

Siemens S7-300 MPI

Supported Series: Siemens S7-300 series PLC Website: <u>http://www.siemens.com/entry/cc/en/</u>

HMI Setting:

Parameters	Recommende	Options	Notes
PLC type	SIEMENS S7-30	0 MPI	
PLC I/F	RS-485 2W		
Baud rate	187.5K	19200,187.5K	
Data bits	8		
Parity	Even		
Stop bits	1		
PLC sta. no.	2	2 ~ 31	

Online simulator	NO	Extend address mode	Yes
Broadcast command	NO		

Device Address:

Bit/Word	Device type	Format	Range	Memo
В	I	DDDDo	0 ~ 40957	Input (I)
В	Q	DDDDo	0 ~ 40957	Output (O)
В	М	DDDDo	0 ~ 40957	Bit Memory
В	DBnBit	FFFFFDDDDo	0 ~ 6553599997	Data Register Bit
В	DBxBit	FFFFFDDDDDo	0 ~ 10700655327	
П	DB1Bit ~		0 055007	Data Dagiatas Dit
Б	DB99Bit	000000	0~000327	Data Register Bit
W	IW	DDDD	0 ~ 4095	Input (I)
W	QW	DDDD	0 ~ 4095	Output (O)
Byte	MB	DDDD	0 ~ 4095	Bit Memory Byte
W	MW	DDDD	0 ~ 4095	Bit Memory
DW	MD	DDDD	0 ~ 4094	
Byte	DBBn	FFFFFDDDD	0 ~ 655359999	Data Register
Byte	DBBx	FFFFFDDDDD	0 ~ 1070065532	
W	DBn	FFFFFDDDD	0 ~ 655359999	Data Register (must be even)

	EK			PLC Connection Guide
Bit/Word	Device type	Format	Range	Memo
W	DBx	FFFFFDDDDD	0 ~ 1070065532	
			0 655250000	Data Register Double Word
Dvv	ווספת	FFFFDDDD	0~000009999	(must be even)
DW	DBDx	FFFFFDDDDD	0 ~ 1070065532	
W	DBn_String	FFFFDDDD	0 ~ 655359999	
W	DBx_String	FFFFFDDDDD	0 ~ 1070065532	
W	DBn_String1	FFFFFDDDD	0 ~ 655359999	
W	DBx_String1	FFFFFDDDDD	0 ~ 1070065532	
DW	DBDn_String	FFFFFDDDD	0 ~ 655359999	
DW	DBDx_String	FFFFDDDDD	0~1070065532	
W	DB1 ~ DB99	DDDDD	0 ~ 65532	Data Register (must be even)

• Double word and floating point value must use DBDn device type.

r

Multi-HMIs-Multi-PLCs Communication Setting:



For SIEMENS S7-300 MPI driver in Multi-HMIs-Multi-PLCs communication, [Max. station no. (MPI network)] parameter must be correctly set. This setting is relevant to the station no. of the devices, as shown, two HMI (station no. 0, 1) and two PLC (station no. 2, 3) are in MPI network, Max. Station No. should be set to 3.





For the effectiveness of communication, users may set PLC device in STEP 7 as shown below. In Properties MPI / Network Settings, set Highest MPI address to the number closest to the actual device station number.

Properties - MPI in General Paramete Address: Highest address: 31 Transmission rate: 1 Subnet: 	terface MPI/DP (R0/S2.1) rs 5	New	×
Properties - MPI	187.5 Kbps	-	
General Network Settings	15 🔽 Change		
Transmission rate:	19.2 Kbps 187.5 Kbps 3.5 Mbps 6 Mbps 12 Mbos		
ОК		Cancel	Help



- HMI sta. no. can not be the same as PLC sta. no.
- Highly recommended that the device station numbers start from 0 sequentially and correctly set [Max. station no. (MPI network)].
- Available for EasyBuilder V4.50 and later.
- X Series does not support multiple-HMI-to-multiple-PLC communication, and supports only 1-HMI-to-1-PLC communication.



