CODESYS V3

Ethernet Tag Driver

(Import User Tag)

V1.4.10.33 or higher

Supported version TOP Design Studio

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Describes connectable devices and network configurations.

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Select a TOP model and an external device.

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4. External device setting Page 9

Describes how to set up communication for external devices.

5. Supported addresses

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Refer to this section to check the data addresses which can communicate with an external device.



1. System configuration

The system configuration of TOP and "CoDeSys Automation Alliance - CODESYS V3 Ethernet Import User Tag" is as follows:

Series	Link I/F	Communication method	System setting	Cable
CODESYS V3 Ethernet (Import User Tag)	-	ТСР	3. TOP communication setting 4. External device setting	Twisted pair cable*Note 1)

*Note 1) Twisted pair cable

- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.

- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ Connectable configuration

• 1:1 connection (one TOP and one external device) connection





2. External device selection

■ Select a TOP model and a port, and then select an external device.

PLC select [Ethernet] Fiter : [AI] Fiter : [AI] FastEcH Co., Ltd. COVA FroSUNG HI TECH DNP FANUC Co., Ltd. BOOSTER Robots and Design CoDeSys V3 Series[Import Liser Tag) CoDeSys V3 Series[Import Liser Tag] Fiter : PLC1 Fiter						
Filter : [AI] Search : @Model @Model Overdor CoDeSys V2 Series FASTECH Co., Ltd. ODVA HYOSUNG HB TECH DNP FANUC Co., Ltd. BOOSTER Robots and Design CoDeSys V3 Series(Import User Tag) CoDeSys V3 Series(Import User Tag) CoDeSys V3 Series(Import User Tag) Robots and Design CoDeSys V3 Series(Import User Tag) Robots and Design CoDeSys V3 Series(Import User Tag) Import Interface : Perpheral Device PLC Setting[CoDeSys V3 Series[Import User Tag)] Alles Name : PIC Setting[CoDeSys V3 Series[Import User Tag)] Comm Manual String Save Mode : Primary Option P 192 @ 192 @ 192 @ 11740 @ Timeout 200 @ meec	PLC select [E	thernet]				
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Ethernet Protocol TCP Port 11740 Send Wait 0 msec	elect Device PLC Setting[COD Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option	eSys V3 Serie : PLC1 : Ethernet : CODESYS V3 : First LH HL CY and ~ TimeOut Condition	s(Import Us	er Tag)] Bind IP : Auto	V Next	Comm Manual
Port 11740 Timeout 300 Send Wait 0 msec	elect Device PLC Setting[COD Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP	ESys V3 Serie: PLC1 Ethernet CODESYS V3 First LH HL CY TimeOut Condition 192 115 15	s(Import Us	er Tag)] Bind IP : Auto	• Next	Comm Manual
Timeout 300 msec Send Wait 0 msec	elect Device PLC Setting[COD Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol	ESys V3 Serie: PLC1 Ethernet: CODESYS V3 First LH HL CY NND TimeOut Condition 192 16 TCP V	s(Import Us	Back Back Image 1 Image	V Next	Comm Manual
Send Walt 0 💽 msec	elect Device PLC Setting[COD Alias Name Interface Protocol String Save Mode USe Redunctan Operate Condition : Primary Option IP Ethernet Protocol Port	eSys V3 Serie : PLC1 : Ethernet : CODESYS V3 : First LH HL CY MND : Condition 192 : 16 TCP : 11740 :	s(Import Us	er Tag)] Bind IP : Auto	Next	Comm Manual
	elect Device PLC Setting[CODA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Primary Option IP Ethernet Protocol Port Timeout	eSys V3 Serie : PLC1 : Ethernet : CODESYS V3 : First LH HL CY TimeOut 102 (C) 11740 (C) 300 (C)	s(Import Us	er Tag)] Bind IP : Auto	V Next	Comm Manual
	elect Device PLC Setting[COD. Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait	eSys V3 Serie: : PLC1 : Ethernet : CODESYS V3 : First LH HL Cy TimeOut 192 : 16 TCP \ 11740 : 300 : 0 : 0 :	s(Import Us	cond)	V Next	Comm Manual
	elect Device PLC Setting[COD. Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait	ESys V3 Serie: : PLC1 : Ethernet : CODESYS V3 : First LH HL CY AND ↓ TimeOut Condition 192 € 16 TCP ↓ 11740 € 300 € 0 €	s(Import Us	er Tag)] Bind IP : Auto	V Next	Comm Manual
	elect Device PLC Setting[COD Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait	ESys V3 Serie: : [PLC1 : Ethernet : CODESYS V3 : First LH HL CY NND ✓ 1 TimeOut Condition 192 () [16 TCP ✓ 11740 () 300 () 0 () 0 ()	s(Import Us	Cond)	V Next	Comm Manual

