

# ECAT\_DMotion Software Guide

English

Ver. 1.0.0, Mar. 2023



## WARRANTY

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

## WARNING

ICP DAS assumes no liability for damages consequent to the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

## COPYRIGHT

Copyright © 2023 by ICP DAS. All rights are reserved.

## TRADEMARK

Names are used for identification only and may be registered trademarks of their respective companies.

## CONTACT US

If you have any questions, please feel free to contact us via email at:

[service@icpdas.com](mailto:service@icpdas.com); [service.icpdas@gmail.com](mailto:service.icpdas@gmail.com)

## SUPPORT

ECAT-2091S

ECAT-2092T

ECAT-2093

ECAT-2094S

ECAT-2094P

ECAT-2094DS

# Contents

1.	Introduction .....	3
2.	ECAT_DMotion Installation .....	3
3.	Module connection .....	4
3.1.1.	Connection .....	4
4.	Operation .....	5
4.0.	Connect .....	5
4.0.1.	Select connection with devices .....	5
4.1.	Main Screen .....	6
4.2.	Parameters .....	7
4.2.1.	Device parameters setting .....	7
4.3.	SDO List .....	8
4.3.1.	Device Service Data Objects list .....	8

# 1. Introduction

The main purpose of the ECAT\_DMotion utility is to configure and test the EtherCAT motion control slaves provided by ICPDAS.

The following slaves are supported by the utility:

- Stepper motor drives:
  - ECAT-2091S
  - ECAT-2094S
  - ECAT-2094P
  - ECAT-2094DS
- Encoder modules:
  - ECAT-2092T
  - ECAT-2093

## 2. ECAT\_DMotion Installation

Double click the “ECATDM\_Utility\_Win\_setup\_1.0.0.exe” installation file to install the utility.

Utility installation path:

*C:\icpdas\ECATDMotion\Utility\ECAT\_DMotion.exe*

## 3. Module connection

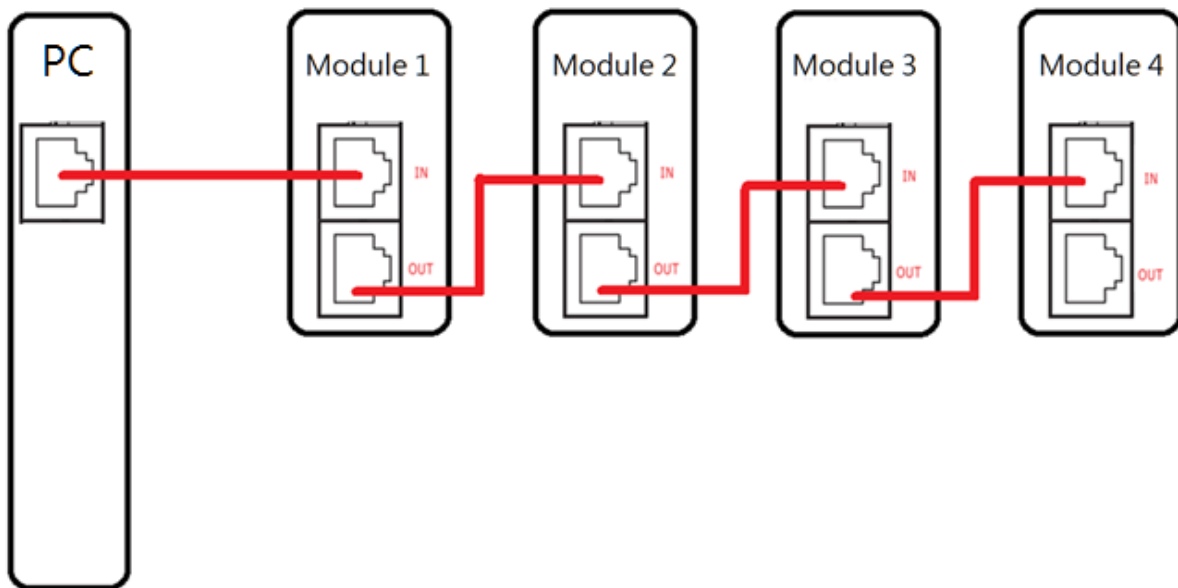
### 3.1.1. Connection

Each EtherCAT slave has at least two communication ports: an input port (IN) and an output port (OUT).

In order to use the ECAT\_DMotion Utility it is necessary to connect the Windows PC to the EtherCAT slaves:

1. Connect the PC Ethernet port to the IN port of the first EtherCAT slave module using a standard Ethernet cable;
2. The OUT port of the first slave module has to be connected to the IN of the second module, and so on.

