Electronic Displays, Inc. EDV111 Series LED Signs Siemens TIA Portal 11, Step 7 Pro Function Block Software Manual

Version Control

Version	Date	Author	Change Description
1.0	11/21/2014	d.fox	Initial release

EDV111 Series - LED Signs Firmware Protocol 3.1

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 1 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

TABLE OF CONTENTS	Page No.
1.0 INTRODUCTION	3
1.1 Supported PLC Controllers	
1.2 Function Block	
1.3 Supported LED Signs	
2.0 SYSTEM BLOCK DIAGRAM	4
2.1 Typical Connection Diagram	
2.2 Single Sign Connection	
2.3 Multiple Sign Connection	
3.0 CONFIGURE RTA 460PSA GATEWAY	5
3.1 Configure PC Communications	
3.2 Configure Gateway	6
3.3 Configure Siemens PLC	11
3.4 Import EDI Function Block, Database and PLC Tags	16
4.0 Use the EDI Function Block	17
4.1 EDI_Message Function Block Description	
4.2 Simple use of the EDI_Message Function Block	19
4.3 Advanced use of the function block	20
4.4 Example uses of the function block	22
4.4.1 Clear display	
4.4.2 Colors	23
4.4.2.1 Red	
4.4.2.2 Green	24
4.4.2.3 Yellow	
4.4.3 Flashing	25
4.4.4 Slide Left	26
4.4.5 Right Justify	27

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 2 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

1.0 INTRODUCTION

This manual is provided as a guide for using EVD111 series LED Signs with TIA Portal 11 (Step 7 Pro v11) software by Siemens. This manual provides instructions for configuring Profinet I/O and importing function blocks to Step 7 Pro v11 software projects.

1.1 Supported PLC Controllers

Siemens controllers that support Profinet I/O in Step 7 software are supported, such as S7-300, S7-400, S7-1200. A sample project is available through the Electronic Displays, Inc. website <u>www.electronicdisplays.com</u>.

Other Siemens PLC's are not covered in this document. Typically, these devices may be connected to a display using a serial port. Please refer to the ASCII protocol manual for examples.

1.2 Function Block

Use the function block described in this manual to easily control an LED sign. The function block (FB) and data block (DB) may be imported into Step 7 software for use in your program.

1.3 Supported LED Signs

- EDV111-3280-IND, EDV111-16160-IND, EDV111-16128-IND
- EDV111-1680-IND, EDV11132340-IND, EDV111-16240-IND
- EDV111-24160-IND

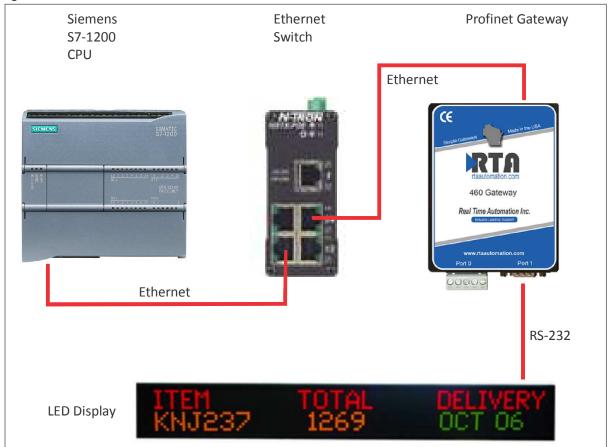
Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 3 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

2.0 SYSTEM BLOCK DIAGRAM

The EDV111 LED signs is supplied with a Profinet I/O gateway device that converts the Profinet I/O protocol into ASCII serial strings that are compatible with the LED signs. In this way, a LED sign may be connected using a CAT5 Ethernet cable, and not limited to a short distance RS-232 cable.

2.1 Typical Connection Diagram

Siemens S7-nnn PLC > CAT5 Ethernet Cable > Industrial Network Switch > CAT5 Ethernet Cable > Profinet I/O Gateway (Default IP address 192.168.1.11) > RS-232 Shielded Cable > EDV111 Series LED Sign



2.2 Single Sign Connection

Single sign connection requires (1) one gateway device.

2.3 Multiple Sign Connection (More than 50 Feet apart)

Each sign requires (1) one gateway device as shown in 2.1

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 4 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

3.0 CONFIGURE RTA 460PSA Profinet Gateway

3.1 Configure PC Communications

On a PC, use the Microsoft Windows "Network and Sharing Center" to configure the "Local Area Connection" to static IP address 192.168.0.1:

- a. In Windows 7, click the START button > Control Panel > Network and Internet > Network and Sharing Center.
- b. Click on the "Local Area Connection" that represents the Ethernet connector that you are connecting to the gateway.
- c. On the "Local Area connection Status" dialog box, click the Properties button.
- d. On the "Local Area Connection Properties" dialog box, select "Internet Protocol Version 4 (TCP/IPv4), then click "Properties".
- e. Select the radio box "Use the following IP address:".
- f. In "IP address:", enter 192.168.0.1
- g. In "Subnet mask:", enter 255.255.255.0
- h. Verify DNS servers are empty and click OK.

