

ECR60 and ECT60

TwinCAT User Manual

Catalogue

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1. Installation of TwinCAT3

1.1 Installation conditions

Operating system : Above Windows 7, TwinCAT3 is compatible with Windows 10.

CPU : Intel CPU

Network card : Intel network card, other manufacturers network card can be

demonstrated, synchronization control accuracy is very poor.

Software version : TwinCAT V3.1.4022.29

About TwinCAT System

TwinCAT System Service v3.1.0.2306

TwinCAT v3.1.4022.29

OK

1.2 Software installation

After normal installation, there is a TwinCAT3 background in the lower right corner.



2. Setup of TwinCAT3

2.1 Add device description file

The description file for ECR60 is ECR60.xml.

The description file for ECT60 is ECT60.xml.

The user needs to copy the ECR60. XML file and ECT60. XML file to the following path:

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		v v	N ECT60		2	019-7-27 1	1:03 XML	源文件		68 KB				v	,
100 个项															ι.

D:\TwinCAT\3.1\Config\Io\EtherCAT.

2.2 Setup

Step1:The user needs to open the Ethernet by using the computer, allow TwinCAt to

access the Ethernet, and know the name of the Ethernet connection used, and select the

corresponding Ethernet connection for subsequent operations.

🕎 网络和共享中心				– 🗆 X
← → • ↑ 💺 > 控制面板 >	> 网络和 Internet > 网络和共享中心			∨ ひ 搜索控制… ♪
控制面板主页	查看基本网络信息并设置连接			
更改适配器设置	查看活动网络			
更改高级共享设置	未识别的网络 公用网络	访问类型: た法 连接: <u>い</u> 大法	去连接到网络 大网	
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		关闭(C)	通定	取消

Step2: Build a new TwinCAT project

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	New Project		? ×
	▷ Recent	.NET Framework 4.5 - Sort by: Default - 📰 🧮	Search Installed Templates (Ctrl+E)
New TwinCAT Project	∡ Installed	TwinCAT XAE Project (XML format) TwinCAT Projects	Type: TwinCAT Projects
Connect To Team Foundation Server	 Templates Other Project Types TwinCAT Measurement TwinCAT PLC TwinCAT Projects Samples 		TwinCAT XAE System Manager Configuration
		Click here to go online and tind templates	
☐ Close page after project load ✓ Show page on startup	Name: TwinCAT	ECAT DEMO	Browse
BECKHOFF	Solution name: TWINCAT		OK Cancel

Step3: Add a new item

Devices	_		
A Mappings	° 🗆	Add New Item	Ins
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📸 NC-Task		Export EAP Config File	
	×	Scan	
	â	Paste	Ctrl+V
		Paste with Links	

Step4:Add a master network card





Step5:Install the driver

Please follow the steps shown below.

Build 4022.29 (Loaded 🚽 🚽 🔛 🧱 📕 🥰 🛠	🍘 💦 🛛 <local> 🔹 🚽 🚛 🚽 🚽 🚽 🚽 🚽 🖌 🖕 C 들 전 🛔 전 전 📲 🖗 C 등 다 드 전 🖓 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다</local>	
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Solution 'TwinCAT ECAT DEMO' (1 project)	Network Adapter	
 TwinCAT ECAT DEMO SYSTEM 	● OS (NDIS) ○ PCI ○ DPRAM	
	Description: 以太网 (Realtek PCIe GBE Family Controller)	
i I/O Idle Task	Device Name: \DEVICE\{1541CA74-BEBE-4828-B37F-B85BCEBCABC3}	
i Tasks 꾧 Routes	PCI Bus/Slot: Search	
🚛 Type System 🌃 TcCOM Objects	MAC Address: 2c fd a1 8a 18 3d Compatible Devices 3	
	IP Address: 192.168.250.100 (255.255.255.0)	
SAFETY	Promiscuous Mode (use with Wireshark only)	
▲ <u></u> 1/O	☐ Virtual Device Names	
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Installation of TwinCAT RT-Ethernet Adapters	×
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Installed and ready to use devices(realtime capable)	Install
————————————————————————————————————	5 Update
WLAN - Qualcomm Atheros AR956x Wireless Network Adapter	Bind
	Unbind
Disabled devices	Enable
	Disable
	Show Bindings

