# Siemens TCP/IP Slave Ethernet Driver Help

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# Siemens TCP/IP Slave Ethernet Driver Help

Help version 1.019

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Overview What is the Siemens TCP/IP Slave Ethernet Driver?

Channel Setup How do I configure a channel?

Device Setup How do I configure a device for use with this driver?

**Configuring Connections Using the SIMATIC Manager** How do I configure connections using the SIMATIC Manager?

Data Types Description What data types does this driver support?

#### Address Descriptions

How do I address a data location on a Siemens TCP/IP Slave Ethernet device?

## Error Descriptions

What error messages does the Siemens TCP/IP Slave Ethernet Driver produce?

# Overview

The Siemens TCP/IP Slave Ethernet Driver provides an easy and reliable way to connect Siemens TCP/IP Slave Ethernet devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications. This driver will act as a simulated Siemens PLC. It is intended for simulation of Siemens S7-300.

See Also: Master Device Configuration

# Channel Setup

Communications Parame	eters
New Channel - Communication	on Parameters
	Specify the port number the driver will listen on. Devices must be configured to connect to this port. Values may range from 0 to 65535.
	Port Number:
	< <u>B</u> ack <u>N</u> ext > Cancel Help

Description of the parameter is as follows:

• **Port Number:** This parameter specifies the port number on which the driver will listen. Devices must be configured to connect to this port: messages sent to all other ports will be ignored by the driver. The valid range is 0 to 65535. The default setting is IE TCP/IP: 102 (TSAP).

Note: Non-standard values may be necessary due to routing and firewall issues.

# Device Setup

# **Supported Protocols**

S7 Messaging on Industrial Ethernet (ISO 8073 Class 0) over TCP/IP. This is defined in RFC1006.

## Supported PLC

S7-300

## Supported Commands

SFB14-GET SFB15-PUT

## **Maximum Number of Supported Channels and Devices**

The Siemens TCP/IP Slave Ethernet Driver supports one channel and 256 virtual devices.

## Libraries

This driver requires a standard Ethernet card. No special libraries or hardware are needed.

Note: In order to communicate with this driver, devices require specialized ladder programming.

# Cable Diagrams



# CPU Settings

The CPU Settings dialog is used to specify the rack and slot values that will be associated with the device.

New Device - CPU Settings	×
	Rack: Rack number the simulated CPU resides in. CPU Slot: Slot number the simulated CPU resides in.
	CPU Settings <u>R</u> ack (0 - 7): 0 : CPU <u>S</u> lot (0-31): 0 :
<u></u> <	ack Next > Cancel Help

Descriptions of the parameters are as follows:

- **Rack:** This parameter specifies the number of the rack in which the simulated CPU of interest resides. The valid range is 0 to 7. The default setting is 0.
- **CPU Slot:** This parameter specifies the number of the slot in which the simulated CPU of interest resides. The valid range is 0 to 31. The default setting is 0.

**Note:** Devices must have unique rack/slot values.

## **Master Device Configuration**

Siemens PLCs must be programmed to issue read and write commands to the driver and to handle returned data. For more information, refer to the Siemens PLC programming documentation. For information on preparing the Master Device and the unsolicited driver for communications, refer to **Configuring Connections Using the SIMATIC Manager**.

Messages must be sent to the IP address of the selected Ethernet adapter of the host computer running the unsolicited driver. To do so, click **Channel Properties** | **Network Interface**. For more information concerning the port number configured for the simulated device, refer to **Channel Setup**.

# **Configuring Connections Using the SIMATIC Manager**

Connections are configured using the SIMATIC Manager software. The following topics provide information on configuring the Siemens TCP/IP Slave Ethernet Driver to run in unsolicited mode, and demonstrate a basic setup using the S7-300 PLC as the active partner and the Siemens TCP/IP Slave Ethernet Driver as the passive partner.

**Note:** The Siemens TCP/IP Slave Ethernet Driver can configure 256 devices, each with an associated slot/rack. When the active partner (master) communicates with the passive partner (unsolicited driver), it directs its requests to a specific device in the unsolicited driver. Multiple remote partners can talk to the same device.

To jump to a specific section, select a link from the list below.

Step One: Creating a New ProjectStep Two: Configuring the Master and PC StationStep Three: Connecting the Master and the Slave DriverStep Four: Inserting Function BlocksStep Five: Creating the DB3 Data BlockStep Six: Inserting PUT FBStep Seven: Downloading to the PLC

## Step One: Creating a New Project

1. To start, open the SIMATIC Manager software and then create a new project. In this example, the project being used is "Setup".

New	×
User projects Libraries	
Name Storage path	
locprj D:\Siemens\Step7\Projects\locprj	
-	
Na <u>m</u> e:	<u>T</u> ype:
Setup	Project 💌
Storage location (path):	
D:\Siemens\Step7\S7proj	Browse
OK Cancel	l Help

Note: The project's main window should appear as shown below.

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]
By Eile Edit Insert PLC View Options Window Help
🗅 🚅 🏭 🔏 🖆 🖳 🏪 🔚 🎬 🏢 🕋 < No Filter > 💌 🌿 🥮 💦
Setup T MPI(1)
Press F1 to get Help.

2. Next, create the Master and PC Station. To do so, right-click in the right pane of the window and then select **Insert New Object** | **SIMATIC 300 Station**.

**Note:** The Master unit is the active partner or the image of the actual PC. The PC Station is the PC on which the SIMATIC Manager software is running.

🛃 SIMATIC Manager - [Setup D:\Si	emens\Step7\S7proj\Setu	ιp]	
B Eile Edit Insert PLC View Option	s <u>W</u> indow <u>H</u> elp		_ B ×
		💼 < No Filte	r> 🔽 💆
Setup		Ctrl+X Ctrl+C Ctrl+V Del F2 Alt+Return	SIMATIC 300 Station SIMATIC 400 Station SIMATIC H Station SIMATIC PC Station Other station SIMATIC S5 PG/PC
			SIMATIC 200 Station S7 Program M7 Program
Inserts SIMATIC 300 Station at the cursor pos	tion.		

Note: The SIMATIC 300 station should appear as shown below.

8

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]	
🖹 Eile Edit Insert PLC View Options Window Help	<u>_ 8 ×</u>
→ 📴 💼 🏜 🔍 San	🖸 💯 🔡 💓
Press F1 to get Help.	

3. Name the new station "MASTER," because it represents the communication's active partner.

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]			_ [	X
Eile Edit Insert PLC View Options Window Help			_ 5	١×
▶≥≌裓४७२ 🏜 ₽≒ ⊵≋ⅲ 🖮	<pre>&lt; No Filter &gt;</pre>	• 🏏	<b>5</b>	<b>N?</b>
Press F1 to get Help.				

4. Next, right-click in the right pane of the window and then select **Insert New Object** | **SIMATIC PC Station**.

SIMATIC Manager - [Setup D:'	\Siemens\Step7\S7proj	Setup]		_ 🗆 🗵
Eile Edit Insert PLC View Opt	tions <u>W</u> indow <u>H</u> elp			_ 8 ×
D 🚅 🏭 👗 🖻 🗈 🏙		🇰 💼 < N	lo Filter > 💌	<b>1</b>
E-Setup	empi(1)	STER		
	Cut Copy	Ctrl+X Ctrl+C		
	Paste	Ctrl+V		
	Delete	Del		
	Insert New Object	•	SIMATIC 300 Station	
	Manage Multilingual Tex	ts 🕨 🕨	SIMATIC 400 Station	
	Rename	F2	SIMATIC PC Station	
	Ubject Properties	Alt+Return	Other station SIMATIC S5	
			PG/PC	
			SIMATIC 200 Station	
			57 Program M7 Program	
				J
Inserts Industrial Ethernet at the cursor posi	ition.			11

**Note:** The SIMATIC PC Station should appear as shown below.

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]	_ 🗆 ×
Eile Edit Insert PLC View Options Window Help	_ 8 ×
🗅 😅 🎇 🐖 👗 🛍 😰 🚘 🕒 🔛 🔛 📖 🔍 No Filter >	• 10
Inserts Industrial Ethernet at the cursor position.	//.

Note: For more information, refer to Step Two: Configuring the Master and PC Station.

# Step Two: Configuring the Master and PC Station

Industrial Ethernet (IE) is the protocol used for communication.

