

### ETHERNET/IP DEVICE SETUP OVERVIEW



### EtherNet/IP Device Setup Overview

### Table of Contents

1.	Introduction	3
	TR EIP Compatible Devices	4
2.	Starting a New Project in Logix Designer	5
3.	Setting your Device Address	8
	Setting a Device Address Using Rotary Switches	9
	Setting a Device Address Using BootP/DHCP	11
4.	Generic Modules VS EDS Files	15
	What are the Differences?	16
	Generic Module Configuration	17
	TR EDS Files	19
5.	Module Configuration	21
	Rotary Device	21
	Linear Device	25
6.	Configuration Assembly	27
	What is a Configuration Assembly?	28
	Changing Direction of a Device	31
	TR Parameter	33
	Scaling the Measuring System - Rotary Device	35
7.	Presetting your Rotary Position Value	39
	Rotary Device	40

## Introduction

### **TR EIP Compatible Devices**



### Rotary Encoders



### Linear Encoders



LE-200 Laser Device



- CEV58 Optical, Solid Shaft
- CEV582 Optical, Solid Shaft
- CMV582 Magnetic, Solid Shaft
- CEH582 Optical, Hollow Shaft
- CES582 Optical, Blind Shaft
- CEV65 Optical, Solid Shaft

### **Old Applications**

- LA 46 Series 321
- LP 46 Series 320
- LMP30 Series 322
- LMRI 46 Series 339
- LMPI 46 Series 340



## Starting a New Project in Logix Designer

# **Studio** 5000

Create

New Project From Import From Sample Project Open Existing Project Sample Project From Upload Release Notes

**Recent Projects** 



### \*\*\*Note to the PLC Programmer\*\*\*

This guide assumes the user has already configured the controller using RSLinx. If you haven't already done so, you may not be able to progress through this guide. To learn how to configure your controllers drivers in RSLinx, please visit:

https://literature.rockwellautomation.com/idc/groups/literature/documents/gr/linx-gr001\_-en-e.pdf

Logix	Sec	arch		
	4	CompactLogix™ 5370 Cont	roller	
		1769-L16ER-BB1B	CompactLogix™ 5370 Controller	
		1769-L18ER-BB1B	CompactLogix™ 5370 Controller	
		1769-L18ERM-BB1B	CompactLogix™ 5370 Controller	
		1769-L24ER-QB1B	CompactLogix™ 5370 Controller	
		1769-L24ER-QBFC1B	CompactLogix <sup>™</sup> 5370 Controller	
		1769-L27ERM-QBFC1B	CompactLogix™ 5370 Controller	
		1769-L30ER	CompactLogix <sup>™</sup> 5370 Controller	
		1769-L30ERM	CompactLogix™ 5370 Controller	
		1769-L30ER-NSE	CompactLogix™ 5370 Controller	
		1769-L33ER	CompactLogix™ 5370 Controller	
		1769-L33ERM	CompactLogix™ 5370 Controller	
Name:	Device_Set	up_Example		
Location:	K:\TR CUR	RENT DATA\SERVICE(Encode	ers)\Etherne <mark>t</mark> IP\Chris's Projects 🔹	Browse

- Open Studio 5000.
- Create a New Project.
- Select your Controller from the list.
- Name your Project and set the local save location.
- Click Next then Finish.



- On the tool bar click the *Who Active* symbol to bring up the tool.
- Expand your controller and select your EtherNet card as shown on the right.
  - Once selected, you can Set Project Path and/or simply click Go Online.
    - Once the download is complete, you can go *Offl ine* again.

#### 7 Starting a New Project in Logix Designer



- Download the Electronic DataSheet (EDS) file from the TR Electronic website.
- EDS File Download.
- Once saved locally, return to Logix Designer.
  - Click Tools.
  - Click EDS Hardware Installation Tool.



- The Rockwell Automation EDS Wizard opens.
- Click Next.
- Select Register an EDS file(s) and click Next.
- You can select Install 1 file or a Directory of EDS Files.
- Click Browse and reference the location you stored the EDS files in the previous slide.
- Follow the wizard until you have successfully installed the EDS file(s), then click *Finish*.



## Setting your Device Address

### Setting a Device Address Using Rotary Switches







HEX rotary switches inside your TR device allow the last octet in your address to be defined using a value between 0x01 and 0x254.

The following is true when the switches are active:

IP Address	192.168.1. <desired address="" node=""></desired>
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254





- Set S1 and S2 rotary switches to your desired HEX value.
- Energize the encoder.
- Upon start-up initialization your encoder will assume this Node ID.
- Ping your Node to verify communication to the device.
- If you have packet loss, try cycling power to the device and retry.



## Setting your Device Address

### Setting a Device Address Using BootP/DHCP



#### 12 Setting a Device Address Using BootP/DHCP

Aug Relation			Disco	very	History		Clear Histo
Ethernet Address	(MAC)	Туре	(hr:min:sec)	#	IP Address	Hostname	
About Boo	otP DHCP	EtherNe	et/IP Commissio	ning	Tool	×	
Copyright © 2019 Rockwell Automation Inc.							
Ethernet Address	(MAC)	Туре	IP Address		Hostname	Description	

### To download Rockwell's BootP DHCP EtherNet/IP Tool Click Here.

- Search BootP/DHCP EtherNet/IP Tool in the download catalog.
- Ensure you are using the most current and up-to-date software version before proceeding with this guide.
- Configure your Network Interface settings based on the computer/laptop that you are using (E.g. Subnet Mask, Gateway, Primary/Secondary DNS' and Domain Name if applicable).

### \*\*\*Note to the PLC Programmer\*\*\*

There are many versions of Microsoft Windows, Network configurations and Firewall security settings, it's not possible to support all scenarios. This is a reference GUIDE to assist with IP address configuration. If the steps outlined in this documentation aren't working as indicated, we recommend that you try another computer or laptop. If problems still persist, contact your local IT department or <u>contact Rockwell Automation for further support</u>.

- Method 1 is used to change the first 3 octets of the device IP address (the Network ID) to match another network. (Eg. 171.125.130.XX instead of the standard 192.168.1.XX).
- Method 2 is used to change the Host ID of an IP address, when using the default Network ID of 192.168.1.XX. (The first 3 octets are fixed).

	Switch activation	
Switch	Config. Control	Action
0.00	0x00	Configuration from FLASH
UXUU	0x02	Configuration via DHCP
0x01 0xFE	not relevant	Switch active
0xFF	not relevant	Configuration via DHCP

### Method 1:

- Connect your device as indicated by the device specific <u>pin-assignment.</u>
- Set SW1 & SW2 to FF to indicate the encoder is now set to configure via DHCP.
- Energize the device.

Add Relation		Disco	very	History		Clea	r History
thernet Address (MAC)	Туре	(hr:min:sec)	#	IP Address	Hostname		
0:03:12:ED:D4:76	DHCP	9:30:45	3				
	New Ent	0/			×		
	New Life	y	-				
		Server IP Addres	s:  1	92.168.1.100			
	Clie	ent Address (MAC	): 0	0:03:12:ED:D4:76			
thernet Address (MAC)		Client IP Addres	s: [	192 . 168 . 1 .	99		
		Hostnam	e: [				
		Descriptio	n: [				
		OK	]	Cancel	1		

- Using the MAC ID printed on the device label, find your device in the Discovery History, cycle power if your device is not listed.
- Enter your desired IP Address, then click *OK.*
- It should now appear under Entered Relations.

- Wait until the desired IP Address populates in the Discovery History next to your devices MAC ID (max 1 minute).
  - If you have changed your IP Address outside of your local network (192.168.1.XXX) you will need to change your network adapter settings for your PC to the same network ID.
  - Click Disable BOOTP/DHCP then verify in the bottom corner it was successful.
  - Power off your device and change SW1 & SW2 to 00.
  - Re-energize your device.