How to Import Tag:

SIEMENS STEP 7 program allows building files of user-defined tag (*.dif file and *.AWL file), and import these files in EasyBuilder8000/EasyBuilderPro -> System Parameter Settings. The following describes how to build and import these two types of files.

1. Building *.dif File

a > In "Symbols" create user-defined tag.



b · Click **Export** to export the edited file and click **Save**.

6 8	Symbol Editor - [S7 Program(3) (Symbols) 312\M3\CF	PU 312C]	
9	Symbol Table Edit Insert View Options Window Help		Export ? 🗙
1	Open Close Save	Ctrl+O Ctrl+F4 Ctrl+S	Save in: Desktop
2 3 4	Properties		Mark Folder (2) Carey 706 New Folder (4)
5	Export		☐ EBpro_v450_500
7 8 0	Print Print Preview Page Setup	Ctrl+P	
$\frac{9}{10}$ $\frac{11}{12}$	1 312\M3\CPU 312C\\Symbols 2 CPU315_2DP_PN\SIMATIC 300\CPU 315-2 PN/DP\\Symbols 3 CPU315_2DP_PN\SIMATIC 300(3)\CPU 315-2 PN/DP\\Symbols		File name: PLC_Tag.dift Save Save as type: Data Interchange Format (*.DIF)
13 14	4 CPU315_2DP_PN\SIMATIC 300(2)\CPU 315-2 PN/DP\\Symbols Exit	Alt+F4	



2. Building *.AWF File

a > In **Blocks** create items as shown below:

⊡ 🎒 312	System data	🕞 OB1	🖽 DB1	🖽 DB2	🖪 DB3
🚊 📶 МЗ	DB4	🖽 DB5	🖽 DB6	🕞 DB7	🖽 DB8
🖮 📓 CPU 312C	🖽 DB10	🕞 DB11	🖽 DB14	🖽 DB16	🖽 DB19
🖻 🗊 S7 Program(3)	🕞 DB20	🖽 DB30	🕞 DB32	🕞 DB40	🖽 DB41
🕞 Sources	🖽 DB42	🖽 DB43	🖽 DB44	🕞 DB45	🗊 DB50
Blocks	🗗 DB51	🖽 DB52	🖽 DB53	田 DB55	🗊 DB60
	🖽 DB64	🖽 DB70	🖽 DB80	🗊 DB85	🗊 DB90
	🗊 DB98	🖽 DB99	🖽 DB100	🕞 DB101	🖽 DB110
	🗗 DB111	🖽 DB120			

b • Open LAD/STL, FBD – Programming S7 Blocks, click File -> Generate Source.

🛗 STEP 7	►	🛅 NCM 57 🛛 🔸	KI AD/STI /FBD : Program blocks
m STEP 7-MicroWIN V4.0.6.35	×	Configure SIMATIC Workspace	File View Ontions Help
m TD Keypad Designer V1.0.6.35	×	57 Converting S5 Files	New Ctrl+N
im WinCC flexible 2008	×	🔣 LAD, STL, FBD - Programming S7 Blocks 🔪	Open Ctrl+O
🎜 SIMATIC Manager		Memory Card Parameter Assignment	Generate Source Ctrl+T
S7-1200 Documentation	×	🞇 NetPro - Configuring Networks	1 312\M3\CPU 312C\\DB2-Off
🛅 Fatek PLC		🔀 PID Control Parameter Assignment	2 312\M3\CPU 312C\\block
🛅 BrowserPlus		😸 S7-PDIAG - Configuring Process Diagnostics	3 312\M3\CPU 312C\\test
🛅 ENI Utility		📆 Setting the PG-PC Interface	4 312(M3(CPU 312C((DB11-Off
🛅 WinPcap		III 405-57 Converting TI Files	Exit Alt+F4
📶 Wireshark		II 505-S7 Converting TI Files	

c > Select **Sources** as storage path, specify the file name then click **OK**.

