

SuperCAT User's Manual

Software EtherCAT Motion Controller



Manual Rev.:1.0Revision Date:April 26, 2023Part Number:50M-00132-1000

LEADING EDGE COMPUTING



Preface

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Revision History

Revision	Description	Date	Ву
1.0	Initial release	2023-04-26	RA

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1 Introduction

ADLINK SuperCAT is a software defined EtherCAT motion controller able to support up to 128 synchronized axes and over 10,000 points simultaneously. SuperCAT fully supports the ADLINK ECAT-4XMO series for EtherCAT to pulse train conversion and diversified pulse control. SuperCAT also supports the ADLINK ECAT-TRG4 series with comparison triggers used for AOI/dispensing machines. Optimum jitter control is provided in minimal cycles of 125µs to optimize synchronous I/O performance for vertical automation applications in the semiconductor and electronics manufacturing industries, among others.

SuperCAT provides an out-of-shell application-ready (APS) function library to generate multi-dimensional, highly synchronized, time-deterministic event-triggered motion and I/O control. A wide range of compatible third-party slaves are easily controlled with ADLINK's APS function library. ADLINK's Motion Creator Pro 2 utility is fully compliant with the Microsoft Windows environment, allowing complete EtherCAT motion and I/O configuration and function evaluation as well as process download functions.

1.1 Product Nomenclature

EM	-	n	x	0	0	У
		Supported Axes	P = P2P	Reserved	Specific application	NA = file license
		2 = 16 axes	C = interpolation			D = dongle license
		4 = 32 axes	A = advance			
		8 = 64 axes				
		F = 128 axes				

- EM: product identifier, short for EtherCAT Motion controller
- n: number of supported axes
- x: product support functionality
- y: license type. If a file license is requested, the license code is stored in the OS and detected via hardware ID or OS information on the platform. If using a dongle license, the license code is stored on the dongle and any platform with the dongle can work with the specific version of SuperCAT.

1.2 Anti-virus Compatibility with Real-time SuperCAT Execution

ADLINK recommends careful consideration when using anti-virus programs.

In general, anti-virus programs are designed to be compatible with a wide range of computer systems and software configurations. Some compatibility issues may arise depending on the specific anti-virus program and the software or hardware installed on the computer.

Some anti-virus programs may conflict with other security software installed on the computer, such as firewalls or anti-spyware programs, that can cause performance issues or prevent programs from functioning properly. In some cases, anti-virus programs may also conflict with other software or drivers, causing system instability or crashes.

Windows Defender is pre-installed in Windows 10 as an anti-virus component.

During regular tests of Windows with Windows Defender in real-time examinations of SuperCAT and ADLINK IPCs, ADLINK has found no real-time violations of SuperCAT; however, no there is no guarantee that future updates will potentially destabilize the system. Tests with active Windows Defender and SuperCAT "real-time operation" can cause real-time violations of SuperCAT because it monitors and examines process sequences and their data by accessing the Windows system.

Third-party anti-virus programs interact in different ways with the Windows system following installation and activation. ADLINK cannot guarantee that systems will remain unaffected by third-party software and its influence on the real-time execution of SuperCAT.

1.3 Disclaimer

ADLINK makes no warranties, expressed or implied, for real-time performance of SuperCAT after installation or update of other software, including but not limited to anti-virus software.



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2 Features and Specifications

2.1 Highlights

- EtherCAT Master software combines the EtherCAT protocol, IO control, and motion control with a short lead time
- Supports 125µs EtherCAT control cycle, and up to 128 axes motion control with one PC
- Fast and stable application that runs in real-time
- Run Motion Creator Pro 2 and applications at the same time to fine tune m/c UPH

2.2 Key Features

- EtherCAT open standard protocol CIA402 compliance for motion control
- Supports 2D coordination bias compensation for high precision movement
- App management and execution in real-time via process download function and GUI
- 16D linear interpolation and 3D spiral
- Real-time processing and EtherCAT Master achieved by allocating one CPU core, memory and LAN port
- Supports APS SDK for machine automation, compatible with ADLINK motion controller products
- Lowest jitter <20µs by fine tuning CAT-PAC controller



2.3 Product Function Portfolio

Category	Sub-category	EM-xP00(D)	EM-xC00(D)	EM-xA00(D)
Single Axis motion	P2P	\checkmark	\checkmark	\checkmark
	Pos/Vel Override	\checkmark	\checkmark	\checkmark
	Blending mode	\checkmark	\checkmark	\checkmark
	Homing	\checkmark	\checkmark	\checkmark
	Motion IO Mapping	\checkmark	\checkmark	\checkmark
Multi-Axes Motion	Linear Interpolation	\checkmark	\checkmark	\checkmark
	2D circular interpolation		\checkmark	\checkmark
	3D Spiral/Helical		\checkmark	\checkmark
	3D Circular interpolation		\checkmark	\checkmark
	Interpolation Group		\checkmark	\checkmark
	Gantry/E-Gear		\checkmark	\checkmark
	Gantry/E-Gear Homing		\checkmark	\checkmark
	Blending mode support	\checkmark	\checkmark	\checkmark
	Continuous Interpolation	Line Only	2D Line + 2D circular	\checkmark
	PVT		\checkmark	\checkmark
Speed Profile	T curve	\checkmark	\checkmark	\checkmark
	S curve		\checkmark	\checkmark
Compensation	Pitch Error Compensation		√	\checkmark
	Backlash compensation		\checkmark	\checkmark
	2D mesh compensation			\checkmark

2.4 System Requirements

- Supported Operating Systems
 - o Windows 10 32/64-bit
 - o Windows 11 32/64-bit
- Hardware
 - Intel Atom (AHL)/Core-i/Xeon with processor clock speed of 1.8 GHz or faster; dual-core or better is recommended supporting x86 architecture
 - RAM:
 - 32-bit systems: 1 GB min., 4 GB recommended
 - 64-bit systems: 2 GB min., 8 GB recommended
 - Storage: 32 GB min. Solid State Disk (SSD) recommended (10 GB for operating system and 1 GB for RT system)
 - x2APIC mode is currently not supported. Windows can be prevented from using this mode by entering **bcdedit.exe** /set {current} x2apicpolicy disable during installation.

2.5 Supported Network Controllers

Link Layer Name	Controller / Device ID	Windows 10/11
emllPcap	OS driver	x86
emlll8254x	82540EM / 0x100E	x86
Intel Pro/1000	82541EI / 0x1013	x64
	82541ER / 0x1078	
	82541GI / 0x1076	
	82541GI / 0x1077	
	82541PI / 0x107C	
	82545GM / 0x1026	
	82546EB / 0x1010	
	82546GB / 0x1079	
	82547EI / 0x1075	
	82547GI / 0x1019	
	82566DM / 0x1049	
	82566DM / 0x104A	
	82566L / 0x10BD	
	82566MC / 0x104D	
	82567V / 0x10CE	
	82567V / 0x1501	
	82567LM / 0x10DE	
	82567LM / 0x10F5	
	82571GB / 0x10A4	
	82571GB / 0x10BC	
	82572GI / 0x10B9	



Link Layer Name	Controller / Device ID	Windows 10/11
	82572PI / 0x107D	
	82573 / 0x108C	
	82573E / 0x108B	
	82573L / 0x109A	
	82574(L) / 0x10D3	
	82575 / 0x10A7	
	82577LM/0x10EA	
	82577LC / 0x10EB	
	82576 / 0x10C9	
	82576 ET2 / 0x1526	
	82576SN / 0x150A	
	82578DM / 0x10EF	
	82578DC / 0x10F0	
	82579LM / 0x1502	
	82579V / 0x1503	
	82580 / 0x150E	
	82580 QF / 0x1527	
	82583V / 0x150C	
	N1E5132 / 0x105E	
	l350 / 0x1521	
	I210AT / 0x1531	
	I210AT / 0x1532	
	l210 / 0x1533	
	I210 CFL / 0x157B	
	I211AT / 0x1539	
	I217LM / 0x153A	
	I217V / 0x153B	
	I218LM / 0x155A	
	l218V / 0x1559	
	l218V / 0x15A1	
	I218V / 0x15A3	
	l219LM / 0x156F	
	I219LM / 0x15B7	
	I219LM / 0x15BB	
	l219LM / 0x15D7	
	I219LM / 0x15E3	
	I219LM / 0x15B9	
	I219LM / 0x15BD	
	I219LM / 0x15BF	

