

Using ACTILINK-S Integro with PROFINET - Quick Start Guide

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1.2. Intended Use

Synapticon documentation contains information to ensure the safe and proper use of its products. As such, all Synapticon products should be handled, installed, and maintained by trained automation and control specialists who have knowledge of electrical systems and/or drive technology. These individuals should also be familiar with the applicable standards and requirements.

It is recommended to understand all components, safety information, and precautions for correct operation prior to use. Refer to, and retain, this documentation for reference.

ATTENTION

Synapticon products must be used in accordance with all specified safety requirements, i.e., all standards and regulations, applicable laws.

1.3. Warnings

Boxes are used to indicate potentially dangerous situations as follows:

NOTE

Background information that is not necessarily required for basic operation but for optimal performance.

IMPORTANT

Required for correct functionality. Ignoring these facts may result in erratic behavior or lack of function.

ATTENTION

Indicates a situation that could possibly lead to serious accidents and/or destruction of the servo drive.

DANGER

If these warnings are ignored, hazardous and potentially fatal situations may arise from improper or careless use.

1.4. Reporting Errors

It is in our best interest to provide detailed, user-oriented and error-free documentation. If something is missing, incomprehensible or incorrect, go to [Suggest Documentation Improvement](#) and complete the form displayed there. In the “Link to documentation page” field, enter **Using ACTILINK-S Integro with PROFINET - Quick Start Guide v1.2**.

1.5. Versioning

This documentation will be constantly updated and improved. The version in the footer reflects the current documentation release.

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3. Introduction

This document provides an overview on how to quickly start application programming of the Siemens S7 PLC with ACTILINK-S Integro.

Although this document uses the Siemens PLC as an example, any PLC with PROFINET network support (directly or with a PROFINET adapter module) can be programmed.

3.1. References, Definitions, and Acronyms

Supporting documents:

1. Parameters List
2. GSDML file
3. Motor configuration

3.2. Assumptions

The following assumptions are applicable:

- The ACTILINK-S Integro device is connected in the PROFINET network and is powered.
- The IP address and station-name is assigned (using the Siemen's PRONETA Tool).
- Siemens TIA Portal V19 is installed. (V19 Update:3 has a fix for OPC UA).
- The user has a working knowledge of TIA Portal.

NOTE

The drive in use should be pre-configured.

4. Detailed Description

4.1. Device Identification

- Vendor ID: **0x07C2**
- Device ID: **0x0401**
- Order ID (Article Nr): **6000.000**
(might be different based on the actual product)

4.2. Modules/Telegrams

The following Modules/Telegrams are available to use with the drive.

Module	Type	Remarks
Telegram 500	Telegram	Generic telegram
Telegram 502	Telegram	Speed setpoint
Telegram 507	Telegram	Position setpoint
Telegram 512	Telegram	Torque setpoint
Telegram 590	Telegram	User defined
Parameter Records	Record data (Acyclic)	Configuration parameters

4.2.1. Telegram 500

This is a generic telegram. It has 35 bytes of output data (to control the drive) and 47 bytes of status information.

Input Parameters (To PLC)

Parameter number	Parameter Name	Bit Length
1040	Statusword	16
1552	Modes of operation display	8
1600	Position actual value	32
1728	Velocity actual value	32
1904	Torque actual value	16
25864	Analog input 1	16
25872	Analog input 2	16
25880	Analog input 3	16
25888	Analog input 4	16
26640	Tuning status	32
4048	Digital inputs	32
26656	User MISO	32
20224	Timestamp	32
4032	Position demand internal value	32
1712	Velocity demand value	32
1856	Torque demand	16

Output Parameters (From PLC)

Parameter Index	Parameter Name	Bit Length
1024	Controlword	16
1536	Modes of operation	8
1808	Target Torque	16
1952	Target position	32
4080	Target velocity	32
2848	Torque offset	16
26632	Tuning command	32
4065	Physical outputs	32
4066	Bit mask	32
26648	User MOSI	32
2832	Velocity offset	32

NOTE

The values are in BIG ENDIAN notation.

