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TBIP-L...-FDIO1-2IOL Safety Block I/O Module

Getting Started



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1 Installing and Licensing Turck Safety Configurator

1.1 Downloading the Software



The Turck Safety Configurator online help contains a detailed program description.

- Download the Turck safety Configurator from the Turck homepage here: http://www.turck.de
- 1.2 Installing the Software
 - > Unpack the downloaded ZIP archive and start the installation via "install.exe".
 - → The setup assistant leads through the installation.

1.3 Licensing the Software

The licensing is done via coupon code.

- Enter the coupon code on the Turck Homepage following this link: http://www.turck.de/en/turck-safety-configurator-license-6174.php
- If the coupon code is missing, please order a coupon code via e-mail under the following e-mail address:

TM-BWSoftwareSupport@turck.com

1.3.1 Software Licensing for Virtual Machines (VM)

- Enter the coupon code on the Turck Homepage following this link: http://www.turck.de/de/turck-safety-configurator-license-vm-6177.php.
- If the coupon code is missing, please order a coupon code via e-mail under the following e-mail address:

TM-BWSoftwareSupport@turck.com

1.4 Starting the Software

- > Start the software via the program icon on the desktop.
- → The Turck Safety Configurator starts with the Start Assistant, which will lead through the first steps after program start.



2 Configuring the device with Turck Safety Configurator

2.1 Setting up a New Configuration

 Select "New configuration" in the Start Assistant and create a new configuration for the safety monitor.

tart Assistant f	or safety mo	nitor	>
Options			
Diagnostics			
New config	uration		
Open confi	guration		
O Load config	uration from saf	fety monitor	
Show dialog o	n start-up		
	OK	Cancel	Help

Fig. 1: Start Assistant

2.1.1 Adapting the Monbitor Settings

The dialog box "Monitor settings" is used to enter the basic data for the new configuration.

Monitor settings	×
Monitor information Local I/O	
Configuration title	
Test	
Release code	
Function range	
○ TBPN-Lx-FDIO1-2IOL	
TBIP-Lx-FDIO1-2IOL	
Monitor detection	
Monitor type has not been detected!	Interface
	OK Cascal Hala

Fig. 2: Monitor settings

- > Enter the configuration title in the register tab "Monitor information".
- > Select the device type of the safety module (monitor type) in the section "Function range".

If no monitor is detected, open the settings for the interface to the connected device via the "Interface..."-button and enter the IP address of the connected device under "UDP".

Interface configuration		×
O Offline		
UDP	192 . 168 . 1 . 110	
	OK Cancel <u>H</u>	telp

Fig. 3: Interface configuration

- > If the IP-address of the device is not known, search the network via the "..."-button.
- > Select the device from the list and close with "OK".

iuex	IP Address	MAC Address	Network	Name	<u>S</u> earch
	192.168.1.110	00:07:46:0E:08:D6	192.168.1.120/24	TBIP-L5-FDI01-2I	Elash LED
					S <u>e</u> tup

Fig. 4: Search IP address



↪	The safety module	(monitor type) is detect	ted, the connection is established.
---	-------------------	--------------------------	-------------------------------------

Monitor settings	×
Monitor information Local I/O	
Configuration title	
Release code	
Function range	
O TBPN-Lx-FDIO1-2IOL	
TBIP-Lx-FDI01-2IOL	
Monitor detection	
Monitor type has been detected.	Interface
	OK Cancel <u>H</u> elp

Fig. 5: Device (monitor type) detected

2.2 Setting up a Standard Configuration

The register tab "Local I/O" in "Monitor settings" shows the standard configuration for the local device in- and outputs.

onitor settings Ionitor informatio	5 on Local I/O					
Terminal	Safety sourcing output	Safety sinking output	Safety Input	Safety antivalent input	Safety electronical input	
FDI 0/1			۲	0	0	
FDI 2/3			۲	0	0	
F50 0	۲					
F50 1	۲					
FDX 4/5	۲	0	0	0	0	
FDX 6/7	۲	0	0	0	0	
					ОК	Iancel <u>H</u> elp

Fig. 6: Standard configuration of the local I/O

- > Close the dialog box "Monitor settings" by pressing "OK".
- → The standard configuration is created.

2.2.1 Standard Configuration

Outputs:

For each device output, which means, for the two internal safety outputs FSO0 and FSO1 as well as for the two SIL3-outputs FDX4/5 and FDX6/7 one release circuit (OSSD 1 - OSSD 4) is created. The outputs are automatically linked to the first four CIP Safety input bits.

Inputs:

Additionally, one release circuit (63. OSSD and 64. OSSD) is created for each of the two SIL3-inputs (FDI0/1 an FDI2/3). The inputs are also automatically assigned to the first two CIP Safety output bits.



Fig. 7: Release circuits (OSSDs) of the standard configuration

2.3 Checking the Configuration

The Turck Safety Configurator checks the created configuration for logical errors, which meas, the logical wiring of the single components in the release circuits is checked. The configuration check does not consider double allocation etc.

→ Start the check using the "Check configuration"-button.