1. To start, right-click in the right pane of the SIMATIC Manager window. Then, select **Insert New Object** | **Industrial Ethernet**.

10

SIMATIC Manager - [Setup	D:\Siemens\Step7\S	7proj\Setup]		_ 🗆 🗵
Bile Edit Insert PLC Vie	w <u>O</u> ptions <u>W</u> indow <u>H</u> elp	)		_ 8 ×
	💼 🔍 🖕 🖫		< No Filter >	- 10
🕀 🕙 Setup	MPI(1) 🖬 MAS	TER 🧧	SIMATIC PC Station	
	Cut Copy Paste	Ctrl+X Ctrl+C Ctrl+V		
	Insert New Object Manage Multilingual Tex	s •	SIMATIC 300 Station SIMATIC 400 Station SIMATIC H Station	
	Rename Object Properties	F2 Alt+Return	SIMATIC PC Station Other station SIMATIC S5 PG/PC SIMATIC 200 Station	
			MPI PROFIBUS Industrial Ethernet PTP	
Inserts Industrial Ethemat at the our			S7 Program M7 Program	

**Note:** The main window should now display an Ethernet icon.

SIMATIC Manager - [Setup D:\Sieme	ns\Step7\S7proj\Setup]
Bile Edit Insert PLC View Options Y	⊻indow <u>H</u> elpX
	🔓 💁 📰 📰 📧 < No Filter > 💽 🏹 🔡 🥮
E Setup mi MASTER mi MASTER mi E IMATIC PC Station	ER _ SIMATIC PC Station 꿈가 MPI(1) 꿈가 Ethernet
Press F1 to get Help.	

2. Next, select the MASTER icon in the left pane of the window. Then, double-click on **Hardware**.

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]	
🖹 File Edit Insert PLC View Options Window Help	_ & ×
🗅 😅 🔡 🚮 👗 🛍 😰 🐾 🖭 📰 🏝 < No Filter >	• 1
Image: Setup       Image: Setup         Image: MASTER       Image: Simatic PC Station         Image: Simatic PC Station       Image: Simatic PC Station	
Press F1 to get Help.	

**Note:** The HW Config window should appear as shown below.

🖳 HW Config - [MASTER (Configuration) Setup]	_ 🗆 🗙
💵 Station Edit Insert PLC View Options Window Help	_ 8 ×
	<b>_</b>
	<b>▼</b>
MASTER	
Steckplatz Bezeichnung	

3. Next, open the **View** tab and select **Catalog**. Then, expand the **SIMATIC 300** menu and the **Rack 300** menu.

12

4. To insert the racks, double-click on **Rail**.



5. Next, expand the **PS 300** menu. Double-click on **PS 307 10A** or any other suitable option to insert the power supply into slot 1.

🔣 HW Config - [MASTEF	R (Configuration) Setup]
🛄 <u>S</u> tation <u>E</u> dit Insert <u>F</u>	<u>PLC View Options Window H</u> elp
	) <u>e e mini – E 22 pr</u>
📼 (0) UR	Profile Standard
1 2 3 4 5 6 7 0 V	•••••••••••••••••••••••••••••
(0) UR	PS 307 104 PS 307 24
Slot Module	
1	E - E - SM-300
$\frac{2}{2}$	THE WILL SIMATIC 400
$\left  \frac{3}{4} \right $	SIMATIC PC Station
5	
6	
$\left  \frac{7}{8} \right $	
9	
10	

6. To insert the CPU, expand both the **CPU 300** menu and the **CPU 315-2 DP** menu. Then, double-click on the CPU that matches the hardware.

🔣 HW Config - [MASTER	(Configuration) Setup]
🗐 <u>S</u> tation <u>E</u> dit <u>I</u> nsert <u>P</u>	LC <u>V</u> iew <u>O</u> ptions <u>W</u> indow <u>H</u> elp
🗅 📂 🖫 🖳 🚑	
🚍 (0) UR	Profile Standard
1 PS 307 🔺	PROFIBUS DP
3	PROFIBUS-PA
4	
5	⊕ - <u>□</u> CP-300
6	🔁 🧰 CPU-300
	⊕ 👝 CPU 313
•	⊕ 🧰 CPU 313C
	E CPU 313C-2 DP
(0) UR	
Slot 🚺 Module	🕀 🧰 CPU 314 IFM
1 PS 307 10A	⊕ 💼 CPU 314C-2 DP
2	E-E CPU 314C-2 PtP
$\frac{3}{4}$	English CPU 315-2 DP
5	6ES7 315-2AF00-0AB0
6	6ES7 315-2AF01-0AB0
7	6ES7 315-2AF02-0AB0
8	
10	V1.1
11	V1.2
	6ES7 315-2AF82-0AB0
	6ES7 315-2AG10-0AB0
	⊕ - 🧰 CPU 315F-2 DP
	⊕ 💼 CPU 614
	É 🧰 CPU M7

7. To insert the CPU into slot 2, click **OK**.

Properties -	PROFIBUS	interface	DP (R0/S2.1)				x
General	Parameters						_
<u>A</u> ddress:		2 -		lf a subnet is se the next availab	lected, le address is s	uggested.	
<u>S</u> ubnet:							
not i	networked				1	<u>\</u> ew	
					Pic	perties	
					[	Dejete	
	_						
OK					Cancel	Help	

- 8. To insert the CP, leave slot 3 empty and then click on slot 4 in the racks.
- 9. Next, expand both the **CP 300** menu and the **Industrial Ethernet** menu. Then, double-click on the CP that matches the hardware.



Note: The window should appear as shown below.

Properties - Ethernet interface CP 343-1 (R	i0/S4) 🗙
General Parameters	
Set MAC address / use ISO protocol	
MAC address:	If a subnet is selected, the next available addresses are
IP protocol is being used	
IP address: 140.80.0.1 Subnet mask: 255.255.0.0	Gateway ● <u>D</u> o not use router ● <u>U</u> se router <u>A</u> ddress: 140.80.0.1
<u>S</u> ubnet:	
not networked Ethernet	New Properties Dejete
ОК	Cancel Help

- 10. Next, enter the PLC's IP address and subnet mask. Then, select **Ethernet** from the subnet box.
- 11. Click **OK** to configure the Master.

Properties - Ethernet interface CP 343-1 (P	10/\$4) 🛛 🗙
General Parameters	
Set MAC address / use ISD protocol	
MAC address:	If a subnet is selected, the next available addresses are
IP protocol is being used	
IP address: 192.168.111.132 Subnet mask: 255.255.255.0	Gateway
Subnet:	New
Ethernet	Properties
	Dejete
ОК	Cancel Help

Note: Once finished, open the View tab and then select **Catalog** to hide the catalog window.

- 12. Save and exit the HW Configuration window.
- 13. To configure the PC station, click on the SIMATIC PC Station in the left pane of the SIMATIC Manager window. Then, double-click on **Configuration**.

SIMATIC Manager - [Setup D:\Siemens\Step7\S7proj\Setup]	_ 🗆 ×
🖹 Eile Edit Insert PLC View Options Window Help	_ 8 ×
<b>₩ ₩ ₩ ₽ ₽ ₩ ₩ ₩ €</b> < No Filter >	70
Image: Setup     Image: Configuration       Image: MASTER     Image: Simatic PC Station	
Press F1 to get Help.	

