



TBEN-LH-8IOL EtherNet/IP[™] Configuration Guide

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1 General Information

1.1 About these instructions

The following configuration guide describes the setup, functions, and use of the TBEN-LH-8IOL station. It helps you to plan, design, and implement the system for its intended purpose.

Note*: Please read this manual carefully before using the system. This will prevent the risk of personal injury or damage to property or equipment. Keep this manual safe during the service life of the system. If the system is passed on, be sure to transfer this manual to the new owner as well.

1.2 Explanation of symbols used

1.2.1 Warnings

Action-related warnings are placed next to potentially dangerous work steps and are marked by graphic symbols. Each warning is initiated by a warning sign and a signal word that expresses the gravity of the danger. The warnings have absolutely to be observed:



DANGER!

DANGER indicates an immediately dangerous situation, with high risk, the death or severe injury, if not avoided.



WARNING!

WARNING indicates a potentially dangerous situation with medium risk, the death or severe injury, if not avoided.



ATTENTION!

ATTENTION indicates a situation that may lead to property damage, if it is not avoid-ed.



NOTE

In NOTES you find tips, recommendations and important information. The notes facilitate work, provide more information on specific actions and help to avoid overtime by not following the correct procedure.

> CALL TO ACTION

This symbol identifies steps that the user has to perform.

→ RESULTS OF ACTION

This symbol identifies relevant results of steps

Italic Text in Italic is associated with the function of the third party software or application (E.g. *Controller Organizer*)

1.3 Contents

The complementary documentation and files:

- TBEN-LH-8IOL Data sheet
- TBEN-L...-8IOL, IO-Link Master Module
- IO-Link Devices Commissioning
- TBEN-LH-8IOL_R2.7.EDS file

The Rockwell PLC demo:

- 1756-L72 controller v30
- 1756-EN2TR Ethernet Bridge
- Studio5000 Logic Designer V30

The Omron PLC demo:

- CJ1M controller v2.0
- CJ1W-EIP21 EtherNet/IP communication adapter v1.01
- Network Configurator 3.21

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to <u>techdoc@turck.com</u>.

1.5 Technical support

For additional support, email inquiries to appsupport@turck.com, or call Application Support at 763-553-7300, Monday-Friday 8AM-5PM CST.



2 Getting Started

2.1 About this document

The configuration guide provides information about configuration of the TBEN-LH-8IOL including:

- Address switches
- IP address assignment
- Configuration options with Rockwell and Omron PLCs



NOTE

The device data sheet and technical information is available for download at www.turck.us.

2.2 Factory default IP address

The TBEN-LH-8IOL device is shipped with address switches set to 600 (PGM-DHCP). It is factory default position of the rotary switches which is associated with the IP address:

IP Address: 192.168.0.254 Subnet mask: 255.255.252.0 Gateway: 0.0.0.0

The device has limited functionality in this state:

- DHCP client is active and running; use any service to assign IP address
- Web server is active
- Some other services are active
- ARGEE PLC is running

The device responds to the PING command as follows:

Administrator: Command Prompt	X
C:\Users\bbegic>Ping 192.168.0.254	-
Pinging 192.168.0.254 with 32 bytes of data: Reply from 192.168.0.254: bytes=32 time=1ms TTL=128	=
Reply from 192.168.0.254: bytes:32 time=1ms TTL=128 Reply from 192.168.0.254: bytes:32 time=1ms TTL=128 Penlu: From 192.168.0.254: bytes:32 time=1ms TTL=128	
Ping statistics for 192.168.0.254:	
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:	
MINIMUM - TWS, MAXIMUM - TWS, HOPTAGE - TWS	

Figure 2.1 - Ping

The first step in the device configuration is to assign an operational IP address.

The device DHCP client is running and waiting for an IP address assignment. When IP address is acquired, the DHCP becomes disabled.

2.3 Address switches

The device has 3 rotary address switches. The position of the switches (Figure 2.2) determines mode of operation of the device. The *Table 2.1* provides a description of the device action when switches are set to a specific position and the device is powered up.







Protective cover opened - Protection class IP65/IP67/IP69K not warranted

- Screw the protective cover over the rotary coding-switches firmly
- Check if seal of the protective cover is correctly placed

Switch position	Mode	Description
000	Restore	IP address is restored to 192.168.0.254
001,,254	Static rotary mode	Sets the last octet of IP address in range [1254].
300	BOOTP	BOOTP client is active and requesting an IP address
400	DHCP	DHCP client is active and requesting an IP address
500	PGM	Device comes up with the last IP address saved in EEPROM. IP address is programmable.
600	PGM-DHCP	DHCP client is active and requesting an IP address. When IP address is acquired, the device transitions to PGM mode.
900	Factory Reset	Device is reset to the factory default setup.

Table 2.1: Address Modes

2.3.1 Static rotary mode

Sets the last octet of the IP address in the range [xxx = 1,..., 254] e.g. 192.168.0.xxx, 10.10.10.xxx.

2.3.2 BOOTP mode (300) and DHCP mode (400)

The device BOOTP or DHCP client is active, requesting an IP address assignment. From any switch position:

- > Turn OFF device power and set switches to 300 or 400
- Start BOOTP / DHCP server
- > Turn ON device power and assign IP address
- > Wait for the acknowledgement from the server
- > Set rotary switches to either the last octet of the IP address or to 500 (PGM)
- > Cycle power



2.3.3 PGM mode (500)

The last known IP address, subnet mask and gateway address are saved in the EEPROM when rotary switches are set to 500. The IP address is programmable and may be programmed using TURCK Service Tool or Web server. The procedure:

- > Assign an IP address using either static rotary mode, or BOOTP/DHCP server
- > When IP address is acquired, change rotary switches position to 500
- > Cycle the power of the device

2.3.4 **PGM-DHCP** mode (600)

When out-of-box device is powered for the first time, while switches are set to 600, the device DHCP client is active and waiting for an IP address assignment. Use any DHCP server to assign the IP address. When IP address is acquired, the device disables its DHCP. The device saves permanently assigned IP address and transitions to the PGM mode.

2.3.5 Factory Reset mode (900)

The factory reset mode resets the device back to the factory default setup and deletes all custom data in the device's internal flash. The procedure:

- Set address switches to 900
- Power-up device and wait 10sec
- > Set switches to either static rotary mode or 300/400/500/600
- Cycle power

2.3.6 Restore IP Address (000)

Set rotary switches to 000 to restore IP address to 192.168.0.254. The device preserves custom data/setup while restoring IP address.

From any switch position:

- Set the address switches to the position 000
- Power-up device and wait 10sec
- Set switches to either static rotary mode or 300/400/500/600
- > Cycle power
- > Depending on the position of the rotary switches, the device comes up as previously described.

2.4 TURCK Service Tool (TST)

The TURCK Service Tool can be downloaded from the TURCK Web site at:

- > Enter "TURCK Service Tool" in the search field
- Download and install the tool



Figure 2.3 – TURCK Web page

The tool has a set of action buttons in the tool bar:

Turck	Ser	vice Tool, Vers. 3	3.1.0				AND MARCH	-			
Yo	ur (Global Autom	ation	Partner						TUR	ск
Q)	Ø	T	\$ \$	•	Ū	, EN ,		X		
Search	(F5)	Change (F2)	Wink	(F3) Actions	(F4) C	lipboard	Language	Expert view OFF	Close		
No.	~	MAC address	N	IP address	Netm	Gatew	Mode	Device	Version	Adapter	Protocol
- 1	00:0)7:46:82:56:07		<u>192.168.0.254</u>	0.0.0.0	0.0.0.0	PGM_DHCP, A	TBEN-LH-8IOL	3.1.8.0	192.168.0.47, 192.168.1.48	DCP, Turck
Found 1	Dev	ice.							1	1	

Figure 2.4 – Service Tool

The tool has following features:

- Scanning for existing devices (F5). All modules are found through use of the protocols DCP (PROFINET Standard) and IBTP (TURCK Service Protocol). With the IBTP protocol extended information such as FW version and operating mode improved scanning are read out of TURCK devices and displayed.
- Setting an IP address (F2)
- Locate device using Wink function (F3)
- Actions menu that resets the device to the factory default or reset network (F4)
- Supports the configuration of PROFINET modules, assigning the PROFINET name
- Clipboard used for Copy: all, IP address or MAC address
- Expert view, when enabled, provides additional functions like DHCP Server, ARGEE and BEEP features by TURCK multiprotocol device
- DHCP server
- ARGEE status
- BEEP status



Frequently used functions of the tool are:

- Search (F5)
- Change (F2)
- DHCP (F6)
- Action (F4)

2.4.1 Search (F5)

The *Search* function is used to identify TURCK multiprotocol device on the continuous physical network segment including layer 2 of the OSI model switches. The IP address 192.168.0.254 appears when the device is in the PGM-DHCP mode and DHCP client is active. The IP address transitions to 0.0.0.0 when DCHP server is started. The device mode is provided (position of the rotary switches), composite firmware revision, ARGEE loaded program is running, and BEEP status of the device if enabled.

