User Manual

iR-COP

This guide walks through important information for iR-COP

V1.00

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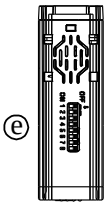
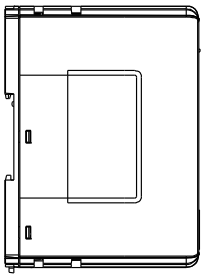
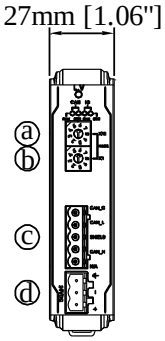
1. Product Overview



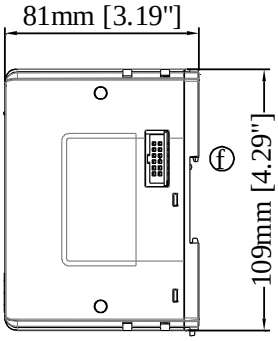
Top View



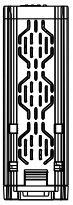
Side View



Front View



Side View



Bottom View

a	Node ID rotary switch x10	*e*	Baud Rate DIP Switch
b	Node ID rotary switch x1	*f*	Expansion Connector
c	CAN bus Connector		
d	Power Connector		

2. Specifications

Communication Interface Specifications							
Expansion I/O Module	No. of Bus Terminals	Depends on Power Consumption					
	Digital Input Point	Max. 512					
	Digital Output Point	Max. 512					
	Analog Input Channel	Max. 64					
	Analog Output Channel	Max. 64					
Indicators	CAN RUN (Green)	CANopen Status Indicator					
	CAN ERR (Red)	CANopan Error Indicator					
	L.V (Red)	Low Voltage Status Indicator					
	IO RUN (Green)	Module Status Indicator					
	IO ERR (Red)	Module Error Indicator					
Data Transfer Rate	1M	800k	500k	250k	125k	100k	50k
Length of the Cable	20m	50m	100m	250m	500m	600m	1,000m
Number of PDOs (CANopen)	8 Transmit PDOs / 8 Receive PDOs						
Process Data Operating Modes	synchronous, event-driven ,event timer, polling						
Number of SDOs Available	1 Standard SDOs						
Bus Connection	1 x open style connector, 5-pole, plug included						
Additional CANopen Features	life/node guarding, heartbeat, emergency object, variables mapping, store/restore, output error mode.						
General Specification							
Power	Power Supply	24 VDC (-15%/+20%)					
	Power Dissipation	Nominal 24VDC@ 100mA					
	Current for Internal Bus	Max 5VDC, 2A					
	Current Consumption	170mA					
	Electrical Isolation	Network to Logic : Isolation Logic to Field power : Isolation					
	Back-up Fuse	≤ 1.6A					
Specification	PCB Coating	Yes					
	Enclosure	Plastic					
	Dimensions WxHxD	27 x 109 x 81 mm					
	Weight	Approx. 0.15 kg					
	Mount	35mm DIN rail mounting					
Environment	Protection Structure	IP20					
	Storage Temperature	-20° ~ 70°C (-4° ~ 158°F)					
	Operating Temperature	0° ~ 55°C (32° ~ 131°F)					
	Relative Humidity	10% ~ 90% (non-condensing)					
	Vibration Resistance	Conforms to EN 60068-2-6 / EN 60068-2-27					
Connection	Cross-section	0.5 mm² ... 2.5 mm², stranded, solid wire, AWG 26-12					
Certification	EMC Immunity	Conforms to EN 55032: 2012+AC: 2013, Class A EN 61000-6-4: 2007+A1:2011 EN 55024: 2010+A1: 2015					

3. LED Insicators

3.1 L.V LED

L.V LED state	Description
OFF	24V power normal
Blinking	Detect 24V power
ON	24V power error

3.2 IO RUN/ERR LED

RUN LED	ERR LED	Description
OFF	OFF	Power off or no power
Blinking	OFF	IO initiating
Blinking	ON	IO initiation error
ON	OFF	IO working
ON	Blinking	IO module alarm
ON	ON	IO communication fault

3.3 CAN-RUN LED

NO	CAN-RUN LED	State	Description
1	ON	OPERATIONAL	The device is in the OPERATIONAL state.
2	Blinking	PRE_OPERATIONAL	The device is in the PRE_OPERATIONAL state.
3	Single flash	STOPPED	The device is in the STOPPED state.

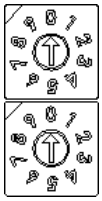
3.4 CAN-ERR LED

NO	CAN-ERR LED	State	Description
1	ON	CAN Bus off	The CAN Bus controller is off.
2	Triple flash	SYNC error	The SYNC message has not been received within the configured communication cycle period time out (see Object Dictionary Entry 0x1006).
3	Double flash	Error control event	A guard event (NMT-Slave or NMT-master) or a heartbeat event (Heartbeat consumer) has Occurred.
4	Single flash	Warning limit reached	At least one of the error counters of the CAN Bus controller has reached or exceeded the warning level (too many error frames).
5	Blinking	Invalid configuration	General configuration error.
6	OFF	No error	The Device is in working condition.

4. Configuration

4.1 Node Setting

The node ID is set by Rotary Switches, range from 1 to 99 (ID 0 is not allowed).

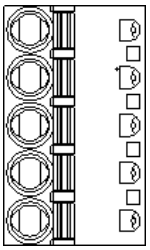


Setting	Description
0	Invalid Node ID
1~99	Valid Node ID

4.2 Baud Rate Setting (DIP Switch)

SW4	SW3	SW2	SW1	Baud Rate
0	0	0	0	Auto rate
0	0	0	1	1Mbps
0	0	1	0	800Kbps
0	0	1	1	500Kbps
0	1	0	0	250Kbps
0	1	0	1	125Kbps
0	1	1	0	100Kbps
0	1	1	1	50Kbps
SW5-7	Reserved			
SW8	CAN Bus 120Ω Terminator			

4.3 CAN Bus Connect



PIN#	Name
1	CAN_G
2	CAN_L
3	SHIELD
4	CAN_H
5	N/A

5. CANOpen Features

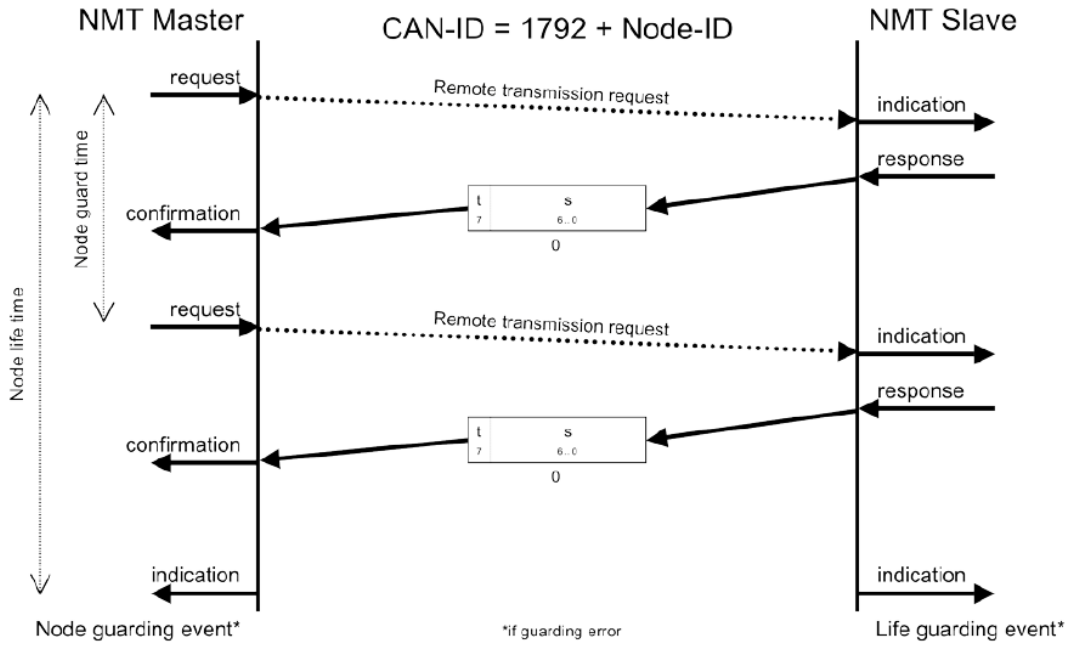
- 8 transmit PDOs
- 8 receive PDOs
- 1 standard SDO (server)
- 1 emergency object
- 1 synchronization object (SYNC, without time stamp)
- guarding
- heartbeat (Producer/ Consumer)
- NMT objects

6. Communication Error Control

6.1 Introduction

Node Guarding protocol and Heartbeat protocol can be used to detect device failures on a CANopen network, please use one of these two protocols at a time.

6.2 Node Guarding Protocol



With Node Guarding, a certain network node (NMT-master) sends a remote transmit request to the other nodes (NMT-slave) in the network one after the other (polling) at defined intervals (Node Guard Time). The NMT-slaves respond to the request by transmitting a data telegram with its current communication state: Pre-operation, Operation, Stopped, within a certain time (Node Life Time). The format of the telegram is as below:

Bit7	Bit6~Bit0
Toggle bit.	4: Stopped 5: Operational 127: Pre-operational

Node Life Time is calculated by multiplying two parameters: Guard Time and Life Time Factor.

Node Life Time = Life Time Factor x Guard Time (ms)

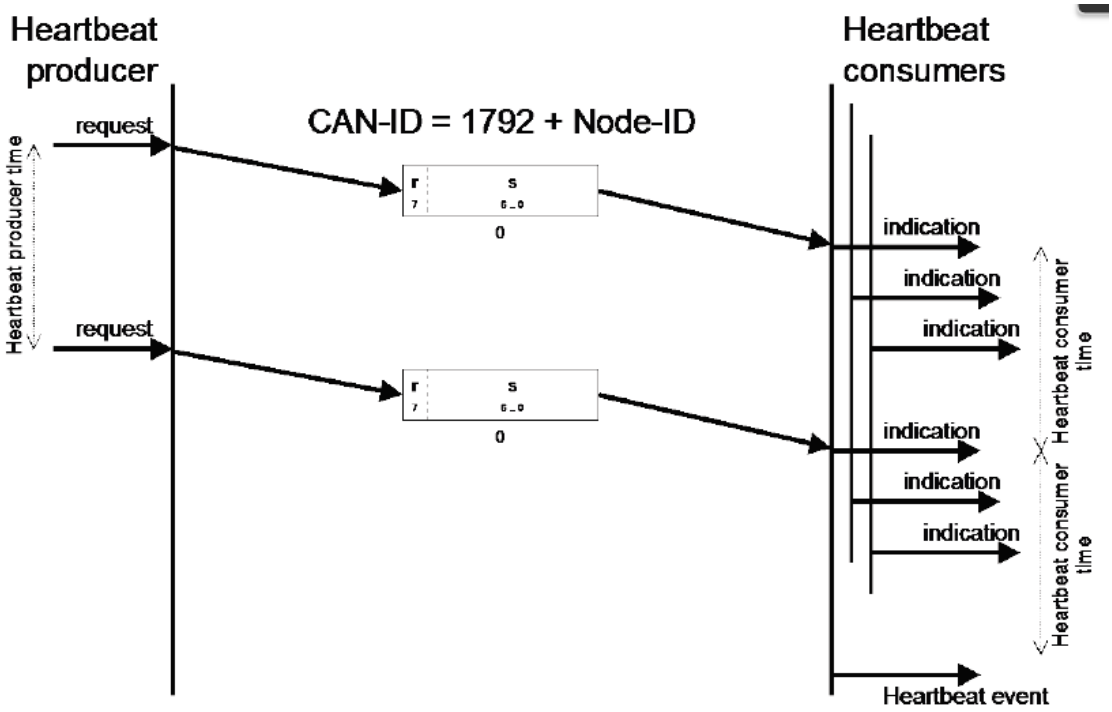
Guard Time				
Index	Sub Index	Data Type	Default Value	Description
100C	00	UNSIGNED16	0000h	0:Disable

Life Time Factor				
Index	Sub Index	Data Type	Default Value	Description
100D	00	UNSIGNED8	00h	0:Disable

The NMT-slaves also monitor whether they have received a request from the NMT-master within “Node Life Time”. If the request was absent for longer than the life time, the NMT-slaves assume that the NMT-master has failed and indicates this as a “Life Guard Event” to the host controller.

6.3 Heartbeat Protocol

Heartbeat protocol is an error control service that does not require remote frames. According to the heartbeat principle, a Heartbeat Producer automatically transmits its communication state at regular intervals to the Heartbeat Consumers, as an evidence of its communication ability. The Heartbeat Consumer Time describes the maximum time within which the arrival of a heartbeat message is expected by a Heartbeat Consumer. Absence of the heartbeat message for longer than Heartbeat Consumer Time will be indicated by the Heartbeat Consumer as a Heartbeat Event to the host controller.



