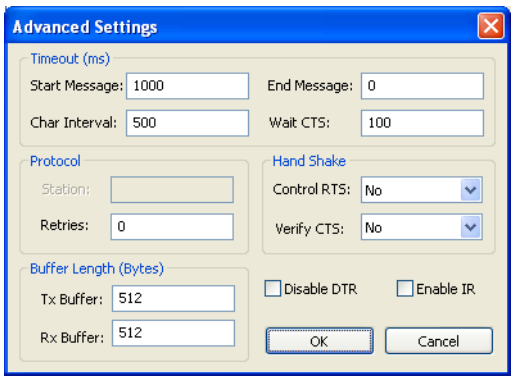
You can enable or disable the DTR and IR settings.

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 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

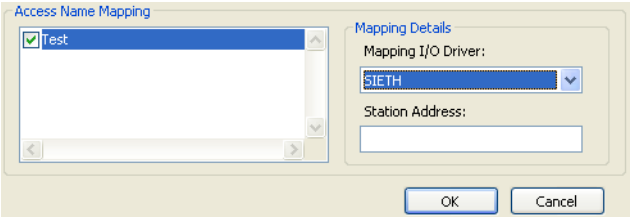
After configuring the PLC driver, you need to associate it with an existing InTouch Access Name. For more information about creating an InTouch Access Name, see the *InTouch HMI Data Management Guide*.

When you associate an PLC driver with an Access Name, you must also specify a Station Address. The Station Address is needed by some drivers to specify slave network addresses of PLCs.

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

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 from WindowMaker.

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>:<Rack>:<Slot>

   Where,

   - *IP Address*: PLC IP Address
   - *Rack*: The rack number.
   - *Slot*: The slot number.

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

Error Code	Description
0	No error
1	Invalid serial port
2	Invalid baud rate
3	Invalid number of bits
4	Invalid number of stop bits
5	Invalid parity
6	Invalid irq
7	Serial port already in use
8	Invalid buffer size
9	Out of memory
10	Tx buffer empty
11	Tx buffer full
12	Rx buffer empty
13	Rx buffer full
14	Time out waiting CTS
15	Time out waiting to start a message
16	Time out waiting for a message to finish

Error Code	Description
17	Time out between rx char
18	Time out between tx char
19	No carrier detected
32	Time out waiting for a tx message to finish
33	Invalid driver configuration file
34	Invalid/unsupported item name
35	Driver API not initialized
36	Invalid/unsupported item name
37	Invalid/unsupported item name
38	Invalid station address
39	Invalid block size
244	Function is not supported
245	Internal error, please check
246	Listed job number is invalid
247	At least one parameter for opening the device is invalid
248	No free space in the request queue
249	The necessary class cannot be initialized
250	The necessary memory cannot be allocated
251	Device is not open
252	Device was not found
253	Device is already in use, open, or update is not valid
254	Function is not valid
255	End of program request
256	A parameter was not in the defined range
508	Not all parameters can be changed because the adapter is already initialized
509	Communication process could not be started
510	The parameters were changed because of plausibility checks
511	Parameter length is not supported
512	Requested option is not available

Error Code	Description
752	Sending buffer too small for packet
753	Receiving buffer too small for packet
754	Time out while waiting for DLE after sending the packet
755	Packet to be sent is not correct (length 0 or NULL pointer)
756	After STX arbitrary information was sent instead of DLE
757	After STX NAK was sent instead of DLE
758	Time out after initialization conflict (both have high priority)
759	Time out while waiting for DLE after sending STX
760	Initialization conflict
761	Wrong protocol status
762	CheckSum error
763	Time out while waiting for CheckSum
764	Information after DLE was not DLE or ETX
765	Time out while waiting for packet information (ZVZ)
766	Time out while waiting for beginning of packet (QVZ)
767	Wrong information received instead of STX
768	Time out while waiting for STX at the beginning of the program
1019	Adapter is not initialized
1020	Unknown error message from adapter
1021	Wrong MPI baud rate
1022	The address code is higher than HSA
1023	Requested adapter address already exists
1024	Received packet has wrong content
1260	Type (of data) is not supported
1261	Access to object is not permitted
1262	Invalid station address
1263	Context is not supported
1264	PLC sends no data
1265	Function protection level is not sufficient