14. Next, click on the **View** tab and select **Catalog**.

	🖥 HW С	Config	j - [SIMA	ATIC PO	C Statio	n (Confi	guration)	- Setu	ир]	
	0 <u>S</u> tatio	n <u>E</u>	dit <u>I</u> nser	t <u>P</u> LC	⊻iew	<u>O</u> ptions	Window H	<u>H</u> elp		
Г	۔ احما م	9.1		134	Ball	1 <b></b>		n <b>a</b> n I		
L						a 📷				
Γ										
	😐 (U) I	-0								
	1									
	2									
	3									
	<u>4</u> 5	+								
	6	+								
	7	-								
	0	1								
L										
┛										
		0)	PC							
	tindex	) (O)	PC Module		0 rder r	umber	Firmware	- IN	1PL address	Comment
	Index	(0)	PC Module		Order r	umber	Firmware	e M	1PI address	Comment
	Index		PC Module		Order r	umber	Firmware	e M	1PI address	Comment
	Index 1 2 3		PC Module		Order r	umber	Firmware	e M	1PI address	Comment
	Index 1 2 3 4		PC Module		Order r	umber	Firmware	e M	1PI address	Comment
	Index 1 2 3 4 5		PC Module		Order r	umber	Firmware	e M	1PI address	Comment
	Index 1 2 3 4 5 6		PC Module		Order r	umber	Firmware		1PI address	Comment
	Index 1 2 3 4 5 6 7 7 -		PC Module		Order r	umber	Firmware		1PI address	Comment
	Index 1 2 3 4 5 6 7 8 0		PC Module		Order r	umber	Firmware		1PI address	Comment
	Index 1 2 3 4 5 6 7 8 9 10		PC Module		Order r	umber	Firmware		1PI address	Comment
	Index  I I I I I I I I I I I I I I I I I I		PC Module		Order r	iumber	Firmware		1PI address	Comment
	Index 1 2 3 4 5 6 7 8 9 10 11 12		PC Module		Order r	umber	Firmware		1PI address	Comment
	Index 1 2 3 4 5 6 7 8 9 10 11 12 13 13 14 1 1 1 1 1 1 1 1		PC Module		Order r	umber	Firmware		1PI address	Comment

15. Expand both the **SIMATIC PC Station** menu and the **CP Industrial Ethernet** menu. Then, doubleclick on **IE General** or any other suitable option.

🔣 HW Config - [SIMATIC	PC Station (Configuration) Setup]
□□ <u>Station</u> <u>Edit</u> Insert <u>P</u>	LC <u>V</u> iew <u>O</u> ptions <u>W</u> indow <u>H</u> elp
	) he 🏜 🗖 🖺 🕺 🕅
巴 (0) PC	Profile Standard
2 3 4	PROFIBUS-PA
5 6	<ul> <li>SIMATIC 400</li> <li>SIMATIC PC Based Control 300/400</li> <li>SIMATIC PC Station</li> </ul>
7 •	
١	
(0) PC	
Index Module	E General CP PROFIBUS
$\frac{2}{3}$	
5 6 7	
8 9	
$10 \\ 11 \\ 12$	
13	

**Note:** The window should appear as shown below.

Properties - Ethernet interface IE General (	R0/S1) 🛛 🗙
General Parameters	
Set MAC address / use ISD protocol	
MAC address:	If a subnet is selected, the next available addresses are
IP protocol is being used	
IP address:         140.80.0.1           Subnet mask:         255.255.0.0	Gateway ● <u>D</u> o not use router ● <u>U</u> se router Address: 140.80.0.1
<u>S</u> ubnet:	
not networked Ethernet	<u>N</u> ew P <u>r</u> operties Delete
ОК	Cancel Help

- 16. Enter the IP address of the PC running the SIMATIC Manager software, in addition to the correct subnet mask.
- 17. Next, select **Ethernet** from the subnet box. Then, click **OK** to configure the PC station.

Properties - Ethernet interface IE General (R0/S1)							
General Parameters							
Set MAC address / use ISO protocol							
MAC address:	If a subnet is selected, the next available addresses are						
IP protocol is being used							
IP address:         192.168.111.7           Subnet mask:         255.255.255.0	Gateway ⓒ <u>D</u> o not use router ⓒ <u>U</u> se router <u>A</u> ddress: 192.168.111.7						
<u>S</u> ubnet:							
not networked Ethernet	<u>N</u> ew						
	P <u>r</u> operties						
	Delete						
ОК	Cancel Help						

Note: Once finished, open the View tab and then select **Catalog** to hide the catalog window.

18. Save and exit the HW Configuration window.

Note: For more information, refer to Step Three: Connecting the Master and the Slave Driver.

# Step Three: Connecting the Master and the Slave Driver

Once the Master and the PC Station have been successfully configured, the Master and the Slave Driver must be connected.

1. To start, open the **Options** tab in the SIMATIC Manager window and then select **Configure Network**.



2. Next, click on the Master's **CPU 315-2 DP** block. A series of rows should be displayed in the lower half of the window.



3. Right-click on the first row and select Insert New Connection.

![](_page_25_Figure_2.jpeg)

4. Then, click OK.

Ir	sert New Connec	tion	×
	- Connection Partner		
	Station:	(Unspecified)	
	<u>M</u> odule:	<b></b>	
	Connection		
	<u>T</u> ype:	S7 connection	
	Display properti	es dialog	
	ОК	Apply Cancel Help	

**Note:** The window should appear as shown below.

Properties - S7 co	onnection				×
General Status Ir	nformation				
Local Connecti Exed confi Cine-way Establish ar Send opera	on End Point gured dynamic connection n active connection ating mode messages	Block Param Local ID (He 1 Defa	neters ex): ult	W#16#1	
Connection Pa	th				
End point:	Logal MASTER/CPU 315-2 DP	Part <u>n</u> e Unsp	ecified		1
Int <u>e</u> rface:	CP 343-1(R0/S4)	▼ Unsp	ecified	7	
Туре:	Industrial Ethernet	Indus	trial Ethernet		1
Address:	192.168.111.132				
				Add <u>r</u> ess Details	
(OK)			Ca	ancel Help	

5. Next, enter the IP address of the machine on which the Siemens TCP/IP Slave Ethernet Driver will be running.

General Status Local Connec □ Eixed conf □ One-way □ Establish a □ Send oper	Information tion End Point- igured dynamic connection an active connection ating mode messages	Bloc Loca	k Parameters al ID (Hex): Default	W#16#1
Connection Pa	MASTER/CPU 315-2 DP		Part <u>n</u> er Unspecified	
Type: Address:	Industrial Ethernet		Industrial Ethernet	
			[	Add <u>r</u> ess Details

6. Next, click **Address Details** and enter the rack/slot values of the device in the unsolicited driver with which the Master will be communicating.

Address Details		×
	Local	<u>P</u> artner
End Point:	MASTER/CPU 315-2 DP	Unspecified
<u>R</u> ack/Slot:	0 2	0 2
Connection Resource	10 💌	03 💌
TSAP:	10.02	03.02
ОК		Cancel Help

7. Once finished, click **OK** twice to successfully connect the master and slave drivers. The master will use these settings to communicate with the destination device at rack 0 and slot 2.

🚟 NetPro - [Setup (Networl	k) D:\Sieme	ns\Step7\S7proj\Setu	p]
Network Edit Insert PL	.C <u>V</u> iew O <u>p</u> tio	ons <u>W</u> indow <u>H</u> elp	
- 		8 ø ø 🗈 !	<b>?</b>
			1
Industrial Ethernet			
MPI(1) MPI			
MASTER CPU DP CP 315-2 DP 343-1 DP			Station
2 2			
	Partner ID	Partner	Type
1		Unspecified	S7 connection
<u>ا</u>	. <u>+</u>		
Ready			

**Note:** The Local ID number (=1) identifies the connection between the two partners. This number will be used later when creating function blocks for reading and writing data.

8. To finish, save and compile the data by opening the **Network** tab and selecting **Save and Compile**. Then, click **OK**.

Note: There should be no errors on compilation.

Save and Compile		×
Compile		
C Compile and cl	neck <u>e</u> verything	
Compile change	ies <u>o</u> nly	
OK	Cancel	Help
© Compile chang	es <u>only</u> Cancel	Help

Note: For more information, refer to Step Four: Inserting Function Blocks.

# Step Four: Inserting Function Blocks

Once the master has been configured and connected with the unsolicited driver, it must also be prepared to generate requests for the unsolicited partner. This is done by creating function blocks, which can be used to read data from or write data to an unsolicited driver. The function block (FB) used for reading data in this example is FB14 (GET). The function block (FB) for writing data is FB15 (PUT).

- 1. To start, expand the Master menu, the CPU 315-2 DP menu, and the S7 Program[1] menu.
- 2. Next, double-click on **Blocks** and **OB1**.

![](_page_29_Picture_3.jpeg)

3. LAD, STL, or FBD can be used to create function blocks. In this example, FBD is used. In the LAD/STL/FBD window, click on the **Insert** menu.

