Subject: PROFIBUS	**Product:** SI-P3 & SI-P3/V	**Doc:** AN.AFD.30
Title: Using the Yaskawa PROFIBUS Option SI-P3 or SI-P3/V with Siemens Step 7 Software		

Application Note

Using the Yaskawa PROFIBUS Option SI-P3 or SI-P3/V
with Siemens Step 7 Software

USE OF TECHNICAL INFORMATION!
Technical content and illustrations are provided as technical advice to augment the information inthis manual, not supersede it. The information described in this document is subject to change without notice. Yaskawa assumes no responsibility for errors or omissions or damages resulting from the use of the information contained in any technical document. All warnings, cautions and product instruction for product use must be followed. Qualified personnel should carry out installation, operation and maintenance.

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Introduction

This document describes how to add a Yaskawa 1000 series AC Drive with an SI-P3 or SI-P3/V Option to a PROFIBUS network using the Siemens Step 7 software. Although this document refers to the SI-P3, the same steps should be followed for the SI-P3/V. The connections of the SI-P3 and SI-P3/V to a PROFIBUS network are identical.

Intended Audience

This document is intended for those involved in designing, installing and/or commissioning a PROFIBUS system including Yaskawa 1000 series AC Drives. It is assumed that the reader is familiar with Yaskawa 1000 Series AC Drives, PROFIBUS and Siemens Step 7 programming. Familiarity with the SI-P3 and SI-P3/V Options and with Yaskawa AC Drives' installation guides and technical manuals is highly recommended.

References

Siemens documentation may be downloaded from	https://support.automation.siemens.com
49948856	SIMATIC PROFIBUS with STEP 7
45531107	SIMATIC Programming with STEP 7
Following manuals may be downloaded from	https://www.yaskawa.com
SIEPC71061641	Yaskawa 1000 Series AC Drive Technical Manual
TOBPC73060042	1000 Series Drive Option - PROFIBUS-DP Installation Manual SI-P3
SIEPC73060042	1000 Series Drive Option - PROFIBUS-DP Technical Manual SI-P3
SIEPC71060618	Yaskawa V1000 AC Drive Technical Manual
TOBPC73060023	V1000 Option PROFIBUS-DP Installation Manual
SIEPC73060023	V1000 Option PROFIBUS-DP Technical Manual
PROFIBUS information may be downloaded from	https://www.profibus.com/technology/profibus/

Create a Project

Create Project

- Open the Step 7 software
- Cancel the **Wizard**
- Select **File → New**

Name Project

- Enter the project **Name**
- Click **OK** to accept the entries

Add Station

- Select **Insert → Station**

Add System Rack

- Select station type (**SIMATIC 300 Station** for this example)
- Select **Object → Insert Object → Station**, **Rack** and **Rail**

Open Hardware Catalog

Add CPU to System Rack

- Select CPU from Catalog
- Add the CPU to the system rack

PROFIBUS Network Configuration

- Enter the CPU **IP Address** and **Subnet Mask**
- Click **New**

PROFIBUS Network Name

- **General** Tab
- Enter the network **Name**

PROFIBUS Network Settings

- **Network Settings** Tab
- Verify **S7 subnet ID**
- Click **OK**

Create Project

Open the Step 7 software. Only use the project wizard if your PLC can be automatically selected in the wizard.. Select **New** from the **File** drop down menu. The **New Project** dialog box will automatically be displayed.

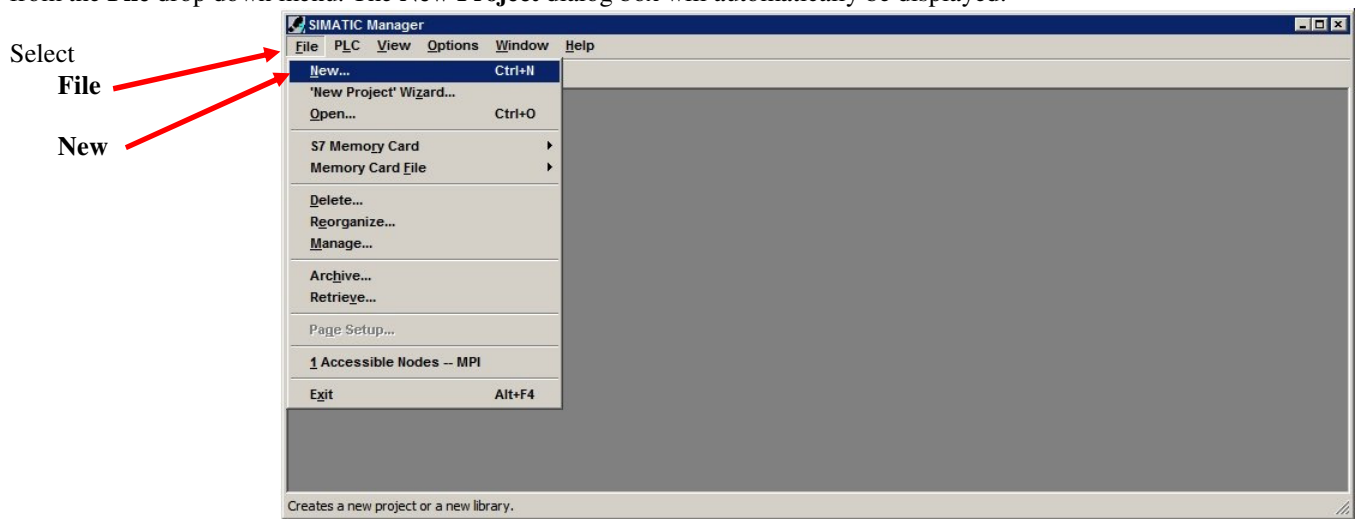

Figure 1 -- Create Project

Name Project

After the **New Project** dialog box is displayed, enter the name of the project in the **Name** box. Verify that the project directory is correct and Click **OK**.

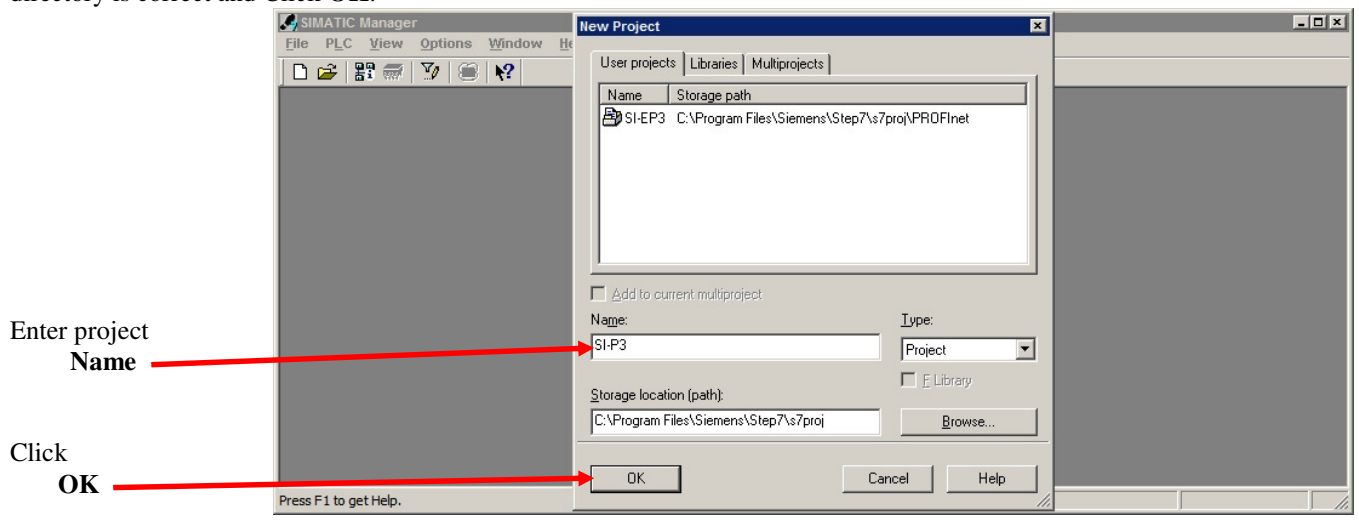

Figure 2 – Enter Project Name

Add Station

A station needs to be added to the project to represent the controlling device. Select **Insert** from the main menu, **Station** from the subsequent menu and the appropriate station from the displayed list. The **SIMATIC 300 Station** is used in this example.

Select
Insert

Station

SIMATIC 300 Station

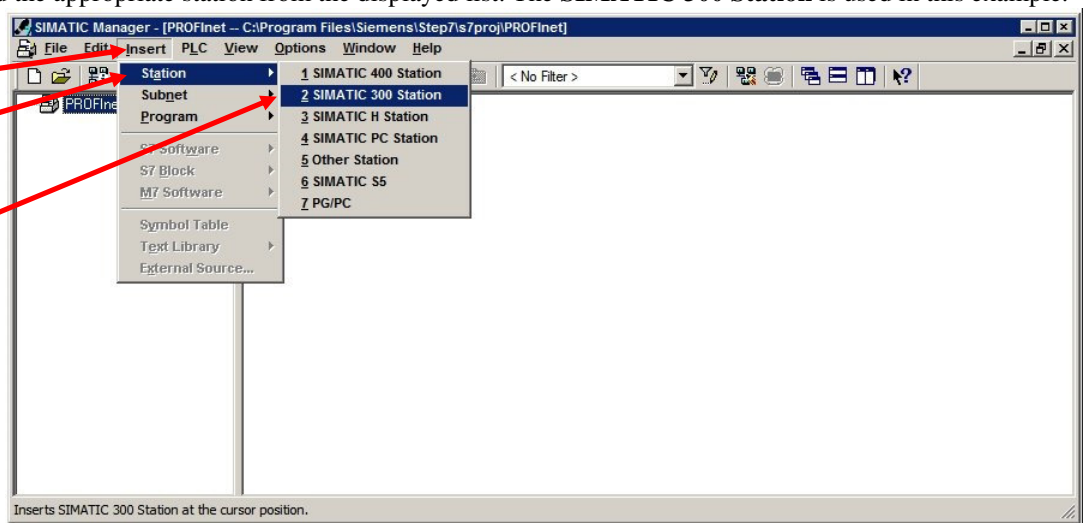

Figure 3 -- Select Station

Select station **SIMATIC 300** from the left frame of the main dialog box. Double Click **Hardware** in the right frame of the main dialog box. The **HW Config** dialog will automatically be displayed.

Double Click
Hardware

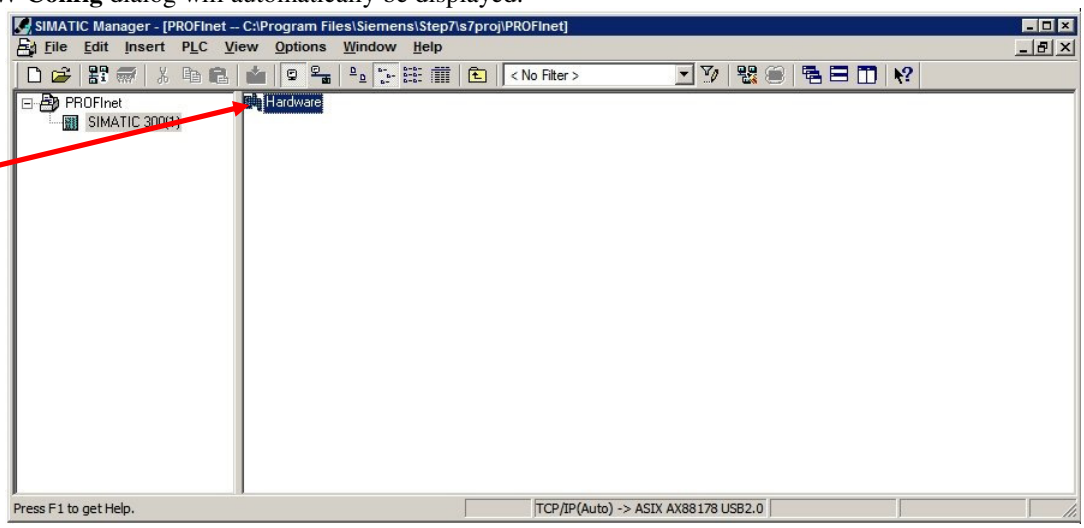

Figure 4 -- Open Hardware Configuration

Add System Rack

The initial **HW Config** dialog box should not contain any hardware. To add a system to the project hardware an object must be inserted to contain the CPU, power supply and any additional modules that would belong to the system. Select **Insert** from the main menu then **Insert Object** from the subsequent menu.

Select
Insert
Insert Object

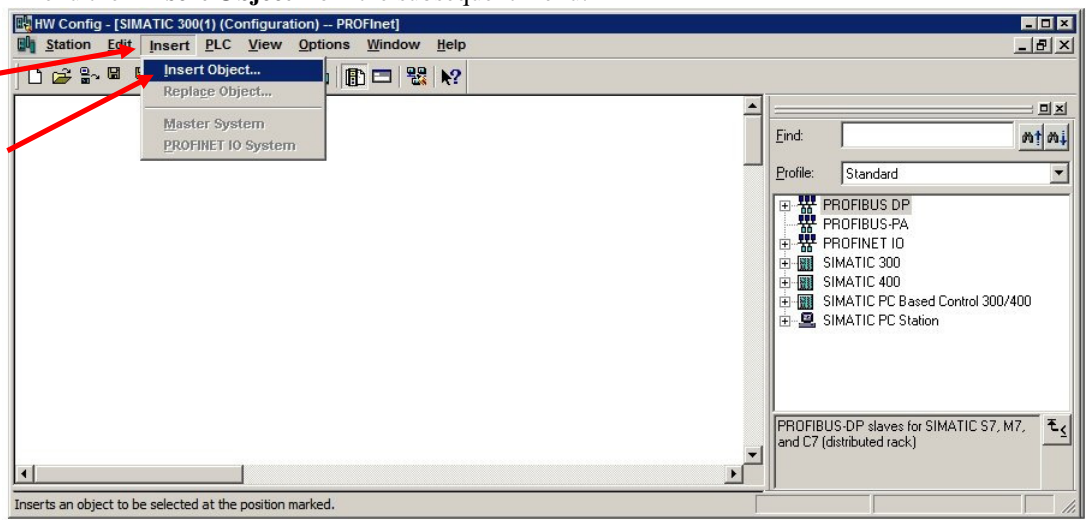

Figure 5 -- Insert CPU Object

A dialog box will automatically appear in the upper left corner of the **HW Config** dialog. Select the appropriate station (**Station 300** in this example). Select **Rack** and then **Rail** from subsequent menus. A station configuration dialog box representing the system rack will automatically be displayed.

Select
Station
Rack
Rail

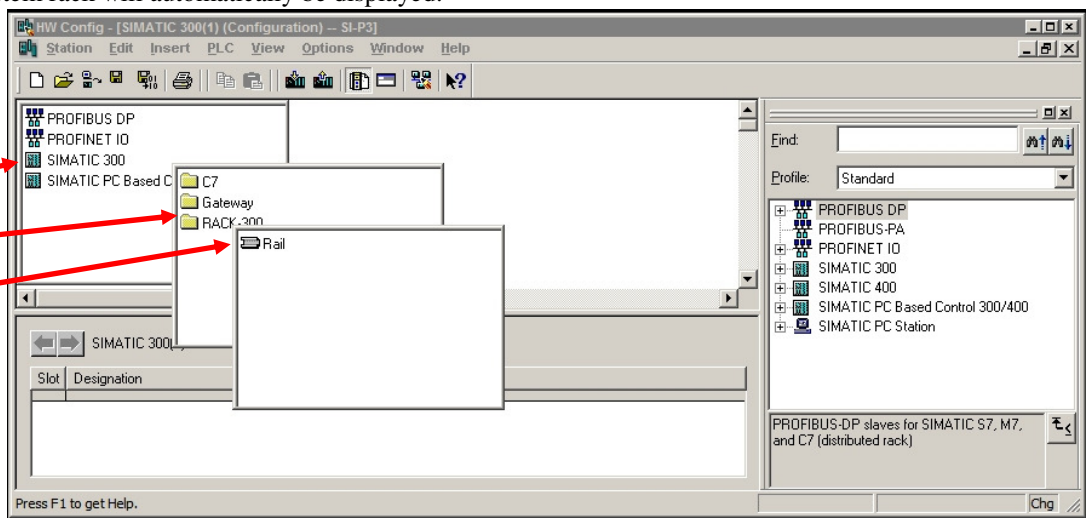

Figure 6 -- Define Inserted Object Type

Open Hardware Catalog

The CPU and subsequent hardware modules and devices must be selected from the hardware catalog. If the catalog is not open, select **View** from the main menu and **Catalog** from the **View** menu.

