How to Read/Write I-7000 module for SIMATIC STEP 7 ?

Example : PLC writes data to DO module from I-7550.

<u>1. Architecture</u>



"Follow the below steps to establish the system!"

2. Module Configuration

- 2.1 Searching Principles:
 - a. Search and configure the I/O one by one.

If there are several I/O modules with unknown Net Address, Baud rate, Checksum and Protocol, they have to be searched and configured one by one.

If failed to find the I/O module, it is better to Power on the I/O module with INIT* pin connects to the GND to get the I/O module's initial communication settings.

Initial communication settings of I-7000 are list at the table below.

	I-7000
Address	0
Baudrate	9600
Checksum	Disable
Protocol	DCON protocol

The old style of INIT* needs to use a wire to connect to the GND



The new style of INIT* pin is a dip switch and located at back side



2.2 Search I/O with DCON Utility:

a. Choose the COM port and select the searching parameters.

Ø 8	elect the COb	f Port an	d Baud	l Rate.		×				
)M to search:)M1 💌			Time	Out Sett	ing : IS				
Ba	ud Rate Opti	on								
	321600 □ 57600 □ 4800 □	460800 38400 2400	☐ 23 ☐ 19 ☐ 12	0400 200 :00	✓ 1152 ✓ 960	200 D				
	Select All	Clear	AII	PDSa	SPPDS-70	00				
Ch	Z DCON F In the contract of	Modbus ion isable	RTU) Г	Enal	fodbus AS ble	icii				
- Pa	rity Option:									
	None (N,8,1)		Γ Ev	en (E.)	3,1)					
	None (N,8,2)		— 0a	d (0,8	,1)					
In	Industry Computer RS-485 Port Option RTS_CONTROL_TOGGLE Set_RTS (for Vision Box)									
	Cancel				Dk					

2.3 Configure the I/O modules with DCON Utility:

a. Press 🖻 button to start search.

DCON	UTILITY	YER[519] res	ult of finding	I/O modules							
File COM	Port Searc	h Run Termin	al Language	Help							
	』≝		WIN		Start 🗌	0 E	ind 1 ()	(Addres	ss 0~255)	
module	Addres	s Baudrate:	Checksum	format	Status		Des	cription			
7042D	U[U]	9600	Disable	N,8,1			13*1	DU(DCUN)			
-Searchir	ng Status:-				Boudesta		Devitur		Data Pit	Chan Bit	
COM Port		COM 3	Address 00	[dec] 0 [he	[X] Daudrate	1 9600	Parity:	None	Data Dit: 8	Stop bit:	1

b. "Double click" module to configure com port parameter and press setting button

Configuration	on for 7042D Module V	ersion: B103				×		
District Octo		7	042D					
LSB (CH:0)	Jut	7042D -	> Setting C	DU ommunication J	Parameters OK:	CH:7)		
- Configuration	on Setting:	Setting Step1. Step2. Step3.	Setting Baud Rate, Checksum or Protocol OK!! Please do following steps Step1. Disconnect INIT* Pin from GND Pin. or adjust the Dip Switch to Normal side.(DCON necessary only) Step2. Power off then Power on the module. Step3. Search the module again.					
Address: Baudrate:	2 115200		Funder	C確定				
Checksum Parity Option	Disable	Setting		Set Value Read Value	E	Set Value Read Value Enable WDT First		
-Host Watch	dog Setting							
Timeout	0 (0.1 ~ 25.5 s	ec)	⊏ s	end Host OK	1	Exit		

- c. Disconnect INIT* Pin from GND Pin or adjust the Dip switch to Normal side.
- d. Power off then power on the module.
- e. Search the module again.

1	DCON_U	TILITY	YER[519	result of f	inding I/O 1	nodules							
File	COM Po	art Searc	h Run Ter	minal Lang	age Help								
ť					s s s s s s s s s s s s s s s s s s s	Star	t 0	End	10		(Addres	ss 0~255)	
mo		Addres	s Baudra	te: Chec	ksum form	at Stat	us		Descriptio	n YONU			
(704	<u>+20 j</u>	2[2]	11520	u Disac	ie N,8,	, I			13"DU(DU	UNJ.			
	o robina I	Ptotuor											
C C	OM Port:	Status	COM 3	Address	10 [dec]	A [hex]	Baudrate:	115200 Pa	arity: No	ne D	ata Bit: 8	Stop Bit:	1
		· · · · ·			,								
							_						

