

# Siemens S7-1200 (Symbolic Addressing)

# (Ethernet)

Supported Series: Siemens S7-1200 series Ethernet. Website: <u>http://www.siemens.com/entry/cc/en/</u>

### HMI Setting:

Parameters	Recommended	Options	Notes
PLC type	Siemens S7-1200 (Sy	mbolic Addressing)	(Ethernet)
PLC I/F	Ethernet		
Port no.	102		
Rack	0		
CPU slot	1		

On-line simulator	Yes	Multi-HMI connect	TIA Settings *Note
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\*Note:

According to Connection resource / HMI Communication settings

General IO tags System	m constants Texts					
General						
PROFINET interface [X1]	Connection resources					
PROFINET interface (X2)						
Startup						
			Station resource		Module resources	
Cycle		Res	erved	Dynamic	PLC_1 [CPU 1515-2 PN]	
Communication load	Maximum number of resources:		10	98	108	
System and clock memory		Maximum	Configured	Configured	Configured	
<ul> <li>System diagnostics</li> </ul>	PG communication:	4				
Web server	HM communication:	4	0	0	0	
<ul> <li>Display</li> </ul>	\$7 communication:	0		0	0	
User interface languages	Open user communication:	0		0	0	
Time of day	Web communication:	2				
Protection	Other communication:			0	0	
System power supply	Total resources used:		0	0	0	
Configuration control	Available resources:		10	98	108	
Connection resources	And the resources.			20		
Overview of addresses						



### **PLC Setting:**

- 1. In S7-1200 program software create PLC program and tag and then download to PLC.
- 2. Select Go offline, EasyBuilder will connect to PLC and get tag data. In PLC type select "SIEMENS S7-1200 (Ethernet)".

Device Properties	
Name :	Siemens S7-1200 (Ethernet)
	OHMI ⊙PLC
Location :	Local Settings
PLC type :	Siemens \$7-1200 (Ethernet)
PLC I/F :	V.1.80, SIEMENS_S7_1200.so Ethernet
IP :	192.168.1.95, Port=102 Settings Use UDP (User Datagram Protocol )
	PLC default station no. : 2
	OK Cancel

3. Click "Settings...", input PLC IP address.

IP Address Settings	
IP address : 192 . 168 . Port no. : 102	. 0 . 95
Timeout (sec) : 1.0 💌	Turn around delay (ms) : 0
Send ACK delay (ms) : 0	Parameter 1 : 0
Parameter 2 : 0	Parameter 3 : 0
	OK Cancel



- 4. Check the PLC that is not connected to any PC. Click "Get tag info...".
- 5. Supported by firmware V3.X and previous versions. For V4.0 or later, please see <u>How</u> to Connect With S7-1200 Firmware V4.0)

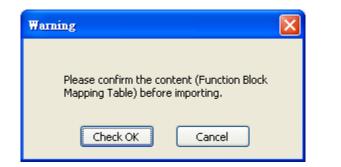
Font		Extended M	emory		Printer/Back	ap Server
Device	Model	Ger	neral	System	.Setting	Security
Device list :						
No.	Name	Location	Device type		Interface	
Local HMI	Local HMI	Local	MT6070iH/MT	8070	Disable	
Local PLC 4	SIEMENS \$7/1200	Local	SIEMENS S7/1	200	Ethernet(IP=19	2.168.1.96, Port
						X
<						>
New			Settings	Get	tag info	>



6. If the software used is a version later than TIA Portal V11 , SP2, a dialog of FunctionBlock directory will be shown, users have to define the mapping from FB to DB in this directory then click "Check OK". The tag information will be gained and a successful message is shown.







Get tag information successfully. Please click [Exit].	Exit
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7. When opening an existing project and get the tag information again, if the PLC software used is TIA Portal V12 and later versions, the DB name must be entered again in order to compile the project.