Select
View

Catalog

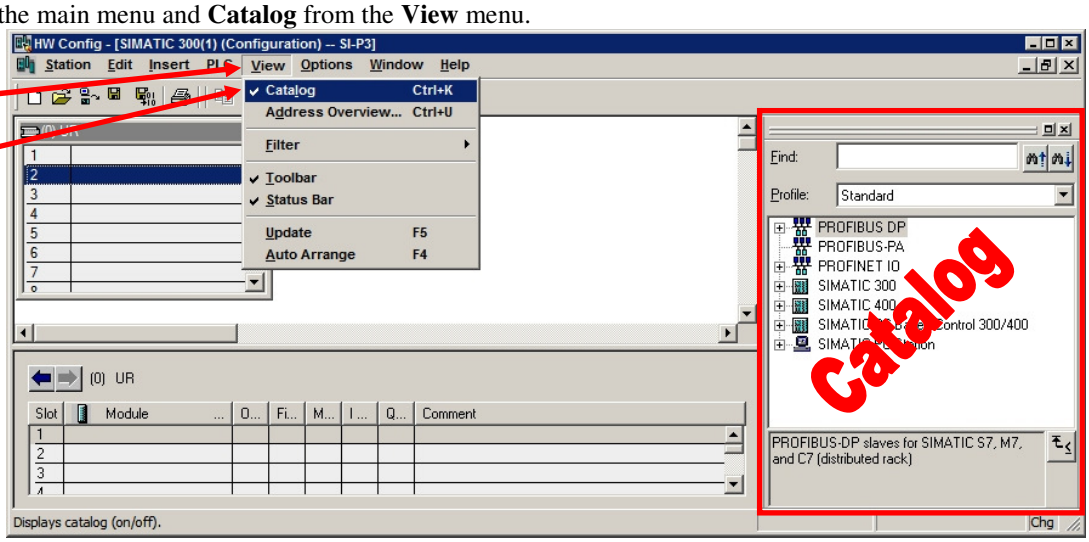

Figure 7 – Open Catalog

Add CPU to System Rack

Select the CPU and firmware version from the catalog and drag the selection to the highlighted slot in the system rack. This example uses a **315 2 DP V2.6** CPU. When the CPU is inserted in the rack, the network configuration dialog will open.

Your CPU may be different and require additional hardware; power supply, input, output, analog modules, etc. Additional modules should also be selected from the hardware catalog and similarly dragged to their appropriate slot in the system rack.

Select
CPU

Drag (- - - -)
The CPU to the
Designated slot in
The system rack

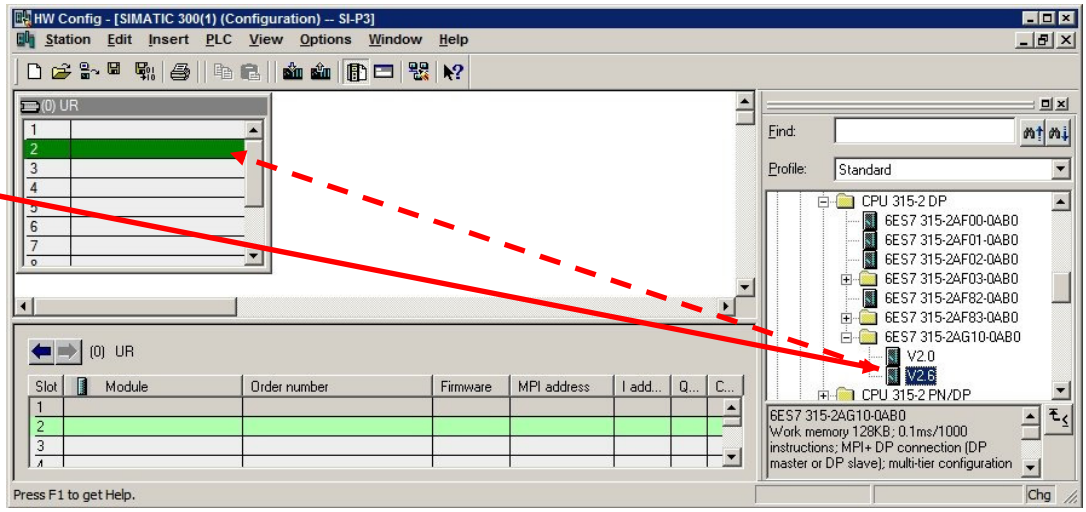

Figure 8 -- Add CPU to System Rack

PROFIBUS Network Configuration

Configuring a PROFIBUS network in a PROFINET/PROFIBUS enabled CPU is slightly different than for a PROFIBUS only CPU and shown in this example. See Appendix B for an example of configuring a PROFIBUS network on a PROFINET/PROFIBUS enabled CPU.

Select the CPU's node **Address** on the PROFIBUS network. Click **New** to add a network to the CPU.

Select
CPU **Address**

Click
New

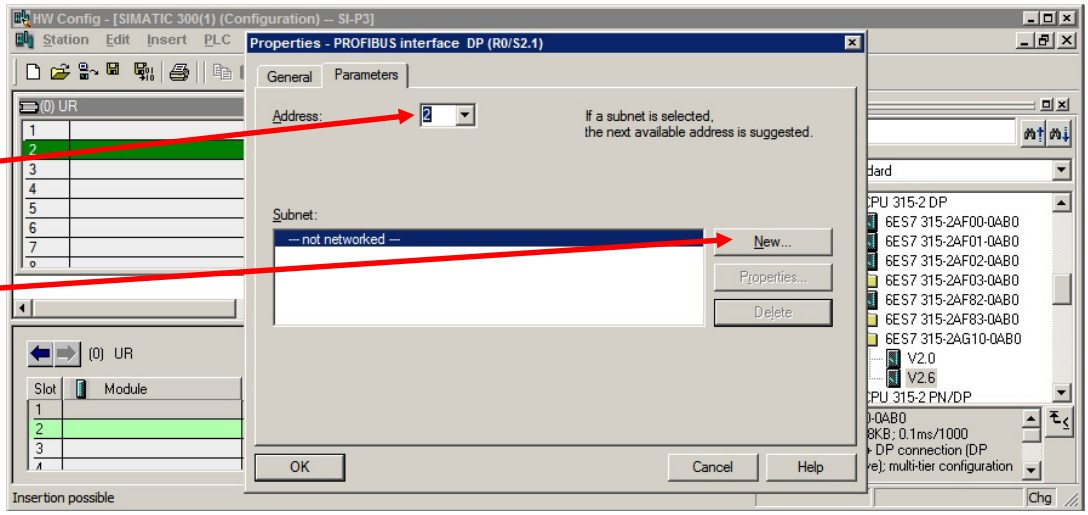

Figure 9 – Select Node Number

PROFIBUS Network Name

At the **General** tab, enter a network **Name** and verify the **S7 subnet ID**. Optionally, enter the project **Author** and project **Comments**. Select the **Network Settings** tab to continue with the network configuration.

Enter Network
Name

Verify
S7 subnet ID

Optionally Enter
Author

Comments

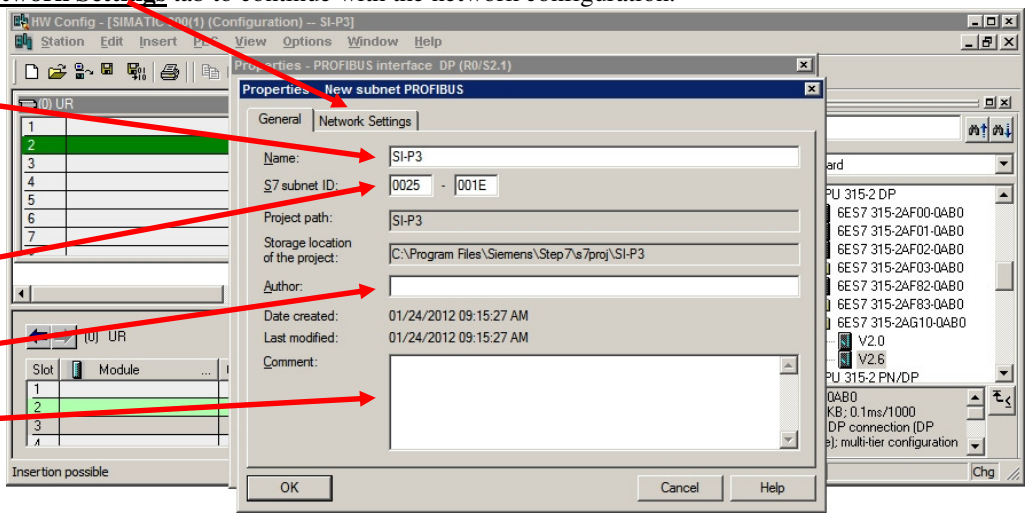

Figure 10 – Define PROFIBUS Network

PROFIBUS Network Settings

Verify the network **Highest PROFIBUS Address**, **Transmission Rate** and **Profile**. Click **OK** to accept the settings.

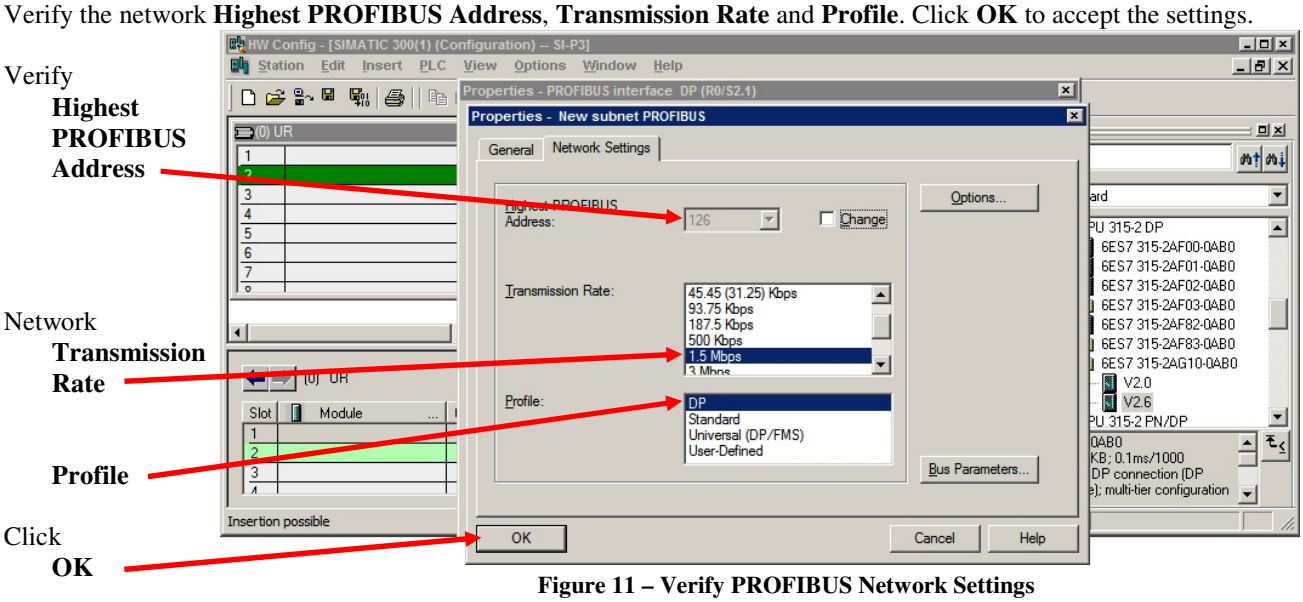

Figure 11 – Verify PROFIBUS Network Settings

Add an SI-P3 PROFIBUS Option

Install GSD File

- Select **Options → Install GSD File** from the sebsequent menu
- Browse for the SI-P3 GSD file location
- Select the SI-P3 GSD file
- Select **Install**
- Click **Close**

Add SI-P3 Option

- Select SI-P3 from the hardware catalog
- Add the SI-P3

Configure SI-P3 Network Connection

- Select node address
- Select network subnet for connection

Add Cyclic IO

PPO Types Supported

Select PPO

- Select the SI-P3 IO telegram
- Add the selected telegram

Add Symbols to IO

PPO Telegram Header Symbols

- Select IO area
- Select **Edit Symbols**
- Enter symbols
- Apply edits

Control & Status Word Symbols

- Select IO area
- Select **Edit Symbols**
- Enter symbols
- Apply edits

Download Hardware Configuration

Save and Compile

- Select **Station → Save and Compile**

Download to PLC

- Select **PLC → Download**
- Close the **HW Config** dialog

Install GSD File

The SI-P3 and SI-P3/V use the same GSD file. If the file has not already been installed, select **Options** from the main menu, then **Install GSD File** from the subsequent menu.

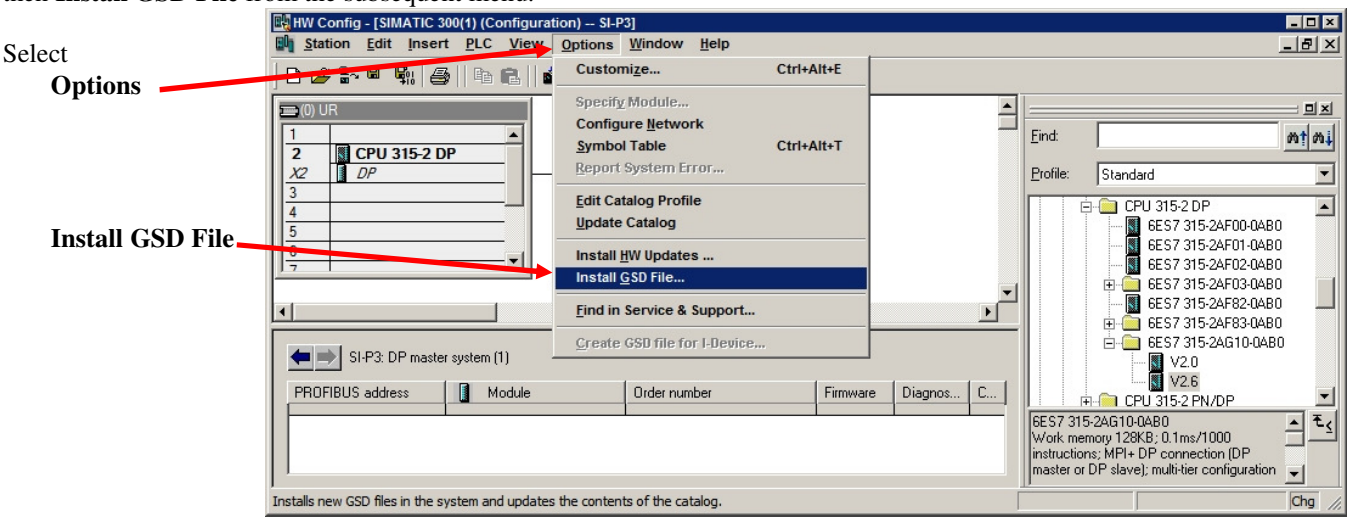

Figure 12 -- Install GSD File

Browse for the SI-P3 GSD file's location, select ***YASK0ACF.gsd*** then **Install**. Click **Close** after the file has been installed to return to the **HW Config** dialog.

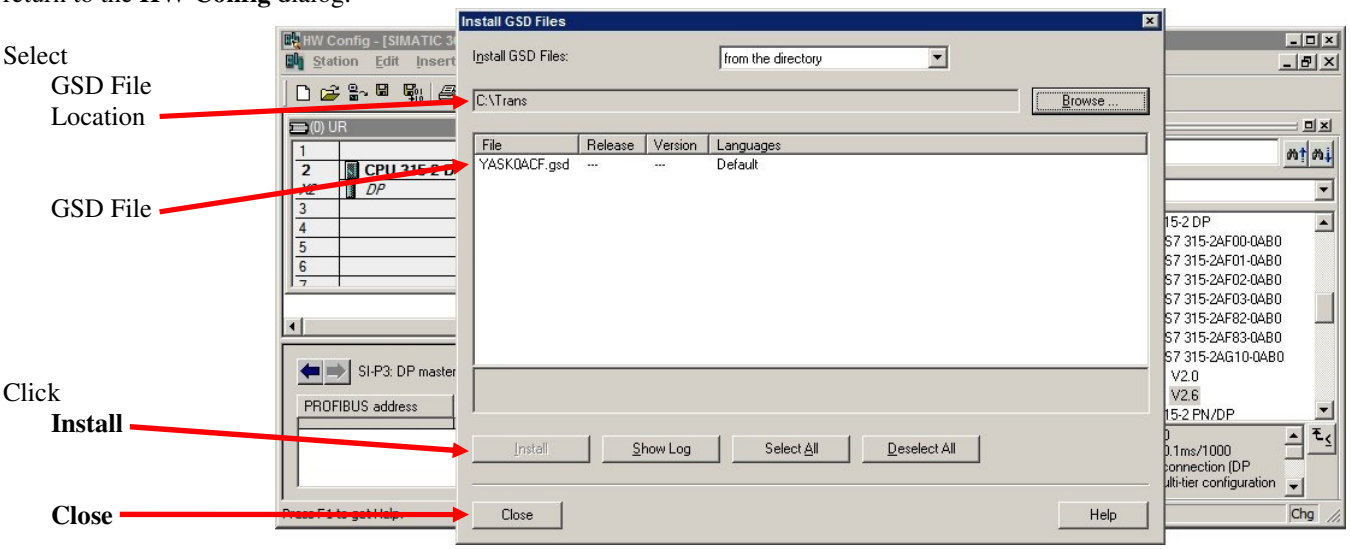

Figure 13 -- Select SI-P3 GSD File

Add SI-P3 Option

Select the **SI-P3 PROFIBUS-DP** from the hardware catalog. It is located under **PROFIBUS DP → Additional Field Devices → Drives → SI-P3** in the hardware catalog. Drag the selection to the PROFIBUS network.