Add Relation		Disco	very	History		Clear History
Ethernet Address (MAC)	Туре	(hr:min:sec)	#	IP Address	Hostname	)
0:03:12:ED:D4:76	DHCP	9:32:21	6	192.168.1.99		
Delete Relation		Enter	red R	elations Enable B	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation	Туре	Enter IP Address	red R	elations Enable B	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC) 0:03:12:ED:D4:76	Type DHCP	Enter IP Address 192.168.1.99	red R	elations Enable B	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC) 0:03:12:ED:D4:76	Type DHCP	Enter IP Address 192.168.1.99	red R	elations Enable B	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC) 0:03:12:ED:D4:76	Type DHCP	Enter IP Address 192.168.1.99	red R	Hostname De	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation thermet Address (MAC) 0:03:12:ED:D4:76	Type DHCP	Enter IP Address 192.168.1.99	red R	elationsEnable B	OOTP/DHCP	Disable BOOTP/DHCP
Delete Relation Ethernet Address (MAC) 00:03:12:ED:D4:76	Type DHCP	Enter IP Address 192.168.1.99	red R	elations <u>Enable B</u> Hostname De	ootpyDHCP	Disable BOOTP/DHCP





#### Command Prompt icrosoft Windows [Version 10.0.17134.829] c) 2018 Microsoft Corporation. All rights reserved.

Y:\>ping 192.168.1.3

pingin	ng 192	2.168.1.3 with	h 32 bytes	s of data	
Reply	from	192.168.1.3:	bytes=32	time<1ms	TTL=64
Reply	from	192.168.1.3:	bytes=32	time<1ms	TTL=64
Reply	from	192.168.1.3:	bytes=32	time<1ms	TTL=64
Reply	from	192.168.1.3:	bytes=32	time<1ms	TTL=64

Ping statistics for 192.168.1.3: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 0ms, Average = 0ms

:\>

Help

Address (MAC	) Type	(hr:min:sec)	#	IP Address	Hostname				
		1	-		-				
New	New Entry								
	Serve	er IP Address: 192	2.168	.1.200					
	Client Ad	Idress (MAC): 000	)3126	edd476					
	Clier	nt IP Address: 📃 1	92	. 168 . 1 . 3					
Address (		Hostname:							
		Description:							
		ОК		Cancel					

- In your Command Prompt application, PING the device at the desired address.
- Once all packets are received, the device addressing is complete.
- If you receive 100% loss, set SW1 & SW2 back to FF and cycle power to the device.
- As long as your relation is still listed in BOOTP, the desired IP Address will be sent again to your device.
- Ensure you click Disable BOOTP/DHCP before changing your rotary switches or cycling power as indicated on the previous page.
- If you are still experiencing issues, refer to method 2.

#### Method 2:

- Connect your device as indicated by the device specific <u>pin-assignment.</u>
- Set SW1 & SW2 to 03, effectively setting the address of the device to 192.168.1.3.
- Energize the device and Ping the address to confirm the encoder is on the network.

- In BootP DHCP Utility Tool click Add Relation.
- Using the device label, enter the MAC ID and IP Address.
- Once completed the relation will be reflected in the Entered Relations field.
- Now you are able to change the IP address as desired. Reference Method 1 for steps on how to commit this to the device.

## Generic Modules vs EDS Files

What are the Differences?



Fype: /endor:	ETHERNET-MODULE Generic Rockwell Automation/Allen-Brad	Ethernet Module fley				
Parent:	LocalENB					
Name:	TR_Device	Connection Par	ameters Assembly	0.		
Description:		-	Instance:	Size:		
		Input:		125		(32-bit)
		Output:		124		(32-bit)
Comm Format	Data - DINT	Configuration:		0		(9.5in
Address / H	ost Name	Coningulation.			<b>.</b>	(0-Dit)
IP Addre	SS: · · ·	Status Input:			_	
🔘 Host Na	me:	Status Output				

### What are the differences?

#### Generic Module

- Allows the user to configure the I/O assembly data of the device manually using explicit messages.
- \*\*\*If you are using RS Logix Ver. 19 or below, you must use a Generic Module\*\*\*

#### **EDS** Files

- Pre-configured I/O assembly data specific to the device type, designed for quick setup.
- Configuration Assembly Data designed for quick and easy parameterization of your device (based on device compatibility).

## Generic Modules vs EDS Files

**Generic Module Configuration** 



Type: Vendor:	ETHERNET-MODULE Generic Ether Rockwell Automation/Allen-Bradley	net Module	
Parent:		Connection Parameters	
Name. Description:	TR_Device	Assembly Instance:	Size:
o coonpaon.	^	Input:	125 🊔 (32-bit)
		Output:	124 🎅 (32-bit)
Comm Format:	Data - DINT 👻	Configuration:	0 🔼 (9.50)
Address / H	ost Name	Conliguration.	
IP Addre	SS:	Status Input:	
🔘 Host Na	me:	Status Output:	

RSLogix 5000 - Chris_Test_Program in Blank_Progr	am.ACD [1769-L23E-QB120.11] - [MainProgram - MainRoutine]	- 0
幕 File Edit View Search Logic Communics 語 🎯 🖬 🍪 炎 陆 💼 🅫 👓 👓 InOut_T	atons Tools Window Help R_L1200 Preston · # 4, 12, 15, 17, 19, 19, 19, 10, 10, 11, 11, 11, 11, 11, 11, 11, 11	- 
Forces P. BAT	(* ) \ Truorites A 20000 A 2000 A 20	
ontroller Organizer 👻 🕸		
Control Transformer Control Control Control Control Transformer Control Contr		
1/O Configuration CompactLogid323E-QB1 System		
- 1769-L23E-QB1 Chris_Test_Program	< > MainRoutine <	
Bing Comps     New Module	In Frome ELogis S000 project saved successfully. haplete - 0 error(s). 0 warning(s)	•
Expe Print Ctr	+-V'	
	x	
	Errors 🗟 Search Results 🖉 Watch	
eate a module		Runa (End) of 0 APP VER

Right-Click Ethernet in the Controller
Organizer.

- Select New Module.
- Select and Create a Generic Ethernet Module.



- Enter your desired device name and IP Address.
- Change Comm Format to Input Data DINT.
- Set your Connection Parameters as shown on the left.
- Click OK.
- For more information on I/O assembly data, refer to Chapter 6 – Object Model in your device manual.

**S** 

## EDS Compatible Devices

**TR EDS Files** 



#### 20 TR EDS Files

You will need your devices corresponding EDS file to progress past this point. To download EDS files for all TR Electronic devices <u>Click Here</u> and use the Readme file to locate the correct sub-folder where your EDS file is stored.

You will need your devices corresponding EDS file to progress past this point.

Electronic Data Sheet file(s) will be ad	dded to your system for use in Rockwell Automation applications.	<b>X</b>
<ul> <li>Register a single file</li> </ul>		
C Register a directory of EDS files	Look in subfolders	
Named		
My Documents\TR EDS Files\04710022	2_TR_C_SERIES_INC_1_3.eds Browse	
	the same name as the file(s) you are registering	
If there is an icon file (ico) with t then this image will be associated	with the device	
* If there is an icon file (ico) with t then this image will be associated	I with the device.	
If there is an icon file (ico) with t then this image will be associated	I with the device.	
if there is an icon file (ico) with t then this image will be associated	I with the device. To perform an installation test on the file(s), click Next	
if there is an icon file (ico) with t then this image will be associated	I with the device. To perform an installation test on the file(s), click: Next	
If there is an icon file (ico) with the then this image will be associated	I with the device. To perform an installation test on the file(s), click. Next	

- In RS Logix, Click Tools then EDS Hardware Installation Tool.
- Follow through and select whether you would like to register a single file or a directory of EDS file(s).
- Click *Browse* and find the EDS file(s).
- Continue through the screens until you've successfully completed the ESD Wizard.