Producer Heartbeat Time				
Index	Sub Index	Data Type	Default Value	Description
1017	00	UNSIGNED16	00h	0:Disable (unit:ms)

Consumer Heartbeat Time				
Index	Sub Index	Data Type	Default Value	Description
1016	00	UNSIGNED32	00h	---

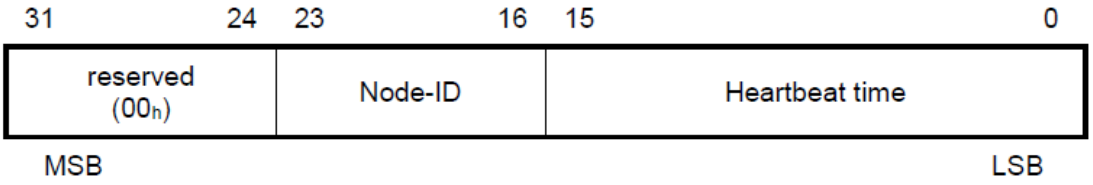


Figure 62: Structure of Consumer heartbeat time

- Node ID: The heartbeat mechanism is disabled when the ID is 0 or larger than 127.
- Heartbeat time unit: ms

Please note that Consumer Heartbeat Time should be longer than Producer Heartbeat time.

6.4 Error Behavior

When a Life Guarding Event or Heartbeat Event occurs:

The state can be configured via the object dictionary entry (Error Behavior Object).

Error Behavior Object		
Index	Sub Index	Description
1029	01	0 ：pre-operation 1 ：no state change 2 ：stopped

Digital Output can be configured via **Error Mode** and **Error Value Digital Output**.

Analog Output can be configured via **Analog Mode** and **Analog Value Digital Output**.

If Error Mode is enabled when an event occurs, the output value will be given in Error Value.

If Error Mode is disabled when an event occurs, the output value remains the same.

Index 6206：Error mode digital output 8-bit			
Sub Index	Description		Default
00	Highest sub-index supported		
01	Error mode output 01h to 08h	0：output value remains same	0XFF
02	Error mode output 09h to 10h		0xFF

03-FE	Error mode output 11h to 7F0h	1：output value is given in 0D6207	0xFF

Index 6207：Error value digital output 8-bit		
Sub Index	Description	Default
00	Highest sub-index supported	
01	Error Value output 01h to 08h	0X00
02	Error Value output 09h to 10h	0X00
03-FE	Error Value output 11h to 7F0h	0X00

Index 6443：Analog output error mode			
Sub Index	Description		Default
00	Highest sub-index supported		
01	Error mode analog output 01h	0：actual value rest 1：output value is given in 0D6444 others = reserved	0X01
02	Error mode analog output 02h		0X01
03-FE	Error mode analog output 03-FEh		0X01

Index 6444：Analog output error value integer		
Sub Index	Description	Default
00	Highest sub-index supported	
01	Analog output 01h	0X0000 000h
02	Analog output 01h	0X0000 000h
03-FE	Analog output 03h-FEh	0X0000 000h

7. Object Dictionary

Object Area	Index range (hex)
Communication Profile Area	1000-1FFF
Manufacturer Specific Profile Area	2000-5FFF
Standardised Device Profile Area	6000-9FFF

7.1 Communication Profile Area

Index	Sub Index	Description	Type	ro/ rw	Default
1000	00	Device type	UNSIGNED32	ro	---
1001	00	Error register	UNSIGNED8	ro	0
1002	00	Manufacturer status register	UNSIGNED32	ro	0
	01	Module alarm code	UNSIGNED32	ro	0
	02	Module disconnected code	UNSIGNED32	ro	0
	03	iBus initialization error code	UNSIGNED32	ro	0
1003	00	Predefined error field (no. of sub-index)	UNSIGNED32	rw	0
	01	Emergency error code (newest)	UNSIGNED32	ro	0
	02-3F	Emergency error code	UNSIGNED32	ro	0
	40	Emergency error code (latest)	UNSIGNED32	ro	0
1005	00	SYNC COB-ID message	UNSIGNED32	ro	00000080h
1008	00	Manufacturer device name	STRING	ro	‘iR-COP’
1009	00	Manufacturer hardware version	STRING	ro	‘1.00.0’
100A	00	Manufacturer software version	STRING	ro	‘1.00.0’
100C	00	Guard time	UNSIGNED16	rw	0
100D	00	Life time factor	UNSIGNED8	rw	0
1014	00	COB-ID EMCY	UNSIGNED32	rw	80h + Node-ID
1015	00	Inhibit time EMCY	UNSIGNED16	rw	0
1016	00	Number of sub-index	UNSIGNED8	ro	0
	01	Consumer heartbeat time	UNSIGNED32	rw	0
1017	00	Producer heartbeat time	UNSIGNED16	rw	0
1018		**Identity object**			
	00	Number of sub-index	UNSIGNED8	ro	04
	01	Vendor-ID	UNSIGNED32	ro	0000044Eh
	02	Product code	UNSIGNED32	ro	00000701h
	03	Revision number	UNSIGNED32	ro	---
	04	Serial number	UNSIGNED32	ro	---
1027	00	Number of connected modules	UNSIGNED8	ro	01h – 10h
	01-10	Module 1-16 of Device code	UNSIGNED16	ro	----
1029		**Error behavior object**			
	00	Number of sub-index	UNSIGNED8	ro	01
	01	Communication error	UNSIGNED8	rw	0

7.1.1 【1000】Device Type

Additional information		General information
Specific functionality	I/O functionality	Device profile number
31 24	23 16	15 0
MSB		LSB

Specific functionality: Remains 0 since iR-COP model does not have specific functionality.

General information: 0x191 according to document DS-401

I/O functionality:

When bit 16 is 1: Digital input channel exists.

When bit 17 is 1: Digital output channel exists.

When bit 18 is 1: Analog input channel exists.

When bit 19 is 1: Analog output channel exists.

Bit 20 to 23 reserved: Value is 1.

7.1.2 【1001】Error Register

Please find OD1003 for more information on error registers.

Bit	Meaning
0	Generic error
1	Current error
2	Voltage error
3	Temperature error
4	Communication error
5	Pertains to the device profile
6	Reserved(0)
7	Manufacturer specific

7.1.3 【1002】Manufacturer Status Register

Bit	Description
0	Low power alarm
1	Hardware error
2	Reserved
3	Heartbeat event
4	Guard event

5	CAN in error passive mode
6	CAN overrun
7	Module lost connection
8	Module alarm
9	iBus initialization fault
10	Number of iBus exceeds 16
11	Power consumption exceeded at iBus system

Sub Index 01: Module alarm

Bit0 is 1 means that the alarm is triggered by the first module, and Bit2 is 1 means that the alarm is triggered by the second module, and so on.

Sub Index 02: Module lost connection

Bit0 is 1 means that the first module has lost its connection, and Bit2 is 1 means that the second module has lost its connection, and so on.

Sub Index 03: iBus initialization error

Sub Index 01: Error bit (Error Code)

7.1.4 【1003】Predefined Error Field

When an error occurs, Emergency Object will be generated and recorded in Predefined Error Field, providing an Error History.

Sub Index 01 and more: Number of error records

Setting index 0 to 0 will erase the field, and index 0 can only be set to 0.

Setting index 0 to values other than 0 will make SDO reply abort 0609 and 0030h.

Bit0~15 describe Error Code while Bit16~31 provide additional information.

Byte:

MSB LSB

Additional information	Error code

Emergency Error Codes:

Error Code (hex)	Meaning
00xx	Error Reset or No Error
10xx	Generic Error
20xx	Current
21xx	Current, device input side
22xx	Current inside the device
23xx	Current, device output side

30xx	Voltage
31xx	Mains Voltage
32xx	Voltage inside the device
33xx	Output Voltage
40xx	Temperature
41xx	Ambient Temperature
42xx	Device Temperature
50xx	Device Hardware
60xx	Device Software
61xx	Internal Software
62xx	User Software
63xx	Data Set
70xx	Additional Modules
80xx	Monitoring
81xx	Communication
8110	CAN Overrun (Objects lost)
8120	CAN in Error Passive Mode
8130	Life Guard Error or Heartbeat Error
8140	Recovered from bus off
8150	Transmit COB-ID collision
82xx	Protocol Error
8210	PDO not processed due to length error
8220	PDO length exceeded
90xx	External Error
F0xx	Additional Functions
FFxx	Device Specific

iR-COP Error Registers:

Error Register	Predefined Error Field	Description
0x01	3100h	Low power alarm
0x01	5000	Hardware error
0x10	8100	CAN Bus off (Reserved)
0x10	8130h	Heartbeat event
0x10	8130h	Guard event
0x10	8120h	CAN in error passive mode

0x10	8110h	CAN overrun
0x80	7000h	Module lost connection
0x80	7001h	Module alarm
0x80	7002h	iBus initialization fault
0x80	7003h	Number of iBus exceeds 16
0x80	7004h	Power consumption exceeded at iBus system

7.1.5 【1005】SYNC COB-ID Message

The COB-ID used for the SUNC message.

Bit0~10: SYNC COB-ID

Bit11~31: iR-COP is 0

7.1.6 【1008】Manufacturer Device Name

Contains the device name as a string: iR-COP

7.1.7 【1009】Manufacturer Hardware Version

Contains the device hardware version as a string: 1.00.0

7.1.8 【100A】Manufacturer Software Version

Contains the device software version as a string: 1.00.0

7.1.9 【100C】Guard Time & 0x100D: Life Time Factor

Guard Time and Life Time Factor are used in Node Guarding Protocol.

Setting 100C to 0 will disable guarding function.

Life Time = Life Time Factor * Guard Time (ms)

(Please find more details in Node Guarding Protocol in this manual.)

7.1.10 【1010】Store Parameters

This object shall control the saving of parameters in non-volatile memory.

VALUE DEFINITION

- Sub Index 01: refers to all parameters that may be stored on the CANopen device.
- Sub Index 02: refers to communication related parameters (index from 1000_h to $1FFF_h$).
- Sub Index 03 refers to application related parameters (index from 6000_h to $9FFF_h$).

MSB			LSB
e	v	a	s
65_h	76_h	61_h	73_h

Storage write access signature

7.1.11 【1011】Restore Default Parameters

With this object the default values of parameters according to the communication profile, device profile, and application profile are restored.

Sub Index 01: refers to all parameters that may be restored

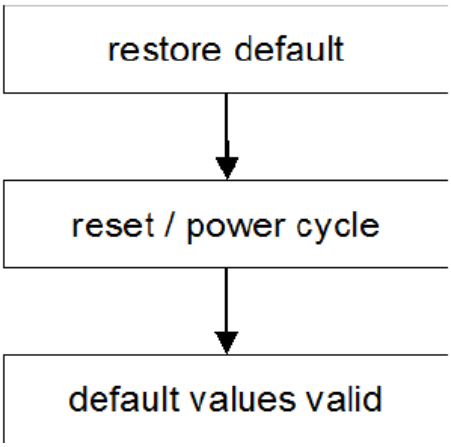
Sub Index 02: refers to communication related parameters (Index from 1000_h to $1FFF_h$).

Sub Index 03: refers to application related parameters (Index from 6000_h to $9FFF_h$).

MSB			LSB
d	a	o	l
64_h	61_h	$6F_h$	$6C_h$

Restore default write access signature

The default values shall be set valid after the CANopen device is reset (NMT service reset node for sub-index from 01h to 7Fh, NMT service reset communication for sub-index 02h) or power cycled.



Communication Parameters (1000h~1FFFh):

Index	Sub-index	Description	Type	Default
100C	00	Guard time	UNSIGNED16	0
100D	00	Life time factor	UNSIGNED8	0
1014	00	EMCY COB-ID	UNSIGNED32	80h + Node-ID
1015	00	EMCY inhibit time	UNSIGNED16	0
1016	01	Consumer heartbeat time	UNSIGNED32	0
1017	00	Producer heartbeat time	UNSIGNED16	0
1029	01	Communication error	UNSIGNED8	0
1400	01	COB-ID used by **RPDO1**	UNSIGNED32	200h + Node-ID
	02	Transmission type of RPDO1	UNSIGNED8	FFh

1401	01	COB-ID used by **RPDO2**	UNSIGNED32	300h + Node-ID
	02	Transmission type of RPDO2	UNSIGNED8	FFh
1402	01	COB-ID used by **RPDO3**	UNSIGNED32	400h + Node-ID
	02	Transmission type of **RPDO3**	UNSIGNED8	FFh
1403	01	COB-ID used by **RPDO4**	UNSIGNED32	500h + Node-ID
	02	Transmission type of RPDO4	UNSIGNED8	FFh
1404-1407	01	COB-ID used by **RPDO5-8**	UNSIGNED32	8000000
	02	Transmission type of RPDO5-8	UNSIGNED8	FFh
1800	01	COB-ID used by TPDO1	UNSIGNED32	180h + Node-ID
	02	Transmission type of **TPDO1**	UNSIGNED8	FFh
	03	Inhibit time of TPDO1	UNSIGNED16	0
	05	Event timer of TPDO1	UNSIGNED16	0
1801	01	COB-ID used by TPDO2	UNSIGNED32	280h + Node-ID
	02	Transmission type of **TPDO2**	UNSIGNED8	FFh
	03	Inhibit time of TPDO2	UNSIGNED16	0
	05	Event timer of TPDO2	UNSIGNED16	0
1802	01	COB-ID used by TPDO3	UNSIGNED32	380h + Node-ID
	02	Transmission type of **TPDO3**	UNSIGNED8	FFh
	03	Inhibit time of TPDO3	UNSIGNED16	0
	05	Event timer of TPDO3	UNSIGNED16	0
1803	01	COB-ID used by TPDO4	UNSIGNED32	480h + Node-ID
	02	Transmission type of **TPDO4**	UNSIGNED8	FFh
	03	Inhibit time of TPDO4	UNSIGNED16	0
	05	Event timer of TPDO4	UNSIGNED16	0
1804-7	01	COB-ID used by **TPDO5-8**	UNSIGNED32	280h + Node-ID
	02	Transmission type of TPDO5-8	UNSIGNED8	FFh
	03	Inhibit time of TPDO5-8	UNSIGNED16	0
	05	Event timer of TPDO5-8	UNSIGNED16	0
1600	00	Number of mapped application objects in **RPDO1**	UNSIGNED8	08h
	01h	1st application object	UNSIGNED32	6200 01 08h
	02h	2st application object	UNSIGNED32	6200 02 08h
	03h	3st application object	UNSIGNED32	6200 03 08h
	04h	4st application object	UNSIGNED32	6200 04 08h
	05h	5st application object	UNSIGNED32	6200 05 08h