Error Code	Description
1266	Context is not supported
1267	Information cannot be determined at the moment
1268	Unknown error message from PLC, please check
1269	Wrong size operands or selected range too large
1270	Wrong operating status of PLC
1271	Error while restarting the PLC
1272	Error while starting the PLC
1273	Wrong PLC operating status
1274	Internal error, please check
1275	No data available (for example, missing DB)
1276	Hardware error (for example, nonexistent peripheral equipment)
1277	Number of frame does not fit
1278	PLC was not found
1279	No additional connection possible
1280	No connection to the requested PLC
1523	DSR signal changed to 0 (modem disconnected)
1524	DCD signal changed to 0 (no carrier)
1525	No connection to remote terminal
1526	No modem found at the device
1527	Error during initialization of auto-answer
1528	Error during initialization of dial tone
1529	Error during initialization of selection procedure
1530	Error during initialization sequence 4
1531	Error during initialization sequence 3
1532	Error during initialization sequence 2
1533	Error during initialization sequence 1
1534	Error during basis initialization (AT&FE0V1)
1535	Modem cannot hang up
1536	General modem error

Error Code	Description
1786	CIF card not logged in on the logical ring (bus)
1787	A resource error exists
1788	Wrong firmware version of CIF card
1789	Wrong hardware version of CIF card
1790	Error in a device driver function
1791	Requested board not found
1792	Requested device driver not found
2038	Close received instead of ReadOK
2039	Time out while reading IP
2040	Error while reading IP
2041	Close received instead of WriteOK
2042	Time out while writing IP
2043	Error while writing IP
2044	Close received instead of ConnectOK (for example, wrong rack or slot number)
2045	Time out while establishing IP connection
2046	Error while establishing IP connection
2047	Listed IP address invalid
2048	Socket cannot be opened
-15	Time out start message
-17	Time out between rx char.

Appendix

SIETH Item References

The SIETH Driver uses an item-naming convention based on two-letter data-type identifiers used in programming the Siemens PLCs. The server accepts both the English and German standard identifiers.

The tables in this section describe the item naming convention for the Siemens S7 PLCs. The ranges specified in these tables vary according to the type of the controller used.

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 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.

The SIETH 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.

The SIETH driver supports valid BCD values from 0 to 9999 and valid LBCD values from 0 to 99999999. Invalid BCD values (e.g.: 1010 in binary base) result in an invalid value written to the tag.

Supported Suffix

Suffix	Supported by InTouch Compact Edition
BCD	Yes
S5T	Yes

Note BCD and S5T are supported only for word type of data

Data Blocks and Instance Blocks

The following table summarizes the data format, item or point, suffix, data type, and range for data blocks and instance blocks.

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Bit	D<B, I>d, Xx.y		VT_BOOL	0 or 1	Yes
String	D<B, I>d, Sx, v		VT_BSTR	String	Yes
	D<B, I>d, STRINGx,v		VT_BSTR	String	
S7 String	D<B, I>d, S7Sx, wD<B, I>d, S7STRINGx, w		VT_BSTR	String	No
			VT_BSTR	String	
Byte	D<B, I>d, Bx	DT	VT_UI1	0 to 255	Yes
	D<B, I>d, BYTEx		VT_UI1	0 to 255	
				1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	D<B, I>d, Bx, vD<B, I>d, BYTEx, v		VT_ARRAY:VT_UI1	0 to 255 for each element	No
			VT_ARRAY:VT_UI1	0 to 255 for each element	
Char	D<B, I>d, CHARx	DT	VT_I1	-128 to 127	Yes
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Char array	D<B, I>d, CHARx, v		VT_ARRAY: VT_I1	-128 to 127 for each element	No

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Word	D<B, I>d, Wn	BCD	VT_UI2	0 to 65535	Yes
	D<B, I>d, WORDn	KT	VT_UI2	0 to 65535	
		S5T	VT_UI2	0 to 9999	
		TR	VT_BSTR	0.0 to 999.3	
		D	VT_BSTR	0ms to 2h46m30s	
			VT_R4	0.0 to 9990.0 (s)	
			VT_BSTR	1990-1-1 to 2168-12-31	
Word array	D<B, I>d, Wn, vD<B, I>d, WORDn, v		VT_ARRAY:VT_UI2 VT_ARRAY:VT_UI2	0 to 65535 for each element 0 to 65535 for each element	No
Integer	D<B, I>d, INTn	BCD	VT_I2	-32768 to 32767	Yes
		D	VT_I2	-999 to 999	
			VT_BSTR	1990-1-1 to 2168-12-31	
Integer array	D<B, I>d, INTn, v		VT_ARRAY: VT_I2	-32768 to 32767 for each element	No
Double word	D<B, I>d, Dm		VT_UI4	0 to 4294967295	Yes
	D<B, I>d, DWORDm		VT_UI4	0 to 4294967295	
			VT_UI4	0 to 99999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	-24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	
Double word array	D<B, I>d, Dm, vD<B, I>d, DWORDm, v		VT_ARRAY:VT_UI4 VT_ARRAY:VT_UI4	0 to 4294967295 for each element 0 to 4294967295 for each element	No