Network Adapt	ter
	● OS (NDIS) ○ PCI ○ DPRAM
Description:	以太网 (Realtek PCIe GBE Family Controller)
Device Name:	\DEVICE\{1541CA74-BEBE-4828-B37F-B85BCEBCABC3}
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IP Address:	192.168.250.100 (255.255.255.0)
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	□ Virtual Device Names
⊖ Adapter Refere	ence
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mber Box N	Jame Address Type In Size Out Size F-Bus (

	Device Found At	8 ×
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	基才网络连接 (Bluetooth Device (Fersonal Area Network)) 本地连接*1 (Microsoft Wi-Fi Direct Virtual Adapter #2) 7 本地连接*2 (Microsoft Wi-Fi Direct Virtual Adapter) 7	Cancel
		Help

2.3 Find the drive

First, connect the driver to the power supply, motor and network .Then select "Scan" to automatically Scan the slave device.

Solution Explorer		→ ╄ ×	ECR60 + ×			
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SAFETY			Device Name:	V		
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🥏 SyncUnits	×	Remove	Del			
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 Mappings 		Append EtherCAT Cmd	4			
C-Task 1 SAF - Device 1 (Ether	c	Append Dynamic Container				
■ NC-Task T SAF - Device T (Ether	4	Online Reset				
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		Paste with Links		4		
		Independent Project File	e	0		
cable.		Disable		6		

The normal connection is successful. The software prompts to find device 1 ECR60 and

device 2 ECT60, and prompts to add the corresponding motion axis (NC). Click OK.

Solution Explorer	▼ # ×	「winCAT ECAT DEMO →	×				
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TcCOM Objects		MAC Address:	2c fd a1 8a 18 3d		Compatible Devices		
		IP Address:	192.168.250.100 (2	55.255.255.0)			
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Outputs InfoData							
 ▶ # Drive 1 (ECR60) ▶ # Drive 2 (ECT60) 							
Mappings	-						

At this point, the software automatically adds the motion control axis corresponding to the slave station device, as shown in the figure below. The user can select "<u>Motion/ NC-task1 SVB/Axes</u>", and can select Axis 1 and Axis 2 to see whether the slave devices correspond to each other.

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	Description				1.00	Line	Column risjaa	
Solution Explorer Server Explorer Toolbox								

2.4 PDO mapping

Select PDO for device 1 and device 2 and use the default Settings as follows:

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	1 128 MbxIn	0x1A01 11.0 Transmit PDO 2	0		
SAFETY	2 7 Outp	0x1A02 0.0 Transmit PDO 3	0		
	3 11 Inputs	0x1600 7.0 Receive PDO 1	2 0		
4 ¹⁰ Devices		0x1601 19.0 Receive PDO 2	0		
A Device 1 (EtherCAT)		0x1602 15.0 Receive PDO 2	0		
🛟 Image					
🚦 Image-Info					
SyncUnits					
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🗩 Control Word	Ed BDO Assignment	J			
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🗫 Profile Target Position	PDO Configuration	Cons Halt Assistant			
WcState		sync Onic Assignment			
InfoData					
I * Drive 2 (ECT60)					
 Transmit PDO 1 	≻Name Online	Type Size Addre In/Out User Lin	ked to		*
Mades of Operation display	AdsAddr 169.254.136.152	AMSADDR 8.0 1550.0 Input 0			
Position Actual Value	🕫 Chn0 0	USINT 1.0 1558.0 Input 0			
Digital Inputs	Error List - Open Documents				- - ×
A Receive PDO 1		unione L @ 0.560 Marriage L Chara			Council Council Lint Or
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NC-Task TSAF - Device 1 (EtherCAT) 1 V					
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确定

2.5 Activate the Settings

取消

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_										
_		? Restar	t TwinCAT Sy	stem in Run Mod	e					
Т										

3. Motion testing and Parameter setting

3.1 Drive motion test

1) Enable the motor in this step the driver will complete the lock shaft, parameter

self-identification function, and then enter the wait command state.

The figure below enables axis 1 and 2.