Kan Strading (1991) - [Contemp (Strading Strading Stradin							
🖬 <u>F</u> ile <u>E</u> di	🗇 <u>F</u> ile <u>E</u> dit Insert PLC <u>D</u> ebug <u>V</u> iew <u>O</u> ptions <u>W</u> indow <u>H</u> elp						
Address	Declaration	Name	Туре	Initialvalue	Comment		
0.0	temp	OB1_EV_CLASS	BYTE		Bits 0-3 = 1 (Coming event)		
1.0	temp	OB1_SCAN_1	BYTE		l (Cold restart scan l of C		
2.0	temp	OB1_PRIORITY	BYTE		Priority of OB Execution		
3.0	temp	OB1_OB_NUMBR	BYTE		1 (Organization block 1, OE		
4.0	temp	OB1_RESERVED_1	BYTE		Reserved for system		
5.0	temp	OB1_RESERVED_2	BYTE		Reserved for system		
6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of previous OB1		
8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle time of OB1 (		
•		I	1		I		
0B1 : '	"Main Program	Sweep (Cycle)"					
Comment	:						
Network	1: Title:						
Comment	:						

Į,	CAD/	STL	./FBD - [081	Setup\MA	STER\C	PU 315-2	DP]	
1	⊒ <u>F</u> ile	<u>E</u> dit	t <u>I</u> nsert P <u>L</u> C <u>D</u>	lebug <u>V</u> iew	<u>Options</u>	<u>W</u> indow	<u>H</u> elp	
	0 🖻	8	Dbject Block Templat	te	+	0% 📩	<b>• •</b>	»! 🗈 🛍 🕄 👘
	Addres	s	D Data Type		Þ	Туре	Initial value	Comment
	C	0.0	t <u>D</u> eclaration Li	ne	×.	BYTE		Bits 0-3 = 1 (Coming even
	1	0	t <u>N</u> etwork		Ctrl+R	BYTE		l (Cold restart scan l of
	2	2.0	t <u>Symbol</u>		Ctrl+J	BYTE		Priority of OB Execution
	3	3.0	t <u>P</u> rogram Eleme	ents	Ctrl+G	BYTE		1 (Organization block 1,
	4	<b>1.</b> 0	t FBD <u>L</u> anguag	e Elements	•	BYTE		Reserved for system
	5	5.0	temp	OB1_RESE	RVED_2	BYTE		Reserved for system
	θ	5.0	temp	OB1_PREV	CYCLE	INT		Cycle time of previous OE
	ε	3.0	temp	OB1_MIN_	CYCLE	INT		Minimum cycle time of OB1
				1				
IΓ	OB1 :		'Main Program	Sweep (C	ycle)"			
	Comme	ent:	:					
	Netwo	rk	1: Title:					
	Comme	ent:	:					

4. Then, click Program Elements.

5. Next, expand the Libraries, SIMATIC\_NET\_CP, and CP 300 menu. Then, double-click on FB14 GET to insert a function block to read data.

Program elements
SFB blocks
- 🔂 SFC blocks
Multiple instances
E- 📶 Libraries
🚊 🎢 SIMATIC_NET_CP
🖻 💼 CP 300
FB2 IDENT
- FB4 REPORT
FB9 URCV
FB12 BSEND
- FB13 BRCV
FB14 GE1
TLS AU_SEND

6. Close the **Program Elements** window. "FB14" should be inserted as shown below.

🔹 File Edi	anno - font		41 315-2 NPL		
	t Insert PLC D	ebua View Options	Window Help		
			<u>64</u> 🚾 🖭	:«»! 🗈 🛱	
Address	Declaration	Name	Туре	Initial value	Comment
0.0	temp	OB1_EV_CLASS	BYTE		Bits 0-3 = 1 (Co:
1.0	temp	OB1_SCAN_1	BYTE		l (Cold restart :
2.0	temp	OB1_PRIORITY	BYTE		Priority of OB E
3.0	temp	OB1_OB_NUMBR	BYTE		1 (Organization)
4.0	temp	OB1_RESERVED_1	BYTE		Reserved for sys
5.0	temp	OB1_RESERVED_2	BYTE		Reserved for sys
6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of pr
8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle ti
Comment Network	: ]]: Title:	sweep (siste)			
Comment	:				
Comment	: — EN — REQ — ID — ADDR	<pre>??? "GET" NDR ERROR 1 STATUS</pre>	 		
Comment Symbol i	: — EN — REQ — ID — ADDR_ — RD_1 information:	<pre>??? "GET" NDR ERROR 1 STATUS EN0</pre>	  		

7. Next, associate a data block (DB) with the function block (FB). To do so, click above the FB where there are three red question marks.

- KAD/STL/FBD [OB1 -- Setup\MASTER\CPU 315-2 DP] □ File Edit Insert PLC Debug View Options Window Help 0 😂 🗣 日 X 🖻 🖻 🗠 🗠 9 673 🏙 🖂 1%  $\gg$ I 661 Address Declaration Initial value Comment Name Туре 0.0 temp OB1\_EV\_CLASS BYTE Bits 0-3 = 1 (Coming event), Bits 4 1.0 temp OB1\_SCAN\_1 BYTE 1 (Cold restart scan 1 of OB 1), 3 2.0 temp OB1\_PRIORITY BYTE Priority of OB Execution 3.0 temp OB1\_OB\_NUMBR BYTE 1 (Organization block 1, OB1) 4.0 temp OB1\_RESERVED\_1 BYTE Reserved for system 5.0 temp OB1\_RESERVED\_2 BYTE Reserved for system OB1\_PREV\_CYCLE INT Cycle time of previous OB1 scan (mi 6.0 temp OB1\_MIN\_CYCLE INT Minimum cycle time of OB1 (millisec 8.0 temp • OB1 : "Main Program Sweep (Cycle)" Comment: Network 1: Title: Comment: DB2 "GET" EN . . . – NDR ... REQ ... -ERROR ... ID ...-ADDR 1 STATUS ... ENO RD\_1 . . . – Symbol information: GET FB14 Read Data From a Remote CPU
- 8. Enter the name of a data block. In this example, it is "DB2".

9. Next, click **Yes** to create the data block.

LAD/STL/FBD (30:150)					
The instance data block DE want to generate it?	2 does not exist. Do you				
Yes <u>N</u> o	Help				

- 10. Next, fill in the other details as appropriate for the fields in the function block. Users should consider the following:
  - "ADDR\_1" is the address on the destination device in the unsolicited driver.
  - "RD\_1" is the address local to the PLC.
  - The value at the remote address specified by "ADDR\_1" is written (GET) to the local address specified by "RD\_1".
  - Enter the Local ID number that was generated when setting up the connection between the Master and the Slave Driver in the **ID** field. In this example, the Local ID number is 1.

**Important:** The number of bytes in both the "ADDR\_1" and "SD\_1" fields should be same in order for the unsolicited driver to respond correctly. Otherwise, an error message will be sent.

	TL/FBD - [OB1	Setup\MASTER	\CPU 315-2 DP]		
<mark>⊪</mark> <u>F</u> ile <u>E</u> ∕	dit <u>I</u> nsert P <u>L</u> C	_ <u>D</u> ebug <u>V</u> iew <u>O</u> pti	ions <u>W</u> indow <u>H</u> el	P	
		X 🖻 🖬 🗠 🤇	- 6% 🚵 🔁	66° !«»!	B 🔛 B D D D D D
Address	Declaration	Name	Туре	Initial value	Comment
0.0	temp	OB1_EV_CLASS	BYTE		Bits 0-3 = 1 (Coming eve
1.0	temp	OB1_SCAN_1	BYTE		1 (Cold restart scan 1 o
2.0	temp	OB1_PRIORITY	BYTE		Priority of OB Execution
3.0	temp	OB1_OB_NUMBR	BYTE		1 (Organization block 1
4.0	temp	OB1_RESERVED_1	BYTE		Reserved for system
5.0	temp	OB1_RESERVED_2	BYTE		Reserved for system
6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of previous (
8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle time of O
10.0	temp	OB1_MAX_CYCLE	INT		Maximum cycle time of O
2 0	temn	OBI DATE TIME	DATE AND TIME		Data and time OR1 start
Commen	.t:				
		DB2 "GET"			
	MO.O -EN				
	M0.1 - RE(	2			
	******	1	MDR MO.2		
P#I TE 1	0.0 BY 10 ADI	I DR_1 ERI	NDR MO.2 ROR MO.3		
P#I TE ] P#DF	0.0 BY 10 ADI 83.DBX	DR_1 ERI STAT	NDR - MO.2 ROR - MO.3 FUS - MW1		
P#I TE : P#DF 0.0	0.0 BY 10 — ADI B3.DBX BYTE 1	DR_1 ERI STAT	NDR — MO.2 ROR — MO.3 FUS — MW1		
P#I TE : P#DI 0.0 0	0.0 BY 10 ADI B3.DBX BYTE 1 RD	DR_1 ERI STAT	NDR — MO.2 ROR — MO.3 FUS — MW1 ENO —		
P#I TE P#DH 0.0 0 Symbol	0.0 BY 10 ADI B3.DEX BYTE 1 RD information	DR_1 ERI STAT _1 I	NDR — MO.2 ROR — MO.3 TUS — MW1 ENO —		

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**Note:** Now that the GET function block has been created successfully, users must remember that the block gets executed/triggered only on a rising edge (REQ).