2.4 Loading the Configuration into the Safety Module.

- > Stop the safety module using the "Stop"-button.
- ➤ Download the configuration created in the software to the device by using the button "Send configuration" → "PC -> Monitor".

Config	urator for safety	/ monitor	- [Test] - []			- 🗆 ×	
			₽.	F	\ ?		
Tile horizontally z	Start diagnostics :	Start	Monitor operations *	<u>P</u> C -> Monitor =	Context		
Window	ungnoraur	١	Monitor	Monitor	-> PC	^	
-	□ ×	🛱 FDX	6/7 Stop categ	₽C -> Mo	onitor	- • ×	
F\$00 Stop cate	egory D"	יט-	4 CIP Safety Input" [2] [#0-4] CIP Safety Input			FDX 6/7 Stop category 0"	

Fig. 8: Send configuration "PC->Monitor"

> Enter the password for the configuration.

During the first download of a configuration to the device, the standard password "SIMON" has to be changed.

NOTE

If the device is reconfigured, a new password has to be assigned. This password, must be known only to the responsible authorized safety representative.

2.4.1 Change Password

> Enter a new password for the application in the "Password dialog".

Password dialog ×								
Enter password:								

Enter new password:								

Repeat new password:								

OK Cancel								

Fig. 9: Entering a new password.



2.5 Checking the Configuration

- Confirm the "Information" dialog with "OK" and confirm the configuration validation in the dialog box "Configuration validation".
- > Enter the name of the authorized person who is in charge of the validation and enter a password.

Plaintext log of the monitor	- 🗆	>	¢
0000 **********************************	*****	0	\wedge
0001 CONFIGURATION		1	
0002 Ident: "Test"		2	
0003 ***********	*********	З	
0004 Monitor Secti I ensure that I will check the		4	
0005 ************ plaintext log of the monitor	********	5	
0006 Monitor Versi and the functionality of the		6	
0007 Config Struct Connected sensors.		7	
0008 PC Version:		8	
0009 Download Time		9	
0010 Not Validated Enter your name:		0	
0011 Diag Freeze:		1	
UUIZ Krror Unlock: Turck		Z	
0014 Device General Ester segured		3	
COLE TETETETETETE	+++++++++++++++++++++++++++++++++++++++	4	
0016 Number of Deer		2	
		2	
0017 OK Cancel		é	
0019 Type:		9	
0020 Subtype: n station test		ñ	
0021 Subtype: no local acknowledge		1	V
<		>	

Fig. 10: Configuration release

The configuration log is part of the safety documentation of the machine.

> Copy the plain text log to a text editor, save, print and archive it.

or

Save the configuration log as text file via "Monitor operations → configuration log → save as...", print and archive it.

NOTE

Chapter 5.8 of the software's online help contains a detailed description of the structure of the configuration log.

Informa	ation ×
1	Configuration successfully validated! VALIDATED: 2018/01/24 10:34 BY: "Turck" CODE: 4C36
	Activate protective operation for the safety monitor?
	Yes No

Fig. 11: Releasing the Configuration

Closing the dialog box with "Yes" activates the protective operation of the device (safety monitor). The device is started. → After the configuration release, the device is in diagnostics mode.



NOTE

The CIP Safety section at the end of the configuration log contains the CIP Safety Configuration Signature with ID and time stamp which have to be entered in the EtherNet/IP[™] PLC software, s. **Configuration Signature vergeben (page 35)**.

Plaintext log of the monitor	x	
0130 FDI 6/7: not used or available	0 ^	1
0131 FDX 4/5: Safety Output (P)	1	
0132 FDX 6/7: Safety Output (P)	2	
0133 FSO 0: Safety Output (P)	з	
0134 FSO 1: Safety Output (P)	4	
0135 ************************************	5	
0136 CIP Safety	6	
0137 ************************************	7	
0138 Configuration Signature:	8	
0139 ID: 485071CE	9	
0140 Timestamp: 2018-01-24 10:34:00.000 UTC	0	
0141	1	
0142 Output Reference List	2	
0143	3	
0144 Instance 1, byte 1, bit 6: device: 17 = "1-6 CIP Safety Output"	4	
0145 Instance 1, byte 1, bit 7: device: 16 = "1-7 CIP Safety Output"	5	
0146 ************************************	6	
0147 ************************************	7	
0148 Validated: 2018-01-24 10:34 by: "Turck" code: 4C36 count: 1	8	
0149 End of Configuration	9	
0150 ***********************************	0	
	~	1
<	>	

Fig. 12: CIP Safety Configuration Signature

2.6 Loading the Diagnostics Configuration

- 0 - 9 -Configurator for safety monitor - [---> Monitor online diagnostics <----] × III -Start Edit Display ۶ Ê **k**? 00 Contex help * Help Check configuration Tile horizontally Monitor workspace dia operation File FSO 0 Stop category 0 -> 1. OS 10-1 CIP Safety Inj '0-4 CIP Safety Inpu of same D 껃 껃 [15] ... ! 🗖 [6] [9] tomatic star Automatic star ₩ FSO 1 Stop category 0 -> 2. OSSD × -6 CIP Safety Output _ CIP Sarfety O [4] [#0-2] - CIP Safety Input P] PFD12.8] 껃 , [17] [13] io star CIP Safety Outp CIP Safety [1-6] ! 🗖 [7] Automatic star 做 □ × □ × "FDI 0/1 Emergency shutdo 10-3 CIP Safety In [1] (#FD1071] 껃 [16] [14] CIP Safety Outp CIP Safety [1-7] . 🗖 ! 🗖 [8] [10] Automatic start Automatic start

If the diagnostics are activated, the TSC shows the state of the safety I/Os.