Turo	k Service Tool, Vers. 3	.1.0									
Y	our Global Autom	ation Partner							TL	JRC	×
Search	(F5) Change (F2)	Wink (F3) Action	ති (F4)	ard Lan	EN , Experi	t view ON Start DHCF	• (F6) Co	EIP	7) ARGEE (F8)	BEEP (F9)	× Close
No.	MAC address	N IP address	Netmask	Gatew	Mode	Device	Version	Adapter	ARGEE		
- 3	00:07:46:82:56:07	192.168.0.2	255.255.252.0	0.0.0.0	PGM_DHCP, A	TBEN-LH-8IOL	3.1.8.0	192.168.0.47	running: Honda	_TBEN_Map_1_V	1_0_16NOV Ξ
- 2	00:07:46:0D:77:81	136.129.1.2	255.255.255.0	0.0.0.0	PGM_DHCP	TBEN-S2-2RFID-4DXP	3.5.1.0	192.168.0.47	supported		
- 1	00:07:46:07:37:B8	192.168.1.1	255.255.255.0	0.0.0.0	PGM DHCP	TBEN-S2-4IOL	3.2.5.0	192.168.0.47	supported		*
- 4	Deview				111						4
Found	3 Devices.										

Figure 2.5 – Search function

2.4.2 DHCP (F6)

The device IP address may be assigned using the DHCP server provided by the tool. The procedure:

- Search (F5) to discover device with address 192.168.0.254
- Highlight that device
- Start DHCP (F6)
- Select network adapter in the DHCP server settings page and click Start DHCP



Figure 2.6 – Initialize DHCP server

> Wait until DHCP server locates the device (IP transitions to 0.0.0.0)

Turck	Service Tool, Vers.	3.1.0						
Yo	ur Global Auton	nation Pa	rtner					
Search	(F5) Change (F2)	Wink (F3	رې) Actions (F4)	Clipboard	EN Langua	ge Expert	view ON Stop DHCP ((F6) Confi
No.	MAC address	Name	IP address	Netmask	Gatew	Mode	Device	Version
- 1	00:07:46:02:8F:20		<u>0.0.0.0</u>	0.0.0	0.0.0.0	PGM_DHCP	TBEN-LH-16DIP	3.0.4.0
- 2	00:07:46:0D:77:81		136.129.1.231	255.255.255.0	0.0.0.0	PGM_DHCP	TBEN-S2-2RFID-4DXP	3.5.1.0
- 3	00:07:46:07:37:B8		<u>192.168.1.100</u>	255.255.255.0	0.0.0.0	PGM_DHCP	TBEN-S2-4IOL	3.2.5.0
Wait for devices to be found via DHCP. Then select device and assign IP address with "Change (F2)".								

Figure 2.7 – Device DHCP client active view

- > Highlight device
- Click Change (F2)
- > Assign IP address
- Click Stop DHCP (F6) button

Turck Service Tool, Vers. 3.1.0	
Your Global Automation Partner	Change device configuration Change device name:
Search (F5) Change (F2) Wink (F3) Actions (F4) No. ▼ MAC address N IP address Netro 3 00:07:46:82:56:07 00:00 0.00 0.00 • 1 00:07:46:07:37:B3 192:168:1:100 255:1 • 1 00:07:46:07:37:B3 192:168:1:100 255:1 • 1 Wait for devices to be found via DHCP. Then select devices 1	IP configuration MAC address IP address 00.07.46:82:56:07 192:168:0.17 Netmask Gateway 255:255:25:0 0:00.0 Set IP configuration temporarily Status messages:
	Set in device Cancel

Figure 2.8 – IP Configuration

After the IP address is assigned, the device responds with:

🛨 Turc	k Service Tool, Vers. 3.	.1.0							-		
Y	our Global Automa	ation	Partner							TU	JRC
Search.) (F5) Change (F2)	Wink	(F3) Actions ((F4) Clipboa	rd Lan	EN	t view ON Stop DHCF	(F6) Co	EIP onfiguration (F	7) ARGEE (F8)	BEEP (F9)
No.	MAC address	N	IP address	Netmask	Gatew	Mode	Device	Version	Adapter	ARGEE	
- 3	00:07:46:82:56:07		<u>192.168.0.17</u>	255.255.252.0	0.0.0.0	PGM_DHCP, A	TBEN-LH-8IOL	3.1.8.0	192.168.0.47	running: Honda	_TBEN_Map_1_V1_
- 2	00:07:46:0D:77:81		<u>136.129.1.231</u>	255.255.255.0	0.0.0.0	PGM_DHCP	TBEN-S2-2RFID-4DXP	3.5.1.0	192.168.0.47	supported	
- 1	00:07:46:07:37:B8		<u>192.168.1.100</u>	255.255.255.0	0.0.00	PGM_DHCP	TBEN-S2-4IOL	3.2.5.0	192.168.0.47	supported	

Figure 2.9 – IP address assigned



2.4.3 Set IP address using Web server

The device Web server is a communication interface with the device and offers several setup options. It is necessary to login as an administrator to change device IP address.

The procedure:

- > Enter current IP address of the device into a browser
- > If you don't know what is current IP address, use TURCK Service Tool to discover device
- > Enter "password" into *Login* field to get administrator's privilege.

The station Information X +					x
← → C △ O Not secure 192.1	168.0.254/info.html			☆ B	Т
👯 Apps 🕒 Suggested Sites 📒 Imp ted F	rom IE 💪 Google 📙 Health 🚺	MSNBC 🌐 Merriam-Webster's 🗆	TURCK USA - Capacit	🔠 Google News	»
TURCK COM For comments	it TURCK Support	Enter password "password"	TUI	RCH	K Î
TBEN-LH-8IOL			LOGIN		
STATION > Station Information I Station Diagnostics	Station Information			-	
Event Log Ethernet Statistics Links	Type Identification Number	TBEN-LH-8IOL			
BASIC >	Firmware Revision	V3.1.8.0			
I IO-LINK PORT 1 > I IO-LINK PORT 2 > I IO-LINK PORT 3 >	Bootloader Revision EtherNet/IP™ Revision	V1.0.0.0 V2.7.21.0			

Figure 2.10 – Device Web server

- > Open Network Configuration menu, enter new IP address and then Submit
- If your PC network adapter is set to the same subnet as the device's subnet, you are going to see the device which comes up with the new setup

3EN-LH-8IOL		LOGOUT [ADMIN@192.168.0.47]
	Network Configuration	
I Station Diagnostics	Network Settings	
Event Log Ethernet Statistics	Ethernet Port 1 setup	Autonegotiate *
Links	Ethernet Port 2 setup	Autonegotiate •
Station Configuration	IP Address	192.168.0.17
BEEP Network Configuration	Netmask Enter new IP	255.255.252.0
Change Admin Password	Default Gateway address	0.0.0.0
BASIC	SNMP Public Community	public
I IO-LINK PORT 1	SNMP Private Community	private
I IO-LINK PORT 2		procession and a second s
I IO-LINK PORT 3	MAC Address	00:07:46.82:56:07
I IO-LINK PORT 4	LLDP MAC Address 1	00.07.46.82.56.08
I IO-LINK PORT 5	LLDP MAC Address 2 Submit	00:07:46:82:56:09
I IO-LINK PORT 6		
I IO-LINK PORT 7		Submit Reset

Figure 2.11 – Network Configuration menu

2.5 BOOTP/DHCP utility

The BOOTP/DHCP utility may be used while the device is in the PGM-DHCP mode on the first power-up. When the IP address is assigned, the device DHCP client becomes disabled. The procedure:

- Start Rockwell DHCP server
- Select network interface



Figure 2.12 - BOOTP / DHCP tool

> At Tools menu, click at Network Settings

贤 В					
File	Тс	pols Help			
		Network Settings			Clear History
		Add Relation			
	E	Clear Discovery History	dress	Hostname	
)	Delete Relation			
		Enable BOOTP/DHCP			
		Disable BOOTP/DHCP			
		Reset Module's Network Settings to Factory Defaults			
		Properties			
	_	Entered Belati	ons		

