



**The Siemens Simatic S5,S7 plugin
PRINTED MANUAL**

Siemens Simatic S5,S7 plugin

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1 Introduction

The Multi-Point Interface – Siemens (MPI) is a proprietary interface of the programmable logic controller SIMATIC S7 of the company Siemens. It is used for connecting the stations programming (PC or personal computer), operator consoles, and other devices in the SIMATIC family.

Our plugin allows to exchange data with Siemens PLCs: S7-200, 300 and 400 families. It has also been successfully tested with a Speed7 CPU. It can be also used with S7-compatible PLCs from SAIA. It allows to read data from all memory areas and variables you can access in your PLC programs. For example flags, data blocks, input and output image memory, timers and counters.

Supported interfaces:

- MPI for S7 300/400
- PPI for S7 200
- ISO over TCP
- ISO over TCP with CP243
- MPI with IBH NetLink MPI to ethernet gateway

This module has the following features:

- Can send valid data request to any S7-compatible device;
- CRC for each data packet will be calculated and verified automatically;
- Can poll PLC data by a custom interval;
- Can flexibly parse all received data packets and extract register's values.

2 System requirements

The following requirements must be met for "Siemens Simatic S5,S7" to be installed:

Operating system: Windows 2000 SP4 and above, including both x86 and x64 workstations and servers. The latest service pack for the corresponding OS is required.

Free disk space: Not less than 5 MB of free disk space is recommended.

Special access requirements: You should log on as a user with Administrator rights in order to install this module.

The main application (core) must be installed, for example, Advanced Serial Data Logger.

3 Installing Siemens Simatic S5,S7

1. Close the main application (for example, Advanced Serial Data Logger) if it is running;
2. Copy the program to your hard drive;
3. Run the module installation file with a double click on the file name in Windows Explorer;
4. Follow the instructions of the installation software. Usually, it is enough just to click the "Next" button several times;
5. Start the main application. The name of the module will appear on the "Modules" tab of the "Settings" window if it is successfully installed.

If the module is compatible with the program, its name and version will be displayed in the module list. You can see examples of installed modules on fig.1-2. Some types of modules require additional configuration. To do it, just select a module from the list and click the "Setup" button next to the list. The configuration of the module is described below.

You can see some types of modules on the "Log file" tab. To configure such a module, you should select it from the "File type" list and click the "Advanced" button.

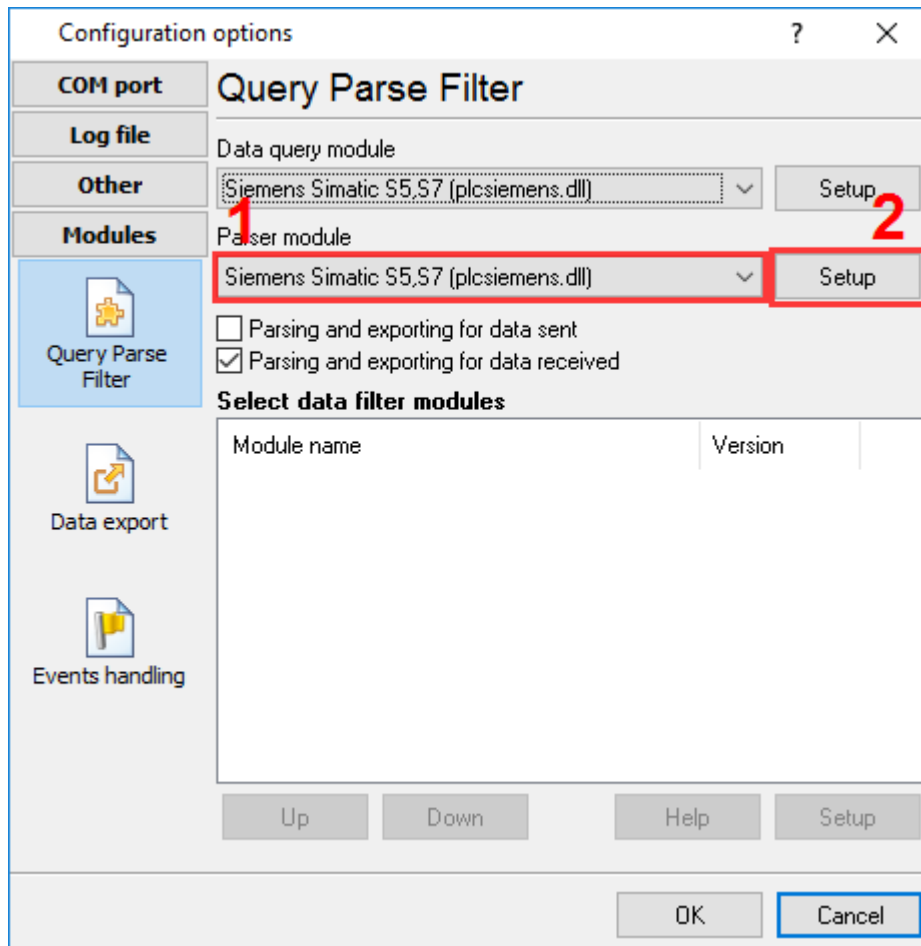


Fig. 1. Example of installed module

4 Glossary

Main program - it is the main executable of the application, for example, Advanced Serial Data Logger and asdlog.exe. It allows you to create several configurations with different settings and use different plugins.