ntrol Panel Home	View your basic network information and s	et up connections	e		gned automatically if your network suppor
nage wireless networks	A	🎱	See full map	this capability. Otherwise, y for the appropriate IP settin	ou need to ask your network administrato igs.
inge adapter settings inge advanced sharing	d computer Multiple network	s Interne		Service 1 and the l	
ings	(This computer) View your active networks		- Connect or disconnect	 Obtain an IP address a 	20 mm
	New your active networks	Access type: Internet	connect of disconnect	O Use the following IP ad	
	WiFi Home network	HomeGroup: Joined	N.S. Contraction	IP address:	192.168.0.1
	Home network	Connections: all Wireless	Network Connection	Subnet mask:	255 . 255 . 255 . 0
			net access	Default gateway:	4 10 12
	Unidentified network	Connection U Local A	rea Connection	🔵 Obtain DNS server add	lress automatically
			E	Our Sector Se	server addresses:
				Preferred DNS server:	
	Change your networking settings			Alternate DNS server:	

OK Cancel

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 5 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

3.2 Configure Gateway

- a. Connect the power supply to the gateway.
- b. Connect an Ethernet crossover cable between the PC. Instead, an unmanaged Ethernet switch can be used with straight-through Ethernet cables. A managed switch can be used, but configuration is outside the scope of these instructions.
- c. Use Microsoft Windows Explorer or another web browser. In the address bar, type the default address (192.168.0.100) and press Enter to connect to the gateway.

DTO			_	www.rtaautomation.com
Real Time Auto	omation, Inc.			MODE: CONFIGURING 460PSA
		Main	Page	
Main Page	Device Configuration	Edit		
CONFIGURATION Port Configuration PROFINET IO Server ASCII	Device Description: IP Address: Subnet: Default Gateway: DNS Gateway:	192.168.0.100 255.255.255.0 0.0.0.0		100 Mbps, Full Duplex 00:03:F4:07:BF:4C Nov 21 2013
Display Data Display String Restart Now Refresh	ASCII Status Device Status: Queued Messages: Last Parsed Error: LED Status:	Configuration Mode Gatew		
DIAGNOSTICS -Select-	Profinet IO Server Status Device Status: LED Status:	Configuration Mode Gatew		
-Select-	Data Mapping Status # Enabled: # of Errors: First Error:			
	String Mapping Status # Enabled: # Error: First Error:			

d. In the upper-right corner of the web page, find "MODE". If the mode is not "CONFIGURING", click the "Configuration Mode" button that appears on the top left, then OK, OK.



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 6 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

e. On the "Main Page", review the network settings. To change values, click the "Device Configuration" "Edit" button.

Device Configuration Edit				
	192.168.0.100 255.255.255.0 0.0.0.0	MAC Address:	100 Mbps, Full Duplex 00:03:F4:07:BF:4C Nov 21 2013	

- 1. Change "Device Description" to a name that represents how the gateway is being used, for example, "EDI Display".
- 2. Change "IP Address", "Subnet", "Default Gateway", "DNS Gateway" and "Ethernet Link" to values that are compatible with the associated control system. (Usually, subnet = 255.255.255.0, default and DNS gateway = 0.0.0.0, Ethernet link = Auto-negotiate)
- 3. Click the "Save Parameters" button to make the change. These settings take effect when the gateway power is removed and restored.
- f. Click the "Port Configuration" button.

RTA			www.rtaautomation.com
Real Time Auton	nation, Inc.		MODE: CONFIGURING 460PSA
c	comm Ports Configuration		Jumper Hel
Main Page	Enable Port 0:	Enable Port 1:	
ONFIGURATION	Mode: RS232	Mode:	RS232 •
Port Configuration	Serial Baud: 19200 •	Serial Baud:	9600 🔻
PROFINET IO Server	Parity: None V	Parity:	None 🔻
ASCII	Data Bits: 8 🔹	Data Bits:	8 🔻
Display Data	Stop Bits: 1 V	Stop Bits:	1 •
Display String	Flow Control: None	Flow Control:	None •
Restart Now	RTS: High (default) • (RS232 only)	RTS:	High (default) • (RS232 only)
Refresh	DTR: High (default) • (RS232 only)	DTR:	High (default) • (RS232 only)
AGNOSTICS	RS232		RS232
-Select- THER -Select- T		(1 2 3 4 5 6 7 8 9 0 7 8 9
ol		arameters	
Check "Enable I	Port 0" or "Enable Port 1" but not	both.	
Required settin	gs are		
• Mode:	R\$232		• Stop Bits: 1
- moue.			Ctop Dito: 1

- Serial Baud: 9600
- Parity: None
- Data Bits: 8

- Flow Control: None
- RTS: High
- DTR: High
- 3. Click the "Save Parameters" button to make the change. These settings take effect when the "Restart Now" button is pressed or the gateway power is removed and restored.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 7 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

g. Click the "PROFINET IO Server" button.

1	Profinet	IO Server Co	nfiguration			Help
Main Page			Device La	ibel ns01		
ONFIGURATION			Donio Li	provi		
Port Configuration			Auto-(Configure Serve	r	
PROFINET IO Server	Input		to Profinet IO)	Outro	t Clote /Drofin	et IO to 460PSA)
ASCII	input	Data Size	(to Prolinet IO)		Data Size	
Display Data	Slot	(Bytes)	Data Format	Slot	(Bytes)	Data Format
Display String	1	Disabled v	16 Bit Int 🔹	11	128 🔻	Short String 🔹
Restart Now	2	Disabled •	16 Bit Int 🔻	12	Disabled V	16 Bit Int 🔻
Refresh	3	Disabled •	16 Bit Int 🔹	13	Disabled •	16 Bit Int 🔹
AGNOSTICS	4	Disabled 🔻	16 Bit Int 🔹	14	Disabled •	16 Bit Int 🔹
-Select-	5	Disabled V	16 Bit Int 🔻	15	Disabled V	16 Bit Int 🔻
THER	6	Disabled V	16 Bit Int 🔻	16	Disabled V	16 Bit Int 🔻
-Select-	7	Disabled 🔻	16 Bit Int 🔻	17	Disabled V	16 Bit Int 🔻
	8	Disabled 🔻	16 Bit Int 🔻	18	Disabled •	16 Bit Int 🔻
	9	Disabled V	16 Bit Int 🔻	19	Disabled •	16 Bit Int 🔻

