



# TwinCAT<sup>®</sup> 3 Integration Guide

## ACSI Integrated Servo Motor/Drive/Controller





ACSI Servo Motor/Drive/Controller with EtherCAT are DISCONTINUED. Replacements are not available. For legacy ACSI units with EtherCAT use this document for reference only. ACSI Motor/Drive/Controllers with EtherNet/IP, Modbus and Basic continue with full Tolomatic Support

## Contents

Introduction	3
Additional Information	3
Initial Setup	
Installing ACSI TwinCAT Library	8
Assign PlcTask Inputs and Outputs to Drive	12
ACS TwinCAT Library Structure	
ACS High Level Samples	19
Command Register and Fault Clearing	20
ACS Interface Functions	20
ACS Scan Functions	20
Motion Functions	21
ACS Command Functions	22
ACS Drives Global Variable Lists	23
ACS Data Types	24

#### **Device Information**

Vendor ID: 0x00000986 Vendor Name: Tolomatic, Inc. Product Code: 0x2362 Type: ACSI Drive & Controller Name: ACSI Drive & Controller Interface

#### For use with 3604-3324\_ACSI\_ESI definitions file.

#### For use with 3604-3325 ACSI TwinCAT Library.

#### Introduction

This integration guide provides step by step instructions on how to get an ACS Integrated Motor up and running in a TwinCAT 3 Environment. This guide assumes that the user is familiar with commissioning devices in the TwinCAT 3 environment, and is not intended to provide all necessary steps for commissioning a PLC.

#### **Additional Information**

Additional information for the ACSI EtherCAT implementation can be found in the ACSI Hardware User's Guide, the EtherCAT User's Guide, and the Tolomatic Motion Interface User's Guide.

#### **Initial Setup**

TwinCAT 3 installs with a Visual Studio 2013 Shell.

1. Launch Visual Studio 2013, and select "New TwinCAT Project..."



2. Create a new location for your project, and select "OK"

New Project				7
Recent		.NET Framework 4.5	✓ Sort by: Default	🚽 🔡 🔚 Search Installed Te
▲ Installed			E Project ( TwinCAT Projects	Type: TwinCAT Projects
<ul> <li>Templates</li> <li>Other Project</li> <li>TwinCAT Me TwinCAT PLO TwinCAT Pro Samples</li> </ul>	: Types asurement C jects		L Project ( TWINCAT Projects	TwinCAT XAE System Manager Configuration
▷ Online		<u>Click here to g</u>	o online and find templates.	
Name:	TwinCAT Sampl	e Project		
Location:	C:\Users\eng-te	ch\Desktop\Temp ACSI	ECAT Sample Project\	Browse
Solution name:	TwinCAT Sampl	e Project		Create directory for solution
				OK Cancel

3. Select Target System (PLC) for your project. This can be "Local" for a simulated TWinCAT PLC, or a defined route. More information about setting up routes can be found in the Beckhoff TwinCAT documentation.



4. If the platform differs from current platform, change the solution platform.



5. Right click on Devices in the Solution Explorer, and select "Scan..."

Mg] Solution ▲ TwinC ▷ ▲ SYS ▲ MC ④ PLC ● SAI €. C+ ▲ 2 I/O	AT Sampl STEM DTION C FETY +	e Project		
40 12 04	Devi Mai	Add New Item	Ins	
Ú.		Add Existing Item	Shift+Alt+A	
		Export EAP Config File		
	14	Scan		
	â	Paste	Ctrl+V	
		Paste with Links		
6. Accept box "Not al	l types o	of devices can be four	nd automatically"	
Microsoft Vi	sual Studi	0		
HINT: Not	all types o	of devices can be found au	comatically Cancel	