	06h	6st application object	UNSIGNED32	6200 06 08h
	07h	7st application object	UNSIGNED32	6200 07 08h
	08h	8st application object	UNSIGNED32	6200 08 08h
1601	00	Number of mapped application objects in **RPDO2**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 01 10h
	02h	2st application object	UNSIGNED32	6411 02 10h
	03h	3st application object	UNSIGNED32	6411 03 10h
	04h	4st application object	UNSIGNED32	6411 04 10h
1602	00	Number of mapped application objects in **RPDO3**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 05 10h
	02h	2st application object	UNSIGNED32	6411 06 10h
	03h	3st application object	UNSIGNED32	6411 07 10h
	04h	4st application object	UNSIGNED32	6411 08 10h
1603	00	Number of mapped application objects in **RPDO4**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 09 10h
	02h	2st application object	UNSIGNED32	6411 0A 10h
	03h	3st application object	UNSIGNED32	6411 0B 10h
	04h	4st application object	UNSIGNED32	6411 0C 10h
1604	00	Number of mapped application objects in **RPDO5**	UNSIGNED8	08h
	01h	1st application object	UNSIGNED32	6200 09 08h
	02h	2st application object	UNSIGNED32	6200 0A 08h
	03h	3st application object	UNSIGNED32	6200 0B 08h
	04h	4st application object	UNSIGNED32	6200 0C 08h
	05h	5st application object	UNSIGNED32	6200 0D 08h
	06h	6st application object	UNSIGNED32	6200 0E 08h
	07h	7st application object	UNSIGNED32	6200 0F 08h
	08h	8st application object	UNSIGNED32	6200 10 08h
1605	00	Number of mapped application objects in **RPDO6**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 0D 10h
	02h	2st application object	UNSIGNED32	6411 0E 10h
	03h	3st application object	UNSIGNED32	6411 0F 10h

	04h	4st application object	UNSIGNED32	6411 10 10h
1606	00	Number of mapped application objects in **RPDO7**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 11 10h
	02h	2st application object	UNSIGNED32	6411 12 10h
	03h	3st application object	UNSIGNED32	6411 13 10h
	04h	4st application object	UNSIGNED32	6411 14 10h
1607	00	Number of mapped application objects in **RPDO8**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6411 15 10h
	02h	2st application object	UNSIGNED32	6411 16 10h
	03h	3st application object	UNSIGNED32	6411 17 10h
	04h	4st application object	UNSIGNED32	6411 18 10h
1A00	00	Number of mapped application objects in **TPDO1**	UNSIGNED8	08h
	01h	1st application object	UNSIGNED32	6000 01 08h
	02h	2st application object	UNSIGNED32	6000 02 08h
	03h	3st application object	UNSIGNED32	6000 03 08h
	04h	4st application object	UNSIGNED32	6000 04 08h
	05h	5st application object	UNSIGNED32	6000 05 08h
	06h	6st application object	UNSIGNED32	6000 06 08h
	07h	7st application object	UNSIGNED32	6000 07 08h
	08h	8st application object	UNSIGNED32	6000 08 08h
1A01	00	Number of mapped application objects in **TPDO2**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6401 01 10h
	02h	2st application object	UNSIGNED32	6401 02 10h
	03h	3st application object	UNSIGNED32	6401 03 10h
	04h	4st application object	UNSIGNED32	6401 04 10h
1A02	00	Number of mapped application objects in **TPDO3**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6401 05 10h
	02h	2st application object	UNSIGNED32	6401 06 10h
	03h	3st application object	UNSIGNED32	6401 07 10h
	04h	4st application object	UNSIGNED32	6401 08 10h
1A03	00	Number of mapped application	UNSIGNED8	04h

		objects in **TPDO4**		
	01h	1st application object	UNSIGNED32	6401 09 10h
	02h	2st application object	UNSIGNED32	6401 0A 10h
	03h	3st application object	UNSIGNED32	6401 0B 10h
	04h	4st application object	UNSIGNED32	6401 0C 10h
1A04	00	Number of mapped application objects in **TPDO5**	UNSIGNED8	08h
	01h	1st application object	UNSIGNED32	6000 09 08h
	02h	2st application object	UNSIGNED32	6000 0A 08h
	03h	3st application object	UNSIGNED32	6000 0B 08h
	04h	4st application object	UNSIGNED32	6000 0C 08h
	05h	5st application object	UNSIGNED32	6000 0D 08h
	06h	6st application object	UNSIGNED32	6000 0E 08h
	07h	7st application object	UNSIGNED32	6000 0F 08h
	08h	8st application object	UNSIGNED32	6000 10 08h
1A05	00	Number of mapped application objects in **TPDO6**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6401 0D 10h
	02h	2st application object	UNSIGNED32	6401 0E 10h
	03h	3st application object	UNSIGNED32	6401 0F 10h
	04h	4st application object	UNSIGNED32	6401 10 10h
1A06	00	Number of mapped application objects in **TPDO7**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6401 11 10h
	02h	2st application object	UNSIGNED32	6401 12 10h
	03h	3st application object	UNSIGNED32	6401 13 10h
	04h	4st application object	UNSIGNED32	6401 14 10h
1A07	00	Number of mapped application objects in **TPDO8**	UNSIGNED8	04h
	01h	1st application object	UNSIGNED32	6401 15 10h
	02h	2st application object	UNSIGNED32	6401 16 10h
	03h	3st application object	UNSIGNED32	6401 17 10h
	04h	4st application object	UNSIGNED32	6401 18 10h

Application Parameters (6000h~9FFFh):

Index	Sub-index	Description	Type	Default

6206	01-40	Error mode digital output 8-bit (DO 1~512)	UNSIGNED8	0xFF
6207	01-40	Error value digital output 8-bit(DO 1~512)	UNSIGNED8	0x00
6443	01-40	Error mode analog output (AO 1~64 channel)	UNSIGNED8	0x01
6444	01-40	Analog output error value integer (AO 1~64 channel)	INTEGER32	0000 0000h

7.1.12 【1014】COB-ID EMCY

According to DS301, before setting COB-ID for EMCY, Bit31 should be set to 1 (Invalid), otherwise COB-ID cannot be set.

Bit31	Bit30 Bit11	Bit10 Bit0
0/1 (valid/invalid)	Reserved(always 0)	COB-ID

7.1.13 【1015】Inhibit Time EMCY

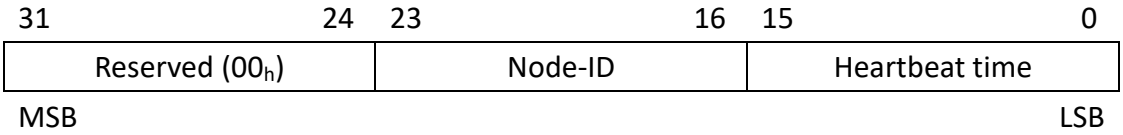
The interval between two EMCY messages must be longer than the Inhibit Time (unit: 100μs). 0 means disabling this function.

7.1.14 【1016】Consumer Heartbeat Time

Consumer Heartbeat Time specifies the interval at which the node receives heartbeat messages in milliseconds (ms). If Heartbeat Time is 0 or Node-ID equals to 0 / greater than 127, no heartbeat message is sent.

Word index 00h: Number of word index

Word index 01h: Consumer heartbeat time



7.1.15 【1017】Producer Heartbeat Time

Producer Heartbeat Time specifies the interval at which the node sends heartbeat messages (0x700+Node-ID) in milliseconds (ms). By default this object is set to 0 which means no heartbeat message is sent.

7.1.16 【1029】Error Behavior Object

When the following communication errors occur:

- CAN Bus-OFF
- Life Guarding Event
- Heartbeat Event

This object can be used to give the following commands:

Value	Description
00	Change to NMT state Pre-operational. (If currently in NMT state Operational)
01	No change of the NMT state.
02	Change to NMT state Stopped.

7.2 PDO Communication Parameter

7.2.1 RxPDO Communication Parameter

Index	Sub-index	Description	Type	ro/rw	Default
1400	00	Number of word index in **RPDO1**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO1	UNSIGNED32	rw	200h + Node-ID
	02	Transmission type of RPDO1	UNSIGNED8	ro	FFh
1401	00	Number of word index in **RPDO2**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO2	UNSIGNED32	rw	300h + Node-ID
	02	Transmission type of RPDO2	UNSIGNED8	ro	FFh
1402	00	Number of word index in **RPDO3**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO3	UNSIGNED32	rw	400h + Node-ID
	02	Transmission type of RPDO3	UNSIGNED8	ro	FFh
1403	00	Number of word index in **RPDO4**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO4	UNSIGNED32	rw	500h + Node-ID
	02	Transmission type of RPDO4	UNSIGNED8	ro	FFh
1404	00	Number of word index in **RPDO5**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO5	UNSIGNED32	rw	8000000
	02	Transmission type of RPDO5	UNSIGNED8	ro	FFh
1405	00	Number of word index in **RPDO6**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO6	UNSIGNED32	rw	8000000
	02	Transmission type of RPDO6	UNSIGNED8	ro	FFh
1406	00	Number of word index in **RPDO7**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO7	UNSIGNED32	rw	8000000
	02	Transmission type of RPDO7	UNSIGNED8	ro	FFh
1407	00	Number of word index in **RPDO8**	UNSIGNED8	ro	02h
	01	COB-ID used by RPDO8	UNSIGNED32	rw	8000000

	02	Transmission type of RPDO8	UNSIGNED8	ro	FFh

- Word index 0x01: COB-ID used by RPDO

  Transmission of RxPDO is only possible in NMT state Operational. As shown below, setting Bit31 to 1 disables the function. Each Node-ID supports four RxPDO, to use more than four, please find available Node-ID.

Bit31	Bit30 Bit11	Bit10 Bit0
0/1 (valid/invalid)	Reserved(always 0)	COB-ID

- Word index 0x02: Transmission Type of RPDO

  00~F0: synchronous, 0xFE/0xFF: event driven

Value	Description
00_h	synchronous
:::::	:::::
$F0_h$	synchronous
$F1_h$	reserved
:::::	:::::
FD_h	reserved
FE_h	event-driven (manufacturer-specific)
FF_h	event-driven (device profile and application profile specific)

7.2.2 TxPDO Communication Parameter

Index	Sub-index	Description	Type	ro/rw	Default
1800	00	Number of word index in **TPDO1**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO1	UNSIGNED32	rw	180h + Node-ID
	02	Transmission type of TPDO1	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO1	UNSIGNED16	rw	0
	05	Event timer of TPDO1	UNSIGNED16	rw	0
1801	00	Number of word index in **TPDO2**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO2	UNSIGNED32	rw	280h + Node-ID
	02	Transmission type of TPDO2	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO2	UNSIGNED16	rw	0
	05	Event timer of TPDO2	UNSIGNED16	rw	0
1802	00	Number of word index in **TPDO3**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO3	UNSIGNED32	rw	380h + Node-ID
	02	Transmission type of TPDO3	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO3	UNSIGNED16	rw	0
	05	Event timer of TPDO3	UNSIGNED16	rw	0

1803	00	Number of word index in **TPDO4**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO4	UNSIGNED32	rw	480h + Node-ID
	02	Transmission type of TPDO4	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO4	UNSIGNED16	rw	0
	05	Event timer of TPDO4	UNSIGNED16	rw	0
1804	00	Number of word index in **TPDO5**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO5	UNSIGNED32	rw	8000000
	02	Transmission type of TPDO5	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO5	UNSIGNED16	rw	0
	05	Event timer of TPDO5	UNSIGNED16	rw	0
1805	00	Number of word index in **TPDO6**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO6	UNSIGNED32	rw	8000000
	02	Transmission type of TPDO6	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO6	UNSIGNED16	rw	0
	05	Event timer of TPDO6	UNSIGNED16	rw	0
1806	00	Number of word index in **TPDO7**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO7	UNSIGNED32	rw	8000000
	02	Transmission type of TPDO7	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO7	UNSIGNED16	rw	0
	05	Event timer of TPDO7	UNSIGNED16	rw	0
1807	00	Number of word index in **TPDO8**	UNSIGNED8	ro	05h
	01	COB-ID used by TPDO8	UNSIGNED32	rw	8000000
	02	Transmission type of TPDO8	UNSIGNED8	ro	FFh
	03	Inhibit time of TPDO8	UNSIGNED16	rw	0
	05	Event timer of TPDO8	UNSIGNED16	rw	0

- Word index 0x01: COB-ID used by TPDO

  Transmission of TxPDO is only possible in NMT state Operational. As shown below, setting Bit31 to 1 disables the function. Each Node-ID supports four TxPDO, to use more than four, please find available Node-ID.