4.2.2. Telegram 502

This is used for speed control. It sends *speed-set-point* along with *control-word* and receives the *actual-speed* value and *status-word*. It has 6 bytes of input and 6 bytes of output.

Input Parameters (To PLC)

Parameter number	Parameter Name	Bit Length
1040	Statusword	16
1728	Velocity actual value	32

Output Parameters (From PLC)

Parameter Index	Parameter Name	Bit Length
1024	Controlword	16
4080	Target velocity	32

4.2.3. Telegram 507

This is a simplified Position control telegram. It sends *position-set-point* along with *control-word* and receives the *actual-position* value and *status-word*. It has 6 bytes of input and 6 bytes of output.

Input Parameters (To PLC)

Parameter number	Parameter Name	Bit Length
1040	Statusword	16
1600	Position actual value	32

Output Parameters (From PLC)

Parameter Index	Parameter Name	Bit Length
1024	Controlword	16
1952	Target position	32

4.2.4. Telegram 512

This is a simplified Torque control telegram. It sends *torque-set-point* along with *control-word* and receives the *actual-torque* value and *status-word*. It has 4 bytes of input and 4 bytes of output.

Input Parameters (To PLC)

Parameter number	Parameter Name	Bit Length
1040	Statusword	16
1904	Torque actual value	16

Output Parameters (From PLC)

Parameter Index	Parameter Name	Bit Length
1024	Controlword	16
1808	Target Torque	16

4.2.5. Telegram 590 (User defined)

The parameters that are part of this telegram are user defined during configuration .

- A maximum of five parameters up to 18 bytes in total can be configured in set point.
- A maximum of nine parameters up to 34 bytes in total can be configured as actual vaues.

For information on how to configure this telegram, refer to [Parameter Records](#)..

4.2.6. Parameter Records

The parameter records are read and written acyclically. The distributed IO instruction RDREC and WRREC could be used to read and write the records.

Reference code for parameter read write:

```

REGION Read_record_region
  "RDREC_DB"(REQ := "read_parameter_flag_tag",
             ID := "somanet-integro~ParameterSetup_module",
             INDEX := "parameter_number_to_read_tag",
             MLEN := "parameter_length_to_read_tag",
             RECORD := "config_read_data".data);

  "parameter_read_status_tag" := "RDREC_DB".STATUS;

  // If the output is valid then copy to the global tag
  IF ("RDREC_DB".VALID = TRUE) THEN
    // Read is success, hence clear the tag
    "read_parameter_flag_tag" := FALSE;

    // Move it to a variable
    #status_error := Deserialize(SRC_ARRAY := "config_read_data".data,
                                DEST_VARIABLE =>
"parameter_value_readout_tag",
                                POS := #arr_pos_parameter);
  END_IF;
END_REGION

REGION Write_record_region

  #arr_pos_parameter := 0;

  // Serialize the data
  #status_error := Serialize(SRC_VARIABLE := "parameter_value_to_write_tag",
                             DEST_ARRAY => "config_write_data".data,
                             POS := #arr_pos_parameter
  );

  "WRREC_DB"(REQ := "write_parameter_flag_tag",
             ID := "somanet-integro~ParameterSetup_module",
             INDEX := "parameter_number_to_write_tag",
             LEN := "parameter_length_to_write_tag",
             RECORD := "config_write_data".data);

  IF "WRREC_DB".DONE THEN
    "write_parameter_flag_tag" := FALSE;
  END_IF;
END_REGION

```

NOTE:

To view all parameter records, see: [PROFINET Parameter Records List](#).