Fig. 13: Released configuration, diagnostics configuration loaded



2.7 Customizing the Configuration

The standard configuration in the Turck Safety Configurator can be customized in order to meet the requirements of different applications.

- 2.7.1 Customizing a Standard Application (Preliminary Considerations)
 - 1 What is needed?
 - Definition of amount and type of the required in- and outputs
 - Which components are used for the safety function:
 - electromechanical components
 - electric components
 - dual channel switching
 - antivalent switching
 - components with semiconductor OSSD output
 - 2 Where will the components be placed??

All red-labeled M12-connectors on the left side of the TBIP-L...-FDIO1-2IOL are designed for connecting safety components.

In the standard configuration, the two lower M12-connectors (C2 and C3) are configured as dual channel SIL3-outputs. However, depending on the application, they can be used as SIL3-inputs. In total, up to four dual channel safety related SIL3-inputs can be connected to the device.

Possible input configurations:



Fig. 14: Input configurations

Possible output configurations:

- PP-switching
- PM-switching



Fig. 15: Output configurations

2.7.2 Setting-up an Own configuration

 Adapt the standard configuration of the safety channels in the Turck Safety Configurator under "Monitor settings → Local I/O".

nitor informatio	n Local I/O						
Terminal	Safety sourcing output	Safety sinking output	Safety Input	Safety antivalent input	Safety electronical input		
FDI 0/1			0	0	۲		
FDI 2/3			۲	0	0		
500.0							
F50 U	۰						
F50 1	۲						
FDX 4/5	0	0	۲	0	0		
FDX 6/7	۲	0	0	0	0		
						C 1	

Fig. 16: Customized configuration of the local I/O



- > Close the dialog box with "OK".
- → The configuration change is done.
- → The software generates the new release circuits (OSSDs) if the following dialog box is closed with "yes".

Confirm	×
?	The configuration has been changed. Should an automatic configuration be created for the unused safety inputs and outputs?
	Yes No

→ Again, the CIP Safety in- and output bits are automatically assigned.



NOTE

Release circuits (OSSDs) which are no longer used, have to be deleted.

New configuration (assignment of release circuits):

Inputs	
FDX4/5	ightarrow 62. OSSD (new release circuit for the input)
FDI0/1	\rightarrow 64. OSSD
FDI2/3	\rightarrow 63. OSSD
Outputs	
FDX6/7	\rightarrow 4. OSSD
FDX4/5	ightarrow 3. OSSD (no longer necessary, will be deleted, see Deleting OSSDs (page 16)
FSO0	\rightarrow 2. OSSD
FSO1	\rightarrow 1. OSSD

2.7.3 Deleting OSSDs

OSSDs which are no longer necessary are deleted in the software's Component Manager.

> Open the component manger via "Display \rightarrow Window \rightarrow Component manager"".



Fig. 17: Open the component manager

Delete the release circuits (OSSDs) which are no longer used in the component manager (in this example OSSD 3).



Fig. 18: Deleting OSSDs



2.8 Application Example

- Emergency Stop at FDI0/1 at C0 (64. OSSD), page 18
- Light grid (AOPD) at input FDI2/3 at C1 (63. OSSD), page 18
- Non-safety channels at C4 C7 will be switched on permanently via the internal safety outputs (1. and 2. OSSD), page 19
- Output FDX4/5 at C2 (3. OSSD) is switched off if the emergency stop and/or the light grid are activated, page 21
- Output FDX6/7 at C3 (4. OSSD) is switched off, if output FDX4/5 is switched off, page 24. The output state is transferred to the F-CPU.
- Release of the complete safety function via a release bit in the F-CPU (3. OSSD), page 25

x Monitor settings Monitor information Local I/O Safety antivalent input Safety electronical input Safety Safety Safety Terminal sourcing output sinking output Input FDI 0/1 ۲ FDI 2/3 ۲ FSO 0 ۲ FSO 1 ۲ FDX 4/5 ۲ ۲ FDX 6/7 ОК Cancel Help

The application example is based on the standard configuration.

Fig. 19: Standard configuration of the local I/O

2.8.1 Add emergency shutdown in 64. OSSD

The release circuit remains unchanged as it corresponds to the standard configuration.

Emergency shutdown at SIL3-input FDI0/1, assigned to CIP Safety output bit 1-7.



Fig. 20: 64. OSSD with emergency shutdown

2.8.2 Light grid (AOPD) in 63. OSSD

- > Delete the input element "Emergency shutdown".
- ➤ Define the input as Safety electronical input in "Monitor settings → Local I/O".