Bit31	Bit30 Bit11	Bit10 Bit0
0/1 (valid/invalid)	Reserved(always 0)	COB-ID

- Word index 0x02: Transmission Type of TPDO

  00~F0: synchronous, transmits PDO when the number of SYNC reaches the specified number.

  0xFC: Transmits PDO after receiving RTR.

  0xFD: Transmits PDO after receiving RTR and triggering event.

0xFE/0xFF: Transmits PDO when an event is triggered.

Value	Description
00_h	synchronous (acyclic)
01_h	synchronous (cyclic every sync)
02_h	synchronous (cyclic every 2nd sync)
03_h	synchronous (cyclic every 3rd sync)
04_h	synchronous (cyclic every 4th sync)
:::::	:::::
$F0_h$	synchronous (cyclic every 240th sync)
$F1_h$	reserved
:::::	:::::
FB_h	reserved
FC_h	RTR-only (synchronous)
FD_h	RTR-only (event-driven)
FE_h	event-driven (manufacturer-specific)
FF_h	event-driven (device profile and application profile specific)

- Word index 0x03: Inhibit Time
  When Transmission Type of PDO is set to 0xFE/0xFF, the inhibit time specifies the minimum length of time in 100μs that must be allowed to elapse between the transmissions. 0 means disabling this function.
- Word index 0x05: Event Timer
  When Transmission Type of PDO is set to 0xFE/0xFF, the Event Timer specifies the minimum length of time in milliseconds that must be allowed to elapse between the transmissions. 0 means disabling this function.

7.2.3 PDO Mapping Parameter

Index	Sub-index	Description	Type	ro/ rw	Default
RPDO1 mapping parameter**(digital outputs)**					
1600	00	Number of mapped application objects in RPDO1	UNSIGNED8	rw	08h
	01h	1st application object	UNSIGNED32	rw	6200 01 08h
	02h	2st application object	UNSIGNED32	rw	6200 02 08h
	03h	3st application object	UNSIGNED32	rw	6200 03 08h
	04h	4st application object	UNSIGNED32	rw	6200 04 08h
	05h	5st application object	UNSIGNED32	rw	6200 05 08h
	06h	6st application object	UNSIGNED32	rw	6200 06 08h
	07h	7st application object	UNSIGNED32	rw	6200 07 08h

	08h	8st application object	UNSIGNED32	rw	6200 08 08h
RPDO2 mapping parameter **(analog outputs**)					
1601	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6411 01 10h
	02h	2st application object	UNSIGNED32	rw	6411 02 10h
	03h	3st application object	UNSIGNED32	rw	6411 03 10h
	04h	4st application object	UNSIGNED32	rw	6411 04 10h
RPDO3 mapping parameter **(additional analog outputs**)					
1602	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6411 05 10h
	02h	2st application object	UNSIGNED32	rw	6411 06 10h
	03h	3st application object	UNSIGNED32	rw	6411 07 10h
	04h	4st application object	UNSIGNED32	rw	6411 08 10h
RPDO4 mapping parameter **(additional analog outputs**)					
1603	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6411 09 10h
	02h	2st application object	UNSIGNED32	rw	6411 0A 10h
	03h	3st application object	UNSIGNED32	rw	6411 0B 10h
	04h	4st application object	UNSIGNED32	rw	6411 0C 10h
RPDO5 mapping parameter**(digital outputs)**					
1605	00	Number of mapped application objects in PDO	UNSIGNED8	rw	08h
	01h	1st application object	UNSIGNED32	rw	6200 09 08h
	02h	2st application object	UNSIGNED32	rw	6200 0A 08h
	03h	3st application object	UNSIGNED32	rw	6200 0B 08h
	04h	4st application object	UNSIGNED32	rw	6200 0C 08h
	05h	5st application object	UNSIGNED32	rw	6200 0D 08h
	06h	6st application object	UNSIGNED32	rw	6200 0E 08h
	07h	7st application object	UNSIGNED32	rw	6200 0F 08h
	08h	8st application object	UNSIGNED32	rw	6200 10 08h
RPDO6 mapping parameter **(additional analog outputs**)					
1606	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h

	01h	1st application object	UNSIGNED32	rw	6411 0D 10h
	02h	2st application object	UNSIGNED32	rw	6411 0E 10h
	03h	3st application object	UNSIGNED32	rw	6411 0F 10h
	04h	4st application object	UNSIGNED32	rw	6411 10 10h
RPDO7 mapping parameter **(additional analog outputs**)					
1607	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6411 11 10h
	02h	2st application object	UNSIGNED32	rw	6411 12 10h
	03h	3st application object	UNSIGNED32	rw	6411 13 10h
	04h	4st application object	UNSIGNED32	rw	6411 14 10h
RPDO8 mapping parameter **(additional analog outputs**)					
1608	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6411 15 10h
	02h	2st application object	UNSIGNED32	rw	6411 16 10h
	03h	3st application object	UNSIGNED32	rw	6411 17 10h
	04h	4st application object	UNSIGNED32	rw	6411 18 10h
TxPDO communication parameter					
1800	01	COB-ID used by TPDO1	UNSIGNED32	rw	180h + Node-ID
1801	01	COB-ID used by TPDO2	UNSIGNED32	rw	280h + Node-ID
1802	01	COB-ID used by TPDO3	UNSIGNED32	rw	380h + Node-ID
1803	01	COB-ID used by TPDO4	UNSIGNED32	rw	480h + Node-ID
1804	01	COB-ID used by TPDO5	UNSIGNED32	rw	0x8000000
1805	01	COB-ID used by TPDO6	UNSIGNED32	rw	0x8000000
1806	01	COB-ID used by TPDO7	UNSIGNED32	rw	0x8000000
1807	01	COB-ID used by TPDO8	UNSIGNED32	rw	0x8000000
TPDO1 mapping parameter**(digital inputs)**					
1A00	00	Number of mapped application objects in TPDO1	UNSIGNED8	rw	08h
	01h	1st application object	UNSIGNED32	rw	6000 01 08h
	02h	2st application object	UNSIGNED32	rw	6000 02 08h

	03h	3st application object	UNSIGNED32	rw	6000 03 08h
	04h	4st application object	UNSIGNED32	rw	6000 04 08h
	05h	5st application object	UNSIGNED32	rw	6000 05 08h
	06h	6st application object	UNSIGNED32	rw	6000 06 08h
	07h	7st application object	UNSIGNED32	rw	6000 07 08h
	08h	8st application object	UNSIGNED32	rw	6000 08 08h
TPDO2 mapping parameter **(analog inputs)**					
1A01	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 01 10h
	02h	2st application object	UNSIGNED32	rw	6401 02 10h
	03h	3st application object	UNSIGNED32	rw	6401 03 10h
	04h	4st application object	UNSIGNED32	rw	6401 04 10h
TPDO3 mapping parameter **(additional analog inputs)**					
1A02	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 05 10h
	02h	2st application object	UNSIGNED32	rw	6401 06 10h
	03h	3st application object	UNSIGNED32	rw	6401 07 10h
	04h	4st application object	UNSIGNED32	rw	6401 08 10h
TPDO4 mapping parameter **(additional analog inputs)**					
1A03	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 09 10h
	02h	2st application object	UNSIGNED32	rw	6401 0A 10h
	03h	3st application object	UNSIGNED32	rw	6401 0B 10h
	04h	4st application object	UNSIGNED32	rw	6401 0C 10h
TPDO5 mapping parameter**(digital inputs)**					
1A04	00	Number of mapped application objects in PDO	UNSIGNED8	rw	08h
	01h	1st application object	UNSIGNED32	rw	6000 09 08h
	02h	2st application object	UNSIGNED32	rw	6000 0A 08h
	03h	3st application object	UNSIGNED32	rw	6000 0B 08h
	04h	4st application object	UNSIGNED32	rw	6000 0C 08h
	05h	5st application object	UNSIGNED32	rw	6000 0D 08h
	06h	6st application object	UNSIGNED32	rw	6000 0E 08h

	07h	7st application object	UNSIGNED32	rw	6000 0F 08h
	08h	8st application object	UNSIGNED32	rw	6000 10 08h
TPDO6 mapping parameter **(additional analog outputs)**					
1A05	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 0D 10h
	02h	2st application object	UNSIGNED32	rw	6401 0E 10h
	03h	3st application object	UNSIGNED32	rw	6401 0F 10h
	04h	4st application object	UNSIGNED32	rw	6401 10 10h
TPDO7 mapping parameter **(additional analog outputs)**					
1A06	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 11 10h
	02h	2st application object	UNSIGNED32	rw	6401 12 10h
	03h	3st application object	UNSIGNED32	rw	6401 13 10h
	04h	4st application object	UNSIGNED32	rw	6401 14 10h
TPDO8 mapping parameter **(additional analog outputs)**					
1A07	00	Number of mapped application objects in PDO	UNSIGNED8	rw	04h
	01h	1st application object	UNSIGNED32	rw	6401 15 10h
	02h	2st application object	UNSIGNED32	rw	6401 16 10h
	03h	3st application object	UNSIGNED32	rw	6401 17 10h
	04h	4st application object	UNSIGNED32	rw	6401 18 10h

7.2.4 Mapping Parameter

Sub Index 0x00:

Value	Description
00_h	Mapping disabled
01_h	Sub-index 01_h valid
….	….
08_h	Sub-index 08_h valid

Sub Index 0x01~0x08 Structure:

31 16	15 8	7 0
Index	Sub-index	Length
MSB		LSB

7.3 Standard Device Profile Area (DS401)

7.3.1 Read digital input (512 point)

Index	Sub-index	Description	Type	ro/ rw	Default
6000		**Read digital input 8-bit**			
	00	Number of Digital inputs 8bit	UNSIGNED8	ro	40h
	01	Read input 001h to 008h	UNSIGNED8	ro	----
	…..	……			
	40	Read input 1F8h to 200h	UNSIGNED8	ro	----
6020		**Read digital input 1-bit (1~128)**			
	00	Number of Digital inputs 1bit	UNSIGNED8	ro	80h
	01~80	Read input 001h~080h	UNSIGNED8	ro	0
6021		**Read digital input 1-bit (129~256)**			
	00	Number of Digital inputs 1bit	UNSIGNED8	ro	80h
	01~80	Read input 081h~0FFh	UNSIGNED8	ro	0
6021		**Read digital input 1-bit (256~383)**			
	00	Number of Digital inputs 1bit	UNSIGNED8	ro	80h
	01~80	Read input 100h~180h	UNSIGNED8	ro	0
6022		**Read digital input 1-bit (384~512)**			
	00	Number of Digital inputs 1bit	UNSIGNED8	ro	80h
	01~80	Read input 181h~1FFh	UNSIGNED8	ro	0
6100		**Read digital input 16-bit**			
	00	Number of Digital inputs 16bit	UNSIGNED8	ro	20h
	01	Read input 001h to 010h	UNSIGNED16	ro	----
	…..	……			
	20	Read input 1F0h to 200h	UNSIGNED16	ro	----
6120		**Read digital input 32-bit**			
	00	Number of Digital inputs 32bit	UNSIGNED8	ro	10h
	01	Read input 001h to 020h	UNSIGNED32	ro	----
	…..	……			
	10	Read input 1E0h to 200h	UNSIGNED32	ro	----

7.3.2 Write digital output (512 point)

Index	Sub-index	Description	Type	ro/ rw	Default
6200		**Write digital output 8-bit**			
	00	Number of Digital outputs 8bit	UNSIGNED8	ro	40h

	01	Write output 001h to 008h	UNSIGNED8	ro	----
	.....	.....			
	40	Write output 1F8h to 200h	UNSIGNED8	ro	0
6220		**Write digital output 1-bit (1~128)**			
	00	Number of Digital outputs 1bit	UNSIGNED8	ro	80h
	01~80	Write output 001h~080h	UNSIGNED8	ro	0
6221		**Write digital output 1-bit (129~256)**			
	00	Number of Digital outputs 1bit	UNSIGNED8	ro	80h
	01~80	Write output 081h~0FFh	UNSIGNED8	ro	0
6222		**Write digital output 1-bit (256~383)**			
	00	Number of Digital outputs 1bit	UNSIGNED8	ro	80h
	01~80	Write output 100h~180h	UNSIGNED8	ro	0
6223		**Write digital output 1-bit (384~512)**			
	00	Number of Digital outputs 1bit	UNSIGNED8	ro	80h
	01~80	Write output 181h~1FFh	UNSIGNED8	ro	0
6300		**Write digital output 16-bit**			
	00	Number of Digital outputs 16bit	UNSIGNED8	ro	20h
	01	Write output 001h to 010h	UNSIGNED16	ro	0
	.....	.....			
	20	Write output 1F0h to 200h	UNSIGNED16	ro	0
6320		**Write digital output 32-bit**			
	00	Number of Digital outputs 32bit	UNSIGNED8	ro	10h
	01	Write output 001h to 020h	UNSIGNED32	ro	0
	.....	.....			
	10	Write output 1E0h to 200h	UNSIGNED32	ro	0

7.3.3 Read Analog input (64 channel)

Index	Sub-index	Description	Type	ro/ rw	Default
6401		**Read analog input 16-bit**			
	00	Number of analog input 16bit	UNSIGNED8	ro	40h
	01	analog input 01h	INTEGER16	ro	0
	.....	.....			
	40	Write output 40h	INTEGER16	ro	0

7.3.4 Write Analog output (64 channel)

Index	Sub-index	Description	Type	ro/ rw	Default
6411		**Write analog output 16-bit**			
	00	Number of analog output 16bit	UNSIGNED8	ro	40h
	01	analog input 01h	INTEGER16	ro	0
	.....	.....			
	40	analog output 40h	INTEGER16	ro	0