## **Module Configuration**

### **Rotary Device**



If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help         If the first two such log: Communication Tail: Wellow Help <th></th>	
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<ul> <li>Analog</li> <li>CIP Motion Conv</li> <li>Communication</li> <li>Communications</li> </ul>	erter Adapter		Advanced Er Advanced M Cognex Corp Dialight	nergy Industries, Inc. icro Controls Inc. (AMCI) oration		
•		• •		III		۴
Catalog Number	Description	Vendor	Category			-
0471_0022_0031	TR - EthemetIP Encoder	TR-Electronic G	Encoder			
0471_0022_012C	TR-Loox_3M	TR-Electronic G	Encoder			
0471_0022_0140	TR-LP46_EIP	TR-Electronic G	Encoder			
0471_0022_0141	TR-LA46_EIP	TR-Electronic G	Encoder			
0471_0022_0142	TR-LMP30_EIP	TR-Electronic G	Encoder			
0471_0022_0898	TR_LE200_ENIP	TR-Electronic G	Encoder			
0471_0022_4353	TR C-Series Encoder	TR-Electronic G	Encoder			
0471_0022_4354	TR C-582 Encoder	TR-Electronic G	Encoder			

Type:	Module Definition	on*					23
Parent:	Revision:	1 •	003	×			
Name:	Electronic Keying:	Compatible Mod	dule		•		
Description:	Connections:						<b>A</b> .
	Name		Size		Tag S	uffix	
	Position Value 32	2 Bit + put:	2	DINT		TR_Device:I1	
	Velocity	utput:	0		· ·	<none></none>	
Module De Revision:	Select a connect	ion 🔻					
Electronic							
Connection							
				ОК		Cancel Help	

- Right-Click Ethernet in the Controller Organizer.
- Select New Module.
- In the filter field, type 0471 to find the list of TR Electronic Devices.
- 0471\_0022\_0031 CEV65M.
- 0471\_0022\_012C All Linears w/ built in switch (Dual Communication Ports In/Out).
- 0471\_0022\_0140 LP46 w/ no switch.
- 0471\_0022\_0141 LA46 w/ no switch.
- 0471\_0022\_0142 LMP30 w/ no switch.
- 0471\_0022\_0898 LE200.
- 0471\_0022\_4353 CXX58 or CXX58:2-1XXXX Rotary Encoder.
- 0471\_0022\_4354 CXX582 Rotary Encoder.
- Select your device EDS file and click Create.
- Enter your desired device Name.
- Set your device specific IP Address.
- Click Change to select the type of data you desire from the device.
- For more information on I/O assembly data, refer to Chapter 6 – Object Model in your device manual.
- \*\*\*If you would like to use the AOI to commission your device, refer to the AOI Configuration Guide\*\*\*

**3** 

endor:			002	A.]			
arent:	Revision:	•	003	¥			
ame:	Electronic Keying:	Compatible Mod	dule		-		
escription:	Connections:						v
	Name		Size		Tag S	uffix	
	Position Value 32 Bi	it + Input:	2	DINT		TR_Device:I1	
	Velocity	Output:	0	DINT		<none></none>	
F E C	These changes will c Data will be set to de Verify module prope Change module defi	ause module fault values u rties before A inition?	data ty inless it pplying	pes and pr can be rec g changes.	operties to	o change. om the existing module	properties.

File Edit View Search Logic Communications 📋 🚅 🖶 🎒 👗 🖻 💼 🗠 🖓 🚺 InOut\_TR Rem Run 🚺 📕 Run Mode Controller OK No Forces ■ 1/0 OK No Edits 0 Controller Organizer - 4 X 🖃 😁 Controller Chris\_Test\_Program 🧭 Controller Tags Controller Fault Handler Power-Up Handler 🗖 📇 Tasks 🛓 🚭 MainTask 🗄 🕞 MainProgram 🗀 Unscheduled Programs 🗧 🔄 Motion Groups Ungrouped Axes Add-On Instructions 🗄 🔄 Data Types User-Defined E Strings Add-On-Defined + Redefined Hodule-Defined Trends 🛓 🔠 I/O Configuration CompactLogix5323E-QB1 System

1769-L23E-QB1 Chris\_Test\_Program 1769-L23E-QB1 Ethernet Port LocalENB 등 器 Ethernet 1769-L23E-QB1 Ethernet Port Lo 5 0471\_0022\_4354 TR\_Device CompactBus Local 🖶 🔄 Embedded I/O [1] Embedded IQ16F Discrete\_In
 [2] Embedded OB16 Discrete\_O Expansion I/O

- For this demonstration we will select Position Value 32 Bit + Velocity.
- Click OK.
- You will receive a message that you have made a change to the module properties. Click Yes to proceed.
- Your module is now created and you may *Close* the module window.

- Download your project to the controller and using *Remote Run* go online with the controller.
- If you see a yellow triangle like the example below, there is a communication fault and network troubleshooting will need to be completed.

🗄 🚠 Ethernet



Name	A 52	Value 🗧	Force Mask 🗧 🕈	Style	Data Type
± Local1:C		{}	{}		AB:Embedded_IQ16F:C:0
I Local1:i		{}	{}		AB:Embedded_IQ16F:I:0
± Local2C		{}	{}		AB:Embedded_0B16:C:0
± Local21		{}	{}		AB:Embedded_0B16I:0
+ Local20		{}	{}		AB:Embedded_0B16:0:0
+ TR_Device:C		{}	{}		_0471:0022_4354_17998952:0:0
- TR_Device:I1		{}	{}		_0471:0022_4354_96F81438:1:0
TR_Device:11.ConnectionFaulted		0		Decimal	BOOL
TR_Device:I1.Data		{}	{}	Decimal	DINT[2]
+ TH_Device:11.Data[0]		79107		Decimal	DINT
+ TR Device: 11.Data[1]		112		Decimal	DINT

- Go to Controller Tags and find your devices Input Data tags.
- In this example it is TR\_Device:I1.Data.
- {Device\_Name}:I1.Data[0] = Position Data.
- {Device\_Name}:I1.Data[1] = Velocity Data.

## **Module Configuration**

### **Linear Device**



Most linear devices come scaled by default to output in  $1\mu m$  or 1000nm increments. In order to calculate the total number of steps across the entire measuring length a simple formula can be used.

Measuring length in steps =	Measuring length [mm]	
Measuring length in steps –	Resolution [mm]	

The measuring system can be scaled to output in other units of measurement using the parameter Position Format.

Type: Vendor: Parent:	TR-Lxxx_3M TR-Electronic GmbH LocalENB				
Name:	TR_Device	100	Ethernet Address Private Network:	192.168.1. 4	
		Ŧ	<ul> <li>IP Address:</li> <li>Host Name:</li> </ul>		
Module Defi	nition				
Electronic K	leying: Compatible Module				
Connection	S Position Value 1 + Velocity				
	Chan	ne l			

Refer back to Module Configuration
and follow the first page, noting the
changes below.

 Set your Connections to Position Value 1 + Velocity as shown on the right.

- Set the data type to DINT.
- Set your device specific IP Address and click OK to create.