Select
SI-P3
Drag (- - -)
The SI-P3 to the
PROFIBUS network

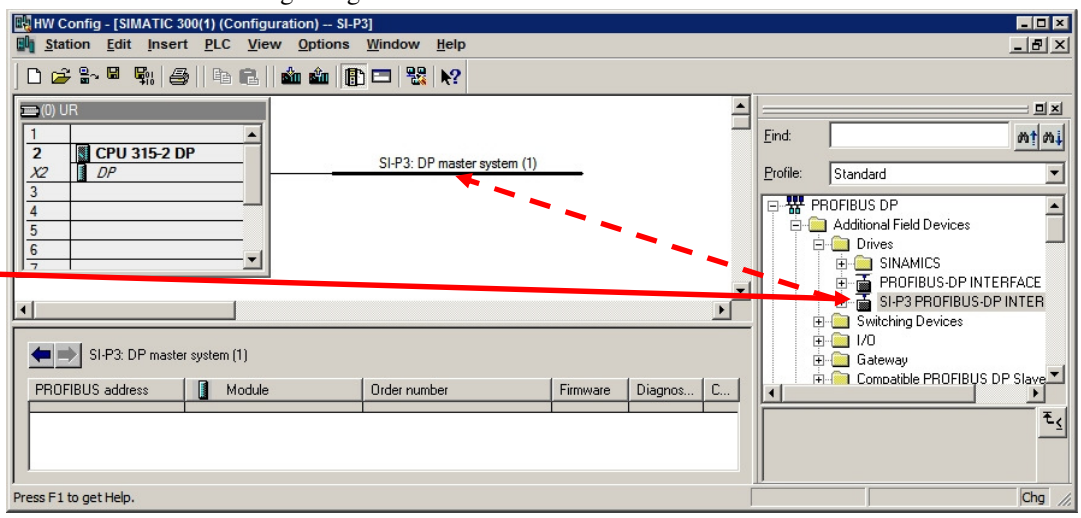

Figure 14 -- Add SI-P3 Drive to Network

Configure SI-P3 Network Connection

To add the SI-P3 to the network, select the node **Address** assigned to the SI-P3. Note that no two devices on the same subnet may have the same node **Address**. Select the network connection from the list of **Subnets**. This should be the same network that was created for the installed CPU. Click **OK** to accept the selections.

Select
Node **Address**

Network Connection
Subnet

Click
OK

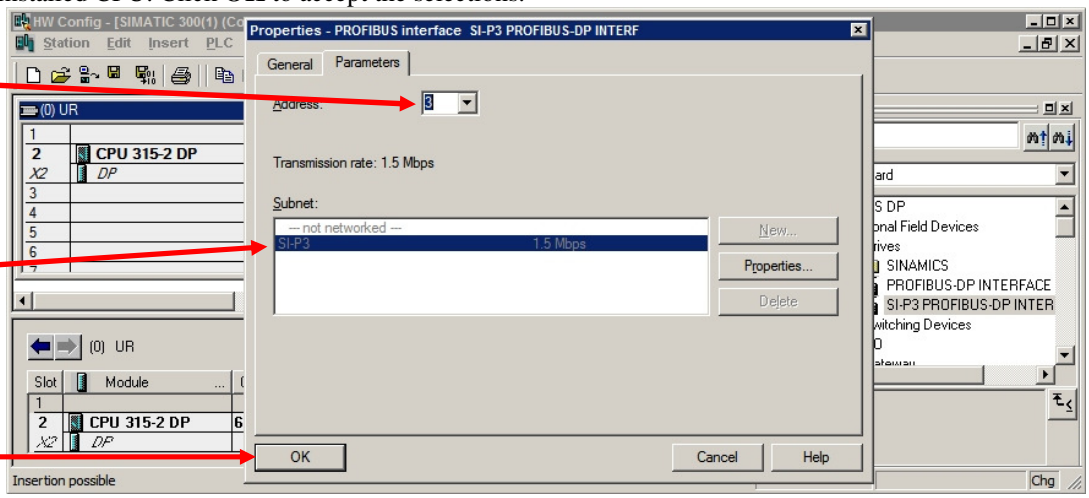

Figure 15 – Configure SI-P3 Network Connection

Add Cyclic IO

PPO Types Supported

The table below shows the PPO types supported by the SI-P3. The PPO Type sections are shown as WORDs. Notice that PPO Types 3 and 4 do not support the PPO header.

Since **PPO Type 1** is used in this example, the WORD addresses assigned by adding the SI-P3 Option to the network are shown below the **PPO Type 1** header section names. Notice that each section begins on even byte boundaries.

Table 1 - Supported PPO Types												
PKW			PZD									
PKE	IND	PWE	PZD 1	PZD 2	PZD 3	PZD 4	PZD 5	PZD 6	PZD 7	PZD 8	PZD 9	PZD 10

PPO Type 1

PKE	IND	PWE		PZD 1	PZD 2
256	258	260	262	264	266

PPO Type 2

PKE	IND	PWE		PZD 1	PZD 2	PZD 3	PZD 4	PZD 5	PZD 6

PPO Type 3

PZD 1	PZD 2

PPO Type 4

PZD 1	PZD 2	PZD 3	PZD 4	PZD 5	PZD 6

PPO Type 5

PKE	IND	PWE		PZD 1	PZD 2	PZD 3	PZD 4	PZD 5	PZD 6	PZD 7	PZD 8	PZD 9	PZD 10

Select PPO

Select the SI-P3 Option connected to the PROFIBUS network. From the list of telegrams supported by the SI-P3 Option in the catalog, select the telegram to be used for cyclic communications (**PPO Type 1** in this example) and drag it to the highlighted slot in the in the device table located at the bottom of the **HW Config** dialog..

Select
PPO Type

Drag (- - -)
The selection to
The device Table

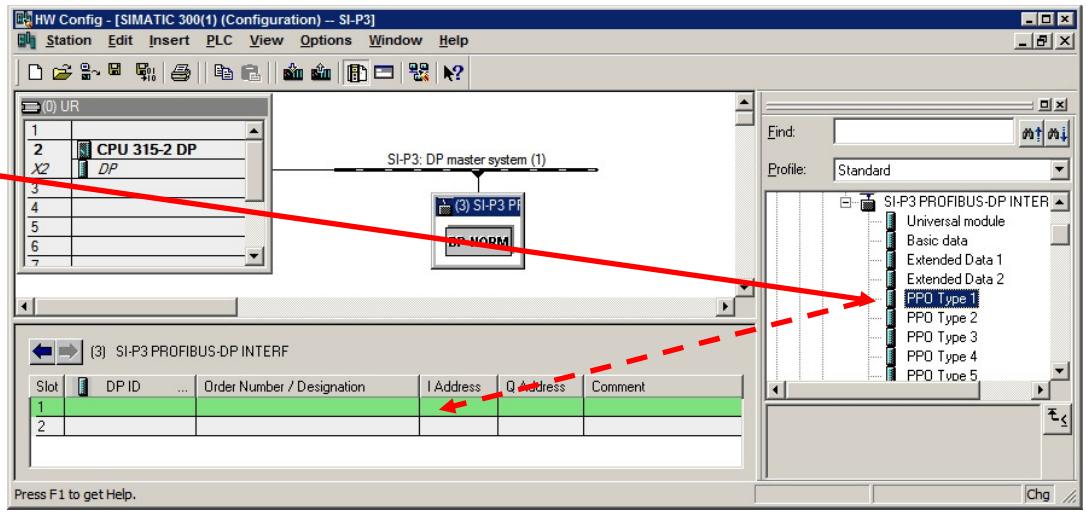

Figure 16 -- Add Cyclic I/O

PPO Type 1 telegram's IO is split into the telegram header (PKE, IND, PWE)and the data (STW/ZSW, HIW/HSW).

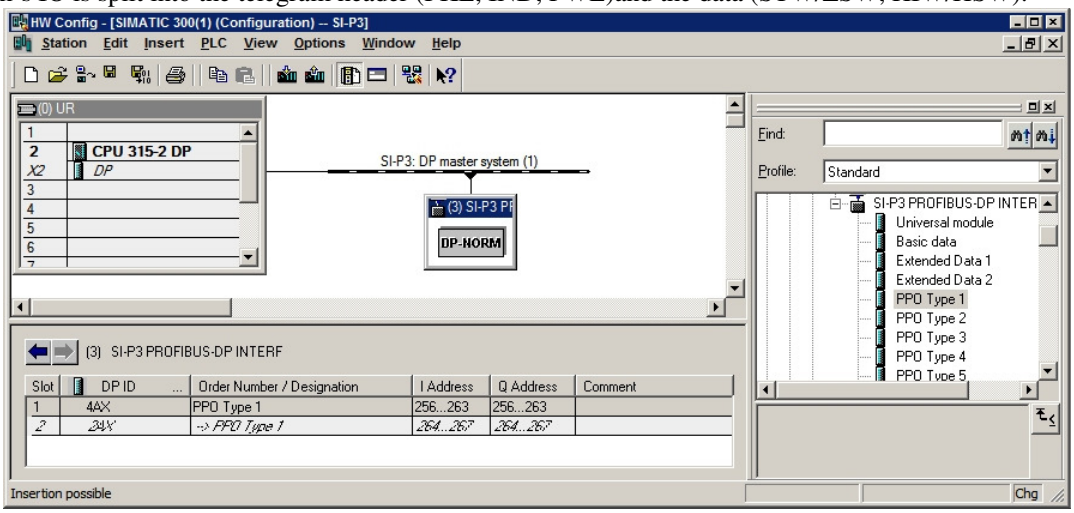

Figure 17 -- Cyclic I/O Properties

Add Symbols to IO

Right click on the IO area in the device table that is to receive symbol representation. The **PPO Type 1 *4AX*** section was selected in the example below. Select **Edit Symbols** from the subsequent menu.

Select
Edit Symbols

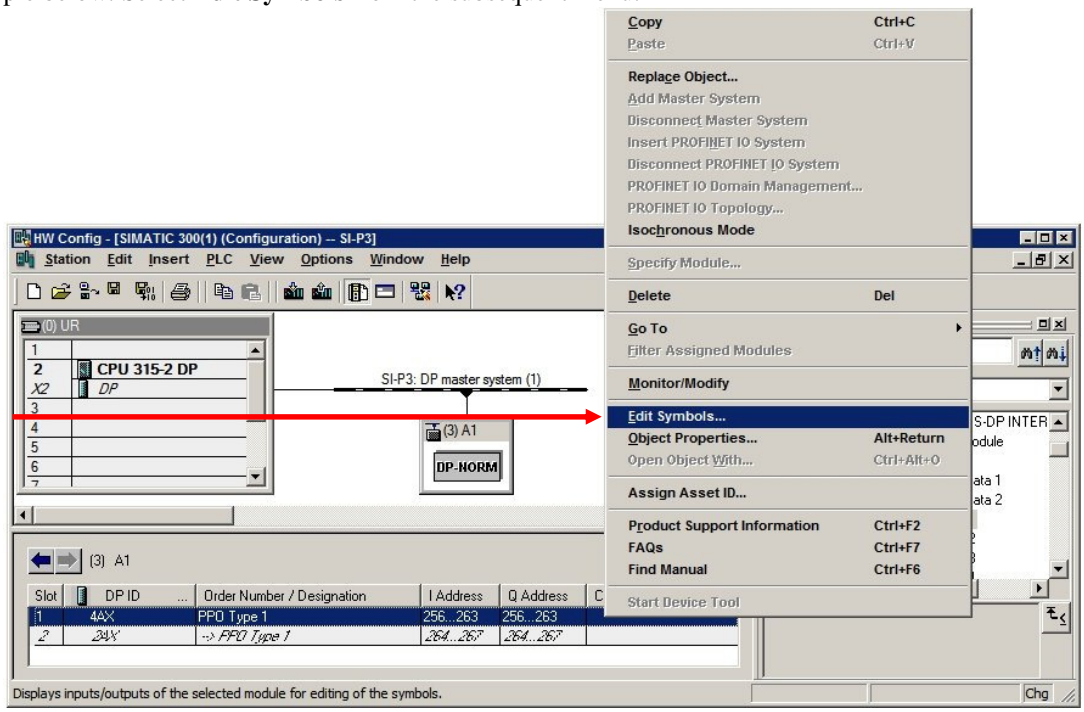

Figure 18 – Edit Symbols

PPO Telegram Header Symbols

In the dialog that appears after selecting **Edit Symbols** above, enter the symbol for the IO point in the **Symbol** column. In the example below comments were also added to the IO point. When all symbols have been entered, click on **Apply** to accept the entries. After the symbols have been applied, the **Cancel** button will change to **Close**. Click on **Close** to return to the **HW Config** dialog.

Enter
Symbols

Click
Apply

Close

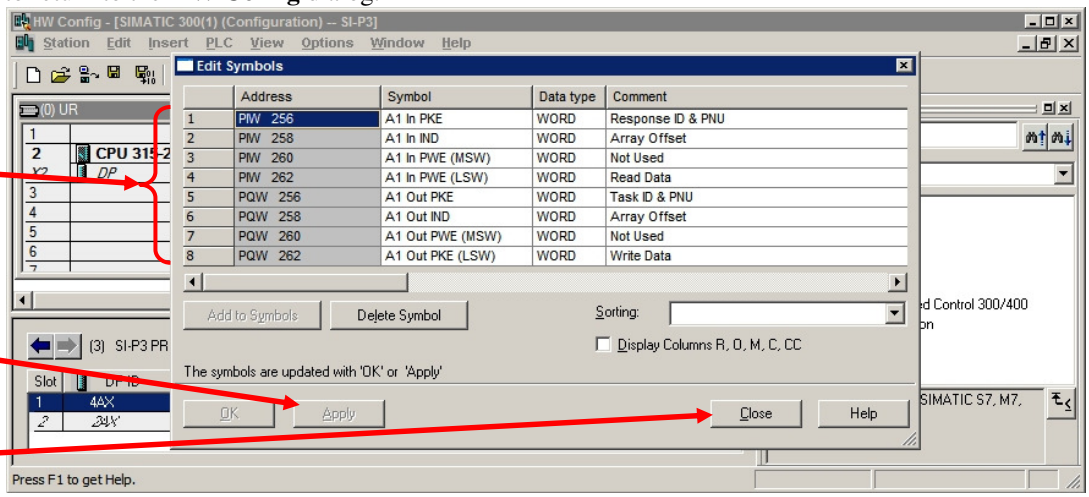

Figure 19 – PPO Telegram Header Symbols

Control & Status Word Symbols

Follow the same steps as described in the PPO Header section above for adding symbols to the **Control** and **Status Words**.

Enter Symbols

Click **Apply**

Close

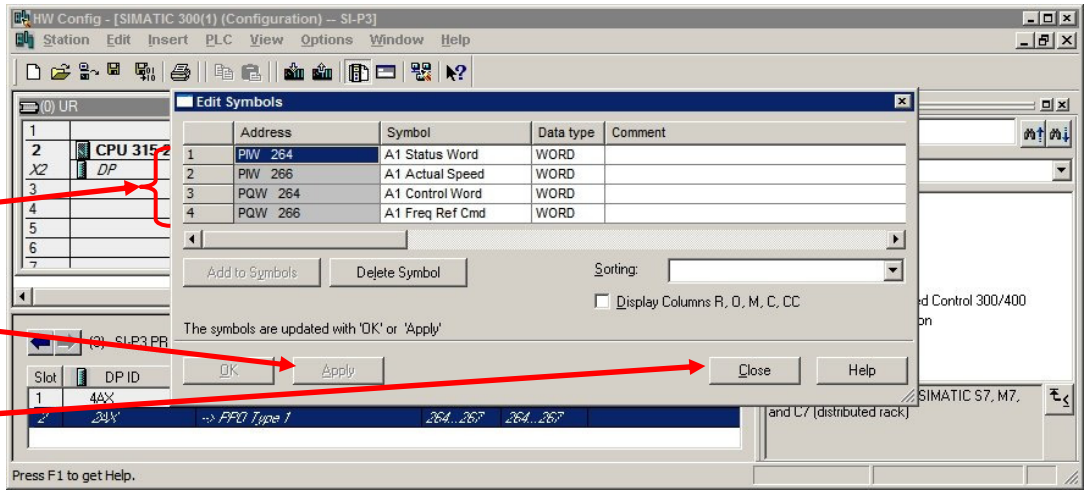

Figure 20 – Control & Status Word Symbols

Note: Symbols reside on the Step 7 programming device and are not stored in CPU memory.