DB Number	Data Block Name	Add
1	Data_Block_1	Import
		Export
		ОК

8. Added Tag Manager that allows selecting the Siemens S7-1200 PLC tags to be imported.

Tag Manager	×
Find :	
Int_Arr[DB7]         Int_Arr[DB1]         Int_Arr[DB1]         Int_Arr[DB1]         Int_Arr[DB4]         Int_Arr[DB4]         Int_Arr[DB8]         Int_Arr[DB5]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[DB6]         Int_Arr[D0]         Int_Arr[D0]	<
Select all Discard all OK Cance	1



WEINTEK Create an object and click read address "Setting..." 9.

Bit Lamp Object's Properties	×
General Security Shape Label Profile	
Description :	
~ Read address	
PLC name : Local HMI	Setting
Address : LB_0	
Invert signal	<u> </u>

10. In PLC name select S7-1200 then click Tag.

Address	
PLC name : Tag : Data type :	
	OK Cancel

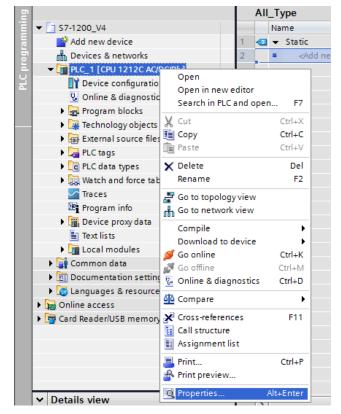
11. Select PLC tag.

Address PLC name : Tag :			
Data type :	Program blocks  DB_in_SubFolder [DB3]  FB_in_SubFolder_DB [DB4]  myDB_1 [DB1]  PLC tags  Area  QArea	Name Start_A_Motor_1 Start_B_Motor Start_A_Motor_2 Start_A_Motor_B Start_B_Motor_2 123	Data type Bool Bool Bool Bool Bool Bool Bool
	Tag: IArea		OK Cancel



### How to Connect With S7-1200 Firmware V4.0

There are certain restrictions in S7-1200 firmware V4.0, therefore, to avoid communication errors, please follow the steps to set up.( EasyBuilder8000 does not support Siemens S7-1200 firmware V4.0 and later versions).



Right click on the PLC program, and then click [Properties].

Select [Protection], and then select [Permit access with PUT/GET communication from remote partner (PLC,HMI,OPC,...].

	Select the access level for the PLC.					
Project information						
Catalog information	Access level		Access		Access permission	
Identification & Maintenance		HMI	Read	Write	Password	
PROFINET interface	<ul> <li>Full access (no protection)</li> </ul>	~	~	~	-	
General	Read access	×	×			
Ethernet addresses	HM access	×				
Time synchronization	No access (complete protection)					
Operating mode						
<ul> <li>Advanced options</li> </ul>						
Hardware identifier						
DI8/DO6	Full access (no protection):					
AI2	TIA Portal users and HMI applications will h No password is required.	ave access to al	functions.			
Web and a second second second second	no passiona is required.					
High speed counters (HSC)						
High speed counters (HSC) Pulse generators (PTO/PWM)						
Pulse generators (PTO/PWM)						
Pulse generators (PTO/PWM) Startup Cycle						
Pulse generators (PTO/PWM) Startup						
Pulse generators (PTO/PWM) Startup Cycle Communication load						
Pulse generators (PTO/PWM) Startup Cycle Communication load System and clock memory Web server						
Pulse generators (PTO/PWM) Startup Cycle Communication load System and clock memory Web server Time of day						
Pulse generators (PTO/PWM) Startup Cycle Communication load System and clock memory	Connection mechanisms					
Pulse generators (PTO/PWM) Startup Cycle Communication load System and clock memory Web server Time of day User interface languages Protection	Connection mechanisms					
Pulse generators (PTO/PWM) Startup Cycle Communication load System and clock memory Web server Time of day User interface languages		t access with PL	T/GET.comm	unication from	1 remote partner (PLC, HM, OPC,)	

The following part introduces how to export S7-1200 PLC Tags and Program Blocks.