7.3.5 Manufacturer-specific profile area

Index	Sub-index	Description	Type	ro/ rw	Default
2000h	00	Number of digital input	UNSIGNED8	ro	FFh
	01-FF	Digital input 001h - 1FFh filter time	UNSIGNED16	rw	0000h
2001h	00	Number of digital input	UNSIGNED8	ro	FFh
	01-FF	Digital input 100h - 1FFh filter time	UNSIGNED16	rw	0000h

8. Power Consumption

Type	Device	Consumption(5V)	Power Supply(5V)
Coupler	iR-ETN	220mA/1.1w	2A/10w
	iR-COP	170mA/0.85w	2A/10w
Digital I/O	iR-DM16-P	130mA/0.65w	--
	iR-DM16-N	130mA/0.65w	--
	iR-DQ08-R	220mA/1.1w	--
	iR-DQ16-N	205mA/1.02w	
	iR-DQ16-P	196mA/0.984w	
	iR-DI16-K	83mA/0.418w	

Note:

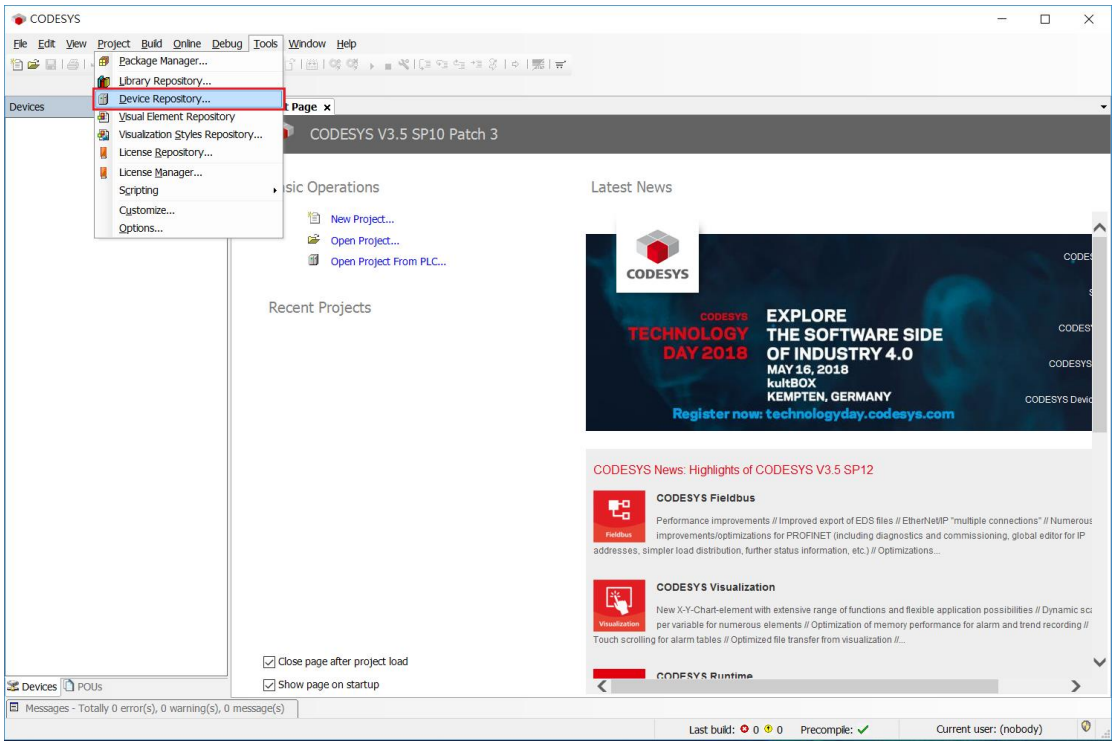
The coupler is the only power supply for the modules in this system. Please consider power requirements when connecting multiple modules.

Example:

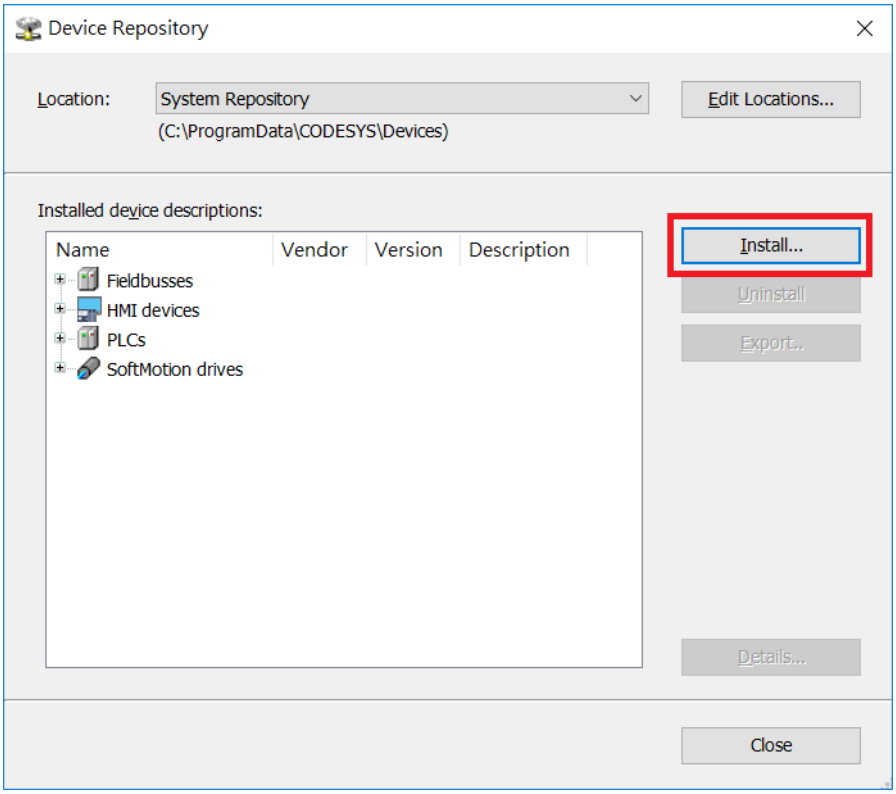
Device	Name	Consumption	Power Supply
Coupler	iR-COP	220mA/1.1w	2A/10w
Module	iR-DQ08-R *8	220mA*8=1.76A	X
System	Power consumption：$220mA + 1.76A = 1.98\ A$ Power supply: $2A > 1.98A$		

9. Creating program in CODESYS

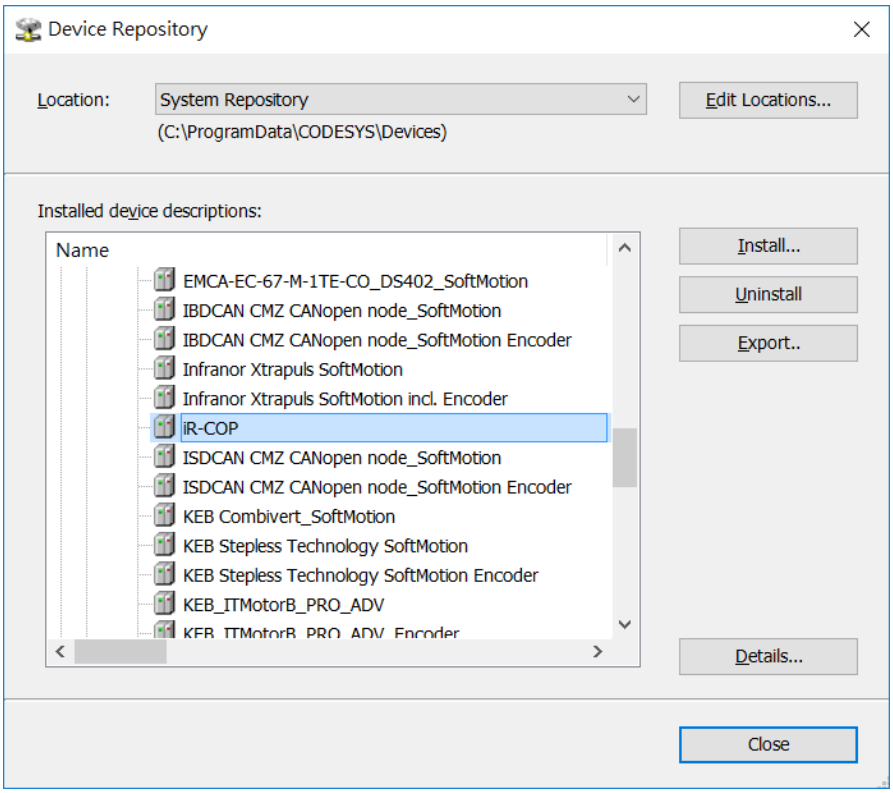
1. Click [Tools] » [Device Repository] to install the .eds file.



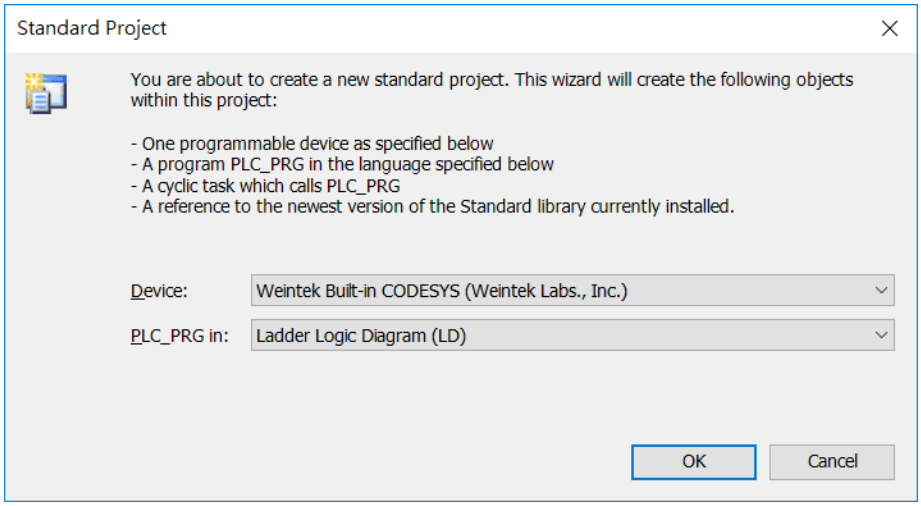
2. Click [Install] and browse for the .eds file to be installed.



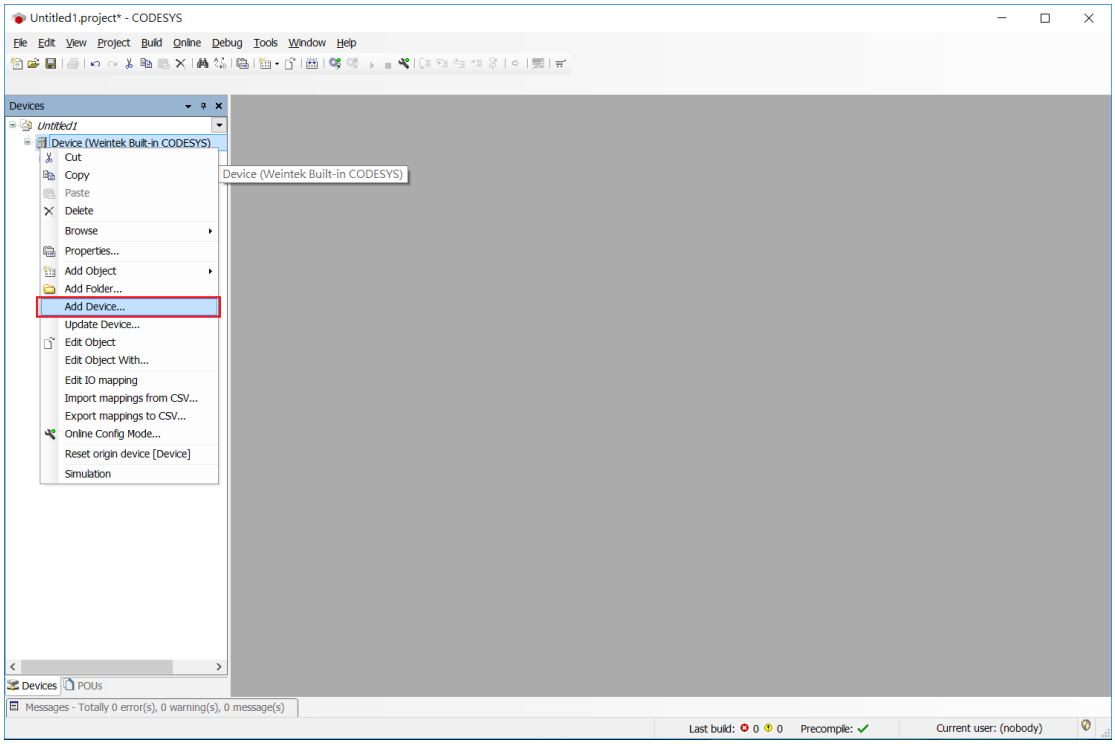
3. After installing, iR-COP can be found in the list of Installed Device Descriptions.