SuperCAT

Link Layer Name	Controller / Device ID	Windows 10/11
	I219LM / 0x15E1	
	l219V / 0x1570	
	I219V / 0x15B8	
	I219V / 0x15BC	
	I219V / 0x15BE	
	I219V / 0x15D8	
	I219V / 0x15D6	
	I219V / 0x15E0	
	I219V / 0x15E2	
emllRTL8169	RTL8110 / 0x8169	x86
Realtek Gigabit	RTL8111 / 0x8168	x64
	RTL8168 / 0x8168	
	RTL8169 / 0x8169	
	RTL8169SC/0x8167	
	RTL8169 / 0x4300	
	RTL8103 / 0x8136	
emllCCAT	Beckhoff CCAT	x86
	CX2xxx, CX5xxx;	x64
	CX9020	



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3 System Configuration

3.1 Installation Guide

There are two SuperCAT packages:

- APS SDK: Includes all APIs for users to develop their own applications for ALDINK motion control products
- **EMA Core SDK**: Used for SuperCAT only. It provides the real-time environment for the EtherCAT master stack

3.1.1 Installing EMA Core and APS SDK

The EMA Core SDK and APS SDK require the Microsoft Visual C++ 2022 Redistributable package pre-installed. **Step 1**: Run the APS SDK executable, and then click **Install**.

A	DLINK A	PS-SDK - InstallShield Wizard
	A Ir	DLINK APS-SDK requires the following items to be installed on your computer. Click nstall to begin installing these requirements.
	Status	Requirement
	Pending	Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)
	Pending	Microsoft Visual C++ 2015 Redistributable Package (x86)
	Pending	Microsoft Visual C++ 2015 Redistributable Package (x64)
	Pending	Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)
	Pending	Microsoft Visual C++ 2005 SP1 Redistributable MFC Security Update KB2538242(x64)
	Pending	Microsoft Visual C++ 2005 SP1 Redistributable MFC Security Update KB2538242(x86)
	Pending	Microsoft Visual C++ 2005 SP1 Redistributable Package (x64)
	Pending	Microsoft Visual C++ 2005 SP1 Redistributable Package (x86)
		Install Cancel



The Microsoft Visual C++ 2022 Redistributable package begins installing.

ADLINK APS-SDK - InstallShield Wizard			
AD Ins	DLINK APS-SDK requires the following items to be installed on your computer. Click stall to begin installing these requirements.		
Status	Requirement		
Installing	Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)		
Pending	Microsoft Visual C++ 2015 Redistributable Package (x86)		
Pending	Pending Microsoft Visual C++ 2015 Redistributable Package (x64)		
Pending	Pending Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)		
Pending	Pending Microsoft Visual C++ 2005 SP1 Redistributable MFC Security Update KB2538242(x64)		
Pending	Microsoft Visual C++ 2005 SP1 Redistributable MFC Security Update KB2538242(x86)		
Pending	Microsoft Visual C++ 2005 SP1 Redistributable Package (x64)		
Pending	Microsoft Visual C++ 2005 SP1 Redistributable Package (x86)		
<	>		
Installing M	licrosoft Visual C++ 2010 SP1 Redistributable Package (x64)		
	Install Cancel		

Step 2: After the Microsoft Visual C++ 2022 Redistributable package finishes installing, the APS SDK begins installing.

ADLINK APS-SDK - InstallShield Wizard				
2	Preparing to Install			
	ADLINK APS-SDK Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.			
$\mathbf{A}_{\mathbf{A}}$	Extracting: ADLINK APS-SDK.msi			
	Cancel			

Step 3: After the installation file is extracted, the ADLINK APS-SDK installation dialog displays. Click **Next** to continue.



Step 4: Select I accept the terms in the license agreement and then click Next. (The installation process will be aborted if the terms in the license agreement are not accepted.)

🛃 ADLINK APS-SDK - InstallShield Wizard	×
License Agreement Please read the following license agreement carefully	
LICENSE AGREEMENT	^
IMPORTANT: PLEASE READ THE TERM THIS LICENSE AGREEMENT ("LICENS CAREFULLY BEFORE USING THE PRO PROVIDED BY ADLINK TECHNOLOG ADLINK, IS WILLING TO SELLING TH CUSTOMER AS THE INDIVIDUAL, THE LEGAL ENTITY THAT WILL BE UTILIZ	MS AND CONDITIONS OF SE AGREEMENT") ODUCT(PRODUCT) Y INC ("ADLINK"). IE PRODUCT TO E COMPANY, OR THE UNG ASSAMBLING OR
 I accept the terms in the license agreement I do not accept the terms in the license agreement 	Print
< Back	Next > Cancel



Step 5: Click Install to install the APS SDK.

🖟 ADLINK APS-SDK - InstallShield Wi	zard		×
Ready to Install the Program The wizard is ready to begin installation			と
Click Install to begin the installation.			
If you want to review or change any of exit the wizard.	your installation set	tings, click Back. C	lick Cancel to
InstallShield			
	< Back	Install	Cancel

APS SDK begins installing.

H ADLINK	APS-SDK - InstallShield Wi	zard	_		×
Installing The prog	ADLINK APS-SDK ram features you selected are	being installed.			と
13	Please wait while the InstallS take several minutes.	hield Wizard installs	ADLINK APS-SDK	. This may	
	Status:				
	Publishing product information	n			
InstallShield					
		< Back	Next >	Cano	el



Step 6: Once the APS SDK installation is complete, click Finish.

Step 7: After the APS SDK installation has completed, execute the EMA Core SDK installation file and then click **Install** to continue installing the Visual C++ 2022 Redistributable package.

EMA Core	-SDK - InstallShield Wizard
🗲 🕇	MA Core-SDK requires the following items to be installed on your computer. Click Install b begin installing these requirements.
Status	Requirement
Pending	Microsoft Visual C++ 2022 Redistributable Package (x64)
	Install Cancel



EMA Core-SDK - InstallShield Wizard
EMA Core-SDK requires the following items to be installed on your computer. Click Install to begin installing these requirements.
Status Requirement
Installing Microsoft Visual C++ 2022 Redistributable Package (x64)
Installing Microsoft Visual C++ 2022 Redistributable Package (x64)
Install Cancel

The Visual C++ 2022 Redistributable package starts installing.

Step 8: After the Visual C++ 2022 Redistributable package installation is completed, the EMA Core SDK begins installing. Click **Next** to install the EMA Core SDK.

🔀 EMA Core-SDK - InstallShie	ld Wizard	×
ک	Welcome to the InstallShield Wizard for EMA Core-SDK	1
	The InstallShield(R) Wizard will install EMA Core-SDK on your computer. To continue, click Next.	
	WARNING: This program is protected by copyright law and international treaties.	
	< Back Next > Cancel	

Step 9: Select I accept the terms in the license agreement and then click Next. (The installation process will be aborted if the terms in the license agreement are not accepted.)