Name	8 4	Value 🗧	·F	Force Mask 🔹	Style	Data T	уре
+-Local:1:C		{}		{}		AB:Emb	edded_IQ16F:C:0
+-Local:1:I		{}		{}		AB:Emb	edded_IQ16F:I:0
+-Local:2:C		{}		{}		AB:Emb	edded_0B16:C:0
+-Local:2:I		{}		{}		AB:Emb	pedded_0B16:I:0
+-Local:2:0		{}		{}		AB:Emt	edded_0B16:0:0
+-TR_Device:C		()		{}		_0471:	0022_012C_17998952:C:0
- TR_Device:I1		{}		{}		_0471:	0022_012C_96F81438:1:0
TR_Device:I1.Connec	stio	0			Decimal	BOOL	
- TR_Device:I1.Data		{}		{}	Decimal	DINT[2	1
+ TR_Device:I1.Data	i[0]	233091			Decimal	DINT	
+-TR_Device:I1.Data	a[1]	0	)		Decimal	DINT	

- Download and go online with the PLC.
- Go to *Controller Tags* and find your devices Input Data tags.
- In this example it is TR\_Device:I1.Data.
- {Device\_Name}:I1.Data[0] = Position Data.
- {Device\_Name}:I1.Data[1] = Velocity Data.



## Configuration Assembly

### What is a Configuration Assembly?



🖻 TR_Device:C.Data	{}
+ TR_Device:C.Data[0]	0
TR_Device:C.Data[1]	0
+ TR_Device:C.Data[2]	16
+ TR_Device:C.Data[3]	0
+ TR_Device:C.Data[4]	0
+ TR_Device:C.Data[5]	0
+ TR_Device:C.Data[6]	0
+ TR_Device:C.Data[7]	0
+ TR_Device:C.Data[8]	1
TR_Device:C.Data[9]	15
+ TR_Device:C.Data[10]	31
+ TR_Device:C.Data[11]	0
🛨 TR_Device:C.Data[12]	0
+ TR_Device:C.Data[13]	0
+ TR_Device:C.Data[14]	1
+ TR_Device:C.Data[15]	0
+ TR_Device:C.Data[16]	0
TR_Device:C.Data[17]	0
+ TR_Device:C.Data[18]	0
+ TR_Device:C.Data[19]	0
+ TR_Device:C.Data[20]	16
+ TR_Device:C.Data[21]	0
+ TR_Device:C.Data[22]	0
+ TR_Device:C.Data[23]	1
+ TR_Device:C.Data[24]	0
+ TR_Device:C.Data[25]	0
+ TR_Device:C.Data[26]	0
+ TR_Device:C.Data[27]	0
+ TR Device:C.Data[28]	0



The Configuration Assembly is a set of data tags that make parameterizing your encoder a one-time process.

Each tag corresponds to a measuring system parameter that is transferred to the device in the start-up phase of communication.

As long as the tag values are saved in your project -if a new device is connected with the same IP address- all the parameter data will be stored to the new device.

This is designed to limit downtime associated with device change out and re-confi guration.

### \*\*\*If your existing project utilizes Explicit Message Instructions and this method of parameterization is not desired, the tag values of all parameters should be set to "0"\*\*\*



#### Configuration Assembly Compatible Devices

- Cxx58 Rotary Encoders (w/ firmware version 1.15).
- Cxx582 Rotary Encoders.
- LA, LP, LMRI-46/LMPI-46, LMP (w/switch) Magnetostriction Linear Devices.

			100 million -				V	
	Default (Hex)	Default (Decimal)	Default (Decimal)	Possibilities	Description	When TR Parameter = 0	When TR Parameter = 1	
CEV582:C.Data[0]	00	0	0	0 or 1	Direction Toggle – Attribute: 12			
CEV582:C.Data[1]	00	0						
CEV582:C.Data[2]	10	16	4005	CMX-582 (1-8 192)	Measuring Units Per Span	11-15-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	Configuration Value Ignored - Leave As	
CEV582:C.Data[3]	00	0	4096	COX-582 (1-52 708)	Attribute: 16	Used For Configuration	Attribute Value is Calculated	
CEV582:C.Data[4]	00	0						
CEV582:C.Data[5]	00	0						
CEV582:C.Data[6]	00	0	16777216	16 4104067306	Total Measuring Range (<32 Bit)	Used For Configuration	Configuration Value Ignored - Leave As	
CEV582:C.Data[7]	00	0	16///216	10-4294907295	Attribute: 17	Used For Configuration	Attribute Value is Calculated	
CEV582:C.Data[8]	01	1						
CEV582:C.Data[9]	OF	15	7051	7940 (steps/s), 7941 (steps/ms),	Velocity Format			
CEV582:C.Data[10]	1F	31	7951	7950 (rev/s), 7951 (rev/min)	Attribute: 25			
CEV582:C.Data[11]	00	0						
CEV582:C.Data[12]	00	0	]		Total Measuring Range (<64 Bit) Attribute: 101	Configuration Value Ignored - Leave As Default Attribute Value is Calculated		
CEV582:C.Data[13]	00	0						
CEV582:C.Data[14]	01	1	16777016	CMX-582 (16-33 554 432)			Used For Configuration	
CEV582:C.Data[15]	00	0	10///210	COX-582 (1-5 368 608 600)				
CEV582:C.Data[16]	00	0						
CEV582:C.Data[17]	00	0	]					
CEV582:C.Data[18]	00	0						
CEV582:C.Data[19]	00	0						
CEV582:C.Data[20]	10	16	4096	1 356000	Number Of Revolutions – Numerator	Configuration Value Ignored - Leave As Default Attribute Value is Calculated	Used Fee Configuration	
CEV582:C.Data[21]	00	0	4096	1-256000	Attribute: 102		Used For Configuration	
CEV582:C.Data[22]	00	0	с.					
CEV582:C.Data[23]	01	1						
CEV582:C.Data[24]	00	0	] ,	1 16284	Number Of Revolutions – Divisor	Configuration Value Ignored - Leave As	Used For Configuration -	
CEV582:C.Data[25]	00	0	1	1-10584	Attribute: 103	Attribute Value is Calculated	Recommend to leave at 1	
CEV582:C.Data[26]	00	0						
CEV582:C.Data[27]	00	0	0	0 or 1 - Recommended to set to 1	TR – Parameter - Attribute: 105			
CEV582:C.Data[28]	00	0						
CEV582:C.Data[29]	00	0		<u>,</u>	Decement			
CEV582:C.Data[30]	00	0		0	neserved			
CEV582:C.Data[31]	00	0	1					

\*\*\*Rotary Encoders Only\*\*\*



	Default (Hex)	Default (Decimal)	Default (Decimal)	Possibilities	Description	
Linear:C.Data[0]	00	0	0	0 or 1	Direction Counting Toggle - Attribute: 12	
Linear:C.Data[1]	04	4	0700	8706 (cm), 8707 (mm),	Position Format	
Linear:C.Data[2]	22	34	8708	8708 (μm), 8709 (nm)	Attribute: 15	
Linear:C.Data[3]	01	1				
Linear:C.Data[4]	00	0	1	1 1 000 000	Position Measuring Increment	
Linear:C.Data[5]	00	0	1	1-1000000	Attribute: 18	
Linear:C.Data[6]	00	0				
Linear:C.Data[7]	01	1	11000	7940 (stp/s) -	Velocity Format	
Linear:C.Data[8]	2B	43	11009	11009 (cm/s)	Attribute: 25	
Linear:C.Data[9]	01	1				
Linear:C.Data[10]	00	0	1	1	Velocity Resolution	
Linear:C.Data[11]	00	0	1	T	Attribute: 26	
Linear:C.Data[12]	00	0				
Linear:C.Data[13]	00	0	0	N/A	Personand	
Linear:C.Data[14]	00	0	0	N/A	Keserved	
Linear:C.Data[15]	00	0	0	0, 1, 4, 7	Velocity Observer - Attribute: 108	
Linear:C.Data[16]	01	1	1	1-16	Position Filter - Attribute: 109	
Linear:C.Data[17]	01	1	1	1, 2, 3	Number of Magnets – Attribute: 110	
Linear:C.Data[18]	00	0				
Linear:C.Data[19]	00	0	0	N/A	Percented	
Linear:C.Data[20]	00	0	U	N/A	Reserved	
Linear:C.Data[21]	00	0				
Linear:C.Data[22]	00	0				
Linear:C.Data[23]	00	0	0	N/A	Percentred	
Linear:C.Data[24]	00	0	U	N/A	Reserved	
Linear:C.Data[25]	00	0				
Linear:C.Data[26]	00	0				
Linear:C.Data[27]	00	0	0	N/A	Reserved	
Linear:C.Data[28]	00	0	U	N/A	Neserveu	
Linear:C.Data[29]	00	0				
Linear:C.Data[30]	00	0	0	Ν/Λ	Beserved	
Linear:C.Data[31]	00	0	U	N/A	Neserveu	