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Double integer	D<B, I>*d*, DINT*m*	BCD TOD T	VT_I4 VT_I4 VT_BSTR VT_BSTR	-2147483648 to 2147483647 -9999999 to 9999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	Yes
Double integer array	D<B, I>d, DINTm		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	No
Real	D<B, I>d, REALm		VT_R4	-3.4e38 to 3.4e38	Yes
Real array	D<B, I>d, REALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	No

Where:

d	The data block number, with a range from 1 to 65535.
x	The start address, with a range from 0 to 65535.
y	The bit position, with a range from 0 to 7. 0 is the LSB (Least Significant Bit).
n	The start address of 2-byte data/2-byte data arrays.
m	The start address of 4-byte data/4-byte data arrays.
v	The length of data in bytes, with a range from 0 to 65534.
w	The length of the net S7 string data in characters (size in S7 message is w+1, size of string representation in S7 PLC is w+2).

Note the following:

- All data blocks are read/write.
- The longest string that can be read in a cyclic service has the length of the PDU size minus 32 bytes. The longest string the InTouch software can process is 131 bytes.
- The longest string that can be written is 256 bytes or the PDU size minus 28 bytes, whichever is less.

For example,

DB123, W24

DB23, DINT10BCD

DI5, X2.0

DI6, BYTE4, 10

Flag Bytes

The following table summarizes data format, item or point, suffix, data type, and range for flag bytes.

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Bit	FX*x.y*		VT_BOOL	0 or 1	Yes
	MX*x.y*		VT_BOOL	0 or 1	
String	FS*x, v*		VT_BSTR	String	Yes
	MS*x, v*		VT_BSTR	String	
	FSTRINGx, v		VT_BSTR	String	
	MSTRING*x, v*		VT_BSTR	String	
Byte	FB*x*	DT	VT_UI1	0 to 255	Yes
	MB*x*		VT_UI1	0 to 255	
	FBYTE*x*		VT_UI1	0 to 255	
	MBYTE*x*		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	FBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	No
	MBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	FBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	MBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Char	FCHAR*x* MCHAR*x*	DT	VT_I1 VT_I1 VT_BSTR	-128 to 127 -128 to 127 1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	Yes
Char array	FCHARx, v MCHARx, v		VT_ARRAY: VT_I1 VT_ARRAY: VT_I1	-128 to 127 for each element -128 to 127 for each element	No
Word	FWn MWn FWORDn MWORDn	BCD KT S5T TR D	VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_BSTR VT_BSTR VT_R4 VT_BSTR	0 to 65535 0 to 65535 0 to 65535 0 to 65535 0 to 9999 0.0 to 999.3 0ms to 2h46m30s 0.0 to 9990.0 (s) 1990-1-1 to 2168-12-31	Yes
Word array	FWn, v MWn, v FWORDn, v MWORDn, v		VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2	0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element	No
Integer	FINT*n* MINT*n*	BCD D	VT_I2 VT_I2 VT_I2 VT_BSTR	-32768 to 32767 -32768 to 32767 -999 to 999 1990-1-1 to 2168-12-31	Yes
Integer array	FINTn, v MINTn, v		VT_ARRAY: VT_I2 VT_ARRAY: VT_I2	-32768 to 32767 for each element -32768 to 32767 for each element	No

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Double word	FD*m*	BCD	VT_UI4	0 to 4294967295	Yes
	MD*m*	TOD	VT_UI4	0 to 4294967295	
	FDWORD*m*	T	VT_UI4	0 to 4294967295	
	MDWORD*m*		VT_UI4	0 to 4294967295	
			VT_UI4	0 to 9999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	-24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	
Double word array	FDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	No
	MDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	FDWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	MDWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
Double integer	FDINT*m*	BCD	VT_14	-2147483648 to 2147483647	Yes
	MDINT*m*	TOD	VT_14	-2147483648 to 2147483647	
		T	VT_14	-9999999 to 9999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	-24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS 7	
Double integer array	FDINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	No
	MDINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Real	FREAL*m*		VT_R4	-3.4e38 to 3.4e38	Yes
	MREAL*m*		VT_R4	-3.4e38 to 3.4e38	
Real array	FREALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	No
	MREALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	