New		
Entry point: Project	View: Component view	▼ C Online 🗭 Offline
Name: 312	Storage path: C:\Program Files\Siemens\Si	ep7\s7prc Browse 🗈 🖽 🏢
→ → 312 → → M3 → → CPU 312C → → S7 Program(3) → → Sources → → Blocks		
	Object name: Object_Ta	ag
N	Object type: STL Sour	ce 🔽
ок		Cancel Help





d > Select the objects to be exported then click **OK**.

Generate source Object_Tag	
Note: Automatic generation of single source: Menu 'Options' > 'Customize' in the 'So	s per block: burces' tab
Path: 312\M3\CPU 312C\S7 Program(3)\Source Blocks Not Selected: □ DB1 ● DB3 ● DB4 ● DB5 ● DB7 ● DB8 ● DB10 ● DB16 ● DB32 ● DB40 ●	ces Blocks Selected: DB2 DB6 DB11 DB20
Name/Family:	Addresses Absolute
 Sort according to program structure Source contains checksum of the blocks 	C Symbolic
ОК	Cancel Help

e • Under **Sources** there will be names of the saved files, select **Export Source** to build *.AWL file.

SIMATIC Manager - [312 C:	Program Files\Siemens	\Step7\s7proj\312]	
🎒 File Edit Insert PLC View Op	tions Window Help		
D 😂 🎛 🛲 👗 🖻 🖻 i		🗰 主 < No Filter >	Export source
I ⊡-∰) 312	Object_Tac Open Object	Ctrl+Alt+O	Look in: 🞯 Desktop 💌 🔶 💼 📸 📰 -
E- CPU 312C	Cut	Ctrl+X	My Documents 🗀 Larry
E Sources	Copy	Ctrl+C	My Computer Diverse Calder (2)
Blocks	Pasce		Carev706
	Delete	Del	EBpro_v450_500
	Insert New Obj	ject 🕨	EBproV500
	PLC	• •	
	Compile	Ctrl+B	
	Export Source.		File name: Object_Tag Same
	Print	hg +	Files of type: Sources (".awl,".gr7,".scl,".inp,".zg,".sdg,".sd Cancel
	Rename	F2	
	Object Properti	ies Alt+Return	
	Special Object	Properties •	



The generated *.dif and *.AWL files can be imported in EasyBuilder8000/EasyBuilderPro **System Parameter Settings**, by clicking **Import Tag**.

Font	E	tended Mer	more	Printer/Backup Server	-	
Device	Model	Gene	and System S	Setting Secu	arity	
evice list :						
4o.	Name	Location	Device type	Interface	UF F	Import Address Tag
ocal HMI	Local HMI	Local	MT6070iH/MT8070	Disable	N/A	
ocal PLC 1	SIEMENS S7-300 MPI	Local	SIEMENS \$7-300 MPI	COM 1 (187.5K,E,8,	1) RS4	Import DIF file
						File name: C:\Documents and Settings\rd\桌面\1\PLC_Tag.dif Browse
						Import AWL file
						File name : CilDonuments and Settings)rd) (Tim) 1) Object, Tag A
						The name : (C. (Documents and Security) (0; (b)(0)(C_10), (c))
						Cancel
				17		

Tag information successfully imported.







Pass-Through Settings:

[Designate client IP]: In Pass-through mode designate the client IP address to connect HMI. The "client" usually refers to Siemens Step 7 application.

Z Designate client IP		
IP address : 1	92 . 168 . 1 . 10	
	ОК	Cancel

[Utility Manager Settings]: Utility manager -> Serial Pass-through Mode: MPI ISOTCP

Serial Pass-through	
Interface (PC <-> HMI)	
Ethernet COM port	
V(z) = 100MR(z) + (RC < SR(0))	
Virtual COM Port (PC <-> PLC)	
СОМЗ	
Install Uninstall	
Settings of Destination HMI	
Mode : MPI ISOTCP	·
IP: 192.168.1.133	
Communication port : 8010 V (Defau	ılt : 8000)
Pass-through port : 102	
PLC connection : COM 1 (LW-9)	902 on HMI))
	Apply
	Exit

The following lists the system registers relevant to Siemens S7-200 PPI and Siemens S7-300 MPI Pass-through feature.