3.SIMATIC STEP7 Configuration:

Step 1: Setup the I-7550 module

a. Select I-7550 module

🙀 HW Config - [SIMATIC 300 Station (Configuration) \$7_Pro1]			
💵 Station Edit Insert PLC View Options <u>W</u> indow <u>H</u> elp			- 8 ×
D 🚅 🐂 🖳 🎒 B B. 🚵 🏟 🖪 🖂 💥 N2			
	1		- Elsi
😑 (I) UR	Fr 1	7550	
1 PROFIBUS(1): DP master system (1)	Ema:	1,000	<u>wi</u> w†
2 <u>CPU31</u>	Profile:	Standard	-
		i i	
2.2 D10/00 Click i-7550		Universal mo	dule 🔛
		📕 🛛 System settin	g
4		1 Byte In	
		2 Byte In	=
		4 Byte In	
		5 Byte In	
(5) i-7550		🧧 6 Byte In	
Slot D DB ID Order Number / Designation L &ddmon O &ddmon Comment		7 Byte In	
Siot Drib Oner wanter / Designation P Autress Q Autress Comment		8 Byte In	
		9 Byte In 10 Pute In	
3		11 Byte In	
4		12 Byte In	
		📕 13 Byte In	
		14 Byte In	
8		15 Byte In	
9		10 Byte In	
10		2 Word In	
		📕 3 Word In	12201
		A Mord In	×
12			
15			۳ī
16			
	J		
Press F1 to get Help.			Chg /

b. Add a "System module"

me T.	W Coni	iig - <mark>[SIMAT</mark> I	C 300 Stati	on (Configuration)	S7_Pro1]								
00 <u>S</u> t	tation]	Edit Insert Pl	LC <u>V</u> iew <u>C</u>	<u>D</u> ptions <u>W</u> indow <u>H</u> elp									- 8 ×
	产 🔓	🖬 🗣 🖂	1 B B	📩 🏟 🚯 🗆 🤮	3 N?								
1			11										
-	(0) UR										2550		
1		~		PROFIBIIS(1): DP master	r system (1)					Find:	1550		<u>m</u> † mi
2		CPU31		111011200(1): 21 11000	Y I I I I I I I I I I I I I I I I I I I	ana ana an				Profile:	Standard		-
4 1/2	Z [DP									· 古玉:	7550	
2.2		DII6/DX			(5) i-	7550	double o	lick				Iniversal m	odule.
$\frac{2.3}{3}$	4 1				2 X		uouble c	IICK				System settin	ıg
4					Land		"system	setti	ng			1 Byte In	
Ē							module		~			2 Byte In	
<							modulo	>				3 Byte In 4 Dete In	
									-			4 Dyte III 5 Byte In	
-	(5	i-7550										6 Byte In	
		DRID			[TA1]	0.411			ı I		[7 Byte In	
	2	ODI											
$\frac{1}{2}$	~	2 H H	System settin		0.3		Comment		-			8 Byte In	
	3	7	System settin	ig ettor	03	05	Comment	^				8 Byte In 9 Byte In 10 Data In	
	3	7	System settin > System se	ig etting	03	05	Comment	^				8 Byte In 9 Byte In 10 Byte In 11 Byte In	
4	3	7	System settin > System se	ig effing	03	05	Comment	^				8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In	
4	3.	7	System settin, > System se	ig citog	03	05						8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In	
4 5 6 7	- 1	7 7 32DI	System settin, > System so	ettorz ettorz Astem setting	03	os	Comment					8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In	
4 5 6 7 8	3	7 7 32DI	System settin > System se	etting ystem setting	03	os						8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In	
4 5 6 7 8 9	3 - 1 - 2	32DI 37	System settin > System so Sy	reting yotem setting > System setting	03	03	05					8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In 16 Byte In	
4 5 6 7 8 9 10	3 1 2	32DI 37	System settin > System se Sy	reting yotem setting > System setting	03	as	05					8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 16 Byte In 1 Word In 2 Word In	
4 5 6 7 8 9 10 11	3 	32DI 37	System settin > System settin Sy	reting potem setting > System setting	03	os	05					8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In 16 Byte In 1 Word In 3 Word In	
4 5 6 7 8 9 10 11 12	3 1 2	32DI 37	System settin > System settin Sy	rs etting ystem setting > Sysitem setting	03	03	05					8 Byte In 9 Byte In 10 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In 16 Byte In 1 Word In 3 Word In 4 Morel In	×
4 5 6 7 8 9 10 11 12 13 14	3 - 1 - 2	32DI 37	System settin > System se	etting ystem setting > System setting		03	05					8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In 15 Byte In 16 Byte In 1 Word In 2 Word In 4 Word In	>
4 5 6 7 8 9 10 11 12 13 14 15	3 - 1 - 2	32DI 37	System settin > System se	etting ystem setting > System setting		03	05			<		8 Byte In 9 Byte In 10 Byte In 11 Byte In 12 Byte In 13 Byte In 14 Byte In 15 Byte In 15 Byte In 16 Byte In 1 Word In 3 Word In 3 Word In	<mark>ک</mark> تر
4 5 6 7 8 9 10 11 12 13 14 15 16	<u> </u>	32DI 37	System settin > System se	etting ystem setting > System setting		as	05			<		8 Byte In 9 Byte In 10 Byte In 11 Byte In 13 Byte In 13 Byte In 14 Byte In 15 Byte In 16 Byte In 16 Byte In 2 Word In 3 Word In 4 Morel In	ک تر
4 5 6 7 8 9 10 11 12 13 14 15 16	<u> </u>	32DI 37	System settin > System settin Sy Sy 	etting ystem setting > System setting		03	05			<		8 Byte In 9 Byte In 10 Byte In 11 Byte In 13 Byte In 13 Byte In 14 Byte In 15 Byte In 16 Byte In 1 Word In 3 Word In 4 Mord In	× ₹_s