7. Select PLC Device



10. Verify ACSI Box was added to Device 1



11. Double click on ACSI Box and verify "InputToggle" bit continuously toggles between '0' d '1'

a	n	d	1

Name	Online	Туре	Size	>Addr	In/Out	User ID	1
🔁 CurrentPosition	20188.641	REAL	4.0	39.0	Input	0	
📌 Drive Status	0x0 (0)	BITARR32	4.0	43.0	Input	0	
📌 Drive Faults	0x0 (0)	BITARR32	4.0	47.0	Input	0	
📌 Digital Inputs	0x0 (0)	BITARR32	4.0	51.0	Input	0	
📌 Digital Outputs	0x0 (0)	BITARR32	4.0	55.0	Input	0	
🕫 🔁 Analog Input	0.46818638	REAL	4.0	59.0	Input	0	
🕈 🔁 Analog Output	0.0	REAL	4.0	63.0	Input	0	
🔁 WcState	0	BIT	0.1	1522.1	Input	0	
👻 InputToggle	1	BIT	0.1	1524.1	Input	0	
📌 State	8	UINT	2.0	1550.0	Input	0	
🔁 AdsAddr	192.168.0.152.2.1:1	AMSADDR	8.0	1552.0	Input	0	
Drive Command	0	USINT	1.0	39.0	Output	0	
Move Select	0	USINT	1.0	40.0	Output	0	
Target0 Pos	0.0	REAL	4.0	41.0	Output	0	
Target0 Vel	0.0	REAL	4.0	45.0	Output	0	
Target0 Accel	0.0	REAL	4.0	49.0	Output	0	
📕 🍽 Target0 Decel	0.0	REAL	4.0	53.0	Output	0	
Target0 Force	0.0	REAL	4.0	57.0	Output	0	
Target0 MotTyp	0	UDINT	4.0	61.0	Output	0	
P DigitalOutsWr	0x0 (0)	BITARR32	4.0	65.0	Output	0	

[7]

Troubleshooting tip: If values do not update, or ACSI Box Online state does not go to "OP", please reference the EtherCAT User's Guide section about updating EEPROM through TwinCAT.

Pre-Op		Bootst Safe-C	ap p	Current State:	OP			
Ор		Clear F	irror	Requested State	: OP			
DLL Status								
Port A:	Carrie	r / Open						
Port B:	No C	arrier / Cl	osed					
Port C:	No C	arrier / Cl	osed					
Port D:	No C	arrier / Cl	sed					
File Access Downlos alling Right	ad ACS	erCAT Up I Tw I PI C	inCAT	Library ution Explorer	and select "Ad	ld New Iter	n"	
File Access Downloa alling Right	ACS click o	erCAT - Up I TW I PLC Iution I TwinCd	in CAT winCAT San T Sample P TEM	Library ution Explorer nple Project' (1 p roject	and select "Ad roject)	ld New Iter	n"	
File Access Downloa alling Right	ACS click o	erCAT - Up I T W n PLC Iution ' TwinC/ SYS S MC	in CAT in the Solu winCAT San AT Sample P TEM TION	Library ution Explorer nple Project' (1 p roject	and select "Ad roject)	ld New Iter	n"	
Access Downloa alling Right	ACS click o	erCAT	in CAT in the Solu winCAT San AT Sample P TEM TION	Library ution Explorer nple Project' (1 p roject	and select "Ad roject)	ld New Iter	n"	
Access Downloa alling Right	ACS click o	erCAT Up In PLC Iution I TwinCA In SYS In MC	in CAT in the Solu winCAT San AT Sample P TEM TION I Add New Add Exist	Library ution Explorer nple Project' (1 p roject	and select "Ad roject) Ins Shift+Alt+A	ld New Iter	n"	
Access Downloa alling Right	ACS click o	erCAT	in CAT in the Solu winCAT San AT Sample P TEM TION I Add New I Add Exist Paste	Library ution Explorer nple Project' (1 p roject	and select "Ad roject) Ins Shift+Alt+A Ctrl+V	ld New Iter	n"	
Access Downloa alling Right	ACS click o	erCAT Up In PLC Iution 1 TwinC/ SYS MO In C/ SYS	in CAT in the Solu winCAT Sam AT Sample P TEM TION Add Exist Paste Paste Paste wit	Library ution Explorer nple Project' (1 p roject Item ing Item	and select "Ad roject) Ins Shift+Alt+A Ctrl+V	ld New Iter	n"	

