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How to read or write multiple parameters using FB286

SINAMICS G120, FB286, read or write multiple parameters, TIA Portal, PROFINET, PROFIBUS, Acyclic communication

https://support.industry.siemens.com/cs/ww/en/view/109475973

1 Read or write multiple parameters using FB286

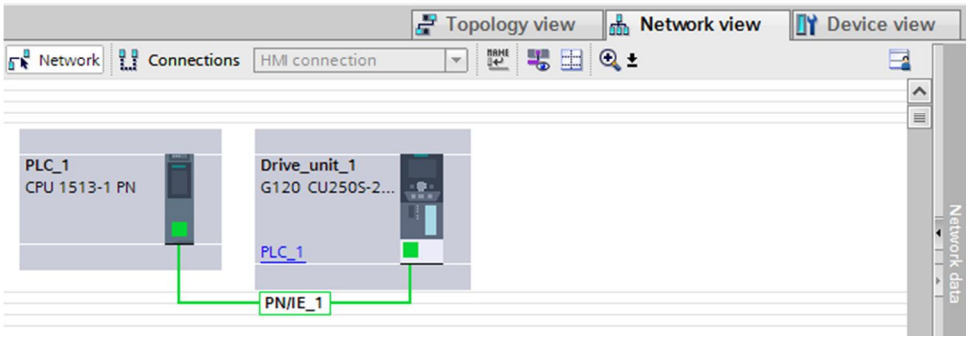
FB286 is a function block for multiple parameter access, which calls the acyclic communication blocks RDREC/SFB52 and WRREC/SFB53 internally. FB286 is integrated in the libraries of the TIA Portal software.

1.1.1 Configure hardware in TIA Portal.

Before the utilization of FB286, make sure the configuration is completed in TIA Portal and the communication between the controller and the drive is established.

This example includes a CPU1513-1 PN (V1.5) and a G120 with CU250S-2 PN (V4.6).