11. To finish, click **Save** and then close the **LAD/STL/FBD** window.

![](_page_36_Picture_2.jpeg)

Note: For more information, refer to Step Five: Creating the DB3 Data Block.

# Step Five: Creating the DB3 Data Block

While configuring GET FB, the data block "DB3" was used for the "RD\_1" field. This is the data block that will store read values.

1. To start, right-click in the right pane of the SIMATIC Manager window and then select **Insert New Object**| **Data Block**.

![](_page_37_Picture_1.jpeg)

2. Next, change the name to "DB3."

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Properties - Data Block	X
General - Part 1 General	- Part 2 Calls Attributes
Name and type:	DB3 Shared DB
<u>S</u> ymbolic Name:	
Symbol <u>C</u> omment:	
Created in <u>L</u> anguage:	DB
Project path:	
Storage location of project:	D:\Siemens\Step7\S7proj\Setup
	Code Interface
Date created: Last modified:	08/09/2004 04:25:28 08/09/2004 04:25:28 08/09/2004 04:25:28
C <u>o</u> mment:	
ОК	Cancel Help

Note: The window should appear as shown below.

SIMATIC Manager - [Setup	D:\Siemens\Step7\S7proj\Setup]		_ 🗆 ×
Eile Edit Insert PLC View	<u>O</u> ptions <u>W</u> indow <u>H</u> elp		_ B ×
	🔬 🗣 📲 🖳 🛍 🗰 🖻	No Filter >	• 7
Setup  MASTER  MASTER  CPU 315-2 DP  Sources  Sources  Sources  Simaric PC 343-1  SIMATIC PC Station	🚵 System data 🛛 🙃 OB1 👔	📮 FB14 🛛 🔁 DB2	DB3
Press F1 to get Help.			

 Next, double-click on DB3. In order to assign some memory to the data block, users can make changes similar to those shown in the window below. Although the array size in this example was chosen arbitrarily, values should be specified to fit a particular need.

į	🔣 LAD/STL/FBD - [DB3 Setup\MASTER\CPU 315-2 DP]							
Eile Edit Insert PLC Debug View Options Window Help								
I	Address Name Type Download 1 value Comment							
I	0.0		STRUCT					
I	+0.0	DB_VAR	ARRAY[1500]					
I	*1.0		BYTE					
I	=500.0		END_STRUCT					
ľ								
L	• <b>_</b>					<b>`</b> _		
L	oads the curr	ent block to the PLC.		오 offline	Abs Inse	rt //		

4. Once finished, save and close the **LAD/STL/FBD** window.

Note: For more information, refer to Step Six: Inserting PUT FB.

# Step Six: Inserting PUT FB

 Next, create a separate data block for the PUT FB, which holds the data that is written to the remote partner. To insert this new data block, follow the steps in <u>Step Five: Creating the DB3 Data Block</u> but name it "DB5."

![](_page_39_Picture_6.jpeg)

2. Double-click on **DB5**, and then specify a memory size. Although the array size in this example was chosen arbitrarily, the values should be specified to fit a particular need.

K LAD/STL	./FBD - [DB5 Setup\	MASTER\CPU 315-2	DP]		_ 🗆 ×
💶 <u>F</u> ile <u>E</u> dit	: <u>I</u> nsert P <u>L</u> C <u>D</u> ebug ⊻	(iew <u>O</u> ptions <u>W</u> indow	<u>H</u> elp		_ 8 ×
		ы со <b>6</b> 8 🏜	<b>6</b> 60 143	.! <b>№?</b>	
Address	Name	Туре	Initial value	Comment	
0.0		STRUCT			
+0.0	DB_VAR	ARRAY[1500]			
*1.0		BYTE			
=500.0		END_STRUCT			
Press F1 to get	t Help.		9 offline	Abs	Insert //

3. To insert the PUT FB, double-click on **OB1** in the SIMATIC Manager window. In **LAD/STL/FBD**, rightclick in the blank space below **GET FB**. 4. Next, click Insert Network and then select the blank space below.

į	🔣 LAD/STI	./FBD - [OB1	Setup\MASTER\CP	U 315-2 DP]		
1	🖬 <u>F</u> ile <u>E</u> di	t <u>I</u> nsert P <u>L</u> C <u>D</u>	<u>l</u> ebug <u>V</u> iew <u>O</u> ptions	<u>W</u> indow <u>H</u> elp		
	0 🖻 🖁	~ 🖬 🎒 🐰		<b>Gii 🏜 🔽</b> 🚳	!«»! <b>B</b>	
Γ	Address	Declaration	Name	Туре	Initial value	Comment
	0.0	temp	OB1_EV_CLASS	BYTE		Bits 0-3 = 1 (Coming event),
	1.0	temp	OB1_SCAN_1	BYTE		1 (Cold restart scan 1 of 0)
	2.0	temp	OB1_PRIORITY	BYTE		Priority of OB Execution
	3.0	temp	OB1_OB_NUMBR	BYTE		1 (Organization block 1, OB.
	4.0	temp	OB1_RESERVED_1	BYTE		Reserved for system
	5.0	temp	OB1_RESERVED_2	BYTE		Reserved for system
	6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of previous OB1 :
	8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle time of OB1 (1
	10.0	temp	OB1_MAX_CYCLE	INT		Maximum cycle time of OB1 ()
	12.0	temp	OB1_DATE_TIME	DATE_AND_TIME		Date and time OB1 started
1						

![](_page_41_Figure_3.jpeg)

## Symbol information:

FB14	GET	Read Data From a Remote CPU
Network 2: Title	:	
Comment:		

5. Next, click **Insert** | **Program Elements**. Then, expand the **Libraries**, **SIMATIC\_NET\_CP**, and **CP 300** menus.

6. To insert a function block to write data, double-click on **FB15 PUT**. Then, close the **Program Elements** window.

K LAD/STL/FBD - [0B1 Setup\MASTER\CPU 315-2 DP]							
🖬 <u>F</u> ile <u>E</u> di	it <u>I</u> nsert P <u>L</u> C <u>D</u>	tebug ⊻iew <u>O</u> ptions	<u>W</u> indow <u>H</u> elp				
	- 🖬 🎒 👗		<b>Ch 🏜 📼</b> 🚳	' <u>!</u> «»! <b>B</b>			
Address	Declaration	Name	Туре	Initial value	Comment		
0.0	temp	OB1_EV_CLASS	BYTE		Bits $0-3 = 1$ (Coming event),		
1.0	temp	OB1_SCAN_1	BYTE		l (Cold restart scan 1 of OB		
2.0	temp	OB1_PRIORITY	BYTE		Priority of OB Execution		
3.0	temp	OB1_OB_NUMBR	BYTE		1 (Organization block 1, OB)		
4.0	temp	OB1_RESERVED_1	BYTE		Reserved for system		
5.0	temp	OB1_RESERVED_2	BYTE		Reserved for system		
6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of previous OB1 s		
8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle time of OB1 (m		
10.0	temp	OB1_MAX_CYCLE	INT		Maximum cycle time of OB1 (n		
12.0	temp	OB1_DATE_TIME	DATE_AND_TIME		Date and time OB1 started		
Symbol:	information:	Ъ.	Read D	ata From a Rem	ote CPIL		
Symbol : FB14 Network	information:	GET	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network Comment	information:	GET	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network	information:	GET ??? "PUT"	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network Comment	information: 2: Title:EN	GET ??? "PUT"	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network	information: 2: Title: — EN — REQ TD	GET ??? "PUT" DONE	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network	information: 2: Title: — EN — REQ — ID	GET ??? "PUT" DONE ERROR	Read D	ata From a Rem	ote CPU		
Symbol : FB14 Network	information: 2: Title: — EN — REQ — ID — ADDR — SD 1	GET ??? "PUT" DONE ERROR _1 STATUS ENO	Read D	ata From a Rem	ote CPU		

7. Next, associate a data block (DB) with the function block (FB). To do so, click above the FB where there are three red question marks. Then, specify a name. In this example, "DB4" is used.

