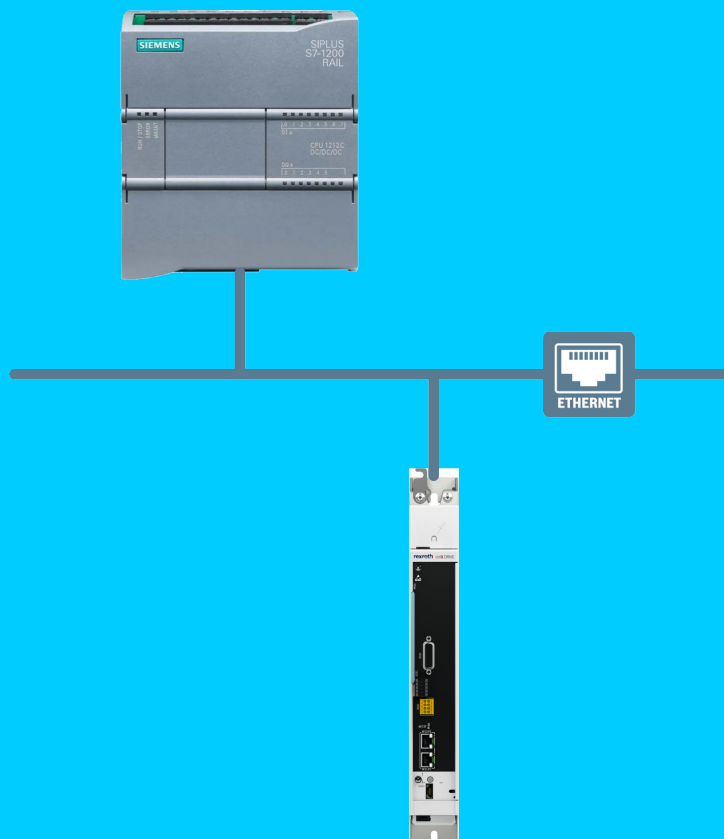


ctrlX DRIVE

Siemens PROFINET

Accessing Parameters via Ethernet (S/IP) with Function Blocks



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DOK-XDRV**-TIA*_ET_SIP-RE01-EN-P

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1 Trademark information

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2 Terms of use

Bosch Rexroth accepts no liability and provides no warranty for the error-free function of the function block(s) in operating conditions other than those specified in this documentation.

The use of the function block(s) in the customer's application program is at the customer's own responsibility.

The described function blocks/applications serve only as examples, i.e. Bosch Rexroth does not assume any liability for compatibility problems that may occur in connection with future controls.

Furthermore, there is no claim to maintenance and/or extension of the released function blocks/applications.

3 About this documentation

It is possible to communicate with a ctrlX DRIVE drive controller via standard Ethernet telegrams. These Ethernet telegrams contain TCP/IP or UDP/IP telegrams for integration in the application.

This documentation describes the PLC function blocks that enable read/write operations of drive parameters via S/IP with TCP/IP telegrams.



See also Application Manual of firmware "S/IP protocol"

The read/write operations are performed asynchronously and not in real time. Furthermore, this documentation describes the required settings in ctrlX DRIVE.

Editions of this documentation

Edition	Release date	Comment
01	2023-11-27	First edition

Feedback on this documentation



Your experience is an important part of the product and documentation improvement process.

In case of any errors or if you want to suggest changes to this documentation, please do not hesitate to contact us.

Please send your feedback to:

➔ dokusupport@boschrexroth.de

4 Configuration – ctrlX DRIVE Engineering

The following paragraphs describe the required configuration of ctrlX DRIVE by means of ctrlX DRIVE Engineering in order to perform read/write operations of drive parameters via S/IP with TCP/IP telegrams using the function blocks described in this documentation.



See also Application Manual of firmware "Establishing a connection to the drive"

Prerequisites

- ctrlX DRIVE Engineering has been installed
- ctrlX DRIVE uses at least firmware AXS-V-0308 or newer

Configuring the master communication of ctrlX DRIVE

➔ The master communication of ctrlX DRIVE has to be set to "PROFINET".

Selecting the application profile:

- AXS-V-0402 and below: "Sercos profile" has to be selected as application profile.
- AXS-V-0404 and above: "FSP Drive profile" has to be selected as application profile.

To change the master communication, restart ctrlX DRIVE.

➔ Master communication and application profile have been configured.

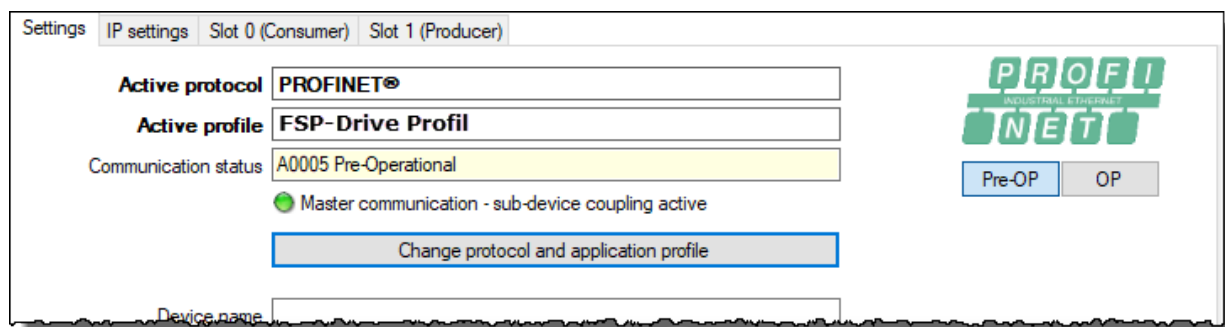


Fig. 1: Configuring the master communication

5 Description of the FB_SIP_Connect function block

Brief description

With the function block FB_SIP_Connect it is possible to establish a connection to the drive controller via the "Connect" S/IP service.