**Warning:** Do not use USB network adapter, Ethernet Switch or Hub to connect the PC to the EtherCAT slaves.



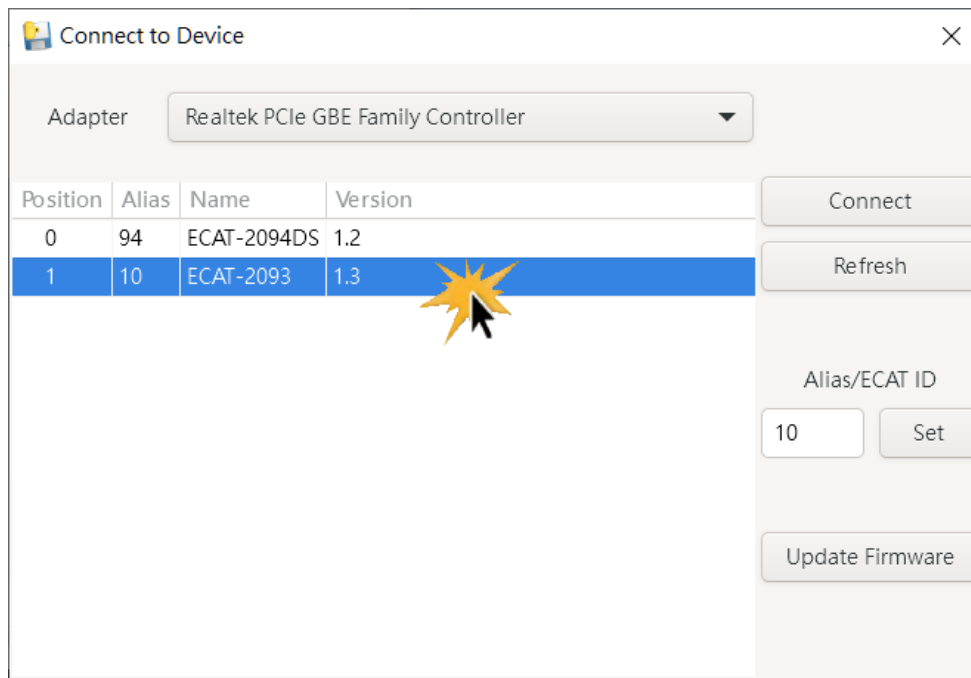
## 4. Operation

Start the utility by double clicking the *ECAT\_DMotion.exe* execution file.

### 4.0. Connect

#### 4.0.1. Select connection with devices

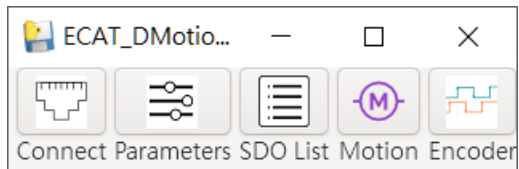
A connection windows pops up after the Utility started which list all the online motion control slaves. If not slaves are displayed then select the adapter device to which the slaves are connected. Select one of the slaves you like to configure or control and press the “Connect” button to establish a connection with the slave.


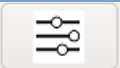





Item	Description
Connect	Connect to selected device
Refresh	Refresh EtherCAT device list
Alias/ECAT ID	EtherCAT Alias
Update Firmware	Update Firmware via FoE

## 4.1. Main Screen

User can open the function window in this main screen.






Item	Description
 Connect	Connect to selected device, Alias/ ECAT ID Setting, Update Firmware via FoE
 Parameters	Device parameters setting
 SDO List	Service Data Objects list
 Motion	Operate Motors
 Encoder	Operate Encoders

## 4.2. Parameters

### 4.2.1. Device parameters setting




Double-click an object to edit its value.

All parameters of this window can be saved to non-volatile memory of the device.

 Save
  Load
  EEPROM

0%

Index	Name	Flags	Current Value	Default Value	Type
▼ 8000	ENC Settings Ch.0		>11<	>11<	DT8000
8000:01	A signal polarity	RW	1:"Active high"	0x01(1)	DT0803
8000:02	B signal polarity	RW	1:"Active high"	0x01(1)	DT0803
8000:03	C signal polarity	RW	1:"Active high"	0x01(1)	DT0803
8000:09	Counting mode	RW	3:"Quadrant counting mode"	0x03(3)	DT0801
8000:0A	Low pass filter	RW	0:"4MHz AB Phase: 6MH	0x00(0)	DT0802
8000:0B	Latch encoder channel	RW	0:"Default channel"	0x00(0)	DT0804
▶ 8010	ENC Settings Ch.1		>11<	>11<	DT8010
▶ 8020	ENC Settings Ch.2		>11<	>11<	DT8020

Item	Description
 Save	Save parameters to a file
 Load	Load parameters to a file
 EEPROM	Save parameters to non-volatile memory of the device Note: If device parameters are set, the device does not automatically store the data to its non-volatile memory, therefore the data will be lost once the device is powered off.

## 4.3. SDO List

### 4.3.1. Device Service Data Objects list

Double-click an object to edit its value.