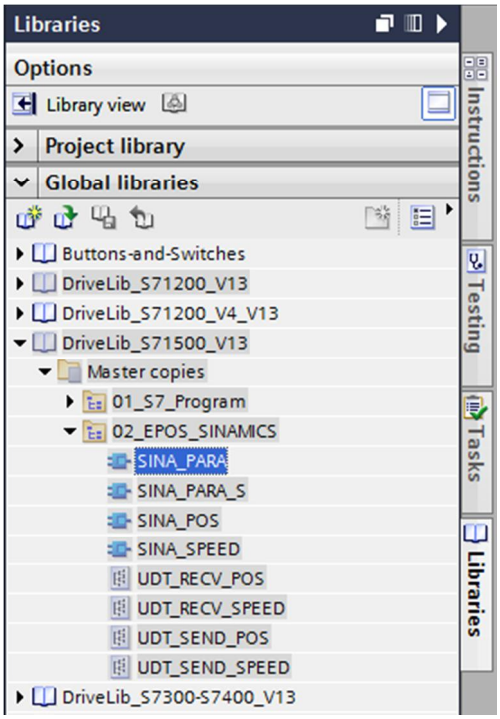
Figure 01 Communication configuration



1.1.2 Insert FB286 in the main program (OB1) or cyclic interrupt OB (e.g. OB32).

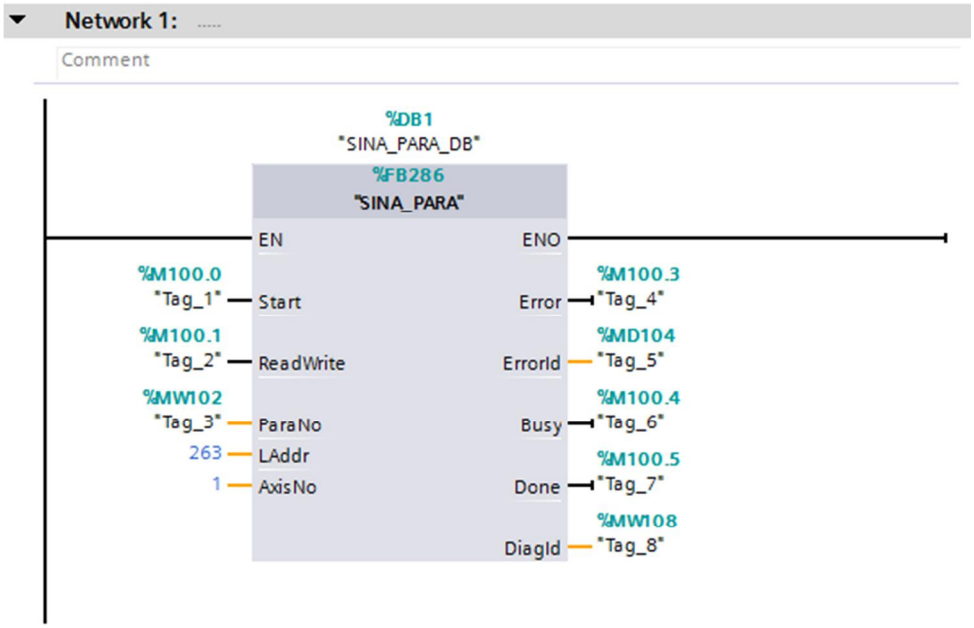
FB286 can be found as SINA_PARA in the libraries. There are different libraries for different PLCs (S7-300/S7-400, S7-1200, S7-1500).

Figure 02 Drive libraries



The following picture shows the FB286 with terminals assigned.

Figure 03 FB286



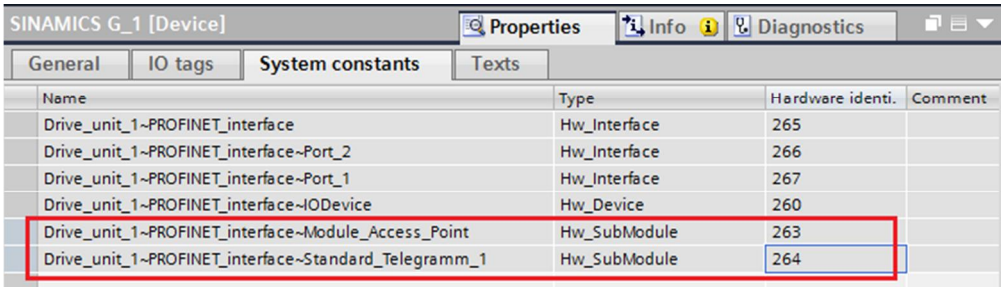
The following table shows the definition for each terminal of the block.

Table 01 Terminal definition for FB286

Terminal	Type	Description
Start	BOOL	Start of the job
ReadWrite	BOOL	Type of job: 0=read, 1=write
ParaNo	INT	Number of parameters: 1 to 16
LAddr	HW-IO/INT	Hardware ID of the actual value telegram slot or diagnostics address of the axis or drive
AxisNo	INT	Axis number for multi-axis system For G120 inverters, AxisNo=1
Error	BOOL	Group error active: Error=1
ErrorId	DWORD	Error ID
Busy	BOOL	Job being processed: Busy=1
Done	BOOL	Job completed without error: edge change from 0 to 1
DiagId	WORD	Extended communication error: error during SFB call

For terminal LAddr, hardware ID of the actual value telegram slot or diagnostics address of the axis or drive can be assigned to it.

Figure 04 Hardware ID selection for terminal LAddr



1.1.3 Read p1001, p1002, p1003 and p1004 (fixed speed setpoint 1, 2, 3 and 4).

Use a watch table to read multiple parameters after compiling and downloading the project to the PLC.

The original values of the 4 parameters are shown in the parameter view of Startdrive.

Figure 05 The original values of the parameters

Number	Parameter text	Value	Unit
<All>	<All>	<All>	<All>
p1001[0]	Fixed speed setpoint 1	1000.000	rpm
p1002[0]	Fixed speed setpoint 2	0.000	rpm
p1003[0]	Fixed speed setpoint 3	0.000	rpm
p1004[0]	Fixed speed setpoint 4	0.000	rpm

Set the following values to the tags on FB286's terminals:

ReadWrite=0, reading request

ParaNo=4, 4 parameters to be read

Set the following values to the variables of FB286's instance DB:

"SINA_PARA_DB".sxParameter[1].siParaNo=1001, 1st parameter to be read

"SINA_PARA_DB".sxParameter[1].siIndex=0, index of 1st parameter

"SINA_PARA_DB".sxParameter[2].siParaNo=1002, 2nd parameter to be read

"SINA_PARA_DB".sxParameter[2].siIndex=0, index of 2nd parameter

"SINA_PARA_DB".sxParameter[3].siParaNo=1003, 3rd parameter to be read

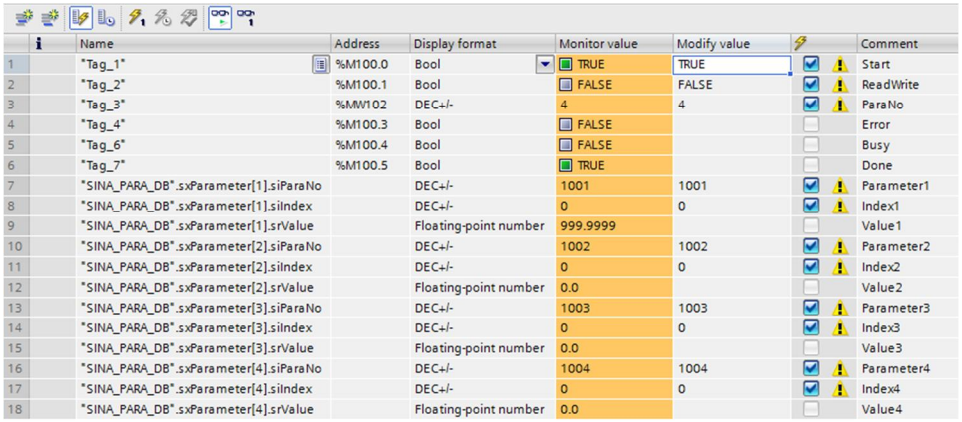
"SINA_PARA_DB".sxParameter[3].siIndex=0, index of 3rd parameter

"SINA_PARA_DB".sxParameter[4].siParaNo=1004, 4th parameter to be read

"SINA_PARA_DB".sxParameter[4].siIndex=0, index of 4th parameter

A rising edge on terminal Start starts the reading task. After the reading task is finished, the Done bit is set. And the parameter values are shown in .sxParameter[x].srValue.

Figure 06 Watch table for reading parameters



	Name	Address	Display format	Monitor value	Modify value		Comment
1	"Tag_1"	%M100.0	Bool	TRUE	TRUE		Start
2	"Tag_2"	%M100.1	Bool	FALSE	FALSE		ReadWrite
3	"Tag_3"	%MW102	DEC+/-	4	4		ParaNo
4	"Tag_4"	%M100.3	Bool	FALSE			Error
5	"Tag_6"	%M100.4	Bool	FALSE			Busy
6	"Tag_7"	%M100.5	Bool	TRUE			Done
7	"SINA_PARA_DB".sxParameter[1].siParaNo		DEC+/-	1001	1001		Parameter1
8	"SINA_PARA_DB".sxParameter[1].siIndex		DEC+/-	0	0		Index1
9	"SINA_PARA_DB".sxParameter[1].srValue		Floating-point number	999.9999			Value1
10	"SINA_PARA_DB".sxParameter[2].siParaNo		DEC+/-	1002	1002		Parameter2
11	"SINA_PARA_DB".sxParameter[2].siIndex		DEC+/-	0	0		Index2
12	"SINA_PARA_DB".sxParameter[2].srValue		Floating-point number	0.0			Value2
13	"SINA_PARA_DB".sxParameter[3].siParaNo		DEC+/-	1003	1003		Parameter3
14	"SINA_PARA_DB".sxParameter[3].siIndex		DEC+/-	0	0		Index3
15	"SINA_PARA_DB".sxParameter[3].srValue		Floating-point number	0.0			Value3
16	"SINA_PARA_DB".sxParameter[4].siParaNo		DEC+/-	1004	1004		Parameter4
17	"SINA_PARA_DB".sxParameter[4].siIndex		DEC+/-	0	0		Index4
18	"SINA_PARA_DB".sxParameter[4].srValue		Floating-point number	0.0			Value4

1.1.4 Modify the 4 parameter values as below.

p1001=600rpm

p1002=800rpm

p1003=1000rpm

p1004=1200rpm

Use a watch table to write multiple parameters.