Where:

x	is the start address, with a range from 0 to 65535.
y	is the bit position, with a range from 0 to 7. 0 is the LSB (Least Significant Bit).
n	is the start address of 2-byte data/2-byte data arrays, with a range from 0 to 65534.
m	is the start address of 4-byte data/4-byte data arrays, with a range from 0 to 65532.
v	is the length of data in bytes, with a range from 1 to (net PDU data size/type size - header information).

Note the following:

- All flags are read/write.
- The longest string that can be read in a cyclic service is the length of the PDU size minus 32 bytes. The longest string the InTouch software can process is 131 bytes.
- The longest string that can be written is 256 bytes or the PDU size minus 28 bytes, whichever is less.

Input Bytes

The following table summarizes the data format, item or point, suffix, data type, and range for input bytes.

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Bit	Ix.y		VT_BOOL	0 or 1	Yes
	Ex.y		VT_BOOL	0 or 1	
	IXx.y		VT_BOOL	0 or 1	
	EXx.y		VT_BOOL	0 or 1	
String	ISx, v		VT_BSTR	String	Yes
	ESx, v		VT_BSTR	String	
	ISTRINGx, v		VT_BSTR	String	
	ESTRINGx, v		VT_BSTR	String	
Byte	IB*x*	DT	VT_UI1	0 to 255	Yes
	EB*x*		VT_UI1	0 to 255	
	IBYTE*x*		VT_UI1	0 to 255	
	EBYTE*x*		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	IBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	No
	EBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	IBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	EBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
Char	ICHAR*x*		VT_I1	-128 to 127	Yes
	ECHAR*x*		VT_I1	-128 to 127	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Char array	ICHARx, v		VT_ARRAY: VT_I1	-128 to 127 for each element	No
	ECHARx, v		VT_ARRAY: VT_I1	-128 to 127 for each element	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Word	IW*n* EW*n* IWORD*n* EWORD*n*	BCD KT S5T TR D	VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_BSTR VT_BSTR VT_R4 VT_BSTR	0 to 65535 0 to 65535 0 to 65535 0 to 65535 0 to 9999 0.0 to 999.3 0ms to 2h46m30s 0.0 to 9990.0 (s) 1990-1-1 to 2168-12-31	Yes
Word array	IWn, v EWn, v IWORDn, v EWORDn, v		VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2	0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element	No
Integer	IINT*n* EINT*n*		VT_I2 VT_I2 VT_I2 VT_BSTR	-32768 to 32767 -32768 to 32767 -999 to 999 1990-1-1 to 2168-12-31	Yes
Integer array	IINTn, v EINTn, v		VT_ARRAY: VT_I2 VT_ARRAY: VT_I2	-32768 to 32767 for each element -32768 to 32767 for each element	No
Double word	IDmEDm IDWORDm EDWORDm		VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_BSTR VT_BSTR	0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 99999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	Yes

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Double word array	IDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	No
	EDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	IDWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	EDWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
Double Integer	IDINTm		VT_I4	-2147483648 to 2147483647	Yes
	EDINTm		VT_I4	-2147483648 to 2147483647	
			VT_I4	-9999999 to 9999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	-24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	
Double integer array	IDINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	No
	EDINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	
Real	IREALm		VT_R4	-3.4e38 to 3.4e38	Yes
	EREALm		VT_R4	-3.4e38 to 3.4e38	
Real array	IREALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	No
	EREALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	

Where:

x is the start address, with a range from 0 to 65535.

y is the bit position, with a range from 0 to 7. 0 is the LSB (Least Significant Bit).

n is the start address of 2-byte data/2-byte data arrays, with a range from 0 to 65534.

Where:

m is the start address of 4-byte data/4-byte data arrays, with a range from 0 to 65532.

v is the length of data in bytes, with a range from 1 to (net PDU data size/type size - header information).

Note the following:

- All inputs are read-only.
- The longest string that can be read in a cyclic service is the length of the PDU size minus 32 bytes. The longest string the InTouch software can process is 131 bytes.