Figure 2.13 – Network Settings menu

> Enter Mask and Gateway addresses in the Network Settings dialog

Network Settings	X
Defaults Adapter: ASIX AX887	72 USB2.0 to Fast Ethernet Adapter #2
Server IP address:	192.168.0.47
Subnet Mask:	255 . 255 . 252 . 0
Gateway:	192 . 168 . 0 . 1
Primary DNS:	
Secondary DNS:	
Domain Name:	
Reset Defaults	OK Cancel

Figure 2.14 – Network Settings view



> Enter new IP address in the New Entry dialog

5	BootP DHCP EtherNet/IP	Commissioning Tool	
Fil	e Tools Help		
	Add Relation	Discovery History	Clear History
	Ethernet Address (N	AAC) Type (hr:min:sec) # IP Address Hostname	
	00:07:46:02:8F:20	New Entry	
		Server IP Address: 192.168.0.47	
		Client Address (MAC): 00:07:46:02:8F:20	
	_	Client IP Address: 192 . 168 . 0 . 17	
	Ethorpot Addross ()	Hostname:	
	Ethernet Address (i	Description:	
		OK Cancel	

Figure 2.15 – IP address setup

> Wait for confirmation – assigned IP address appears in the IP Address column

5	BootP DHCP EtherNet/IP Commissioning Tool											
Fil	File Tools Help											
	Add Relation		Clear History									
	Ethernet Address (MAC)	Туре										
	00:07:46:02:8F:20	DHCP	10:26:51	102	92.168.0.	17						
	Criteria Relations											
	Ethernet Address (MAC)	Туре	IP Address		Hostname	Descr	iption					
	00:07:46:02:8F:20	DHCP	192.168.0.17									

Figure 2.16 – IP address assignment complete

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3 TBEN-LH-8IOL Controls Reference

3.1 Device Overview

The summary of the device installation guidance, connector's assignment, power distribution and grounding requirements are as follows.

3.1.1 Dimensions and connector assignment



Figure 3.1 – Connector assignment

3.1.2 Power connector pin assignment



Figure 3.2 – X1 and X2 connector pinout

3.1.3 IO connector pin assignment



Figure 3.3 – C0...C7 connector pinout

3.1.4 Power supply

Power supply					
Supply voltages	24 V DC from operating voltage				
Permissible range	18 30 V DC				
	IO-Link: 20,4 28,8 V DC (acc. to IO-Link standard)				
	Total current max. 9 A per module				
Operating current	< 120 mA				
Sensor/actuator supply V _{AUX1}	Supply from V1 short-circuit proof, max. 4 A for C0 & C4, short-circuit proof, 2 A per group C1 - C4, C5 - C8				
Sensor/actuator supply V _{AUX2}	Class B-supply from V2 short-circuit proof, 2 A per connector C0-C7				
Potential isolation	\geq 500 V (V2 to Ethernet and V1)				
IO-Link					
Number of ports	8				
IO-Link specification	V1.0, V1.1 according to IEC 61 61131-9				
IO-Link port type	Class A at C0 to C3 Class B at C3 to C7				
Frame type	Supports all specified frame types				
Process data for IO-Link devices					
– Input data	max. 32 Byte per channel				
– Output data	max. 32 Byte per channel				
Transmission rate	4,8 kbps (COM 1) 38,4 kbps (COM 2) 230,4 kbps (COM 3)				
Transmission cable	Length: max. 20 m standard cables, 3- or 4-wire (depending on the application), unshielded				



ATTENTION!

Wrong supply of IO-Link devices *Damage to the electronics*

The IO-Link devices must only be supplied with the voltage provided at the supply terminals of the TBEN



ATTENTION!

Connection of Class A devices to Class B ports *Loss of the galvanic isolation*

Only use Class A devices with signals on pin 1, pin 3 and pin 4 at Class B ports. The connection of Class A devices with signals on pin 2 and pin 5 leads to the loss of the galvanic isolation



3.1.5 LEDs



Figure 3.4 – LED assignment

LED	Color	Status	Meaning	Remedy
PWR	WR gree off		V1 missing or < 17 V DC	Check V1
n		on	V1 and V2 OK	-
		blinking	V2 missing or < 14.5 VDC	Check V2
ETHx	gree	on	Link established,100 Mbps	
	n	blinking	Ethernet Traffic, 100 Mbps	
	yel-	on	Link established,10 Mbps	
	low	blinking	Ethernet Traffic, 10 Mbps	
	-	off	No Ethernet link.	Check the Ethernet connection.
ERR	gree n	on	No diagnostic message available	
	red	on	Diagnostic message pending	
BUS	gree	on	Active connection to a master	-
	n	blinking	Device is ready for operation	-
	Red	on	IP address conflict or restore mode or timeout	control IP addresses in the network waiting for the device to be ready for operation
		blinking	Blink-/wink-command active	see also description of LED "right to ERR"
	red/ gree n	on	Autonegotiation and/or waiting for DHCP-/BootP-address assign- ment.	

Figure 3.5 – Module LED behavior

LED	Color	Status	Meaning	Remedy						
IOLx	Channel in IO-Link-mode									
	gree n	off	No IO-Link communication, diag- nostics deactivated	 – connect an IO-Link device – Parameterize the channel as DI if necessary. 						
		flashing	IO-Link communication active, valid process data	-						
	Red	on	No IO-Link communication and/or module error, invalid process data	 Possible causes: Sensor supply is below the admissible range, IO-Link port is parameterized as simple digital input, No device connected to the masters, 						
	Red	flashing	IO-Link communication active and module error, invalid process data	 No input data received from the connected device (only valid for devices with an input data length > 0), the connected device does not respond on sending output data (only valid for devices with an output data length of > 0). connected device sends an error: "process data invalid". see also: Start-up problems - frequent failure causes, page 115 						
	Chann	el in Dl-mode	1	-						
	gree n	off	-							
	gree n	on	Input signal active	-						
DXPx	gree n	off	-							
	gree n	on	In-/ output signal active							
	Red	on	Short circuit at output of the respective channel							
right to ERR	white	flashing	Support for localizing a module if the blink-/wink-command is acti- vated	-						

Figure 3.6 – IO LED behavior



3.2 IO data map

3.2.1 General overview

The default data size of the TBEN-LH-8IOL is:

- 292 Byte Input data size, (146INT)
- 296 Byte Output data size, (148INT)

Honda TBEN-LH-8IOL

Honda TBEN-LH-8IOL Data Map Overview - 7_APF	R_2018				
Data from RSL/Robot to TBEN			Data from TBEN to RSL/Robot		
Description	RSLogix Index	Fanuc Starting bit	Description	RSLogix Index Value	Fanuc Starting bit
IOL Channel Disable and C0 to C7 DXP Outputs	0	0	DXP and Cx Input Status	0	0
IOL C0 to C7 Mapping	1	16	Diagnostic and IOL Data Valid	1	16
VAux 1 and VAux 2 Control	2	32	C0 IOL Port 1 Input Data Word 0	2	32
IOL 16 Data Word Enable	3	48	C0 IOL Port 1 Input Data Word 1	3	48
C0 IOL Port 1 Output Data Word 0	4	64	C1 IOL Port 2 Input Data Word 0	4	64
C0 IOL Port 1 Output Data Word 1	5	80	C1 IOL Port 2 Input Data Word 1	5	80
C1 IOL Port 2 Output Data Word 0	6	96	C2 IOL Port 3 Input Data Word 0	6	96
C1 IOL Port 2 Output Data Word 1	7	112	C2 IOL Port 3 Input Data Word 1	7	112
C2 IOL Port 3 Output Data Word 0	8	128	C3 IOL Port 4 Input Data Word 0	8	128
C2 IOL Port 3 Output Data Word 1	9	144	C3 IOL Port 4 Input Data Word 0	9	144
C3 IOL Port 4 Output Data Word 0	10	160	C4 IOL Port 5 Input Data Word 0	10	160
C3 IOL Port 4 Output Data Word 1	11	176	C4 IOL Port 5 Input Data Word 1	11	176
C4 IOL Port 5 Output Data Word 0	12	192	C5 IOL Port 6 Input Data Word 0	12	192
C4 IOL Port 5 Output Data Word 1	13	208	C5 IOL Port 6 Input Data Word 1	13	208
C5 IOL Port 6 Output Data Word 0	14	224	C6 IOL Port 7 Input Data Word 0	14	224
C5 IOL Port 6 Output Data Word 1	15	240	C6 IOL Port 7 Input Data Word 1	15	240
C6 IOL Port 7 Output Data Word 0	16	256	C7 IOL Port 8 Input Data Word 0	16	256
C6 IOL Port 7 Output Data Word 1	17	272	C7 IOL Port 8 Input Data Word 1	17	272
C7 IOL Port 8 Output Data Word 0	18	288	C0 IOL Port 1 Input Data Word 0 - 16WD Enabled	18	288
C7 IOL Port 8 Output Data Word 1	19	304			
C0 IOL Port 1 Output Data Word 0 - 16WD Enabled	20	320	C0 IOL Port 1 Input Data Word 15 - 16WD Enabled	33	528
			0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-		
C0 IOL Port 1 Output Data Word 15 - 16WD Enabled	35	560	C7 IOL Port 8 Input Data Word 0 - 16WD Enabled	130	2080
C7 IOL Port 8 Output Data Word 0 - 16WD Enabled	132	2112	C7 IOL Port 8 Input Data Word 15 - 16WD Enabled	145	2320
C7 IOL Port 8 Output Data Word 15 - 16WD Enabled	147	2352			

