

# SD700 Servo Drive PN Non-Cycle Read/Write Operation Guidance

## 1、Preface

SD700 PN Servo drive Support WRREC/RDREC、“SINA\_PARA”(FB286) and“SINA\_PARA\_S”(FB287) acyclic communication of function blocks. The Drive\_lib library file (see attachment) needs to be installed when using the latter two function blocks. This document gives operational guidance for the above modules for acyclic communication as follows.

**Note:** read and write operations in the definition of function code instructions: parameter number = 10000 + function code number (need to be converted to decimal first).

**Example:** Read/write function code PnA34, then the actual write parameter number: 10000+2612(0xA34)=12612。

## 2、Read and write parameters via WRREC/RDREC

### 2.1 Data format and parameter structure definition

The data format is defined as follows:

数据	数据类型	值	注释
请求参考	Unsigned8	0x01 ... 0xFF	主站的任务ID/轴组ID的唯一标识。主站会为每个新的请求修改请求参考。从站在它的应答中反映该请求参考。
请求 ID	Unsigned8	0x01 0x02	读请求 写请求
应答 ID	Unsigned8	0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 其它值	表明请求类型。 写入请求中，修改保存在易失性存储器 (RAM)。必须执行保存操作 (p0971, p0977) 将修改的数据保存到非易失性存储器。 读取请求 (+) 写入请求 (-) 写入请求 (-)
驱动对象编号	Unsigned8	0x00 ... 0xFF	编号 指出带多个驱动对象的驱动设备上的驱动对象号。可通过相同的 DPV1 连接访问不同的、有独立参数编号区域的驱动对象。

数据	数据类型	值	注释
参数数量	Unsigned8	0x01 ... 0x27	数量 1 ... 39 受 DPV1 报文长度限制
属性	Unsigned8	0x10 0x20 0x30	定义了多参数任务中参数地址和V或参数值的连续区域的数量。 对于简单请求，参数数量 = 1。 访问的参数单元的类型。 值 描述 文本 (未执行)
元素数量	Unsigned8	0x00 0x01 ... 0x75	特殊功能 数量 1 ... 117 受 DPV1 长度限制
参数号	Unsigned16	0x0001 ... 0xFFFF	编号 1 ... 65535 访问的参数地址。
子索引	Unsigned16	0x0000 ... 0xFFFF	编号 0 ... 65535 访问的第一个参数组单元的地址。

格式	数据类型	值	注释
数据类 Integer8	Unsigned8	0x02 0x03 0x04 0x05 0x06 0x07 0x08 其它值	数据类 Integer8 数据类 Integer16 数据类 Integer32 数据类 Unsigned8 数据类 Unsigned16 数据类 Unsigned32 数据类 FloatingPoint 参见 PROFIdrive Profile V3.1
数据类 Integer16	Unsigned8	0x40 0x41 0x42 0x43 0x44	零 (写入请求的子 应不良好) 字节 字 双字 长字
数据类 Integer32	Unsigned8	0x00 ... 0xFF	格式和精度定义了网文中连续、进行了赋值的值。 根据 PROFIdrive Profile, 在写入时必须设定完整的数据类型, 可设定字节、字和双字。

值的数量	数据类型	值	注释
值的数量	Unsigned8	0x00 ... 0xEA	数量 0 ... 234 受 DPV1 报文长度限制
故障值	Unsigned16	0x0000 ... 0xC0FF	故障值的含义 → 参见下表“DPV1 参数应答中的故障值” 不良应答中的故障值。 如果值由奇数数量的字节组成, 则会添加一个零字节。从而保证报文的字结构。
值	Unsigned16	0x0000 ... 0xC0FF	读取或写入参数的值。 如果值由奇数数量的字节组成, 则会添加一个零字节。从而保证报文的字结构。

The request and response structure of the parameters is as follows:

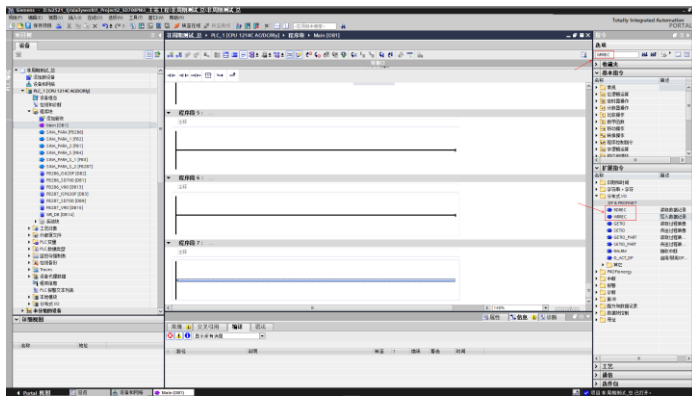
参数请求	偏移
请求标题	0
请求 ID	2
1. 参数地址	4
属性	6
参数号	8
子索引	10
...	...
第 n 个参数地址	...
属性	...
参数号	...
子索引	...
1. 参数值	...
格式	...
值的数量	...
...	...
第 n 个参数值	...
格式	...
值的数量	...
...	...

参数应答	偏移
应答标题	0
对应的请求参考	2
对应的轴	4
1. 参数值	6
格式	8
值的数量	10
...	...
第 n 个参数值	...
格式	...
值的数量	...
...	...

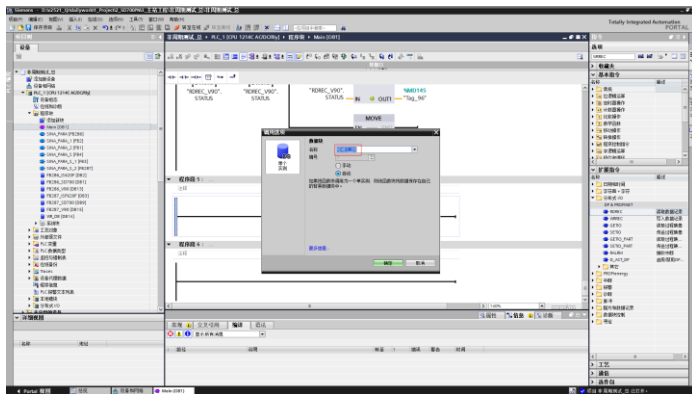
### 2.2 Module addition and configuration

Portal V15 uplink WRREC and RDREC modules are added and configured as follows:

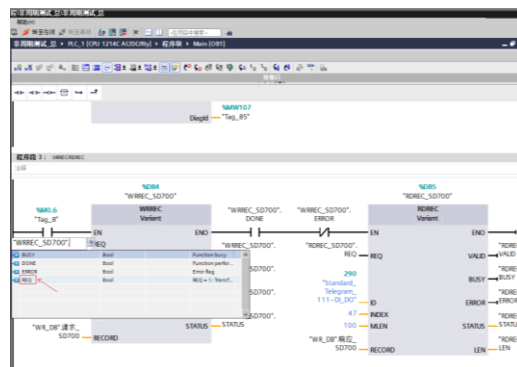
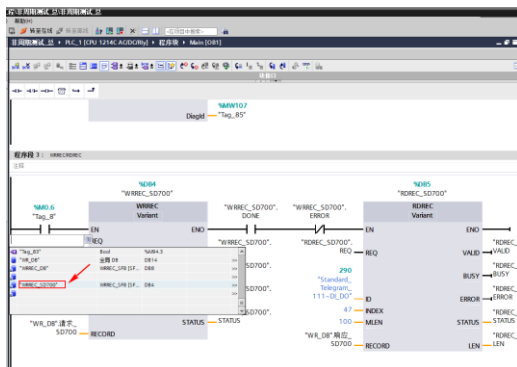
1) Search command WRREC