When a connection to the drive controller has been established, connection information (transaction ID) and information about the available S/IP services of the current connection are exchanged via the "ConnectionInfo" input/output parameter. The actual S/IP requests are carried out with the different S/IP function blocks. The individual S/IP function blocks use "ConnectionInfo", the FB_SIP_Connect function block therefore is required only once per drive controller.

WARNING

Potential PLC crash, data loss, data corruption and loss of communication.

It is essential to comply with the safety instructions specified in the description of the "ConnectionInfo" input/output parameter.

Interface description

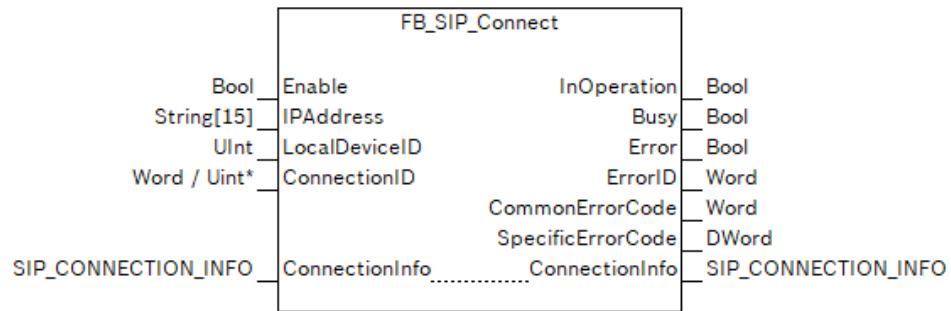


Fig. 2: "FB_SIP_Connect" function block

* see description of the interface variables of the function block regarding the data type

Table 1: Interface variables of the "FB_SIP_Connect" function block

I/O type	Name	Data type	Description
VAR_INPUT	Enable	Bool	<p>With "TRUE" at the Enable input, the function block connects the PLC socket to the drive controller and reads out the list of available services on the drive controller.</p> <p>With "FALSE" at the Enable input, the connection between the PLC and the drive controller is disconnected.</p> <p>Notes:</p> <ul style="list-style-type: none"> At most 6 connections per derivative are possible. If the socket has been inactive for a time almost equal to "lease timeout", the function block executes the "Ping" S/IP service to maintain the connection. The "lease timeout" is 10 seconds.
	IPAddress	String	<p>IP address of the drive controller</p> <p>Format of the IP address: aaa.bbb.ccc.ddd, e.g. 192.168.001.001</p>

I/O type	Name	Data type	Description
	LokalDeviceID	Word (S7-300 and S7-400) UInt (S7-1200 and S7-1500)	<p>ID of the Siemens PLC (built-in Ethernet connection, Ethernet module,...)</p> <p>S7-300</p> <ul style="list-style-type: none"> • B#16#00: Communication via CP 443-1 (EX) <p>S7-400</p> <ul style="list-style-type: none"> • B#16#12: Communication via the following CPs: CP 443-1EX4x, CP 443-1EX20, CP 443-1GX20, CP 443-1EX30, CP 443-1GX30 • B#16#01: Communication via Industrial Ethernet interface on interface slot 1 (IF1) with WinAC RTX (TCP only) • B#16#02: Communication via the integrated Industrial Ethernet interface with CPUs 315-2 PN/DP and 317-2 PN/DP • B#16#03: Communication via the integrated Industrial Ethernet interface with CPU 319-3 PN/DP • B#16#05: Communication via the integrated Industrial Ethernet interface with CPUs 414-3 PN/DP, 416-3 PN/DP, 416-3F PN/DP and 41x-5H PN/DP (Rack 0) • B#16#06: Communication via Industrial Ethernet interface on interface slot 2 (IF2) with WinAC RTX (TCP only) • B#16#0B: Communication via Industrial Ethernet interface on interface slot 3 (IF3) with WinAC RTX (TCP only) • B#16#0F: Communication via Industrial Ethernet interface on interface slot 4 (IF4) with WinAC RTX (TCP only) • B#16#15: Communication via the integrated Industrial Ethernet interface with CPUs 41x-5H PN/DP (Rack 1) <p>S7-1200</p> <ul style="list-style-type: none"> • 64: Default • 1: ID for the local PN/Industrial Ethernet interface. <p>For other additional modules, please refer to the documentation of the module.</p> <p>S7-1500</p> <ul style="list-style-type: none"> • 64: Default <p>For other additional modules, please refer to the documentation of the module.</p>
	ConnectionID	Word	<p>Unique ID for the connection</p> <p>Note: In the case of multiple instances of FB_SIP_Connect, make sure that each instance has its own unique ConnectionID.</p>
VAR_OUTPUT	InOperation	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> • FALSE: No S/IP connection established • TRUE: S/IP connection established
	Busy	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> • FALSE: Function block execution failed • TRUE: Function block execution successful
	Error	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> • FALSE: No error • TRUE: An error occurred

I/O type	Name	Data type	Description
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	<p>Connection information (transaction ID) and information about the available S/IP services of the current connection are exchanged via the "ConnectionInfo" input/output parameter. "ConnectionInfo" is made available to the individual S/IP function blocks for data exchange.</p> <p>WARNING! Potential PLC crash. The "ConnectionInfo" parameter is mandatory and has to be passed to each function block instance that is called in the user program. This parameter reference must not be changed during an online change, since it may result in a PLC crash if the transferred reference is invalid. If the "ConnectionInfo" parameter has to be changed, it is recommended to load the entire program to the PLC to ensure safe operation.</p> <p>CAUTION! If different "ConnectionInfo" variables are used for function block instances communicating over the same connection, data loss, data corruption, and loss of communication may occur. Therefore, there should be only <u>one</u> "ConnectionInfo" variable for each connection from the Siemens PLC to a drive controller. The same variable should be used for the "ConnectionInfo" parameter for all function block instances that use this connection to communicate with the drive controller.</p>

Description of the "SIP_CONNECTION_INFO" data type

Element	Type	Description
Connected	Bool	A connection to the drive is available
Busy	Bool	The connected socket is occupied
TransactionID	DInt	Transaction ID of the current request/response
ConnectionID	Word	Unique identifier for the current connection
SupportedServices	Array[1..50] of DWord	List of S/IP services supported by the connected drive

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

With the function block FB_SIP_Connect it is possible to establish a connection to the drive controller via the "Connect" S/IP service.