- [LW-10850: disable/enable (0 : disable, 1 : normal, 2 : IP limited) (siemens pass-through)]
- [LW-10851: destination COM port (siemens pass-through)]: Generally refers to the COM port connected with PLC.
- [LW-10852: destination PLC station no. (siemens pass-through)]
- [LW-10853: communication protocol (0 : invalid, 1 : PPI, 2 : MPI) (siemens pass-through)]
- [LW-10854 to LW-10857: IP of connecting client (siemens pass-through)]: Displays current client IP address connected with HMI.
- [LW-10858 to LW-10861: IP of designated client (siemens pass-through)]: If LW-10850 is set to 1, the system registers can be used to designate the client IP connected with HMI.
- [LW-10862: connection status (0 : ready, 1 : client connecting) (siemens pass-through)]
- [LW-10863: execution status (0 : normal, 1 : error) (siemens pass-through)]
- [LW-10864: the last error (siemens pass-through)]

The following table lists the error codes, the description of each code, and the possible reason.

Error Code	Description	Possible Reason
0	Successfully executed	
1	Prohibit client from connecting	HMI is already running pass-through
	НМІ	and won't accept any request from
		other client.
2	Prohibit client from connecting	When LW-10850 is set to 1, the
	НМІ	client IP for connecting HMI is
		different from the IP specified in
		LW-10858 ~ LW-10861.
3	Invalid communication	Invalid setting in LW-10853.
	protocol	
4	Invalid PLC station number	The PLC station number specified in
		LW-10852 does not exist.
5	Delayed communication	PLC connection failure.
6	Busy communication	PLC does not accept pass-through
		request, please confirm PLC
		settings.
7	Invalid pass-through request	Environment setup failure.



Wiring Diagram:

Diagram 1

cMT Series	cMT3151
eMT Series	eMT3070/ eMT3105 / eMT3120 / eMT3150

	НМІ			PLC
	COM1	COM3		RS485
	RS485 2W	RS485 2W		9P D-5
	9P Male	9P Male		Male
Data-	1	6	←	8 Dat
Data+	2	9	↓	3 Data
GND	5	5	↓	5 GN

Diagram 2

cMT Series	cMT-SVR / cMT-G01 / cMT-G02 / cMT-HDM / cMT-FHD
mTV	mTV

	НМІ	
	COM2	COM3
	RS485 2W	RS485 2W
	9P Female	9P Female
Data-	7	4
Data+	6	1
GND	5	5



Diagram 3

MT-iE *MT8070iE / MT6070iE / MT8100iE / MT8121iE / MT8150iE*

MT-XE *MT8121XE / MT8150XE*

	НМІ	
	COM1	COM3
	RS485 2W 9P Male	RS485 2W 9P Male
Data-	1	7
Data+	2	8
GND	5	9

Diagram 4

cMT Series	cMT3071 / cMT3072 / cMT3090 / cMT3103
MT-iE	MT8071iE / MT6071iE / MT8072iE / MT6072iE / MT8073iE /
	MT8101iE / MT8102iE / MT8103iE
MT-XE	MT8090XE / MT8092XE
MT-iP	MT6103iP / MT8102iP

	НМІ	
	COM2	COM3
	RS485 2W	RS485 2W
	9P Male	9P Male
ata-	1	6
Data+	2	9
GND	5	5



Diagram 5

MT-iE	MT8050iE / MT8053iE
MT-iP	MT6051iP / MT8051iP

	НМІ	
	COM1	COM3
	RS485 2W 9P Female	RS485 2W 9P Female
Data-	1	7
Data+	2	8
GND	5	5

Diagram 6

MT-iP

MT6071iP / MT8071iP

НМІ			
	COM2		
	RS485 2W		
	9P Female		
Data-	1	<>	
Data+	2	← →	
GND	5	 ←───→	