Solution Explorer 🚽 🕂 🗸	TwinCAT ECAT DEMO 🕫 🗙
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Search Solution Explorer (Ctrl+;)	General Seturgs Parameter Dynamic Omice functions Coupling Compensation
Search Solution Explorer (Ctrl+;) Search Solution Explorer (Ctrl+;) Solution TwinCAT ECAT DEMO' (1 project) Solution TwinCAT ECAT DEMO Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Real-Time Provide Tasks Provide Tasks Real-Time Provide Tasks Provide Task	General Settings Parameter Dynamic Online unctions Coupling Compensation 2 Setpoint Position: mmin 0.0000 0.0000 0.0000 1ag Distance (min/max): mmin Actual Velocity: mm/s Setpoint Velocity: mm/s 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Override: (%) Total / Control Output: %) Firor: 0.0000 0.0000 100.0000 % 0.00 / 0.00% 0.00 / 0.00% 0 (0.00) 0.0000 0.0000 Status (log.) Controller / Status (phys.) Enabling Set Enabling Set Feed Bw Cancel Controller Kv-Factor: Imm/s/mmin Reference Velocity: Imm/s Imm/s Imm/s 1 Immediate 2200 Immediate Imm/s Immediate Immediate 6 Immediate Field Field Field Field Field Field 7 Field Field Field Field Field Field Field Field Field Field
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Image: Solution TwinCAT ECAT DEMO' (1 project) Image: System	2 0.0001 Setpoint Position: mm] 0.0000 ag Distance (min/max): mm1 Actual Velocity: [mm/s] 0.0000 0.0000 0.0000 (0.000, 0.000) 0.0000 0.0000 verride: (%) Total / Control Output: (%) 100.000 % 0.000 / 0.00 % 0 (0x0) Status (log.) Status (phys.) Erabling Controller Set Calibrated Moving Bw In Target Pos. Feed Bw 3 Controller Kv-Factor: [mm/s/mm] Reference Velocity: Set Enabling V 1 2200 Verdete [%] Earler 5 Target Position: [mm] Target Velocity: Verdete [%] Earler 1 2200 Verdete [%] Earler 5 FE F2 F3 F4 F5 F6 F8 Interview 5

2) Reciprocating motion

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Image: Book of the second	Output Value: 0 [%] Stop Set Actual Position
PIC SAFETY Select Axis 1 or Axis 2 C++ TO PO	Set Target Position Absolute V 0 Set

3) Move (Relative)



3) Move(Absolute)

Solution Explorer	- 4 ×	TwinCAT ECAT DEMO 👒 🗙			
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III License ▲ ♦ Real-Time		Start Mode:	Absolute	~	Start
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		Acceleration:	10	[mm/s2]	[mm/s2]
MOTION MC-Task 1 SAF		Jerk:	0	[mm/s2]	Last Time: [s]
i≩i NC-Task 1 SVB ≩≣ Image		Raw Drive Output	Percent	~	Start
Tables ■ Objects ▲ ⊇* Axes		Output Value:	0	[%]	Stop
 ▶ ➡ Axis 1 ▲ ➡ Axis 2 		Set Actual Position Absolute ~	0		Set
 Enc Inputs Outputs 		Set Target Position Absolute ~	0		Set
 ▶ ➡ Drive t Ctrl □ Inputs ▶ ■ Outputs 					

4) JOG(Endless+)

Select Endless+ mode for continuous movement.Start the movement and the current position increases continuously towards Endless+.In the same way, choose Endless- mode to move continuously.Start the movement, the current position to Endless- decreasing.

3.2 Drive internal parameter Settings

According to the user's requirements, the driver current size, instruction subdivision and so on are set here, and how to save parameters and restore factory Settings is pointed out.

Ps: First, modification of internal specified parameters requires modification when the motor is stationary.

Second, after modifying the internal specified parameters, you need to keep the parameters, otherwise the drive will become invalid after power failure.