With "TRUE" at the "Enable" input, the function block connects the PLC socket to the drive controller and reads out the list of available services on the drive controller. With "FALSE" at the "Enable" input, the connection between the PLC and the drive controller is disconnected.



If the socket has been inactive for a time almost equal to "lease timeout", the function block executes the "Ping" S/IP service to maintain the connection. The "lease timeout" is 10 seconds.

As inputs, the IP address of the drive controller (IPAddress), the ID of the Siemens PLC (LokalDeviceID) and a unique ID for the connection (ConnectionID) have to be parameterized.



In the case of multiple instances of FB_SIP_Connect, make sure that each instance has its own unique ConnectionID.

The status of the S/IP connection (InOperation) and for the status of processing the job (Busy) are output at the outputs.

Connection information and information about the available S/IP services of the current connection are exchanged via the "ConnectionInfo" input/output parameter when a connection to the drive controller has been established.

An existing instance can be sequentially used for multiple ctrlX DRIVE. Before selecting another device, set the "Enable" input to FALSE. Afterwards, the IP address can be changed and the "Enable" input can be set to TRUE to establish the connection to the desired ctrlX DRIVE. At most 6 connections per derivative are possible.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

6 Description of the FB_SIP_ReadDataStatus function block

Brief description

The FB_SIP_ReadDataStatus function block facilitates reading out the data status of the operation data of a parameter via S/IP communication.

The data status is available directly at the output of the function block as soon as the process is completed.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

Interface description

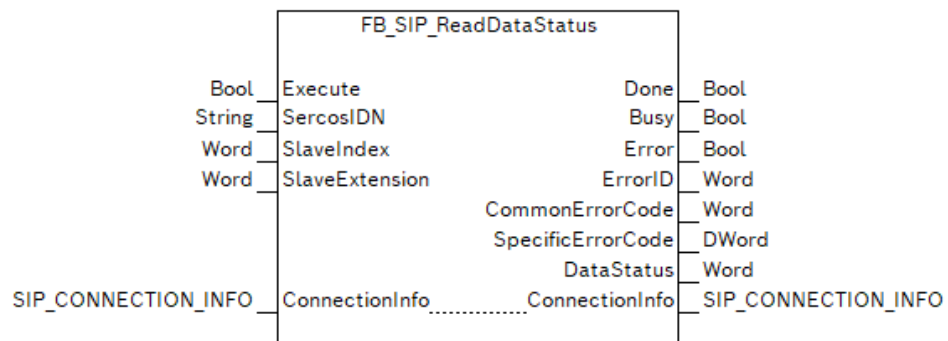


Fig. 3: "FB_SIP_ReadDataStatus" function block

Table 2: Interface variables of the "FB_SIP_ReadDataStatus" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts reading out the data status of the operation data of a parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number ^{*1)} ^{*2)} "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE ^{*1)} "S17" (S-0-0017.0.0) - parameter type and parameter number ^{*2)} "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number ^{*2)} "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
VAR_OUTPUT	Done	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	Error	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: No error ● TRUE: Error occurred during function block execution

I/O type	Name	Data type	Description
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
	DataStatus	Word	Data status of the operation data of a parameter (parameter valid/invalid or command status for command parameters)
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The FB_SIP_ReadDataStatus function block facilitates reading out the data status of the operation data of a parameter via S/IP communication.

The parameter to be read out has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [Table 2 Interface variables of the "FB_SIP_ReadDataStatus" function block on page 18](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the data status is available at the output (DataStatus) of the function block.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

7 Description of the FB_SIP_ReadDescription function block

Brief description

The FB_SIP_ReadDescription function block facilitates reading out the name and different attributes of a parameter via S/IP communication.

The name and attributes of a parameter are available directly at the outputs of the function block as soon as the process is completed.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

⚠ WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program**.

Interface description

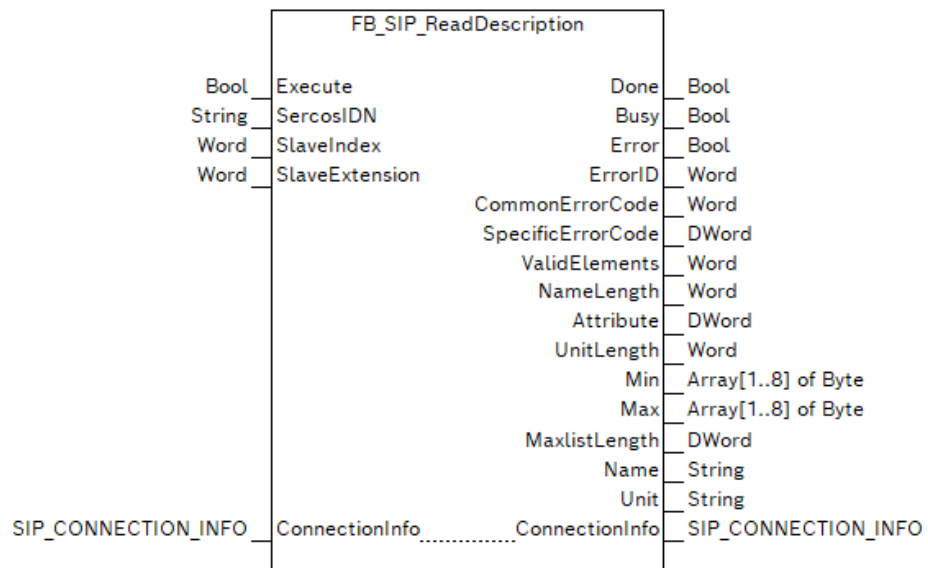


Fig. 4: "FB_SIP_ReadDescription" function block

Table 3: Interface variables of the "FB_SIP_ReadDescription" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts reading out the name and different attributes of a parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number ^{*1)} ^{*2)} "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE ^{*1)} "S17" (S-0-0017.0.0) - parameter type and parameter number ^{*2)} "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number ^{*2)} "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
VAR_OUTPUT	Done	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful

I/O type	Name	Data type	Description
	Busy	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	Error	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: No error ● TRUE: Error occurred during function block execution
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
	ValidElements	Word	Valid elements of the parameter (only for list parameters)
	NameLength	Word	Length of the parameter name in bytes
	Attribute	DWord	Attribute of the parameter See also Application Manual of firmware "Parameter handling, properties/features"
	Min	Array of Byte	Allowed minimum value for the operating data of the parameter
	Max	Array of Byte	Allowed maximum value for the operating data of the parameter
	MaxListLength	DWord	Maximum list length of the parameter (only for list parameters)
	Name	String	Name of the parameter
	Unit	String	Unit of the parameter operating data
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The FB_SIP_ReadDescription function block facilitates reading out the name and different attributes of a parameter via S/IP communication.

The name and attributes of a parameter are available directly at the outputs of the function block as soon as the process is completed (Done="1").

The parameter to be read out has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [Table 3 Interface variables of the "FB_SIP_ReadDescription" function block on page 22](#)).

For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [➔ Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

8 Description of the FB_SIP_ReadEverything function block

Brief description

The FB_SIP_ReadEverything function block facilitates reading out the data status of the operation data of a parameter and the description of a parameter via S/IP communication.

The data status of the operation data of a parameter and the description values are directly available at the outputs of the function block after completion of the operation.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

▲ WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program.**

Interface description

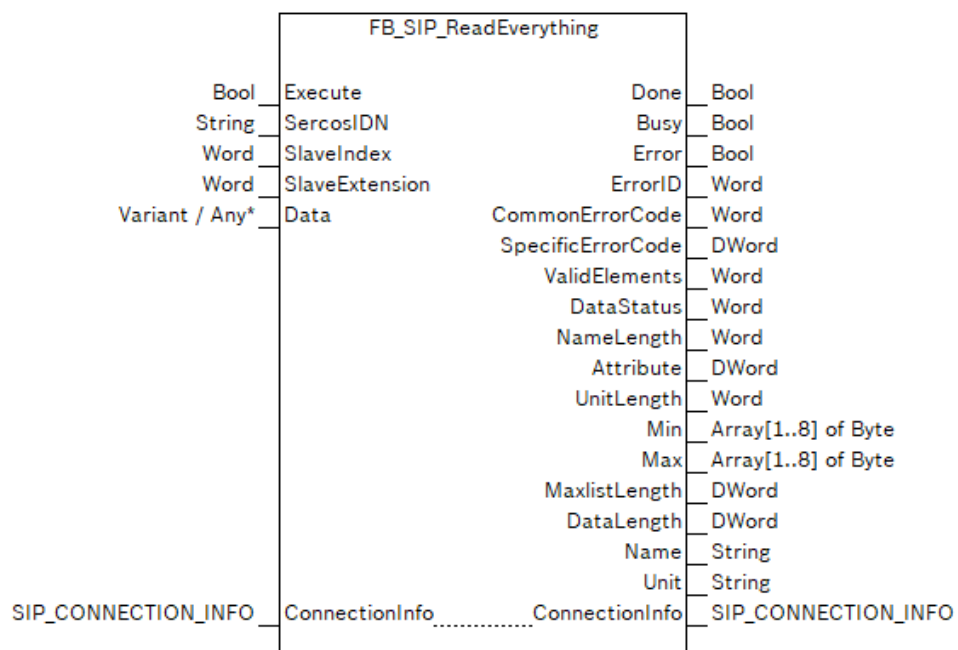


Fig. 5: "FB_SIP_ReadEverything" function block

* see description of the interface variables of the function block regarding the data type

Table 4: Interface variables of the "FB_SIP_ReadEverything" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts reading out the data status of the operation data and the description of a parameter
	SercosIDN	String	<p>Parameter ident number; different notations are possible for the specification of the parameter number</p> <p>Examples of valid notations:</p> <p>"57" (S-0-0057.0.0) - only the parameter number^{*1)*2)}</p> <p>"123.5.1" (S-0-0123.5.1) - parameter number with SI and SE^{*1)}</p> <p>"S17" (S-0-0017.0.0) - parameter type and parameter number^{*2)}</p> <p>"P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE</p> <p>"S-0-0024" (S-0-0024.0.0) - parameter type, parameter number^{*2)}</p> <p>"S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE</p> <p>*1): If no parameter type is specified, the data status of the S-parameter is always read</p> <p>*2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"</p>
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
	Data	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	<p>Reference to the memory range to which the operation data of the parameter have to be copied.</p> <p>NOTE: Make sure that the memory range is big enough for the parameter's operation data. If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.</p>
VAR_OUTPUT	Done	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	Error	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> ● FALSE: No error ● TRUE: Error occurred during function block execution
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)

I/O type	Name	Data type	Description
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific SI/P service error occurs (see ➔ Chapter 13.4 "SpecificErrorCode" output on page 47)
	ValidElements	Word	Valid elements of the parameter (only for list parameters)
	DataStatus	Word	Data status of the operation data of the parameter
	NameLength	Word	Length of the parameter name in bytes
	Attribute	DWord	Attribute of the parameter See also Application Manual of firmware "Parameter handling, properties/features"
	Min	Array of Byte	Allowed minimum value for the operating data of the parameter
	Max	Array of Byte	Allowed maximum value for the operating data of the parameter
	MaxListLength	DWord	Maximum list length of the parameter (only for list parameters)
	Name	String	Name of the parameter
	Unit	String	Unit of the parameter operating data
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The FB_SIP_ReadEverything function block facilitates reading out the data status of the operation data of a parameter and the description of a parameter via S/IP communication.