\*\*\*Linear Magnetostriction Devices Only\*\*\*

## Configuration Assembly

### **Changing Direction of a Device**



- TR_Device:C		{}	{}		_0471:0022_4354_17998952:C:0
- TR Device:C.Data		{}	{}	Decimal	SINT[32]
+ TR_Device:C.Data[0]	*	1		Decimal	SINT
+ TR_Device:C.Data[1]		0		Decimal	SINT
+ TR_Device:C.Data[2]		16		Decimal	SINT
TR_Device:C.Data[3]		0		Decimal	SINT
TR_Device:C.Data[4]		0		Decimal	SINT
+ TR_Device:C.Data[5]		0		Decimal	SINT
TR_Device:C.Data[6]		0		Decimal	SINT
+ TR_Device:C.Data[7]		0		Decimal	SINT
+ TR_Device:C.Data[8]		1		Decimal	SINT
+ TR_Device:C.Data[9]		15		Decimal	SINT
+ TR_Device:C.Data[10]		31		Decimal	SINT
+ TR_Device:C.Data[11]		0		Decimal	SINT
+ TB_Device:C.Data[12]		0		Decimal	SINT
TR_Device:C.Data[13]		0		Decimal	SINT
TR_Device:C.Data[14]		1		Decimal	SINT
+ TR_Device:C.Data[15]		0		Decimal	SINT
TR_Device:C.Data[16]		0		Decimal	SINT
+ TB_Device:C.Data[17]		0		Decimal	SINT
TR_Device:C.Data[18]		• 0		Decimal	SINT
TR_Device:C.Data[19]     U=Incr	ease Clock	wise 💿		Decimal	SINT
+ TR_Device:C.Data[20]		16		Decimal	SINT
TR_Device:C.Data[21] 1 - Incr	oaco Coun	tor-Cloc	wice	Decimal	SINT
TR_Device:C.Data[22]	ease Cour		<b>VVISE</b>	Decimal	SINT
				1	Contract Contract

Name	Requested Packet Interval (RPI) (ms)	Connection over EtherNet/IP	Input Trigger	
Position Value 32 Bit + Velocity	20.0 🚖 1.0 - 3200.0	Unicast 🖉	Cyclic 👻	
	JU DANGER. Uninhibiting module o Uninhibiting module online cou	online. Id affect running	g system.	
Inhibit Module	Apply changes?	Help		

Name	 Value 🕈	Force Mask 🔹 🕈	Style	Data Type
+ Locat1:C	()	()		AB:Embedded_IQ16F:C:0
I Locat1:I	{}	()		AB:Embedded_IQ16F:I:0
± Local2C	{}	{}		AB:Embedded_OB16:C:0
+ Local21	()	()		AB:Embedded_OB16:I:0
+ Local20	()	()		AB:Embedded_OB16:0:0
+ TR_Device:C	()	()		_0471:0022_4354_17998952:0:0
- TR_Device:I1	()	()		_0471:0022_4354_96F81438:1:0
TR_Device:I1.ConnectionFaulted	0		Decimal	BOOL
TR_Device:I1.Data	()	()	Decimal	DINT[2]
+ TH_Device:1.Data(U)	79107		Decimal	DINT
+ TR Device: 11.Data(1)	112		Decimal	DINT

- To change Direction of your device, go to Controller Tags and make sure you are viewing Monitor Tags.
- Look for the name of your device as it was configured in the Module Configuration section.
- In the tag {Device\_Name}:C.Data[0] enter a value of 0 or 1 to change the direction.

Click Here to view Configuration Assembly table.

- Right-Click your device in the Controller Organizer.
- Select Properties.
- Go to the Connection Tab.
- Click the Inhibit Module box and Apply this change.
- Now un-check the *Inhibit Module* box, applying the change once again.

- To verify your change, go to Controller Tags and find your devices Input Data tags.
- In this example it is TR\_Device:I1.Data.
- {Device\_Name}:I1.Data[0] = Position Data.
- {Device\_Name}:I1.Data[1] = Velocity Data.

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## Configuration Assembly

### **TR Parameter**



#### 34 TR Parameter

#### Attribute 105, TR-Parameter in use (scaling)

TR-Parameter in use sets which scaling attributes are in use.

#### BOOL

Access	Value	Description	Default
	= 0	Standard EthernNet/IP scaling attributes in use	X
Set / Get	= 1	Manufacturer specific TR scaling attributes in use	

#### Standard EthernNet/IP scaling parameters:

- Attribute 16, Measuring Units per Span
- Attribute 17, Total Measuring Range in Measuring Units

#### Manufacturer specific TR scaling parameters:

- Attribute 101, Total Measuring Range
- Attribute 102/103, Revolution Numerator/Denominator

Connection path, Packed EPATH with 8 bit class

0x20	0x23	0x24	0x01	0x30	0x69
Logical Type = Class	Class #23	Logical Type = Instance	Instance #1	Logical Type =AttrID	AttrID #105

This attribute only takes effect after executing service code  $0x16\ {\tt save}$  or attribute 112 Accept Parameter.

+ TR Device:C.Data[26]		0	Decimal	SINT
+ TR Device:C.Data[27]		1	Decimal	SINT
+ TR_Device:UData[28]		0	Decimal	SINT
TR_Device:C.Data[29] 0 = Standard EtherNet/I	P scaling attributes in use	0	Decimal	SINT
TR_Device:C.Data[30] 1 = Manufacturer specif	c scaling attributes in use	0	Decimal	SINT
+ TR Device:C.Data[31]		0	Decimal	SINT

- TR Parameter allows the measuring system to be configured outside of the factory default settings.
- It can be turned ON/OFF using the configuration assembly.
- Tag{Device\_Name}:C.Data[27]= TR-Parameter.

- To turn TR-Parameter ON, place a value of 1 in the corresponding tag.
- Cycle communication via the module properties window like in the Direction setting example.
- It is recommended that this parameter be set to 1 if customer specific scaling is desired.



## Configuration Assembly

### Scaling the Measuring System Rotary Device



#### 36 Scaling the Measuring System - Rotary Devices

In order to scale the measuring system to a customer specific resolution, a combination of 3 parameters are used:

- Total Measuring Range the total number of steps the encoder will output before restarting to zero.
- Revolution Numerator/Denominator defines the number of revolutions before the measuring system restarts at zero.

Number of Revolutions Numerator Total measuring range = Steps per revolution \* Number of Revolutions Denominator

Let's set the device so that it outputs 360 steps over 10 full rotations, before starting over at zero. This will also effectively output in degrees of rotation.