- 1. Change "Device Label" to "ps01", without the quotation marks. This name is also used in the Siemens Step 7 software, and they must match exactly.
- 2. If the data values are greyed-out, click the "Edit Data Groups" button, OK, OK, OK to change the following values:
 - "Data Size" for all slots except "Slot" 11 should be disabled.
 - "Data Format" for all slots except "Slot" 11 should be 16 Bit Int.
 - "Slot" 11 "Data Size bytes" is 128, "Data Format" is "Short String".
- 3. Click the "Save Parameters" button to make the change. These settings take effect when the "Restart Now" button is pressed or the gateway power is removed and restored.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 8 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

RTA				www.rtaau	tomation.co
Real Time Auto	omation, Inc.			460PS	
	ASCII Configuration				Help
Main Page		Add ASCII Devic	e Delete ASCII Device		
CONFIGURATION Port Configuration			1 >>> 1-1	A	
PROFINET IO Server ASCII	 Enable 	ASCII Dev	ice 1	Copy From AS	Cll 1 V Go
Display Data	Port	Port 1 (DB9) 🔻	Devic	e Label ASCII01	
Display String		LED Inactivity 0	0-60000 s		_
Restart Now			0-60000 S		
DIAGNOSTICS -Select-	Receive Data (ASCII Enal Max Message Leng Receive Character Timed	ble: gth: 0 0-255 chars	Max Messag		-255 chars -60000 ms
-Select-	Gateway Hold Msg Time	x00 v [NUL] 0 0x00 v s from ASCII Message: arsing (Optional) out: 0 0-60000 ms vior: Discard Old v	End O 🔹 [NUL] 0 0×00 ▼ [NU	L] 0 0x00 ▼ L] 0 0x00 ▼
		Save	Parameters		

- 1. Use the "Add ASCII Device" button and the "Delete ASCII Device" buttons so that only one ASCII device exists named "ASCII Device 1". Use the << and >> buttons to navigate through existing ASCII devices.
- 2. Check the "Enable" checkbox.
- 3. Change "Port" to "Port 0 (T-strip)" or "Port 1 (DB9)" to match the selected port in "Port Configuration"
- 4. Under "Receive Data (ASCII to 460PSA)", uncheck "Enable".
- 5. Under "Transmit Data (460PSA to ASCII)",
 - Check "Enable"
 - "Max Message Length" = 128
 - "Transmit Timeout" = 0
 - Under "Add Delimiters"
 - Start = 0, [NUL] 0, [NUL] 0
 - End = 0, [NUL] 0, [NUL] 0
- 6. Click the "Save Parameters" button to make the change. These settings take effect when the "Restart Now" button is pressed or the gateway power is removed and restored.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 9 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

h. Click the "ASCII" button.

- i. Remove, then restore power to the gateway. If the IP address was changed, change the IP address of the PC to a compatible address using the instructions listed earlier in this manual named "Configure PC Communications".
- j. After the gateway reboots, around ten seconds, enter the IP address of the gateway in the web browser address bar and press Enter.
- k. In the upper-right corner of the web page, find "MODE: RUNNING". If the mode is not "RUNNING", review and verify the PROFINET IO Server settings.



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 10 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

3.3 Configure Siemens PLC

Note: These instructions are written for Siemens TIA Portal v11, and an S7-1200 CPU.

3.3.1 On the "Start" tab of TIA Portal, open an existing project "in the project view", or create a new project with a compatible CPU, then open "in the project view".

3.3.2 If an RTA Profinet Gateway device has not been configured before,

a. Click the menu item: Options > Install general station description file (GSD).

Ma Siemens - EDI_57_1200		
Project Edit View Insert Online	Options Tools Window Help	
📑 🎦 🔒 Save project 🚇 🐰 💷	Y Settings	Goo
Project tree	Support packages	_\$7_*
Devices	Install general station description file (GSD)	
	Now reference text	
	🕕 Global libraries 🕨	
	54117 (a. ora	

- b. Use the ellipsis (...) and browse to the folder where the GSD files are located.
- c. Check the item found and click "Install".

Install general s	tation description file				×
Source path:	C:\MyPath\ElectronicDisplays	\RTA Documer	its\GSDML		
Content of imp	orted path				
File		Version	Language	Status	Info
GSDML-V2.2-F	RTA-460P5xx-20140317.xml	V2.2	English	Ready to install	ро
				Install	ncel

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 11 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