Sett	ings		Contents		
ТОР	Model	Check the display and process	Check the display and process of TOP to select the touch model.		
External device	Vendor	Select the vendor of the extern Select "CoDeSys Automation A	al device to be connected to TC Iliance".	DP.	
	PLC	Select the external device to be	e connected to the TOP.		
		Model	Interface	Protocol	
		CoDeSys V3 Series (Import User Tag)	Ethernet	CODESYS V3	
		Please check the system config connect is a model whose syste	guration in Chapter 1 to see if em can be configured.	the external device you want to	



3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

- $\blacksquare [Project] \rightarrow [Property] \rightarrow [TOP Setting] \rightarrow [Use HMI Setup] \rightarrow [HMI Setup Check] \rightarrow [Edit] \rightarrow [System] \rightarrow [Ethernet]$
 - Set the TOP communication interface in TOP Design Studio.



Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.1.71	192.168.1.70	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.1.1	192.168.1.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

X The above settings are examples set by the company. It must be set up to suit user environment.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



(2) Communication option setting

- [Project > Project Property > PLC Setting > ETHERNET > "PLC1 : CoDeSys V3 Series"]
 - Set the options of the CoDeSys V3 Series communication driver in TOP Design Studio.

Project Option	Х
Change HMI[H] Keine Add PLC [A]	Delete PLC[D]
 TOP Setting TOP Setting Option Module Setting FieldBus (0) RFID (0) COM1 (0) COM2 (0) COM3 (0) Ethernet (1) Wireless (0) USBDevice (0) PLC1: CoDeSys V3 Series Wireless (0) PLC1: CoDeSys V3 Series Wireless (0) PLC1: CoDeSys V3 Series Wireless (0) PLC1: CoDeSys V3 Series PLC1: CoDeSys V3 Series PLC1: CoDeSys V3 Series PLC3: Condition:	Series(Import User Tag)] t Series(Import Address Comm Manual H Change S S S S S S S S S
< >>	
	Apply Close

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Choose "CODESYS V3".	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next command request.	



3.2. Communication setting in TOP

* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and <u>drag</u> it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

■ [Main Screen > Control Panel > Ethernet]

	Ethelhar	
n 🔇 System	Port Ethernet Port : ETH1 + 0 •	Detion
	Link Speed : Auto	-1.0
	MAC Address : 00:15:1D:00:00:00 IP Address : 192.168.1.71	Sound
· ۱	Gateway : 192.168.1.1	(((-
Ethernet	DNS (1) : DNS (2) :	Wi-Fi
en t	Ethernet	
Diagnostic M	Cable Status : ETH1 Not connecte Bridge Mode : Use Bridge	d Analysis
[System]	Check duplicate Apply Cancel	Close

Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.1.71	192.168.1.70	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

X The above settings are examples set by the company. It must be set up to suit user environment.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

(2) Communication option setting



■ [Main Screen > Control Panel > PLC]

		PLC	×
Run VIC Viewer Screen Shot Screen Shot Screen Shot Screen Shot Screen Shot Screen Shot	Drvier(ETH) Interface Protocol Bind IP IP Ethernet Proto Port TimeOut (ms) SendWait (ms)	PLC1(CoDeSys V3 Series(Import Ethernet	t User Tag •
[System]	Diagnostic	Ping Test	Apply Cancel
Toprx - Toprx0800s		A 2021	-08-31 05:12:24 PM

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Choose "CODESYS V3".	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next command request.	



3.3 Communication diagnostics

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
- Check if the ETH port settings you want to use in [Control Panel > Ethernet] are the same as those of the external device.
- Diagnosis of whether the port communication is normal or not
- Touch "Communication diagnostics" in [Control Panel > PLC].

- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

ОК	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the cable, TOP, and external device setting status. (Reference: Communication diagnostics sheet)

Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Check		Remarks	
System	How to connect the system		OK	NG	1 Cystem configuration	
configuration	Connection cable name		OK	NG	1. System configuration	
ТОР	Version information		OK	NG		
	Port in use		OK	NG		
	Driver name		OK	NG		
	Other detailed settings		OK	NG		
	Relative prefix	Project setting	OK	NG	2. External device selection	
		Communication diagnostics	ОК	NG	3. Communication setting	
	Ethernet port setting	IP Address	OK	NG		
		Subnet Mask	OK	NG		
		Gateway	OK	NG		
External device	ernal device CPU name Communication port name (module name)		OK	NG		
			OK	NG		
	Protocol (mode)	ОК	NG			
	Setup Prefix		OK	NG	4 External device setting	
	Other detailed settings		OK	NG	4. External device setting	
	Ethernet port setting	IP Address	OK	NG		
		Subnet Mask	OK	NG		
		Gateway	OK	NG		
	Check address range		ОК	NG	<u>5. Supported addresses</u> (For details, please refer to the PLC vendor's manual.)	



4. External device setting

Set as below using "CoDeSys V3.5". For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not use duplicate IP addresses over the same network.

1. Please create a project.

2. In device list, add "Symbol configuration".

Devices	★ д	×		Add Symbol configuration
Untitled7 Untitled7 Device (CODESYS Device (CODESYS Device)	i Control Win V3)	•		Remote access symbol configuration.
	Cut Copy Paste Delete Properties Add Object		Alarm configuration	Name: Symbol configuration Include Comments in XML Support OPC UA Features
	Add Folder Git Object Edit Object With Edit Object With	 ◇ ◇	Application DUT Global Variable List Network Variable List (Sender) Persistent Variables POU POU Redundancy Configuration	
			Symbol configuration Trace Trend recording manager Unit conversion Visualization Visualization Manager	Add Cancel

3. Select PLC_RPG and when tag information is shown, build a project..

[build] -> [Generate Code]

Changed symbol configuration wil	be transferred with	the next down	load or online	e change	
Symbols	Access Rights	Maximal	Attribute	Туре	1
🖲 📄 Constants					
🕸 📄 📄 IoConfig_Globals					
PLC_PRG					
V TEST_BOOL		-		BOOL	
-👿 🔷 TEST_BYTE		-		BYTE	
-V 🔷 TEST_DINT		-		DINT	
V TEST_DWORD	50			DWORD	
-🔽 🔷 TEST_INT	**			INT	
V TEST_REAL	***			REAL	
-V 🔷 TEST_SINT	540	-		SINT	
-🔽 🔷 TEST_STRING				STRING(29)	
V TEST_UDINT				UDINT	
V TEST_UINT	-	-		UINT	
- 🔽 🔷 TEST_USINT	-	-		USINT	
- 📝 🔷 TEST_WORD	50			WORD	
-🔽 🛷 a_bool	-			ARRAY [355] OF BOOL	
🚽 🛷 add_var1	540	-		REAL	
🛛 📝 🧇 b_bool	50			BOOL	
– 🔽 🛷 c_int		-		INT	
📝 🛷 d_int		-		INT	
- 🔽 🛷 e_int		-		INT	
-🔽 🔷 f_word				ARRAY [099, 099, 01] OF WORD	
📝 🛷 g_int	50			ARRAY [100149] OF INT	
🛛 📝 🧳 h_real	5	-		REAL	
-👿 < i_real				ARRAY [099] OF REAL	
— 📝 🗇 j_int	**	-		UDINT	
🛛 📝 🧳 s_string		-		STRING(80)	



4. Create a *.xml file in the project folder.

DEMO.Device.Application.ab0ac3b4-a470-4ded-9878-420cd2bd770d.bootinfo	2018-07-26 오전 10:25	BOOTINFO 파일	1,131KB
DEMO.Device.Application.ab0ac3b4-a470-4ded-9878-420cd2bd770d.bootinfo_guids	2018-07-26 오전 10:25	BOOTINFO_GUID	1KB
DEMO.Device.Application.ab0ac3b4-a470-4ded-9878-420cd2bd770d.compileinfo	2018-07-26 오전 10:25	COMPILEINFO 파일	1,131KB
DEMO.Device.Application.xml	2018-07-26 오전 10:25	XML 문서	5KB
DEMO.Device.CK.xml	2018-06-15 오후 4:50	XML 문서	4KB
DEMO.project	2018-07-26 오전 10:35	CODESYS project	127KB

- 3. 'CodeSys V3 Address Import' will be activated by clicking the "Import Address" button.
- At this point, when you select the file after clicking the "Import" button, the global variable list information created by "CODESYS