Plugin - it is the additional plugin module for the main program. The plugin module extends the functionality of the main program.

Parser - it is the plugin module that processes the data flow, singling out data packets from it, and then variables from data packets. These variables are used in data export modules after that.

Core - see "Main program."

5 User Manual

5.1 Data query

To add new item click "Actions - Add new request". The dialog window will be shown (fig.1). Enter a request description, that can contain any characters and click the "OK" button.

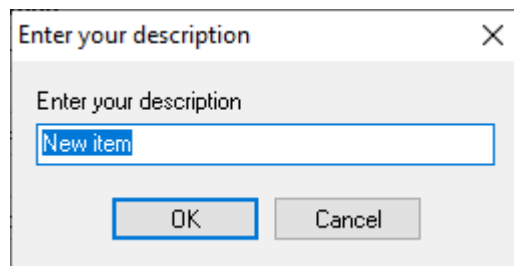


Fig.1. Name dialog

The new request will appear in the requests tree (fig.2). Each request has few important options:

Protocol - the protocol type that the plugin will use to interact with your PLC.

CPU	Connection	Protocol	TCP port (default)
S7 300 or 400	Serial with MPI adapter cable	MPI protocol	
S7 200	Serial with PPI adapter cable	PPI protocol	
S7 300 or 400	Ethernet CP343/443	ISO over TCP	102
S7 200	Ethernet CP243	ISO over TCP (CP243)	102
S7 300 or 400	Ethernet with IBH/MHJ-NetLink Gateway	IBH-Link with TCP/MPI adapter	1099

S7 200	Ethernet with IBH/MHJ-NetLink Gateway	IBH-Link with TCP/MPI adapter using the PPI protocol	1099
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TCP connections are possible in Advanced TCP/IP Data Logger and Data Logger Suite.

Serial connections are possible in Advanced Serial Data Logger and Data Logger Suite.

CPU rack/slot - CPU rack and slot of your PLC. It is used for the ISO over TCP transport with CP343/CP443. Default rack 0, slot 2.

MPI local/remote address - this address will be used with the MPI protocol type and specifies the local address of the computer (in the MPI network) and the remote address of the PLC. Default local address 0, remote address 2.

Area - a memory area in the PLC.

Data block - the number of a data block. Only applicable if Area is "Data block". Otherwise: 0;

Data address - the address of the first byte in the block;

Read bytes - the number of **bytes** to read from the specified memory area and block. Later, the program will decode these bytes to values of various data types. The maximum size depends on your CPU type. It is 222 or 218 bytes in one request.

Request timeout - this is the time interval for which the program is sending request to a device. After reaching the timeout limit the program will automatically cancel current request and execute next request in the queue. The timeout value depends on the network on which master (program) and slave (device) is running. If the network is slow then timeout value should be larger and if network is fast then timeout value can be small.

Simatic 4.0.19 build 1103

Protocol: MPI protocol (Step 7 version)

CPU rack/slot: 0 2

MPI local/remote address: 0 2

Requests queue

Property	Value
Request #1	
<input checked="" type="checkbox"/> Send requests, otherwise parse response only	
Area	Analog Inputs
Data block (global)	0
Data address	0
Read bytes	1
Request timeout (ms)	3000
Request method	
<input type="radio"/> Once, on program startup	
<input checked="" type="radio"/> Polling	
Interval (ms)	1000
Interval units	Millisecond
Response items	
Item #1	
Name	ITEM1

Action: [v]

Minimal interval between data packets (ms): 0

OK Cancel

Fig. 2. Request

5.2 Request method

The plugin can send requests in two modes:

Once, on program startup - the program will send a request once when the program starts.

Polling - the program will send a request periodically based on an interval specified. The interval between requests depends on the network on which master (program) and slave (device) is running. If the network is slow, then the time for each request will be larger and vice versa. Because the program executes all requests in the queue one by one, the time between requests depends on the number of requests in the queue.

Request method	
<input type="radio"/>	Once, on the program startup
<input checked="" type="radio"/>	Polling
Interval (ms)	10000
Interval units	Millisecond

Fig. 2. Request methods

If you have added several requests to the queue, you can move them up or down. To do it, select a request, click the "Action" button, and select an action ("Move up" or "Move down").