The parameter to be read out has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [➔ Table 4 Interface variables of the "FB_SIP_ReadEverything" function block on page 27](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the data status of the operation data of a parameter and the description of a parameter are available at the outputs of the function block.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [➔ Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

9 Description of the FB_SIP_ReadOnlyData function block

Brief description

The FB_SIP_ReadOnlyData function block facilitates reading out the operation data of a parameter via S/IP communication.

The operation data of a parameter are directly available at the outputs of the function block after completion of the operation.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program.**

Interface description

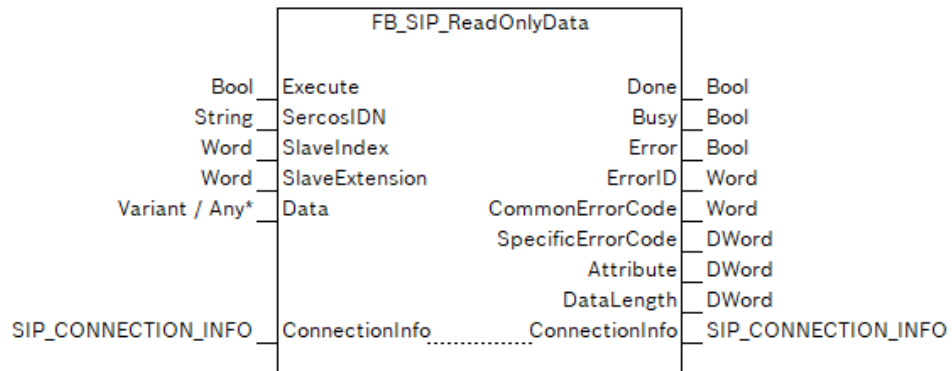


Fig. 6: "FB_SIP_ReadOnlyData" function block

* see description of the interface variables of the function block regarding the data type

Table 5: Interface variables of the "FB_SIP_ReadOnlyData" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts reading out the operation data of a parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number* ¹⁾ * ²⁾ "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE* ¹⁾ "S17" (S-0-0017.0.0) - parameter type and parameter number * ²⁾ "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number * ²⁾ "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"

I/O type	Name	Data type	Description
	Data	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	<p>Reference to the memory range to which the operation data of the parameter have to be copied.</p> <p>NOTE: Make sure that the memory range is big enough for the parameter's operation data. If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.</p> <p>Tip: More information on the parameter is provided by these function blocks:</p> <ul style="list-style-type: none"> ● FB_SIP_ReadEverything ● FB_SIP_ReadDescription
VAR_OUTPUT	Done	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	<p>Status parameter with the following values:</p> <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
	Attributes	DWord	Attribute of the parameter See also Application Manual of firmware "Parameter handling, properties/features"
	DataLength	DWord	Length of the operation data of the parameter in bytes
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The function block FB_SIP_ReadOnlyData facilitates reading out the operation data of a parameter via S/IP communication.

The parameter to be read out has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [↗ Table 5 Interface variables of the "FB_SIP_ReadOnlyData" function block on page 30](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the operation data of a parameter are available at the outputs of the function block.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [↗ Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

10 Description of the FB_SIP_ReadSegment function block

Brief description

The FB_SIP_ReadSegment function block facilitates reading part of the operation data of a list parameter via S/IP communication.

The part of the operation data of a list parameter is directly available at the outputs of the function block after completion of the operation.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

⚠ WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program.**

Interface description

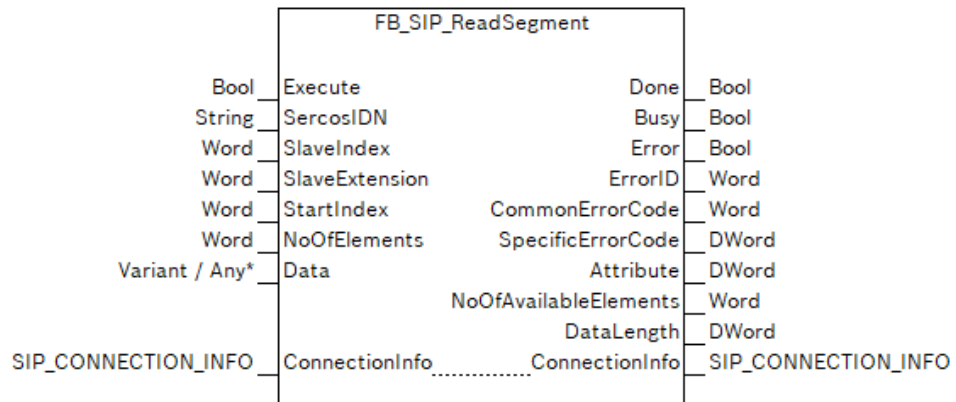


Fig. 7: "FB_SIP_ReadSegment" function block

* see description of the interface variables of the function block regarding the data type

Table 6: Interface variables of the "FB_SIP_ReadSegment" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts reading out part of the operation data of a list parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number* ¹⁾ * ²⁾ "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE* ¹⁾ "S17" (S-0-0017.0.0) - parameter type and parameter number * ²⁾ "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number * ²⁾ "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
	StartIndex	Word	Index from which the data are to be read
	NumberOfElements	Word	Number of elements to be read WARNING! With S7-1200 up to 8192 bytes per TCP telegram can be processed. This is the maximum permitted read and write length for list parameters for this PLC. Attempting to read/write larger list parameters results in a function block error and a loss of connection.
	ConnectionInfo	SIP_CONNECTION_INFO	

I/O type	Name	Data type	Description
	Data	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	Reference to the memory range to which the operation data of the parameter have to be copied. NOTE: Make sure that the memory range is big enough for the parameter's operation data. If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.
VAR_OUTPUT	Done	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
	Attributes	DWord	Attribute of the parameter See also Application Manual of firmware "Parameter handling, properties/features"
	NoOfAvailableElements	Word	Total number of available elements
	DataLength	DWord	Length of the operation data of the parameter in bytes
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The function block FB_SIP_ReadSegment facilitates reading part of the operation data of a list parameter via S/IP communication.