Output Bytes

The following table summarizes data format, item or point, suffix, data type, and range for output bytes.

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Bit	Ox.y		VT_BOOL	0 or 1	Yes
	Ax.y		VT_BOOL	0 or 1	
	OXx.y		VT_BOOL	0 or 1	
	AXx.y		VT_BOOL	0 or 1	
String	OSx, v		VT_BSTR	String	Yes
	ASx, v		VT_BSTR	String	
	OSTRINGx, v		VT_BSTR	String	
	ASTRINGx, v		VT_BSTR	String	
Byte	OBx	DT	VT_UI1	0 to 255	Yes
	ABx		VT_UI1	0 to 255	
	OBYTEx		VT_UI1	0 to 255	
	ABYTEx		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Byte array	OBx, v ABx, v OBYTEx, v ABYTEx, v		VT_ARRAY: VT_UI1 VT_ARRAY: VT_UI1 VT_ARRAY: VT_UI1 VT_ARRAY: VT_UI1	0 to 255 for each element 0 to 255 for each element 0 to 255 for each element 0 to 255 for each element	No
Char	OCHARx ACHARx	DT	VT_I1 VT_I1 VT_BSTR	-128 to 127 -128 to 127 1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	Yes
Char array	OCHARx, v ACHARx, v		VT_ARRAY: VT_I1 VT_ARRAY: VT_I1	-128 to 127 for each element -128 to 127 for each element	No
Word	OWn AWn OWORDn AWORDn	BCD KT S5T TR D	VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_BSTR VT_BSTR VT_R4 VT_BSTR	0 to 65535 0 to 65535 0 to 65535 0 to 65535 0 to 9999 0.0 to 999.3 0ms to 2h46m30s 0.0 to 9990.0 (s) 1990-1-1 to 2168-12-31	Yes
Word array	OWn, v AWn, v OWORDn, v AWORDn, v		VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2	0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element	No
Integer	OINTn AINTn	BCD D	VT_I2 VT_I2 VT_I2 VT_BSTR	-32768 to 32767 -32768 to 32768 -999 to 999 1990-1-1 to 2168-12-31	Yes

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Integer array	OINTn, v		VT_ARRAY: VT_I2	-32768 to 32767 for each element	No
	AINTn, v		VT_ARRAY: VT_I2	-32768 to 32768 for each element	
Double word	ODm	BCD	VT_UI4	0 to 4294967295	Yes
	ADm	TOD	VT_UI4	0 to 4294967295	
	ODWORDm	T	VT_UI4	0 to 4294967295	
	ADWORDm		VT_UI4	0 to 4294967295	
			VT_UI4	0 to 99999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	- 24D_20H_31M_23 S_648MS to 24D_20H_31M_23 S_647MS	
Double word array	ODm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	Yes
	ADm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	ODWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
	ADWORDm, v		VT_ARRAY: VT_UI4	0 to 4294967295 for each element	
Double Integer	ODINTm	BCD	VT_I4	-2147483648 to 2147483647	Yes
	ADINTm	TOD	VT_I4	-2147483648 to 2147483647	
		T	VT_I4	-9999999 to 9999999	
			VT_BSTR	0:00:00.000 to 23:59:59.999	
			VT_BSTR	- 24D_20H_31M_23 S_ 648MS to 24D_20H_31M_23 S_ 647MS	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Double integer array	ODINTm, v ADINTm, v		VT_ARRAY: VT_I4 VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element -2147483648 to 2147483647 for each element	No
Real	OREALm AREALm		VT_R4 VT_R4	-3.4e38 to 3.4e38 -3.4e38 to 3.4e38	Yes
Real array	OREALm, v AREALm, v		VT_ARRAY: VT_R4 VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element -3.4e38 to 3.4e38 for each element	No

Where:

x is the start address, with a range from 0 to 65535.

y is the bit position, with a range from 0 to 7. 0 is the LSB (Least Significant Bit).

n is the start address of 2-byte data/2-byte data arrays, with a range from 0 to 65534.

m is the start address of 4-byte data/4-byte data arrays, with a range from 0 to 65532.

v is the length of data in bytes, with a range from 1 to (net PDU data size/type size - header information).

Note the following:

- All outputs are read/write.
- The longest string that can be read in a cyclic service is the length of the PDU size minus 32 bytes. The longest string the InTouch software can process is 131 bytes.
- The longest string that can be written is 256 bytes or the PDU size minus 28 bytes, whichever is less.