Set the following values to the tags on FB286's terminals:

ReadWrite=1, writing request

ParaNo=4, 4 parameters to be written

Set the following values to the variables of FB286's instance DB:

"SINA_PARA_DB".sxParameter[1].siParaNo=1001, 1st parameter to be written

"SINA_PARA_DB".sxParameter[1].siIndex=0, index of 1st parameter

"SINA_PARA_DB".sxParameter[1].srValue=600.0, value of 1st parameter to be written

"SINA_PARA_DB".sxParameter[2].siParaNo=1002, 2nd parameter to be written

"SINA_PARA_DB".sxParameter[2].siIndex=0, index of 2nd parameter

“SINA_PARA_DB“.sxParameter[2].srValue=800.0, value of 2nd parameter to be written

“SINA_PARA_DB“.sxParameter[3].siParaNo=1003, 3rd parameter to be written

“SINA_PARA_DB“.sxParameter[3].siIndex=0, index of 3rd parameter

“SINA_PARA_DB“.sxParameter[3].srValue=1000.0, value of 3rd parameter to be written

“SINA_PARA_DB“.sxParameter[4].siParaNo=1004, 4th parameter to be written

“SINA_PARA_DB“.sxParameter[4].siIndex=0, index of 4th parameter

“SINA_PARA_DB“.sxParameter[4].srValue=1200.0, value of 4th parameter to be written

Figure 07 Watch table for writing parameters

	Name	Address	Display format	Monitor value	Modify value		Comment
1	"Tag_1"	%M100.0	Bool	TRUE	TRUE		Start
2	"Tag_2"	%M100.1	Bool	TRUE	TRUE		ReadWrite
3	"Tag_3"	%MW102	DEC+/-	4	4		ParaNo
4	"Tag_4"	%M100.3	Bool	FALSE			Error
5	"Tag_6"	%M100.4	Bool	FALSE			Busy
6	"Tag_7"	%M100.5	Bool	TRUE			Done
7	"SINA_PARA_DB".sxParameter[1].siParaNo		DEC+/-	1001	1001		Parameter1
8	"SINA_PARA_DB".sxParameter[1].siIndex		DEC+/-	0	0		Index1
9	"SINA_PARA_DB".sxParameter[1].srValue		Floating-point number	600.0	600.0		Value1
10	"SINA_PARA_DB".sxParameter[2].siParaNo		DEC+/-	1002	1002		Parameter2
11	"SINA_PARA_DB".sxParameter[2].siIndex		DEC+/-	0	0		Index2
12	"SINA_PARA_DB".sxParameter[2].srValue		Floating-point number	800.0	800.0		Value2
13	"SINA_PARA_DB".sxParameter[3].siParaNo		DEC+/-	1003	1003		Parameter3
14	"SINA_PARA_DB".sxParameter[3].siIndex		DEC+/-	0	0		Index3
15	"SINA_PARA_DB".sxParameter[3].srValue		Floating-point number	1000.0	1000.0		Value3
16	"SINA_PARA_DB".sxParameter[4].siParaNo		DEC+/-	1004	1004		Parameter4
17	"SINA_PARA_DB".sxParameter[4].siIndex		DEC+/-	0	0		Index4
18	"SINA_PARA_DB".sxParameter[4].srValue		Floating-point number	1200.0	1200.0		Value4

A rising edge on terminal Start starts the writing task. After the writing task is finished, the Done bit is set. And the modified parameter values can be seen from the parameter view of Startdrive.

Figure 08 The modified values of the parameters

Number	Parameter text	Value	Unit
<All>	<All>	<All>	<All>
p1001[0]	Fixed speed setpoint 1	600.000	rpm
p1002[0]	Fixed speed setpoint 2	800.000	rpm
p1003[0]	Fixed speed setpoint 3	1000.000	rpm
p1004[0]	Fixed speed setpoint 4	1200.000	rpm

NOTE

1. FB286 is available for S7-300/400, S7-1200 and S7-1500 PLCs.
2. FB286 is available for both PROFINET and PROFIBUS.
3. FB286 is available for both SINAMICS S and SINAMICS G inverters.
4. The parameter value is handled in the format of floating-point number. For example, if p1000=6 (setpoint selection, integer 16), 6.0 will be the result of a reading request. For a writing request, 1.0 for the .sxParameter[x].srValue can change p1000 to 1.