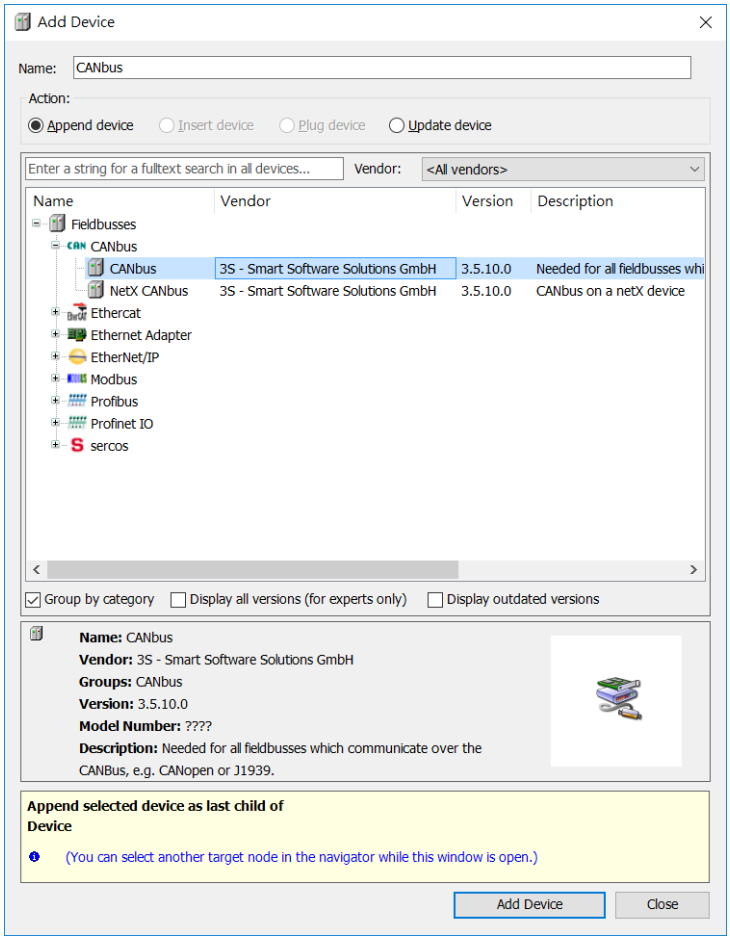
4. Create a new project and select Device “Weintek Built-in CODESYS”.



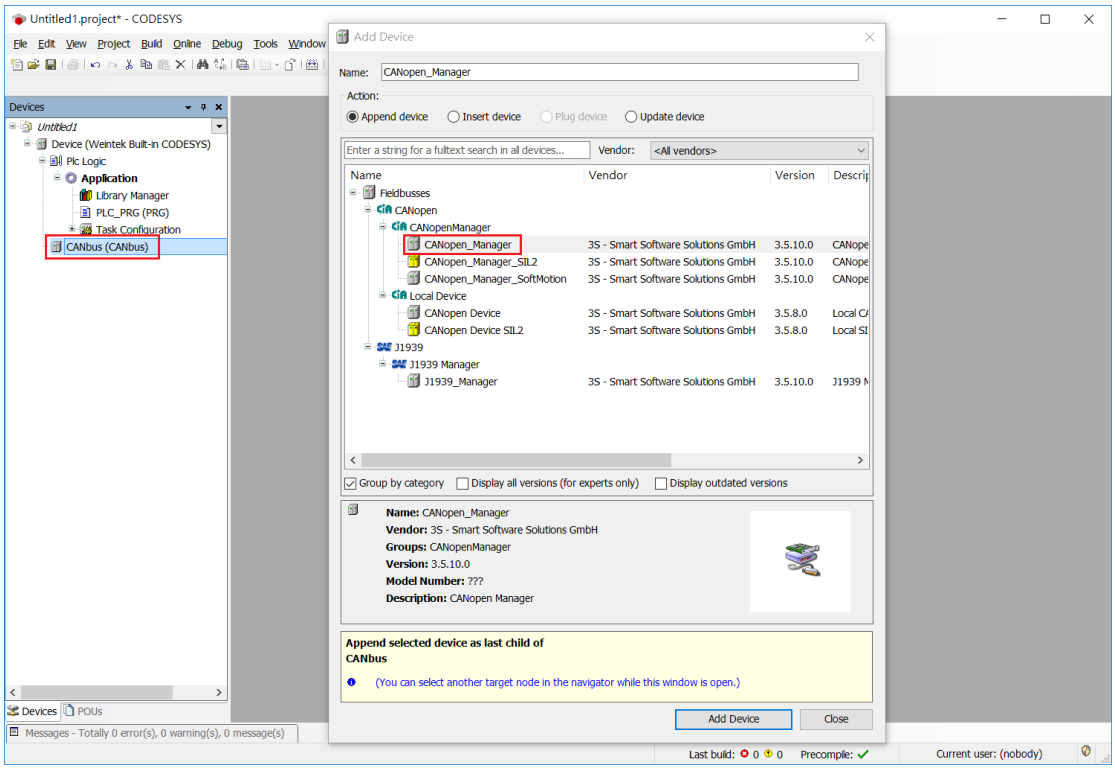
5. Select Device (Weintek Built-in CODESYS) and right click mouse to select [Add Device…].



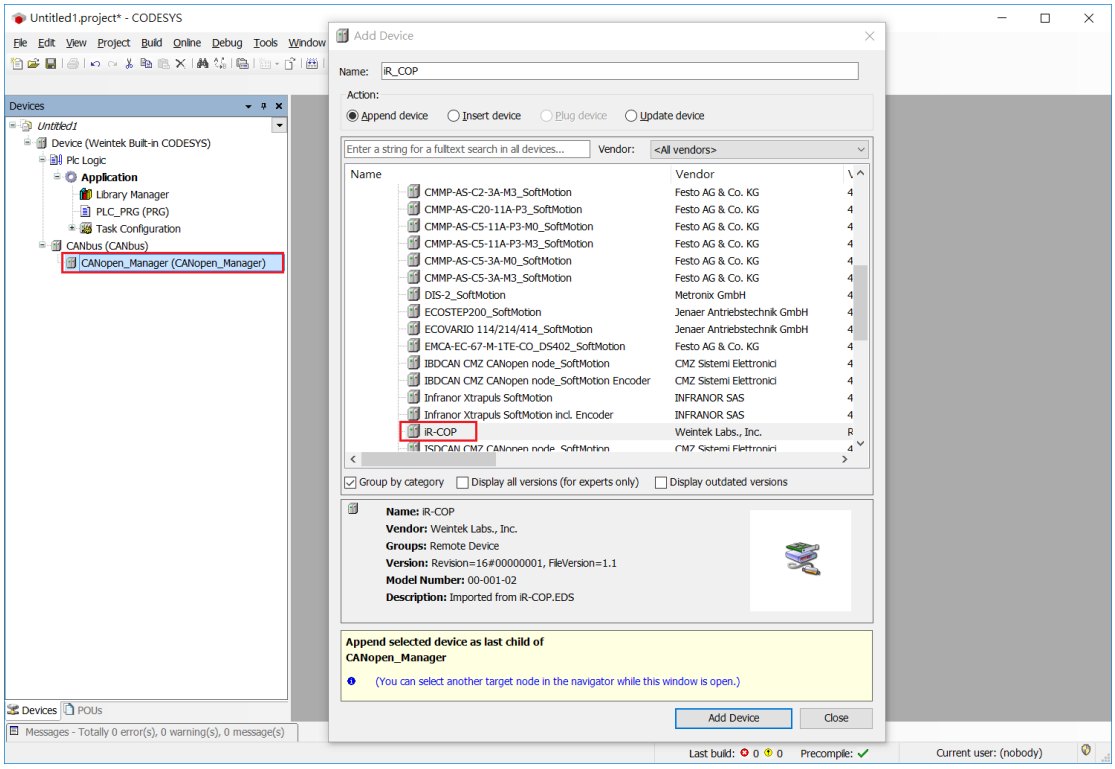
6. Select CANbus and click [Add Device].



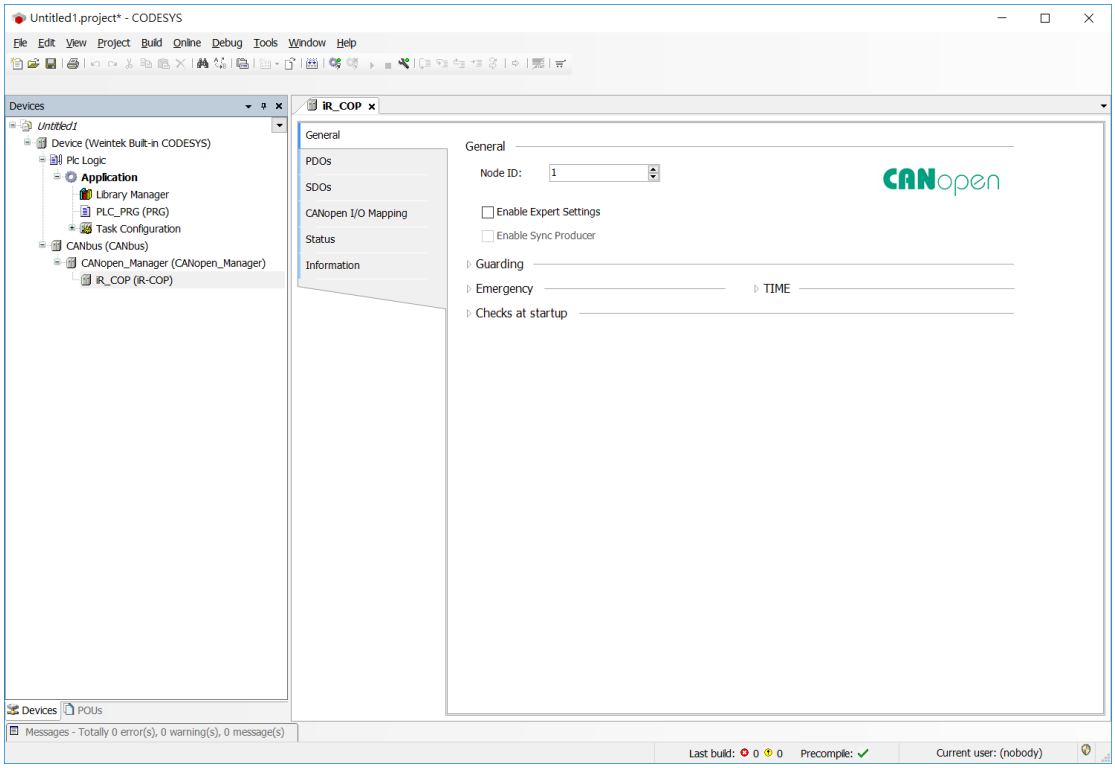
7. Select CANbus and select the CANopen_Manager to be added.



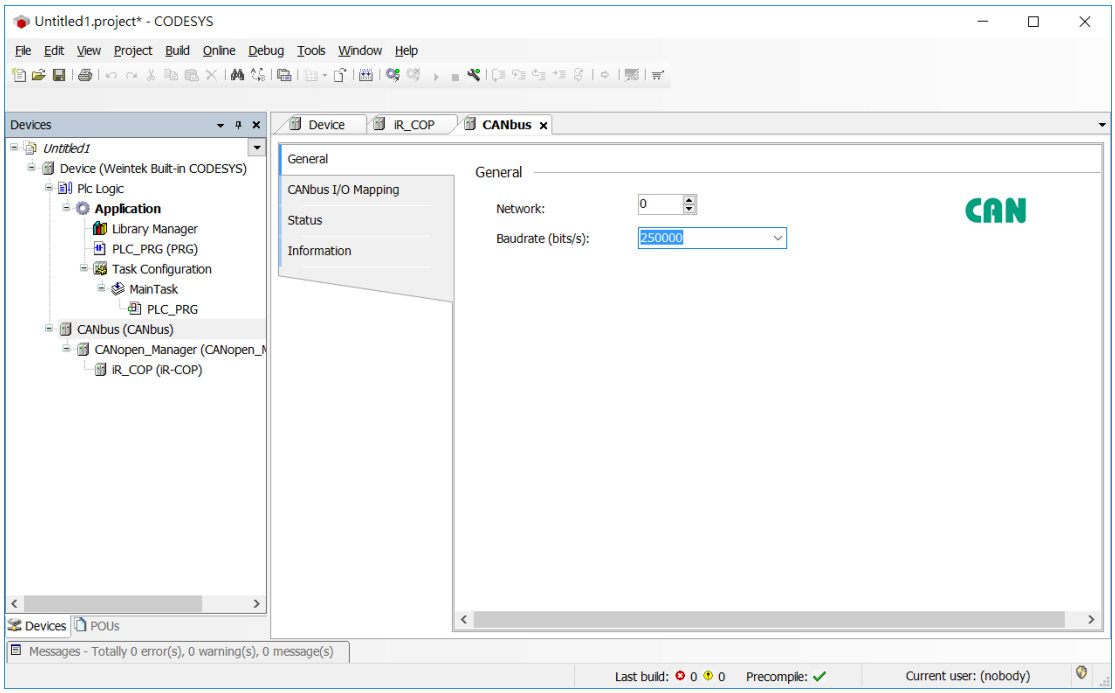
8. Select CANopen_Manager and select the iR-COP to be added.



