

## 5.12 S7-300&400 (MPI/Profibus - ISOTCP)

### 5.12.1 Introduction

S73&400 IO Server is dedicated to communicate directly with SIEMENS PLC (S7-300 & S7-400). The eWON will connect directly to the PLC's MPI interface or Profibus DP interface.

**WARNING: The MPI/Profibus interface require a special serial port hardware!**  
**ONLY the eWON MPI/Profibus are able to communicate in MPI/Profibus**  
 eWON product codes like EWxxx6x (i.e.: EW41264 eWON4001 MPI with pstn modem)

eWONs MPI/Profibus have a Serial Gender-Changer fixed on DB9 connector to provide female DB9 connector.

eWONs MPI/Profibus have a coloured (in light blue) square around DB9 connector labeled MPI (see photo on right).

Others Serial IO Server (i.e.: PPI, modbus RTU) are not available on eWON MPI/Profibus.

The ISOTCP (Ethernet) is available on all eWON types.

With an eWON500 (with a standard Serial Port), you can have access by Ethernet to a S7-300&400 Siemens PLC thanks to the ISOTCP protocol.

With an eWON500-MPI, you can have acces by the MPI port **and** by ISOTCP to your S7-300&400, if it has the two interfaces.

**Multi-Session:** Since firmware 5.4, the ISOTCP-MPI gateway allows multiple clients to access the same PLC at the same time.



### 5.12.2 Setup

#### 5.12.2.1 COM configuration

573 & 400 IO Server & Gateway settings			
<b>Gateway Configuration</b>			
Destination MPI/PROFIBUS Node:	<input type="text" value="destination Node"/>	<input type="text"/>	0..126,default: 2
<b>MPI/PROFIBUS Setup</b>			
Baud Rate:	<input type="text" value="187500"/>		Default 187500
Reply Timeout:	<input type="text"/>	M5	50..50000, default: 3000
MPI/PROFIBUS Address:	<input type="text"/>		Device address of eWON on link (0..126, default: 0)
MPI/PROFIBUS Highest Station Address:	<input type="text" value="31"/>		Default: 31

Figure 91: MPI link configuration

Parameter	Description
<b>Gateway MPI/Profibus Destination Node</b>	Identifies the PLC MPI/Profibus Destination address when ISOTCP is used
<b>Baud Rate</b>	Speed of the MPI port. Available speeds are: <ul style="list-style-type: none"> <li>• <b>disable</b></li> <li>• <b>19.2 kBauds</b></li> <li>• <b>187.5 kBauds</b></li> <li>• <b>1.5 MBauds</b></li> <li>• <b>3 MBauds (only for 2005CD-MPI or 4005CD-MPI)</b></li> <li>• <b>6 MBauds (only for 2005CD-MPI or 4005CD-MPI)</b></li> <li>• <b>12 MBauds (only for 2005CD-MPI or 4005CD-MPI)</b></li> </ul>
<b>Reply Timeout</b>	Maximum time the eWON will wait for a valid MPI message response
<b>MPI Address</b>	Device address of eWON on MPI link (0..126, default is 0)
<b>MPI Highest Station Address</b>	Highest station address polled by eWON. Select between 15, 31, 63 or 127.

Figure 92: MPI/Profibus settings

5.12.2.2 Topic configuration

<b>Topic A :</b>		<input checked="" type="checkbox"/> Enabled
Topic Name:	A	
Global Device Address:	<input type="text" value="MPI,7"/>	MPI/PROFIBUS, <u>destination Node</u> or ISOTCP, ISOTCP address
Poll Rate	<input type="text" value=""/> MS	Default: 2000
<b>Topic B :</b>		<input checked="" type="checkbox"/> Enabled
Topic Name:	B	
Global Device Address:	<input type="text" value="PROFIBUS,9"/>	MPI/PROFIBUS, <u>destination Node</u> or ISOTCP, ISOTCP address
Poll Rate	<input type="text" value=""/> MS	Default: 2000
<b>Topic C :</b>		<input checked="" type="checkbox"/> Enabled
Topic Name:	C	
Global Device Address:	<input type="text" value="ISOTCP,10.0.120.204,03.02"/>	MPI/PROFIBUS, <u>destination Node</u> or ISOTCP, ISOTCP address
Poll Rate	<input type="text" value=""/> MS	Default: 2000