The parameter to be read out has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [➔ Table 6 Interface variables of the "FB_SIP_ReadSegment" function block on page 34](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "StartIndex" input is used to specify the index from which the data are to be read, and the "NoOfAvailableElements" input is used to specify the total number of available elements.

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the specified part of the operation data of the list parameter is available at the outputs of the function block.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [➔ Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

11 Description of the FB_SIP_WriteData function block

Brief description

The FB_SIP_WriteData function block facilitates writing the operation data of a parameter via S/IP communication.

The operation data to be written to the parameter have to be provided at the "Data" input.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

⚠ WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program.**

Interface description

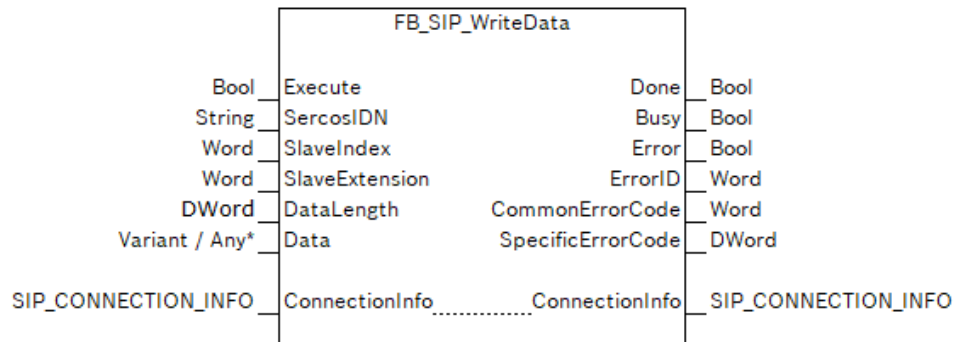


Fig. 8: "FB_SIP_WriteData" function block

* see description of the interface variables of the function block regarding the data type

Table 7: Interface variables of the "FB_SIP_WriteData" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts writing the operation data of a parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number*1)*2) "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE*1) "S17" (S-0-0017.0.0) - parameter type and parameter number *2) "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number *2) "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
	DataLength	DWord	Length of the operation data of the parameter in bytes
	Data	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	Reference to the memory range to which the operation data of the parameter have to be copied. NOTE: Make sure that the memory range is big enough for the parameter's operation data. If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.
	ConnectionInfo	SIP_CONNECTION_INFO	

I/O type	Name	Data type	Description
VAR_OUTPUT	Done	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The function block FB_SIP_WriteData facilitates writing the operation data of a parameter via SIP communication.

The operation data to be written to the parameter have to be provided at the "Data" input.

The parameter to be written has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [Table 7 Interface variables of the "FB_SIP_WriteData" function block on page 38](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the operation data have been written to the parameter.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

12 Description of the FB_SIP_WriteDataBits function block

Brief description

The FB_SIP_WriteDataBits function block facilitates writing specific bits of the operation data of a parameter via S/IP communication.



Writing specific bits of a parameter's operation data is only possible for individual parameters and is not supported for list parameters.

The data to be written to the parameter and their data mask have to be provided at the "Data" and "DataMask" inputs.



The variable "SIP_CONNECTION_INFO" for the current drive linked to the FB_SIP_Connect function block should be provided to this function block via the "ConnectionInfo" input/output parameter.

▲ WARNING

Incorrect interpretation of data due to different byte order of S7 controls and ctrlX DRIVE devices.

The byte order of S7 controls and ctrlX DRIVE devices is different (S7 controls: big endian, ctrlX DRIVE devices: little endian). Therefore, the byte order of the received and the written parameter data has to be exchanged on the PLC side.

The data exchange can be performed in the function blocks of the S7-300 and S7-1500 controls.

With S7-1200, the data exchange has to be performed **manually in the application program**.

Interface description

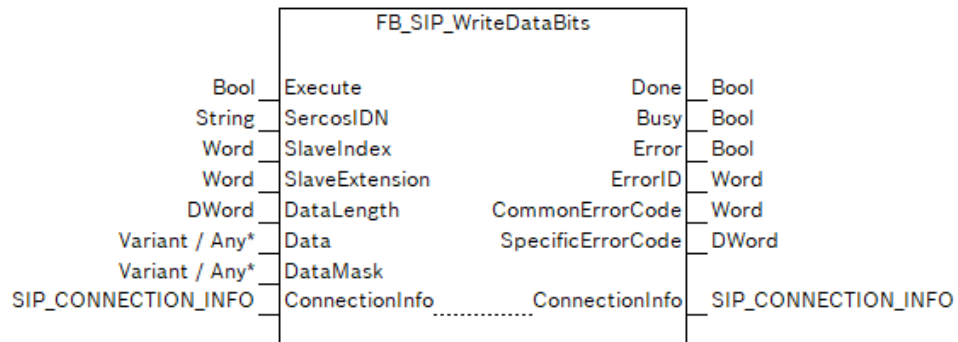


Fig. 9: "FB_SIP_WriteDataBits" function block

* see description of the interface variables of the function block regarding the data type