#### 2. Create a Standard PLC Project

Add New Item - TwinCAT Sample Project	t				? 💌
▲ Installed	Sort by	Default	- # E	Search Installed Templates (Ctrl+E)	ρ-
Plc Templates	0	Standard PLC Project	Plc Templates	Type: Plc Templates	
	00			Creates a new TwinCAT PLC proje containing a task and a program.	ct
	-	Empty PLC Project	Plc Templates		
		Citat I and a second second	1 Contractory		
		Click here to go online and	a find templates.		
Name: MyPLC	ch\Dockt		la Project\TwinC =	Provers	
Location: C:\osers\eng-te	CH\DESKI	op/remp ACSI ECAT Samp	Sie Project (Twinc. •	Drowse	ancel
Right click on PLC Project a	ind s ect	select "Import	trom ZIP"		
SYSTEM					
MOTION					
PLC					
MyPLC					
MyPLC Proj	Ъ				
MyPLC Inst	Ĥ	Build			
SAFETY		Rebuild			
9 <sub>6+</sub> C++		Check all obje	ects		
🔀 I/O		Clean			
Devices					
🔺 🧮 Device 1 (Et		Add		•	
📑 Image		Export to ZIP			
📑 📮 Image-Ii		Import from Z	IP		
👂 🥏 SyncUni		Export PLCope	enXML		
Inputs		Import DI Con	en XMI		
Outputs	H	протгесор	CHANE		
	X	Remove		Del	
		Save as library			
P Box 3 (A		Save as library	and install		
iviappings	2	Onen Estile :	- File Freedow		
	C	Open Folder II	h File Explorer		
	¥	Properties		Alt+Enter	

4. Browse to TwinCAT Library ZIP file and select "Open"



#### 5. Select Items to Import



6. Verify PlcTask Cycle ticks set at 10.000 ms (Drive should not be written to faster than 10ms)



Resolve any errors with build (these typically include duplicate PlcTasks, Main functions, etc.)

#### Assign PlcTask Inputs and Outputs to Drive

ACS Drives are defined in the ACS\_DRIVES GVL. Initially, just a single (ACS\_DRIVE\_1) is defined, but the idea is that multiple axis definitions would be defined in this GVL for systems that contain multiple ACS Drives.

Under PlcTask Inputs in the Solution Explorer

- - MAIN MyPLC Instance
  - PicTask Inputs
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputCurrentPosition
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputStatus
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputFaults
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputDigitalInputs
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputDigitalOutputs
      - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogOutput
      - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogInput
  - 🔺 🖷 PlcTask Outputs
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputCommand
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputMoveSelect
- 2. Select the "Linked to..." button

Name:	AC3_DHIVE3.AC3_DHI	VE_1InputCurrentr	osition	
Type:	REAL			
Group:	PlcTask Inputs	Size:	4.0	
Address:	513028 (0x7D404)	User ID:	0	
Linked to				
ADS Info:	Port: 350, IGrp: 0x850200	00, IOffs: 0x8007D40	)4, Len: 4	
ADS Info: Symbol Info:	Port: 350, IGrp: 0x850200 Port: 851, 'ACS_DRIVES	00, IOffs: 0x8007D41 ACS_DRIVE_1Inr	04, Len: 4 putCurrentPosition'	



3. Select the Variable in the ACSI Drive & Controller box (defined under Device 1)

- 4. Use the following mapping
  - a. ACS\_DRIVES.ACS\_DRIVE\_1.InputCurrentPosition->CurrentPosition
  - b. ACS\_DRIVES.ACS\_DRIVE\_1.InputStatus->Drive Status
  - c. ACS\_DRIVES.ACS\_DRIVE\_1.InputFaults->Drive Faults
  - d. ACS DRIVES.ACS DRIVE 1.InputDigitalInputs->Digital Inputs
  - e. ACS\_DRIVES.ACS\_DRIVE\_1.InputDigitalOutputs->Digital Outputs
  - f. ACS\_DRIVES.ACS\_DRIVE\_1.InputAnalogOutput->Analog Output
  - g. ACS\_DRIVES.ACS\_DRIVE\_1.InputAnalogInput->Analog Input

#### Under PlcTask Outputs in the Solution Explorer

- 1. Double click on each Output
- ACS\_DRIVES.ACS\_DRIVE\_1.\_InputDigitalOutputs P ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogOutput ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogInput PlcTask Outputs ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputCommand ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputMoveSelect ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetPosition ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetVelocity ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetAcceleration ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetDeceleration ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetForce ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetMotionType ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputDigitalOutputs



#### 2. Select the "Linked to..." button

TWINCAT Sample	
Variable Flags	Online
Name:	ACS_DRIVES.ACS_DRIVE_1OutputCommand
Туре:	USINT
Group:	PlcTask Outputs Size: 1.0
Address:	513056 (0x7D420) User ID: 0
Linked to	
Commént:	Synchronization Variable (Read/Write Routines)
ADS Info:	Port: 350, IGrp: 0x8502000, IOffs: 0x8107D420, Len: 1
Symbol Info:	Port: 851, 'ACS_DRIVES.ACS_DRIVE_1OutputCommand'
Full Name:	TIPC^MyPLC^MyPLC Instance^PlcTask Outputs^ACS_DRIVES.ACS_DRI\



3. Select the Variable in the ACSI Drive & Controller box (defined under Device 1)

#### 7. Select TWINCAT->Activate Configuration

studio	(Adm	inistratory
BUG	TW	NCAT TWINSAFE PLC TOOLS SCOPE WIND
a	1	Activate Configuration
5	*	Restart TwinCAT System
		Restart TwinCAT (Config Mode)
	2	Reload Devices
	14	Scan
_		Toggle Free Run State
)	٢	Show Online Data
		Show Sub Items
		Security Management
	RE6	Access Bus Coupler/IP Link Register
		Update Firmware/EEPROM
		Show Realtime Ethernet Compatible Devices
		File Handling
		Selected Item
		EtherCAT Devices
		About TwinCAT
8. Accept Acti	vatior	
Mic	rosoft	Visual Studio
	0	Activate Configuration
	V	(Old Configurations will be overwritten!)
		OK Cancel
9. Restart Twi	nCAT	System in Run Mode
Mi	crosoft	Visual Studio
	2	Restart TwinCAT System in Run Mode
		OK Cancel



#### 13. Verify InputAnalogInput has value in "Online" column

TwinCAT Sample Project 🚽 🗙 Error List Output					
Name		Online	Туре	Size	
ACS_DRIVES.ACS_DRIVE_1InputCurrentPosition	Х	1988.8187	REAL	4.0	
ACS_DRIVES.ACS_DRIVE_1InputStatus	Х	0x0 (0)	BITARR32	4.0	
ACS_DRIVES.ACS_DRIVE_1InputFaults	Х	0x0 (0)	BITARR32	4.0	
ACS_DRIVES.ACS_DRIVE_1InputDigitalInputs	Х	0x0 (0)	BITARR32	4.0	
ACS_DRIVES.ACS_DRIVE_1InputDigitalOutputs	Х	0x0 (0)	BITARR32	4.0	
ACS_DRIVES.ACS_DRIVE_1InputAnalogOutput	Х	0.0	REAL	4.0	
ACS_DRIVES.ACS_DRIVE_1InputAnalogInput	Х	0.45469096	REAL	4.0	

### ACS TwinCAT Library Structure

The following sections outline the various parts of the library and how they interact with each other.

#### ACS High Level Samples

The Library includes a number of high level samples that encapsulate an entire single axis program. They include the Input Scan, some processing, and an Output Scan.

- ACS High Level Samples
  - ACS\_INITIALIZATION\_NOBRAKE (PRG)
  - ACS\_INITIALIZATION\_WITH\_BRAKE (PRG)
  - ACS\_SAMPLE\_BACK\_AND\_FORTH (PRG)
  - ACS\_SAMPLE\_INDEXED\_MOVES (PRG)
  - ACS\_SAMPLE\_VELOCITY\_MOVES (PRG)
- ACS Motion

Also included are examples of initialization routines. These are entitled

"ACS\_INTIALIZATION\_NOBRAKE", and "ACS\_INITIALIZATION\_WITH\_BRAKE". These two different programs show that, depending on the hardware configuration of the drive and purpose, the initialization routines for drives could differ.

The primary difference between the NOBRAKE and WITH\_BRAKE initializations is the check for the Brake Not Active status bit. We do not want to command motion with the brake enabled. This could cause false homing, I2T faults, or position errors.