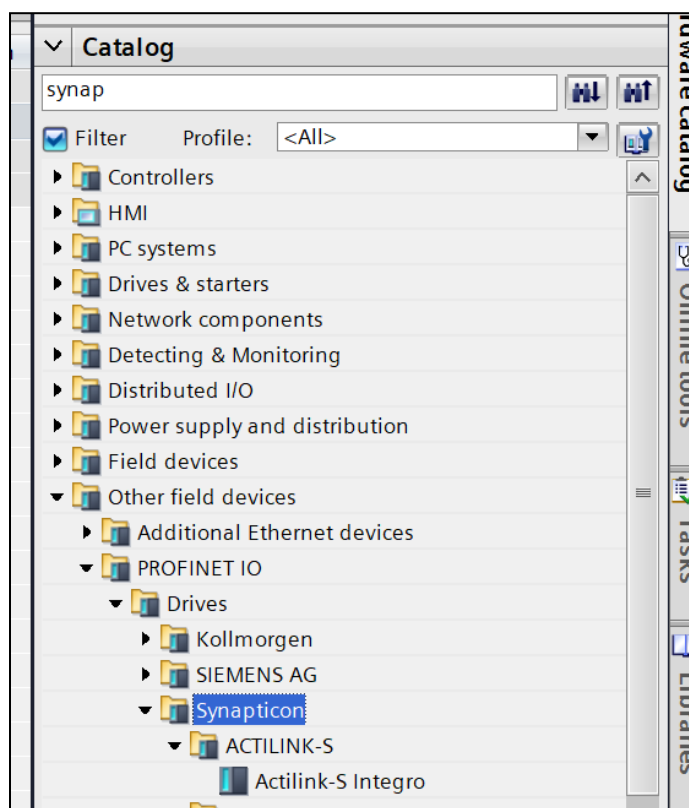
4.3. Fault Detection

The parameter records Statusword (1040), Error Code (1008), and Error Report (17392) would provide a good indication about the Fault conditions.

5. Setting Up the Drive in TIA Portal

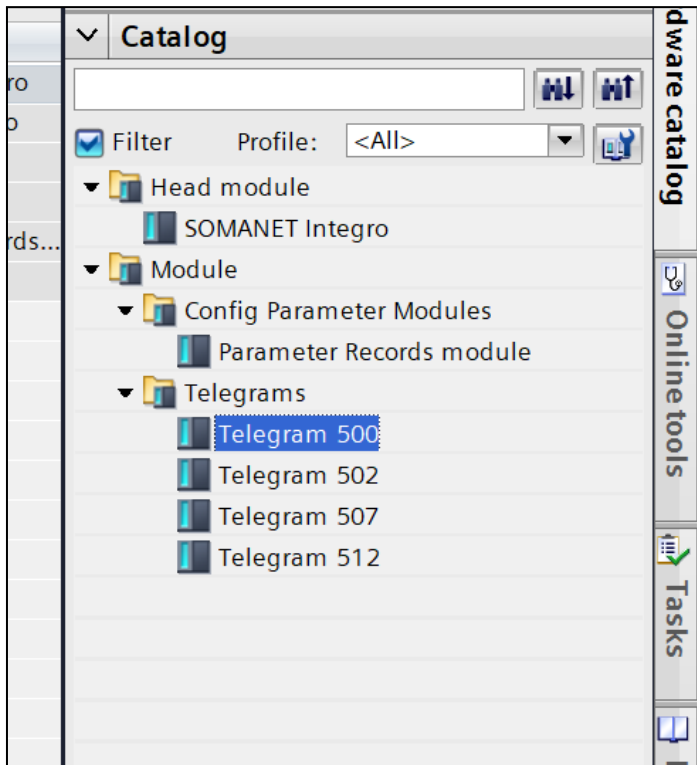
Follow the instructions below to set up the drive in the TIA portal.

1. Install the GSDML file. The current version is:
GSDML - V2.45 - SYNAPTICON - ACTILINK_S - 20250901.xml
2. Search for the 'synapticon' device in the catalog.