VA	Siemens - EDI_S7_1200_Config	gTest				□ X
Pr	oject Edit View Insert Online	Option	s Tools Window Help	To	tally Integrated Automation	
	🗿 🎦 🔚 Save project ا 🐰 🚈	ā ×	ち 🛧 🖓 📲 🛄 🗓 🖳 🖉 Go online 🖉 Go offine b 🎼 🕼 🚽 🛄		PORTAL	L
	Project tree		EDI_\$7_1200_ConfigTest + Devices & networks	I IX	Hardware catalog 👘 🗐 🕮 🕨	
	Devices		🛃 Topology view 🔒 Network view 🛐 Device	view	Options	
	1 H O O	•	Network			Hai
		-	IO system: PLC_1.PROFINET IO-System	n (100) ^	✓ Catalog	dw
Devices & netv	EDL_S7_1200_ConfigTest Add new device Devices & networks Devices & networks Devices onfiguration Devices onfiguration Online & disgnastics Device configuration Devices blocks Devices Devices blocks Devices block		PLC_1 CPU 1211C PS01 Standard PLC_1 PLC_1.PROFINETIO-Syste		▶ 🛅 HMI	Hardware catalog S Online tools
	Control Costs operation Cost operation	~			 ↓ Other field devices ↓ Other field devices ↓ Other ↓ Other ↓ Other ↓ Other ↓ NO ↓ NO ↓ NO ↓ AOPFSxt ↓ Other ↓ Port(O Device) 	Tasks 🛛 Lib
			۲	> 🗐	Ident Systems	-
	Name		Network data		> 🛅 Sensors	1200
			General	a e 🗸	PROFIBUS DP	
			No 'properties' available. No 'properties' can be shown at the moment. There is either no object selected or the selected object does not have any displayable properties.		< m → Information	
	🖣 Portal view 🔚 Overv	new	n Devices & ne	Project EDI	_S7_1200_ConfigTest created.	

3.3.3 Add an RTA Profinet Gateway to the project

- a. In the "Project Tree", expand the [Project name] > [PLC name] and double-click on "Device configuration".
- On the [Project name] > "Devices & networks" window, click on the "Network view" tab.
- c. In the "Hardware catalog" flyout, browse to "Other field devices" > "I/O" > "RTA Inc." > "460PSxx" > "port IO Device Conformance Test 1" > "Standard"
- d. Drag "Standard" to an empty space in the "Network view".
- e. Notice the name "ps01" is assigned, the same as configured on the gateway.
- f. Drag a line from the green square of [PLC name] to the green square of "ps01".

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 12 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

Siemens - EDI_\$7_1200_Config	Test					12
roject Edit View Insert Online	Option	is Tools Window Help			-	otally Integrated Automation
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Project tree		EDI_S7_1200_ConfigTest → Devi			_ # # ×	Hardware catalog 🛛 🗊 🗊
Devices			e	F Topology view 🛛 🛔 Network view 🔄 🕅	evice view	Options
000	1	Network	nnection 💌 👯 🔠 🍳 🛓	100%		
		2010- 201-0000 VII			^	✓ Catalog
 EDI_S7_1200_ConfigTest 	^					<search> №1 №1</search>
📑 Add new device						Filter
Devices & networks		PLC_1 CPU 1211C	ps01 Standard			PLC
- PLC_1 [CPU 1211C DC/DC/DC]			PLC_1			HMI
Device configuration		a	<u>nec_r</u>			PC systems
🛂 Online & diagnostics				21		Drives & starters
🕶 🔂 Program blocks	=		PN/IE_1			Network components
Add new block						Detecting & Monitoring
Hain [OB1]						Distributed I/O
Technology objects						Field devices
External source files						Other field devices
✓ Carps		1				
Show all tags					~	
Add new tag table	- 11	<			> 🗉	Gateway
💥 Default tag table [20]			Network d			→ 📑 I/O
▼ PLC data types		X1 : PN(LAN)		Properties Info (1) Diagnostics		TA Inc.
Add new data type				roperties into a biagnostics		 ▼ 460PSxx
Watch and force tables	1.00	General				v 1 4001 SXX v 1 port IO Devic
Program info	~	General			^	Standard
Details view		Ethernet addresses b	Ethernet addresses		- 1	Ident Systems
		Advanced	Interface networked with			Sensors
Name		Time synchronization				PROFIBUS DP
			Subne	:: PN/IE_1	3	
			_	Add new subnet		
			•	· · · · · · · · · · · · · · · · · · ·		
			IP protocol			
			- In protocol	C		
				Set IP address in the project	2	
				IP address: 192 . 168 . 0 . 10		
				Subnet mask: 255 . 255 . 255 . 0		<
				Use IP router		> Information
Portal view	_	Devices & ne				DL S7 1200 ConfinTest opened

3.3.4 Set the IP address of the CPU

a. In the [PLC Name] graphic, right-click on the green square and select "Properties".

- b. On the left side of the "Properties" view, click on "Ethernet addresses".
- c. On the right side of the "Properties" view, enter values that are compatible with the associated control system. Normal values are

"Interface networked with Subnet" = "PN/IE_1"

Note: This is created by making the connection from the gateway to the CPU.

"IP protocol" = "Set IP address in the project"

"IP address" as needed, for example 192.168.0.10

"Subnet mask" as needed, for example 255.255.255.0

"Use IP router" = not checked

"PROFINET", "Set PROFINET device name..." = not checked

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 13 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