Download Hardware Configuration

Save and Compile

Once all of the devices have been added to the network and configured, the information must be compiled and downloaded to the PLC. Select **Station** from the main menu then **Save and Compile** from the subsequent menu.

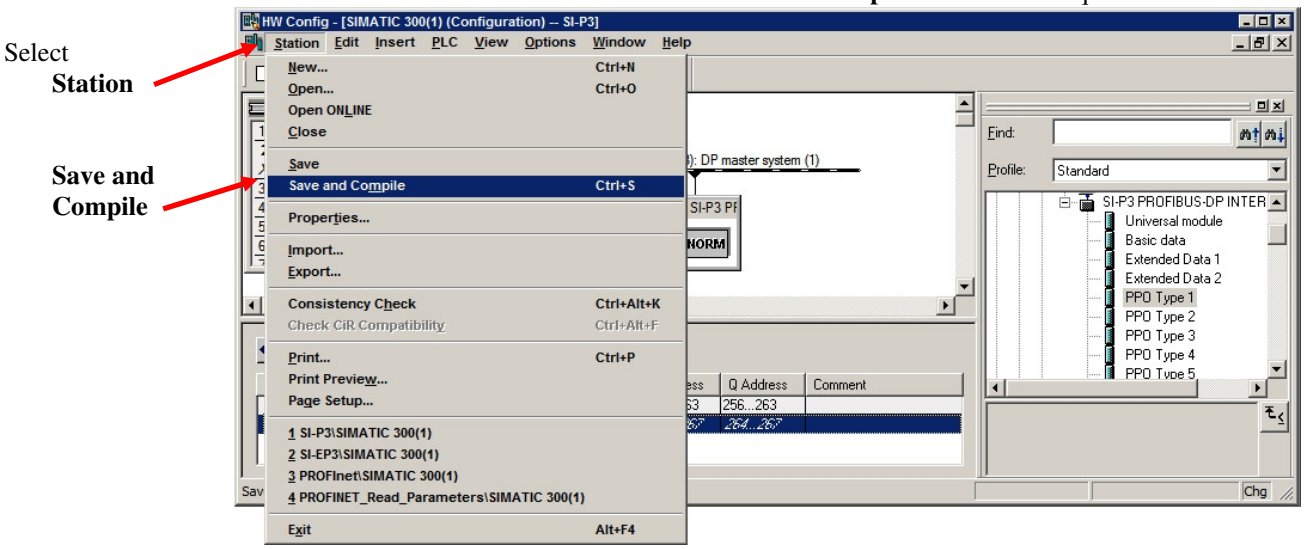

Figure 21 -- Save and Compile

Download to PLC

After the project hardware has been saved and compiled, download it to the PLC. Select **PLC** from the main menu and **Download** from the subsequent menu. After the program has been downloaded to the PLC, close the **HW Config** dialog.

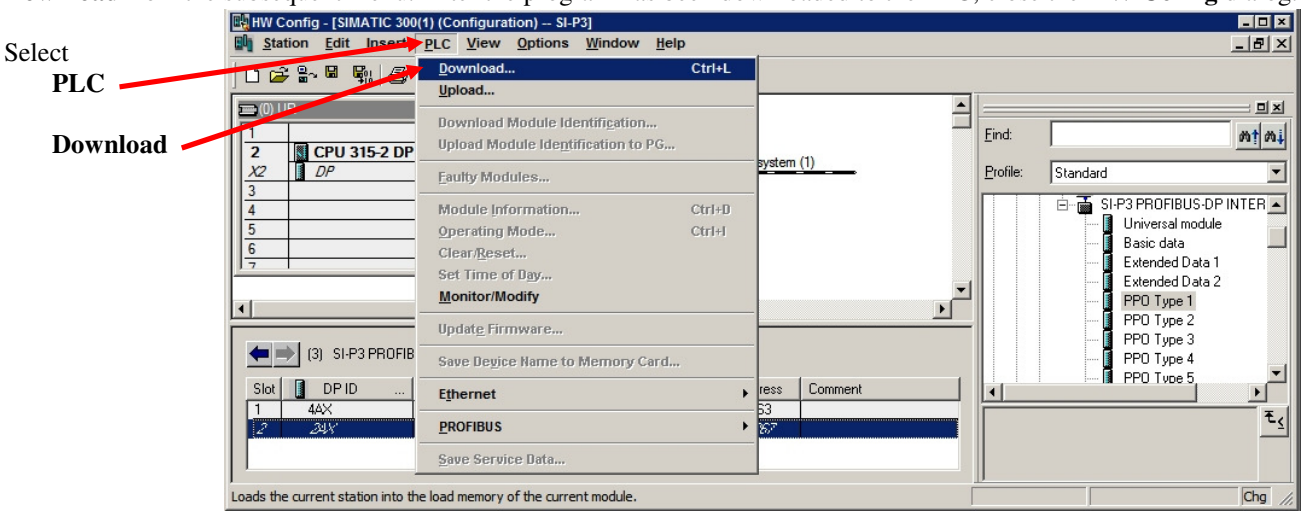

Figure 22 -- Download to PLC

Drive Control via. Variable table

Variable Table

Create Variable Table

- Select **Insert → S7 Block → Variable Table**

Name Variable Table

- Enter a **Symbolic name** (**SI-P3 IO** in this example)
- Click **OK**

Populate Variable Table

- All inputs and outputs are of data type WORD and begin on even BYTE boundaries

Input Variables

- Inputs are entered as PIW [Address]

Output Variables

- Outputs are entered as PQW [Address]

Monitor Input Variables

- Press **Ctrl+F7** on the keyboard or
- Select **Variable** from the main menu
- Select **Monitor** from the subsequent menu

Drive Control

Base Block

- Set Control Word to 0Fh

Drive Run

- Set Control Word (STW) to W#16#7F
- Set Data Word to (HSW) W#16#1770

Drive Parameters

Write to C1-01 (Accel 1)

- Set PKE to W#16#701F
- Set IND to W#16#1
- Set PWE (LSW) to W#16#64

Read Manufacturer's Coding

- Set PKE to W#16#63C4
- Set IND to W#16#1

Read U1-01 (Frequency Reference)

- Set PKE to W#16#60D#
- Set IND to W#16#1

Variable Table

Create Variable Table

From the project's main screen select **Insert** from the main menu, **S7 Block** then **Variable Table** from subsequent menus.

Select
Insert

S7 Block

Variable Table

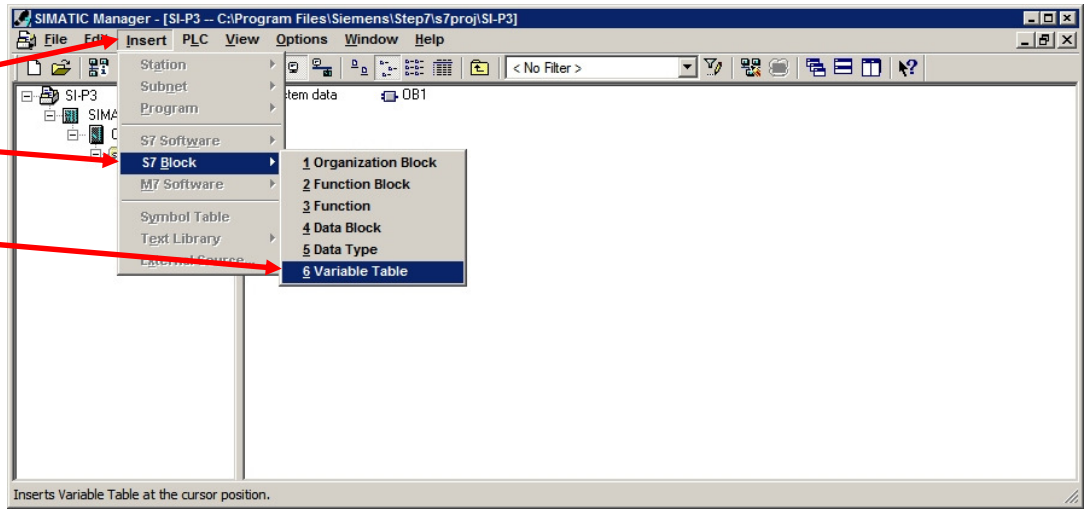

Figure 23 -- Create Variable Table

Name Variable Table

Once the variable table has been added, it should be named. Enter a **Symbolic Name** for the table and Click **OK** to accept the entry.

Enter
Symbolic Name

Click
OK

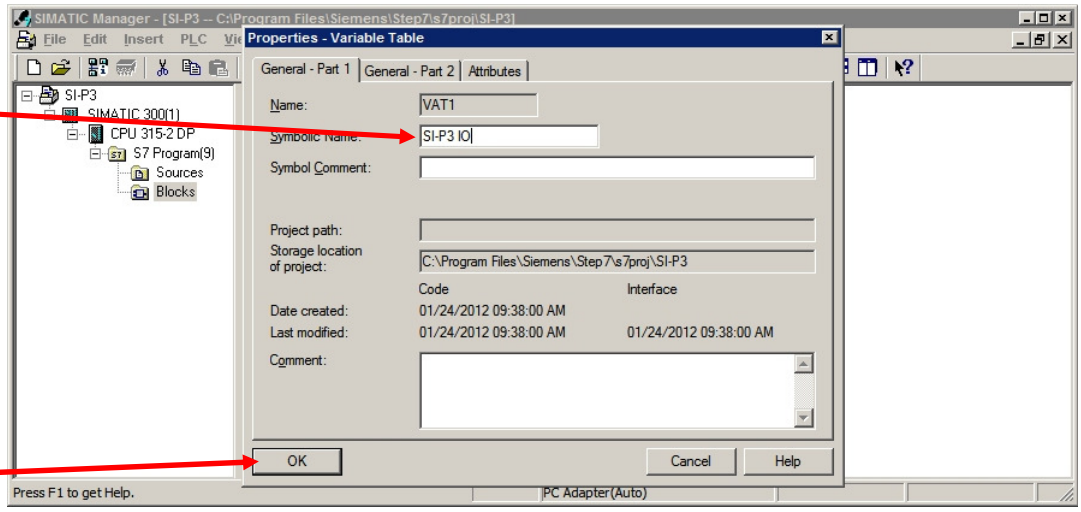

Figure 24 -- Name the Variable Table

Populate Variable Table

Input Variables

Once created, the variable table needs to be populated with the variables that are to be monitored and/or modified. This example uses all of the input and output words of the chosen cyclic IO telegram.

Select **Insert** from the main menu and **Range of Variables** from the subsequent menu.

Select
Insert

Range of Variables

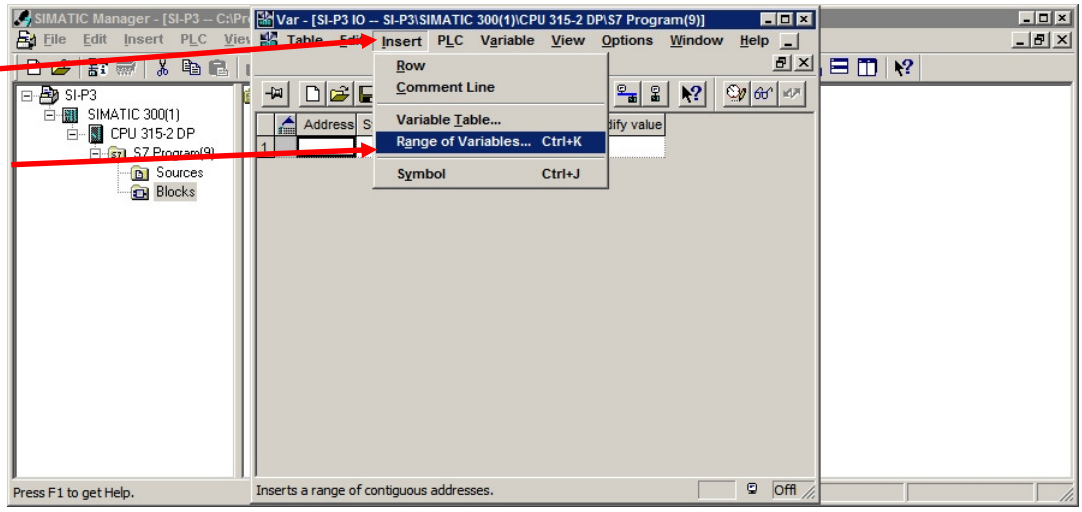

Figure 25 -- Populate Variable Table - Inputs

From the dialog shown after the **Range of Variables** has been selected, enter the address of the first variable in the range of inputs. Enter the number of variables included in the range and the data display data type. Click **OK** to accept the data entered.

Inputs are prefaced by **PIW**. All inputs are of data type Word (16 bits) and begin on even BYTE boundaries.

Enter
Starting
Address

Select
Number of Variables

Display Format

Click
OK

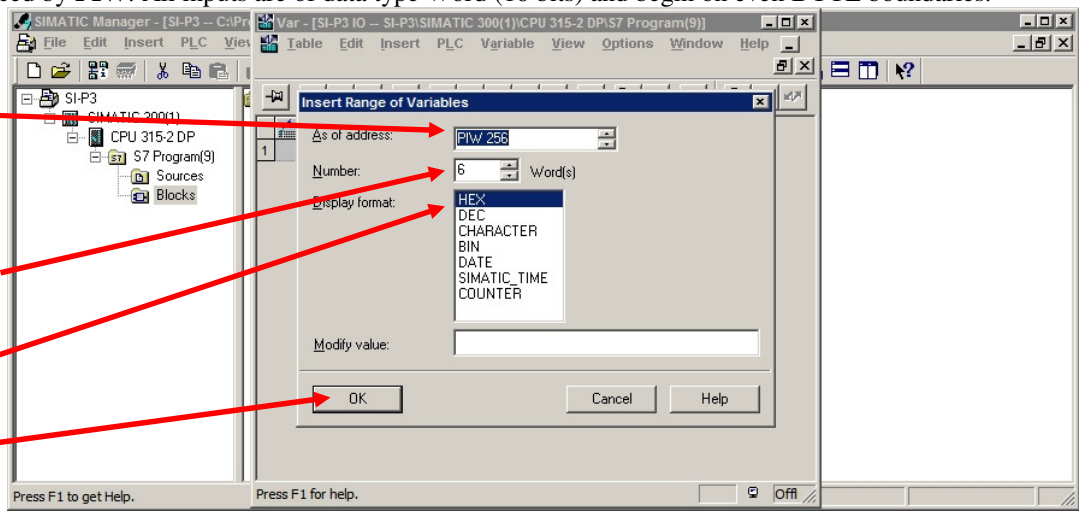

Figure 26 -- Set Table Input Range

Output Variables

Select **Insert** from the main menu and **Range of Variables** from the subsequent menu to add outputs to the list.

From the dialog shown after the **Range of Variables** has been selected, enter the address of the first variable in the range of outputs. Enter the number of variables included in the range and the data display data type. Click **OK** to accept the data entered.

Outputs are prefaced by **PQW**. All outputs are of data type Word (16 bits) and begin on even BYTE boundaries.