SDO List					
Index	Name	Flags	Current Value	Default Value	Type
1000	Device type	RO	0x00020000(131072)	0x00020000(131072)	UDINT
1001	Error register	RO	0x00(0)	0x00(0)	USINT
1008	Device name	RO		ECAT-2093	STRING(9)
1009	Hardware version	RO		1.4	STRING(3)
100A	Software version	RO		1.3	STRING(3)
▶ 1018	Identity		>4<	>4<	DT1018
▶ 10F1	Error Settings		>2<	>2<	DT10F1
▶ 1600	ENC Control Ch.0		>5<	>5<	DT1600
▶ 1610	ENC Control Ch.1		>5<	>5<	DT1610
▶ 1620	ENC Control Ch.2		>5<	>5<	DT1620
▶ 1A00	ENC Status Ch.0		>11<	>11<	DT1A00
▶ 1A01	ENC VEL Status Ch.0		>12<	>12<	DT1A01
▶ 1A10	ENC Status Ch.1		>11<	>11<	DT1A10
▶ 1A11	ENC VEL Status Ch.1		>12<	>12<	DT1A11
▶ 1A20	ENC Status Ch.2		>11<	>11<	DT1A20



## 4.4. Motion

### 4.4.1. Operate Motors

Motion

AxisNo: X

Servo On Servo Off

Velocity (pulse/s): 51200 MoveAbs MoveRel

Position (pulse): 51200 Jog+ Jog-

Clear Error Clear Position

Acc (pulse/s<sup>2</sup>): 512000

Dec (pulse/s<sup>2</sup>): 512000 Stop

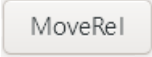
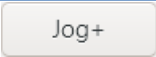


Method SpeedSw SpeedZr Acc Dec Home


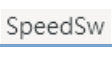
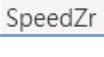


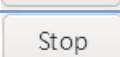

17 51200 5120 51200 51200 Stop








Status Position Velocity Ready Busy Error NOT POT


Disabled 0 0

Item	Description
AxisNo X	Axis number
Servo On	Servo ON
Servo Off	Servo Off
Clear Error	Clear Error
Clear Position	Clear Position
Velocity (pulse/s):	Tartget Velocity
Position (pulse):	Tartget Position
Acc (pulse/s <sup>2</sup> ):	Tartget acceleration
Dec (pulse/s <sup>2</sup> ):	Tartget deceleration
MoveAbs	Move to target position

	Moves the input Pulse in the positive or negative direction according to the sign of the position
	Moves in the positive direction according to the target velocity
	Moves in the negative direction according to the target velocity
	Stop motion

Item	Description
	Homing method
	Speed during search for Home switch
	Speed during search for z phase signal
	Homing Acceleration
	Homing Deceleration
	Start homing
	Stop homing

Item	Description
	Axis state
	Axis position
	Axis velocity
Ready 	Axis is standstill, and no motion command active
Busy 	Axis is moving
Error 	Axis is stopped because of error
NOT 	Negative limit switch

POT 	Positive limit switch
--	-----------------------

# 4.5. Encoder

## 4.5.1. Operate Encoders (ECAT-2093)

Encoder

Encoder No

0

Actual Counter Value

0

Latch Counter Counts

0

Latch Counter Value

0

Reset Counter Value

Item	Description
Encoder No	Encoder channel number
Actual Counter Value	The encoder counter value
Latch Counter Counts	Latched counter counts
Latch Counter Value	The latched counter value
Reset Counter Value	Reset counter value

## 4.5.2. Operate Encoders (ECAT-2092T)

### Encoder counter

Item	Description
Encoder No	Encoder channel number
Actual Counter Value	The encoder counter value
Latch Counter Value	The latched counter value
Ext Latch Counter Value(R)	Latched encoder position triggered by the rising edge of "I" signal
Ext Latch Counter Value(F)	Latched encoder position triggered by falling edge of "I" signal
Reset Counter Value	Reset counter value

### Equidistant position compare output trigger function

Item	Description
First Pos	The first compare position
Interval	The next compare position will be automatically calculated by adding the interval value to the current

	compare position
Dir.	Set the autoincremental direction for the compare value
Equid Compare	Enable the equidistant position compare output trigger function

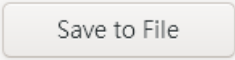
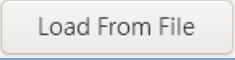
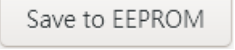
### Array position compare output trigger function

Item	Description
Array Settings	Position Compare Array Settings
End Index	The number of compare positions to be used for the compare process
Array Compare	Enable the array position compare output trigger function

Item	Description
Next Compare Position	Indicates the next compare position at which an output will be triggered

Position Compare Array Settings; double-click an object to edit its value.

Compare Array Setting			
Index	Compare Position	DO Trigger	
0	33	1	<div>Save to File</div> <div>Load From File</div> <div>Save to EEPROM</div>
1	100	1	
2	150	1	
3	200	1	
4	250	1	
5	300	1	
6	350	1	
7	400	1	
8	450	1	
9	555	1	
10	0	0	
11	0	0	
12	0	0	

Item	Description
	Save parameters to a file
	Load parameters to a file
	<p>Save parameters to non-volatile memory of the device</p> <p>Note: If device parameters are set, the device does not automatically store the data to its non-volatile memory, therefore the data will be lost once the device is powered off.</p>