🔀 EMA Core-SDK - InstallShield Wizard	×
License Agreement	
Please read the following license agreement carefully.	
LICENSE AGREEMENT	^
IMPORTANT: PLEASE READ THE TERMS AND CONDITIONS OF	
THIS LICENSE AGREEMENT ("LICENSE AGREEMENT")	
CAREFULLY BEFORE USING THE PRODUCT(PRODUCT)	
PROVIDED BY ADLINK TECHNOLOGY INC ("ADLINK").	
ADLINK, IS WILLING TO SELLING THE PRODUCT TO	
CUSTOMER AS THE INDIVIDUAL, THE COMPANY, OR THE	
LEGAL ENTITY THAT WILL BE UTILIZING, ASSAMBLING OR	<u> </u>
I accept the terms in the license agreement Print	
\bigcirc I do not accept the terms in the license agreement	
InstallShield	
< Back Next > Cancel	

Step 10: Click Install to continue installing the EMA Core SDK.

🖟 EMA Core-SDK - InstallShield Wizard	×
Ready to Install the Program	4.
The wizard is ready to begin installation.	0
Click Install to begin the installation.	
If you want to review or change any of your installation settings, exit the wizard.	click Back. Click Cancel to
InstallShield	
< Back In	Cancel



The EMA Core SDK begins installing.

🛃 EMA Co	re-SDK - InstallShield Wiza	ırd	_		\times
Installing The prog	EMA Core-SDK ram features you selected are	being installed.		Š	3
17	Please wait while the InstallSl take several minutes.	hield Wizard installs E	EMA Core-SDK. This	s may	
	Status:				
	Publishing product information	n			
InstallShield					
		< Back	Next >	Cance	el

Step 11: When the EMA Core SDK installation is completed, click Finish.

🛃 EMA Core-SDK - InstallShie	ld Wizard	×
ک	InstallShield Wizard Completed	
	The InstallShield Wizard has successfully installed EMA Core-SDK. Click Finish to exit the wizard.	
	Show the Windows Installer log	
	< Back Finish Cancel	

3.2 RTOS Configurator Tool

3.2.1 Start RTOS Configurator

Select RTOS Configurator from the Start menu.



3.2.2 CPU Assignment for RTOS

🗲 Configure RTOS			- 🗆 X	
То	olbar			
CPU Assignmnet NIC Assignmne	t			
Assign the operating system CPUs	to the RTOS.			
CPU	WIN10	RTOS	Reset	Control Zone
	 ✓ 		The Reset button means, that all CPUs with RTOS operating system are configured back to Windows operating	Configure button and
CPU3	V		system.	function description
CPU4	V		You must reboot after setting! ! !	
CPU5	V		The Default Define hutter more CDU	
CPU6	✓		configured for RTOS default definition.	
CPU7	V		You must reboot after setting!!!	
CPU8	✓		Save and Reboot	
CPU9	V		The Save & Reboot button means,after select number of configured CPUs for	
CPU10	V		RTOS.You need to save the configuration and reboot system.	
CPU11	V		You must reboot after setting!!!	
CPU12		V	v	
Starting!!!Please wait.			0.7.10.230106	Message bar and Status



Reset: All CPU cores with the RTOS operating system are configured back to the Windows operating system. The system must be rebooted after selecting this setting.

Default Define: CPU cores are configured for RTOS default definition. The system must be rebooted after selecting this setting.

CPU Assignmnet NIC Assignmne	t		
Assign the operating system CPUs	to the RTOS.		
CPU	WIN10	RTOS	^ Reset
CPU1	✓		The Recet button means that all CRU
SCPU2	V		with RTOS operating system are configured back to Windows operatin
CPU3	<		system.
CPU4	V		You must reboot after setting!!
CPU5	✓		Default Define
CPU6	V		The Default Define button means,CP configured for RTOS default definitio
CPU7	✓		You must reboot after setting! !
S CPU8	V		Save and Reboot
CPU9	V		The Save & Reboot button means, af select number of configured CPUs for
CPU10	V		RTOS.You need to save the configuration and reboot system.
CPU11	V		You must reboot after setting! !
		7	

When prompted to reboot the system, click Yes.

\mathbf{D}				
CPU Assignmnet NIC Assignm	nnet			
Assign the operating system CP	Us to the RTOS.			
CPU	WIN10	RTOS	^	Reset
CPU1	V		т	he Reset button means that all CPUs
CPU2	v		w	ith RTOS operating system are onfigured back to Windows operating
CPU3	RTOS Configurator Application	×	S	/stem.
CPU4	You must reboot after settin	gillill	Y	ou must reboot after setting! ! !
CPU5	Do you want to reboot after	the configuration is complete?		Default Define
CPU6	Yes	No Cancel	TI	he Default Define button means,CPU onfigured for RTOS default definition
SCPU7	✓		Y	ou must reboot after setting! ! !
SCPU8	✓			Save and Reboot
CPU9	V		TI	he Save & Reboot button means,afte elect number of configured CPUs for
CPU10	V		R	TOS.You need to save the onfiguration and reboot system.
CPU11	V		Y	ou must reboot after setting! ! !
CPU12		✓		

Save and Reboot: After selecting the number of configured cores for RTOS, you need to save the changes and reboot system.

CPU Assignmet NIC Assignment	t		
Assign the operating system CPUs	to the RTOS.		
CPU	WIN10	RTOS	Reset
CP01	V		The Recet button means that all CPI
CPU2	V		with RTOS operating system are configured back to Windows operatin
E CPU3	✓		system.
CPU4	V		You must reboot after setting! !
SCPU5	✓		Default Define
SCPU6	✓		The Default Define button means,CF configured for RTOS default definition
SCPU7	✓		You must reboot after setting! !
CPU8	V		Save and Reboot
CPU9	V		The Save & Reboot button means,af select number of configured CPUs fo
CPU10		V	RTOS.You need to save the configuration and reboot system.
CPU11		V	You must reboot after setting! !
		√	

When prompted to reboot the system, click Yes.

CPU Assignmet NIC Assignm	net Us to the RTOS.		
CPU	WIN10	RTOS	^ Reset
CPU1	V		The Reset button means, that all CPU with RTOS operating system are configured back to Windows operating
CPU3	🗲 RTOS Configurator Application	×	system.
CPU4	Do you want to reboot after the c	configuration is complete?	You must reboot after setting! !
CPU5			Default Define
CPU6		Yes No	The Default Define button means,CF configured for RTOS default definition
CPU7	V		You must reboot after setting! !
S CPU8	V		Save and Reboot
CPU9	V		The Save & Reboot button means, af select number of configured CPUs for
CPU10	V		RTOS.You need to save the configuration and reboot system.
CPU11	V		You must reboot after setting! !
CPU12		✓	



3.2.1 NIC Assignment for RTOS

Assign To RTOS:

- 1. Select the NIC from the Supported Network Controllers.
- 2. Click Assign to RTOS to select the NIC as EtherCAT LAN.

				_
Configure RTOS		-		
PU Assignmnet NIC Assignmnet				
WinOS NIC				
Y 🐚 Network interface controller(NIC)	Device Description:			
Positok DCIo ChE Esmily Controllor	Realtek PCIe 2.5GbE Family Controller 網路卡			
Realtek PCIe 2.5GbE Family Controller 網路卡	Hardware ID: PCI\VEN 10ECRDEV_8125&SUBSYS 87D71043&REV_05			
(1	Compatible ID:			
	PCI\VEN_10EC&DEV_8125&REV_05	Assign To	RTOS	
	PCI 匯流排 10,裝置 0,函數 0			2
	Friendly name:			(
	Realter PCIe 2.5GDE Family Controller 網路卡 v			
RTOS NIC				
A Realtime OS Devices				
		Revert To	WinOS	

After configuration is finished, the settings will be shown as below.