Siemens - EDI_S7_1200_Confi						-
oject Edit View Insert Online						Totally Integrated Automation
🔮 🎦 🔚 Save project 🚢 🐰 🟥		(** 🖬 🖥 🗓 🗓 🗒	🔄 🌌 Go online 🖉 Go offline			PORTA
Project tree		67_1200_ConfigTest ► 1	Devices & networks		_ # 1	🗙 Hardware catalog 🛛 🗐 🗉 I
Devices				📲 Topology view 🛔 🖡	Network view 📑 Device view	Options
1900	R Ne	etwork	🛿 connection 🖃 👯 🔛	⊕ ± 100%	8	4
	Challenter	interesting [1999 Contraction of the Interest		10/2897/ Madematical Control of C		^ ✓ Catalog
 EDI_S7_1200_ConfigTest 	^					≡ ⊲earch> Wi Wi
Add new device						hannessee have been been been been been been been be
Bevices & networks		PLC_1	ps01	a 📮 🚮		Filter
		CPU 1211C	Standard			▶ 🛅 PLC
Device configuration		T	PLC_1			🕨 🫅 HMI
Q Online & diagnostics						PC systems
▼ → Program blocks	-		PN/IE_1			Drives & starters
Add new block	=		PN/IE_1			Network components
- Main [OB1]						Detecting & Monitoring
Technology objects						Distributed I/O
External source files						Field devices
🕶 🌄 PLC tags						 Other field devices
Show all tags						✓ PROFINETIO
Add new tag table	<	Ш			>	🔄 🕨 🧊 Drives
Gefault tag table [20]				twork data		🕨 🚺 Gateway
✓ C PLC data types	-		NE			
Add new data type	IE1			🔍 Properties 📩 Inf	fo 追 🖫 Diagnostics 👘 🗐 🖃	
Watch and force tables	Ge	neral				
Program info	VE	neral	Π			
 Details view 		ernet addresses	Ethernet addresses	[Standard
		anced options	Interface networker			Ident Systems
	r Adv	anced options	Interface networked	with		Sensors
Name				Subnet: PN/IE 1		PROFIBUS DP
				Add new subnet		
			E			
			 IP protocol 			
			Use IP protocol			
				Set IP address in the p	iroject	
				IP address: 1	92.168.0.1	
						<
				Subnet mask: 2	55 . 255 . 255 . 0	↓ Information

3.3.5 Configure the RTA Profinet Gateway device

- a. In the "ps01" graphic, right-click on the green square and select "Properties".
- b. On the left side of the "Properties" view, click on "Ethernet addresses".
- c. On the right side of the "Properties" view, enter values that are compatible with the associated control system. Normal values are

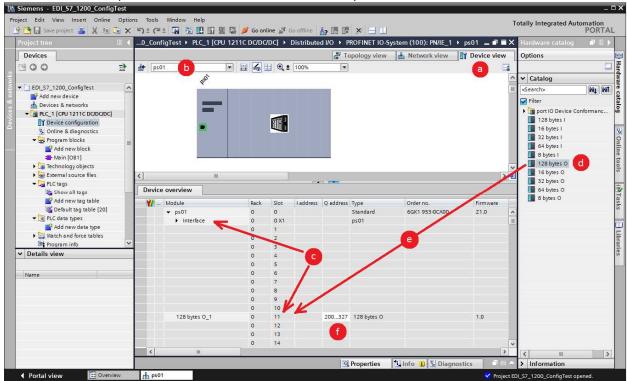
"Interface networked with Subnet" = "PN/IE_1"

Note: This is created by making the connection from the gateway to the CPU.

"IP protocol" = "Use IP protocol"

Other values are default or are not important.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 14 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	



3.3.6 Choose memory locations for the RTA Profinet Gateway device

- a. On the [Project name] > "Devices & networks" window, click on the "Device view" tab.
- b. At the top-left of the view, select "ps01" from the "Device Selection" drop-down list.
- c. Below the view, expand the "Device Overview" and expand "ps01" > Interface > Rack 0 Slot 11.
- d. On the right, expand to find "Hardware Catalog" > "128 bytes O"
- e. Drag "128 bytes O" onto "Rack 0 Slot 11"
- f. In the "Q address" column, enter a start and end address that does not conflict with addresses already assigned in the system (Default addresses are 200...327). End address = start address + 127.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 15 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

Project Edit View Insert Online Options book Window * Totally Integrated Automation PORTAL Project rice Devices Devices Anetworks Care conjugation Care conjugation Ca	74 Siemens - EDI 57 1200	_	TA Siemens - EDI S7 1200 ConfigTest	_ □ X
Induly integrate Automation Project tree Project tree <th></th> <th></th> <th></th> <th></th>				
Project tree Image: Second				Totally Integrated Automation
Vortices Provices Devices Provice Device Provice				
U Image: Second Sec				
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3.4 Import EDI Function Block, Database and PLC Tags

- a. Start a second instance of TIA Portal software.
- b. On the "Start" tab of TIA Portal, open the reference project named "EDI_S7_1200".
- c. Click on the ">Project view" to see the project tree.
- d. In the reference project , expand the Project tree to EDI_S7_1200 > PLC_1 > Program blocks.
- e. Right-click on "EDI_Message[FC200]" and click "Copy".
- f. In your target project, expand the Project tree [Project Name] > PLC_1 > Program Blocks.
- g. Right-click on "Program blocks" and click "Paste".
- h. Repeat steps e. through g. to copy "EDI_MessageB[DB200]" from the reference project to your project.
- i. In the reference project, expand the project tree to EDI_S7_1200 > PLC_1 > PLC tags.
- j. Right-click on "EDI_Display [222]" and click "Copy".
- k. In your target project, expand the Project tree to [Project Name] > PLC_1 > PLC tags.
- I. Right-click on "PLC tags" and click "Paste".

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 16 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.0 Use the EDI Function Block

The EDI function block lets the user send messages to an LED display using the MCS protocol v3.1. The complete specification for the MCS Protocol is available at <u>www.electronicdisplays.com</u>. Common use of the protocol is shown in the examples in this section.