Note: A window prompt will ask for confirmation of data block creation. Click Yes.

- 8. Fill in the other details as appropriate. Users should consider the following:
  - "ADDR\_1" address is on the destination device in the unsolicited driver.
  - "SD\_1" is the address local to the PLC.

- The value at the local address specified by "SD\_1" is written (PUT) to the remote address specified by "ADDR\_1".
- Enter the Local ID number that was generated when setting up the connection between the Master and the Slave Driver in the **ID** field. In this example, the Local ID number is 1.

**Important:** The number of bytes in both the "ADDR\_1" and "SD\_1" fields should be same in order for the unsolicited driver to respond correctly. Otherwise, an error message will be sent.

🔣 LAD/STI	_/FBD - [0B1 -	Setup\MASTER\C	PU 315-2 DP]		
🕩 <u>F</u> ile <u>E</u> di	t <u>I</u> nsert P <u>L</u> C	<u>D</u> ebug <u>V</u> iew <u>O</u> ption:	s <u>W</u> indow <u>H</u> elp		
0 🗃 🖁	- 🖬 🎒 🛛	( B 🔁 🔊 🗠	<u>622</u>	67 <u>!</u> «»! 🖪	
Address	Declaration	Name	Туре	Initial value	Comment
0.0	temp	OB1_EV_CLASS	BYTE		Bits 0-3 = 1 (Coming ev
1.0	temp	OB1_SCAN_1	BYTE		l (Cold restart scan l
2.0	temp	OB1_PRIORITY	BYTE		Priority of OB Executio
3.0	temp	OB1_OB_NUMBR	BYTE		l (Organization block l
4.0	temp	OB1_RESERVED_1	BYTE		Reserved for system
5.0	temp	OB1_RESERVED_2	BYTE		Reserved for system
6.0	temp	OB1_PREV_CYCLE	INT		Cycle time of previous
8.0	temp	OB1_MIN_CYCLE	INT		Minimum cycle time of O
10.0	temp	OB1_MAX_CYCLE	INT		Maximum cycle time of O
12.0	temp	OB1_DATE_TIME	DATE_AND_TIME		Date and time OB1 start

![](_page_43_Figure_6.jpeg)

9. To finish, click **Save** and then close **LAD/STL/FBD**.

![](_page_44_Picture_2.jpeg)

Note: For more information, refer to Step Seven: Downloading to the PLC.

# Step Seven: Downloading to the PLC

Once the Master has been prepared to generate Read/Write requests for the remote unsolicited partner, the information must be downloaded to the PLC.

- 1. To start, click **Master** in the left pane of the SIMATIC Manager window. Then, select the **PLC** menu.
- 2. Next, select **Download** to begin downloading the project to the PLC.

Stop Target Modules		×
The following modules will b data.	e stopped for loading of t	ne system
Module	Racks Slot	
CPU 315-2 DP	0 2	
(OK)	Cancel	Help

3. Click **OK**.

![](_page_45_Picture_2.jpeg)

4. Then, click Yes.

Download	(13:4363)
<u>.</u>	The module CPU 315-2 DP [R 0/S 2] is in the STOP mode. Do you want to start the module now (complete restart)?
<u> </u>	No

Note: The master must be run in order to trigger the function blocks that generate Read/Write requests.

5. Double-click on **OB1** in the SIMATIC Manager window.

![](_page_45_Picture_7.jpeg)

6. In LAD/STL/FBD, click Debug | Monitor.

KAD/STL/FBD - [0B1	Setup\MASTER\CPL	J 315-2 DP]		_ 🗆 🗵
🗗 <u>F</u> ile <u>E</u> dit <u>I</u> nsert P <u>L</u> C	Debug View Options	<u>W</u> indow <u>H</u> elp		_ 8 ×
	M <u>o</u> nitor	Ctrl+F7		
	Call Environment		<b>b</b> I	
Address Declaration	Modify Address Modify Address to 0		pe Init	ial valu
0.0 temp	Modify Address to <u>0</u> Modify Address to <u>1</u>		ΓE	
1.0 temp	Set Breekpoint	ChileH	TE	
2.0 temp	Delete All Breakpoints	Ctrl+Shift+H		
3.0 temp	Breakpoints Active	F4		
4.0 temp	Show Next Breakpoint	0.1.50		
6.0 temp	Hesume Execute Next Statement	Cm+F8 Cm+F9	r	
8.0 temp	Execute Call	Ctrl+F12	r	
		1	4 <u> </u>	▼
OB1 : "Main Progra	um Sweep (Cycle)"			_
Comment:				
Network 1: Title:				
Comment:				
	DB2			
	"GET"			
MO.1 - REQ				
M0.1 - REQ	NDR	<b>-M</b> O 2		
MO.1 - REQ W#16#1 - ID	NDR -	<b>-M</b> 0.2		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY	NDR - ERROR -	-MO.2 -MO.3		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY TE 10 - ADD	NDR - ERROR - R_1 STATUS -	-MO.2 -MO.3 -MW1		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY TE 10 - ADD P#DB3.DBX0	NDR - ERROR - R_1 STATUS -	-MO.2 -MO.3 -MW1		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY TE 10 - ADD P#DB3.DBX0 .0 BYTE 10 - RD_	NDR - ERROR - R_1 STATUS - 1 ENO -	-MO.2 -MO.3 -MW1		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY TE 10 - ADD P#DB3.DBX0 .0 BYTE 10 - RD_	NDR - ERROR - R_1 STATUS - 1 ENO -	-M0.2 -M0.3 -MW1		
MO.1 - REQ W#16#1 - ID P#I 0.0 BY TE 10 - ADD P#DB3.DBX0 .0 BYTE 10 - RD_ Symbol information: FB14	NDR - ERROR - R_1 STATUS - 1 ENO -	-MO.2 -MO.3 -MW1 -	Data From a Remote	CPU

Note: LAD/STL/FBD should appear in Online Mode as shown below.

🗱 LAD/STL/FBD - [@OB1 Setup\MASTER\CPU 315-2 DP] ONLINE 📃 🔲 🗙						
File       Edit       Insert       PLC       Debug       View       Options       Window       Help						
🗋 🗁 🔓	E 🖨 🐰	<b>自己</b> 2 C -	6H 📩 💌			
<u>60</u> <u>!≪≫</u> !		8. 21 .= ???	-[ T H	<b>N?</b>		
Address De	eclaration	Name		Туре	I	nitial valu
0.0 te	emp	OB1_EV_CLASS		BYTE		
1.0 te	emp	OB1_SCAN_1		BYTE		
2.0 te	emp	OB1_PRIORITY		BYTE		
3.0 te	emp	OB1_OB_NUMBR		BYTE		
4.0 te	emp	OB1_RESERVED_1		BYTE		
5.0 te	emp	OB1_RESERVED_2		BYTE		
6.0 te	emp	OB1_PREV_CYCLE		INT		
8.0 te	emp	OB1_MIN_CYCLE		INT		<b>_</b>
	1			1		
						<u> </u>
0B1 : "Ma	ain Program	Sweep (Cycle)"				
Comment:						
Network 1	:Title:					
Comment:						
		DB2				
1		"GET"				
Ι,						
r.	10.0					
. P	MO.1 REQ					
16	#0001	100	0			
W#1	16#1 - 10	NDR	-M0.2			
P#I 0.0	о ву	ERROR	-M0.3			
TE 10	ADDR	1	16#0000			
		STATUS	-MW1			
P#DB3.I	DBX0	ENO	_			
Symbol inf	formation:					
FB14	G	ET	Re	ead Data	From a Rem	ote CPU
•						
Press F1 to get H	lelp.				Abs	

7. To execute **GET/PUT FBs**, change the **REQ** value to 0 and then 1 to indicate the rising edge. To do so, right-click on the **REQ** field and select **Modify to 0** to force a zero to the field.