Table 8: Interface variables of the "FB_SIP_WriteDataBits" function block

I/O type	Name	Data type	Description
VAR_INPUT	Execute	Bool	"TRUE" at the input starts writing the operation data of a parameter
	SercosIDN	String	Parameter ident number; different notations are possible for the specification of the parameter number Examples of valid notations: "57" (S-0-0057.0.0) - only the parameter number ^{*1)*2)} "123.5.1" (S-0-0123.5.1) - parameter number with SI and SE ^{*1)} "S17" (S-0-0017.0.0) - parameter type and parameter number ^{*2)} "P1044.0.0" (P-0-1044.0.0) - parameter type, parameter number, SI, and SE "S-0-0024" (S-0-0024.0.0) - parameter type, parameter number ^{*2)} "S-1-0100.0.0" - parameter type, parameter set number, parameter number, SI and SE *1): If no parameter type is specified, the data status of the S-parameter is always read *2): If an element of the parameter ident number is not specified in the string, its value is assumed to be "0"
	SlaveIndex	Word	Slave index; 0..n local axes; only relevant for multi-axis devices
	SlaveExtension	Word	Slave extension (<i>reserved</i>), always "0"
	DataLength	DWord	Length of the operation data of the parameter in octets/bytes

I/O type	Name	Data type	Description
	Data	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	Reference to the memory range to which the operation data of the parameter are to be written. NOTE: Make sure that the memory range is big enough for the parameter's operation data, as specified at "Data-Length". If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.
	DataMask	Any (S7-300, S7-400, S7-1500) Variant (S7-1200)	Reference to the memory range in which the data mask for the operation data to be written to the parameter has to be available. NOTE: Make sure that the memory range is big enough for the parameter's operation data, as specified at "Data-Length". If the memory range for the parameter's operation data is too small, the integrity of the data received from the drive is lost. The function block outputs an error if the memory range is not big enough; the connection then has to be reset with the FB_SIP_Connect function block.
VAR_OUTPUT	Done	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution failed ● TRUE: Function block execution successful
	Busy	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● FALSE: Function block execution not yet started or still in process ● TRUE: Function block is executed
	ErrorID	Word	At the "ErrorID" output an error code for the current error of the function block is output in the event of an error. (See Chapter 13.2 "ErrorID" output on page 45)
	CommonErrorCode	Word	This output provides the general error code returned by the drive controller when an error occurs (see Chapter 13.3 "CommonErrorCode" output on page 46)
	SpecificErrorCode	DWord	This output provides the error code returned by the drive controller when a specific S/IP service error occurs (see Chapter 13.4 "SpecificErrorCode" output on page 47)
VAR_InOut	ConnectionInfo	SIP_CONNECTION_INFO	Link to the existing S/IP connection via "ConnectionInfo" that is provided by the FB_SIP_Connect function block.

Minimum, maximum and default values

The values of the function block inputs are applied continuously.

The default value for inputs with the data type "BOOL" is "FALSE"; for inputs with the data type "REAL" it is "0".

Functional description

The function block FB_SIP_WriteDataBits facilitates writing specific bits of the operation data of a parameter via S/IP communication.



Writing specific bits of a parameter's operation data is only possible for individual parameters and is not supported for list parameters.

The data to be written into the parameter and its data mask has to be set at the "Data" and "DataMask" inputs.

The parameter to be written has to be named via the "SercosIDN" input.

There are different notations available for naming the parameter (see [➔ Table 8 Interface variables of the "FB_SIP_WriteDataBits" function block on page 42](#)). For multi-axis devices, the local axis also has to be named (SlaveIndex).

The "Busy" output shows whether the function block is executed.

As soon as the process is completed (Done="TRUE"), the named bits of the operation data of the parameter have been written.

Error handling

If an error occurs, this is indicated at the "Error" output with "TRUE".

In the event of an error, the "ErrorID", "CommonErrorCode" and "SpecificErrorCode" outputs contain error codes that provide information on the cause of the error (see [➔ Chapter 13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode" on page 45](#)).

13 Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode"

13.1 Introduction

In the event of an error, the function blocks for accessing the drive controller via S/IP services provide error information via the outputs "ErrorID" and "CommonErrorCode" or "SpecificErrorCode".

If an error occurs, the "Error" output of the function block is additionally set to "TRUE".

13.2 "ErrorID" output

At the "ErrorID" output, an error code is output for the error pending at the function block in the event of an error.

The error code that is output may be an error that affects the function block itself or an error that was triggered by one of the internally used communication instructions of a Siemens SIMATIC S7 control.



The function blocks for accessing the drive controller via S/IP services internally use the following communication instructions by Siemens: TCON, TDISCON, TSEND and TRCV.

If a returned error code is not listed in the following table, please refer to the Siemens TIA Portal help for the description of the error code.

Error code (hexadecimal)	Name	Description
1001	ERR_INVALID_INPUT	One or more inputs are invalid or the function block is called without transferring the "ConnectionInfo" parameter
1002	ERR_CONNECT_TIMEOUT	A timeout has occurred when connecting to the drive controller
1003	ERR_TCPSSEND_TIMEOUT	A timeout has occurred when attempting to send data to the drive controller
1004	ERR_TCPRECEIVE_TIMEOUT	A timeout has occurred when attempting to receive data to the drive controller
1005	ERR_RECEIVE_LENGTH_INVALID	The length of the data received by the drive controller is invalid. Execute the function block again – or – disconnect the connection to the drive controller and re-establish it.
1006	ERR_INVALID_RESPONSE	The response received by the drive controller is invalid. Execute the function block again – or – disconnect the connection to the drive controller and re-establish it.
1007	ERR_TOO_MANY_MESSAGE_TYPES	The number of message types received by the drive controller exceeds the maximum of possible types. Execute the function block again.