Figure 3.7 – IO data map overview

3.2.2 Input data map

Input data map overview

Honda TBEN-LH-8IOL

Data from TBEN to RSL/Robot RSLogix Index Value Fanuc Starting bit
Data from TBEN to RSL/Robot
Description RSLogix Index Value Fanuc Starting bit
DXP and Cx Input Status 0 0 DXP Input Bits and Disabled IOL Port 24V Input Bits
Diagnostic and IOL Data Valid 1 16 IOL Indicators
C0 IOL Port 1 Input Data Word 0 2 32
C0 IOL Port 1 Input Data Word 1 3 48
C1 IOL Port 2 Input Data Word 0 4 64
C1 IOL Port 2 Input Data Word 1 5 80
C2 IOL Port 3 Input Data Word 0 6 96
C2 IOL Port 3 Input Data Word 1 7 112
C3 IOL Port 4 Input Data Word 0 8 128
C3 IOL Port 4 Input Data Word 0 9 144 IOL ink data from TBIL Stations or Stack Lights or
C4 IOL Port 5 Input Data Word 0 10 160 valve banks or other 1 or 2 word devices
C4 IOL Port 5 Input Data Word 1 11 176
C5 IOL Port 6 Input Data Word 0 12 192
C5 IOL Port 6 Input Data Word 1 13 208
C6 IOL Port 7 Input Data Word 0 14 224
C6 IOL Port 7 Input Data Word 1 15 240
C7 IOL Port 8 Input Data Word 0 16 256
C7 IOL Port 8 Input Data Word 1 17 272
C0 IOL Port 1 Input Data Word 0 - 16WD Enabled 18 288
C0 IOL Port 1 Input Data Word 15 - 16WD Enabled 33 528
Exercise Sector
C7 IOL Port 8 Input Data Word 0 - 16WD Enabled 130 2080
C7 IOL Port 8 Input Data Word 15 - 16WD Enabled 145 2320

Figure 3.8 – Input data map, overview

■ Input data map, word 0

Honda TBEN-LH-8IOL

			TUI	ICK
Honda TBEN-LH-8IOL Input Data Word (- 7_APR_2018			
Data from TBEN to RSL/Robot Description DXP and Cx Input Status	Word 0.0 to .15 RSLogix Index Value 0	Fanuc Starting bit		
C0 DXP Input Active	0	0	Set when C0 DXP input (Pin 2) is 24V=ON	M12 x 1 I/O Port
C1 DXP Input Active C2 DXP Input Active	1 2	2		-C 1 = V_rm1 (V1)
C3 DXP Input Active	3	3	Set when C3 DXP input (Pin 2) is 24V=ON	2 = DXP(V1) 1 = 0 = 0 3 = GND(V1)
reserved	5	5		5 = 0.00 (V1) 4 = C/Q (V1) 5 = n c
reserved	6	6		C0C3
co PIN4 DI	8	8	Set when disabled IOL Port 1 (Pin 4) is 24V=ON	M12 x 1 I/O Port
C1 PIN4 DI	9	9		
C2 PIN4 DI C3 PIN4 DI	10	10 11		$1 = V_{aux} 1 (V1)$
C4 PIN4 DI	12	12		$2 = V_{aux} 2 (V2)$ 3 = GND (V1)
C5 PIN4 DI	13	13	:	4 = C/Q (V1) 5 4 5 = GND (V2)
C6 PIN4 DI C7 PIN4 DI	14 15	14 15	Set when disabled IOL Port 8 (Pin 4) is 24V=ON	C4C7

Figure 3.9 – Input data map, word 0



Input data map, word 1

Honda TBEN-LH-8IOL

Honda TBEN-LH-8IOL Input Data Word 1	L-7_APR_2018						
Data from TREN to PSI / Pobot	Word 1 0 to 15						
Description	RSLogix Index Value	Fanuc Starting bit					
Diagnostic and IOL Data Valid	1	16					
Diag	0	16	}-	Diagn	ostic Active		
reserved	1	17	_				
V1	. 2	18	F	V1out	t of range		
V2	3	19		V2 out	t of range		
FCE	4	20	≻	Forcin	gEnabled		
reserved	5	21					
reserved	6	22					
reserved	7	23					
COIOL Port 1 Data Valid	8	24	┢	Setwh	nen IOL Port 1 Data is '	Valid	
C1IOL Port 2 Data Valid	9	25	:				
C2 IOL Port 3 Data Valid	10	26	:				
C3IOL Port 4 Data Valid	11	27	:				
C4IOL Port 5 Data Valid	12	28	:				
C5IOL Port 6 Data Valid	13	29	:				
C6IOL Port 7 Data Valid	14	30	:				
C7 IOL Port 8 Data Valid	15	31	_}	Setwh	nen IOL Port 8 Data is '	Valid	

Figure 3.10 – Input data map, word 1

3.2.3 Output data map overview

Honda TBEN-LH-8IOL

Honda TBEN-LH-8IOL Output Data Overview - 7_A	PR_2018								
Data from RSL/Robot to TBEN									
Description	RSLogix Index	Fanuc Starting bit							
IOL Channel Disable and C0 to C7 DXP Outputs	0	0	\square	IOLii	nk channel	disable, 2	4V output	ontrol	
IOL C0 to C7 Mapping	1	16		Data	Mapping f	or each IC	Link Chann	el	
VAux 1 and VAux 2 Control	2	32	\supset	Turn	off VAux1	and VAux	2power		
IOL 16 Data Word Enable	3	48	\geq	Enab	le 16 Data	Word IOL	ink data tra	nsfer	
C0 IOL Port 1 Output Data Word 0	4	64							
C0 IOL Port 1 Output Data Word 1	5	80							
C1 IOL Port 2 Output Data Word 0	6	96							
C1 IOL Port 2 Output Data Word 1	7	112							
C2 IOL Port 3 Output Data Word 0	8	128							
C2 IOL Port 3 Output Data Word 1	9	144							
C3 IOL Port 4 Output Data Word 0	10	160							
C3 IOL Port 4 Output Data Word 1	11	176		10	Link data t	o TBIL Stat	tions or Sta	ck Lights o	r
C4 IOL Port 5 Output Data Word 0	12	192		va	lve banks	or other 1	or 2 word	devices	
C4 IOL Port 5 Output Data Word 1	13	208							
C5 IOL Port 6 Output Data Word 0	14	224							
C5 IOL Port 6 Output Data Word 1	15	240							
C6 IOL Port 7 Output Data Word 0	16	256							
C6 IOL Port 7 Output Data Word 1	17	272							
C7 IOL Port 8 Output Data Word 0	18	288							
C7 IOL Port 8 Output Data Word 1	19	304							
C0 IOL Port 1 Output Data Word 0 - 16WD Enabled	20	320							
C0 IOL Port 1 Output Data Word 15 - 16WD Enabled	35	560							
			ļ	- Fut	ture proofi	ng - RFID o	r other unp	lanned de	vices
C7 IOL Port 8 Output Data Word 0 - 16WD Enabled	132	2112							
C7 IOL Port 8 Output Data Word 15 - 16WD Enabled	147	2352							