Peripheral Output Bytes

The following table summarizes data format, item or point, suffix, data type, and range for Peripheral Output Bytes.

Data Format	Item/Point	Suffix	Data Type	Range	CE Supported
Bit	POx.y		VT_BOOL	0 or 1	No
	PAx.y		VT_BOOL	0 or 1	
	POXx.y		VT_BOOL	0 or 1	
	PAXx.y		VT_BOOL	0 or 1	
String	POSx, v		VT_BSTR	String	No
	PASx, v		VT_BSTR	String	
	POSTRINGx, v		VT_BSTR	String	
	PASTRINGx, v		VT_BSTR	String	
Byte	POBx	DT	VT_UI1	0 to 255	No
	PABx		VT_UI1	0 to 255	
	POBYTEx		VT_UI1	0 to 255	
	PABYTEx		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	POBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	No
	PABx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	POBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	PABYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
Char	PACHARx	DT	VT_I1	-128 to 127	No
	POCHARx		VT_I1	-128 to 127	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	

Data Format	Item/Point	Suffix	Data Type	Range	CE Supported
Char array	POCHARx, v PACHARx, v		VT_ARRAY: VT_I1 VT_ARRAY: VT_I1	-128 to 127 for each element -128 to 127 for each element	No
Word	POWn PAWn POWORDn PAWORDn	BCD KT S5T TR D	VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_UI2 VT_BSTR VT_BSTR VT_R4 VT_BSTR	0 to 65535 0 to 65535 0 to 65535 0 to 65535 0 to 9999 0.0 to 999.3 0ms to 2h46m30s 0.0 to 9990.0 (s) 1990-1-1 to 2168-12-31	No
Word array	POWn, v PAWn, v POWORDn, v PAWORDn, v		VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2	0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element 0 to 65535 for each element	No
Integer	POINTn PAINTn	BCD D	VT_I2 VT_I2 VT_I2 VT_BSTR	-32768 to 32767 -32768 to 32767 -999 to 999 1990-1-1 to 2168-12-31	No
Integer array	POINTn, v PAINTn, v		VT_ARRAY: VT_I2 VT_ARRAY: VT_I2	-32768 to 32767 for each element -32768 to 32767 for each element	No
Double word	PODm PADm PODWORDm PADWORDm	BCD TOD T	VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_BSTR VT_BSTR	0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 99999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_ 648MS to 24D_20H_31M_23S_ 647MS	No

Data Format	Item/Point	Suffix	Data Type	Range	CE Supported
Double word array	PODm, v PADm, v		VT_ARRAY: VT_UI4 VT_ARRAY: VT_UI4	0 to 4294967295 for each element 0 to 4294967295 for each element	No
Double Integer	PODINTm PADINTm	BCD TOD T	VT_I4 VT_I4 VT_I4 VT_BSTR VT_BSTR	-2147483648 to 2147483647 -2147483648 to 2147483647 -9999999 to 9999999 0:00:00.000 to 23:59:59.999 - 24D_20H_31M_23 S_ 648MS to 24D_20H_31M_23 S_ 647MS	No
Double integer array	PODINTm, v PADINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	No
Real	POREALm PAREALm		VT_R4 VT_R4	-3.4e38 to 3.4e38 -3.4e38 to 3.4e38	No
Real array	POREALm, v PAREALm, v		VT_ARRAY: VT_R4 VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element -3.4e38 to 3.4e38 for each element	No

Peripheral Input Bytes

The following table summarizes data format, item or point, suffix, data type, and range for peripheral input bytes.