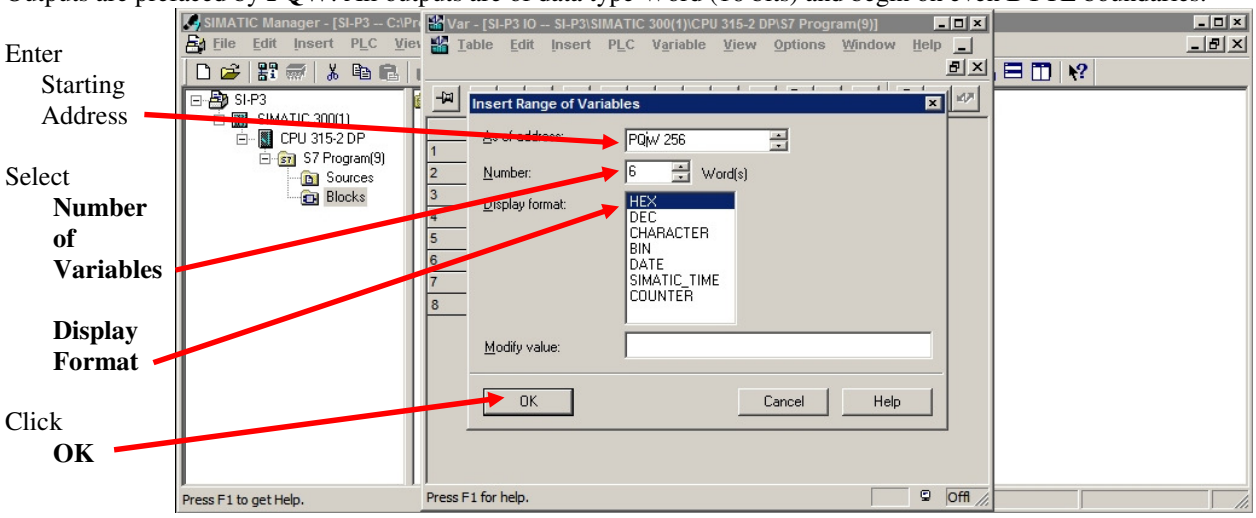

Figure 27 -- Set Table Outputs Range

Monitor Input Variables

To monitor the input variables, simultaneously press **Ctrl + F7** or select **Variable** from the main menu and **Monitor** from the subsequent menu.

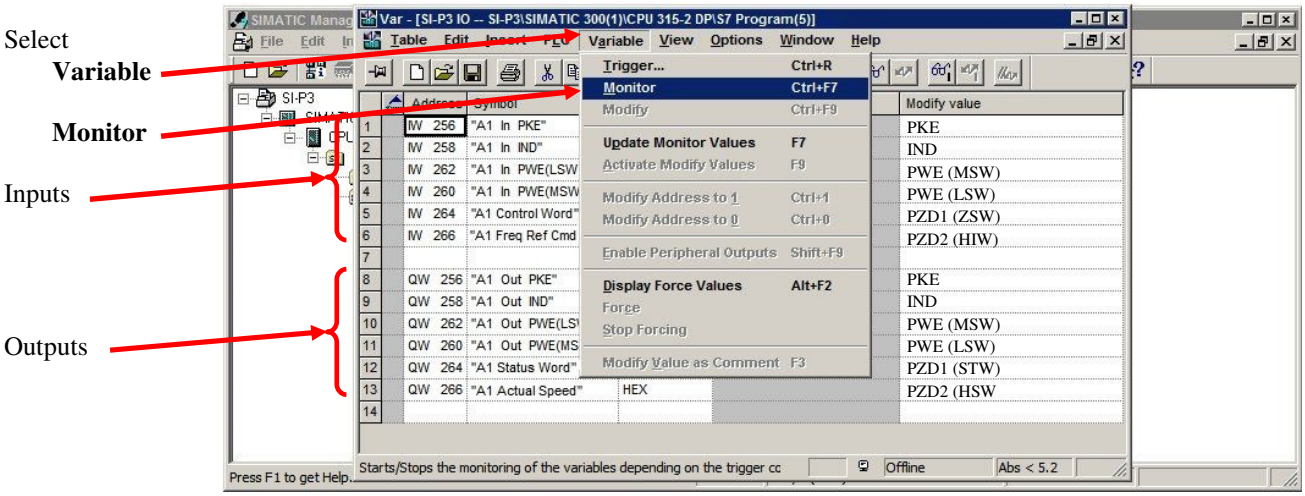

Figure 28 – Monitor Input Variables

Drive Control

Base Block

Base Block removes any output to the motor terminals, removes any Run command and sets the Frequency Reference to 0.00Hz . Since the PPO **Control Word** is initially all zeros, the drive will power up in Base Block (bb). To remove Base Block set the first byte of the **Control Word** to Fh (15d). Refer to ***Control and Status Words*** below.

Enter **Control Word**

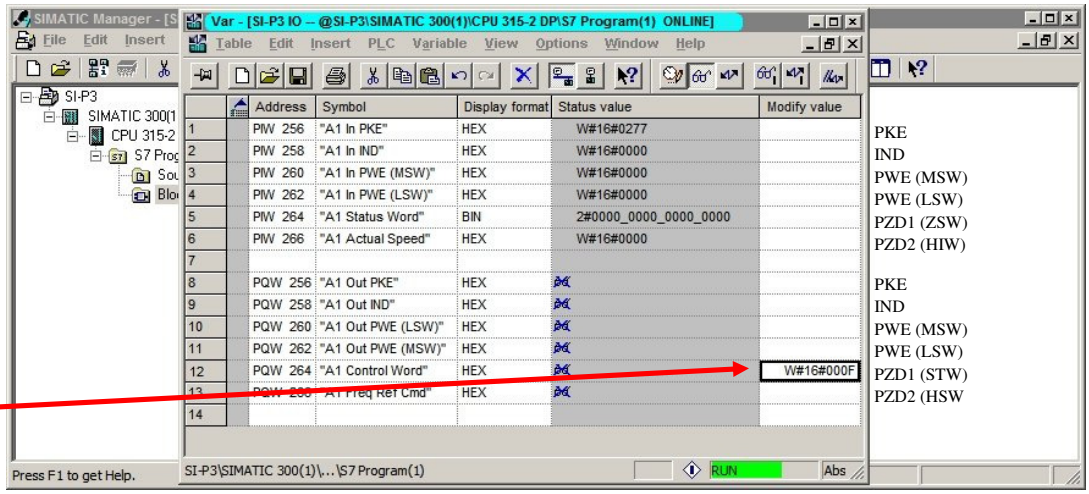

Figure 29 – Remove Base Block Variable Table

Drive Run

To control the attached drive, modify the **Control** and **Data Word** output values. Enter the **Control Word** value W#16#7F (127d) (Run command) in the **Modify value** column for output **"A1 Control Word"**. Enter the **Data Word** value W#16#1770 (6000d) (frequency reference) in the **Modify value** column of output **"A1 Freq Ref Cmd"**. Press the **F9** key on the keyboard to send the modified values to the drive.

Enter **Control Word**

Enter **Data Word**

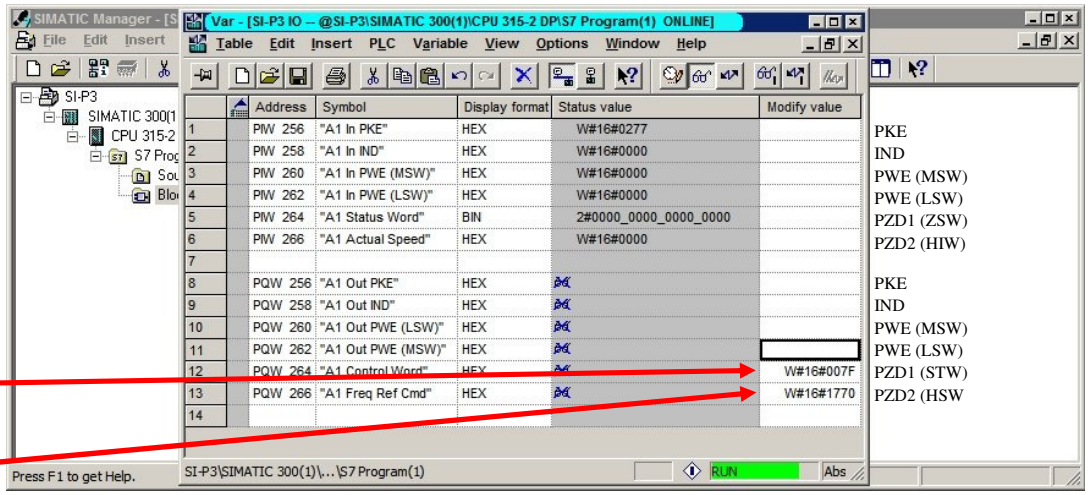

Figure 30 – Run Drive

Drive Parameters

Write to C1-01 (Accel 1)

To access drive parameters the telegram header must be modified. To write to parameter C1-02

Set PKE to 701Fh

The Task ID is 7 which is Write Parameter in Array (WORD)

The PNU is 1Fh which is the array designation for C1 Category.

Set IND to 1, the array offset for C1-01

Set PWE to 64h to set C1-01 to 10.0Hz

If the write is successful, the Response ID will be 4 as shown for **"A1 In PKE"** below.. It will be 7 if the write was not successful.

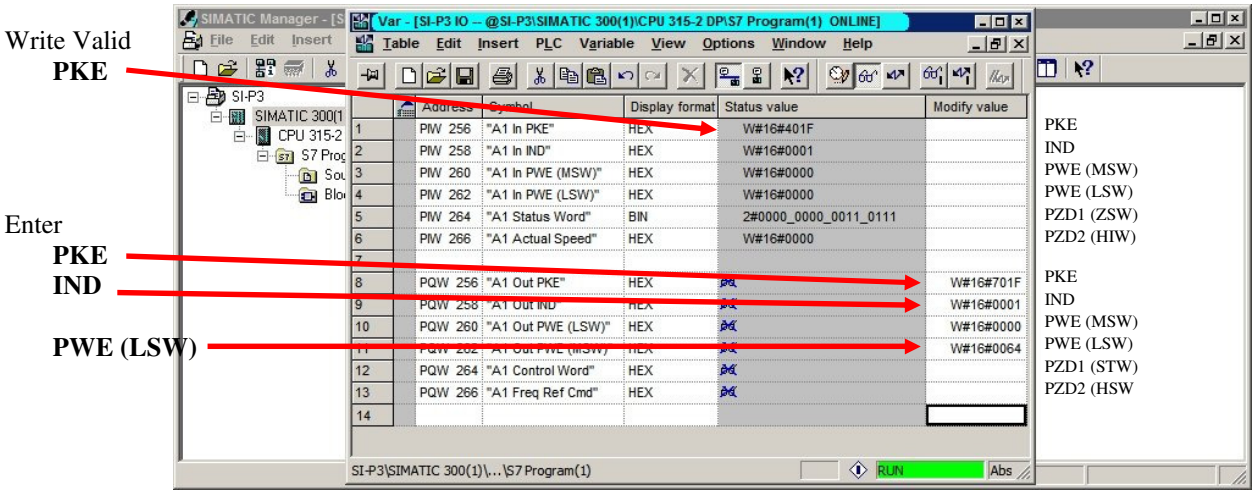

Figure 31 – Write Value to C1-01

Read Manufacturer's Coding

To read the manufacturer's coding,

Set PKE to 63C4h.

Task ID is 6 which is Read A Parameter Value From An Array (WORD)

The PNU is 3C4h (964) see **Supported PNUs** below.

Set IND to 1, the array offset for the first member of the array, **Manufacturer's Coding**.

The response will be returned in **"A1 Status Word"**. If the **Response ID** is 4### the response is valid. If the **Response ID** is 7### the response is invalid.

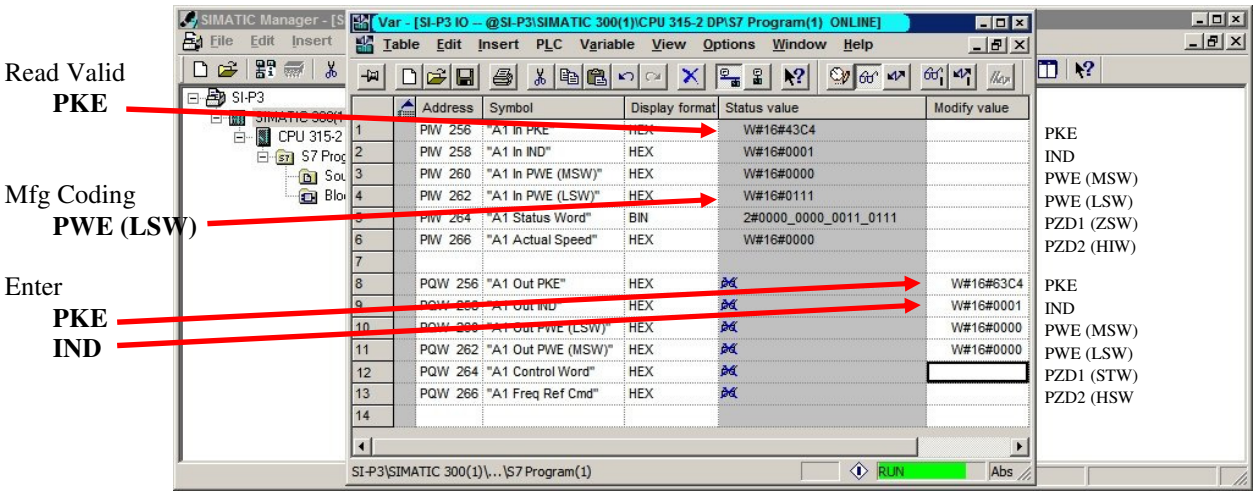

Figure 32 – Read Manufacturer's Coding

Read U1-01 (Frequency Reference)

U1-01 contains the current Frequency Reference for the drive. To read U1-01,

Set PKE to 60D3h.

Task ID is 6 which is Read A Parameter Value From An Array (WORD)

The PNU is D3h (211) which is the array designation for the U1 Category.

Set IND to 1, the array offset for the first member of the array, U1-01.

The response will be returned in **"A1 IN PWE (LSW)"**. If the **Response ID** is 4### the response is valid. If the **Response ID** is 7### the response is invalid.

Read Valid
PKE

U1-01
PWE (LSW)

Enter
PKE
IND

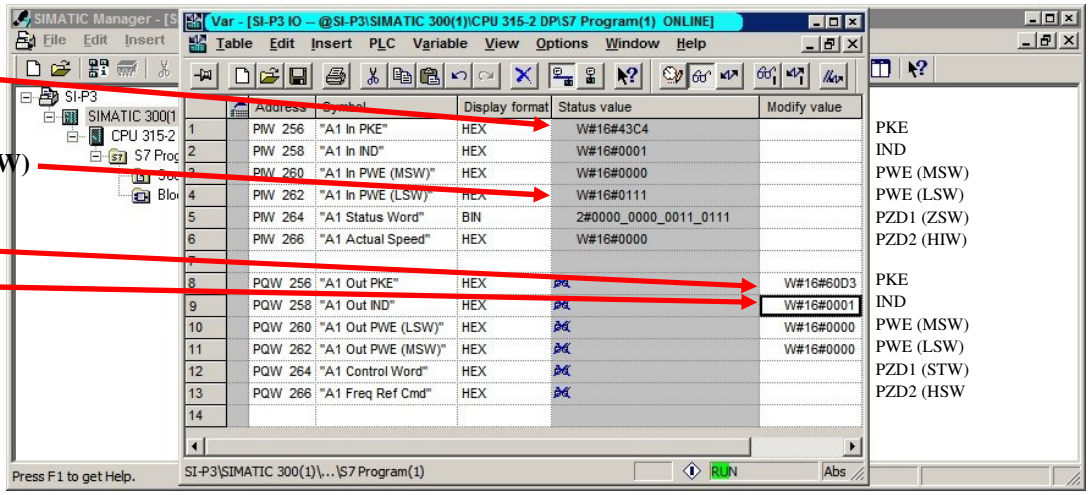

Figure 33 – Read U1-01

Ladder Logic (LAD) Programming Examples

Drive Control

Run the Drive

- One shot a move of W#16#7F to **"A1 Control Word"** and W#16#1770 to **"A1 Freq Ref Cmd"**

Stop the Drive

- One shot a move of W#16#0 to **"A1 CONTROL WORD"** and W#16#0 to **"A1 Freq Ref Cmd"**

Read Parameter C1-01 (Accel 1)

Verify Parameter Read

- Shift **"A1 In PWE (LSW)"** twelve bits right.
- Compare shifted word to 4

Write Parameter Read Command to Drive

- One shot a move of W#16#701F to **"A1 Out PKE",** W#16#1 to **"A1 Out IND"** and W#16#64 to **"A1 Out PWE (LSW)"**

Write C1-01 (Accel 1)

Verify Write Command

- Shift **"A1 In PWE (LSW)"** twelve bits right.
- Compare shifted word to 4

Write Parameter Command

- One shot a move of W#16#701F to **"A1 Out PKE",** W#16#1 to **"A1 Out IND"** and W#16#64 to **"A1 Out PWE (LSW)"**
- One shot a move of W#16#701F to **"A1 Out PKE",** W#16#1 to **"A1 Out IND"** and W#16#64 to **"A1 Out PWE (LSW)"**

Write Enter RAM & Enter ROM Commands

- **Enter RAM (Accept)** - One shot a move of W#16#212C to **"A1 Out PKE"**
- **Enter ROM (Enter)** - One shot a move of W#16#212CD to **"A1 Out PKE"**

Drive Control

Run the Drive

The example below shows that when enable contact (M1.0) is true and the positive edge triggered one shot (M2.0) is true, the drive control and frequency reference are moved to the **Control** and **Data Words**, **"A1 Control Word"** and **"A1 Freq Ref Cmd"** respectively.