		Confid	urator for safety m	ionitor - [Test] - []			-	□ ×
Start Edit Display		-	, , , , , , , , , , , , , , , , , , , ,					
Save Open configuration * workspace * File	Check Undo iguration	Tile horizontally * Window	Start diagnostics =	Stop Monitor operations Monitor	<u>P</u> C -> • Monitor •	Context help * Help		^
🛱 FSO 0 Stop category 0 -> 1. OSSD		-	• × ¢	FDX 6/7 Stop cal	egory 0 -> 4. C	SSD	-	×
10-1 CIP Safety Input"	Monitor settings						×	Â
	Monitor information	Local I/O						ategory 0"
- CIP Safety hput	Terminal	Safety sourcing output	Safety sinking output	Safety Input	Safety antivalent input	Safety electronical input		gory D
	FDI 0/1			۲		0		-
FSO 1 Stop category 0 -> 2. OSSD	FDI 2/3			0	0	۲		• a
10-2 CIP Safety Input"								afety Output"
- CIP Safety hput	F50 0	۲						[17]
	F50 1	۲						afety Output afety [1-6]
· Ator	FDX 4/5	۲	0	0	0	0		
DX 4/5 Stop category 0 -> 3. OSSD	FDX 6/7	۲	0	0	0	0		×
"D-3 CIP Safety Input"								afet y Output"
[3] [#0-3] - CIP Safety hput						OK Cancel	Help	(100)
"Automatic [[8]	start#2"	- Stop categ	ory D			"Automatic start#4"	- CIP S	afety Output afety [1-7]
- Automa	tio start					- Automatic start		
Edit monitor settings	U 13.00			Interface: 192.168	.1.110; The safety r	nonitor is running in protective (operation	

Fig. 21: Define FDI2/3 as Safety electronical input



Select the light grid from the Device library and add it to the release circuit (OSSD) instead of the emergency shutdown.?

The Device library is opened via "Display \rightarrow Window \rightarrow Device library".



Fig. 22: Light grid (AOPD) in 63. OSSD

- → The light grid at FDI2/3 is configured and assigned to CIP Safety output bit 1-6.
- 2.8.3 Switch-on Unsafe Channels Permanently (1. and 2. OSSD)

The non-safety channels at C4 - C7 of the device can be safe switched off via the internal safety outputs FSO0 and FSO1. If they have to be switched on permanently, then FSO0 and FSO1 need a permanent switch-on condition (TRUE). The programming is done in the 1. and 2. OSSD.

Delete the element "CIP Safety Input" in both OSSDs (1. and 2. OSSD) and replace it by a "TRUE"element from the device library.



→ Both internal outputs are permanently active.

Fig. 23: Permanent activation of FSO0 and FSO1.



2.8.4 Switch-off of FDX4/5 if emergency shutdown or light grid activated

Output FDX4/5 at C2 (3. has to be switched off as soon as the emergency shutdown at FDI0/1 (64. OSSD) or the light grid at FDI2/3 (63. OSSD) are activated. This means, the state of the OSSD 63 and 64 controls the state of FDX4/5.

- > Delete "CIP Safety input" in OSSD 3.
- Select the element "Output F-CPU" in the Device library and place it at the third input of the function.



➤ In the dialog box "State of output switching element x" select OSSD 63.

Fig. 24: State of output switching element OSSD 63

 Select the element "Output F-CPU" in the Device library and place it at the third input of the function.







Fig. 25: State of output switching element OSSD 63 and OSSD 64

→ The activation of the emergency shutdown at FDI0/1 or the light grid at FDI2/3 switches off output FDX4/5.

2.8.5 Switch-off FDX6/7 at C3 (4. OSSD), if output FDX4/5 is switched.

Output FDX6/7 has to switch off if output FDX4/5 (3. OSSD) switches off.

- > Delete "CIP Safety input" in OSSD 4.
- Select the element "Output F-CPU" in the Device library and place it at the third input of the function.
- ➤ In the dialog box "State of output switching element x" select OSSD 3.

	FDX 6/7 Stop category 0 -> 4. OSSD - Con	ifigurator for safety monitor - [Test] - []	- 🗆 ×
🔲 - Start Edit Display			- 🗗 🗙
Save Open configuration - workspace - File	Output assignment Configuration	Tile Tile Start diagnostics * Monitor	^
Device library ■ × → Monitored start - device ● Activation via standard input → Activation via device ● External device monitoring devices ● EDM with standard input >↓ 2 EDM with standard input ● State of output switching ele ● State of output switching ele ● State of cost	*Atom *A	V Qutput Qutput Qutput Qutput	
Paste device	U 13.00	Interface: 192.168.1.110; The safety monitor is running in protective operation	

Fig. 26: State of output switching element OSSD 3 in OSSD 4

→ The state of 3. OSSD controls the output FDX6/7 in 4. OSSD.



2.8.6 Release of the safety function via a release bit in the F-CPU

The release of the safety function is done using a release bit in the F-CPU. Therefore, an output bit of the F-CPU is assigned to the output function in the 3. OSSD.

