TBEN-LG EtherNet/IP™

Configuration Guide

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TURCK Inc.

Table of Contents

Introduction

The guide provides information about device features, connection diagrams and LED diagnostics. It also shows how to set up device IP address using different tools. TBEN-LG devices can be configured with EDS files, or using a generic device profile. Device web server provides advanced configuration and diagnostics information. TURCK IP address tool is used for quick discovery of TURCK devices residing on different VLANS.

The guide, together with the data sheets, provides sufficient information for using TBEN in DLR (device level ring) or QC (quick connect) applications. DLR application does not require any specific device setup, as devices are ready for DLR networks. QC mat be enabled or disabled by a single configuration bit, part of configuration data tag. Address conflict detection (ADC) is implemented and enabled in the device by default. TBEN supports up to 3 TCP connections and 6 CIP connections, and it may be configured with 3 PLCs using Exclusive Owner, Input only or Listen Only connections.

TBEN-LG

TBEN-LG Product Line

The TBEN-LG series are multiprotocol communication adapters and they support Modbus TCP/IP, EtherNet/IP and PROFINET communication protocols. All protocols are enabled "out-of-box" by default. After power up, a multiprotocol station queries all necessary ports to detect what protocol is used. The "Active Fieldbus Protocol" is defined as the first protocol to do one of the following actions:

- Modbus TCP — Write to output register range.
- EtherNet/IP — Establish Class 1 Exclusive Owner connection to device.
- PROFINET — Connect request.

This "Configuration Guide" shows TBEN-LG-8DIP-8DOP in an EtherNet/IP environment to describe features and configuration procedures of the TBEN-LG series.