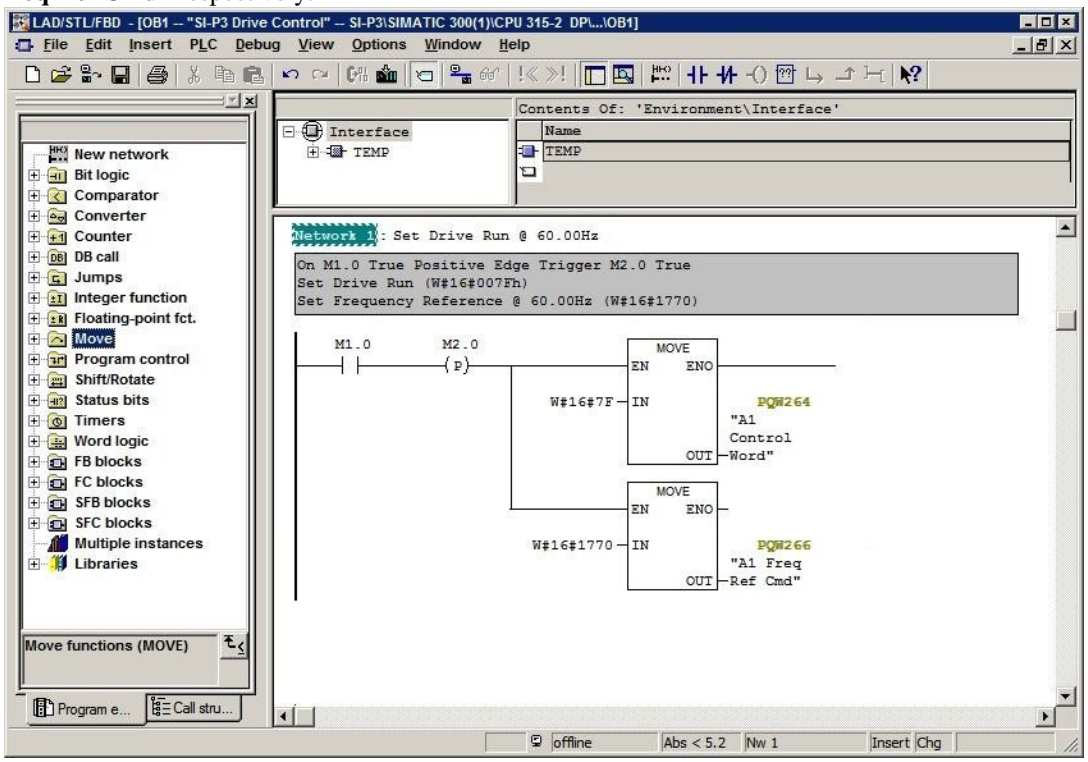

Figure 34 – Basic Drive Control Program – Run @ 60.00Hz

Stop the Drive

This second circuit shows that if the moves are not enabled, the run command is removed and zero frequency reference is sent to the drive.

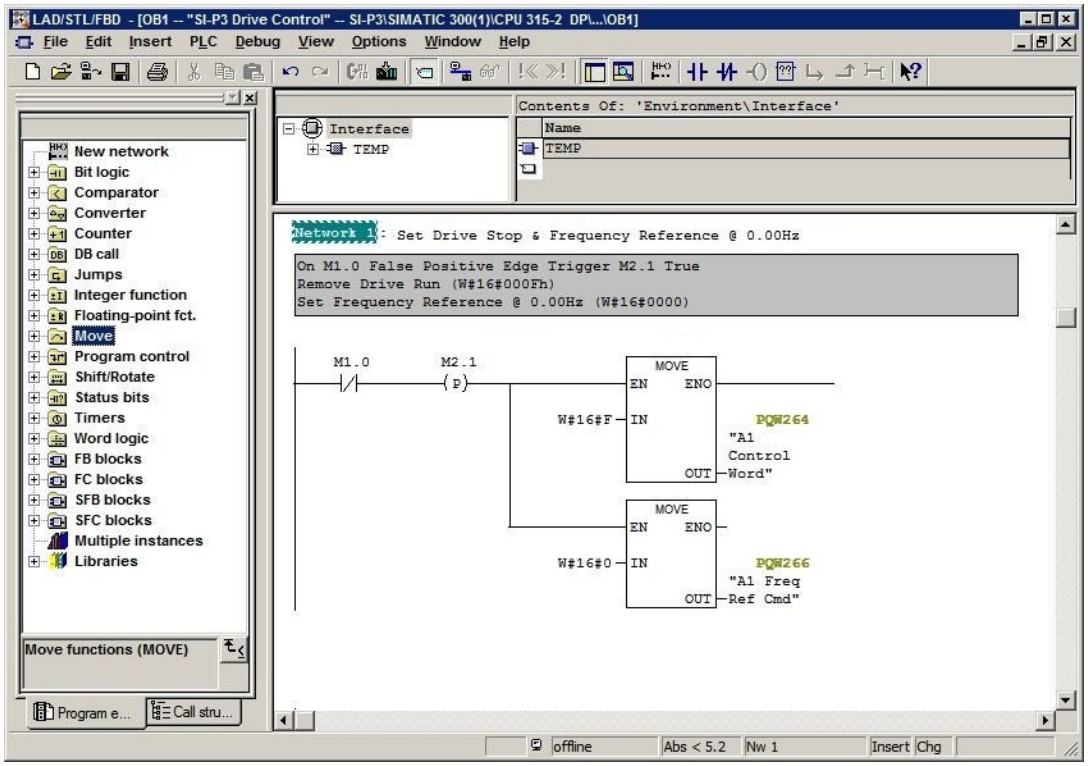

Figure 35 – Basic Drive Control Program – Stop Drive

Read Parameter C1-01 (Accel 1)

To read a parameter, the command for the device to respond with a parameter value must be written to the device. The actual parameter read circuit precedes but is dependent on the write circuit. This is to allow the device some time to respond to the write command.

Verify Parameter Read

Network 1 stores the value read and checks the **Response ID** for validity. If the **Response ID** is greater than 4, a fault is declared (M1.2). If the **Response ID** is 4, the value returned is valid and the write sent bit is reset.

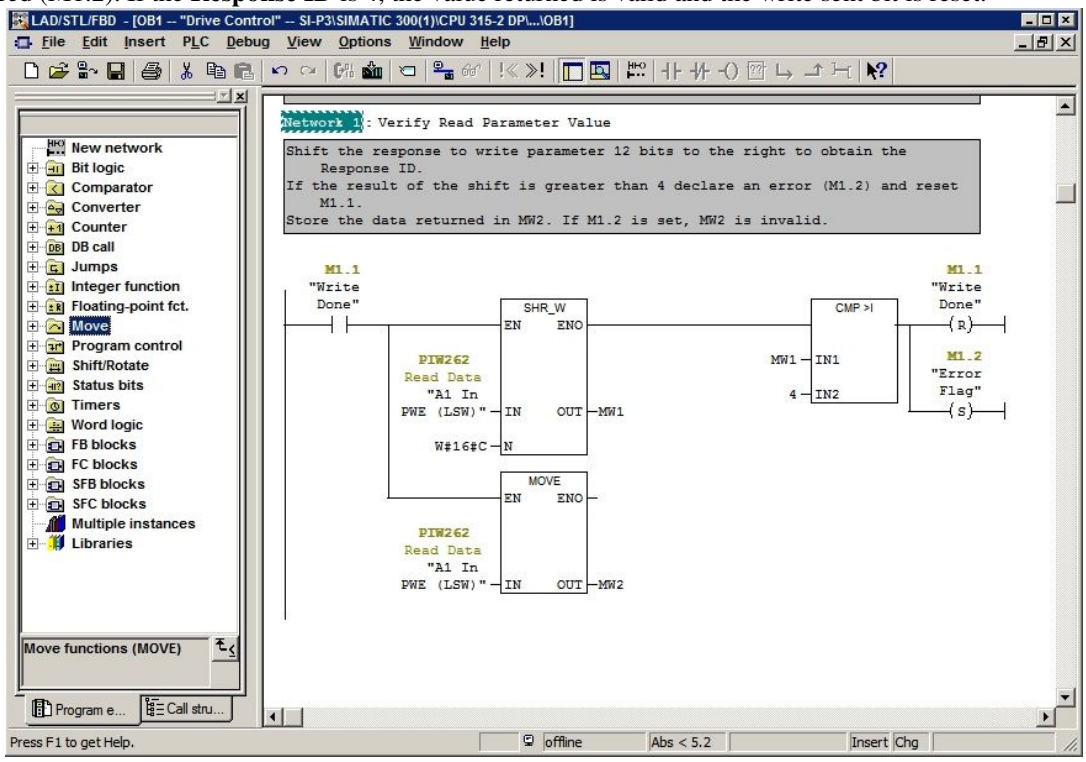

Figure 36 – Verify Parameter C1-01 Read

Write Parameter Read Command to Drive

Network 2 is the command to the device to return the parameter value. The first **MOVE** block shows moving PKE and IND to the telegram header. The **Task ID** is 6 signifying a Read Parameter from Array (WORD) command. The array designation (the PNU) is 1Fh (31), C1 Category. Refer to the **Standard Drive Parameters** table below for supported drive parameter PNUs. IND is 1 signifying that the first element of the array is to be read (C1-01).

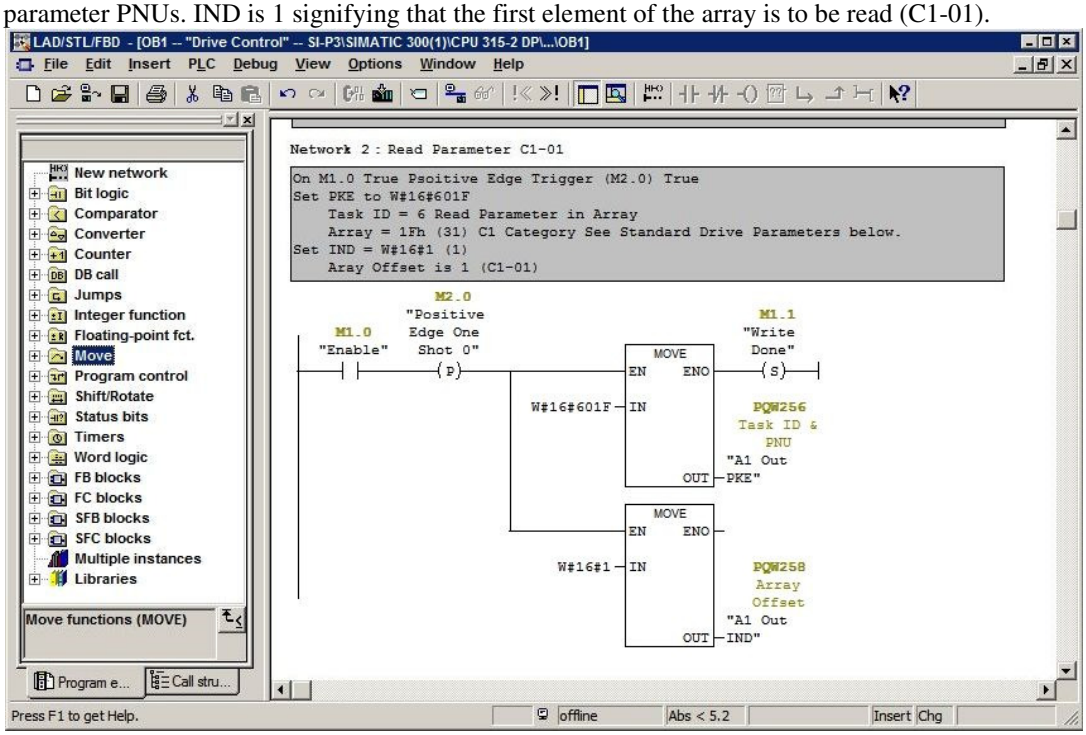

Figure 37 – Command to Read Parameter C1-01

Write C1-01 (Accel 1)

The format of a parameter write is the same as for a parameter read. With the **Task ID** and the Data area changed. The validity of the parameter write should be checked.

Run operative and non-run operative parameters are available for writing. Refer to the appropriate drive technical manual for information on run operative and non-run operative parameters.

- Run operative parameters become active as soon as they are written to the drive. If not followed by an **Enter ROM** command, they will be overwritten on a drive power cycle.
- Non-run operative parameters are only made active if followed by either an **Enter RAM** or **Enter ROM** command. If followed by an Enter RAM command, the parameter value will be over written on drive power cycle.

Verify Write Command

The verification precedes the write command but is controlled by it. This is to allow some time for the response. Network 1 below shows how the command written is verified. The **Response ID** is stored in MW1. MW1 is then compared to 4. If the **Response ID** is greater than 4, the write command failed and an error is set (M1.2).

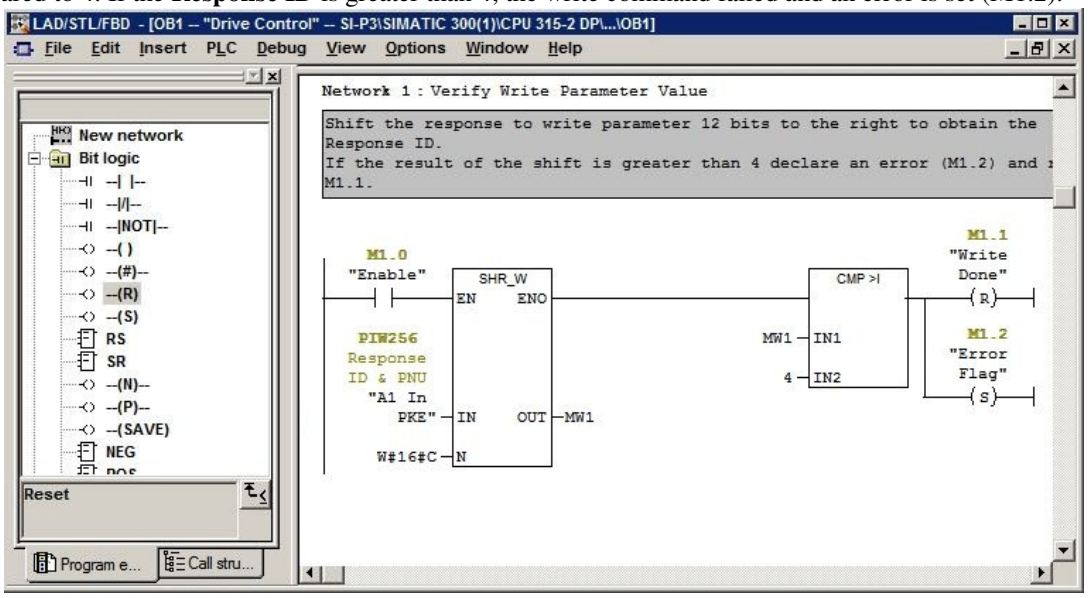

Figure 38 – Verify Parameter C1-01 Write

Write Parameter Command

Network 2 is the command to write the parameter value to the device. The first **MOVE** block shows moving PKE and IND to the telegram header. **Task ID** is 7 signifying a Write Parameter to Array (WORD) command. The array designation (the PNU) is 1Fh (31), C1 Category. Refer to the **Standard Drive Parameters** table below for supported drive parameter PNUs. IND is 1 signifying that the first element of the array is to be read (C1-01). The PWE data to be sent, is 64h (100) which changes the Accel 1 time to 10.0 seconds.