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Bit	PIx.y		VT_BOOL	0 or 1	No
	PEx.y		VT_BOOL	0 or 1	
	PIXx.y		VT_BOOL	0 or 1	
	PEXx.y		VT_BOOL	0 or 1	
String	PISx, v		VT_BSTR	String	No
	PESx, v		VT_BSTR	String	
	PISTRINGx, v		VT_BSTR	String	
	PESTRINGx, v		VT_BSTR	String	
Byte	PIBx	DT	VT_UI1	0 to 255	No
	PEBx		VT_UI1	0 to 255	
	PIBYTEx		VT_UI1	0 to 255	
	PEBYTEx		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	PIBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	No
	PEBx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	PIBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
	PEBYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
Char	PICHARx	DT	VT_I1	-128 to 127	No
	PECHARx		VT_I1	-128 to 127	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Word	PIWn	BCD	VT_UI2	0 to 65535	No
	PEWn	KT	VT_UI2	0 to 65535	
	PIWORDn	S5T	VT_UI2	0 to 65535	
	PEWORDn	TR	VT_UI2	0 to 65535	
		D	VT_UI2	0 to 9999	
			VT_BSTR	0.0 to 999.3	
			VT_BSTR	0ms to 2h46m30s	
			VT_R4	0.0 to 9990.0 (s)	
			VT_BSTR	1990-1-1 to 2168-12-31	
Word array	PIWn, v		VT_ARRAY: VT_UI2	0 to 65535 for each element	No
	PEWn, v		VT_ARRAY: VT_UI2	0 to 65535 for each element	
	PIWORDn, v		VT_ARRAY: VT_UI2	0 to 65535 for each element	
	PEWORDn, v		VT_ARRAY: VT_UI2	0 to 65535 for each element	
Integer	PIINTn	BCD	VT_I2	-32768 to 32767	No
	PEINTn	D	VT_I2	-32768 to 32767	
			VT_I2	-999 to 999	
			VT_BSTR	1990-1-1 to 2168-12-31	
Integer array	PIINTn, v		VT_ARRAY: VT_I2	-32768 to 32767 for each element	No
	PEINTn, v		VT_ARRAY: VT_I2	-32768 to 32767 for each element	

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Double word	PIDm PEDm PIDWORDm PEDWORDm	BCD TOD T	VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_UI4 VT_BSTR VT_BSTR	0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 4294967295 0 to 99999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_648MS to 24D_20H_31M_23S_647MS	No
Double word	Array PIDm, v PEDm, v PIDWORDm, v PEDWORDm, v		VT_ARRAY: VT_UI4 VT_ARRAY: VT_UI4 VT_ARRAY: VT_UI4 VT_ARRAY: VT_UI4	0 to 4294967295 for each element 0 to 4294967295 for each element 0 to 4294967295 for each element 0 to 4294967295 for each element	No
Double integer	PIDINTm PEDINTm	BCD TOD T	VT_I4 VT_I4 VT_I4 VT_BSTR VT_BSTR	-2147483648 to 2147483647 -2147483648 to 2147483647 -9999999 to 9999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_ 648MS to 24D_20H_31M_23S_647MS	No
Double integer array	PIDINTm, v PEDINTm, v		VT_ARRAY: VT_I4 VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element -2147483648 to 2147483647 for each element	No

Data Format	Item/Point	Suffix	Data Type	Range	Supported by InTouch Compact Edition
Real	PIREALm		VT_R4	-3.4e38 to 3.4e38	No
	PEREALm		VT_R4	-3.4e38 to 3.4e38	
Real array	PIREALm, v PEREALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	No
			VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	

Counters

The following table summarizes data format, item or point, suffix, data type, and range for Counters.

Data Format	Item/Point	Suffix	Data Type	Range	CE Supported
Word	C*x*	BCD	VT_UI2	0…65535	Yes
	Z*x*	KT	VT_UI2	0 to 65535	
		S5TT	VT_UI2	0 to 9999	
			VT_BSTR	0.0 to 999.3	
			VT_BSTR	0ms to 2h46m30s	

Where:

x is the start address, with a range from 0 to 65535.

When the suffix is used, the client is responsible for ensuring the correct value is specified or returned.

Note the following:

- All counters are read/write.
- Although the SIETH driver allows writing any word value into counters, the S7 PLC can only process values in the range of 0…2457.

Timers

The following table summarizes data format, item or point, suffix, data type, and range for timers.

Data Format	Item/Point	Suffix	Data Type	Range	CE Supported
Word	T*x*	BCD	VT_UI2	0 to 14745	Yes
		KT	VT_UI2	0 to 9999	
		S5T	VT_BSTR	0.0 to 999.3	
			VT_BSTR	0ms to 2h46m30s	
Real	TREALx		VT_R4	0.0 to 9990.00	No

Where:

x is the start address, with a range from 0 to 65535.

When the suffix is used, the client is responsible for ensuring the correct value is specified or returned.

Note the following:

- All timers are read/write.
- Although the SIETH driver allows writing any word value into timers, the S7 PLC can only process values that represent a valid time format.