, ,		,			
HW Config - [SIMATIC 300 Station (Configure	tion) S7_Pro1]				
W Station Edit Insert PLC View Options Window	v <u>H</u> elp				- 8 ×
🗅 😅 🐂 🦉 🐂 🎒 🕒 🖻 🛍 🏙 👔) 🗖 📲 💦				
		~			ㅋㅋㅋ
■ (0) UR			Find: 7	550	at ail
1 PROFIBUS(1):	DP master system (1)				
2 CP031			Profile: Si	tandard	_
2.2 DI16/DX	孟(2) :-7550			2 Byte Out	~
2.4 Count				3 Byte Out	
	1 A A A A A A A A A A A A A A A A A A A			5 Byte Out	
<u>+</u> <u>→</u> <u>→</u>	Tanta	double click		6 Byte Out	
		"16 Byte out		7 Byte Out	
		& 110 Date 1-1		8 Byte Out	
		16 Byte In		10 Byte Out	
		module 🗸		11 Byte Out	
		2		12 Byte Out	_
				13 Byte Out	
(2) 1-7550				14 Byte Out	_
Slot DP ID Order Number / Designation	I Address Q Addres	Comment		16 Byte Out	
1 32DI System setting	03	<u>^</u>		1 Word Out	
3 47 16 Byte Out	6.21			2 Word Out	
4 31 16 Byte In	419	=		4 Word Out	
2				5 Word Out	
6				6 Word Out	
				7 Word Out	
		k 01		9 Word Out	
ID Byte Uut		0		📕 10 Word Out	
1 11 10 10 11	1.10			11 Word Out	
4 Si lib Byte in	419			12 Word Out	~
15					÷≤
10		✓ ✓			
			J		
Press F1 to get Help.					Chg /

c. Add "16 Byte out" module and "16 Byte In" module

Step 2: Setup the parameters of the I-7550

- a. Double click I-7550 icon
- b. Select "Parameter Assignment"

🙀 HW Config - [SIMATIC 300 Station (Configuration) S7_Pro1]		🛛
I Station Edit Insert PLC View Options Window Help		- 8 ×
		Find: 7550 mt mi
PROFIBUS(1): DP master system (1)		
		Profile: Standard
2.2 DIGOX 1. double click	7550	📕 🛛 Universal module 🔼
2.4 Count		— 🚺 System setting
3 I-7550 ICON		1 Byte In
4		2 Byte In
	2. select "Paramet	3 Byte In
19	21 Select T dramer	4 Byte in
	Properties - DP slave ASSIGNMENt"	
	The Description of the Internet of the Interne	
	General Parameter Assignment	
<	Parameters	
	and an enters	
(5) i-7550	Device-specific parameters	
Slot DP ID Order Number / Designation L &ddress	and ate 1152	00 baud
1 32DI System setting 0.3	- parity none	
2 37> System setting	— 🗐 data 8 data	a bit
3 39 8 Byte Out	end char of input data	
4 16DI 2 Byte In 45	 input fixed length data Disab 	de
5	_ ≡ unit of time out value 1 ms	
6	I diagnosis of time out	
7 5		
8		
9		
10		
12		
13		
14		
15		₹.
16	OK	Cancel Help
17		
Proce El to cot Halp	1	
11000 FT BD get Help.		Cng