V3.5"	appears.
-------	----------

📧 CodeSys V3 주소 가져오기		- 0 x
가져오기[]]	키워드 :	검색[5]
	데이터 타입 : All 🗸	
선택 / 선택 해제[1] 에러 데이터 삭제[1]	삭제[D] 주소 검사[]	
이름	데이터 타입 설명	^
CK.CK_PRG.TEST_BYTE	BYTE	
CK.CK_PRG.TEST_BOOL	BOOL	
Application.PLC_PRGTEST.e_int	INT	
Application PLC_PRGTEST.c_int	INI INT	
Application.PLC PRGTEST.b bool	BOOL	
Application.PLC_PRGTEST.a_bool	BOOL[015]	
Application.PLC_PRG.s_string	STRING(80)	
Application.PLC_PRG.j_int	UDINT	
Application.PLC_PRG.i_real	REAL[099]	
Application.PLC_PRG.n_real	KEAL WORDIG 300]	_
Application.PLC_PRG.g int	INT[100149]	
Application.PLC_PRG.e_int	INT	
Application.PLC_PRG.d_int	INT	
Application.PLC_PRG.c_int	INT	
Application.PLC_PRG.b_bool	BOOL	
Application.PLC_PRG.add_var1	REAL BOOL[3:55]	
Application.PLC_PRG.TEST_WORD	WORD	
Application.PLC_PRG.TEST_USINT	USINT	-
Application.PLC_PRG.TEST_UINT	UINT	-
Application.PLC_PRG.TEST_UDINT	UDINT	
Application.PLC_PRG.TEST_STRING	STRING(29)	
Application PLC_PRG.TEST_SINT	DEAL	
Application.PLC_PRG.TEST_INT	INT	
Application.PLC_PRG.TEST_DWORD	DWORD	
Application.PLC_PRG.TEST_DINT	DINT	
Application.PLC_PRG.TEST_BYTE	BYTE	
Application.PLC_PRG.TEST_BOOL	BOOL	•
		•
선제 개수: 50 검색 개수:		
		닫기

4. Click the 'Close' button to apply and make it a global variable in TOP Design Studio.



5. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

TAG : User Setup Tag Name Tag Specification					
Device Type		Bit Address	Word Address	32bit	Remarks
POOL	SINGLE	TAG.0 – TAG		1.711	*1)*2)
BOOL	ARRAY[1]	TAG[0] – TAG[x-1]	-	L/H	
BYTE	SINGLE	TAG.0 – TAG.7	TAG		*1)*2)*3)
SINT	ARRAY[1]	TAG[0].0 – TAG[x-1].7	TAG[0] – TAG[x-1]	L/H	
USINT	ARRAY[1]	TAG[0].0 - TAG[x-1].15	TAG[0] – TAG[x-1]		
INT	SINGLE	TAG.0 – TAG.15	TAG		*1)*2)
UINT				L/H	
WORD	ARRAY[1]	IAG[0].0 - IAG[X-1].15	IAG[U] – IAG[X-1]		
DINT	SINGLE		TAG		*1)*2)
UDINT		$TAGIOI O = TAGIY_11 31$	TAGIO1 - TAGIN 11		
DWORD	ARRAT[1]				
DEAL	SINGLE		TAG		*1)*2)*4)
REAL	ARRAY[1]	-	TAG[0] – TAG[x-1]		
LREAL	SINGLE	-	TAG		*1)*4)
TIME					
DATE			71.0		+4)
TIME_OF_DAY	SINGLE	-	IAG		*1)
DATE_AND_TIME					
STRING	SINGLE	TAG.0 - TAG.x-1	TAG		*1)

*1) TAG: Maximum number of characters in tag name is 255, including section characters and property numbers. When ARRAY script is used, the maximum no. of characters is 54.

The number of elements in the ARRAY is included in the controller tag information from an arrangement of 0 to [Element-1] of the array element.

- ARRAY[1]: EX) ARRAY[65535](INT) Element number 65535
- ARRAY[2]: EX) ARRAY[232767](BOOL) Element number 65534
- ARRAY[3] : EX) ARRAY[1116383](DINT) Element number 65532

*3) In PLC, BYTE, SINT, and USINT types are 8-bit units, but the TOP series is based on 16-bit units, so be careful when writing data. E.g.) low byte – Write (O) , High byte – Write (X)

*4) REAL(32Bit) LREAL(64Bit) are real-type data types.

*5) STRING is 81Byte.

LINT, LWORD, ULINT, LTIME, WSTIRN are not supported data types.