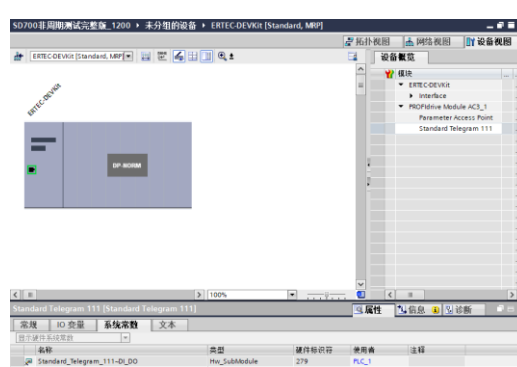
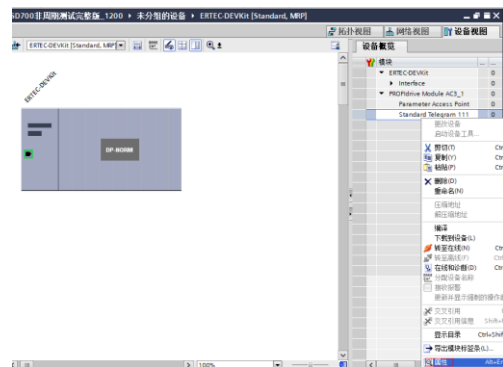
2) After double-clicking or dragging the block to the specified position, set the corresponding data block name.



3) Pin assignment: After clicking the pin twice (take REQ of WRREC module as an edge module as an example), select the corresponding pin corresponding value of the corresponding module.



**Note:** INDEX is fixed to 47, ID is the hardware identifier of the module, and read MLENX is set to 100. hardware identifier lookup is as follows:



4) Data block addition and data filling





## 2.4 Write parameters

This section combines the WRREC and RDREC modules to give examples of acyclic write operations in a variety of situations.

Please refer to section 2.1 for specific data format definitions.

### 2.4.1 Write 32-bit parameter code

Write PnA34 (32-bit) parameters, Portal upper computer data block definition and parameters before writing the initial value as follows:

名称	数据类型	起始值	最大值
Static			
Request ID	Byte	1681	16801
Request ID	Byte	2	16802
Request ID	Byte	1681	16801
Parameters number	Byte	1	16801
Attribute	Byte	16810	16810
Number of Elements	Byte	1	16801
Parameter	Unit	12612	12612
Subindex	Unit	0	0
Write Format	Byte	16843	16843
Write Value	Byte	16843	16843
Write Value	Unit	123	123
Static			
Response Reference	Byte	1680	16800
Response ID	Byte	1680	16800
Response ID	Byte	1680	16800
Parameters number	Byte	1680	16800
Format	Byte	1680	16800
Value	Unit	0	0

功能码	参数名称	初始值	单位	范围
PnA20	原点归零方法	30	-	1~35
PnA21	高速搜索减速点	54321	1000...	0~1073741824
PnA22	搜索零点速度	5000	1000...	0~1073741824
PnA25	回零加速倍率	4321	0m/s...	0~16384
PnA26	PI 最大加速度	100	1000...	0~4294967295
PnA28	PI 最大减速度	100	1000...	0~4294967295
PnA2A	PI 位置正向位置	2147483647	UI	-2147483648~2147483647
PnA2C	PI 位置反向位置	-2147483648	UI	-2147483648~2147483647
PnA30	JOG速度(正向)	30	1000...	0~4294967295
PnA32	JOG速度(反向)	30	1000...	0~4294967295
PnA33	用户命令选择	[0]无	-	0~1
PnA33	用户位置选择	[0]无	-	0~2
PnA34	原点偏移	123	UI	-2147483648~2147483647

**Note:** The data format of the parameter value in the request should correspond exactly, here it is defined as a double word (0x43). Note the distinction between the data type in the data block and the data format corresponding to the parameter code.