PU Assignmnet NIC Assignmnet			
Network interface controller(NIC) Realtek PCIe GbE Family Controller		Assign To	RTOS
TOS NIC Realtime OS Devices A RTOS Ethernet Controller	Device Description: RTOS Ethernet Controller Hardware ID: PCI\VEN_10EC&DEV_8125&SUBSYS_87D71043&REV_0 5 Compatible ID: PCI\VEN_10EC&DEV_8125&REV_05	Revert To V	VinOs
	Location Information: PCI 運流排 10, 裝置 0, 函數 0		

PU Assignmnet NIC Assignmnet		
WinOS NIC		
 V Network interface controller(NIC) Realtek PCIe GbE Family Controller 	Assign To R	ros
RTOS NIC		
A RTOS Ethernet Controller	RTOS Ethernet Controller Hardware ID: PCI/VEN_10EC&DEV_8125&SUBSYS_87D71043&REV_0 S Compatible ID: PCI/VEN_10EC&DEV_8125&REV_05 Location Information: PCI 廣流推 10, 裝置 0, 函數 0	nOS

Revert To WinOS: Clicking this item returns all NICs to the Windows configuration.

Start / Stop RTOS: Click the Run or Stop buttons to affect SuperCAT operations in real-time.

CPU Assignmnet NIC Assignmnet			
Assign the operating system CPUs f	to the RTOS.		â
CPU	WIN10	RTOS	Reset
CPU1	⊻		The Reset button means,that all CPI
CPU2	V		with RTOS operating system are configured back to Windows operati
CPU3	V		system.
CPU4	V		You must reboot after setting! !
CPU5	✓		Default Define
CPU6	✓		The Default Define button means,Cl configured for RTOS default definition
SCPU7	✓		You must reboot after setting! !
S CPU8	₹		Save and Reboot
CPU9	₹		The Save & Reboot button means,a select number of configured CPUs for
CPU10	✓		RTOS.You need to save the configuration and reboot system.
CPU11	✓		You must reboot after setting! !
CPU12		v	



If SuperCAT cannot work normally, a message will display indicating **Please reboot OS!!!**. Reboot the system and try again.

CPU Assignmnet NIC Assignmnet	t		
ssign the operating system CPUs	to the RTOS.		
CPU	WIN10	RTOS	^ Reset
g CPU1	V		The Reset button means that all CPL
CPU2	V		with RTOS operating system are configured back to Windows operating
CPU3	V		system.
CPU4	V		You must reboot after setting! !
CPU5	V		Default Define
CPU6	V		The Default Define button means,CF configured for RTOS default definition
CPU7	V		You must reboot after setting! !
CPU8	✓		Save and Reboot
CPU9	V		The Save & Reboot button means, af select number of configured CPUs for
CPU10	V		RTOS.You need to save the configuration and reboot system.
CPU11	V		You must reboot after setting! !
		J	

When the message bar displays RTOS Status: Start, the SuperCAT run-time operation is working.

CPU Assignment NIC Assignment	t the BTOS		
CPU	WIN10	RTOS	A
CPU1	V		The Reset button means,that all CPI
CPU2	✓		with RTOS operating system are configured back to Windows operati
CPU3	<		You must reboot after setting! !
CPU4	<		Default Define
CPU5	<		The Default Define button means,C
CPU6	<		configured for RTOS default definition
CPU7	<		Save and Reboot
CPU8	<		The Save & Reboot button means a
CPU9	<		select number of configured CPUs for RTOS.You need to save the
CPU10	✓		configuration and reboot system.
CPU11		✓	Tou must reboot after setting!

Clicking the Stop button during SuperCAT run-time will display RTOS Status: STOP in the message bar.

🗲 Configure RTOS			- 🗆 ×
00			
CPU Assignmnet NIC Assignmnet			
Assign the operating system CPUs to	o the RTOS.		
CPU	WIN10	RTOS	^ Reset
	✓		The Reset button means, that all CPUs
CPU2	V		with RTOS operating system are configured back to Windows operating
CPU3	✓		system.
CPU4	V		You must reboot after setting!!!
CPU5	✓		Default Define
CPU6	√		The Default Define button means,CPU configured for RTOS default definition.
CPU7	√		You must reboot after setting!!!
CPU8	✓		Save and Reboot
CPU9	✓		The Save & Reboot button means, after select number of configured CPUs for
CPU10	V		RTOS.You need to save the configuration and reboot system.
CPU11	V		You must reboot after setting!!!
CPU12		V	

Click the minimize button to have the GUI minimize to the system tray.

🗲 Configure RTOS			- 🗆 X
$\bigcirc \bigcirc$			爱小化
CPU Assignmnet NIC Assignmne	t		
Assign the operating system CPUs	to the RTOS.		
CPU	WIN10	RTOS	^ Reset
CPU1	V		The Benet button means that all CBUs
CPU2	V		with RTOS operating system are configured back to Windows operating
CPU3	<		system.
CPU4	V		You must reboot after setting!!!
CPU5	✓		Default Define
CPU6	V		The Default Define button means,CPU configured for RTOS default definition.
CPU7	✓		You must reboot after setting!!!
CPU8	V		Save and Reboot
CPU9	V		The Save & Reboot button means,after select number of configured CPUs for
CPU10	V		RTOS.You need to save the configuration and reboot system.
CPU11	V		You must reboot after setting!!!
CPU12		V	~
RIOS Status: Stop			0.7.10.230106



Hovering over the SuperCAT icon in system tray indicates the current run-time status. **Working** means the SuperCAT run-time is running, while **Not working** means the SuperCAT run-time has stopped.



4 Appendix

4.1 SuperCAT Function Support List

Function name	Description	EM-xP00	EM-xC00	EM-xA00
System & Initialization			•	
APS_initial	Device initialization	\checkmark	\checkmark	\checkmark
APS_close	Device close	\checkmark	\checkmark	\checkmark
APS_version	Get the version of the library	\checkmark	\checkmark	\checkmark
APS_device_driver_version	Get the device driver version	\checkmark	\checkmark	\checkmark
APS_get_axis_info	Get the information of the specified axis	\checkmark	\checkmark	\checkmark
APS_get_card_name	Get card index	\checkmark	\checkmark	\checkmark
APS_disable_device	Disable cards	\checkmark	\checkmark	\checkmark
APS_set_board_param	Set board parameter	\checkmark	\checkmark	\checkmark
APS_get_board_param	Get board parameter	\checkmark	\checkmark	\checkmark
APS_set_axis_param	Set axis parameter	\checkmark	\checkmark	\checkmark
APS_get_axis_param	Get axis parameter	\checkmark	\checkmark	\checkmark
APS_set_axis_param_f	Set axis parameter by double	\checkmark	√	\checkmark
APS_get_axis_param_f	Get axis parameter by double	\checkmark	\checkmark	\checkmark
APS_get_system_timer	Get system timer counter	\checkmark	\checkmark	\checkmark
APS_get_device_info	Get device information	\checkmark	\checkmark	\checkmark
APS_get_first_axisId		\checkmark	\checkmark	\checkmark
APS_save_parameter_to_flash	Save system & axes parameters to flash	\checkmark	\checkmark	\checkmark
APS_load_parameter_from_flash	Load system & axes parameters from flash	\checkmark	\checkmark	\checkmark
APS_load_parameter_from_default	Load system & axes parameters by default value.	\checkmark	\checkmark	\checkmark
APS_set_security_key	Set security password	Х	Х	Х
APS_check_security_key	Verify security password	Х	Х	Х
APS_reset_security_key	Reset security password	Х	X	Х
APS_save_param_to_file	Save parameters to file	Х	Х	Х
APS_load_param_from_file	Load parameters from file	\checkmark	\checkmark	\checkmark
APS_load_config_from_file	Load configure file to card. Each card would have different function with option argument.	\checkmark	\checkmark	\checkmark
Motion IO and motion status			•	
APS_motion_status	Return motion status	\checkmark	\checkmark	\checkmark
APS_motion_status_async	Return motion status while async mode enable	\checkmark	\checkmark	\checkmark
APS_motion_io_status	Return motion IO status	\checkmark	\checkmark	\checkmark
APS_motion_io_status_async	Return motion IO status while async mode enable	\checkmark	\checkmark	\checkmark



Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_set_servo_on	Set servo ON/OFF	\checkmark	\checkmark	\checkmark
APS_get_position_f	Get feedback position by double	\checkmark	\checkmark	\checkmark
APS_get_position_f_async	Get feedback position by double while async mode enable	\checkmark	\checkmark	\checkmark
APS_set_position_f	Set feedback position by double	\checkmark	\checkmark	\checkmark
APS_get_command_f	Get command position by double	\checkmark	\checkmark	\checkmark
APS_get_command_f_async	Get command position by double while async mode enable	\checkmark	\checkmark	\checkmark
APS_set_command_f	Set command position by double	\checkmark	\checkmark	\checkmark
APS_get_error_position_f	Get error position by double	\checkmark	\checkmark	\checkmark
APS_get_target_position_f	Get target position by double	\checkmark	\checkmark	\checkmark
APS_get_command_velocity_f	Get command velocity by double	\checkmark	\checkmark	\checkmark
APS_get_feedback_velocity_f	Get feedback velocity by double	\checkmark	\checkmark	\checkmark
APS_get_mq_free_space	Get free space of motion queue	\checkmark	\checkmark	\checkmark
APS_get_mq_usage	Get usage of motion queue	\checkmark	\checkmark	\checkmark
APS_get_stop_code	Get stop code	\checkmark	\checkmark	\checkmark
APS_get_encoder	Get raw feedback counter	\checkmark	\checkmark	\checkmark
APS_get_command_counter	Get raw command counter	\checkmark	\checkmark	\checkmark
APS_reset_command_counter	Reset raw command counter	\checkmark	\checkmark	\checkmark
Single axis motion	<u> </u>		ł	
APS_home_move	Begin a home move	\checkmark	\checkmark	\checkmark
APS_stop_move	Stop move	\checkmark	\checkmark	\checkmark
APS_emg_stop	Emergency stop	\checkmark	\checkmark	\checkmark
Multi-axes move trigger & stop			<u>.</u>	
APS_move_trigger	Send a trigger to sync all waiting moves		\checkmark	\checkmark
APS_stop_move_multi	Multi-axes stop move		\checkmark	\checkmark
APS_emg_stop_multi	Multi-axes emg stop move		\checkmark	\checkmark
Jog move				
APS_jog_start	Start / stop jog move		\checkmark	\checkmark
Advanced single move & interpolation			1	
APS_ptp	Begin a single move	\checkmark	\checkmark	\checkmark
APS_ptp_v	Begin a single move with Vm profile	\checkmark	\checkmark	\checkmark
APS_ptp_all	Begin a single move with all profile	\checkmark	\checkmark	\checkmark
APS_vel	Begin a velocity move	\checkmark	\checkmark	\checkmark
APS_vel_all	Begin a velocity move with all profile	\checkmark	\checkmark	\checkmark
APS_line	Begin a line move	\checkmark	\checkmark	\checkmark
APS_line_v	Begin a line move with Vm profile	\checkmark	\checkmark	\checkmark
APS_line_all	Begin a line move with all profile	\checkmark	\checkmark	\checkmark

Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_arc2_ca	Begin an Arc2 move of angle type		\checkmark	\checkmark
APS_arc2_ca_v	Begin an Arc2 move of angle type with Vm profile		\checkmark	\checkmark
APS_arc2_ca_all	Begin an Arc2 move of angle type with all profile		\checkmark	\checkmark
APS_arc2_ce	Begin an Arc2 move of end position		\checkmark	\checkmark
APS_arc2_ce_v	Begin an Arc2 move of end position with Vm profile		\checkmark	\checkmark
APS_arc2_ce_all	Begin an Arc2 move of end position with all profile		\checkmark	\checkmark
APS_arc3_ca	Begin an Arc3 move of angle type		\checkmark	\checkmark
APS_arc3_ca_v	Begin an Arc3 move of angle type with Vm profile		\checkmark	\checkmark
APS_arc3_ca_all	Begin an Arc3 move of angle type with all profile		\checkmark	\checkmark
APS_arc3_ce	Begin an Arc3 move of end position		\checkmark	\checkmark
APS_arc3_ce_v	Begin an Arc3 move of end position with Vm profile		\checkmark	\checkmark
APS_arc3_ce_all	Begin an Arc3 move of end position with all profile		\checkmark	\checkmark
APS_spiral_ca	Begin a 3D spiral-helix move of angle type		\checkmark	\checkmark
APS_spiral_ca_v	Begin a 3D spiral-helix move of angle type with Vm profile		\checkmark	\checkmark
APS_spiral_ca_all	Begin a 3D spiral-helix move of angle type with all profile		\checkmark	\checkmark
APS_spiral_ce	Begin a 3D spiral-helix move of end position		\checkmark	\checkmark
APS_spiral_ce_v	Begin a 3D spiral-helix move of end position with Vm profile		\checkmark	\checkmark
APS_spiral_ce_all	Begin a 3D spiral-helix move of end position with all profile		\checkmark	\checkmark
Interrupt				
APS_int_enable	Interrupt main switch	\checkmark	\checkmark	\checkmark
APS_set_int_factor	Enable/Disable interrupt factor and get interrupt handle.	\checkmark	\checkmark	\checkmark
APS_get_int_factor	Get interrupt factor enable or disable	\checkmark	\checkmark	\checkmark
APS_wait_single_int	Wait single interrupt event	\checkmark	\checkmark	\checkmark
APS_wait_multiple_int	Wait multiple interrupt events	\checkmark	\checkmark	\checkmark
APS_wait_error_int	Wait error interrupts(Non-mask) (HW function)			
APS_reset_int	Reset interrupt event to non-signaled state.	\checkmark	\checkmark	\checkmark
APS_set_int	Set interrupt event to signaled state.	\checkmark	\checkmark	\checkmark
APS_set_int_factorH	Enable/Disable interrupt factor and get interrupt handle.(Win32)	\checkmark	\checkmark	\checkmark
APS_int_no_to_handle	Convert interrupt event number to interrupt handle.(Win32)			



Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_register_int_callback	Register callback function while interrupt occurred	\checkmark	\checkmark	\checkmark
Sampling				
APS_set_sampling_param	Set sampling parameter.	\checkmark	\checkmark	\checkmark
APS_get_sampling_param	Get sampling parameter.	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling	Waiting for sample data.	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling_async	Waiting for sample data asynchronously	\checkmark	\checkmark	\checkmark
APS_get_sampling_count	Get sampled data count.	\checkmark	\checkmark	\checkmark
APS_stop_wait_sampling	Force stop wait sampling	\checkmark	\checkmark	\checkmark
APS_auto_sampling	Start/Stop auto sampling	\checkmark	\checkmark	\checkmark
APS_get_sampling_data	Get sampling data in auto sampling mode by 4 Channels.	\checkmark	\checkmark	\checkmark
APS_set_sampling_param_ex	Set sampling parameter by structure. It is an extension to 8 channels.	\checkmark	\checkmark	\checkmark
APS_get_sampling_param_ex	Get sampling parameter by structure. It is an extension to 8 channels.	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling_ex	Waiting for sample data. It is an extension to 8 channels.	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling_async_ex	Waiting for sample data asynchronously. It is an extension to 8 channels.	\checkmark	\checkmark	\checkmark
APS_get_sampling_data_ex	Get sampling data in auto sampling mode. It is an extension to 8 channels.	\checkmark	\checkmark	\checkmark
APS_set_sampling_param_advanced	Set 16 channel sampling parameter	\checkmark	\checkmark	\checkmark
APS_get_sampling_param_ advanced	Get 16 channel sampling parameter	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling_advanced	Waiting for 16 channel sample data.	\checkmark	\checkmark	\checkmark
APS_wait_trigger_sampling_async_advanced	Waiting for 16 channel sample data asynchronously	\checkmark	\checkmark	\checkmark
APS_get_sampling_data_advanced	Get sampling data in auto sampling mode by 16 Channels.	\checkmark	\checkmark	\checkmark
DIO & AIO				
APS_set_field_bus_d_channel_output	Set field bus digital output by channel	\checkmark	\checkmark	\checkmark
APS_get_field_bus_d_channel_output	Get field bus digital output by channel	\checkmark	\checkmark	\checkmark
APS_get_field_bus_d_channel_input	Get field bus digital input by channel	\checkmark	\checkmark	\checkmark
APS_set_field_bus_d_port_output	Set field bus digital output by port	\checkmark	\checkmark	\checkmark
APS_get_field_bus_d_port_input	Get field bus digital input by port	\checkmark	\checkmark	\checkmark
APS_get_field_bus_d_port_output	Get field bus digital output by port	\checkmark	\checkmark	\checkmark
Advanced Point table				
APS_pt_enable	Enable point table.	\checkmark	\checkmark	\checkmark
APS_pt_disable	Disable point table.	\checkmark	\checkmark	\checkmark
APS_get_pt_info	Get information of point table.	\checkmark	\checkmark	\checkmark
APS_pt_set_vs	Set configuration of Vs to point table	\checkmark	\checkmark	\checkmark

Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_pt_get_vs	Get configuration of Vs in the point table	\checkmark	\checkmark	\checkmark
APS_pt_start	Set control command to point table	\checkmark	\checkmark	\checkmark
APS_pt_stop	Stop point table	\checkmark	\checkmark	\checkmark
APS_get_pt_status	Get status of point table	\checkmark	\checkmark	\checkmark
APS_reset_pt_buffer	Reset buffer of point table	\checkmark	\checkmark	\checkmark
APS_pt_roll_back	Rollback to previous point		\checkmark	\checkmark
APS_get_pt_error	Get error code of point table		\checkmark	\checkmark
APS_pt_dwell	Push a dwell move into point buffer of point table.		\checkmark	\checkmark
APS_pt_line	Push a line move into point buffer of point table.	\checkmark	\checkmark	\checkmark
APS_pt_arc2_ca	Push a 2D arc move into point buffer of point table.		\checkmark	\checkmark
APS_pt_arc2_ce	Push a 2D arc move into point buffer of point table.		\checkmark	\checkmark
APS_pt_arc3_ca	Push a 3D arc move into point buffer of point table.			\checkmark
APS_pt_arc3_ce	Push a 3D arc move into point buffer of point table.			\checkmark
APS_pt_spiral_ca	Push a helical move into point buffer of point table.			\checkmark
APS_pt_spiral_ce	Push a helical move into point buffer of point table.			\checkmark
APS_pt_ext_set_do_ch	Set Do extension command into command buffer. Command buffer is active when pushing a move into point table.			\checkmark
APS_pt_set_absolute	Set absolute profile into profile buffer.	\checkmark	\checkmark	\checkmark
APS_pt_set_relative	Set relative profile into profile buffer.	\checkmark	\checkmark	\checkmark
APS_pt_set_trans_buffered	Set transition to buffer mode in profile buffer.		\checkmark	\checkmark
APS_pt_set_trans_inp	Set transition to in-position mode in profile buffer.		\checkmark	\checkmark
APS_pt_set_trans_blend_dec	Set transition to blending mode with deceleration in profile buffer.		\checkmark	\checkmark
APS_pt_set_trans_blend_dist	Set transition to blending mode with residue distant in profile buffer.		\checkmark	\checkmark
APS_pt_set_trans_blend_pcnt	Set transition to blending mode with residue distant percentage in profile buffer.		\checkmark	\checkmark
APS_pt_set_acc	Set acceleration profile into profile buffer.	\checkmark	\checkmark	\checkmark
APS_pt_set_dec	Set deceleration profile into profile buffer.	\checkmark	\checkmark	\checkmark
APS_pt_set_acc_dec	Set acceleration / deceleration profile into profile buffer	\checkmark	\checkmark	\checkmark
APS_pt_set_s	Set S-factor profile into profile buffer.		\checkmark	\checkmark



Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_pt_set_vm	Set maximum velocity profile into profile buffer.	\checkmark	\checkmark	\checkmark
APS_pt_set_ve	Set end velocity profile into profile buffer.	\checkmark	\checkmark	\checkmark
Field bus functions				
APS_scan_field_bus	Scan field bus and generate ENI file	\checkmark	\checkmark	\checkmark
APS_start_field_bus	Start the network of specified field bus	\checkmark	\checkmark	\checkmark
APS_stop_field_bus	Stop the network of specified field bus	\checkmark	\checkmark	\checkmark
APS_set_field_bus_a_output	Set field bus analog output	\checkmark	\checkmark	\checkmark
APS_get_field_bus_a_output	Get field bus analog output	\checkmark	\checkmark	\checkmark
APS_get_field_bus_a_input	Get field bus analog input	\checkmark	\checkmark	\checkmark
APS_get_slave_online_status	Get the online status of slave	\checkmark	\checkmark	\checkmark
APS_get_field_bus_master_status	Get field bus master status	\checkmark	\checkmark	\checkmark
APS_get_field_bus_last_scan_info	Get fieldbus info after system scanning.	\checkmark	\checkmark	\checkmark
APS_get_field_bus_module_info	Get slave information	\checkmark	\checkmark	\checkmark
APS_reset_field_bus_alarm	Reset the alarm signal of slave	\checkmark	\checkmark	\checkmark
APS_get_field_bus_alarm	Get alarm code of slave	\checkmark	\checkmark	\checkmark
APS_get_field_bus_pdo	Get value from PDO memory	\checkmark	\checkmark	\checkmark
APS_set_field_bus_pdo	Set value to PDO memory	\checkmark	\checkmark	\checkmark
APS_get_field_bus_pdo_offset	Get PDO information	\checkmark	\checkmark	\checkmark
APS_get_field_bus_sdo	Get SDO data from slave	\checkmark	\checkmark	\checkmark
APS_set_field_bus_sdo	Set SDO data to slave	\checkmark	\checkmark	\checkmark
APS_set_field_bus_od_data	Set EtherCAT OD raw data	\checkmark	\checkmark	\checkmark
APS_get_field_bus_od_data	Get EtherCAT OD raw data	\checkmark	\checkmark	\checkmark
APS_get_field_bus_od_module_info	Get EtherCAT slave information	\checkmark	\checkmark	\checkmark
APS_get_field_bus_module_map	Get mapped slave ID in manual ID mode	\checkmark	\checkmark	\checkmark
APS_set_field_bus_module_map	Set mapped slave ID in manual ID mode	\checkmark	\checkmark	\checkmark
APS_get_field_bus_slave_state	Get the status of slave's state machine	\checkmark	\checkmark	\checkmark
APS_set_field_bus_slave_state	Set the status of slave's state machine	\checkmark	\checkmark	\checkmark
APS_get_field_bus_ESC_register	Get EtherCAT Slave Controller register	\checkmark	\checkmark	\checkmark
APS_set_field_bus_ESC_register	Set EtherCAT Slave Controller register	\checkmark	\checkmark	\checkmark
APS_get_system_loading	Get system loop loading	\checkmark	\checkmark	\checkmark
APS_get_field_bus_analysis_topology	Get current and past topology then analysis	\checkmark	\checkmark	\checkmark
APS_get_field_bus_loss_package	Get the loss of EtherCAT frame count on receive bus direction.	\checkmark	\checkmark	\checkmark

Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_set_drive_input_mapping	send the configuration CSV file of drive input mapping			
APS_set_trigger_output_mapping	send the configuration CSV file of trigger output mapping,			
Gear / Gantry functions				
APS_start_gear	Enable/Disable a specified gear mode		\checkmark	\checkmark
APS_get_gear_status	Get gear status		\checkmark	\checkmark
APS_get_gantry_number	Get number of this master's corresponding slaves		\checkmark	\checkmark
APS_get_gantry_info	Get slave axis ID array		\checkmark	\checkmark
APS_get_gantry_deviation	Get position deviation between master and slaves		\checkmark	\checkmark
Pitch error compensation functions				
APS_set_pitch_table	Set configurations and data of pitch error compensation table		\checkmark	\checkmark
APS_get_pitch_table	Get configurations and data of pitch error compensation table		\checkmark	\checkmark
APS_start_pitch_comp	Start pitch error compensation		\checkmark	\checkmark
Field bus Compare trigger				
APS_set_field_bus_trigger_param	Set compare trigger related parameter	\checkmark	\checkmark	\checkmark
APS_get_field_bus_trigger_param	Get compare trigger related parameter	\checkmark	\checkmark	\checkmark
APS_set_field_bus_trigger_linear	Set linear comparing function	\checkmark	\checkmark	\checkmark
APS_set_field_bus_trigger_table	Set table comparing function	\checkmark	\checkmark	\checkmark
APS_set_field_bus_trigger_manual	Manual output trigger	\checkmark	\checkmark	\checkmark
APS_set_field_bus_trigger_manual_s	Manual output trigger synchronously	\checkmark	\checkmark	\checkmark
APS_get_field_bus_trigger_table_cmp	Get current table comparing value	\checkmark	\checkmark	\checkmark
APS_get_field_bus_trigger_linear_cmp	Get current linear comparing value	\checkmark	\checkmark	\checkmark
APS_get_field_bus_trigger_count	Get triggered count.	\checkmark	\checkmark	\checkmark
APS_reset_field_bus_trigger_count	Reset triggered count.	\checkmark	\checkmark	\checkmark
APS_get_field_bus_linear_cmp_remain_count	Get remaining counter of linear comparator	\checkmark	\checkmark	\checkmark
APS_get_field_bus_table_cmp_remain_count	Get remaining counter of table comparator	\checkmark	\checkmark	\checkmark
APS_get_field_bus_encoder	Get encoder counter	\checkmark	\checkmark	\checkmark
APS_set_field_bus_encoder	Set encoder counter	\checkmark	\checkmark	\checkmark
APS_get_field_bus_timer_counter	Get the timer counter value.	\checkmark	\checkmark	\checkmark
APS_set_field_bus_timer_counter	Set timer count value. The timer is used to simulate for encoder, and be comparator source.	\checkmark	\checkmark	\checkmark
APS_set_field_bus_multi_trigger_table	Push data in table (FIFO) for comparing. There are two comparators designed for multi- dimension comparing application	\checkmark	\checkmark	\checkmark



Function name	Description	EM-xP00	EM-xC00	EM-xA00	
APS_get_field_bus_multi_trigger_table_cmp	Get current comparing value in the specified multi-dimension table comparator	\checkmark	\checkmark	\checkmark	
APS_get_field_bus_multi_table_cmp_remain_count	Used to get remaining counter of multi-dimension comparator.	\checkmark	\checkmark	\checkmark	
Field bus position latch functions					
APS_get_field_bus_ltc_fifo_point	Get latch point array.	\checkmark	\checkmark	\checkmark	
APS_set_field_bus_ltc_fifo_param	Set latch parameter value.	\checkmark	\checkmark	\checkmark	
APS_get_field_bus_ltc_fifo_param	Get latch parameter value.	\checkmark	\checkmark	\checkmark	
APS_reset_field_bus_ltc_fifo	Reset latch queue and fifo.	\checkmark	\checkmark	\checkmark	
APS_get_field_bus_ltc_fifo_usage	Get latch queue used space.	\checkmark	\checkmark	\checkmark	
APS_get_field_bus_ltc_fifo_free_space	Get latch queue free space.	\checkmark	\checkmark	\checkmark	
APS_get_field_bus_ltc_fifo_status	Get latch queue and fifo status.	\checkmark	\checkmark	\checkmark	
Watch dog timer			1		
APS_wdt_start	Start / Stop watch dog timer	\checkmark	\checkmark	\checkmark	
APS_wdt_get_timeout_period	Get a timeout period of watch dog timer	\checkmark	\checkmark	\checkmark	
APS_wdt_reset_counter	Reset counter of watch dog timer	\checkmark	\checkmark	\checkmark	
APS_wdt_get_counter	Get counter of watch dog timer	\checkmark	\checkmark	\checkmark	
APS_wdt_set_action_event	Set action event of watch dog timer	\checkmark	\checkmark	\checkmark	
APS_wdt_get_action_event	Get action event of watch dog timer	\checkmark	\checkmark	\checkmark	
Circular limit functions		Į	4		
APS_set_circular_limit	Set circular limit configurations		\checkmark	\checkmark	
APS_get_circular_limit	Get circular limit configurations		\checkmark	\checkmark	
Backlash functions		<u> </u>	<u> </u>		
APS_set_backlash_en	Enable/Disable backlash	\checkmark	\checkmark	\checkmark	
APS_get_backlash_en	Check backlash is enabled / disabled	\checkmark	\checkmark	\checkmark	
2-D compensation					
APS_set_2d_compensation_table	Create 2D compensation table			\checkmark	
APS_get_2d_compensation_table	Get 2D compensation table configuration			\checkmark	
APS_start_2d_compensation	Start or stop 2D compensation table			\checkmark	
APS_absolute_linear_move_2d_compensation	2D absolute linear interpolation			\checkmark	
APS_get_2d_compensation_command_position	Get command and feedback position			\checkmark	
Single axis torque motion					
APS_torque_move	Proceed motion of torque for single axis	\checkmark	\checkmark	\checkmark	
APS_get_torque_command	Get command torque value.	\checkmark	\checkmark	\checkmark	
APS_get_actual_torque	Get actual torque value from device.	\checkmark	\checkmark	\checkmark	

Function name	Description	EM-xP00	EM-xC00	EM-xA00
APS_set_command_control_mode	Set the command control mode of axis to cyclic synchronous position (CSP)mode or cyclic synchronous torque(CST) mode	\checkmark	\checkmark	~
APS_get_command_control_mode	Get the command control mode of axis	\checkmark	\checkmark	\checkmark
Diagnostic function				
APS_get_field_bus_frame_loss_diagnostic	Confirm if EtherCAT Master was under continuous frame losing situation	\checkmark	\checkmark	\checkmark
APS_reset_field_bus_frame_loss_diagnostic	Reset frame loss diagnostic result.	\checkmark	\checkmark	\checkmark
APS_get_field_bus_slave_connecting_diagnostic	Confirm whether the connecting slave is in the connecting state	\checkmark	\checkmark	\checkmark
Table definition		\checkmark	\checkmark	\checkmark
Board parameter table		\checkmark	\checkmark	\checkmark
Axis parameter table		\checkmark	\checkmark	\checkmark
Sampling parameter table		\checkmark	\checkmark	\checkmark
Sampling source table		\checkmark	\checkmark	\checkmark
Motion IO status and motion status definitions		\checkmark	\checkmark	\checkmark
Motion status definition table		\checkmark	\checkmark	\checkmark
Interrupt factor table		\checkmark	\checkmark	\checkmark
Field bus parameter table		\checkmark	\checkmark	\checkmark
Gantry parameters table		\checkmark	\checkmark	\checkmark
APS functions return code		\checkmark	\checkmark	\checkmark



4.2 SuperCAT Performance Optimization

4.2.1 Adjust BIOS Settings

4.2.1.1. CRB_Advanced Menu Settings

• Disable Legacy USB Support.