Figure 3.11 – Output data map, overview



Output data map, word 0

Honda TBEN-LH-8IOL

			TURC	>K	
Honda TBEN-LH-8IOL Output Word 0 - 7_APR_201	8				
Data from RSL/Robot to TBEN	Word 0.0 to .15				
Description	RSLogix Index	Fanuc Starting bit			
IOL Channel Disable and C0 to C3 DXP Output Bits	0	0	IOLink channel disable , 24V DXP output control		
Disable C0 IOL Port 1	0	0			
Disable C1 IOL Port 2	1	1			
Disable C2 IOL Port 3	2	2	Dischlaurung di Ol Darts og their red discregatio		
Disable C3 IOL Port 4	3	3	LED is off. Disabled IOL Ports so their red diagnostic		
Disable C4 IOL Port 5	4	4	standard 24V digital inputs		
Disable C5 IOL Port 6	5	5			
Disable C6 IOL Port 7	6	6			
Disable C7 IOL Port 8	7	7			
Enable C0 DXP Output	8	8		M12 x 1 I/O Po	rt
Enable C1 DXP Output	9	9	Enable DXP 24V outputs available on C0 to C2	6	
Enable C2 DXP Output	10	10		2	1-1/ 10/1
Enable C3 DXP Output	11	11		2	2 = DXP(V1)
Activate C0 DXP Output	12	12		1(000)3	3 = GND(V1)
Activate C1 DXP Output	13	13	Control enabled DXP 24V outputs available on C0 to C3	5 4	4 = C/Q(VI) 5 = n.c.
Activate C2 DXP Output	14	14	control enabled by 240 outputs available of co to co	60.60	
Activate C3 DXP Output	15	15		003	

Figure 3.12 –Output data map, word 0

Output data map, word 1

Honda TBEN-LH-8IOL

Honda TBEN-LH-8IOL Output Word 1 - 7_APR_2018					B1	BO					
					0	0	Direct				
Data from RSL/Robot to TBEN	Word 1.0 to .15				0	1	Swap 16				
Description	RSLogix Index	Fanuc Starting bit			1	0	Swap 32				
IOL C0 to C7 Data Mapping	1	16			1	1	Swap All				
C0 IOL Port 1 Mapping B0	0	16			inli Domit II	Mara Dite					
C0 IOL Port 1 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	1	17		TOLINK Port 1 Map Bits							
C1 IOL Port 2 Mapping B0	2	18	:								
C1 IOL Port 2 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	3	19	:	00	d	iroct A		The proce	se data are	not swapp.	od
C2 IOL Port 3 Mapping B0	4	20	:				(0×0123 4567 89AB CDEF)			eu.	
C2 IOL Port 3 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	5	21	: 01 swap 16 bit The bytes are swapp			ed per word	ч				
C3 IOL Port 4 Mapping B0	6	22	: (0×2301 6745 AE			745 AB89 I	EFCD)				
C3 IOL Port 4 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	7	23	: 10 swap 32 bit The bytes are swap			are swapp	ed per dout	ble word			
C4 IOL Port 5 Mapping B0	8	24	: (0× 6745 2301 EFCD		AB89)						
C4 IOL Port 5 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	9	25	: 11 swap all All bytes are swapped			d.					
C5 IOL Port 6 Mapping B0	10	26	: (0×EFCD AB89 6745 23			2301)					
C5 IOL Port 6 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	11	27	:								
C6 IOL Port 7 Mapping B0	12	28	:								
C6 IOL Port 7 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	13	29	:								
C7 IOL Port 8 Mapping B0	14	30		101	ink Dort 9	Man Dite					
C7 IOL Port 8 Mapping B1 - 00=Direct, 01=Swap 16, 01=Swap 32, 11=Swap All	15	31	1 IOLINK Port 8 Map Bits								

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Figure 3.13 – Output data map, word 1

Output data map, word 2

Honda TBEN-LH-8IOL



Figure 3.14 – Output data map, word 2



Honda TBEN-LH-8IOL



Figure 3.15 – Output data map, word 3



URCK

3.3 Application Requirements

Honda TBEN-LH-8IOL

Application Requirements

- IOLink Master optimized for use with Omron, RSL5000 and Fanuc Robot
 - Default Network Settings
 - IP Address: 192.168.0.XXX
 - Subnet: 255.255.252.0
 - Reduced Data Footprint
 - 18 words input, 20 words output for simple IOL device integration
 - 146 words input, 148 words output for integration of 32 byte IOL devices
 - Station Configuration in process Output Data
 - No configuration via web-server required
 - Device support including:
 - IO Link TBIL standard 24V device expansion
 - IO Link Valve Bank integration (Class B Power)
 - IO Link Stack Light
 - IO Link RFID
 - Standard 24V inputs on unused IOL Ports
 - Standard 24V In/Out DXP control on C0 to C3
 - Quick Connect and non-Quick Connect supported



Honda TBEN-	LH-8IOL Turck
Integration with RSL5000 using - Connection information incl - Connection State (14, 800, Sample, MAP1 - Controller Flack Handler - Controller Handler - Controller - Controller Handler - Controller - Controller	g Generic Ethernet Connection uded in catalog file

Figure 3.17 – TBEN-LH-8IOL integration into RSLogix5000

3.4 IO-Link Port Setup

3.4.1 Open Web Server

> Enter IP address of the deice into Web browser

URCK.COM For comments or question	ns, please email TURCK Support	TURCK
BEN-LH-8IOL		LOGIN
STATION Station Information	> Station Information	
Station Diagnostics	Station Information	
Event Log	Туре	TBEN-LH-8IOL
Links	Identification Number	100002195
BASIC	> Firmware Revision	V3.1.8.0
IO-LINK PORT 1	> Bootloader Revision	V1.0.0.0
I IO-LINK PORT 2	> EtherNet/IP™ Revision	V2.7.21.0
! IO-LINK PORT 3	> PROFINET Revision	V1.4.7.0
IO-LINK PORT 4	Modbus TCP Revision	V2.2.2.0
I IO-LINK PORT 6	Addressing Mode	PGM DHCP
I IO-LINK PORT 7	> PROFINET Station Name	
I IO-LINK PORT 8	> ARGEE Boot Project	Running
IO-LINK EVENTS	ARGEE Project Title	Honda_TBEN_Map_1_V1_0_16NOV2017_xxx
	ARGEE Factory Programmed Network Settings	No
	Ethernet Port 1 setup	Autonegotiate
	Ethernet Port 2 setup	Autonegotiate
	IP Address	192.168.1.17
	Netmask	255.255.252.0
	Default Gateway	0.0.0.0
	MAC Address	00:07:46:82:56:07
	LLDP MAC Address 1	00:07:46:82:56:08
	LLDP MAC Address 2	00:07:46:82:56:09
	EtherNet/IP™ Status	
	Network topology	Linear
	DLR State	Normal
	QuickConnect	Disabled
	PROFINET Status	
	Network topology	Linear
	FastStartUp	Disabled





3.4.2 Administrator access

When someone is logged-in as an administrator, it gains the access to the device IP address setup, the parameters setup and other control functions. The administrator access is controlled by the password, which may be changed.

The procedure:

Enter "password" into LOGIN field

T Station Information × +		x	Î
← → C ↑ A Not secure 192.168.1.17/info.html	\$:	
🗰 Apps ▶ Suggested Sites 📙 Imported From IE 💪 Google 📒 Health 🚺 MSNBC 🌐 Merriam-Webster's 🗤 🔽 TURCK USA - Capacit 👼 Google Ner	ws	>>	
TURCK.COM For comments or questions, please email TURCK Support	CI	<	
TBEN-LH-8IOL			



If you forget the password, reset the device to the factory defaults (900). Before the reset takes place, save all IOL current setup, as it will be deleted and set to the factory defaults. After the

reset, the first thing to do is to assign an IP address to the device.

3.4.3 Basic Parameter Setup

- Activate DXP outputs 1.3.5 and 7 by entering "yes" in the drop down selection dialog
- If DXP output short condition needs to be confirmed by the PLC, enter "yes" in the drop down selection dialog

TURCK.COM For comments or questions, please email TURCK Support							
TBEN-LH-8IOL		LOGOUT [ADMIN@192.168.1.50]					
STATION > Station Information	Basic - Parameters						
I Station Diagnostics Event Log	DXP 1 - Manual reset after overcurr. DXP 1 - Activate output	no T					
Links Station Configuration	DXP 3 - Manual reset after overcurr. DXP 3 - Activate output	no T					
Network Configuration BEEP Network Configuration Change Admin Password	DXP 5 - Manual reset after overcurr. DXP 5 - Activate output	no T					
BASIC >	DXP 7 - Manual reset after overcurr. DXP 7 - Activate output	no 🔻					
Inputs Outputs	Submit Reset Refresh						

Figure 3.20– Basic parameter setup

3.4.4 IOL Master Default Setup

Refer to the TBEN-Lx...-8IOL User Manual for the description of the IO-Link master's features and setup. The setup made by the Web server is saved in the device permanent memory. If the device is reset to the factory default values, the custom setup will be lost.