You can also click this button to change a request's description or remove a request from the queue.

You can also perform the same actions by using the context menu that pops up when you right-click items in the request tree.

5.3 Data parser

All data export modules use parser variables containing parsed (decoded) values. Our Siemens Simatic S5,S7 picks out significant data blocks (data packets) from the common data flow, analyzes the extracted data packet, and checks its integrity using CRC (cyclical redundancy check).

All parser items are assigned with a corresponding request in the queue. You can define one or more parser items (variables) in one request.

You can add a new parser item (variable) to the request by clicking "Actions - Add response item." Before, you should select a caption of the corresponding request. A new parser item (variable) will appear in the "Response items" group (fig. 3).

Response items	
Voltage Va-n (V)	
Name	VOLTAGE_VA_N
Offset	0
Count	1
<input type="checkbox"/> Append counter to name	
Data type	Single precision float, 32 bit
<input type="checkbox"/> Little endian, otherwise Big endian (numbers only)	
<input type="checkbox"/> Unsigned, otherwise Signed (decimal numbers only)	
<input checked="" type="checkbox"/> Swapped (most significant register first) (32 and 64 bit numbers only)	

Fig. 3. Data parser items.

Each response item has a few important options:

- **Name** - the of the parser variable. This name you'll bind with fields in data publication modules.
- **Offset** - the device can respond few data bytes, but you need only some of them. The "Offset" field contains a byte offset of the data from the beginning of the data block. This value is zero-based. If the first byte of your value is located at the beginning of the data block, then this value

should be 0. You can specify -1 here. Then the program will automatically calculate the value offset. Please, note, the data block does not include a data packet header (address and data size).

- **Count** - is the number of values (not bytes) with the same parameters (data type and default value), located one after another since the offset. If you specify more than one here, then a value index (1, 2, 3, etc.) will be added to the parser item name. Please note that it is a count of values, not bytes or registers (one value can allocate one or more bytes or registers).
- **Data type** - is the data type of the value. Each value can utilize one (for the "Byte" data type) or more bytes.
- **Default value** - this value will be used if the parser can't parse data block for this parser item. For example, if the data block has a small size or offset is too large.

6 Troubles?

6.1 Possible problems

No data for publication/exporting - no data is passed for export. Solution: configure the parser and make sure that one or more variables are defined in the parser.

Error on binding variable with name %s [%s] - the error usually occurs if data does not correspond to the specified format. For example, the date and time format does not match source data.

Unable to disconnect from the database [%s] and **Unable to connect to a database [%s]** - it is impossible to connect or disconnect from the database. You should check the parameters of the database connection. The analysis of the additional information will help you locate the error.

Database access error [%s]. Stop operations with the database? - the message appears if an error occurs during an attempt to execute an SQL query if the second variant of reacting to errors is selected. The message implies the "Yes" or "No" answer. The analysis of the additional information will help you locate the error.

Unable to verify your SQL script [%s] - the message appears when an attempt to analyze your SQL query fails. Check if the syntax of your SQL query is correct.

Tested successfully - the message appears if your database connection is successfully tested. It requires no additional actions.

Database isn't used - the message appears if the module is temporarily disabled (the "Temporarily disabled" check box is selected) or the database name field is empty. Check the connection parameters.

Database isn't selected - the message appears if the database type is not selected. Check the connection parameters.

Database: %s - %s contains the database name. The message appears if the database connection is successful. Usually, you see it when you call the module for the first time. It requires no additional actions.

Invalid data block length (columns=%d,length=%d) - an internal application error. It means that the data sent by the parser is in an invalid format. Perhaps, you are using the module incompatible with the version of the Advanced Serial Data Logger kernel. Update the versions of both the kernel and the module.

The time of connection is not due yet (%d,%d) - the message appears during an attempt to connect to the database after the connection to it has been lost and the "Reconnect after" option is enabled. No additional actions are required.

Invalid procedure call. Bad arguments - an attempt to call the module using invalid parameters. Perhaps, you are using the module incompatible with the version of the Advanced Serial Data Logger kernel. Update the versions of both the kernel and the module.

Writing to the database is complete - the message appears if your queue of SQL queries is successfully executed. It requires no additional actions.

Writing to the database is complete with errors - the message appears if the execution of your queue of SQL queries was interrupted by an error. It requires no additional actions.

Your SQL is empty. Please, specify some SQL text first - the message appears if you do not enter the text for your SQL query. Check if the options on the "SQL queue" tab are configured correctly.

Invalid temporary path - the path to the temporary file specified by you does not exist. Enter a new path in the "Temporary folder" field on the "Errors handling" tab.

%s, %d - will be replaced by additional information.