Name	-== 4	Force Mask *	Style	Data Type	Description
E TR_Devic	e:C.Data	{}	Decimal	SINT[32]	Configuration Assembly - SEE MANUAL FOR MORE INFORMATION
+ TR_De	vice:C.Data[0]		Decimal	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2^7 to 2^0)
+ TR_De	vice:C.Data[1]		Decimal	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2°15 to 2°8)
+ TR_De	vice:C.Data[2]		Decimal	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°23 to 2°16)
+ TR_De	vice:C.Data[3]		Decimal	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°31 to 2°24)
+ TR_De	vice:C.Data[4]		Decimal	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2^39 to 2^32)
+ TR_De	vice:C.Data[5]		Decimal	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_De	vice:C.Data[6]		Decimal	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_De	vice:C.Data[7]		Decimal	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_De	vice:C.Data[8]		Decimal	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_De	vice:C.Data[9]		Decimal	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2 <sup>7</sup> 79 to 2 <sup>7</sup> 72)
+ TR_De	vice:C.Data[10]		Decimal	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2°87 to 2°80)
+ TR_De	vice:C.Data[11]		Decimal	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2^95 to 2^88)
+ TR_De	vice:C.Data[12]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-103</sup> to 2 <sup>-96</sup> )
+ TR_De	vice:C.Data[13]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^111 to 2^104)
+ TR_De	vice:C.Data[14]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^119 to 2^112)
+ TR_De	vice:C.Data[15]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-1</sup> 27 to 2 <sup>-1</sup> 20)
+ TR_De	vice:C.Data[16]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^135 to 2^128)
+ TR_De	vice:C.Data[17]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-143</sup> to 2 <sup>-136</sup> )
+ TR_De	vice:C.Data[18]		Decimal	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2^151 to 2^144)
+ TR_De	vice:C.Data[19]		Decimal	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2 <sup>-159</sup> to 2 <sup>-152</sup> )
+ TR_De	vice:C.Data[20]		Decimal	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^167 to 2^160)
+ TR_De	vice:C.Data[21]		Decimal	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^175 to 2^168)
+ TR_De	vice:C.Data[22]		Decimal	SINT	MSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°183 to 2°176)
± TR_De	vice:C.D.ata[23]		Decimal	SINT	LSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2^191 to 2^184)
E TR_De	vice:C.Data[24]		Decimal	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2~199 to 2~192)
E TR_De	vice:C.Data[25]		Decimal	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2^207 to 2^200)
+ TR_De	vice:C.Data[26]		Decimal	SINT	MSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2°191 to 2°184)
+ TR_De	vice:C.Data[27]		Decimal	SINT	TR-Parameter in Use 0=Not in Use; 1=In Use (Default = 0) Attribute 105 (2^223 to 2^216)
+ TR_De	vice:C.Data[28]		Decimal	SINT	Reserved

- In this example we will set the measuring system to the following values:
  - Steps per Revolution: 360
  - Revolution Numerator: 10
  - Revolution Denominator: 1
  - Total Measuring Range: 3600
- For more information on these calculations and further examples, see your <u>Device Manual</u>.

Name /	Value 🔶	Force Mask	Style	Data Type	Description
- TR_Device:C	{}	{}		_0471:00	
TR_Device:C.Data	{}	{}	Hex	SINT[32]	Configuration Assembly - SEE MANUAL FOR MORE INFORMATION
+ TR_Device:C.Data(0)	16#00		Hex	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2"7 to 2"0)
+ TR_Device:C.Data(1)	16#00		Hex	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>-15</sup> to 2 <sup>-8</sup> )
TR_Device:C.Data[2]	16#10		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°23 to 2°16)
TR_Device:C.Data[3]	16#00		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2^31 to 2^24)
+ TR_Device:C.Data[4]	16#00		Hex	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>-39</sup> to 2 <sup>-32</sup> )
+ TR_Device:C.Data[5]	16#00		Hex	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C.Data[6]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C.Data[7]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C.Data[8]	16#01		Hex	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C.Data(9)	16#0f		Hex	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2°79 to 2°72)
+ TR_Device:C.Data(10)	16#1f		Hex	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2°87 to 2°80)
+ TR_Device:C.Data(11)	16#10		Hex	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2^95 to 2^88)
+ TR_Device:C.Data[12]	16#0e		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^103 to 2^96)
+ TR_Device:C.Data[13]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^111 to 2^104)
+ TR_Device:C.Data[14]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^119 to 2^112)
+ TR_Device:C.Data[15]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^127 to 2^120)
TR_Device:C.Data[16]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^135 to 2^128)
+ TR_Device:C.Data[17]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^143 to 2^136)
+ TR_Device:C.Data[18]	16#00		Hex	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2°151 to 2°144)
TR_Device:C.Data[19]	16#0a		Hex	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°159 to 2°152)
+ TR_Device:C.Data(20)	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2 <sup>167</sup> to 2 <sup>160</sup> )
+ TR_Device:C.Data[21]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^175 to 2^168)
+ TR_Device:C.Data[22]	16#00		Hex	SINT	MSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2 <sup>-183</sup> to 2 <sup>-176</sup> )
+ TR_Device:C.Data[23]	16#01		Hex	SINT	LSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2"191 to 2"184)
+ TR_Device:C.Data[24]	16#00		Hex	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>199</sup> to 2 <sup>192</sup> )
+ TR_Device:C.Data[25]	16#00		Hex	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2^207 to 2^200)
+ TR_Device:C.Data[26]	16#00		Hex	SINT	MSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>-191</sup> to 2 <sup>-184</sup> )
+ TR_Device:C.Data[27]	16#01		Hex	SINT	TR-Parameter in Use 0=Not in Use; 1=In Use [Default = 0] Attribute 105 (2^223 to 2^216)

- Find your device in the Controller Tags window.
- Change the data *Style* to *Hex*.
- Convert your desired values to Hexadecimal values.
- Total Measuring Range = 3600Dec = 0xE10Hex.
- Revolutions/Numerator = 10Dec = 0x0AHex.
- TR-Parameter = In-Use = 0x01Hex.
- Enter the values as depicted on the left.



Name	-8 4	Value 🔸	Force Mask *	Style	Data Type	Description
E TF	LDevice:C.Data[0]	16#00		Hex	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2^7 to 2^0)
E TF	LDevice:C.Data[1]	16#00		Hex	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2~15 to 2~8)
± TF	_Device:C.Data[2]	16#10		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2^23 to 2^16)
E TF	_Device:C.Data[3]	16#00		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2"31 to 2"24)
E TF	P_Device:C.Data[4]	16#00		Hex	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>-39</sup> to 2 <sup>-32</sup> )
± TF	_Device:C.Data[5]	16#00		Hex	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attriibute 17 (2°47 to 2°40
E TF	_Device:C.Data[6]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attriibute 17 (2^47 to 2^40)
+ TF	_Device:C.Data[7]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
E TF	_Device:C.Data[8]	16#01		Hex	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^4)
E TF	LDevice:C.Data[9]	16#0f		Hex	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2"79 to 2"72)
± TF	_Device:C.Data[10]	16#1f		Hex	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2°87 to 2°80)
E TF	_Device:C.Data[11]	16#10		Hex	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2^95 to 2^88)
± TF	P_Device:C.Data[12]	16#0e		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°103 to 2°96)
± TF	P_Device:C.Data[13]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°111 to 2°104)
E TF	_Device:C.Data[14]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°119 to 2°112)
E TF	_Device:C.Data[15]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-127</sup> to 2 <sup>-120</sup> )
E TF	_Device:C.Data[16]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-135</sup> to 2 <sup>-128</sup> )
E TF	_Device:C.Data[17]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2~143 to 2~136)
+ TF	LDevice:C.Data[18]	16#00		Hex	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2^151 to 2^144)
E TF	_Device:C.Data[19]	16#0a		Hex	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^159 to 2^152)
+ TF	_Device:C.Data[20]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^167 to 2^160)
± TF	_Device:C.Data[21]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2*175 to 2*168)
Monito	or Tags (Edit Tags	/				
ch						
Quick Wate	ch .	Enter Quick Watch List Name	1			
Name		II 4 Scope	Value			Force Mask     Cescription

- Press *ALT+3* to call up the *Watch* table.
- Click the drop down menu and select *Quick Watch.*
- Add your input data tag for position value (E.g. {Device\_Name}:I.Data[0]).
- This will allow you to view the position value and validate the changes to the measuring system.
- Cycle power to the device or inhibit/ re-inhibit communication as shown in the direction example.