In some installations, such as rotary installations, you may not require homing as part of the initialization. If the drive is configured in rotary mode (accomplished in Tolomatic Motion Interface), homing is optional. See the ACS\_SAMPLE\_VELOCITY\_MOVES program. The initialization routine is simply enabling the drive if there are no faults and it is disabled.

#### Command Register and Fault Clearing

ACS drives are command edge triggered. This means that the drive will only use Outputs when it detects a change in the Output Command register. Motion profiles can be changed continuously as long as the command register remains the same. As soon as the command register is updated, the drive will execute the command.

The command register is polled at a periodic rate internally to the drive. If commands are changed too quickly, the drive may not see a command, and not execute the command. This is especially important to note when making very fast moves, and clearing faults.

Some faults are cleared by disabling and re-enabling the drive. (See TMI Users Guide for further detail about faults). In practical terms, this means that the program should disable the drive for at least 20ms (longer is better) before re-enabling the drive.

#### ACS Interface Functions

The PLC program will interface with the ACS drive using three categories of functions

- 1. Scan Functions
- 2. Motion Functions
- 3. Command Functions

#### ACS Scan Functions

A typical PLC program will contain an Input Scan at the beginning, a Processing section, and an Output Scan (or update) section.

#### ACS TWINCAT LIBRARY STRUCTURE



For the Input Scan routine, the library provides a function called "ACS\_DRIVE\_INPUT\_SCAN" which updates all of the Inputs from the drive into memory that can be manipulated by the processing functions.

For the Output Scan routine, the library provides a function called "ACS\_DRIVE\_OUTPUT\_SCAN" which copies all of the memory that was manipulated by the processing functions back to the drive.

There are also a number of sub routines that the INPUT\_SCAN and OUTPUT\_SCAN use, however the PLC program should not need to access these directly.



#### **Motion Functions**

The primary purpose for the motion functions is to prime the drive outputs for a specific motion function. These are typically different types of move. Note that some moves are specific for Rotary applications and some are for linear applications. Rotary applications do not require homing, and need to be configured in Tolomatic Motion Interface.

- ACS HIGH LEVELSAMPLES
- ACS Motion
  - ACS\_MOVE\_ABSOLUTE (PRG)
  - ACS\_MOVE\_FORCE (PRG)
  - ACS\_MOVE\_HOME (PRG)
  - ACS\_MOVE\_INCREMENTAL\_LINEAR\_NEGATIVE (PRG)
  - ACS\_MOVE\_INCREMENTAL\_LINEAR\_POSITIVE (PRG)
  - ACS\_MOVE\_INCREMENTAL\_ROTARY\_NEGATIVE (PRG)
  - ACS\_MOVE\_INCREMENTAL\_ROTARY\_POSITIVE (PRG)
  - ACS\_MOVE\_INDEXED (PRG)
  - ACS\_MOVE\_NO\_ACTION (PRG)
  - ACS\_MOVE\_VELOCITY\_ROTARY\_FORWARD (PRG)
  - ACS\_MOVE\_VELOCITY\_ROTARY\_REVERSE (PRG)
- ACS Scan Functions

The motion functions require a reference to the target axis, as well as additional motion profile parameters specific for the move type. An Absolute Move example is below.

ACS\_MOVE\_ABSOLUTE(Axis:=Axis,

ProfilePosition:=ExtendPosition, ProfileVelocity:=ProfileVelocity, ProfileAcceleration:=ProfileAccelDecel, ProfileDeceleration:=ProfileAccelDecel, ProfileForce:=ProfileForce);

Some motion functions, such as the Home function, and Indexed function, use predefined motion profiles (in Tolomatic Motion Interface). These do not require the PLC to define the motion profiles.

Execution of these motion functions do not cause actual motion to occur. In order to start motion, the user must perform an ACS Command.

#### ACS Command Functions

The ACS Commands defined in the library allow the user to send specific commands to the drive. These include starting motion, homing, performing the ESTOP (Software Stop) action (defined in Tolomatic Motion Interface), etc.