 Select the element "CIP Safety input" in the Device library and place it at the third input of the function.



Fig. 27: 3. OSSD with release bit from F-CPU

➡ After an error, the safety function will only restart if the emergency shutdown as well as the light grid are error free and the release bit in the F-CPU is set.



3 Configuring the device at CIP Safety (Rockwell Studio 5000)

3.1 Basic Information

The TBIP-Lx-FDIO1-2IOL has two IP addresses. One IP address (in the example: 192.168.1.110) addresses the safety side (left side) of the device, the second IP address (in the example: 192.168.1.111) addresses the non-safety side (right side) of the device.

The TBIP-Lx-FDIO1-2IOL therefore has to be configured in the following two steps in the configuration software of the safe Ethernet/IP[™] PLC.

1Generic EtherNet/IP Safety Module: Module for the safety side

2 Generic EtherNet/IP Module: Module for the none-safety side

3.1.1 Used Hardware

- TBIP-L5-FDIO1-2IOL
- Allen-Bradley Controller: Compact Logix 1769-L30ERMS/A LOGIX5370

3.1.2 Used Software

- RSLinx (Rockwell Automation)
- Studio 5000 (Rockwell Automation)

3.2 RSLinx – Searching the Network for Devices

- > Scan the network with RSLinx using the "RSWho"-function.
- ➡ The device responds with two IP addresses. One IP address (in the example: 192.168.1.110) addresses the safety side (left side) of the device, the second IP address (in the example: 192.168.1.111) addresses the non-safety side (right side) of the device.



Fig. 28: RSLinx - two IP addresses per device

3.3 Creating a New Project

- > Start Studio 5000.
- > Click "New Project" select the used Safety controller and enter a project name.
- ➤ Confirm with "Next".



Fig. 29: Studio 5000 - new project

 If necessary, adjust the settings in the "New Project" window and complete the project creation using the "Finish" button.

🧿 New Project		?	×
1769-L30ERMS C	Compact GuardLogix® 5370 Safety Controller		
Re <u>v</u> ision:	30 *		
Security <u>A</u> uthority:	No Protection	¥	
	Use only the selected Security Authority for authentication and authorization	on	
Secure With:	Logical Name <controller name=""></controller>		
	<u>P</u> ermission Set	¥	
Description:			
	Cancel <u>B</u> ack <u>N</u> ext	<u>F</u> in	ish

Fig. 30: Completing the project creation



→ The project is created and opened in the RSLogix Designer.



Fig. 31: New project in the RSLogix Designer

3.4 Configuring the project in RSLogix Designer

Defining the Project Path

▶ Scan the network via "Communications" \rightarrow "Who Active".



Fig. 32: Calling the "Who Active" function

- > Select the used controller.
- > Click "Set Project Path" to define he project path for the project.



Fig. 33: Setting the project path

Close the "Who Active" window.



3.4.1 Adding the safety side

➤ Right-click onto "Ethernet" → "New Module".



Fig. 34: Adding the device to the Ethernet via "New Module"

Select the entry "Generic EtherNet/IP Safety Module" in the "Select Module Type" window.

Select Module Type							
Catalog Module Discovery Favori	tes						
generi		<u>C</u> lear	Filter	s		Hide Filters	*
Module Type Category Fit	iers	^		Module Type Ve	ndor Filters		
Analog				Allen-Bradley			
CIP Motion Converter				Advanced Energy	y Industries, Inc.		
Communication			1	Cognex Corporati	on		
Communications Adapter		<u>``</u>		Endress+Hauser			、 ×
<		/					/
Catalog Number	Description				Vendor	Category	
ETHERNET-BRIDGE	Generic EtherNet/IP CIP B	ridge			Allen-Bradley	Communication	
ETHERNET-MODULE	Generic Ethernet Module	-			Allen-Bradley	Communication	
ETHERNET-SAFETYMO	Generic EtherNet/IP Safety	y Modi	ule		Allen-Bradley	Safety,Other	
ETHERNET-SAFETY-ST	Generic EtherNet/IP Safety	and s	Stand	ard Module	Allen-Bradley	Safety,Other	
<							>
4 of 560 Module Types Found						Add to Favo	rites
					Create	Class	Hala
Ciose on Create					Create	Close	neip

Fig. 35: Generic EtherNet/IP Safety Module

- > Click "Create" and create a new module.
- → The window "New Module" is opened.
- > Assign a name for the new device and set the IP address (in the example 192.168.1.110).