c. Set common parameters of the GW-7552

Baud rate	Parity	Data	end char of Input fixed		unit of time	diagnosis of	
			input data	length data	out value	time out	
115200	none	8	CR	Disable	1ms	None	

Properties - DP slave	
General Parameter Assignment	
Parameters Station parameters Device-specific parameters data e and char of input data e mit of time out value diagnosis of time out Hex parameter assignment	Value 115200 baud none 8 data bit CR Disable 1 ms None
OK	Cancel Help

Step 3: Download the HW settings into SIMATIC PLC

a. Save and Compile

Dig I	IW Config - [SIMATI	C 300 Station (Config	uration)	S7_Pro1]							
800	Station Edit Insert PI	LC <u>V</u> iew <u>O</u> ptions <u>W</u> i	adow <u>H</u> elp							-	Ξ×
	<u>N</u> ew Open	Ctrl+N Ctrl+O		R ∖?							
5	Open ON <u>L</u> INE						^				크지
ĥ	Close		L					Find:	7550	65	nt mi
	Save): DP master	system (1)				Profile	Standard		-
	Save and Compile	Ctrl+S						Lionic.	Istantuaru		<u> </u>
	Durantin		1	(5) i-	7550					Universal modu	de 🔼
	riopernes			- I 👼 🐧	CT 10					1 Byte In	
	Import		1		DAS'					2 Byte In	
L	Export								🛽	3 Byte In	
	Consistency Check	Ctrl+Alt+K								4 Byte In 5 Date In	=
	Check CiR Compatibili	ity Ctrl+Alt+F	1							5 Byne In 6 Bynte In	_
	During	Chin								7 Byte In	
_	<u>r</u> mn Drint Drawing	Cultr					~		[8 Byte In	
<	Page Setun						>			9 Byte In	
	rage serap									10 Byte In 11 Parts In	
1	1 S7_Pro1\SIMATIC 3	00 Station								12 Byte In	
	Exit	Alt+F4	on	I Address	Q Address	Comment				13 Byte In	
	77	oyanın artınış	-	03	0.5					14 Byte In	
$\frac{4}{3}$	39	> System setume 8 Byte Out			6 13		_			15 Byte In	
4	16DI	2 Byte In		45						10 Byte In 1 Word In	
5										2 Word In	
6							_			3 Word In	
1 /							_			4 Word In	
							_			5 Word In 6 Word In	
1)						_			7 Word In	
1	1									8 Word In	
1	2						_			9 Word In	~
$\frac{1}{1}$	5							<	Ш		>
$\frac{1}{1}$	5										₹.
1	5										
11	7						×				
, Saves	and creates all system date	a in the current station.								C	hg /