4.1 EDI_Message Function Block Description

	%	FC200	
	"EDI_	Message"	
_	EN	ENO -	-
_	DB_Number	ER -	4
_	QB	ErrorCode -	•
_	Clear		
_	String1		
-	String2		
-	String3		
-	String4		
_	Complete		
_	MessageBuffer		

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 17 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

"EDI_Message" fu	nction block i	interface
Interface Name	Data Type	Description
EN	Bool	Enable EN to transfer the input strings to the LED display.
DB_Number	Int	Set DB_Number to the data block that contains a string used as the PLC message buffer. This is used by this function block to assemble a message for the LED display. Default: The default datablock number is 200 (for DB200). This may be changed if data block DB200 is needed for something else. The first member of the datablock must be as follows: Name: MessageType: String[128]Offset: 0
QB	Int	Set QB to the associated I/O output start address that is configured in the project tree: Default: The default output address is 200 for (%QB200). This may be changed if output %QB200 is needed for a different purpose. Address configuration: YourProjectName > YourPLCName > Distributed I/O > Profinet IO-System > ps01 > 128 bytes O_1, Q address 200327 PLC_tag configuration: YourProjectName > YourPLCName > PLC_tags > EDI_Display[222] > EDI_Display type Char, Address %QB200
Clear	Bool	Use Clear to manage the PLC message buffer. Set to TRUE or FALSE to clear or retain the PLC message buffer. This allows more text to be added with another call to this function.
String1	_	Use String1 through String4 to add text to the PLC message buffer. If Clear is True, the buffer is cleared
String2	String	String1 is added to the buffer
String3		String2 is added to the buffer String3 is added to the buffer
String4		String4 is added to the buffer
Complete MessageBuffer	Bool	Use Complete to send the PLC message buffer to the display Set to TRUE to send the PLC message buffer 1) The message buffer is copied to the specified %QB output. 2) The Profinet gateway receives the string 3) If the Profinet gateway recognizes a change in the string (different than previous message), the string is transmitted by RS232 to the display. Set to FALSE to prevent the message from being sent to the buffer. For example, if three EDI_Message blocks are used to build a message, only the last has the Complete bit TRUE. Set MessageBuffer to the PLC message buffer string
-		The default string is DB200.Message which is named in the reference project, "EDI_MessageB".Message
ER	Bool	True when the function encounters an error during processing.
ErrorCode	Bool	0 = No error; 1 = Overflow (Max Length = 128 characters)

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 18 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.2 Simple use of the EDI_Message Function Block

On a new network, add a positive signal edge contact -**|P|**-. Then drag the EDI_Message [FC200] block onto the rung. Populate the inputs and outputs like this example:

Network 6: E	DI Message, Simple			
Comment				
%0.0 "EDI_Demo_ TriggerMessage"			C200 Aessage"	
P		EN	ENO	
%M0.0	200 -	DB_Number	ER	 #EDI_ErrorStatus
"EDI_Demo_ TriggerMessageP"	200 -	QB	ErrorCode	 #EDI_ErrorCode
inggenwessager	TRUE -	Clear		
	'^^^BOO^AAA'	String1		
	'0123456789012'	String2		
	'0123456789012' -	String3		
	'^C'	String4		
	TRUE -	Complete		
	DB200.??? "EDI_MessageB". Message —	MessageBuffer		

- a. DBNumber: Datablock DB200
- b. QB: Output byte %QB200
- c. Clear: TRUE to clear the function block buffer and start a new message
- d. String1: ^^B00^AAA includes the MCS protocol items needed to begin a message.
 - And Header required for gateway memory alignment
 - ^B Start of transmission (STX)
 - 00 Address 00
 - ^A Start command
 - A Command: Write to text file
 - A Text filename A
- e. String1, String2: This the text for display on the LED display.
- f. String4: End of transmission (ETX)
- g. MessageBuffer: "EDI_MessageB".Message is the first element of DB200.
- h. ER: FALSE if the message size is not ok.
- i. ErrorCode: 0 = No error; 1 = Overflow (Max Length = 128 characters)

Note: The message can organized as desired, with unused inputs empty ("). For example, this message could be '^^B00^AAA01234567890120123456789012^C" placed into String1, with the same results as the example shown above.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 19 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.3 Advanced use of the function block

The MCS protocol includes many codes used to change colors and display styles. The codes may be manually entered similar to the ones in example 4.2. Because this might become complicated, the reference project also comes with a tag table that contains constants for the MCS protocol. These constants are located in the project tree > [YourProjectName] > [YourPLCName] > PLC Tags > EDI_Display[222], on the tab named "User constants". The list is also located in the files **EDI_PLC tags.xls**, where they are grouped for easier view.