Figure 93: Topic configuration

Three (3) topics can be used for the IO Server. These topics are used to give a common property to a group of MPI/ISOTCP Tags like:

- Enable/Disable
- Global Device Address
- Polling Rate

Topic configuration item	Description
<b>Topic enabled</b>	Enable or disable polling of all Tags in the topic.
<b>Global Device Address</b>	See below for the Device Address Syntax. If an address is specified here, it will replace (overload) the address-defined Tag by Tag.
<b>Poll rate</b>	Defines the refresh rate of the Tag name. In a complex application, we can imagine that some Tag names must be refreshed every second - typically for digital input - and other every minute - typically: temperature-.

5.12.3 Tag name convention

<b>IO Server Name</b>	S73&400	
<b>Topic Name</b>	A	
	B	
	C	
<b>Item Name</b>	ValueName, Global Device Address	PLC address is defined Tag by Tag
	ValueName	Topic PLC Address is used.

Table 96: S73&400 IO server - Tag name convention table

The Item Name can contain the PLC address where the value is polled, or not. If address is also specified at topic level, the address specified at Tag level will be ignored.

**5.12.3.1 Value Name**

The syntax is the following:

**<Memory Type><Modifier><address>**

Symbol	Memory Type	Modifier	Address
<b>DBx</b>	Data Block number x	B, C, W, S, D, L, F	Byte offset
<b>M</b>	Internal Memory	B, C, <b>W</b> , S, D, L, F	Byte offset
<b>C</b>	Counter	<b>W</b> , S	Object number
<b>T</b>	Timer	<b>W</b> , S	Object number
<b>I</b>	Discrete Inputs	B, C, <b>W</b> , S, D, L, F	Byte offset
<b>Q</b>	Discrete Outputs	B, C, <b>W</b> , S, D, L, F	Byte offset
<b>PI</b>	Peripheral Inputs	B, C, <b>W</b> , S, D, L, F	Byte offset
<b>PQ</b>	Peripheral Outputs	B, C, <b>W</b> , S, D, L, F	Byte offset

**Table 97: S7 300-400 Memory types**

**Important: All addresses are always in BYTES (except for Counter and Timer that are objects)**

**Note: The Modifier can be omitted, the modifier in bold will be used (DB type must have a modifier).**

Symbol	Modifier	value range
<b>B</b>	Byte	0 .. 255
<b>C</b>	signed Byte	-128 .. 127
<b>W</b>	Word	0 .. 65535
<b>S</b>	signed Word	-32768 .. 32767
<b>D</b>	DWord	0 .. 4294967296 (*)
<b>L</b>	signed DWord	-2147483648 .. 2147483647 (*)
<b>F</b>	Float	+/- 3.4e38

**Table 98: S7 300-400 Modifiers**

(\*) Important: See "Tags are stored as Float" on page 62

**Examples**

address	point to
<b>MW4</b>	the Word at address 4 (in bytes) in the Internal Memory
<b>CS1</b>	the Counter number 1, read it as Signed Word
<b>DB2L5</b>	the DWord at address 5 (in bytes) in the Data Block 2
<b>IB3</b>	the Byte at address 3 (in bytes) in the Discrete Inputs zone
<b>I5#2</b>	the bit 2 from the Byte (read 'Bit access modifier' note below) at address 5 in the Discrete Inputs zone

**Table 99: S7 300-400 register address examples**

**• Bit access modifier:**

In any Memory Type (excluding Counter and Timer), it is possible to access a single bit.

A **#x** must be appended to the Value name.

**As the address is always in byte, the Bit index goes only from 0 to 7, no Modifier are allowed (except B to separate DB block from the address).**

The syntax can be used for reading bits and for writing them as well.