After enabling the write operation there is

名称	数据类型	起始值	最大值
Static			
Request ID	Byte	1681	16801
Request ID	Byte	2	16802
Request ID	Byte	1681	16801
Parameters number	Byte	1	16801
Attribute	Byte	16810	16810
Number of Elements	Byte	1	16801
Parameter	Unit	12612	12612
Subindex	Unit	0	0
Write Format	Byte	16843	16843
Write Value	Byte	16843	16843
Write Value	Unit	123	123
Static			
Response Reference	Byte	1680	16800
Response ID	Byte	1680	16800
Response ID	Byte	1680	16800
Parameters number	Byte	1680	16800
Format	Byte	1680	16800
Value	Unit	0	0

功能码	参数名称	初始值	单位	范围
PnA20	原点归零方法	30	-	1~35
PnA21	高速搜索减速点	54321	1000...	0~1073741824
PnA22	搜索零点速度	5000	1000...	0~1073741824
PnA25	回零加速倍率	4321	0m/s...	0~16384
PnA26	PI 最大加速度	100	1000...	0~4294967295
PnA28	PI 最大减速度	100	1000...	0~4294967295
PnA2A	PI 位置正向位置	2147483647	UI	-2147483648~2147483647
PnA2C	PI 位置反向位置	-2147483648	UI	-2147483648~2147483647
PnA30	JOG速度(正向)	30	1000...	0~4294967295
PnA32	JOG速度(反向)	30	1000...	0~4294967295
PnA33	用户命令选择	[0]无	-	0~1
PnA33	用户位置选择	[0]无	-	0~2
PnA34	原点偏移	123	UI	-2147483648~2147483647

PnA34 data writing is normal as shown by SD700 upper computer monitoring.

### 2.4.2 Write 16-bit parameter code

Write PnA20 (16 bits) parameters, Portal upper data block definition and parameters before writing the initial value as follows:

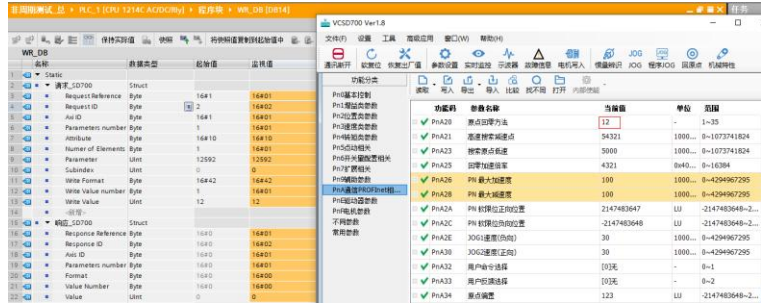
名称	数据类型	起始值	最大值
Static			
Request ID	Byte	1681	16801
Request ID	Byte	2	16802
Request ID	Byte	1681	16801
Parameters number	Byte	1	16801
Attribute	Byte	16810	16810
Number of Elements	Byte	1	16801
Parameter	Unit	12592	12592
Subindex	Unit	0	0
Write Format	Byte	16842	16842
Write Value	Byte	1	16801
Write Value	Unit	12	12
Static			
Response Reference	Byte	1680	16800
Response ID	Byte	1680	16800
Response ID	Byte	1680	16800
Parameters number	Byte	1680	16800
Format	Byte	1680	16800
Value	Unit	0	0

功能码	参数名称	初始值	单位	范围
PnA20	原点归零方法	30	-	1~35
PnA21	高速搜索减速点	54321	1000...	0~1073741824
PnA22	搜索零点速度	5000	1000...	0~1073741824
PnA25	回零加速倍率	4321	0m/s...	0~16384
PnA26	PI 最大加速度	100	1000...	0~4294967295
PnA28	PI 最大减速度	100	1000...	0~4294967295
PnA2A	PI 位置正向位置	2147483647	UI	-2147483648~2147483647
PnA2C	PI 位置反向位置	-2147483648	UI	-2147483648~2147483647
PnA30	JOG速度(正向)	30	1000...	0~4294967295
PnA32	JOG速度(反向)	30	1000...	0~4294967295
PnA33	用户命令选择	[0]无	-	0~1
PnA33	用户位置选择	[0]无	-	0~2
PnA34	原点偏移	123	UI	-2147483648~2147483647

Note: The data format of the parameter values in the request should correspond exactly, here it is defined as a double word (0x42).