1) Set current size and motor instruction subdivision

ECR60:



ECT60:

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image	:e 2007:0	Inputs Function	RW P	> 6 <							
in Image-Into	2008	Inputs Polarity	RW P	0x003F (63)							
b SyncOnits	2009	Filter Time	RW P	0x6400 (25600)							
P Outputs	200A	Soft lock Time	RW P	0x03E8 (1000)							
InfoData	🛞 200B:0	Current loop parameters	RW P	> 4 <							
 I * Drive 1 (ECR60) 	🕀 200C:0	Motor parameters	RW P	> 6 <							
Transmit PDO 1	200D	Invert motor direction	RW P	0x0000 (0)							
🜮 Status Word	200E	Alarm Code	RO P	0x0000 (0)							
🚰 Modes of Operation display	200F	Status Code	RO P	0x0084 (132)							
🚰 Position Actual Value	2010	Zero Position	RW P	0x0000 (0)							
🕫 Digital Inputs	2011	Control mode	RW P	0x0001 (1)							
Receive PDO 1	2020	Encoder Resolution	RW P	0x0FA0 (4000)							
Secontrol Word	2021	Encoder Counter in one rev	RO P	0x063E (1598)							
ModeOfOperation	2022	Position Trae Error Limit	RW P	0x00000FA0 (4000)							
WeState	÷ 2023:0	Position loop parameters	RW P	> 5 <							
b InfoData											-
 Drive 2 (ECT60) 											
Transmit PDO 1	Name	Online Type	Siz	e ≻Add In/Out	User Linked to						
The status word	Status Word	X 4657 UINT	2.0	82.0 Input	0 nState1 nState	e2					
Position Actual Value	Error List - Oper	n Documents	2.0	and mput	etate 1, notat	99 8 9					- m - x
Pigital Inputs			0 0 (44)						0.15	12.4	
A Receive PDO 1	T - 0 0 of	5 Errors 0 of 0 Warnings	U of 14 I	viessages Clear					Search Erro	r List	Q,
🕞 Control Word	Descriptio	in 🔺					File	Line	Column	Project	

The subdivision of ECT60 is equal to the encoder resolution(The default ECT60 resolution

is 4000, which means: 4000 pulses/r)

2) Store all parameters

/ □ [□ - □ / -	General Ether	CAT DC Process Data Plc	Startup	CoE - Online Online	NC: Online	NC: Functions				
arch Solution Explorer (Ctrl+;)										
🚼 Type System 🔺	Upda	te List Auto Update	Sinale U	pdate Show Offline	Data					
TcCOM Objects			_ ,	. –						
A MOTION	Advar	nced								
NC-Task 1 SAF			- M-							
PLC	Add to S	Online Data								
SAFETY			-1							
964 C++	Index	Name	Flags	Value	Uni	t				
▲ 🔀 I/O	1000	Device type	RO	0x00040192 (262546	i)					
▲ ^e th _{th} Devices	1001	Error register	RO	0x00 (0)						
 Device 1 (EtherCAT) 	1008	Device name	RO	ECT60						
🛟 Image	1009	Hardware version	RO	A1	Set Value D	Dialog	×			
🛟 Image-Info	100A	Software version	RO	101A						
SyncUnits	B-1010-0	Store Parameters	RW	214	Dec:	1	OK			
Inputs	10100	1. Save all parameters	RW	0x0000 (0)	Hex	0x0001	Cancel			
Outputs	*	Restore Varameters	R W	210	Float					
P 🔚 InfoData	÷ 1019-0	Identity		- 1 -	TIOG.					
I Drive 1 (ECR60)	1010.0	5 o ul		245						
A U Transmit PDO 1	E TOFT:0	Error Settings		> 2 <	Book:	0 1	Hex Edit			
Status Word	10F8	Timestamp Object	RW P	0x8c48b050t3et202	Piener	01.00				
Modes of Operation display	⊕ 1600:0	RXPDO 1 Mapping Parameter	RW	> 3 <	Dinary.	0100				
Position Actual Value	1601:0	RXPDO 2 Mapping Parameter	RW	> 6 <	Bit Size:	○1 ○8 ●16 ○32 ○64 (22			
Digital inputs	1602:0	RXPDO 3 Mapping Parameter	RW	> 5 <						
Control Wood	⊕ 1A00:0	TXPDO 1 Mapping Parameter	RW	> 4 <						
Mada Of Canadian	⊞-1A01:0	TXPDO 2 Mapping Parameter	RW	> 4 <						
ModeOtOperation Profile Target Desition		TXPDO 3 Mapping Parameter	RW	> 0 <						
b WcState		Sync manager type		> 4 <						
- Westake										
Le Drive 2 (ECT60) Select 1	he drive where	e you want to save the pa	rameters							
a Transmit PDO 1		- ,								
🐔 Status Word	Name	Online Type	Size	>Add In/Out	User Linke	d to				
Modes of Operation display	📌 Status Word	X 4657 UINT	2.0	82.0 Input	0 nStat	e1, nState2				
📌 Position Actual Value	Error List - Oper	n Documents								
Digital Inputs		5 Errors	0 of 14 N	lessages Clear						Search Error List
🔺 🛄 Receive PDO 1			0 01 14 1	clear						Search erfor List
🗫 Control Word	Descriptio	n 🔺						File	Line	Column Project
ModeOfOperation										
Profile Target Position										