Error code (hexadecimal)	Name	Description
1008	ERR_EXCEPTION_RESPONSE	An error was reported by the drive controller (see ↗ Chapter 13.3 "CommonErrorCode" output on page 46 and ↗ Chapter 13.4 "SpecificErrorCode" output on page 47 for more information)
1009	ERR_DRIVE_NOT_CONNECTED	There is no active connection to the drive controller
100A	ERR_CONNECTION_BUSY	Socket is occupied. Try again later – or – disconnect the connection to the drive controller and re-establish it.
100B	ERR_PING_TIMEOUT	A timeout has occurred when attempting to perform the "Ping" S/IP service
100C	ERR_SERVICE_NOT_SUPPORTED	The current service is not supported by the drive controller
100D	ERR_INSUFFICIENT_DATA_SIZE	The size of the data variable is not sufficient to copy the parameter data of the drive controller. Increase the memory range of the data variable.
100E	ERR_INVALID_DATA_AREA	The memory range specified by the data variable is invalid. Try again with another memory range.

13.3 "CommonErrorCode" output

At the "CommonErrorCode" output, the error code reported by the drive controller is output in the event of a general error.

Error code (hexadecimal)	Name	Description
1	CONNECTION_ERROR	The server is not able to serve a TCP-based S/IP connection
2	TIMEOUT	A timeout has occurred or a TCP connection has been interrupted. Network activities are controlled by local timeout processing. If the server does not respond in time, this error code is used to indicate the error to the user on the client side.
3	UNKNOWN_MESSAGE_TYPE	The server has received an unknown message type. In the case of a TCP-based S/IP request, the server returns the exception to the client and closes the TCP stream socket connection.
4	SERVICE_SPECIFIC	A specific S/IP service error has occurred, see ↗ Chapter 13.4 "SpecificErrorCode" output on page 47
5	PDU_TOO_LARGE	This is a UDP-specific error. For more details, see PDU size limitations.

Error code (hexadecimal)	Name	Description
6	PDU_PROTOCOL_MISMATCH	This is a UDP-specific error. This error indicates an incompatible implementation. For example, the length of the received datagram does not match the expected PDU size of the service.

13.4 "SpecificErrorCode" output

At the "SpecificErrorCode" output, the error code reported by the drive controller is output in hexadecimal format in the event of a specific S/IP service error.

Error code		Description
Hexadecimal	Decimal	
0x0000	0	No error in the service channel
0x0001	1	Service channel not open
0x0009	9	Invalid access to closing the service channel
0x1001	4097	No IDN
0x1009	4105	Invalid access to element 1
0x2001	8193	No name
0x2002	8194	Name transmission too short
0x2003	8195	Name transmission too long
0x2004	8196	Name cannot be changed (read only)
0x2005	8197	Name is write-protected at this time
0x3002	12290	Attribute transmission too short
0x3003	12291	Attribute transmission too long
0x3004	12292	Attribute cannot be changed (read only)
0x3005	12293	Attribute is write-protected at this time
0x4001	16385	No units
0x4002	16386	Unit transmission too short
0x4003	16387	Unit transmission too long
0x4004	16388	Unit cannot be changed (read only)
0x4005	16389	Unit is write-protected at this time
0x5001	20481	No minimum input value
0x5002	20482	Minimum input value transmission too short
0x5003	20483	Minimum input value transmission too long
0x5004	20484	Minimum input value cannot be changed (read only)
0x5005	20485	Minimum input value is write-protected at this time
0x6001	24577	No maximum input value
0x6002	24578	Maximum input value transmission too short
0x6003	24579	Maximum input value transmission too long
0x6004	24580	Maximum input value cannot be changed (read only)
0x6005	24581	Maximum input value is write-protected at this time
0x7002	28674	Operation data transmission too short
0x7003	28675	Operation data transmission too long
0x7004	28676	Operation data cannot be changed (read only)

Description of the outputs "ErrorID", "CommonErrorCode" and "SpecificErrorCode"

Error code		Description
Hexadecimal	Decimal	
0x7005	28677	Operation data is write-protected at this time (e.g. Communication phase)
0x7006	28678	Operation data is smaller than the minimum input value
0x7007	28679	Operation data is greater than the maximum input value
0x7008	28680	Invalid operation data: Configured IDN will not be supported, invalid bit number or bit combination
0x7009	28681	Operation data write protected by a password
0x700A	28682	Operation data is write protected, it is configured cyclically. (IDN is configured in the MDT or AT. Therefore writing via the service channel is not allowed).
0x700B	28683	Invalid indirect addressing: (e.g., data container, list handling)
0x700C	28684	Operation data is write protected, due to other settings. (e.g., parameter, operation mode, drive enable, drive on etc.)
0x700D	28685	invalid floating point number
0x700E	28686	Operation data is write protected at parametrization level
0x700F	28687	Operation data is write protected at operating level
0x7010	28688	Procedure command already active
0x7011	28689	Procedure command not interruptible
0x7012	28690	Procedure command at this time not executable (e.g., in this phase the procedure command can not be activated)
0x7013	28691	Procedure command not executable (invalid or false parameters)
0x7014	28692	The received current length of list parameter does not match to expectation
0x7015	28693	Operation data is not yet created completely
0x7101	28929	IDN in S-0-0394 not valid
0x7102	28930	Empty list in S-0-0397 not allowed for write access
0x7103	28931	Maximum length of the list in S-0-0394 is exceeded by take-over of the list segment.
0x7104	28932	Read access only: The length of the list segment as of the list index exceeds the current length of the list in S-0-0394.
0x7105	28933	IDN in S-0-0394 is write protected
0x7106	28934	Operation data in list segment is smaller than the minimum value
0x7107	28935	Operation data in list segment is greater than the maximum value
0x7108	28936	Invalid list index in S-0-0395
0x7109	28937	Parameter in IDN S-0-0394 does not have variable length
0x710A	28938	IDN S-0-0397 not permitted as operation data in S-0-0394

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