After enabling the write operation there is

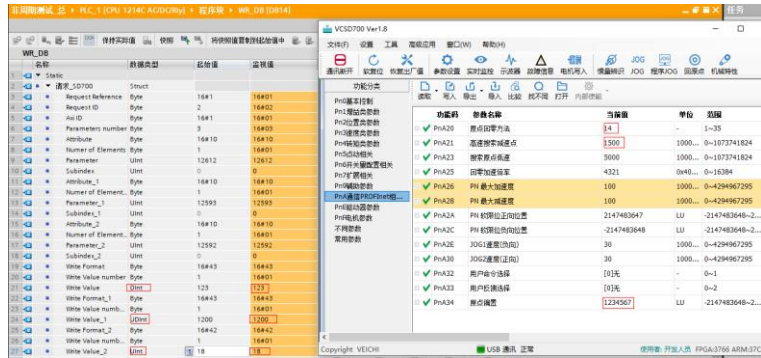




The PnA20 data writing is normal as shown by the SD700 upper computer monitoring. .

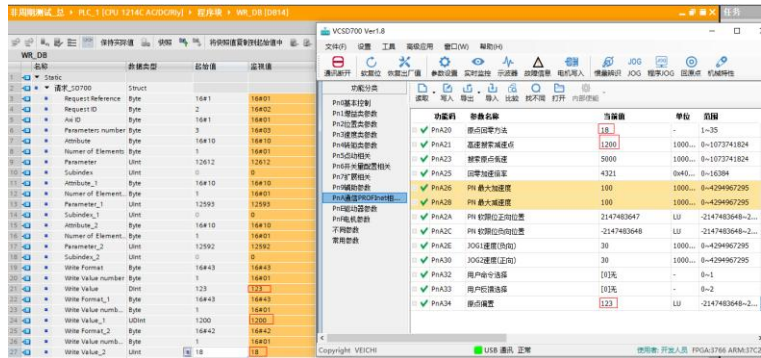
## 2.4.3 Multi-write operation

Write parameter codes PnA34 (32 bits), PnA21 (32 bits), PnA20 (16 bits), and Portal upper data block are defined as follows :



**Note:** The data format marked above must correspond well with the selected function code format, otherwise the write operation fails.

After enabling the write operation there are:



The SD700 upper computer monitoring shows that the data of three parameters are written normally. .

## 3、 Read and write parameters via FB286

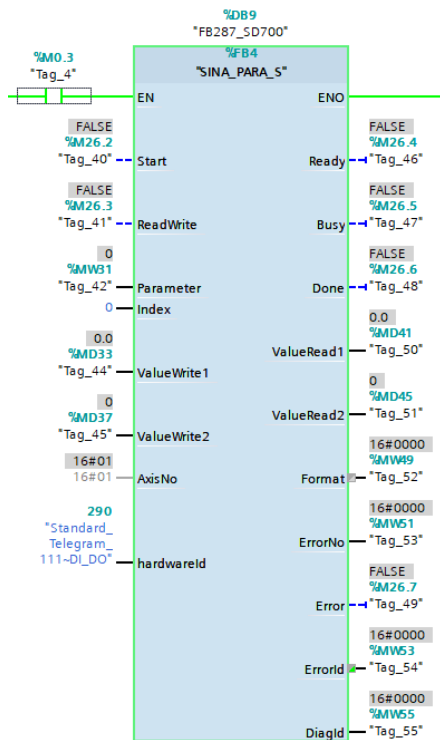
### 3.1 Function block description

Start	The rising edge of start during a parameter operation will start the parameter operation task
ReadWrite	Parameter = 0 indicates a read operation parameter = 1 indicates a write operation
ParaNo	Number of read/write parameters, range 1 to 16
hardwareID	Hardware Identifier
AxisNo	Drive number, SD700PN set to 1