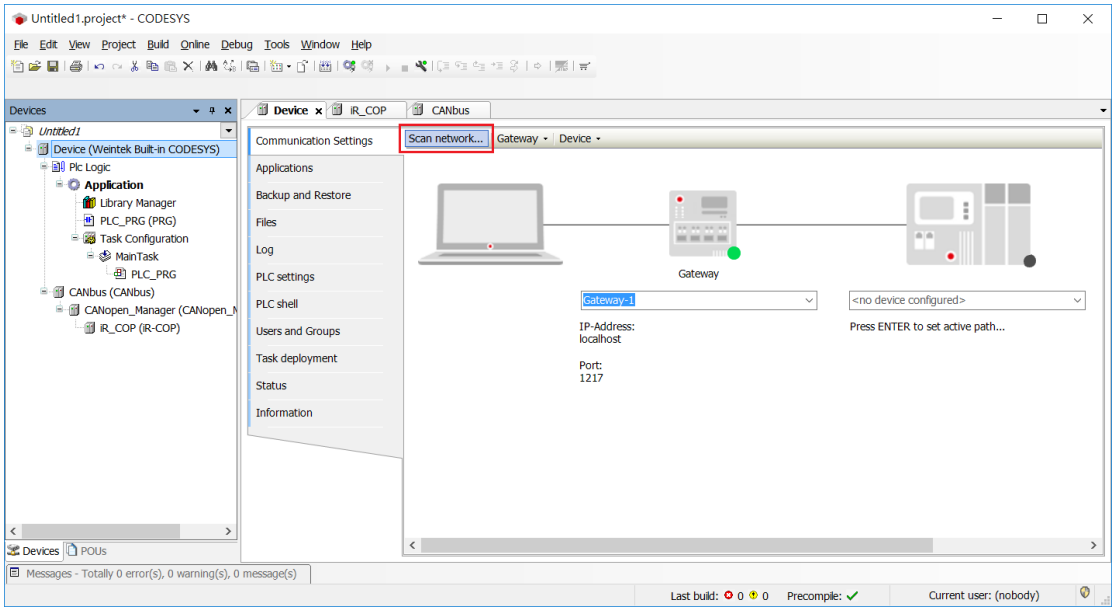
9. Double click iR-COP to set up parameters and I/O mapping.



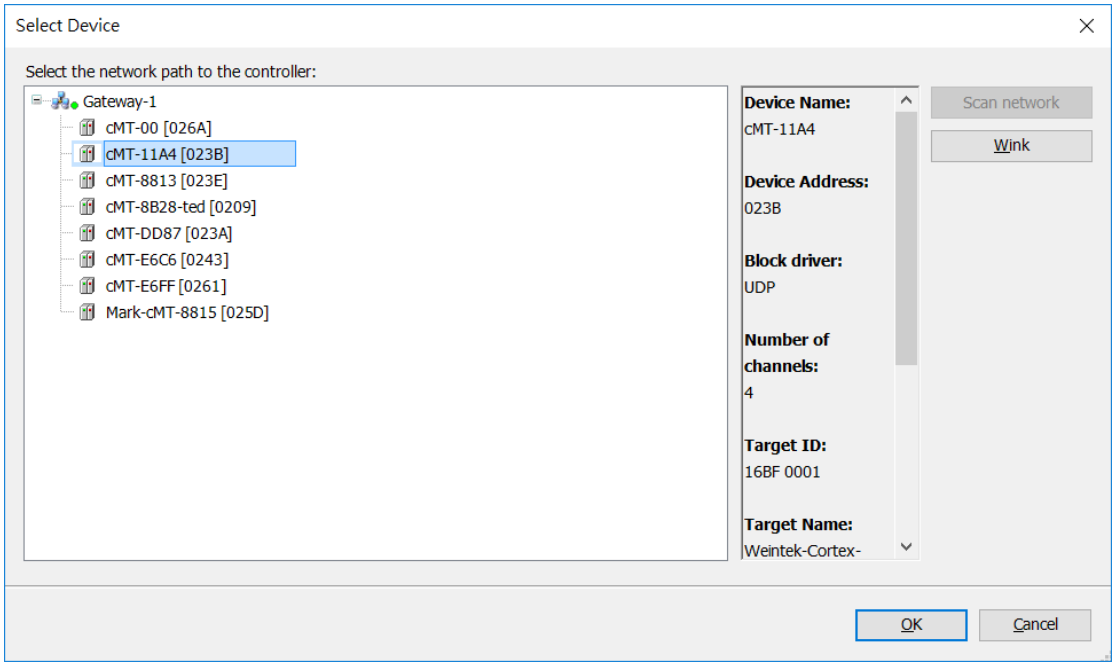
10. Double click CANbus to set up baud rate.



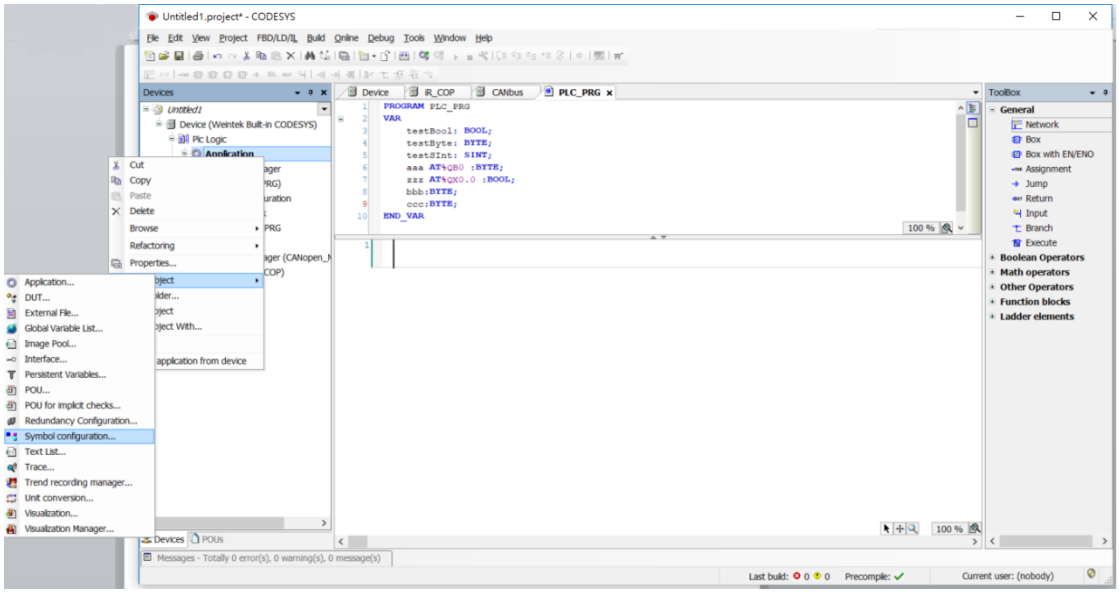
11. Double click Device and then click [Scan network] to search for devices.



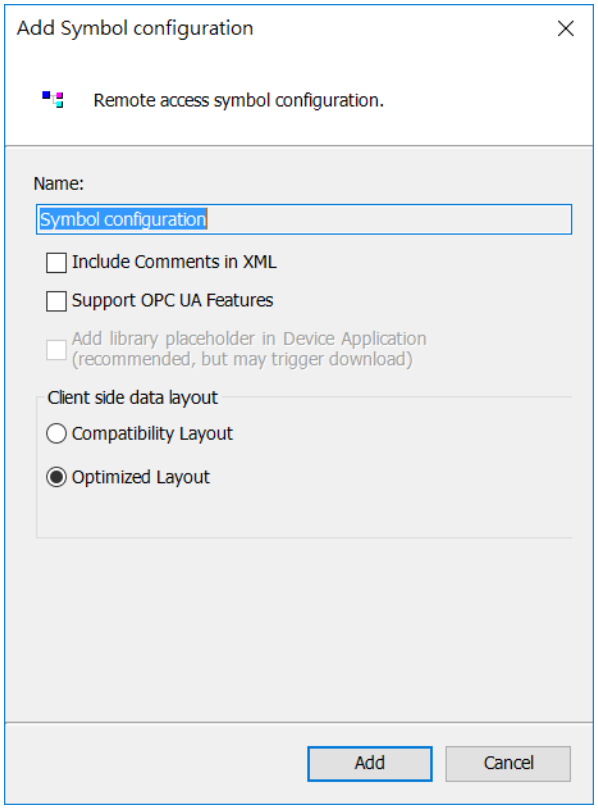
12. Select the device to be connected and then click OK.



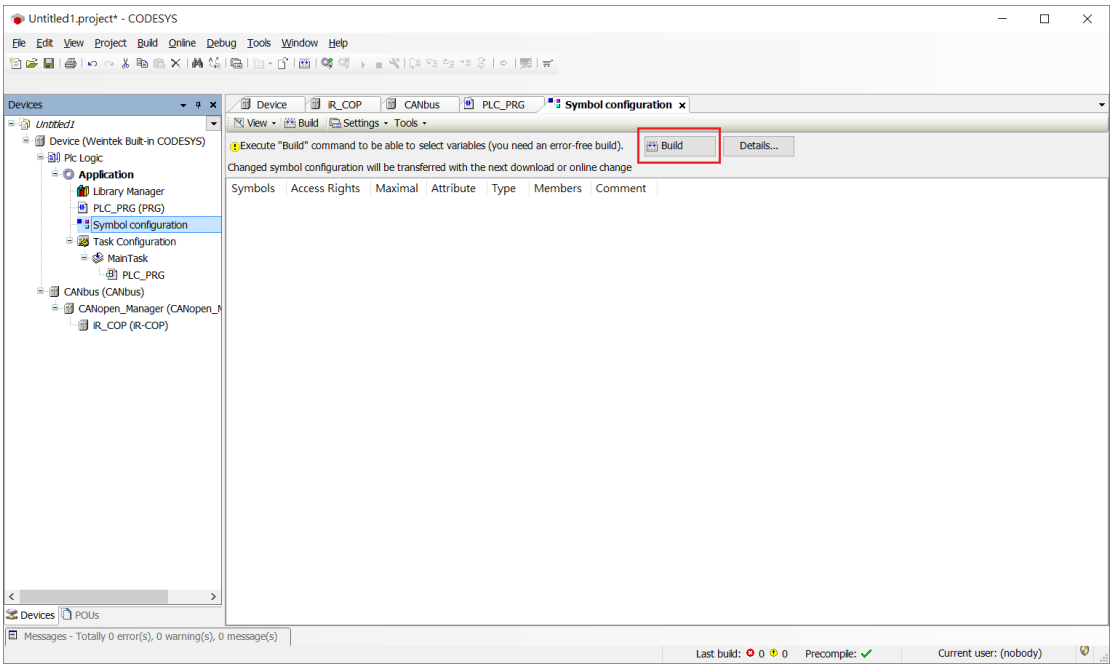
13. After programming PLC_PRG, please select [Application] and right click mouse to select [Add Object] » [Symbol configuration…].



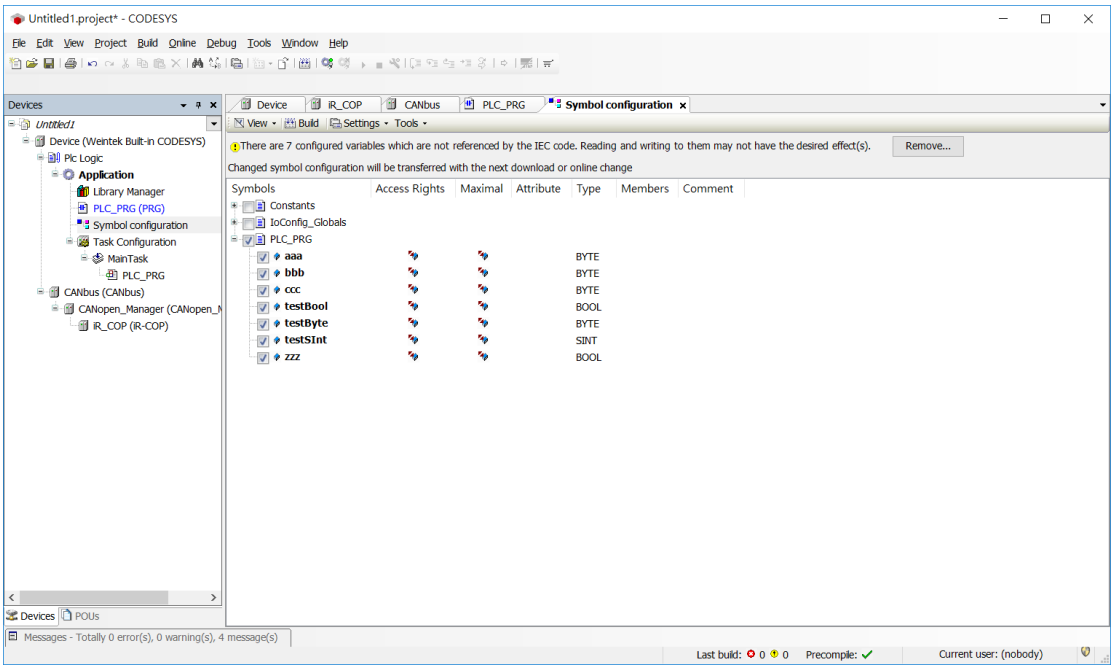
14. Click [Add] here.