After saving all parameters, the drive power outage restart is valid.

3) Restore all default parameters

Solution Explorer 👻 🕂 >	TwinCAT ECAT D	EMO 👳 🗙									
○ ○ 습 io - @ / -	General Ethe	rCAT DC Process Data Plc	Startup	CoE - Online On	line NC: Onlir	ne NC: Functions					
Search Solution Explorer (Ctrl+;)	-										
Type System	▲ Upda	te List 🛛 Auto Undate	Single L	Indate Show Off	line Data						
TcCOM Objects											
MOTION	Adva	nced									
NC-Task 1 SAF		Calina Data	Mo	dule OD (AoF	0						
PLC	Add to	onine Data			-						
CO SAFETY	Index	Name	Flags	Value		Unit					
Mi C++	1000	Device type	PO	0-00040102 (26)	2546)	onic					
4 🚾 I/O	1000	Device type	RO	0x00040192 (20	2040)						
Devices	1001	Error register	RO	0x00 (0)							
turnere limage	1008	Device name	RU	ECTOD							
image-Info	1009	Hardware version	RO	AI	Set Value Dia	write 1	×				
SvncUnits	- 100A	Software version	RO	101A	Deci	1		100 A.			
Inputs	±-1010:0	Store Parameters	RW	>1<	Dec.						
Outputs	=- 1011:0	Restore Parameters	RW	>1<	Hex	0x0001	Cancel				
InfoData	1011:0	01 Restore all default parameters	RW	0x0000 (0)	Float						
 I * Drive 1 (ECR60) 	⊕ 1018:0	Identity		> 4 <							
🔺 🔜 Transmit PDO 1	🖲 10F1:0	Error Settings		> 2 <							
🌮 Status Word	10F8	Timestamp Object	RW P	0x8c48b3b7355	BOOK	<u> </u>	Hex Edit				
🚰 Modes of Operation display	E 1600:0	RXPDO 1 Mapping Parameter	RW	> 3 <	Binary:	01 00	2				
Position Actual Value	€ 1601:0	RXPDO 2 Mapping Parameter	RW	> 6 <	Bit Size:	○1 ○8 ●16 ○	32 0 64 0 ?				
Digital Inputs		RXPDO 3 Mapping Parameter	RW	> 5 <							
A Receive PDO 1		TXPDO 1 Mapping Parameter	RW	> 4 <							
Mada Of Operation		TXPDO 2 Mapping Parameter	RW	> 4 <							
Profile Target Position	⊞ 1A02:0	TXPDO 3 Mapping Parameter	RW	> 0 <							
WeState		Sync manager type		> 4 <							
InfoData											*
A Select	t the drive wher	e you want to restore all o	lefault pa	rameters							
🔺 🛁 Transmit PDO 1											
😤 Status Word	Name	Online Type	Size	e ≻Add In/O	Out User L	inked to					
😤 Modes of Operation display	📌 Status Word	X 4657 UIN1	2.0	82.0 Inpu	ut 0 n	State1, nState2					
📌 Position Actual Value	Error List - Ope	n Documents									-
Digital Inputs	🝸 - 🔀 0 of	5 Errors 0 of 0 Warnings	1 0 of 14 N	Messages Clear						Search Erro	or List
A 🖷 Receive PDO 1	Descriptio	10 A						File	Line	Column	Project
See Control Word	Beschpue								cine	Column	ojo ot

After restoring all default parameters, the drive power outage restart is valid.

4. Contact information

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