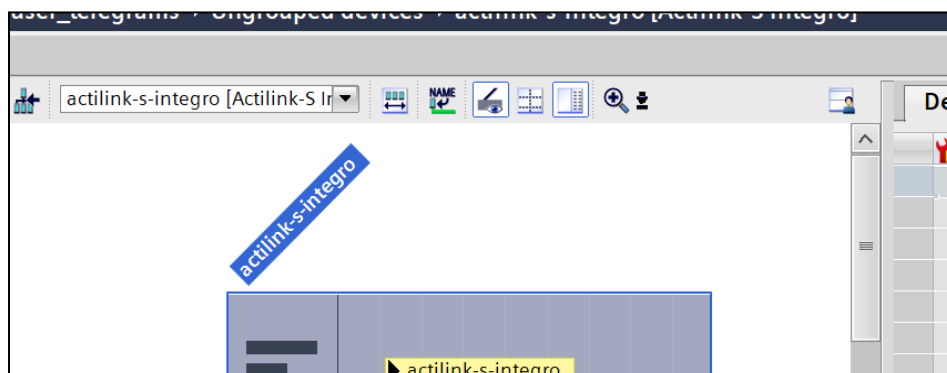


3. Add this device to the "Devices & Networks".

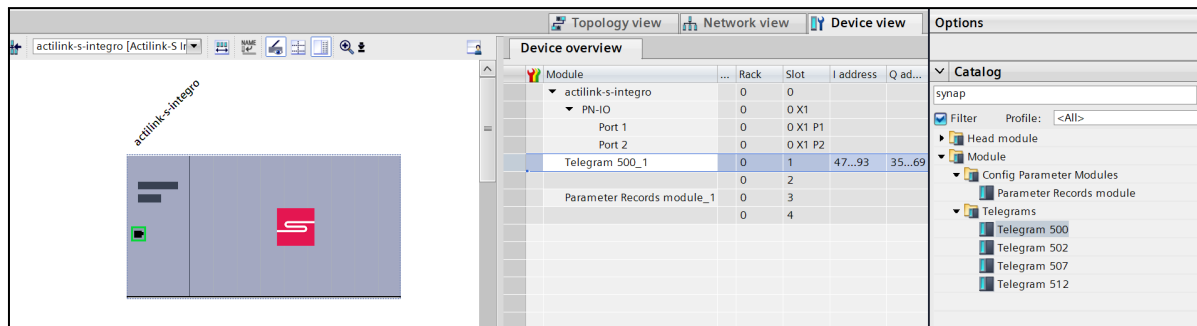
4. Select this device and add the **necessary** sub modules. Only one telegram module can be installed at a time. Additionally, it goes into slot 1. The configuration module goes into slot 3.



5. Assign the station name.
6. Assign the IP address.



7. Connect it to the PLC.



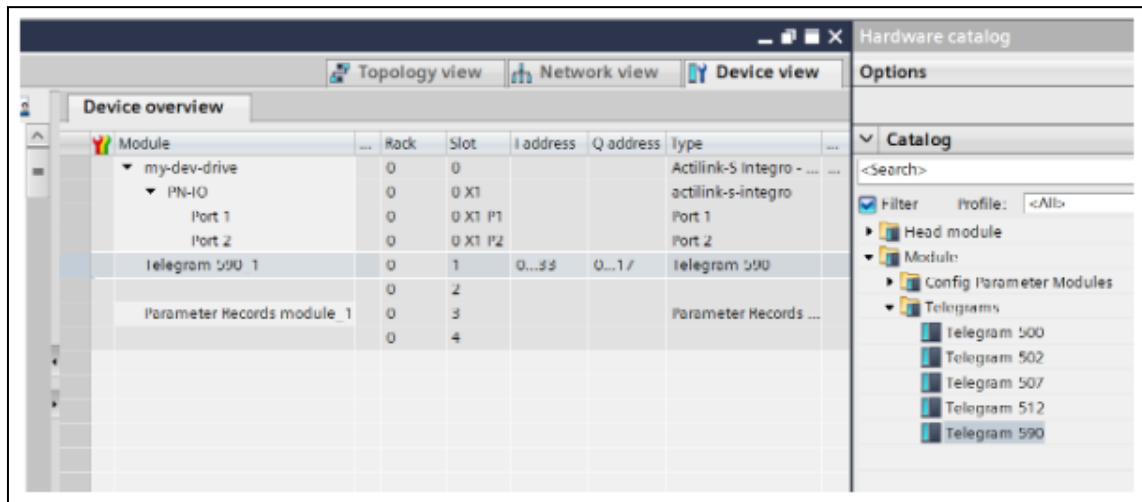
8. Compile the hardware and download; the device is ready for operation.