- 🗾 FUUS
- ACS Commands
  - ACS\_CMD\_CLEAR\_START\_MOTION (PRG)
  - ACS\_CMD\_DISABLE (PRG)
  - ACS\_CMD\_ENABLE (PRG)
  - ACS\_CMD\_HOME (PRG)
  - ACS\_CMD\_HOME\_HERE (PRG)
  - ACS\_CMD\_SOFTWARE\_STOP (PRG)
  - ACS\_CMD\_START\_MOTION (PRG)
  - ACS\_CMD\_STOP\_MOTION (PRG)
- ACS High Level Samples

It is important to note that the ACS Drive is Edge Triggered, meaning that the drive must detect a change in the Command Register in order to execute a command. See the following example.



This also can lead to race conditions on the Command register. The user must use caution to prevent multiple different concurrent programs from sending commands to the drive during the same scan cycle. Only one command will be executed. The drive also polls the command register at an approximate 10ms rate. Commands updating faster than this rate will be ignored.

It is better to design the PLC program to prevent writes to the Drive faster than 10ms.

#### ACS Drives Global Variable Lists

The library contains three Global Variable Lists (GVLs). Two of these lists (ACS\_COMMANDS and ACS\_MOTION\_TYPES) are constant variables and used in library functions. The third, ACS\_DRIVES, is meant to be a container for ACS Drive Axes.

Multiple drive axes can be defined in this list, and the user can access them directly from programs. Most functions require a reference to an ACS\_DRIVE\_TYPE variable.

```
{attribute 'qualified_only';
VAR_GLOBAL
//Global GVL for drives
ACS_DRIVE_1 : ACS_DRIVE_TYPE;
END_VAR
```

#### ACS Data Types

There is one data type defined in the ACS TwinCAT Library. The ACS\_DRIVE\_TYPE is a structure that contains mapping to input and output registers for a specific drive, as well as a shadow memory area for library function processing.

```
    DUTs
    ACS_DRIVE_TYPE (STRUCT)
```

When a variable is defined as ACS\_DRIVE\_TYPE, it creates PlcTask Inputs and PlcTask Outputs for the defined variable.

- iviye comstance
- 🔺 📃 PicTask Inputs
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputCurrentPosition
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputStatus
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputFaults
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputDigitalInputs
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputDigitalOutputs
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogOutput
    - ACS\_DRIVES.ACS\_DRIVE\_1.\_InputAnalogInput
- PlcTask Outputs
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputCommand
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputMoveSelect
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetPosition
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetVelocity
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetAcceleration
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetDeceleration
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetForce
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputTargetMotionType
  - ACS\_DRIVES.ACS\_DRIVE\_1.\_OutputDigitalOutputs

#### AFETY

The user then is required to link these inputs and outputs to a defined I/O box

Additional information for the ACSI EtherCAT implementation can be found in: 3604-4185 ACSI Hardware User's Guide, 3600-4201 EtherCAT User's Guide, 3604-4184 Tolomatic Motion Interface User's Guide.

See tolomatic.com for the most up-to-date technical information.

EtherCAT<sup>®</sup> is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. http://www.beckhoff.com



USA - Headquarters Tolomatic Inc. 3800 County Road 116 Hamel, MN 55340, USA Phone: (763) 478-8000 Toll-Free: 1-800-328-2174 sales@tolomatic.com www.tolomatic.com

#### 0 73 EXCELLENCE IN MOTION

### MEXICO Centro de Servicio

Parque Tecnológico Innovación Int. 23, Lateral Estatal 431, Antiago de Querétaro, El Marqués, México, C.P. 76246 **Phone:** +1 (763) 478-8000 help@tolomatic.com

EUROPE Tolomatic Europe GmbH Elisabethenstr. 20 65428 Rüsselsheim Germany Phone: +49 6142 17604-0 help@tolomatic.eu

www.tolomatic.com/de-de

All brand and product names are trademarks or registered trademarks of their respective owners. Information in this document is believed accurate at time of printing. However, Tolomatic assumes no responsibility for its use or for any errors

that may appear in this document. Tolomatic reserves the right to change the design or operation of the equipment described herein and any associated motion products without notice. Information in this document is subject to change without notice.

Visit www.tolomatic.com for the most up-to-date technical information

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 = Certified site: Hamel, MN

CHINA Tolomatic Automation Products (Suzhou) Co. Ltd. No. 60 Chuangye Street, Building 2 Huqiu District, SND Suzhou Jiangsu 215011 - P.R. China Phone: +86 (512) 6750-8506 TolomaticChina@tolomatic.com