## Exporting PLC Tags (I,Q,M tags)

1. Under [PLC tags] select [Show all tags].

Devices							Tags
B 0 0	<b>1</b>	Ť	, ⊒š¢	⇒ 🛃 🕅			
	_		PLC ta				
UInt_Array [DB9]	^			Name	Tag table	Data type	Address
USInt_Array [DB6]		1		100	Bit	- Bool	%IO.0
Word_Array [DB7]		2		101	Bit	Bool	%IO.1
Technology objects		з	-	102	Bit	Bool	%10.2
External source files		4	-00	103	Bit	Bool	%I0.3
→ DLC tags		5		104	Bit	Bool	%I0.4
Show all tags		6		105	Bit	Bool	%10.5
Add new tag table		7	-	106	Bit	Bool	%I0.6
lefault tag table [26] 🛯		8	-	107	Bit	Bool	%10.7
🖳 All_Type [11]		9	-	110	Bit	Bool	%11.0
🖳 Bit [48]		10		111	Bit	Bool	%11.1
🖳 Byte [33]		11		112	Bit	Bool	%11.2
line [18]		12	-	113	Bit	Bool	%11.3
🎚 Tag table_1 [0]		13	-	114	Bit	Bool	%11.4
🖳 Word [33]		14	-	115	Bit	Bool	%11.5
PLC data types		15	-	116	Bit	Bool	%11.6
Watch and force tables	=	16	-	117	Bit	Bool	%11.7
🔄 Traces		17	-	Q00	Bit	Bool	%Q0.0
Program info		18	-	Q01	Bit	Bool	%Q0.1
Device proxy data		19	-	Q02	Bit	Bool	%Q0.2
Text lists		20	-	Q03	Bit	Bool	%Q0.3
Local modules		21	-	Q04	Bit	Bool	%Q0.4
🕨 🙀 Common data		22	-00	Q05	Bit	Bool	%Q0.5
Documentation settings		23	-	Q06	Bit	Bool	%Q0.6
Dotails view	~	24	-	Q07	Bit	Bool	%Q0.7

2. Click **[Export]** to export the tags.

	\$7-12	00_V4 → PLC_1 [CPU 1212C A(
<b>a</b>	i di	ix 🔁 🗄 🖬
	PL(	C tags
~		NaExport
	1	100
	2	a 101

3. Browse for the directory to save the exported file and then click [OK].

Export to Excel		×
Path of export file:		
C:\Users\tony\Desktop\s7-1200\Tag\PLC tags.xlsx		
Elements to be exported:		
💽 Tags		
Constants		
	OK Cancel	
	OK Cancel	



#### Exporting Program Blocks(DB)

 When the database contains Struct data type, please note the following restrictions. Please at least add one data member that doesn't belong to Struct data type into DB, otherwise, the data cannot be imported to EasyBuilder.

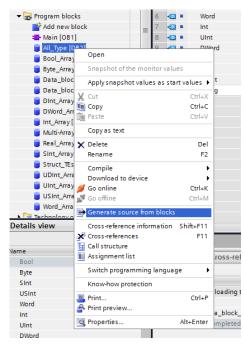
Multidimensional Arrays and Multilayer Structs are not supported.

After building DB, please do the following actions for Struct address:

- (1) Copy the complete Struct data.
- (2) Delete data.
- (3) Add a new row.
- (4) Paste data.

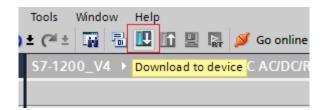
Name	Data type	Start value	Retain	Accessible f	Visible		1	Name	Data type	Sta	art value	Retain	Accessible f.	Ve
1 💶 🖛 Static						\$15	•	<ul> <li>Static</li> </ul>						
test_bool	Bool	false			6	2	•	<ul> <li>test_bool</li> </ul>	Bool	101	18			
i <b>(c) * →</b> 5testc_1	Struct	Cross-re	e interface	Ctrl+) Ctrl+ Ctrl+ De Fi mation Shift+F11		3	.e.	<ul> <li>Static_1</li> </ul>	Struct Step.	2	Cross	ow ne te interface	ormation Shift	Ctrl+ Ctrl+ Ctrl- I
Name Static test_bool	Data type Bool	Start va	lue R	etain Acc	ssibl				Deta type Bool	(als	rt value ie g9 Insert	Retain	Accessible f.	
	Step.3	Add row Cut Copy Paste		Ctrl+X Ctrl+C Ctrl+V Del					Step.4	•	Cut Cut Copy	**	0 0	tri+
		Rename Update inte	rface	12							X Delete Renam			0
		Cross-refere Go to local		tion Shift+F11							Cross-		mation Shift-	E1

2. Right click on DB, click **[Generate source from blocks]**, and then enter the file name to save.





After building and importing PLC Tags and Program Blocks, click [Download to device].