Let's set the device so that it outputs 8192 steps over 4096 full rotations, before starting over at zero. This will also effectively output the maximum resolution of this device. See device label for max. resolution for your device.

Name	A 82	Force Mask *	Style	Data Type	Description
TR_Device:C.D.	ata	{}	Decimal	SINT[32]	Configuration Assembly - SEE MANUAL FOR MORE INFORMATION
+ TR_Device:C	.Data[0]		Decimal	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2^7 to 2^0)
+ TR_Device:C	.Data[1]		Decimal	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>15</sup> to 2 <sup>8</sup> )
+ TR_Device:C	Data[2]		Decimal	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°23 to 2°16)
+ TR_Device:C	.Data[3]		Decimal	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2^31 to 2^24)
+ TR_Device:C	Data[4]		Decimal	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>39</sup> to 2 <sup>32</sup> )
+ TR_Device:C	.Data[5]		Decimal	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2 <sup>47</sup> to 2 <sup>40</sup> )
+ TR_Device:C	Data[6]		Decimal	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C	.Data[7]		Decimal	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)
+ TR_Device:C	Data[8]		Decimal	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2°47 to 2°40)
+ TR_Device:C	.Data[9]		Decimal	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2 <sup>7</sup> 79 to 2 <sup>7</sup> 72)
+ TR_Device:C	.Data[10]		Decimal	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2°87 to 2°80)
+ TR_Device:C	.Data[11]		Decimal	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2^95 to 2^88)
TR_Device:C	Data[12]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-103</sup> to 2 <sup>-96</sup> )
+ TR_Device:C	.Data[13]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^111 to 2^104)
TR_Device:C	.Data[14]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^119 to 2^112)
TR_Device:C	.Data[15]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>1</sup> 27 to 2 <sup>1</sup> 20)
+ TR_Device:C	.Data[16]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>1</sup> 35 to 2 <sup>1</sup> 28)
+ TR_Device:C	.Data[17]		Decimal	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^143 to 2^136)
TR_Device:C	.Data[18]		Decimal	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2^151 to 2^144)
+ TR_Device:C	.Data[19]		Decimal	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2 <sup>-159</sup> to 2 <sup>-152</sup> )
+ TR_Device:C	.Data[20]		Decimal	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^167 to 2^160)
+ TR_Device:C	.Data[21]		Decimal	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^175 to 2^168)
E TR_Device:C	.Data[22]		Decimal	SINT	MSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2*183 to 2*176)
TR_Device:C	.Data[23]		Decimal	SINT	LSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>1</sup> 91 to 2 <sup>1</sup> 84)
+ TR_Device:C	Data[24]		Decimal	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2~199 to 2~192)
+ TR_Device:C	Data[25]		Decimal	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>2</sup> 07 to 2 <sup>2</sup> 00)
+ TR_Device:C	.Data[26]		Decimal	SINT	MSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>-191</sup> to 2 <sup>-184</sup> )
+ TR_Device:C	.Data[27]		Decimal	SINT	TR-Parameter in Use 0=Not in Use; 1=In Use (Default = 0) Attribute 105 (2^223 to 2^216)
+ TR_Device:C	.Data[28]		Decimal	SINT	Reserved

- In this example we will set the measuring system to the following values:
  - Steps per Revolution: 8192
  - Revolution Numerator: 4096
  - Revolution Denominator: 1
  - Total Measuring Range: 33,554,432
- For more information on these calculations and further examples, see your Device Manual.

Name	<u>==</u> 4	Value 🔶	Force Mask 🔹	Style	Data Type	Description			
ΞT	R_Device:C.Data	()	()	Hex	SINT[32]	Configuration Assembly - SEE MANUAL FOR MORE INFORMATION			
Ŧ	TR_Device:C.Data(0)	16#00		Hex	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2^7 to 2^0)			
÷.	TR_Device:C.Data[1]	16#00		Hex	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2^15 to 2^8)			
(+	TR_Device:C.Data[2]	16#10		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°23 to 2°16)			
÷.	TR_Device:C.Data[3]	16#00		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2^31 to 2^24)			
÷	TR_Device:C.Data[4]	16#00		Hex	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2^39 to 2^32)			
i÷.	TR_Device:C.Data[5]	16#00		Hex	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)			
i÷.	TR_Device:C.Data[6]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)			
÷.	TR_Device:C.Data[7]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)			
÷.	TR_Device:C.Data[8]	16#01		Hex	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)			
÷	TR_Device:C.Data[9]	16#0f		Hex	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2°79 to 2°72)			
÷.	TR_Device:C.Data[10]	16#1f		Hex	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2*87 to 2*80)			
+	TR_Device:C.Data[11]	16#00		Hex	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2°95 to 2°88)			
+	TR_Device:C.Data[12]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-103</sup> to 2 <sup>-96</sup> )			
+	TR_Device:C.Data[13]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>111</sup> to 2 <sup>104</sup> )			
+	TR_Device:C.Data[14]	16#02		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2^119 to 2^112)			
+	TR_Device:C.Data[15]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>1</sup> 27 to 2 <sup>1</sup> 20)			
÷	TR_Device:C.Data[16]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>135</sup> to 2 <sup>128</sup> )			
÷	TR_Device:C.Data[17]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>143</sup> to 2 <sup>136</sup> )			
+	TR_Device:C.Data(18)	16#00		Hex	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-151</sup> to 2 <sup>-144</sup> )			
÷.	TR_Device:C.Data(19)	16#00		Hex	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°159 to 2°152)			
	TR_Device:C.Data[20]	16#10		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^167 to 2^160)			
+	TR_Device:C.Data[21]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°175 to 2°168)			
+	TR_Device:C.Data[22]	16#00		Hex	SINT	MSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°183 to 2°176)			
+	TR_Device:C.Data[23]	16#01		Hex	SINT	LSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2°191 to 2°184)			
(+	TR_Device:C.Data[24]	16#00		Hex	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2 <sup>-199</sup> to 2 <sup>-192</sup> )			
÷	TR_Device:C.Data[25]	16#00		Hex	SINT	Number or Revolutions - Denominator (Default = 1) Attribute 103 (2°207 to 2°200)			
+	TR_Device:C.Data[26]	16#00		Hex	SINT	MSB Number or Revolutions - Denominator (Default = 1) Attribute 103 (2^191 to 2^184)			
+	TR_Device:C.Data(27)	16#01		Hex	SINT	TR-Parameter in Use 0=Not in Use; 1=In Use (Default = 0) Attribute 105 (2^223 to 2^216)			
1000									

- Convert your desired values to Hexadecimal values.
- Total Measuring Range = 33554432Dec = 0x2000000Hex.
- Revolutions/Numerator = 4096Dec = 0x1000Hex.
- TR-Parameter = In-Use = 0x01Hex.
- Enter the values as depicted on the left.