Block Items

The following table summarizes data format, item or point, suffix, data type, and range for block items

Data Format	Item/Point	Suffix	Data Types	Ranges	Supported by InTouch Compact Edition
Bit	BLd, Xx.y		VT_BOOL	0 or 1	No
String	BLd, Sx, v		VT_BSTR	String	No
	BLd, STRINGx, v		VT_BSTR	String N	
S7 String	BLd, S7Sx, w		VT_BSTR	String	No
	BLd, S7STRINGx, w		VT_BSTR	String	
Byte	BLd, Bx	DT	VT_UI1	0 to 255	No
	BLd, BYTEx		VT_UI1	0 to 255	
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Byte array	BLd, Bx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	No
	BLd, BYTEx, v		VT_ARRAY: VT_UI1	0 to 255 for each element	
Char	BLd, CHARx	DT	VT_I1	-128 to 127	No
			VT_BSTR	1990-1-1-0:00:00.000 to 2089-12-31-23:59:59.999	
Char array	BLd, CHARx, v		VT_ARRAY: VT_I1	-128 to 127 for each element	No

Data Format	Item/Point	Suffix	Data Types	Ranges	Supported by InTouch Compact Edition
Word	BLd, Wn BLd, WORDn	BCD KT S5T TR D	VT_UI2 VT_UI2 VT_UI2 VT_BSTR VT_BSTR VT_R4 VT_BSTR	0 to 65535 0 to 65535 0 to 9999 0.0 to 999.3 0ms to 2h46m30s 0.0 to 9990.0 (s) 1990-1-1 to 2168-12-31	No
Word array	BLd, Wn, v BLd, WORDn, v		VT_ARRAY: VT_UI2 VT_ARRAY: VT_UI2	0 to 65535 for each element 0 to 65535 for each element	No
Integer	BLd, INTn	BCD D	VT_I2 VT_I2 VT_BSTR	-32768 to 32767 -999 to 999 1990-1-1 to 2168-12-31	No
Integer array	BLd, INTn, v		VT_ARRAY: VT_I2	-32768 to 32767 for each element	No
Double word	BLd, Dm BLd, DWORDm	BCD TOD T	VT_UI4 VT_UI4 VT_UI4 VT_BSTR VT_BSTR	0 to 4294967295 0 to 4294967295 0 to 99999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_ 648MS to 24D_20H_31M_23S_ 647MS	No

Data Format	Item/Point	Suffix	Data Types	Ranges	Supported by InTouch Compact Edition
Double word	Array BLd, Dm, v BLd, DWORDm, v		VT_ARRAY: VT_UI4 VT_ARRAY: VT_UI4	0 to 4294967295 for each element 0 to 4294967295 for each element	No
Double integer	BLd, DINTm	BCD TOD T	VT_I4 VT_I4 VT_BSTR VT_BSTR	-2147483648 to 2147483647 -9999999 to 9999999 0:00:00.000 to 23:59:59.999 -24D_20H_31M_23S_ 648MS to 24D_20H_31M_23S_ 647MS	No
Double integer array	BLd, DINTm, v		VT_ARRAY: VT_I4	-2147483648 to 2147483647 for each element	No
Real	BLd, REALm		VT_R4	-3.4e38 to 3.4e38	No
Real array	BLd, REALm, v		VT_ARRAY: VT_R4	-3.4e38 to 3.4e38 for each element	No

Conversions and Suffixes of Items

This section describes what data-format items and suffixes are converted and what they are converted into.

Endian Conversion

In endian conversions, all items with the following data formats are copied in a reverse-byte order to convert the data from the big endian of the PLC to the little endian of the computer:

- Word
- Integer
- Double word
- Double integer
- Real

Suffix S5T

All items with the following data format and suffix S5T are converted from S5T to a message and back to store a value in the range of 0ms to 2h46m30s.

- Word

The memory in the PLC is exactly the same as for the KT items, but the presentation is different. Although it means the same value. This means a memory content of 0x3999 results in the string of 2h46m30s0ms.

999.3 (KT) means the following:

999	The first three characters are the time value in BCD.
3	The last digit is the multiplier. Possible values are: 0: 0.01s 1: 0.1s 2: 1s 3: 10s.

This means:

A value of 123.0 represents:	123*0.01s=1.23s (equals 1s230ms)
A value of 543.2 represents:	543*1s=543s (equals 9m3s0ms)
A value of 999.3 represents:	999*10s=9990s (equals 2h46m30s0ms)

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