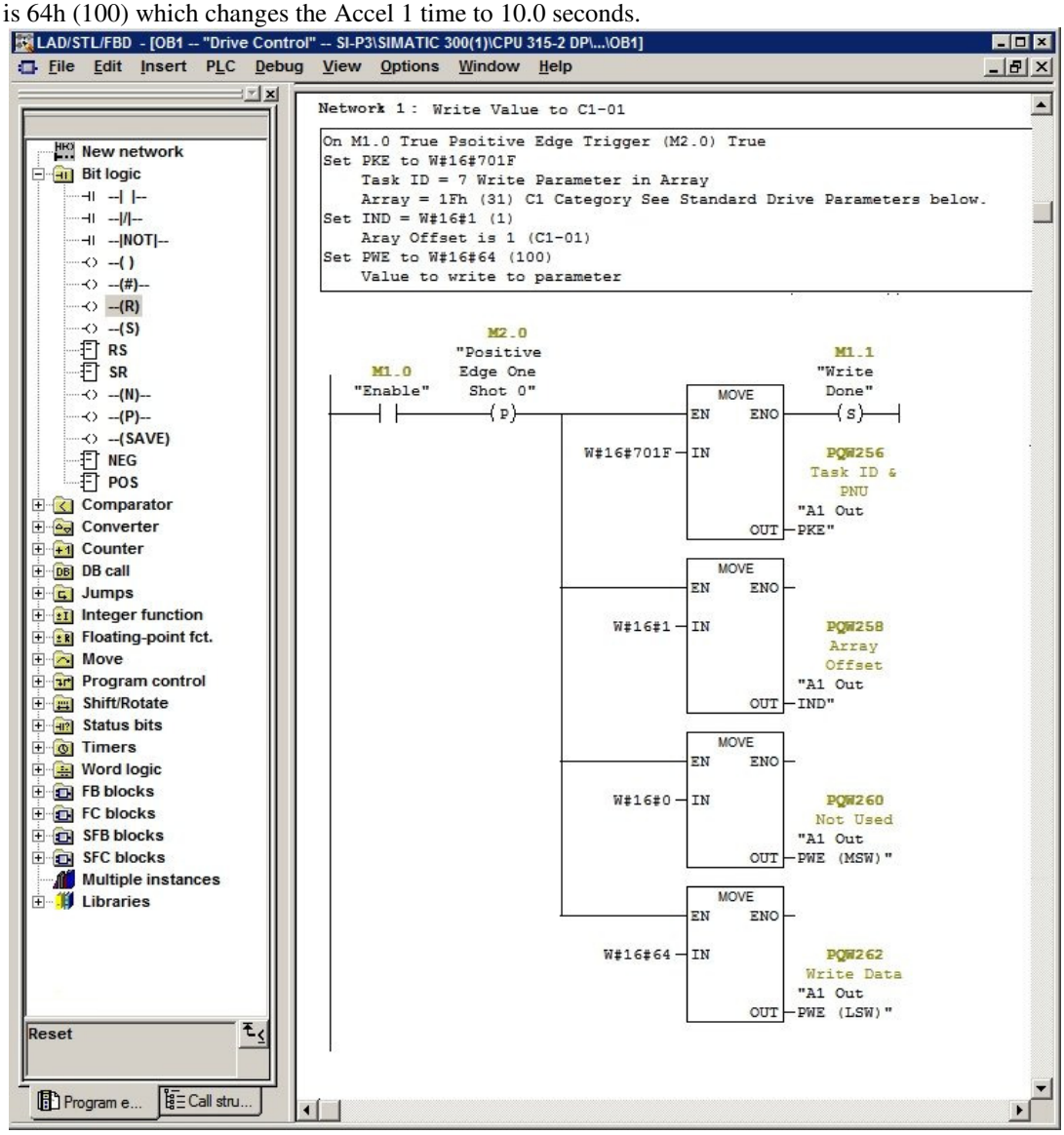

Figure 39 – Command to Write 100 to Parameter C1-01

Write Enter RAM & Enter ROM Commands

The **Enter RAM** command transfers the parameter values written to the drive to active RAM. The values are not saved and are overwritten on a power cycle. The **Enter ROM** command transfers the values written to active RAM but also stores them to NVRAM. Parameter values followed by an **Enter ROM** command will not be reset on power cycle.

The command to write an **Enter RAM** command to the drive uses **Task ID** to 2 to Write a Parameter (WORD) and the PNU to the reference for **Enter RAM** Command, 12Ch (300). The IND and PWE are ignored.

The same steps as used in the **Enter RAM** command are used for the **Enter ROM** command. The only difference is that the **Enter ROM** command PNU is 12Dh (301).

Refer to **Standard Drive Parameters** table below for information on parameter PNUs.

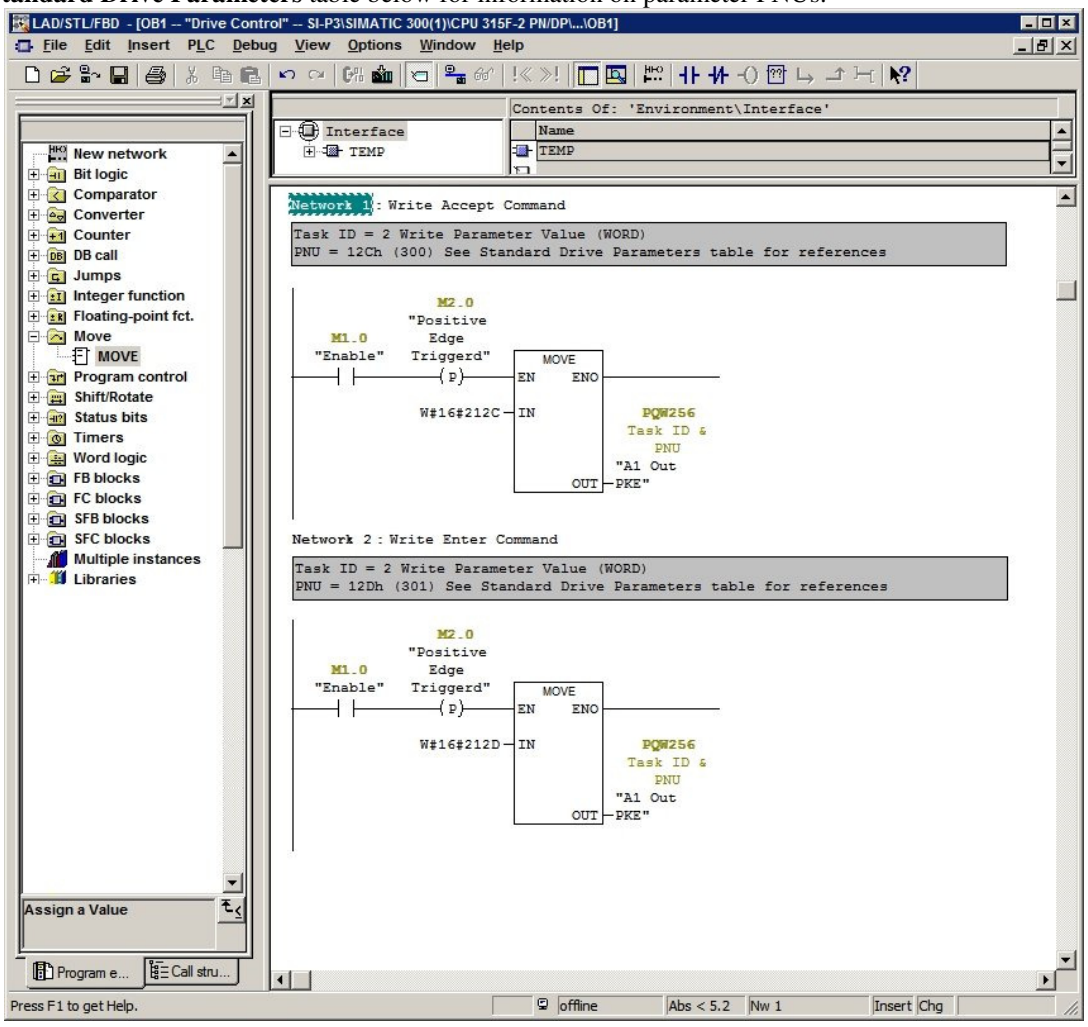

Figure 40 – Write Enter RAM & Enter RAM Commands

Appendix A

Anatomy of PPO Type 1

The table below describes the allocated memory (256…267) for **PPO Type 1** used in this document's example. Those variables prefaced by PIW are inputs to the CPU while those prefaced by PQW are CPU outputs.

Table 2 - PPO Type 1 Produce			
Variable Symbol Names	**Name**	**Bits**	**Description**
"A1 In PKE"	PKE	0 ~ 10	PNU
		11	0
		12 ~ 15	Task ID
"A1 In IND"	IND	0 ~ 15	Parameter Sub-Index Word
"A1 IN PWE (MSW)"	PWE	0 ~ 31	Parameter Write Data
"A1 IN PWE (LSW)"			
"A1 Status Word"	PZD1	0 ~ 15	Control Word (STW)
"A1 Actual Speed"	PZD2	0 ~ 15	Data (HSW)

Table 3- PPO Type 1 Consume			
Variable Symbol Names	**Name**	**Bits**	**Description**
"A1 Out PKE"	PKE	0 ~ 10	PNU
		11	0
		12 ~ 15	Response ID
"A1 Out IND"	IND	0 ~ 15	Parameter Sub-Index Word
"A1 Out PWE (MSW)"	PWE	0 ~ 31	Parameter Read Data
"A1 Out PWE (LSW)"			
"A1 Control Word"	PZD1	0 ~ 15	Status Word (ZSW)
"A1 Freq Ref Cmd"	PZD2	0 ~ 15	Data (HIW)

Control and Status Words

PROFIdrive Control Word (STW)

Table 4 - Control Word			
Bit(s)	**Name**	**Value**	**Description**
0	OFF 1	Reserved	
1	OFF 2	Reserved	
2	OFF 3	Reserved	
3	OPERATION_ENABLE	0	Stop & Baseblock
		1	Not Baseblock
4	RAMP_OUT_ZERO	0	Stop
		1	Run
5	Ramp Function	Reserved	
6	Ramp Enable	Reserved	
7	RESET	0	
		0→1	0 to 1 Transition Resets
8	INCHING_1	0	Stop
		1	Jog FWD
9	INCHING_2	0	Stop
		1	Jog REV
10	REMOTE	0	Local Control
		1	Remote Control (PROFIBUS-DP)
11	Reserved		
12			
13			
14			
15			

PROFIdrive Status Word (ZSW)

Table 5 - Status Word			
Bit(s)	**Name**	**Value**	**Description**
0	RDY_ON	Reserved (Always 1)	
1	RDY_RUN	Reserved (Always 1)	
2	RDY_REF	0	Not Ready
		1	Ready
3	TRIPPED	0	No Fault
		1	Fault
4	OFF2_STA	Reserved (Always 1)	
5	OFF3_STA	Reserved (Always 1)	
6	SWC_ON_INHIB	Reserved (Always 0)	
7	ALARM	0	No Alarm
		1	Alarm
8	AT_SETPOINT	0	Not at Set Point
		1	At Set Point
9	REMOTE	0	Local Control
		1	Remote Control (PROFIBUS-DP)
10	Reserved		
11			
12			
13			
14			
15			

Task and Response IDs

Task ID

Table 6 - Task ID	
ID	**Description**
0	No Action
1	Read Parameter Value
2	Write Parameter Value (WORD)
3	Write Parameter Value (DBL WORD)
4	Reserved
5	Reserved
6	Read Parameter Value From Array
7	Write Parameter Value in Array (WORD)
8	Write Parameter Value in Array (DBL WORD)
9	Read Number of Array Elements

Response ID

Table 7 - Response ID	
ID	**Description**
0	No Action
1	Transfer Parameter Value (WORD)
2	Transfer Parameter Value (DBL WORD)
3	Transfer Parameter Array Value
4	Transfer Parameter Array Value (WORD)
5	Transfer Parameter Array Value (DBL WORD)
6	Transfer Number of Array Elements
7	Task Error

Supported PNUs

Table 8 - Supported PNU(s)			
PNU	**R/W**	**Function**	
900 (384h)	W	PPOI 1	
901 (385h)	W	PPO 2	
902 (386h)	W	PPO 3 (DP V1 Only)	
903 (387h)	W	PPO 4 (DP V1 Only)	
904 (388h)	W	Current PPO	
905 (389h)	W	PPO 5	
907 (38Bh)	R	PPOI 1	
908 (38Ch)	R	PPO 2	
909 (38Dh)	R	PPO 3 (DP V1 Only)	
910 (38Eh)	R	PPO 4 (DP V1 Only)	
911 (38Fh)	R	Current PPO	
912 (390h)	R	PPO 5	
915 (393h)	R/W	Assign MODBUS Write Command to PZD in PPO Write	
916 (394h)	R/W	Assign MODBUS Response to PZD in PPO Read	
918 (396h)	R	Node Address	
947 (3B3h)	R	Fault Number	
948 (3B4h)	R	Elapsed Time at Fault	
963 (3C3h)	R	Baud Rate	
964 (3C4h)	R	Device Identification	Values
		1: Manufacturer	273
		2: Device Type	1
		3: Version	0
		4: Firmware Data (yyyy)	2007
		5: Firmware Date (dd/mm)	0220
		6: Number of Drive Objects	1
965 (3C5h)	R	Profile Code (0x0302)	
967 (3C7h)	R/W	V2 Control Word	
968 (3C8h)	R	V2 Status Word	
971 (3CBh)	R/W	0 to 1 Transition Saves to NVRAM	

Parameter Reference

Control and Status Parameters

Table 9 - Control and Status Parameters						
Control Words				Status (Monitor) Words		
DPV0 PNU	Modbus Address	Index		DPV0 PNU	Modbus Address	Index
0	0001h	1		0	0020h	32
0	0002h	2		0	0021h	33
0	0007h	7		0	0022h	34
0	0009h	9		0	0023h	35
0	000Ah	10		0	0024h	36
0	000Fh	15		0	0025h	37
0	0010h	16		0	0026h	38
0	0011h	17		0	0027h	39
				0	0028h	40
				0	0029h	41
				0	002Ah	42
				0	002Bh	43
				0	002Ch	44
				0	002Dh	45
				0	002Eh	46
				0	002Fh	47
				0	0030h	48
				0	0031h	49
				0	0032h	50
				0	0033h	51
				0	0034h	52
				0	⋮	⋮
				0	00FFh	255

Standard Drive Parameters

Table 10 - Standard Drive Parameters								
DPV0 PNU	Category	Index	DPV0 PNU	Category	Index	DPV0 PNU	Category	Index
11 (0Bh)	A1	01–99	52 (34h)	E2	01–99	141 (8Dh)	n1	01–99
12 (0Ch)	A2	01–99	53 (35h)	E3	01–99	142 (8Eh)	n2	01–99
21 (15h)	b1	01–99	54 (36h)	E4	01–99	143 (8Fh)	n3	01–99
22 (16h)	b2	01–99	55 (37h)	E5	01–99	146 (92h)	n6	01–99
23 (17h)	b3	01–99	61 (3Dh)	F1	01–99	148 (94h)	n8	01–99
24 (18h)	b4	01–99	66 (3Eh)	F6	01–99	151 (97h)	o1	01–99
25 (19h)	b5	01–99	67 (3Fh)	F7	01–99	152 (98h)	o2	01–99
26 (1Ah)	b6	01–99	81 (51h)	h1	01–99	153 (99h)	o3	01–99
28 (1Ch)	b8	01–99	82 (52h)	h2	01–99	154 (9Ah)	o4	01–99
31 (1Fh)	C1	01–99	83 (53h)	h3	01–99	171 (abh)	q1	01–99
32 (20h)	C2	01–99	84 (54h)	h4	01–99	181 (B5h)	r1	01–99
33 (21h)	C3	01–99	85 (55h)	h5	01–99	201 (C9h)	T1	01-99
34 (22h)	C4	01–99	86 (56h)	h6	01–99	211 (D3h)	U1	01–99
35 (23h)	C5	01–99	121 (79h)	L1	01–99	212 (D4h)	U2	01–99
36 (24h)	C6	01–99	122 (7Ah)	L2	01–99	213 (D5h)	U3	01–99
41 (29h)	d1	01–99	123 (7Bh)	L3	01–99	214 (D6h)	U4	01–99
42 (2Ah)	d2	01–99	124 (7Ch)	L4	01–99	215 (D7h)	U5	01–99
43 (2Bh)	d3	01–99	125 (7Dh)	L5	01–99	216 (D8h)	U6	01–99
44 (2Ch)	d4	01–99	126 (7Eh)	L6	01–99	218 (DAh)	U8	01–99
47 (2Fh)	d7	01–99	127 (7Fh)	L7	01–99	300 (12Ch)	RAM Enter	0
51 (33h)	E1	01–99	128 (80h)	L8	01–99	301 (12Dh)	ROM Enter	0

Appendix B – 315 2 PN/DP CPU

Add 315 2 PN/DP CPU

Select the CPU and firmware version from the catalog and drag the selection to the highlighted slot in the system rack. This example uses a **315 2 PN/DP V2.6** CPU. When the CPU is inserted in the rack, the network configuration dialog will open.

Your CPU may be different and require additional hardware; power supply, input, output, analog modules, etc. Additional modules should also be selected from the hardware catalog and similarly dragged to their appropriate slot in the system rack.