Name	Value	Comment
EDI Header	16.6.61	Header required for Profinet Gateway memory alignment
EDI STX	'^B'	Start of transmission
EDI Address	'00'	Address of sign, always 00
EDI SOH	'^A'	Start of command
	1.646	
EDI_CommandWrite_TextFile	'A'	Command: Write to text file
EDI_CommandWrite_VariableFile	'B'	Command: Write to variable file
EDI CommandWriteRead SpecialFunction	'C'	Command: Write/read to/from special function
EDI_CommandWrite_TextFileWithoutRestart	'D'	Command: Write to text file without restart
EDI_EOT	'^D'	End of text
EDI_ETX	'^C'	End of transmission
EDI_CommandWrite_TextFile_ModeField_BEL	'^G'	Command: Write to text file, command code 'A' data area, Start of mode field (BEL)
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Middle	'M'	Command: Write to text file, command code 'A' data area, Display Position, Middle Line, centered
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Top	т	Command: Write to text file, command code 'A' data area, Display Position, Top Line, all lines used minus one
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Bottom	'B'	Command: Write to text file, command code 'A' data area, Display Position, Bottom Line, bottom begins after last top line
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Fill	'F'	Command: Write to text file, command code 'A' data area, Display Position, Fill All, centered
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Left	r	Command: Write to text file, command code 'A' data area, Display Position, Left, all lines used minus one.
EDI_CommandWrite_TextFile_ModeField_DisplayPosition_Right	'R'	Command: Write to text file, command code 'A' data area, Display Position, Right, all lines used minus one.
EDI_CommandWrite_TextFile_ModeField_ModeCode_Scroll	'S'	Command: Write to text file, command code 'A' data area, Mode Code, Scroll right to left
EDI_CommandWrite_TextFile_ModeField_ModeCode_Hold	'H'	Command: Write to text file, command code 'A' data area, Mode Code, Stationary
EDI CommandWrite_TextFile_ModeField_ModeCode_Flash	Ŧ	Command: Write to text file, command code 'A' data area, Mode Code, Stationary, flashing
EDI_CommandWrite_TextFile_ModeField_ModeCode_SlideUp	'A'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message slide up, replaced by new message
EDI_CommandWrite_TextFile_ModeField_ModeCode_SlideDown	'B'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message slide down, replaced by new message
EDI_CommandWrite_TextFile_ModeField_ModeCode_SlideLeft	'C'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message slide left, replaced by new message
EDI CommandWrite TextFile ModeField ModeCode SlideRight	'D'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message slide right, replaced by new message
EDI_CommandWrite_TextFile_ModeField_ModeCode_RollUp	'a'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message roll up, replaced by new message
EDI_CommandWrite_TextFile_ModeField_ModeCode_RollDown	"b'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message roll down, replaced by new message
EDI CommandWrite TextFile ModeField ModeCode RollLeft	'e'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message roll left, replaced by new message
EDI_CommandWrite_TextFile_ModeField_ModeCode_RollRight	'd'	Command: Write to text file, command code 'A' data area, Mode Code, Previous message roll right, replaced by new message

An simple way to use the constants is to copy the name from the .pdf or .xls and paste into the function block String1-String4 inputs.

Notes: The following example sends this command to the LED display: ^^B00^AAA^ES^H1^O0RedMessage^O1GreenMessage^C

While this command could be directly entered into a single function block, it might be easier to use when broken into pieces, with separate function blocks. The contants are not necessary, but can be used to allow the user to recognize what the program is doing.

Notice the first function block uses the Clear input to start, and the last function block uses the Complete input to finish. All others have inputs Clear and Complete as FALSE.

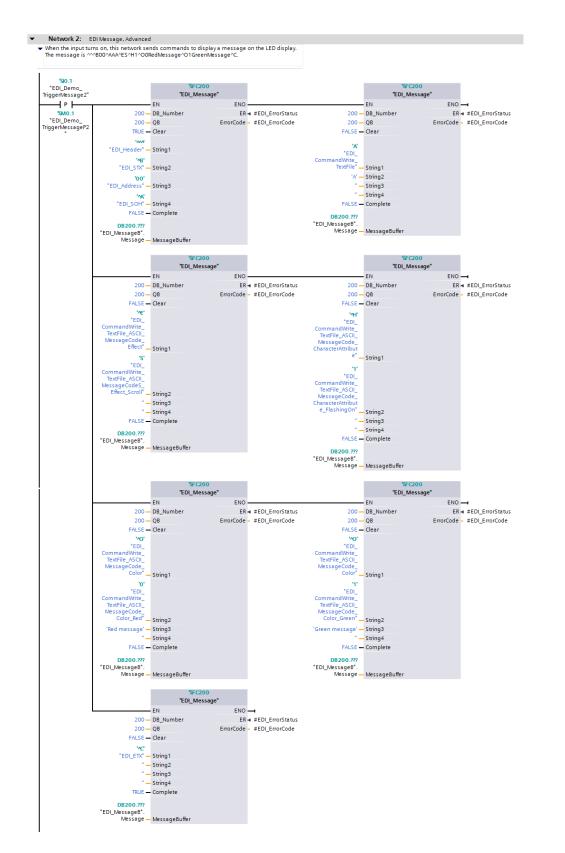
How to Choose between using the contants or manual entry of MCS protocol string:

If your project requires a large amount of interaction with the digital display, it might be better to type the command string. This way, the program size is reduced

If your project only displays simple messages, like fault messages for a machine, it might be better to use the constants. This way the program is easier to understand and troubleshoot.

Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 20 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

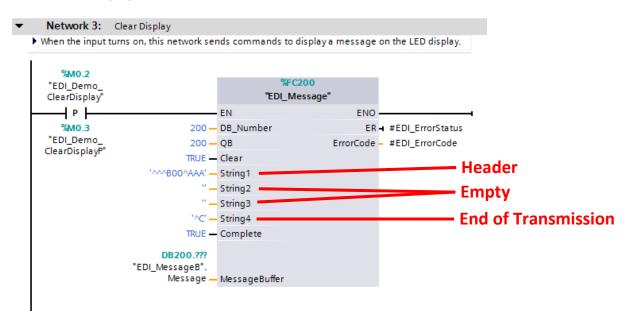
Profinet to EDV111 Series LED Signs – Siemens Function Block Software Manual



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 21 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.4 Example uses of the function block

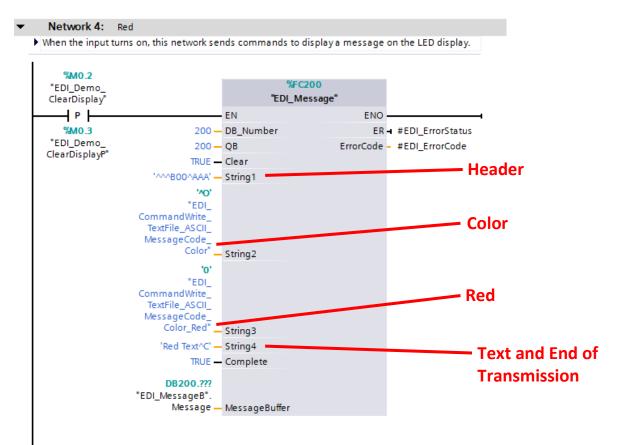
4.4.1 Clear display (^^^B00^AAA^C)