TURCK COM For comments or questions, please email TURCK Support							
TBEN-LH-8IOL		LOGOUT [ADMIN@192.168.1.50]					
STATION >	IO-Link Port 1 - Parameters						
Station Diagnostics	Operation mode	IO-Link without validation					
Event Log Ethernet Statistics	Data storage mode	deactivated, clear 🔻					
Links	Cycle time	automatic 🔻					
Station Configuration	Revision	automatic 🔻					
Network Configuration BEEP Network Configuration	Activate Quick Start-Up	no 🔻					
Change Admin Password	Device parametrization via GSD	inactive •					
BASIC	Process input data invalid	diagnostic generated v					
I IO-LINK PORT 1	Deactivate diagnostics	notifications and warnings ▼					
Inputs	Input data mapping	direct •					
Outputs	Output data mapping	direct •					
I IO-LINK PORT 2	Vendor ID	0					
I IO-LINK PORT 3	Device ID	0					
I IO-LINK PORT 4 >	Submit	Reset Refresh					

Figure 3.21 – IO-Link master setup page



3.4.5 VAUX Control

The Vaux1 and Vaux2 power is controlled by the *"VAUX control – Parameters"* web page: Available options are:

- 0 = 24 VDC
- 1 = switchable
- 2 = off"

TURCK.COM For comments or questions, pl	ease email TURCK Support	TURCK
TBEN-LH-8IOL		LOGIN
STATION > Station Information	VAUX control - Parameters	
I Station Diagnostics Event Log	VAUX1 Pin1 C0 (Ch0/1) VAUX1 Pin1 C1 (Ch2/3)	switchable switchable
Links	VAUX1 Pin1 C2 (Ch4/5)	switchable
BASIC > I IO-LINK PORT 1 >	VAUX1 Pin1 C3 (Ch6/7) VAUX1 Pin1 C4 (Ch8)	switchable
I IO-LINK PORT 2 >	VAUX2 Pin2 C4 (Ch9)	switchable
I IO-LINK PORT 4 >	VAUX2 Pin2 C5 (Ch11)	switchable
IO-LINK PORT 6 >	VAUX1 Pin1 C6 (Ch12) VAUX2 Pin2 C6 (Ch13)	switchable
IO-LINK PORT 8 >	VAUX1 Pin1 C7 (Ch14)	switchable
VAUX CONTROL > Parameters Outputs	Refresh	Switchable
		Revision V3.3.0.0

Figure 3.22 –VAUX control page

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4 Configure TBEN-LH-8IOL with Rockwell PLC

The configuration of the TBEN-LH with the Logix5000 controllers, using RSLogix5000 / Studio5000 programming environment may be done using:

- EDS file
- Generic device profile

4.1 TBEN-LH-8IOL Configuration using EDS files

4.1.1 Install EDS file

The EDS file is the Electronic Data Sheet or the device configuration file, described in the "Volume 1, Common Industrial Protocol (CIP), Edition 3.22, by ODVA". The procedure:

- i ne procedure:
 - Download TBEN-LH-8IOL_R2.7.EDS file from the TURCK web site
 - In the RSLogix5000 menu bar, expand the Tools drop down menu and click on the EDS hardware Installation Tool



Figure 4.1 – Tools menu

- > In the Rockwell Automation's EDS Wizard dialog, click at the Register and EDS file(s) and Next
- > Follow the dialog to complete device registration

Rockwell Automation's EDS Wizard	x
Options What task do you want to complete?	
 Register an EDS file(s). This option will add a device(s) to our database. 	
C Unregister a device. This option will remove a device that has been registered by an EDS file from our database.	
C Create an EDS file. This option creates a new EDS file that allows our software to recognize your device.	
Upload EDS file(s) from the device. This option uploads and registers the EDS file(s) stored in the device.	

Figure 4.2 – Register an EDS file(s)

4.1.2 Create a new module

- > In the Controller Organizer, right-click on Ethernet to access a drop-down menu.
- Click New Module... to open the "Select Module Type" dialog page



Figure 4.3 – Add new module

- > Enter the device name in the search area
- > Highlight the device from the list and click *Create*.

TBEN-LH		Clear Fi	Iters		Hide Filter	s 🛠
Module Type Cat	egory Filters		Module Type Ver	ndor Filters		-
Analog			Advanced Energy	Industries, Inc.		_
CIP Motion Conve	erter		Advanced Micro (Controls Inc. (AM	CI)	
Communication			BALLUFF			
Communications		*	Cognex Corporation	on		-
•		,				
Catalog Number	Description			Vendor	Category	
100001449	TBEN-LH-16DIP			TURCK	Communicatio	ns Ada
100002195	TBEN-LH-8IOL			TURCK	Communicatio	ns Ada
•		m				•

Figure 4.4 – Select Module Type dialog page



4.1.3 Configure TBEN-LH-8IOL using default connection

> Fill in the Name, Description and Ethernet Address of the device

🔜 Module Propert	ties: EIP (100002195 2.007)		x
General Connec	ction Module Info Internet Protocol Port Configu	ration	
Type: Vendor: Parent:	100002195 TBEN-LH-8IOL TURCK EIP		
Name: Description:	Id 100002195 FW V3.1.8.0 EIP V2.7.21.0 Project Honda_TBEN_Map_1_V1_0_16NOV2017_xxx	Ethemet Address Private Network: 192.168.1. 17	
Module Definit Revision: Electronic Key Connections:	tion 2.007 ying: Compatible Module AB TBEN-LH-8IOL Change		
Status: Offline	[OK Cancel Apply Help	

Figure 4.5 –New Module setup

- > Click "Change..." to open the "Module Definition" page, Figure 4.6
- Use default connection "AB TBEN-LH-8IOL"; select INT data format from the drop down menu, per Figure 4.6
- > Click OK to return to previous dialog page
- Click "Apply" and "OK"
- > Follow the dialog to save configuration, download and go on-line.

Module Definition*					×
Revision: 2	007 🌲				
Electronic Keying: Compatible Mod	ule	•			
Connections:					
Name		Size		Tag Su	ffix
AB TBEN-LH-8IOL	Input:	146	INT		TBEN_LH_8IOL:11
	Output:	148		1	TBEN_LH_8IOL:01
AB TBEN-LH-8IOL AB TBEN-LH-8IOL, QC-ON			SINT		
AB TBEN-LH-8IOL, QC-OFF			DINT		
Omron TBEN-LH-8IOL, QC-ON Omron TBEN-LH-8IOL, QC-OFF			REAL		
			6	ОК	Cancel Help

Figure 4.6 – Select connection and data format

4.1.4 Configure TBEN-LH-8IOL_QC_ON Connection

When the device is configured using a "*TBEN-LH-8IOL_QC_ON*" connection, the device is switched to the QuickConnect (QC) mode. The device is "Ready for Connection" at 100msec time after the device power cycle. The actual connection time depends on a controller setup and system architecture. The QC_ON connection is configured as follows:

- Create a new module as described in the section 4.1.2
- > Fill in the Name, Description and Ethernet Address of the device at New Module dialog page

🔜 New Module		
General* Conne Type: Vendor: Parent: Name: Description:	ection Module Info Internet Protocol Port Configu 100002195 TBEN-LH-8IOL TURCK EIP TBEN_LH_8IOL_Conn2 Enable QC	Ethernet Address Private Network: 192.168.1. IP Address: 192.168.1.
Module Defini Revision: Electronic Ke Connections:	tion 2.007 ying: Compatible Module AB TBEN-LH-8IOL Change	Host Name:
Status: Creating		OK Cancel Help

Figure 4.7 – *New Module* configuration

- > Click "Change..." to open the "Module Definition" page
- Use "TBEN-LH-8IOL_QC_ON" connection from the Connection Name" drop down list and select INT data format at the Size drop down list, per Figure 4.8
- Click OK to return to the previous dialog page
- > Click "Apply" and "OK at the New Module dialog page
- > Follow the dialog to save configuration, download program and go on-line.