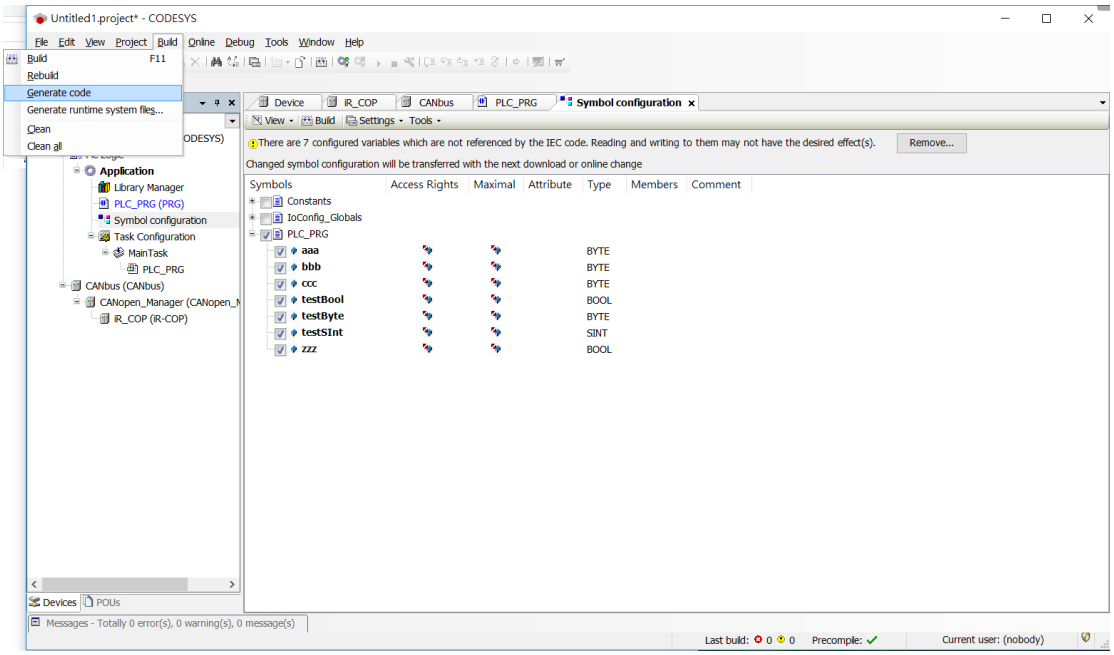
15. Click [Build] to select variables.



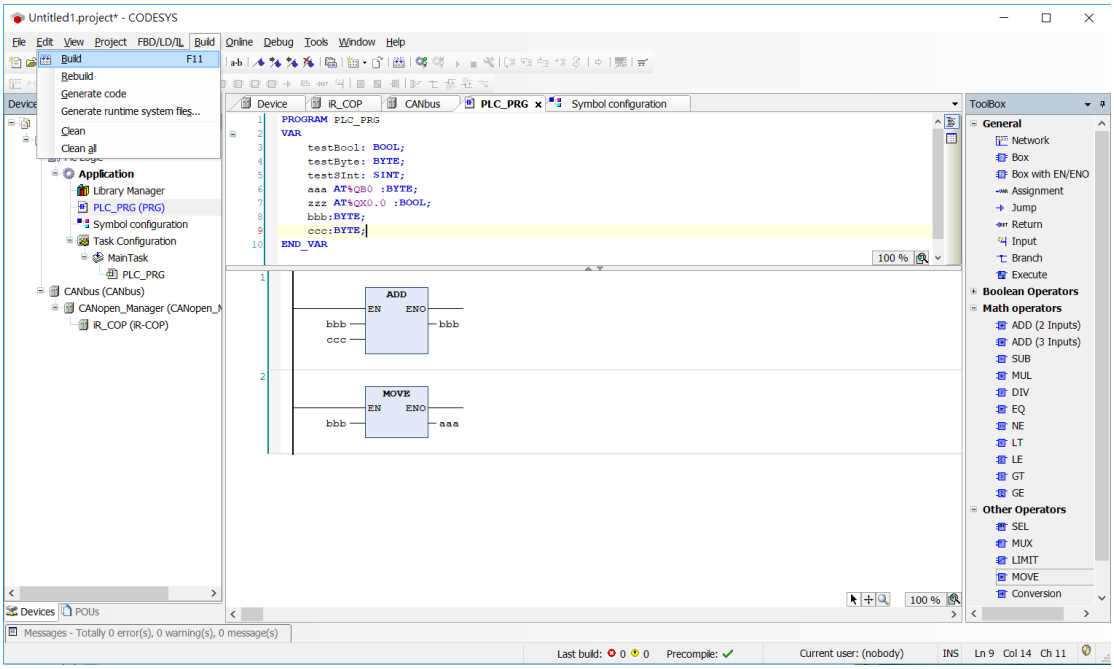
16. Select PLC_PRG variables to be included in .xml file later.



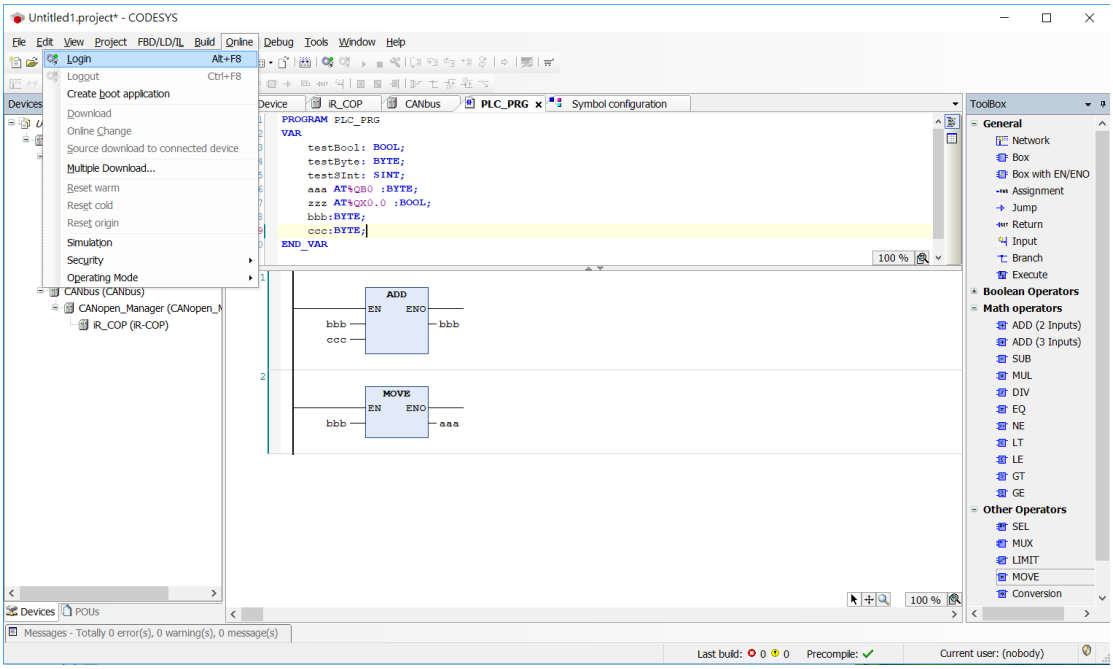
17. Click [Build] » [Generate code] to generate .xml file. The file is generated in the same folder as PLC program.



18. Click [Build] » [Build] to compile the program to see if any error occurs.

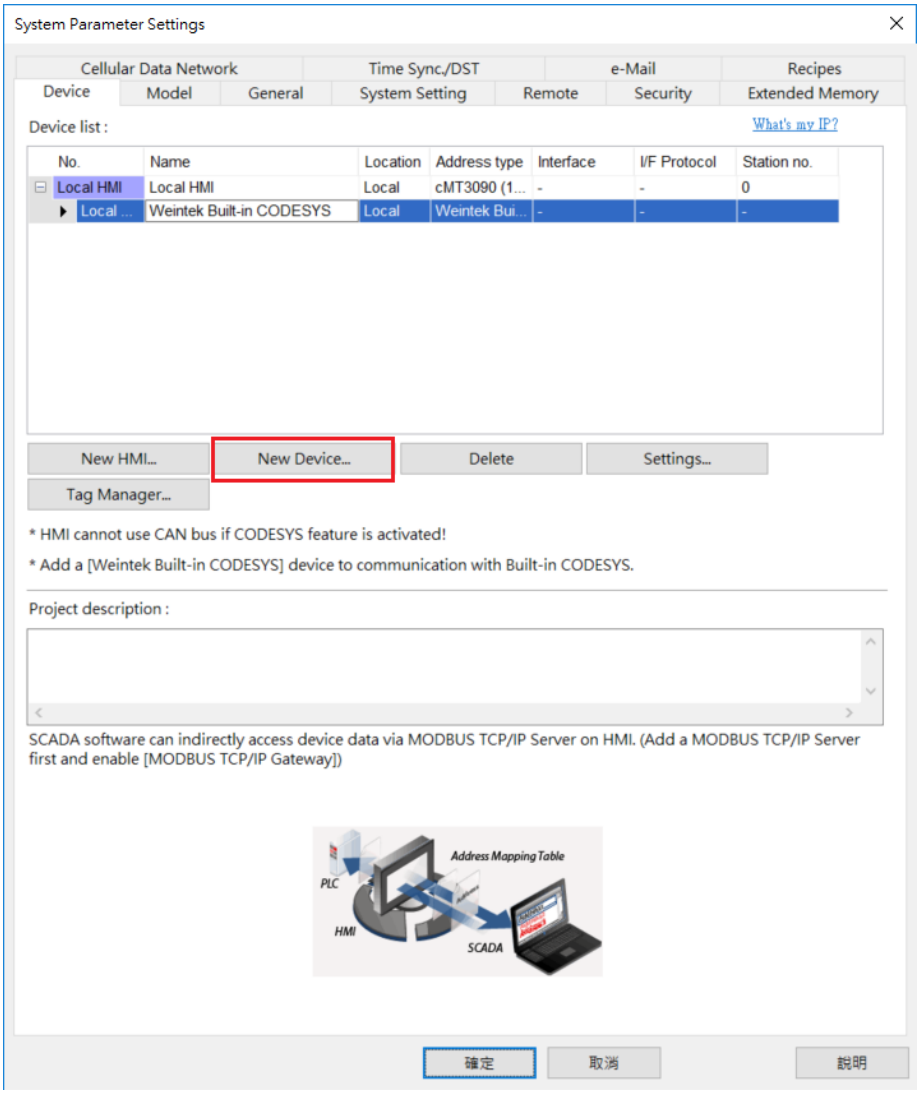


19. Click [Online]» [Login] to download the program.

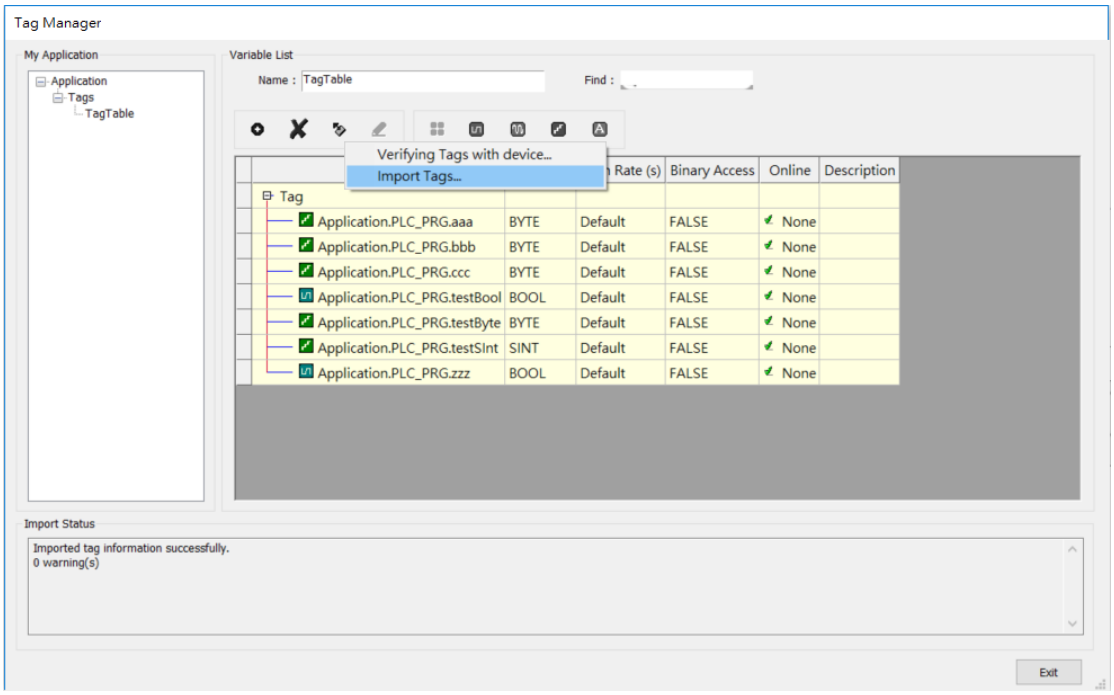


10. Importing .xml file in EasyBuilder Pro

1. Add new device “Weintek Built-in CODESYS” into Device List.



2. Click [Tag Manager] to import the .xml file.


Tag Manager
My Application
Application
Tags
TagTable
Variable List
Name : TagTable
Find :
Verifying Tags with device...
Import Tags...
Rate (s)
Binary Access
Online
Description
Tag
Application.PLC_PRG.aaa BYTE Default FALSE None
Application.PLC_PRG.bbb BYTE Default FALSE None
Application.PLC_PRG.ccc BYTE Default FALSE None
Application.PLC_PRG.testBool BOOL Default FALSE None
Application.PLC_PRG.testByte BYTE Default FALSE None
Application.PLC_PRG.testSInt SINT Default FALSE None
Application.PLC_PRG.zzz BOOL Default FALSE None
Import Status
Imported tag information successfully.
0 warning(s)
Exit