Select
CPU

Drag (- - -)
The CPU to the
Designated slot in
The system rack

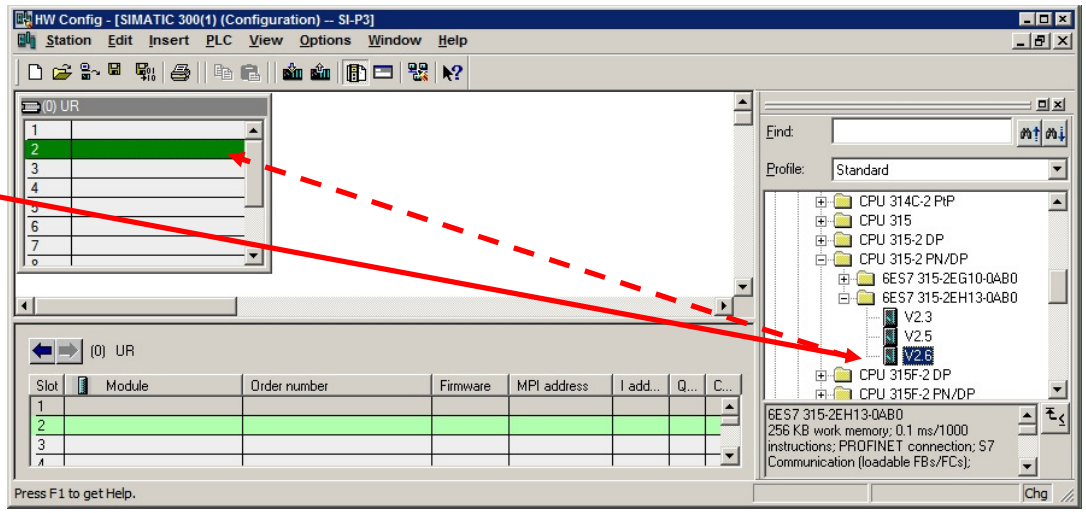

Figure 41 -- Add CPU to System Rack

Configure CPU

After the CPU has been selected ad dragged to the system rack, the **Properties** dialog will appear automatically. Enter the **IP address** and **Subnet mask** that had been assigned to this station. The IP address is 192.168.2.1 and the Subnet mask is 255.255.255.0 in this example. Click **OK** to save the CPU configuration.

Enter
IP address

and
Subnet mask

Click
OK

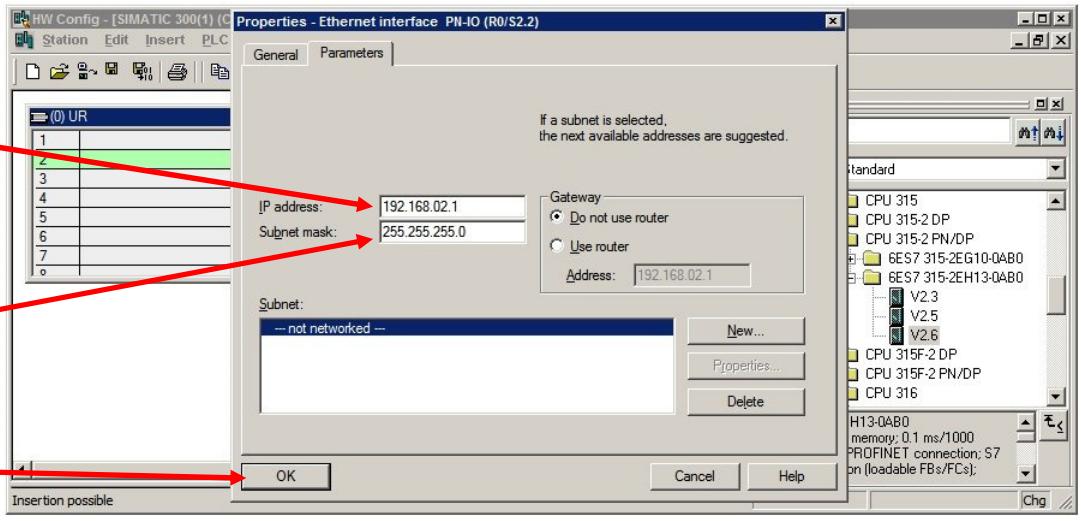

Figure 42 -- Add CPU IP Address an Subnet Mask

Add a Network

Right click on the PROFIBUS connection (**MP/DP**) in the system rack and select Object Properties from the subsequent menu.

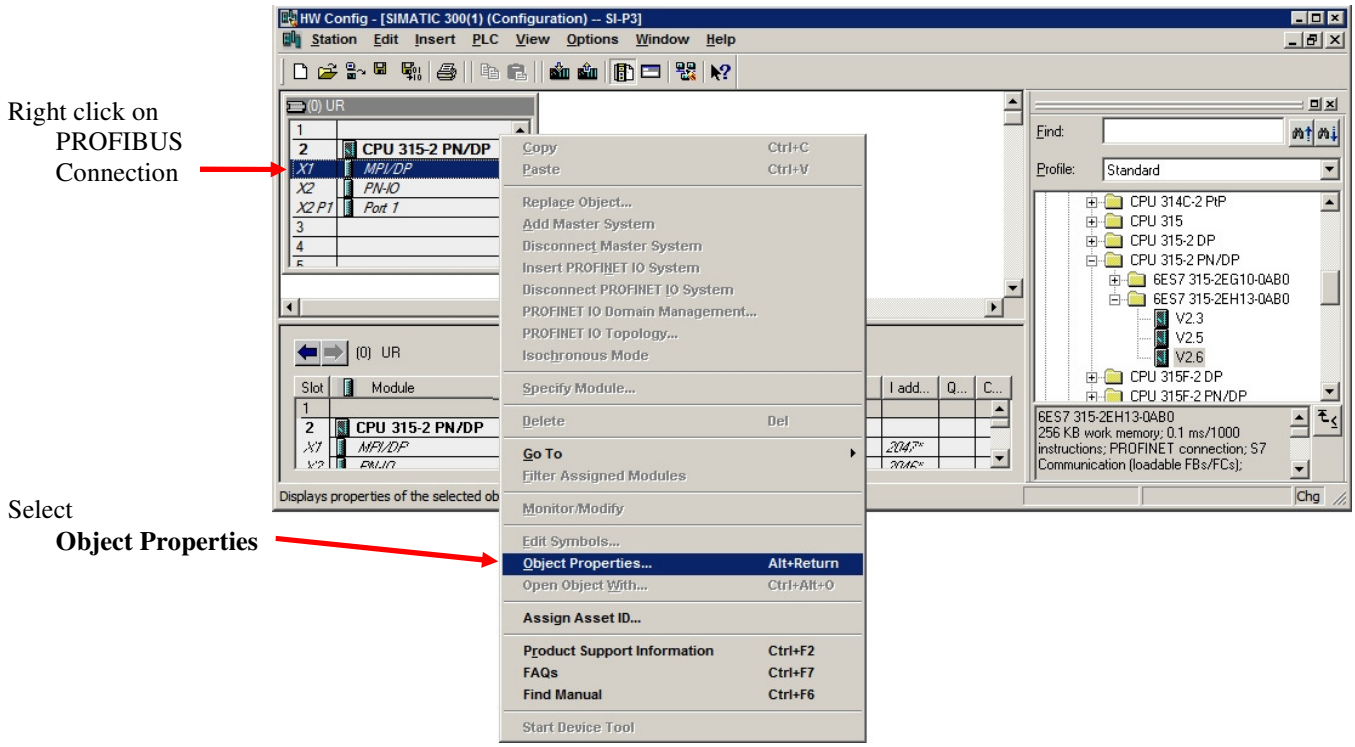

Figure 43 – Edit CPU Connection Object Properties

Network Name and Interface Type

Enter a **Name** for the network and select **PROFIBUS** as the **Interface Type**. Click on Properties to configure the PROFIBUS network.

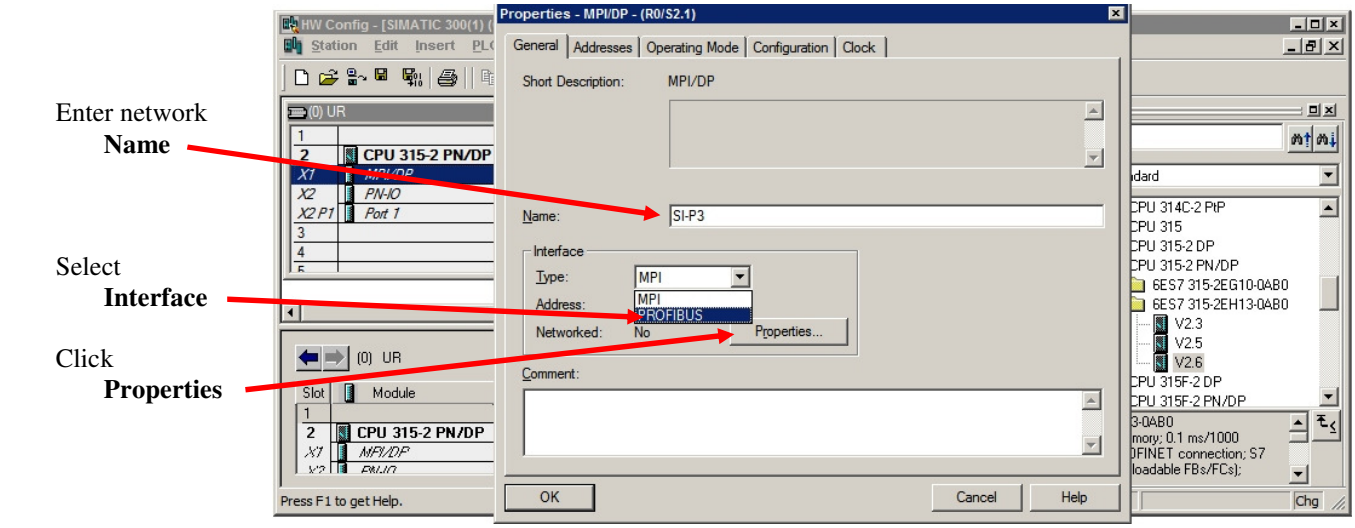

Figure 44 – Select Network Name and Type

Add the PROFIBUS Network

From the **Parameters** tab add the node **Address** of the CPU. Click on **New** to add a PROFIBUS network.

Enter node **Address**

Click **New**

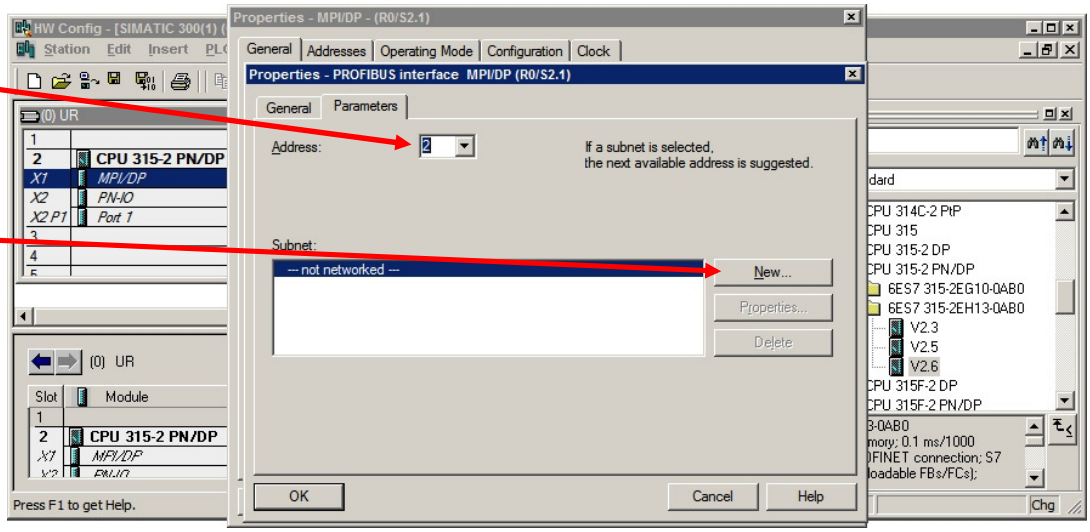

Figure 45 – Add PROFIBUS Network

General Tab

From the **General** tab, enter a **Name** for the network and verify the **S7 subnet ID**. The project **Author** and/or **Comments** may also be entered. Select the **Network Settings** tab.

Enter network **Name**

Verify **S7 subnet ID**

Enter **Author**

Comments

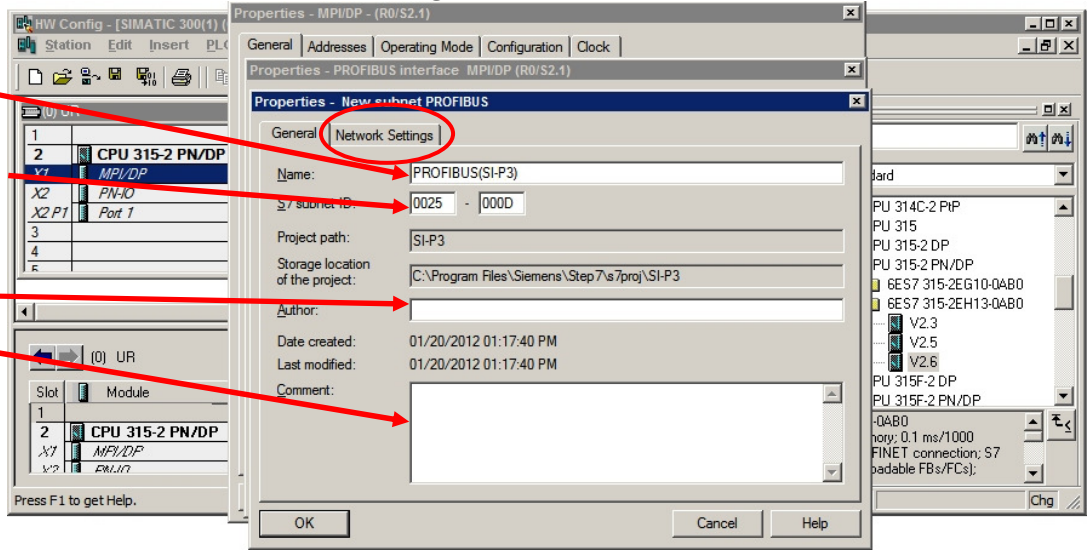

Figure 46 – PROFIBUS Network Description

Network Settings Tab

In the **Network Settings** tab, verify the maximum node number, **Transmission Rate** and **Profile** of the network Click on **OK** to accept the settings. Return to the **hW Config** dialog.

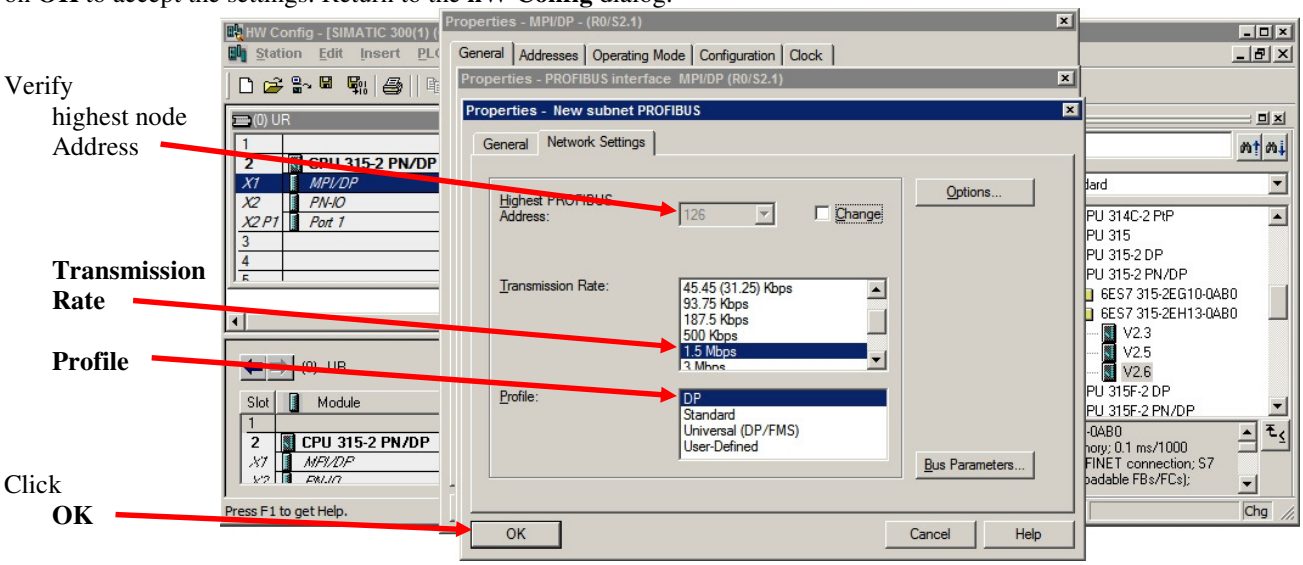

Figure 47 -- PROFIBUS Network Settings

Notes