Module Definition*]			
Revision: 2 • 007 •						
Electronic Keying: Compatible Module						
onnections:						
Name			Size		Tag Su	fix
		Input:	146	INT	1	TBEN_LH_8IOL_Conn2:I1
AD TOLN-LIT-DIOL, G	2C-0N	Output:	148		· ·	TBEN_LH_8IOL_Conn2:01

Figure 4.8 – QC_ON Connection setup



When QuickConnect is enabled, the device sets P1 port (ETH1) and P2 port (ETH2) as follows:

- Fixed speed at 100Mb
- Forced duplex at Full-duplex
- P1 port set as MDI (strait-through connection)
- P2 port set as MDIX (cross-over connection)
- Auto-Negotiate and Auto-MDX are disabled

The TBEN-LH-8IOL QuickConnect operational time:

- Ready-to-connect time = 100ms (time measured from the device power-up to the first ARP)
- CIP connection time < 10ms

NOTE

The incoming Ethernet cable is always connected to P1 port. P2 port is used for daisy-chaining next node if required. All daisy-chained nodes have to be QC enabled, and have unique IP address in the system. The QC enabled device does not perform duplicate address check.

Verify setup using the web server:

← → C △ ③ Not secure 192.168.1.18/info.html ☆ ⑤ :						
🗰 Apps 🕟 Suggested Sites 🛄 Imported From	IE Ġ Google 📙 Health 🚺 MSN	BC 🌐 Merriam-Webster's Li	TURCK USA - Capacit	🚮 Google News	»	
					Â	
TURCK.COM For comments or questions, plea	se email TURCK Support		TU			
TBEN-LH-8IOL			LOGIN			
STATION >	Station Information					
BASIC >	Station Information					
IO-LINK PORT 1	Station mormation					
	Type	IBEN-LH-8IOL				
	Identification Number	100002195				
	Firmware Revision	V3.1.8.0				
	Bootloader Revision	V1.0.0.0				
I IO-LINK PORT 7	EtherNet/IP™ Revision	V2.7.21.0				
	Network Settings					
	Ethernet Port 1 setup	100BT-FD				
	Ethernet Port 2 setup	100BT-FD				
	IP Address	192.168.1.18				
	Netmask	255.255.252.0				
	EtherNet/IP™ Status					
	Network topology	Linear				
	DLR State	Normal				
	QuickConnect	Enabled				

Figure 4.9 - TBEN QC enabled view

4.1.5 Configure TBEN-LH-8IOL_QC_OFF Connection

The "TBEN-LH-8IOL_QC_OFF" connection disables QC mode and restores the device Ethernet ports to:

- Autonegotiate
- Auto-MDIX
- > Follow the steps described in the section 4.1.2 to create a new module
- > Fill in the Name, Description and Ethernet Address of the device at the New Module dialog page

💷 New Module		
General* Conn Type: Vendor: Parent:	ection Module Info Internet Protocol Port Configur 100002195 TBEN-LH-8IOL TURCK EIP	ation
Name: Description:	Disable QC	Private Network: 192.168.1. IP Address: 192.168 1 19 Host Name:
Module Defin Revision: Electronic Ke Connections:	ition 2.007 eying: Compatible Module : AB TBEN-LH-8IOL Change	
Status: Creating		OK Cancel Help

Figure 4.10 – New Module configuration

- Use "TBEN-LH-8IOL_QC_OFF" connection from the Connection Name" drop down list and select INT data format at the Size drop down list, per Figure 4.11
- > Click OK to return to the previous dialog page
- Click "Apply" and "OK at the New Module dialog page
- > Follow the dialog to save configuration, download program and go on-line.

Module Definition*								
Revision: 2 • 007								
Ele	Electronic Keying: Compatible Module							
Cor	Connections:							
	Name			Size		Tag Suffix		
	AB TBEN-LH-8IOL, QC-OFF		Input:	146	INT	4	TBEN_LH_8IOL_Conn3:11	
			Output:	148	•	· ·	TBEN_LH_8IOL_Conn3:01	
	Select a connection	on 👻						

Figure 4.11 – QC_OFF Connection setup



4.2 TBEN-LH-8IOL configuration using generic device profile

4.2.1 Generic device configuration

The procedure:

- > In the Controller Organizer, right-click on *Ethernet* to display a drop-down menu.
- Click New Module to open the configuration page "Select Module Type"
- > Enter "Generic" in the search area, highlight the Generic Ethernet Module and click Create

Generic	Clear Filters	Hide Filter	s 🛠
Image: Module Type Category Image: Analog Image: ClP Motion Converter Image: Communication Image: Communications Image: Communications Image: Communications	pry Filters	Type Vendor Filters ed Energy Industries, Inc. ed Micro Controls Inc. (AMCI) F Corporation	
Catalog Number ETHERNET-BRIDGE ETHERNET-MODUL ETHERNET-SAFETY	Description Generic EtherNet/IP CIP Bridge Generic EtherNet Module ST Generic EtherNet/IP Safety and Standard Module	Vendor Category Rockwell Autom Communication Rockwell Autom Communication Rockwell Autom Safety.Other	
 ✓ 3 of 680 Module Types For 	m	Add to Fa	• vorites

Figure 4.12 – Generic module selection page

- > Enter the Name, Description and IP Address in the New Module page
- Select the Input Data INT data format in the Comm Format field
- > Enter the Connection Parameters as seen in the following figure
- Click OK and download configuration to the PLC

🔜 Module Pro	perties Report: EIP (ETHERNET-MO	DULE 1.001)		— ×-		
General Con	nection Module Info					
Type:	ETHERNET-MODULE Generic Ethernet Module					
Vendor:	Rockwell Automation/Allen-Bradley					
Parent:	EIP					
Name:	TBEN LH 8IOL Conn4	Connection Para	ameters			
Description:	Default configuration		Assembly Instance:	Size:		
		Input:	101	146 🚔 (16-bit)		
	v	Output:	110	148 🊔 (16-bit)		
Comm Format	: Data - INT 👻	Configuration	1	0 (8-bit)		
Address / H	lost Name	configuration.		- (0 Dit)		
IP Addre	ess: 192 . 168 . 1 . 117	Status Input:				
⊚ Host Na	me:	Status Output:				
Status: Offline	ОК	Cancel	Apply	y Help		

Figure 4.13 – TBEN default configuration

4.2.2 Generic device and QC_ON configuration

The procedure:

- > In the Controller Organizer, right-click on *Ethernet* to display a drop-down menu.
- > Click New Module to open the "Select Module Type" configuration page
- > Enter "Generic" in the search area, highlight the Generic Ethernet Module and click Create
- > Enter the Name, Description and IP Address in the New Module page
- Select the Input Data INT data format in the Comm Format field
- > Enter the Connection Parameters as seen in the following figure
- Click OK and download configuration to the PLC

💷 Module Prop	oerties Report: EIP (ETHERNET-MC	DULE 1.001)		X			
General Conr	General Connection Module Info						
Type:	ETHERNET-MODULE Generic Ethemet Module						
Vendor:	Rockwell Automation/Allen-Bradley						
Parent:	EIP	с					
Name:	TBEN_LH_8IOL_Conn5	Connection Para	Assembly				
Description:	OC ON configuration		Instance:	Size:			
		Input:	103	146 🚔 (16-bit)			
		Output:	115	148 🚔 (16-bit)			
Comm Format:	Data - INT	Configuration:	1	0 🦳 (8-bit)			
Address / H	ost Name			· · · · · · · · · · · · · · · · · · ·			
IP Addre	ss: 192 . 168 . 1 . 118	Status Input:					
⊚ Host Nar	ne:	Status Output:					
Status: Offline	ОК	Cancel	Apply	Help			

Figure 4.14 – TBEN QC-ON configuration

4.2.3 Generic device and QC_OFF configuration

- Repeat procedure as described above
- > Enter the Connection Parameters as follows:

	nection Module Info				
Туре:	ETHERNET-MODULE Generic Ethernet Module				
Vendor:	Rockwell Automation/Allen-Bradley	/			
Parent:	EIP				
Name:	TBEN LH 8IOL Conn6				
Description:			Assembly Instance:	Size:	
	QC_OFF conliguiation	Input:	103	146 🌲 (16	i-bit)
		Output:	116	148 🊔 (16	i-bit)
Comm Format	:: Data - INT	Configuration:	1	0 (84	hit)
Address / H	lost Name	Conliguration.	<u> </u>	- (01	July
IP Addre	ess: 192 . 168 . 1 . 119	Status Input:			
Host Na	me:	Status Output:			

Figure 4.15 – TBEN QC-OFF configuration



5 TBEN-LH-8IOL Configuration with OMRON PLC

The configuration of the TBEN-LH device, using the Omron Network Configurator application, is based on extensive use of the device EDS file. It is assumed that a user is familiar with the Network Configurator functions.