#### Importing PLC Tags and Program Blocks(DB)

1. Launch EasyBuilder and set the IP address.

Device Properties
Name : Siemens S7-1200 (Ethernet)
⊖ HMI
Location : Local v Settings
PLC type : Siemens \$7-1200 (Ethemet)
V.2.40, SIEMENS_S7_1200.e30
PLC I/F : Ethernet v
IP : 192.168.1.98, Port=102 Settings
Use UDP (User Datagram Protocol )
OK Cancel

2. Click [Import Tag...].

Pri	inter/Backup	Server		e-	Mail		Recip	pes
Device	Model	General	Syst	tem Setting	Security	Font		ded Memory
Nevice list :								,
No.	Name	•	Location	Device type	Interface	I/F Pr	rotocol	Station no.
Local HMI	Local	HMI	Local	eMT3070 (800	o	-		0
Local PLC	4 Sieme	ins S7-1	Local	Siemens S7-	1 Ethernet (II	P=1 TCP/	IP	N/A
t								
New	1	Delete	-	Settings		ag Info		ort Tag
roject descrip	ption :							^
6	re can indire	TCP/IP Gate	PLC data vi eway])	a MODBUS TCF	Mapping Table	HML (Add e N	NODBUS 1	TCP/IP Server



3. Select the PLC Tags and Program Blocks to be imported. Please remember to change DB number, and select [Use S7-1200 firmware version 4.0 or later versions]. Click [Import] to import the files. The I, Q, and M addresses will be checked, if an error occurs, the communication will fail. If this happens, please check your communication environment, and try to import again.

\* At least one db file must be imported. If only plc tags cannot be imported successfully.

File name	e : C:\Users\tony\Desktop\s7-1200\Tag\PLC tags.xlsx	Browse
rogram blocks		
DB Number	[Program Blocks] file name	
DB1	C:\Users\tony\Desktop\s7-1200\Tag\DB1.scl	
DB2	C: \Users\tony\Desktop\s7-1200\Tag\DB2.scl	
DB3	C:\Users\tony\Desktop\s7-1200\Tag\DB3.sd	
DB4	C:\Users\tony\Desktop\s7-1200\Tag\DB4.sd	
DB5	C:\Users\tony\Desktop\s7-1200\Tag\DB5.sd	
<		>
16 file(s) sele	ected	Browse
·	2,M addresses with PLC	