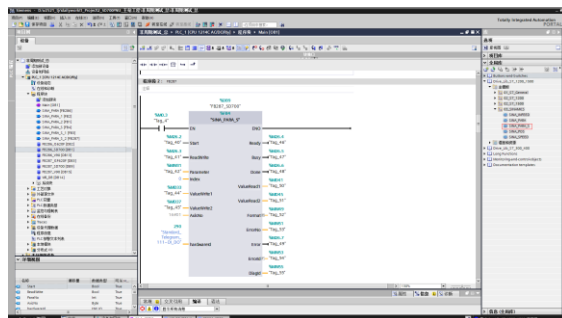
Start	The rising edge of start during a parameter operation will start the parameter operation task
ReadWrite	Parameter = 0 indicates a read operation parameter = 1 indicates a write operation
Parameter	Parameter number to be read or written
INDEX	Parameter subscript
<b>ValueWrite1</b>	Write the 16-bit parameter value here
<b>ValueWrite2</b>	Write the 32-bit parameter value here
AxisNo	Drive number, SD700PN set to 1
hardwareID	Hardware Identifier
Ready	The block is not performing a read or write operation and is in the ready state
Busy	Show 1 when the write parameter is executed, becomes 0 if it finishes or after a failure
Done	Task execution is complete and can be used to reset requests when writing programs
<b>ValueRead1</b>	Read the 16-bit parameter value here
<b>ValueRead2</b>	Read the 32-bit parameter value here
Format	Format of the read parameter
ErrNo	Error Code
Error	Error flag bit
ErrorId	Return Value
DiagId	Return Value

## 4.2 Module addition and configuration

The process of adding and configuring the FB287 module to the Portal V15 uplink is as follows:

1) under Path:

Library->Global Library->Drive\_Lib\_S7\_1200\_1500->Master Templates->03\_SINAMICS Select SINA\_PARA



2) Pin Configuration

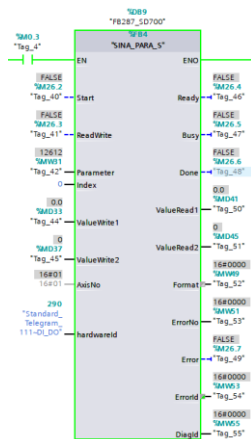
Refer to subsection 4.1, where hardware identifier selection can be found in subsection 2.2.

**Note:** The module does not need to fill data in the data block, operate directly on the function block to achieve a single parameter read and write (does not support multi-parameter read and write).

## 4.3 Read Parameters

### 4.3.1 Read 32-bit parameter code

Read the parameter PnA34 and assign the value of each pin as follows:



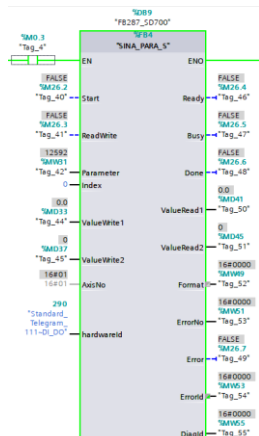
After enabling the read operation there are.:

功能码	参数名称	当前值	单位	范围
✓ PnA20	原点回零方法	18	-	1~35
✓ PnA21	高速搜索减速点	1200	1000...	0~1073741824
✓ PnA22	搜索原点速度	5000	1000...	0~1073741824
✓ PnA23	回零加速倍率	4321	0x40...	0~16384
✓ PnA24	PH 最大加速度	100	1000...	0~4294967295
✓ PnA25	PH 最大减速度	100	1000...	0~4294967295
✓ PnA26	PH 软限位正向位置	2147483647	LU	-2147483648~2...
✓ PnA27	PH 软限位负向位置	-2147483648	LU	-2147483648~2...
✓ PnA28	JOG1速度(正向)	30	1000...	0~4294967295
✓ PnA29	JOG2速度(正向)	30	1000...	0~4294967295
✓ PnA30	用户命令选择	[0]无	-	0~1
✓ PnA31	用户反馈选择	[0]无	-	0~2
✓ PnA32	原点偏置	123	LU	-2147483648~2...