5.1 Get ready environment

5.1.1 Register EDS file

Start Network Configurator and get the device and associated tag sets registered:

- > Expand "EDS File" drop-down menu in the Configurator menu bar, click "Install"
- > Follow the dialog to install TBEN-LH-8IOL_R2.7.EDS file



Figure 5.1 – Install EDS file menu

- > Expand TURCK Inc., Communications Adapter, in the Hardware List Window
- Right--click at the TBEN-LH-8IOL, select Property pop-up menu
- Verify device identity and EDS file property



Figure 5.2 – TBEN-LH-8IOL device property page

5.1.2 Add device to the project

- Add Omron CJ1W-EIP21 Communication Adapter from the Hardware List Window, drag and drop into the new EtherNet/IP network
- Select TURCK TBEN-LH-8IOL Communication Adapter from the Hardware List Window, drag and drop into the new EtherNet/IP network



- Right-Click at TBEN to open pop-up window and click Change Node Address
- Assign the device IP address



Figure 5.4 – Change Node Address



5.1.3 Register tag sets

Create the input tag set, TBEN_LH_8IOL_In, starting at offset D0, length 292 bytes

dit Device Parameters : 192.168.1.5 CJ1W-EIP21				
Connections Tag Sets				
In - Consume Out - Produce				
Name	Over	Size	Bit	ID
TBEN_LH_8IOL_In		292Byte		Auto
D00000		292Byte		

Figure 5.5 – Input data tag

Create the output tag set, TBEN_LH_8IOL_Out, starting at offset D400, length 296 bytes

dit Device Parameters : 192.168.1.5 CJ1W-EIP21				— ×
Connections Tag Sets				
In - Consume Out - Produce				
Name	Over	Size	Bit	ID
TBEN_LH_8IOL_Out		296Byte		Auto
D00500	Enable	296Byte		

Figure 5.6 – Output data tag

5.1.4 The device connection types

The device supports multiple connection types. Those named "Omron" are used for configuration with Omron PLCs:

	Assembly Instance					
Connection Name	Input		Output		Configuration	
	Instance No	Data size	Instance No.	data size	Instance No.	Data size
AB TBEN-LH-8IOL	101	146	110	148	1	0
AB TBEN-LH-8IOL, QC-ON	101	146	115	148	1	0
AB TBEN-LH-8IOL, QC-OFF	101	146	116	148	1	0
Omron TBEN-LH-8IOL	103	146	110	148	1	0
Omron TBEN-LH-8IOL, QC-ON	103	146	115	148	1	0
Omron TBEN-LH-8IOL, QC-OFF	103	146	116	148	1	0

Table 5.7 – Connection types

Connection used by Omron PLC

Explanation of terms:

- Omron
 - TBEN-LH-8IOL Default connection
- QC-ON Connection enables QuickConnect feature
- QC-OFF Connection disables QuickConnect feature

5.2 Configure TBEN-LH-8IOL

5.2.1 Configure TBEN-LH-8IOL using default connection

- Right click at the controller to open pop-up menu
- > Highlight Parameter in the menu and select Edit
- > Drag and drop TBEN-LH-8IOL from the Unregister Device List into Register Device List
- > Click at *New...* button to open the *Edit Connection* configuration page
- > Click at the Connection I/O Type selection field , drop down arrow
- Select Omron TBEN-LH-8IOL connection
- > The Target Device info is auto-populated based on the EDS file definition
- > Enter the Originator Device IO tag sets and connection type as follows
- Register device

192.168.1.17 TBEN-LH-8IOL Edit Connection	×
It will add a connection configuration to originator device. Please configure the Tag Set each of originator device and target o	Jevice.
Connection I/O Type : Omron TBEN-LH-8IOL	•
Originator Device	Target Device
Node Address : 192.168.1.5	Node Address : 192.168.1.17
Comment : CJ1W-EIP21	Comment: TBEN-LH-8IOL
Input Tag Set : Edit Tag Sets	Output Tag Set :
TBEN_LH_8IOL_In - [292Byte] • Connection Type : Point to Point connection •	►> Input_103 - [292Byte]
Output Tag Set : Edit Tag Sets	Input Tag Set :
Connection Type : Point to Point connection	Output_110 - [296Byte] -
Hide Detail	
Detail Parameter	
Packet Interval (RPI) : 50.0 ms (0.5 - 10000.0 ms) Timeout Value : Packet Interval (RPI) x 4	Connection Name :
Connection Structure	

Figure 5.8 – Edit Connection configuration page



5.2.2 Configure TBEN-LH-8IOL using QC-ON connection

The QC-ON connection enables the QuickConnect feature in the device. The procedure:

- Right click at the controller to open pop-up menu
- > Highlight *Parameter* in the menu and select *Edit*
- > Drag and drop TBEN-LH-8IOL from the Unregister Device List into Register Device List
- > Click at New... button to open the Edit Connection configuration page
- > Click at the Connection I/O Type selection field , drop down arrow
- Select Omron TBEN-LH-8/OL, QC-ON connection
- > The Target Device info is auto-populated based on the EDS file definition
- > Enter the Originator Device IO tag sets and connection type as follows
- > Register device

92.168.1.17 TBEN-LH-8IOL Edit Connection	×
It will add a connection configuration to originator device. Please configure the Tag Set each of originator device and target	device.
Connection I/O Type : Omron TBEN-LH-8IOL, QC-ON	•
Originator Device	Target Device
Node Address : 192.168.1.5	Node Address : 192.168.1.17
Comment : CJ1W-EIP21	Comment : TBEN-LH-8IOL
Input Tag Set : Edit Tag Sets	Output Tag Set :
Connection Type : Point to Point connection	►> Input_103 - [292Byte]
Output Tag Set : Edit Tag Sets	Input Tag Set :
Connection Type : TBEN_LH_8IOL_Out - [296Byte]	Output_115 - [296Byte]
Hide Detail	
─Detail Parameter Packet Interval (RPI) : 50.0 ms (0.5 - 10000.0 ms) Timeout Value : Packet Interval (RPI) × 4 ▼	Connection Name : (Possible to omit)
Connection Structure	
🛷 192.168.1.5 CJ1W-EIP21 *	

Figure 5.9 – Register device with QC enabled

5.2.3 Configure TBEN-LH-8IOL using QC-OFF connection

The QC-OFF connection disables the QuickConnect feature in the device. The procedure:

- Right click at the controller to open pop-up menu
- > Highlight Parameter in the menu and select Edit
- > Drag and drop TBEN-LH-8IOL from the Unregister Device List into Register Device List
- Click at *New...* button to open the *Edit Connection* configuration page
- > Click at the Connection I/O Type selection field , drop down arrow
- Select Omron TBEN-LH-8IOL, QC-OFF connection
- > The Target Device info is auto-populated based on the EDS file definition
- > Enter the Originator Device IO tag sets and connection type as follows
- > Register device

lease configure the Tag Set each of originator device and tar	rget device.
Connection I/O Type : Omron TBEN-LH-8IOL, QC-OFF	•
Originator Device	Target Device
Node Address : 192.168.1.5	Node Address : 192.168.1.17
Comment : CJ1W-EIP21	Comment : TBEN-LH-8IOL
Input Tag Set : Edit Tag Sets	Output Tag Set :
Connection Type : Point to Point connection	Input_103 - [292Byte]
Output Tag Set : Edit Tag Sets	Input Tag Set :
Connection Type : Point to Point connection	Cutput_116 - [296Byte]
Hide Detail	
Detail Parameter	
Packet Interval (RPI): 50.0 ms (0.5 - 10000.0 ms) Connection Name :
Timeout Value : Packet Interval (RPI) x 4	(Possible to omit)
Connection Structure	

Figure 5.10 – Register device with QC disabled



6 Resources

6.1.1 IO-Link master user manuals, data sheets, IODDs

- TBEN-Lx-8IOL <u>https://pdb2.turck.de/us/DE/products/000000170001d3a7000a003a</u> <u>https://pdb2.turck.de/us/DE/products/0000001600019e750008003a</u>
- TBEN-S2-4IOL https://pdb2.turck.de/us/DE/products/0000003100008dc50003003a

6.1.2 IO-Link slave devices

The data sheets, configuration files, user manuals <u>https://www.turck.us/en/iolink-2577.php</u>

6.1.3 FLC controller

- ARGEE
 <u>https://pdb2.turck.de/us/DE/products/000000370002b2930005003a</u>
- IO-Link IODDs https://pdb2.turck.de/us/DE/groups/000000600003a8a00010023

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