📧 New Module						×
General* Connection	Safety Module Info	Port Configuration	Port Diagnostics			
Type: ETHI Parent: Loca Name: TBI Description:	ERNET-SAFETYMODULE	Generic EtherN	Ethernet Address Private Network IP Address: Safety Network Number:	k: 19: 192 , 16 415F_022 10/26/2017	2. 168. 1. 8 . 001 Advance 0_4ECA 11:54:31	• • • • • • • • • • • • • • • • • • •
Module Definition Module Paramete Vendor: Product Type: Product Code: Revision: Electronic Keying Input Data: Output Data: Data Format:	1 0 26 1.001 : Exact Match Safety Safety Integer-SINT	Conne Safety Safety Configu	ection Parameters Input Assembly Instance 7 1 7 199 uration Assembly Instan	Output Assembly Instance 199 1 nce: 1	Size 1 199 Cha	(8-biť (8-biť
Status: Creating			ОК	Cance	el	Help

Fig. 36: New Module – Setting name and IP address



Click "Change..." and set the "Communication Parameters" for the device.
Enter the following values in the "module" tab:

	Module definition
Vendor	48
Product Type	100
Product Code	14056
Major Revision	2
Minor Revision	8
Electronic Keying	Compatible Module

📧 New Modu	ıle							×
General* Co	nnection Safety	Module Info	Port Configurati	on Port Diagno	stics			
Type: Parent: Na <u>m</u> e: Description:	ETHERNET-SAI	FETYMODULE (Generic EtherN	Ethernet Priva © IP Ac Safety N Number	Address te Network: idress: vetwork	192.1/ 192 . 168 415F_0220_4 10/26/2017 11:	58.1. . 001 	• 110 • :d 754 AM
Module Def Module P Vendor: Product Revisio Electro Input E Output Data F	Inition arameters Type: 0 Code: 26 Module Definitio Module Conne Vendor: Product Type: Product Type: Product Code: Major Revision: Minor Revision:	n* ction 48 • 100 • 14056 • 2 • 8 •	Ca	nnection Parame In As In	eters but sembly stance X	Output Assembly Instance 199 1 2: 199 2: 199 Cancel	Size 1 1 Chan	(8-bit; (8-bit; ige
	Eectronic Keyin Input Data: Output Data: Data Format:	g:	Compatible Mod Safety Safety Integer-SINT	Help	XXX			

Fig. 37: Module Definition – Module

> Set the following values for the Assembly Instances in the "Connection" tab.

	Input Assembly Instance	Output Assembly Instance	Size (8-bit)
Safety Input	1024	1279	8
Safety Output	1279	1056	8

Configuration Assembly: 1088

	Input Assembly Instance	Output Assembly Instance	Size (8-bit)	
Safety Input: Safety Output:	1024 ≑ 1279 ≑	1279 ≑ 1056 ≑	8 ≑ 8 🌩	
Configuration Assembly Instan	ce:	1088 ↓		
Configuration Assembly Instan	ce:	1088 ▲		

Fig. 38: Module Definition – Connection

- ➤ Accept the entries with "OK".
- > Confirm the changes in the module properties with "Yes".

Logix D	esigner	\times
	These changes will cause module data types and properties to change. Data will be set to default values unless it can be recovered from the existing module properties. Verify module properties before Applying changes.	
	Change module definition?	
	<u>Y</u> es <u>N</u> o	

Fig. 39: Logix Designer – accepting the module properties

- > Click "OK" in the "New Module" window.
- > Click "OK" to confirm the following note.

Logix D	esigner ×
1	Failed to set Configuration Signature. No value entered for the Configuration Signature ID.
	ОК

Fig. 40: Note – Configuration Signature

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3.4.2 Assigning the Configuration Signature

The Configuration Signature serves is used by the Controller to clearly identify the safety device and assures that the configured device matches the connected device concerning the configured safety function. The Configuration Signature is generated by the Turck Safety Configurator and is part of the configuration log in the Turck Safety Configurator ((siehe Seite 13)).



NOTE

The time stamp in the configuration protocol of the Turck Safety Configurator is calculated depending on the system time (local time) of the computer on which the software is installed. The time in RSLogix Designer is though based on the UTC. Therefore, a conversion of the system-time based entry in the protocol to the UTC is necessary. In the example 1 hour has to be added to the CET (Central European Time).



Fig. 41: Entering the Configuration Signature from the configuration protocol

Examples for calculating:

CET (winter time)	UTC MEZ +1 Std.	CEST (summer time)	UTC CEST + 2 hours
1:34:00.000 PM	2:34:00 PM 000 AM	1:34:00.000 PM	3:34:00 PM 000 AM
Minnesota, USA (CST)	UTC	Minnesota, USA (CDT)	UTC
	CST - 6 hours		CDT - 5 hours
2:34:00 000 PM	8:34:00 000 AM	2:34:00 000 PM	7:34:00 000 AM

3.4.3 Going Online with the Controller

- ▶ Click "Offline" \rightarrow "Go Online".
- Load the configuration into the controller by pressing the "Download" button in the "Connected To Go Online" window.
- > Execute the download in the "Download" window by pressing the "Download" button.



Fig. 42: Downloading the configuration into the controller

- The download is executed.
- → The TBIP-Lx-FDIOP1-2IOL (ETHERNET-SAFETYMDOULE TBIP) in the project tree is faulty.



Fig. 43: Error at the TBIP-Lx-FDIOP1-2IOL



- > Open the Module Properties by double-clicking the device entry in the project tree.
- ➡ The fault is specified under "Module Fault" in the "Connection" tab: "Safety Network Number Mismatch".