K LAD	/STL	./FBD - [@0B1	Setup\MA	STER\CPU	315-2 D	P] ONLIN	IE		- 🗆 ×
🗅 <u>F</u> ile	▶ File       Edit       Insert       PLC       Debug       Yiew       Options       Window       Help								
60	!«)	>! <b>[]</b> #**	8 21 .=	?? E -		▶?			
Addre	ss	Declaration	Name			Туре		Initial	valu 📥
	0.0	temp	OB1_EV_CLA	188		BYTE			
	1.0	temp	OB1_SCAN_1			BYTE			
	2.0	temp	OB1_PRIORI	TY		BYTE			
	3.0	temp	OB1_OB_NUM	BR		BYTE			
	4.0	temp	OB1_RESERV	ED_1		BYTE			
	5.0	temp	OB1_RESERV	ED_2		BYTE			
	6.0	temp	OB1_PREV_C	YCLE		INT			
	8.0	temp	OB1_MIN_CY	CLE		INT			<b></b>
•			1			1		1	
0B1	: '	'Main Program	Sweep (Cyc	:le)"					
Com	nent	:							
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FB1	.4		ÆT		R	ead Data	From a Re	emote CPU	J_▼
I he state	ie statements are not being processed.								

8. Next, right-click on the **REQ** field and select **Modify to 1** to force a value of one to the field.

K LAD/STL	🞇 LAD/STL/FBD - [@OB1 Setup\MASTER\CPU 315-2 DP] ONLINE 📃 📃					- 🗆 🗵	
🔁 <u>F</u> ile <u>E</u> di	➡ File Edit Insert PLC Debug View Options Window Help					. B ×	
<mark>66</mark> [≪]	>! <b>[]</b> ##0	8 2 .=	n =[ <b>-</b> [ ⊤	: H			
Address	Declaration	Name		Тура	•	Initial	valu
0.0	temp	OB1_EV_CLA	.55	BYTH	C		
1.0	temp	OB1_SCAN_1		BYTH	C		
2.0	temp	OB1_PRIORI	TY	BYTH	C		
3.0	temp	OB1_OB_NUM	BR	BYTH	C		
4.0	temp	OB1_RESERV	ED_1	BYTH	C		
5.0	temp	OB1_RESERV	ED_2	BYTH	C		
6.0	temp	OB1_PREV_C	YCLE	INT			
8.0	temp	OB1_MIN_CY	CLE	INT			<b>_</b>
•		1		1			
							•
0B1 : '	'Main Program	Sweep (Cyc	:le)"				
Comment	:						
Network	1: Title:						
Comment	:						
DB2							
"GET"							
	0						
MO.1	REQ			ı			
	16#0 Copy		Ctrl+C				
۳ ۱	Insert Emp	ity Box	Alt+F9				
P#I 0	0.0 Modify to (	)					
TE 10	Modify to 1	1		00			
P#DB3	B. DB: Go to Loca	ation	Ctrl+Alt+Q				
.0 BY	TE Edit Symbo		Alt+Return				
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**Note:** Both of the FBs must next be configured to respond to the same rising edge in order for the SIMATIC Manager's variables to be locally monitored and modified.

# 9. In LAD/STL/FBD, click on PLC and then select Monitor/Modify Variables.

10. Enter the variables that will be monitored. To view the changes made to this window, execute the function blocks.

**Note:** Remember that the slot/rack value of the remote device with which the master is communicating is "rack:0 slot:2". The values can be changed from the NetPro window. Users must make sure that the unsolicited driver on the other end has a device with these values and is running.

# **Data Types Description**

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value
Char	Signed 8 bit value
Word	Unsigned 16 bit value
	bit 0 is the low bit
	bit 15 is the high bit
Short	Signed 16 bit value
	bit 0 is the low bit
	bit 14 is the high bit
	bit 15 is the sign bit
DWord	Unsigned 32 bit value
	bit 0 is the low bit
	bit 31 is the high bit
Long	Signed 32 bit value
	bit 0 is the low bit
	bit 30 is the high bit
	bit 31 is the sign bit
BCD	Two byte packed BCD
	Value range is 0-9999. Behavior is undefined for values beyond this
	range.
LBCD	Four byte packed BCD
	Value range is 0-999999999. Behavior is undefined for values beyond
	this range.
Float	32 bit floating point value.
	The driver interprets two consecutive registers as a floating point
	value by making the second register the high word and the first reg-
	ister the low word.
String	NULL Terminated ASCII String

# S7-300 Address Descriptions

The default data types for dynamically defined tags are shown in **bold**.

Address Type	Range	Туре	Access
Discrete Inputs	I0.b-I4095.b*	Boolean	Read/Write
	.b is Bit Number 0-7		
	IB0-IB4095	<b>Byte</b> , Char, String**	Read/Write
	IW0-IW4094	Word, Short, BCD	Read/Write
	IW:KT0-IW:KT4094	DWord, <b>Long</b>	Read/Write
	IW:KC0-IW:KC4094	Word, Short	Read/Write
	ID0-ID4092	DWord, Long, LBCD, Float	Read/Write
Discrete Inputs	E0.b-E4095.b*	Boolean	Read/Write
	.b is Bit Number 0-7		
	EB0-EB4095**	<b>Byte</b> , Char, String**	Read/Write
	EW0-EW4094	Word, Short, BCD	Read/Write
	EW:KT0-EW:KT4094	DWord, <b>Long</b>	Read/Write
Note: I and E access the same memory area.	EW:KC0-EW:KC4094	Word, Short	Read/Write
,	ED0-ED4092	DWord, Long, LBCD, Float	Read/Write
Discrete Outputs	Q0.b-Q4095.b* .b is Bit Number 0-7	Boolean	Read/Write
	QB0-QB4095	Byte, Char, String**	Read/Write
	QW0-QW4094	Word, Short, BCD	Read/Write
	QW:KT0-QW:KT4094	DWord, <b>Long</b>	Read/Write
	QW:KC0-QW:KC4094	Word, Short	Read/Write
	QD0-QD4092	DWord, Long, LBCD, Float	Read/Write
Discrete Outputs	A0.b- A4095.b* .b is Bit Number 0-7	Boolean	Read/Write
	AB0-AB4095	<b>Byte</b> , Char, String**	Read/Write
	AW0-AW4094	Word, Short, BCD	Read/Write
	AW:KT0-AW:KT4094	DWord, <b>Long</b>	Read/Write
<b>Note:</b> O and A access the same memory area	AW:KC0-AW:KC4094	Word, Short	Read/Write
	AD0-AD4092	DWord, Long, LBCD, Float	Read/Write

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Internal Memory	F0.b-F4095.b*	Boolean	Read/Write
	.b is Bit Number 0-7		
	FB0-FB4095	Byte, Char, String**	Read/Write
	FW0-FW4094	Word, Short, BCD	Read/Write
	FW:KT0-FW:KT4094	DWord, <b>Long</b>	Read/Write
	FW:KC0-FW:KC4094	Word, Short	Read/Write
	FD0-FD4092	DWord, Long, LBCD, Float	Read/Write
Internal Memory	M0.b-M4095.b* .b is Bit Number 0-7	Boolean	Read/Write
	MB0-MB4095	Byte, Char, String**	Read/Write
	MW0-MW4094	Word, Short, BCD	Read/Write
	MW:KT0-MW:KT4094	DWord, <b>Long</b>	Read/Write
<b>Note:</b> F and M access the same memory area.	MW:KC0-MW:KC4094	Word, Short	Read/Write
	MD0- MD4092	DWord, Long, LBCD, Float	Read/Write
Data Block Boolean	DB1-N:KM0.b-KM4094.b* 1-N is Block Number .b is Bit Number 0-15	Boolean	Read/Write
	Alternates		
	DB1DBX0.b-DBNDBX4094.b* 1-N is Block Number .b is Bit Number 0-15	Boolean	Read/Write
	DB1D0.b-DBND4094.b* 1-N is Block Number .b is Bit Number 0-15	Boolean	Read/Write
Data Block Left Byte	DB1-N:KL0-KL4095 1-N is Block Number <i>Alternate</i> s	<b>Byte</b> , Char, String**	Read/Write
	DB1DBB0-DBNDBB4095 1-N is Block Number	Byte, Char, String**	Read/Write
	DB1DL0-DBNDL4095 1-N is Block Number	<b>Byte</b> , Char, String**	Read/Write
Data Block Right Byte	DB1-N:KR0-KR4094 1-N is Block Number	Byte, Char, String**	Read/Write
	Alternates		
	DB1DR0-DBNDR4094 1-N is Block Number	Byte, Char, String**	Read/Write
Data Block Unsigned Word	DB1-N:KH0-KH4094 1-N is Block Number	Word, Short, BCD	Read/Write
Data Block Signed Word	DB1-N:KF0-KF4094 1-N is Block Number	Word, <b>Short</b> , BCD	Read/Write
	Alternates		
	DB1DBW0-DBNDBW4094 1-N is Block Number	Word, <b>Short</b> , BCD	Read/Write