**Example:**

**DB1B13#3** represents bit 3 of Byte 13 in DB 1

**invalid: IW5#2** wrong because there is a Modifier

**I5#10** wrong because bit number greater than 7

• **Status register:**

The STATUS Tag is a special Tag that returns information about the current state of the communication for a given device. As for other Tags, the status Tag ValueName is composed of:

**Status, Global Device Address**

- You can define a status Tag for each PLC used.
- If you use the status address, the Tag must be configured as analog.

<b>0</b>	Communication not initialized. Status UNKNOWN. If no Tag is polled on that device address, the communication status is unknown.
<b>1</b>	Communication OK.
<b>2</b>	Communication NOT OK.

**Table 100: Tag Status meaning**

**5.12.3.2 Global Device Address**

The device address is either appended to the ValueName in the Item Name definition, or entered in the Topic global address fields. The device address is composed like following:

MPI					
<b>MPI, MPI node address</b>	<p><b>node address:</b> MPI node address of the PLC</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #00b0f0; color: white;">Topic Name:</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="background-color: #00b0f0; color: white;">Global Device Address:</td> <td style="text-align: center;">MPI,2</td> </tr> </table> <p>Reach by MPI the PLC with the node address 2</p>	Topic Name:	A	Global Device Address:	MPI,2
Topic Name:	A				
Global Device Address:	MPI,2				
<b>PROFIBUS, Profibus node addr</b>	<p><b>node address:</b> PROFIBUS node address of the PLC</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #00b0f0; color: white;">Topic Name:</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="background-color: #00b0f0; color: white;">Global Device Address:</td> <td style="text-align: center;">PROFIBUS,9</td> </tr> </table> <p>Reach by Profibus the PLC with the node address 9</p>	Topic Name:	A	Global Device Address:	PROFIBUS,9
Topic Name:	A				
Global Device Address:	PROFIBUS,9				
ISOTCP					
<b>ISOTCP, IP address, CalledTSAP</b>	<p><b>IP address :</b> IP address of the PLC (ex: 10.0.120.204) <b>Called TSAP :</b> Transport Service Access Point (ex: 03.02)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #00b0f0; color: white;">Topic Name:</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="background-color: #00b0f0; color: white;">Global Device Address:</td> <td style="text-align: center;">ISOTCP,10.0.120.204,03.02</td> </tr> </table> <p>Reach by ISOTCP the PLC at IP 10.0.120.204 with the TSAP 03.02</p>	Topic Name:	B	Global Device Address:	ISOTCP,10.0.120.204,03.02
Topic Name:	B				
Global Device Address:	ISOTCP,10.0.120.204,03.02				
<b>ISOTCP, IP address, CalledTSAP, Subnet ID, MPI node address</b>	<p><b>IP address :</b> IP address of the PLC (ex: 10.0.120.204) <b>Called TSAP :</b> Transport Service Access Point (ex: 03.02) <b>Subnet ID :</b> ID of the MPI subnet <b>MPI node address :</b> address of the PLC</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #00b0f0; color: white;">Topic Name:</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="background-color: #00b0f0; color: white;">Global Device Address:</td> <td style="text-align: center;">ISOTCP,10.0.120.204,03.02,0020-0001,2</td> </tr> </table>	Topic Name:	B	Global Device Address:	ISOTCP,10.0.120.204,03.02,0020-0001,2
Topic Name:	B				
Global Device Address:	ISOTCP,10.0.120.204,03.02,0020-0001,2				

**Table 101: MPI/ISOTCP device address syntax**

**Important:**

If the PLC address is defined at the Topic level, it can be omitted in the Tag definition. In that case the Tag name will only contain the "ValueName".

If the PLC address is specified at the Topic level, it will replace any address defined Tag by Tag.

**note:**

For an S7-300, it's generally always 03.02 .

For an S7-400, you have to take into account the slot number of the CPU.

For example if the CPU is on slot 4 rack 0 use TSAP 03.04, if the CPU is on slot 5 rack 1 use TSAP 03,25.