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 22 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

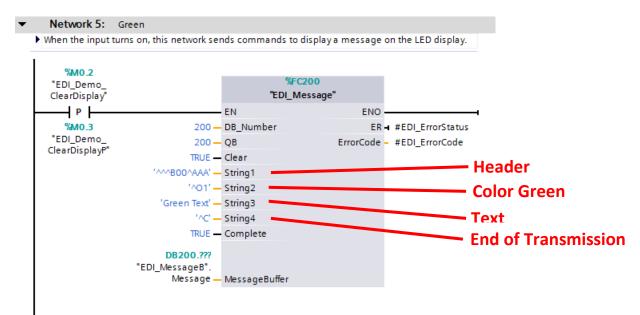
4.4.2 Colors

4.4.2.1 Red (^^^B00^AAA^O0Red Text^C)

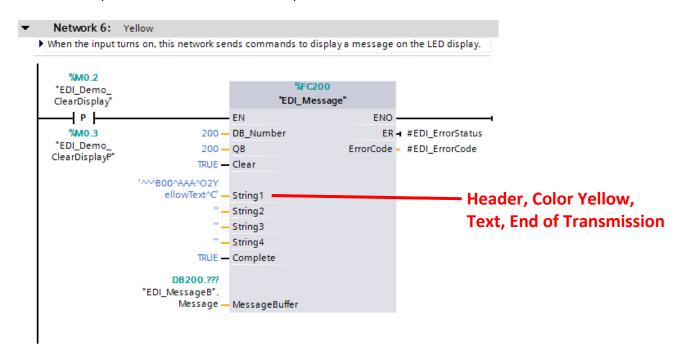


Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 23 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.4.2.2 Green(^^^B00^AAA^O1Green Text^C)

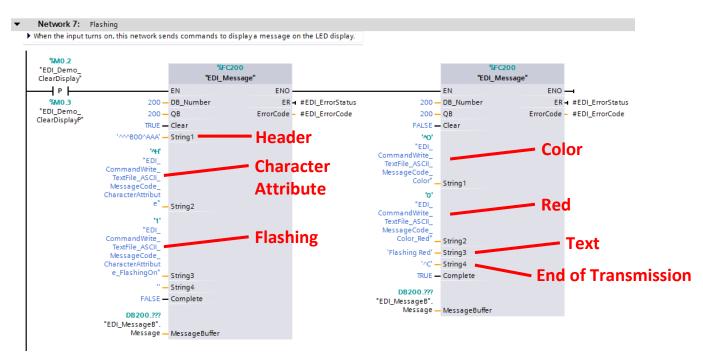


4.4.2.2 Yellow(^^^B00^AAA ^O2Yellow Text^C)



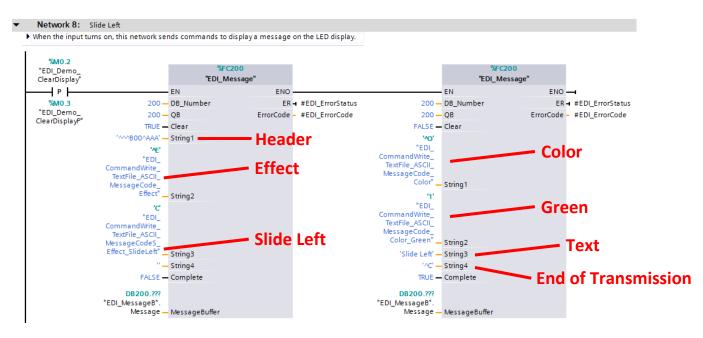
Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 24 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.4.3 Flashing (^^^B00^AAA ^H1^O0Flashing Red^C)



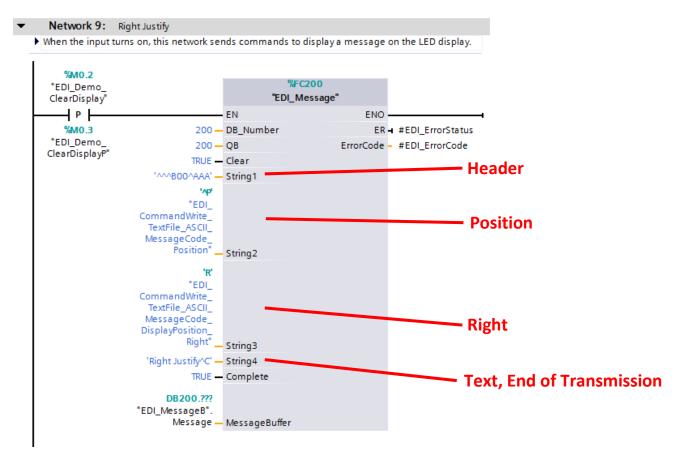
Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 25 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.4.4 Slide Left (^^^B00^AAA ^EC^O1SlideLeft^C)



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 26 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	

4.4.5 Right Justify (^^^B00^AAA ^PRRight Justify^C)



Effective 9/21/2014	Electronic Displays, Inc. EDV111 Series LED Signs	Page 27 of 27
Version 0.1	Siemens Step7 Function Block	
	Software Manual	