3.4.4 Assigning the Safety Network Number

The Safety Network Number clearly assigns the safety I/O module to one CIP Safety Controller.

In case of several controllers in one network, this inhibits an unintentional access of another controller to the safety device.

Copying the Safety Network Number from the controller

- ➤ Go offline.
- > Open the "Controller Properties".
- Click to "..." right to the Safety Network Number in the "General" tab and open the "Safety Network Number" window.
- Use the "Copy" button to copy the Safety Network Number and close the window with "OK".



Fig. 44: Copying the Safety Network Number

Assigning the Safety Network Number to the TBIP-Lx-FDIO1-2IOL

- Open the "General" tab in the "module Properties and open the "Safety Network Number" window by pressing the "..." button.
- Use the "Paste" button paste the controller's Safety Network Number into the module configuration and close the window with "OK".

Parent: Lo	HERNET-SAFETYMODULE Generic EtherN	Ethernet Address
Description:	51P	Private Network: 192.168.1. 111
	Safety Network Number	× · · ·
	Time-based 10/26/2017 11:54:31.754 AM Manual	Generate k 415F_0220_4ECA 10/26/2017 11:54:31.754 AM
Module Definition Module Parame Vendor: Product Type: Product Code: Revision:	Ether(Net/IP: [] (Decimal) Number: 415F_0220_4ECA (Hex)	Copy Paste 1279 8 (8-bit)



3.4.5 Reset Ownership

- ➤ Go online.
- Click "Reset Ownership" in the "Safety" tab in the "Module Properties" and confirm all upcoming warnings with "Yes".

Module Properti	ies: Local (ETHERN	ET-SAFETYMODULE	1.001)		
General Connect	tion Safety Modu	le Info Port Configura	ation Port Dia	agnostics	
Connection Type	Requested Packet Interval (RPI) (ms)	Connection Reaction Time Limit (ms)	Max Obse Network Del	erved lay (ms) ←	
Safety Input Safety Output	1 韋 20	4.0 60.0	?? ??	Reset Reset	Advanced
Configuration O Reset Ow Configuratio ID: C Date: 17	wnership: ?? nership ← n Signature: 3c9_cb65	(Hex)	Copy		
Time: 13	:37:00	0 🐳 ms	T DOLL		
Status: Faulted			ОК	Cancel	Apply Help

Fig. 46: Reset Ownership

- > Open again the "Safety Network Number" window in the "General" tab.
- Press the "set" button to write the Safety Network Number to the device and confirm the writing by pressing the "yes button" in the "Safety Network Number" window.

Type: E Parent: L	THERNET-SAFETYMODULE Generic EtherN	Ethernet Ad	dress			
Name:	TBIP	Opine				
Description:	Safety Network Number	Private N	ss:	. 192	. 168. 1.	
L	Format:				Advanc	ed
	Time-based 10/26/2017 11:12:26:205 AM Omanual Etherblet/IP- Omanual	Generate	ork	415F_01F9 /26/2017 1	_C55D 1:12:26.	 205 AM
Module Definitio	(Decimal)		_	_/		
Module Parar	Number:			/		
Vendor:	415F_01F9_C55D (Hex)	Сору	0	utput		
Product Type		Parte	bly As	sembly stance	Size	
Revision:		1 date	24	1279	8	(8 bit
Electronic Ke		Set ←	79	1056	8	(8-bit
Input Data:			Instance:	108	8	
Data Format:	OK Cancel	Help			Cha	nge

Fig. 47: Writing the Safety Network Number to the device

The Safety Network Number now clearly assigns the device to the CIP Safety Controller and the device is running.