4. The "Import status" field will display the result, click [OK].

	Import <sup>-</sup>	Tags				
✔ Use	S7-1200 firmware version 4.0 or later vers	sions				
C tags						
-	: C:\Users\tony\Desktop\s7-1200\Tag\	PLC tags visy	Browse			
The fidine			browsem			
ogram blocks –						
ogram biocks						
DB Number	[Program Blocks] file name		^			
DB1	C:\Users\tony\Desktop\s7-1200\Tag\	DB1.sd				
DB2	C:\Users\tony\Desktop\s7-1200\Tag\	DB2.sd				
DB3	C:\Users\tony\Desktop\s7-1200\Tag\	DB3.sd				
DB4	C:\Users\tony\Desktop\s7-1200\Tag\DB4.scl					
DB5	B5 C:\Users\tony\Desktop\s7-1200\Tag\DB5.scl					
<			>			
10 61-(-)	- t- d					
16 file(s) sele	cted		Browse			
nport status						
·	,M addresses with PLC (Done)		^			
Verifying I,Q	,M addresses with PLC (Done) Iformation successfully. (C:\Users\tony\De	sktop\s7-1200\Taq\PLC tags.xlsx)	^			
Verifying I,Q Import tag ir		sktop\\$7-1200\Tag\PLC tags.xlsx)	^			
Verifying I,Q Import tag ir Import tag ir	formation successfully. (C: \Users\tony\De	=sktop\\$7-1200\Tag\PLC tags.xlsx)	^			
Verifying I,Q Import tag ir Import tag ir Import tag ir	formation successfully. (C:\Users\tony\De formation successfully. (DB1)	2sktop\s7-1200\Tag\PLC tags.xlsx)	^			
Verifying I,Q Import tag ir Import tag ir Import tag ir	formation successfully. (C:\Users\tony\De formation successfully. (DB1) iformation successfully. (DB2)	sktop\s7-1200\Tag\PLC tags.xlsx)	^ ~ ~			
Verifying I,Q Import tag ir Import tag ir Import tag ir Import tag ir	formation successfully. (C:\Users\tony\De formation successfully. (DB1) iformation successfully. (DB2)	esktop\s7-1200\Tag\PLC tags.xlsx)	×			



## Select the tags to be imported and then click [OK]. 5.

Tag Manager	×
Find :	
	~
Select all Discard all OK Cance	
Binary access of byte, word and dword is allowed for I, Q and M area add Multi-dimensional array and index offset are supported for array address. Right-chick on the tags to edit the array limits.	ress.

6. The following message is displayed when the import has succeed.

Import tag information successfully.	Exit

## Support Device Type:

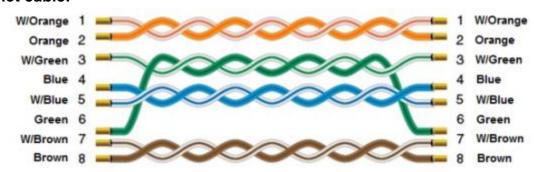
Data type	EasyBuilder data format	Memo
Bool	bit	
Byte	16-bit BCD, Hex, Binary, Unsigned	8-bit
SInt	16-bit BCD, Hex, Binary, Signed	8-bit
USInt	16-bit BCD, Hex, Binary, Unsigned	8-bit
Word	16-bit BCD, Hex, Binary, Unsigned	16-bit
Int	16-bit BCD, Hex, Binary, Signed	16-bit
UInt	16-bit BCD, Hex, Binary, Unsigned	16-bit
DWord	32-bit BCD, Hex, Binary, Unsigned	32-bit
DInt	32-bit BCD, Hex, Binary, Signed	32-bit
Real	32-bit Float	32-bit
UDInt	32-bit BCD, Hex, Binary, Unsigned	32-bit
LInt	64-bit Signed	64-bit
ULInt	64-bit Unsigned	64-bit
LWord	64-bit Unsigned	64-bit
Double	64-bit Float	64-bit
Char	16-bit BCD, Hex, Binary, Unsigned	USInt
CREF		Struct
Date	16-bit BCD, Hex, Binary, Unsigned	UInt
DTL		Read only
ErrorStruct		
IEC_COUNTER		
IEC_DCOUNTER		
IEC_SCOUNTER		
IEC_TIMER		
IEC_UCOUNTER		
IEC_UDCOUNTER		
IEC_USCOUNTER		
NREF		

		PLC Connection Guide
Data type	EasyBuilder data format	Memo
Time	32-bit BCD, Hex, Binary, Unsigned	DWord
Time_Of_Day	32-bit BCD, Hex, Binary, Unsigned	DWord
Array		Bool, Byte, SINT, USInt, Word, Int, UInt, DWord, Dint, Real, UDInt
Struct		Bool, Byte, SINT, USInt, Word, Int, UInt, DWord, Dint, Real, UDInt

**Note1:** EBPro V6.03.02 or later supports 64 bits data type **(cMT Series only)**, but please note that the address limit range is 48 bits in maximum.

**Note2:** Importing data types other than those in the above table may result in failure to communicate.

### Wiring Diagram:



#### **Ethernet cable:**