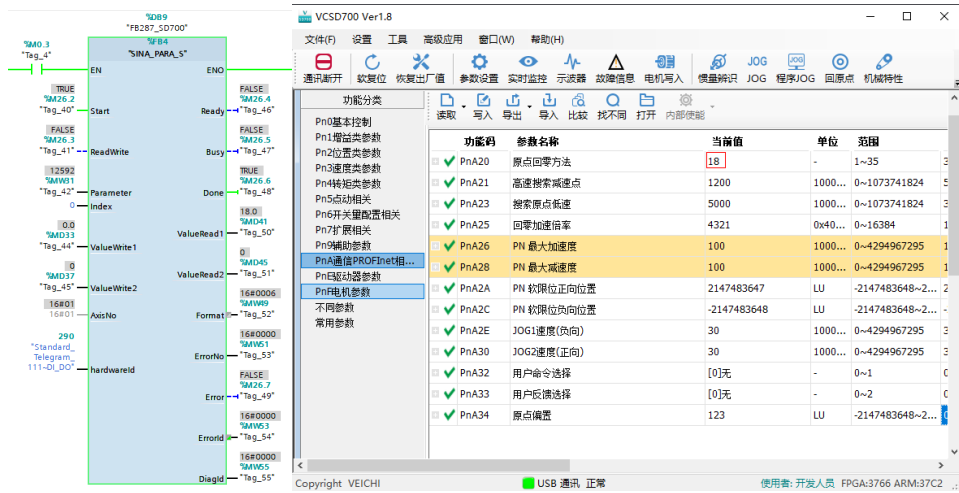
You can see that the read completion flag is set to 1, the read format is signed 32-bit data, and the read data feedback is normal.

### 4.3.2 Read 16-bit parameter code

Read the parameter PnA20 and assign the value of each pin as follows:



After enabling the read operation there is:

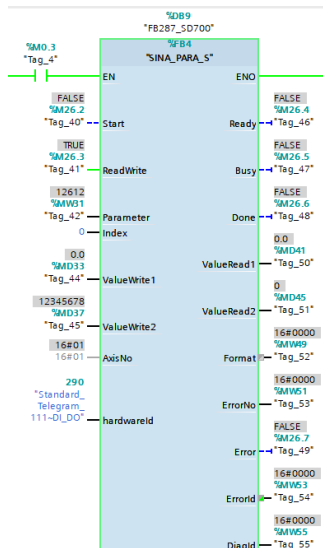


You can see that the read completion flag is set to 1, the read format is unsigned 16-bit data, and the read data feedback is normal.

## 4.4 Write parameters

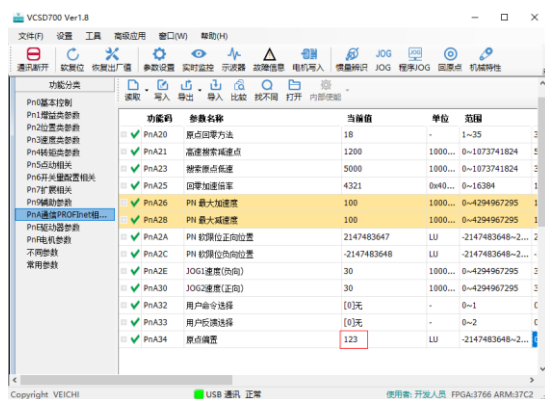
### 4.4.1 Write 32-bit parameter code

Write parameter PnA34 and assign the following values to each pin:

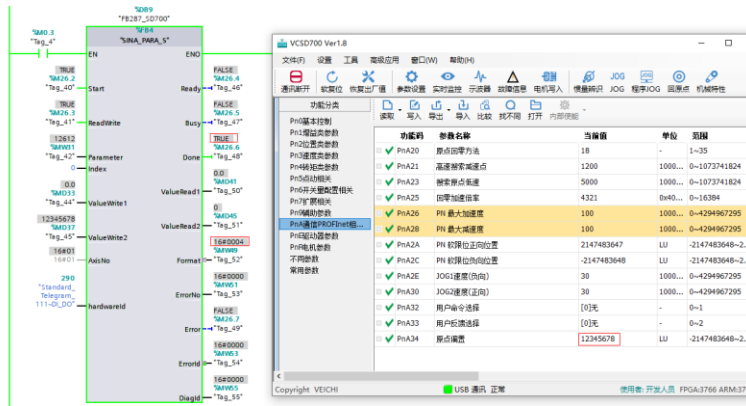


Note the read/write enable, parameter number, and write 32-bit data pin definition.

The initial value of the parameter before enabling the write operation is:



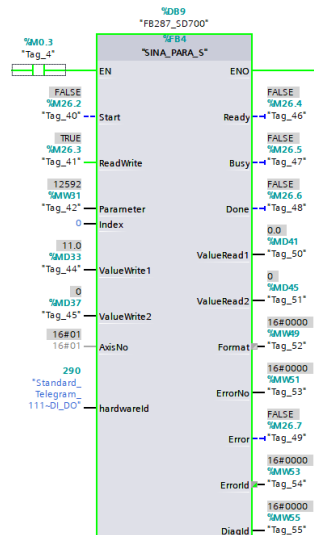
After writing enable there is:



You can see that the write completion flag is set to 1, and the write format is signed 32-bit data, and the data is written normally through the upper computer.。

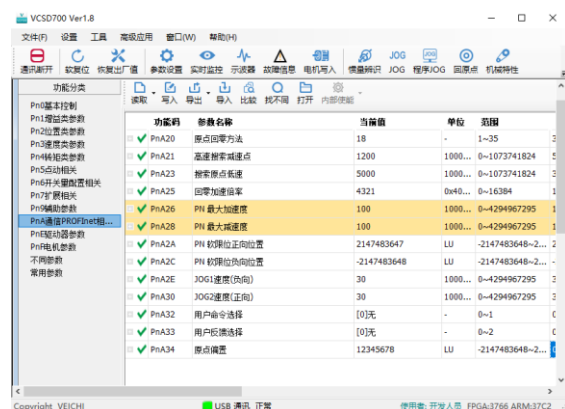
## 4.4.2 Write 16-bit parameter code

Write parameter PnA20 and assign the following values to each pin:

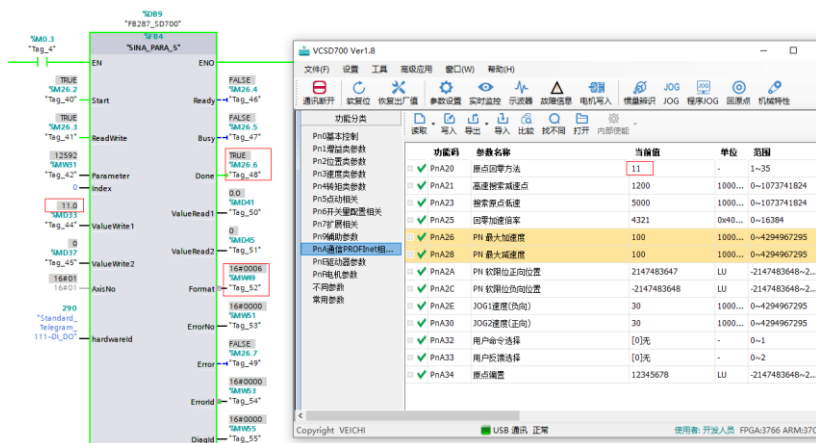


Note the read/write enable, parameter number, and write 16-bit data pin definition.。

The initial value of the parameter before enabling the write operation is:



After writing enable there is:



You can see that the write completion flag is set to 1, the write format is signed 16-bit data, and the data is written normally through the upper computer.。

## Annex:

Protherm Drive\_lib library file (version V15)

109475044\_drivel  
ib\_TIA15\_V511.zip