b. HW settings into SIMATIC PLC

📴 H W Config - [SIMATIC 300 Station (Configuration) 57_Pro1]										
DO St	ation <u>E</u> dit <u>I</u> nsert	PLC View Options Window Hel	þ						-	а×
] 🗅 🕯	<u>~</u> ₽~ ₽ ₽;; ;	Download Upload	Ctrl+L							
	(0) UR	Download Module Identification Upload Module Identification to PG.					<u>F</u> ind:	7550	Ø	: □ × \$† @↓
<mark>2</mark> تکد	2 DP	<u>F</u> aulty Modules					Profile:	Standard		•
2.2 2.4 3 4 5	2 DII6DX 4 Count	Module Information Operating Mode ClearReset Set Time of Day Monitor/Modify Updatg Firmware	Ctrl+D Ctrl+I	-7550					Universal mode System setting 1 Byte In 2 Byte In 3 Byte In 4 Byte In 5 Byte In 6 Byte In 7 Byte In	ıle 📩
<	1	Save Device Name to Memory Card.	•••			>			8 Byte In 9 Byte In	
	(2) i-7550	PROFIBUS	•						10 Byte In 11 Byte In	
Slot	L DP ID	Save Service Data		Q Address	Comment	1			12 Byte In 13 Byte In	
1	32DI	System setting	03			<u>^</u>			14 Byte In	
$\frac{2}{2}$	37	> System setting		05					15 Byte In	
3	39 16DI	2 Parts In	4 5	013		E			16 Byte In	
5	1001	2 Dyle III	42	-					1 Word In 9 Word In	
6				-					2 Word In 3 Mord In	
7									4 Word In	
8									5 Word In	
9								i	6 Word In	
10								- I	7 Word In	
$\frac{11}{12}$			_	_					8 Word In	
$\frac{12}{12}$				_					9 Word In	~
$\frac{13}{14}$							<	101		>
$\frac{14}{15}$			-	-						- E
16			_							<u> </u>
17						✓				
 		A. 1					D			
roaus t	ne current station into	une ioaa memory of the current module	•							11.

Step 4: Insert a new Organization Block (OB1)

SIMATIC Manager - S7_Pro1							
<u>File E</u> dit Insert PLC <u>V</u> iew Optic	ons <u>W</u> indow <u>H</u> elp						
🗅 😅 🎛 🛲 👗 🖻 🔂 I	🚵 😨 💁 🎍 😳	- 🔠 🕅 🗈	< No Filter >	- 🏹 🔡 🎯	🖷 🖃 🔟 🥀		
🔊 \$7_Pro1 C:\Program Fil	les\Siemens\Step7\s7p	roj\\$7_Pro1					
)						
Cu	at	Ctrl+X					
Co	ру	Ctrl+C					
Pas	ste	Ctil+V					
De	elete	Del					
Ins	sert New Object	•	Organization Block				
PL'	.C	,	Function Block				
Re	ewire		Data Block				
Re	Compare Blocks Reference Data		Data Type				
Ch	neck Block Consistency	4	Variable Table				
Pri	int	•					
Re	ename	F2					
Ob	oject Properties	Alt+Return					
	ectat Object Properties	٢					
Inserts Organization Block at the cursor position.							

Properties - Organization Block								
General - Part 1 General - Part 2 Calls Attributes								
<u>N</u> ame:	OB1							
Symbolic Name:	Cycle Execution							
Symbol <u>C</u> omment:								
Created in <u>L</u> anguage:	LAD							
Project path:								
Storage location of project:	C:\Program Files\Siemens\Step7\s7proj\S7_Pro1							
Determined.	Code Interface							
Last modified:	12/22/2010 04:52:42 PM 12/22/2010 04:52:42 PM 12/22/2010 04:52:42 PM							
C <u>o</u> mment:								
OK	CancelHelp							



Step 5: Edit OB1

	Cont	ents Of: 'Environm	ent\Interface\TEMP'		
	<u>~</u>	Name	Data T y pe	Address	Comment
B OB1_EV_CLASS		END	Bool	20.0	
DB1_SCAN_1	<u> </u> 12	Tri	Int	22.0	
	12	Resp01	Byte	24.0	
DB1 RESERVEN	12	Resp02	Byte	25.0	
🕲 OB1_RESERVED	12	Init	Bool	26.0	
<		Cnt	Int	28.0	

Variables used in the example LD Program:

Network1: Reset Counter(C1) Network2: Reset diagnosis message



Network3:Using #Tri to control QB0, and QB2 is ouput data length

Network 3: QBD add "1"; then PLC will send QB6 ~ QB13 out





Network4: Write command

Network 4 : Write Command

example: send #020033 CR set DOD & DOI & DO4 & DO5 on in module 02



Network5: Read command



Network6: Using T2 trigger T1 If counter (C1) add 1 and Tri will add 1 every 1s. **Network 6**: Timer T1 & T2

Using T2 Trigger Tl



Network7: Counter C1 Network 7: Counter C1

If Counter(Cl) add "l"; then Tri will add "l"



Network8: If Tri is equal to 256 then reset counter (C1).

Network 8 : Compare Tri & 256

If Tri = 256, Cl will reset



Step 6: Download the settings into SIMATIC PLC



Step 7: Make sure the RUN LED of the I-7550 is ON.