Fig. 48: Logix Designer - device running



3.4.6 Reading Process Data

n 🖻 🖬 🚭 🗼 🐚 🖻 🕫 🖓 🗆		AL CA. The In. 17		ct language	V 🦻		
em Run 🚺 🖪 Run Mode	Ref Path: AB ETHIP-1\192.168	1 22\CompactBus\0					
Forces							
Edite 1 Energy Storage OK		-1/1()(U)(L)-	•				
fats Units I/O OK		On Cafety Alarma	Bit Timer/C				
ilety Unlocked 23							
Controller Organizer 🛛 👻 🕂 🗙	Scope: TBIP 🗸 Sh	ow: All Tags		✓ Y. Enter Name I	Fiiter		
Controller TBIP	Name == 🛆	Value + Force	Mask 🔶 Style	Data Type	Class	Description	^
- Controller Tags	-TBIP:I	{}	{}	AB:ETHERNET	Safety		
Controller Fault Handler	TBIP:I.RunMode	1	Decimal	BOOL	Safety		-
Power-Up Handler	-TBIP:I.ConnectionFaulted	0	Decimal	BOOL	Safety		-
	- TBIP:I.Data	{}	{} Decimal	SINT[8]	Safety		-
- Main lask	+ TBIP:I.Data[0]	0	Decimal	SINT	Safety		-
H Cafet Tark	+-TBIP:I.Data[1]	0	Decimal	SINT	Safety		-
	+ TBIP:I.Data[2]	0	Decimal	SINT	Safety		-
Inscheduled	+ TBIP:I.Data[3]	0	Decimal	SINT	Safety		-
A Motion Groups	+ TBIP:I.Data[4]	0	Decimal	SINT	Safety		-
Ungrouped Axes	+ TBIP:I.Data[5]	0	Decimal	SINT	Safety		-
Add-On Instructions	+ TBIP:I.Data[6]	0	Decimal	SINT	Safety		-
🖃 🔄 Data Types	+ TBIP:I.Data[7]	0	Decimal	SINT	Safety		-
User-Defined	-TBIP:O	{}	{}	AB:ETHERNET	Safety		-
- Grings	- TBIP:O.Data	{}	{} Decimal	SINT[8]	Safety		
- 🙀 Add-On-Defined	+ TBIP:O.Data[0]	0	Decimal	SINT	Safety		
🕀 🙀 Predefined	+ TBIP:0.Data[1]	0	Decimal	SINT	Safety		-
🗈 🔙 Module-Defined	+ TBIP:O.Data[2]	0	Decimal	SINT	Safety		-
Trends	+ TBIP:O.Data[3]	0	Decimal	SINT	Safety		-
	+ TBIP:O.Data[4]	0	Decimal	SINT	Safety		-
🖮 🔄 I/O Configuration	+ TBIP:O.Data[5]	0	Decimal	SINT	Safety		-
🖨 🎒 1769 Bus	+ TBIP:O.Data[6]	0	Decimal	SINT	Safety		-
[0] 1769-L30ERMS TBIP	- TBIP:O.Data[7]	0	Decimal	SINT	Safety		-
⊟-	-TBIP:O.Data[7].0	0	Decimal	BOOL	Safety		-
1769-L30ERMS TBIP		0	Decimal	BOOL	Safety		-
■ ETHERNET-SAFETYMOL ▼	-TBIP:O.Data[7].2	0	Decimal	BOOL	Safety		-
```````````````````````````````````````	TBIP:O Data[7] 3	0	Decimal	BOOL	Safety		-

> Open the "Controller Tags" in the project tree by double-clicking the entry.

Fig. 49: "Controller Tags" in the project tree

→ The access to the input data (TBIP:I) and output data (TBIP:O) is possible.

#### 3.4.7 Adding the non-safety side of the TBIP-L5-FDIO1-2IOL to the project

- ➤ Go offline.
- ➤ Right-click onto "Ethernet" → "New Module".



Fig. 50: Adding the device to the Ethernet via "New Module"



Select the entry "Generic EtherNet/IP Module" in the "Select Module Type" window.

gener	<u>(</u>	<u>]</u> lear	Filter	S		H <u>i</u> de Filters	*
Module Type Category Filters   Analog   CIP Motion Converter   Communication   Communications Adapter	c	*		Module Type Vendor R Allen-Bradley Advanced Energy Indu Cognex Corporation Endress+Hauser	ilters stries, Inc.	_	^ ~ ~
Catalog Number	Deperietion	_			Voodor	Catag	
1407-CGCM-DLR ETHERNET-BRIDGE	Combination Genera Generic EtherNet/IF	ator C	ontrol Brida	Module, 2-Port	Allen-Bradley	Other	"y unicat
ETHERNET-MODULE	Generic Ethernet Mo	odule	_	-	Allen-Bradley	Comm	unicat
ETHERNET-SAFETYMODULE	Generic EtherNet/IF	^o Safe	ety Mo	dule	Allen-Bradley	Safety	,Othe
ETHERNET-SAFETY-STANDAR	Generic EtherNet/IF	^o Safe	ety an	d Standard Module	Allen-Bradley	Safety	,Other
<							>

Fig. 51: Generic EtherNet/IP Module

- > Click "Create" to create the new device.
- → The window "New Module" is opened.
- Assign a name to the new device in the "New Module" window, set the IP address (in the example 192.168.1.111) and enter the following values for the data format (Comm format) and the Assembly Instances:

New Module						Х
Type: Vendor: Parent:	ETHERNET-MODULE Generic Etherne Allen-Bradley	t Module				
Name: Description:	TBIP_unsafe	-Connection Para	meters Assembly Instance:	Size:		
_		Input:	103	80	🔹 (16-bit)	
	~	O <u>u</u> tput:	104	36	🔹 (16-bit)	
Comm <u>F</u> ormat Address / H	Data - INT ~	Configuration:	1	0	▲ (8-bit)	
IP <u>A</u> ddre	ss: 192 . 168 . 001 . 111	<u>S</u> tatus Input:				
⊖ <u>H</u> ost Na	me:	S <u>t</u> atus Output:				
🗹 Open Modu	le Properties	ОК	Can	cel	Help	

Fig. 52: New Module - defining the data format and the Assembly Instances

► Accept the entries with "OK".

> Adapt the RPI time in the "Connection" tab.



Fig. 53: New Module - adapting RPI

- > Go online and download the project to the controller by pressing the "Download" button.
- Confirm the download warning by pressing "Download" and switch back the controller to "remote Run" by pressing "OK".







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