Name	<b>18</b>	Value 🔶	Force Mask *	Style	Data Type	Description				
⊕ T	R_Device:C.Data[0]	16#00		Hex	SINT	Direction Toggle; 0=Increase CW; 1=Decrease CW (Default = 0) Attribute 12 (2^7 to 2^0)				
⊞-T	R_Device:C.Data[1]	16#00		Hex	SINT	LSB Measuring Units per Span (Default = 4096) Attribute 16 (2°15 to 2°8)				
	R_Device:C.Data[2]	16#10		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°23 to 2°16)				
⊕ T	R_Device:C.Data[3]	16#00		Hex	SINT	Measuring Units per Span (Default = 4096) Attribute 16 (2°31 to 2°24)				
± T	R_Device:C.Data[4]	16#00		Hex	SINT	MSB Measuring Units per Span (Default = 4096) Attribute 16 (2 <sup>-39</sup> to 2 <sup>-32</sup> )				
± T	R_Device:C.Data(5)	16#00		Hex	SINT	LSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)				
⊞-T	R_Device:C.Data(6)	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^4)				
	R_Device:C.Data[7]	16#00		Hex	SINT	Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)				
. ⊞-T	R_Device:C.Data[8]	16#01		Hex	SINT	MSB Total Measuring Range in Measuring Units (Default = 16777216) Attribute 17 (2^47 to 2^40)				
⊞-T	R_Device:C.Data[9]	16#0f		Hex	SINT	LSB Velocity Format (Default = 7951) Attribute 25 (2 <sup>7</sup> 79 to 2 <sup>7</sup> 72)				
	R_Device:C.Data[10]	16#1f		Hex	SINT	MSB Velocity Format (Default = 7951) Attribute 25 (2°87 to 2°80)				
⊕ T	R_Device:C.Data[11]	16#10		Hex	SINT	LSB Total Measuring Range (Default = 16777216) Attribute 101 (2°95 to 2°88)				
± T	R_Device:C.Data[12]	16#0e		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°103 to 2°96)				
±τ	R_Device:C.Data[13]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2~111 to 2~104)				
⊞-T	R_Device:C.Data[14]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°119 to 2°112)				
±-⊺	R_Device:C.Data[15]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2 <sup>-127</sup> to 2 <sup>-120</sup> )				
	R_Device:C.Data(16)	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°135 to 2°128)				
⊞-T	R_Device:C.Data[17]	16#00		Hex	SINT	Total Measuring Range (Default = 16777216) Attribute 101 (2°143 to 2°136)				
E T	R_Device:C.Data[18]	16#00		Hex	SINT	MSB Total Measuring Range (Default = 16777216) Attribute 101 (2^151 to 2^144)				
⊕ T	R_Device:C.Data[19]	16#0a		Hex	SINT	LSB Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2°159 to 2°152)				
÷ T	R_Device:C.Data[20]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^167 to 2^160)				
⊞ T	R_Device:C.Data[21]	16#00		Hex	SINT	Number or Revolutions - Numerator (Default = 4096) Attribute 102 (2^175 to 2^168)				
> \ Moni	tor Tags (Edit Tags	1								
tch				_						
Quick Wa	tch	Enter Quick Watch List Name	8							
Name		Scope	Value			Force Mask     Cescription				
+ TR_	Device:I1.Data[0]	Controller				3599				

- Press ALT+3 to call up the Watch table.
- Click the drop down menu and select *Quick Watch.*
- Add your input data tag for position value (Eg. {Device\_Name}:I.Data[0]).
- This will allow you to view the position value and validate the changes to the measuring system.
- Cycle power to the device or inhibit/ re-inhibit communication as shown in the Direction example.

## Presetting your Rotary Position Value

**Rotary Device** 



## A WARNING

### Danger of physical injury and damage to property due to an actual value jump during execution of the preset adjustment function!

• The preset adjustment function should only be executed when the measuring system is stationary, or the resulting actual value jump must be permitted by both the program and the application!

In the Controller Organizer, right-click

Preset or Homing functions are often carried out after mounting and coupling has been completed. The machinery may need to be "jogged" to a known position of its stroke and then "zeroed". This is done using a Preset function. The following example is for a CXX582 rotary encoder. Attribute numbers vary by device so it is important to reference the device specific manual.

outine and set a Name ng.
w see it in your Controller
in Routine and delete
in Program and select
nfiguration tab, assign Ited routine as your Ik Ok.
our routine, to display an Logic window.
are in an <i>Offline</i> state
Message Control ? (EN) (EN) (ER)
that you see in the e.
N/O contact and create a _Toggle).
nction we will send our to the Message
of a DINT data type.
set_Value.
_Value.
; t

#### 41 Presetting Your Rotary Position Value - Rotary Device

		mmunica	ation   Ta	g				
Message	<u>T</u> ype:	C	IP Generi			•		
Service Type:	Set Att	ribute Si	ngle		•	<u>S</u> ource Element:	Preset_MSG_Va	aluel 🚽
Convine	<u></u>				-	Source L <u>e</u> ngth:	4	(Bytes)
Code:	10	(Hex)	<u>C</u> lass:	23	(Hex)	Destination		*
Instance:	1		Attribute:	13	(Hex)	Liement.	New Tag	
) Enable ) Error Co	O E de:	nable W	'aiting Extende	⊖ SI d Error	tart Code:	Q Done I	Done Length: 0 □ Timed Out ←	

Message	Type:	mmunic	ation*   T	ag		•		
Service Type:	Set Att	ribute Si	ingle		•	Source Element:	Save_Value	
Service Code: Instance:	10 1	(Hex)	Class: Attribute	23 70	(Hex) (Hex)	Source Length: Destination Element:	1	(Bytes) v
) Enable	O E	nable W	'aiting	() St	art	⊖ Done	Done Length: 0	

- In the message Instruction, right-click the ? and create a new tag (Ex. Preset\_ MSG) with the data type MESSAGE.
- Click the box on the Message instruction and enter the attribute information for Attribute 19, Preset Value (≤ 32 bit).
- The Source Element tag should match the Destination tag of the MOV function shown above and can be selected from the drop-down menu.
- Click the Communication tab, then Browse.
- Locate the specific device you are commissioning.
- Assign the Done bit of the Preset message instruction to the One-Shot function.
- This can be done by typing Preset\_MSG.DN as the tag.
- In the message instruction, right-click the ? and create a new tag (Ex. Save\_MSG) with the data type MESSAGE.
- Click the box on the message instruction and enter the attribute information for Attribute 112, Accept Parameter on the left.
- You will need to create a New Tag for the Source Element (Eg. Save\_Value).



🛨 Local:1:C	{}	{}		AB:Embedded_IQ16F:C:0
+ Local:1:I	{}	{}		AB:Embedded_IQ16F:I:0
+ Local:2:C	{}	{}		AB:Embedded_0B16:C:0
+ Local:2:1	{}	{}		AB:Embedded_0B16:I:0
+ Local:2:0	{}	{}		AB:Embedded_0B16:0:0
+ TR_Device:C	()	{}	ĺ	_0471:0022_4354_17998952:C:0
- TR_Device:I1	{}	{}		_0471:0022_4354_96F81438:1:0
-TR_Device:I1.Connectio	0		Decimal	BOOL
- TR_Device:I1.Data	{}	{}	Decimal	DINT[2]
+ TR_Device:I1.Data[0]	0		Decimal	DINT
+ TR_Device:I1.Data[1]	0		Decimal	DINT
Preset_Toggle	0		Decimal	BOOL
+ Desired_Preset_Value	▼ 12345678		Decimal	DINT
+ Preset_MSG_Value	0		Decimal	DINT
+ Preset_MSG	{}	{}		MESSAGE
+ Save_MSG	{}	{}		MESSAGE
+ Save_Value	1		Decimal	DINT

- Click the Communication tab, then Browse.
- Locate the specific device you are commissioning, select it and click OK.
- Go to Controller Tags.
- Set tag values as indicated:
- Save\_Value = 1.
- Desired\_Preset\_Value = Any value within the encoders total measuring range.
- Download the project to the PLC and Go Online.

0	Preset Togge	Move Source Desired_Preset_Value 12345376 Dest Preset_MSG_Value 12345578 e	Preset_MSG.DN	MSG Message Cortrol Preset_MSG (CN) (ER) (CN) (ER) (ER) (ER) (ER) (ER) (ER) (ER) (ER) (ER) (ER)
(End)				

- Once online the position value will show in your controller tags (TR\_Device:I1.Data[0]).
- To write the Preset Value to the encoders EEPROM, simply place a value of 1 in the Preset\_Toggle tag or CTRL+T to Toggle Bit.
- This carries out the logic functions and saves the Desired\_Preset\_Value to the encoders memory.

43 Notes





For Further Information Contact:



www.trelectronic.com

1-800-265-9483

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www.trelectronic.com