NOTE

Example programs are available to communicate with the drive and command it to run the motor.

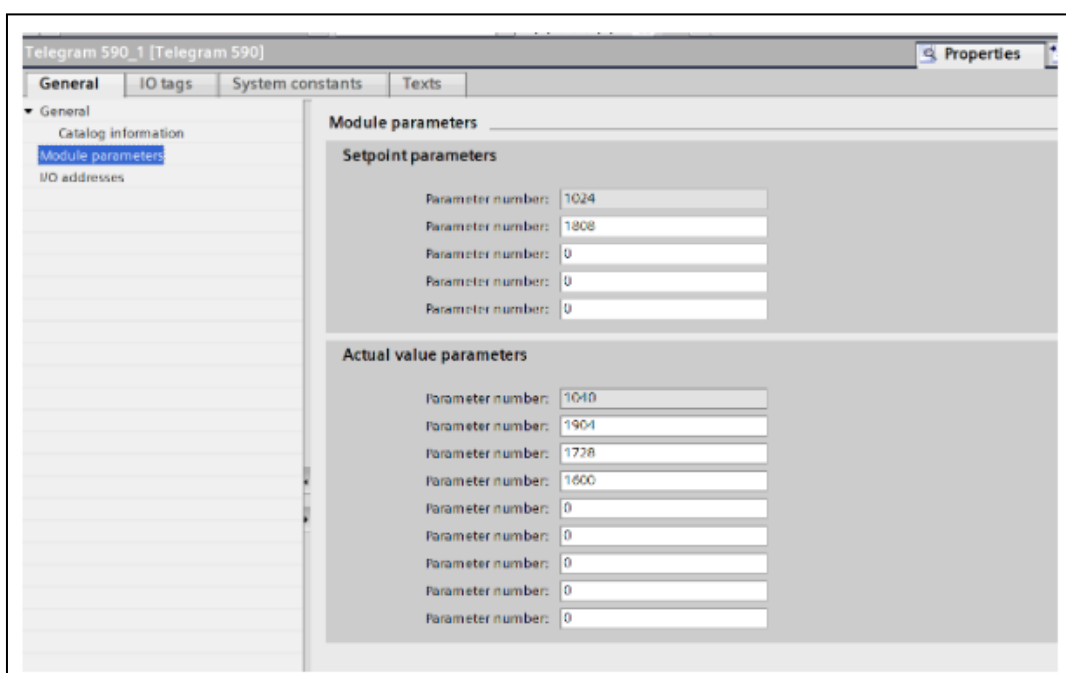
6. Configuring the User Defined Telegram (Telegram 590)

In Tia Portal, Telegram 590 should be selected as a telegram module in slot 1.



Under the **Properties ->General ->Module parameters** tab, add the parameter numbers. The Control word (1024) and Status word (1040) are pre selected.

The user is responsible for entering the correct size of the tags that are created for this telegram. The size of the telegram is fixed (18 bytes and 34 bytes). Ignore the unused bytes.



7. Firmware Update

Firmware updates can be performed using the [OBLAC Drives](#) configuration tool. Additionally, there is an Ethernet-based protocol available for file operations that could be used for sending the firmware file and updating it.