	Aptio Setup – AMI CRB_Adva	nced
USB Configuration		Enables Legacy USB support.
USB Module Version	28	support if no USB devices are connected. DISABLE option will
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices: 1 Drive, 1 Keyboard, 1 Mouse		
Legacy USB Support	[Disabled]	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:	for 1	++: Select Screen
USB transfer time-out Device reset time-out	[20 sec]	I∔: Select Item Enter: Select
Device power-up delay	[Auto]	+/-: Change Opt. E1: General Heln
Mass Storage Devices:		F8: Previous Values
JetFlashTranscend 4GB 8.07	[Auto]	F9: Optimized Defaults F10:Save & Exit ESC: Exit
Version 2	2.22.1286 Copyright (C) 2023	AMI

4.2.1.2. Advanced Menu Settings

Disable the following Advanced menu settings:

- Hyper-Threading
- Intel(R) SpeedStep(tm)
- Intel(R) Speed Shift Technology
- C states

Aptio Setup - AMI Advanced Package Not Implemented Yet Offset from factory set Tcc Stepping CO. activation temprature at which the Thermal Control Circuit Number of Efficient-cores 8Core(s) / 8Thread(s) Number of Performance-cores 8Core(s) / 8Thread(s) must be activated. Tcc will be TD. 0x90672 activated at: Tcc Activation Microcode Revision 23 Temp - Tcc Activation Offset. 2300 MHz Speed Tcc Activation Offset range is L1 Data Cache 48 KB x 8 0 to 63. L1 Instruction Cache 32 KB x 8 L2 Cache 1280 KB × 8 L3 Cache 30 MB VMX. Supported. SMX/TXT Supported ++: Select Screen Hyper-Threading [Disabled] ↑↓: Select Item ACTIVE Performance-cores Enter: Select [AII] [A11] +/-: Change Opt. Active Efficient-cores [Enabled] F1: General Help Intel (VMX) Virtualization Technology F8: Previous Values [Disabled] F9: Optimized Defaults Intel Trusted Execution Technology [Disabled] F10:Save & Exit Intel(R) SpeedStep(tm) ESC: Exit Intel(R) Speed Shift Technology [Disabled] C states [Disabled] Tcc Activation Offset Version 2.22.1286 Copyright (C) 2023 AMI



4.2.1.3. Boot Menu Settings

Disable the following Boot menu setting:

• Fast Boot (if HDD Fast Startup is not available)

Main Advanced Chipset	Aptio Setup – AMI Security Boot Save & Exit CRB_Adv	anced MEBx CRB_Chipset
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot Fast Boot	1 [Off] [Enabled] [Disable Link]	 Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot mode select Boot Configuration Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5 Boot Option #6 Boot Option #7 Boot Option #7 Boot Option #7 Boot Option #10 Boot Option #11 Boot Option #12 Boot Option #13 Boot Option #14	[DUAL] [UEFI Hard Disk] [UEFI NVME] [UEFI CD/DVD] [UEFI CD/DVD] [UEFI SD] [UEFI USB Hard Disk] [UEFI USB Hard Disk] [UEFI USB Key:UEFI: JetFlashTranscend 4GB 8.07, Partition 1] [UEFI USB Floppy] [UEFI USB Floppy] [UEFI USB Lan] [UEFI Network] [UEFI AP] [Hard Disk] [NVME] [CD/DVD]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F8: Previous Values F9: Optimized Defaults F10:Save & Exit ESC: Exit</pre>
	Version 2,22 1286 Convright (C) 202	3 AMT

4.2.2 Windows 10 Real-time Optimization

4.2.2.1. Microsoft Basic Display Adapter Driver

Open the Device Manager by selecting **Start > Control Panel > Device Manager**. Set the default display driver to the Windows driver.

📇 Device Manager	– 🗆 X
<u>File Action V</u> iew <u>H</u> elp	
 DESKTOP-9842MQ5 Computer Disk drives Display adapters Microsoft Basic Display Adapter 	
 Monitors Monitors Network adapters Ports (COM & LPT) Print queues Processors Realtime OS Devices Realtime OS Devices Software devices Software devices Storage controllers System devices Processal Serial Bus controllers 	



4.2.2.2. Power Options Advanced Settings

Open the Power Options Advanced Settings by selecting **Start > Control Panel > Power Options.** Under **Selected plan**, click **Change plan settings**, and then click **Change advanced power settings**.

Set Turn off hard disk after to Never.

🗃 Power Options	?	×
Advanced settings		
Select the power plan that you want to custo then choose settings that reflect how you wa computer to manage power.	imize, an ant your	d
Balanced [Active] \sim		
 Hard disk Turn off hard disk after Setting: Never Internet Explorer Desktop background settings Wireless Adapter Settings Sleep USB settings Intel(R) Graphics Settings Power buttons and lid DCL Express 		~
<u>R</u> estore plan	defaults	
OK Cancel	A	pply

Set the PCI Express > Link State Power Management to Off.



4.2.2.3. Performance Options Settings

Open the Performance Options by selecting Start > Control Panel > System > Advanced system settings and then clicking Settings under Performance.

- Set Visual Effects to Adjust for best performance.
- Disable all unused Windows Services.

Performance Options	×					
Visual Effects Advanced Data Execution Prevention						
Select the settings you want to use for the appearance and performance of Windows on this computer.						
○ Let Windows choose what's best for my computer						
○ Adjust for <u>b</u> est appearance						
Adjust for best performance						
○ <u>C</u> ustom:						
Animate controls and elements inside windows						
Animate windows when minimizing and maximizing						
Animations in the taskbar						
Enable Peek						
Fade or slide menus into view						
Fade or slide ToolTips into view						
Fade out menu items after clicking						
Save taskbar thumbnail previews						
Show shadows under mouse pointer						
Show shadows under windows						
Show translucent selection rectangle						
Show window contents while dragging						
Smooth edges of screen fonts						
Smooth-scroll list boxes						
Use drop shadows for icon labels on the desktop						
OK Cancel A	pply					



4.2.2.4. Power Options

Open the Power Options by selecting **Start > Control Panel > Power Options** and then clicking **Choose what the power buttons do**. Disable **Turn on fast startup (recommended)**.

Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes you make to the settings on this page apply to all of your power plans.

Power an	d sleep button settings			
٢	When I press the power button:	Shut down	*	
0	When I press the sleep button:	Sleep	·	
Shutdow	n settings			
Tur This	n on fast startup (recommended) 5 helps start your PC faster after shu	tdown. Restart isn't affecte	I. <u>Learn More</u>	
Sho	ep w in Power menu.			
Hib 🗌 🗌	ernate w in Power menu.			
<mark>∠ Loc</mark> Sho	k w in account picture menu.			

4.2.3 CodeMeter

The SuperCAT license is protected by WIBU, and CodeMeter is a service that runs in the system tray. Through the CodeMeter Control Center, users can review the license information.





S CodeMeter Control Center − □ ×					×
File Process View He	lp				
License Events					
		No CodeMeter License i No CmContainer found.	nformation	available.	
CodeMeter service is run	ning.			WebAd	lmin

If there is no license available, the CodeMeter Control Center License tab will be empty.

If there is no license agreement, the SuperCAT run-time might not work as designed, or ocassionally stop working altogether, with the following message.



Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User's Manual for later reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment, turn off the power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
 - Keep equipment away from water or liquid sources.
 - Keep equipment away from high heat or high humidity.
 - Keep equipment properly ventilated (do not block or cover ventilation openings).
 - Make sure to use recommended voltage and power source settings.
 - Always install and operate equipment near an easily accessible electrical socket-outlet.
 - Secure the power cord (do not place any object on/over the power cord).
 - Only install/attach and operate equipment on stable surfaces and/or recommended mountings.
 - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.



Getting Service

Ask an Expert: https://www.adlinktech.com/en/Askanexpert

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