	DB1DW0-DBNDW4094 1-N is Block Number	Word, <b>Short</b> , BCD	Read/Write
Data Block Signed Long	DB1-N:KD0-KD4092 1-N is Block Number	DWord, <b>Long</b> , LBCD, Float	Read/Write
	Alternates		
	DB1DBD0-DB1DBD4092 1-N is Block Number	DWord, <b>Long</b> , LBCD, Float	Read/Write
	DB1DD0-DB1DD4092 1-N is Block Number	DWord, <b>Long</b> , LBCD, Float	Read/Write
Data Block Float	DB1-N:KG0-KG4092 1-N is Block Number	Float	Read/Write
Data Block BCD	DB1-N:BCD0-BCD4094 1-N is Block Number	Word, Short	Read/Write
Data Block S5 Timer as DB	DB1-N <b>:</b> KT0-KT4094 1-N is Block Number	DWord, <b>Long</b>	Read/Write
Data Block S5 Counter as DB	DB1-N:KC0-KC4094 1-N is Block Number	Word, Short	Read/Write
Data Block String	DB1:S0.n-DB1:S4095.n* .n is string length. 0 <n<=218.< td=""><td>String</td><td>Read/Write</td></n<=218.<>	String	Read/Write

\*These memory types/subtypes do not support arrays.

\*\*Byte memory types (MB) support strings. The syntax for strings is <address>.<length> where 0<length<=218.

**Note 1:** All offsets for memory types I, Q, and F represent a byte starting location within the specified memory type.

**Note 2:** Use caution when modifying Word, Short, DWord, and Long types. For I, Q and F, each address starts at a byte offset within the device. Therefore, Words FW0 and FW1 overlap at byte 1. Writing to FW0 will also modify the value held in FW1. Similarly, DWord, and Long types can also overlap. It is recommended that these memory types be used so that overlapping does not occur. For example, when using DWords, FD0, FD4, FD8 and so on should be used in order to prevent overlapping bytes.

## Arrays

All memory types/subtypes support arrays (excepting those discussed above). The valid syntax for declaring an array is described below. If no rows are specified, row count of 1 is assumed.

<address>[rows][cols] <address>.rows.cols <address>,rows,cols <address>\_rows\_cols

For Word, Short, BCD and "KT" arrays, the base address+(rows\*cols\*2) cannot exceed 4096. The elements of the array are words, and are located on a word boundary. For example, IW0[4] would return IW0, IW2, IW4 and IW6. "KT" subtypes fall into the 16-bit category because the data stored in the PLC is contained within a Word.

For Float, DWord, Long and Long BCD arrays (excluding "KT" subtypes), the base address+(rows\*cols\*4) cannot exceed 4096. Keep in mind that the elements of the array are DWords, located on a DWord boundary. For example, ID0[4] will return ID0, ID4, ID8 and ID12.

For all arrays, the total number of bytes being requested cannot exceed the internal block size of 218 bytes.

## KL vs. KR vs. DBB

KL and KR determine whether the left byte or right byte of the data block word is returned.

Value	8	9	А	В	С
Byte	0	1	2	3	4

**Example 1** DB1:KH0=0x89 DB1:KL0=0x8 DB1:KR0=0x9 DB1DBB0=0x8

#### Example 2

DB1:KH1=0x9A DB1:KL1=0x9 DB1:KR1=0xA DB1DBB1=0x9

## Examples

1. To access bit 3 of Internal Memory F20, declare an address as follows: F20.3  $\,$ 

2. To access Data Block 5 as word memory at byte 30, declare an address as follows: DB5:KH30  $\,$ 

3. To access Data Block 2 byte 20 and bit 7, declare an address as follows: DB2:KM20.7  $\,$ 

4. To access Data Block 1 as left byte memory at byte 10, declare an address as follows: DB1:KL10  $\,$ 

5. To access Internal Memory F20 as a DWord, declare an address as follows: FD20  $\,$ 

6. To access Input Memory I10 as a Word, declare an address as follows:  $\mathrm{IW10}$ 

# **Error Descriptions**

The following error/warning messages may be generated. Click on the link for a description of the message.

#### Address Validation

Address '<address>' is out of range for the specified device or register Array size is out of range for address '<address>' Array support is not available for the specified address: '<address>' Data Type '<type>' is not valid for device address '<address>' Device address '<address>' contains a syntax error Device address '<address>' is Read Only Missing address

#### **Driver Error Messages**

Failure to start unsolicited communications on Port nWinsock initialization failed (OS Error = n)Winsock V1.1 or higher must be installed to use the Siemens TCP/IP Slave Ethernet device driver

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# Address '<address>' is out of range for the specified device or register

Error Type: Warning

#### **Possible Cause:**

A tag address that has been specified dynamically references a location that is beyond the range of supported locations for the device.

#### Solution:

Verify that the address is correct; if it is not, re-enter it in the client application.

## Array size is out of range for address '<address>'

### Error Type:

Warning

#### **Possible Cause:**

A tag address that has been specified dynamically is requesting an array size that is too large for the address type or block size of the driver.

## Solution:

Re-enter the address in the client application to specify a smaller value for the array or a different starting point.

# Array Support is not available for the specified address: '<address>'

#### Error Type: Warning

#### **Possible Cause:**

A tag address that has been specified dynamically contains an array reference for an address type that doesn't support arrays.

## Solution:

Re-enter the address in the client application to remove the array reference or correct the address type.

# Data Type '<type>' is not valid for device address '<address>'

## Error Type:

Warning

### Possible Cause:

A tag address that has been specified dynamically has been assigned an invalid data type.

### Solution:

Modify the requested data type in the client application.

# Device address '<address>' contains a syntax error

#### Error Type:

Warning

#### **Possible Cause:**

A tag address that has been specified dynamically contains one or more invalid characters.

#### Solution:

Re-enter the address in the client application.

## Device address '<address>' is Read Only

# Error Type:

Warning

#### Possible Cause:

A tag address that has been specified dynamically has a requested access mode that is not compatible with what the device supports for that address.

#### Solution:

Change the access mode in the client application.

## Missing address

Error Type:

Warning

#### **Possible Cause:**

A tag address that has been specified dynamically has no length.

#### Solution:

Re-enter the address in the client application.

## Driver Error Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

#### **Driver Error Messages**

Failure to start unsolicited communications on Port n Winsock initialization failed (OS Error = n) Winsock V1.1 or higher must be installed to use the Siemens TCP/IP Slave Ethernet Driver

## Failure to start unsolicited communications on Port n

Error Type:

Fatal

#### **Possible Cause:**

The driver was not able to create a listen socket for unsolicited communications. This is most often due to another application using the port specified. Much less likely causes are related to low system resources.

# Solution:

Use network monitor software to check if any other application is using the port. If so, shut down the conflicting application and restart the OPC Server. In many cases, the conflicting application is free to pick any available port. If this is the case, make sure the server is always started first so that it may claim the required port. If both the PLC programming software and this driver use the same port, they may not be able to be used simultaneously.

### See Also:

Channel Setup

# Winsock initialization failed (OS Error=n)

# Error Type:

Fatal

OS Error	Indication	Possible Solution
10091	Indicates that the underlying network subsystem is not ready for network communication.	Wait a few seconds and restart the driver.
10067	Limit on the number of tasks supported by the Win- dows Sockets implementation has been reached.	Close one or more applications that may be using Winsock and restart the driver.

# Winsock V1.1 or higher must be installed to use the Siemens TCP/IP Slave Ethernet device driver

Error Type:

Fatal

# **Possible Cause:**

The version number of the Winsock DLL found on the system is less than 1.1.

## Solution:

Upgrade Winsock to version 1.1 or higher.

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