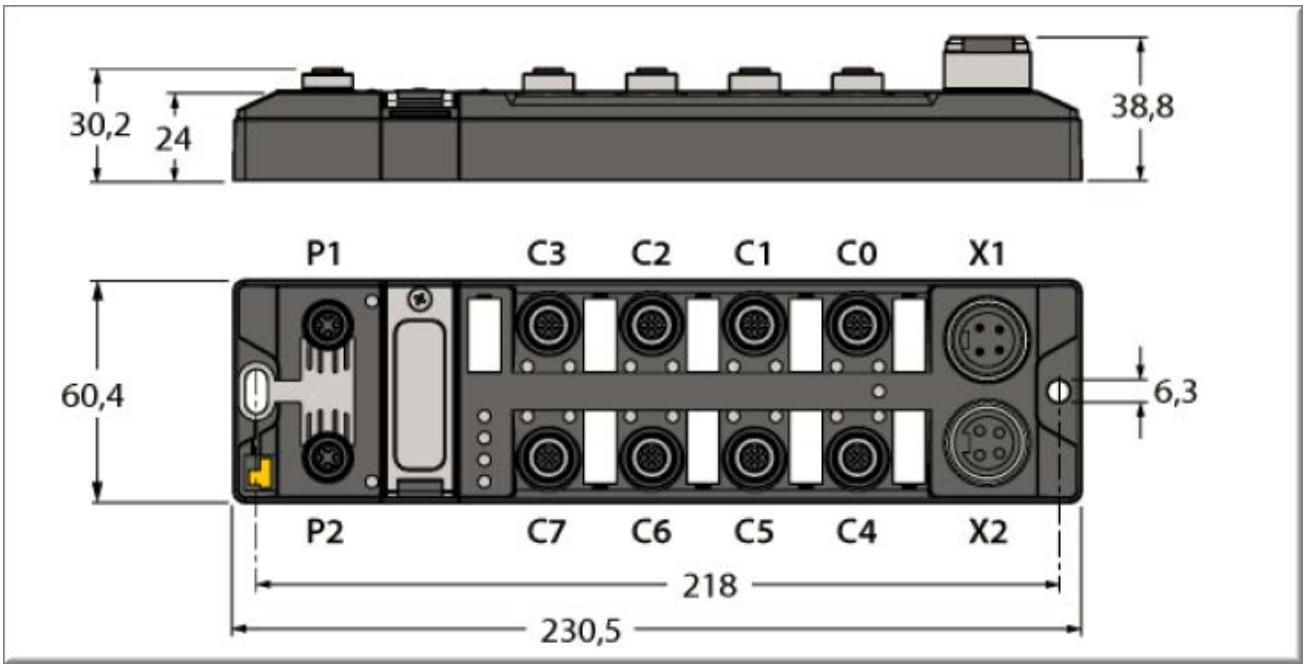
Part Numbers

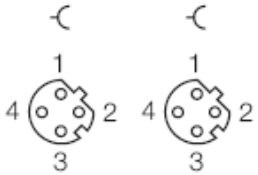
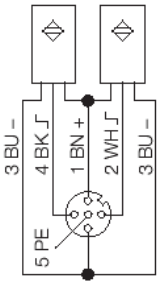
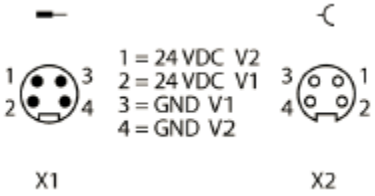
Part Number	Input description				Output description					Ethernet				
	Number of inputs	Input type	Inputs per connector	PNP / NPN type	Number of outputs	Output type	outputs per connector	Maximum output load	Short circuit protection	Ethernet ports	Configuration Assembly	DLR	QC	ACD
TBEN-LG-16DIP	16	2S	2	PNP					✔#2	2	✔	✔	✔	✔
TBEN-LG-16DOP					16	2G	2	1A#1	✔	2	✔	✔	✔	✔
TBEN-LG-16DXP	16	2X	2	PNP	16	2X	2	1A	✔	2	✔	✔	✔	✔
TBEN-LG-8DIP-8DOP	8	2S	2	PNP	8	2G	2	1A	✔	2	✔	✔	✔	✔

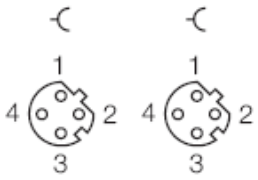
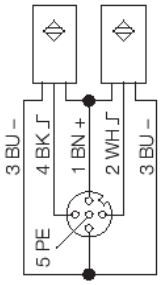
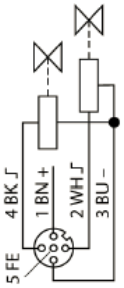
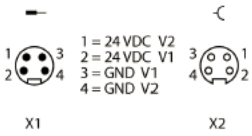
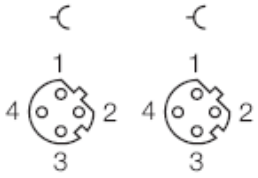
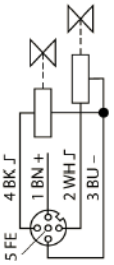
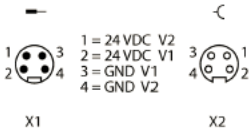
Key:

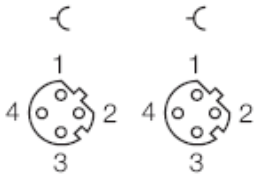
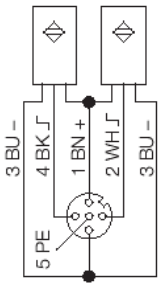
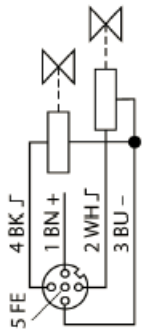
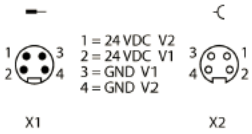
2S: Two PnP inputs per connector
2X: Dual combined input/output per connector, PNP / 1A
2G: Two outputs per connector, 1A each
#1: 2A output when single output per connector is used
#2: Inputs protected per connector; outputs are individually protected
DLR Device Level Ring
QC Quick Connect; QC time 100msec
ACD Address Conflict Detection and resolution

Connection Diagrams



Device Type	Ethernet M12, d-coded	IN M12, a-coded	Power (7/8“)
TBEN-LG-16DIP	 **P1** **P2** **1 = TD+** **1 = RD+** **2 = RD+** **2 = TD+** **3 = TD-** **3 = RD-** **4 = RD-** **4 = TD-** **(see „Note 1“)**	 **C0 … C7** **1 = VAUX1 (+)** **2 = Second input** **3 = V1 (-)** **4 = First input** **5 = FE** **(see „Note 2“)**	 1 = 24 VDC V2 2 = 24 VDC V1 3 = GND V1 4 = GND V2 X1 X2

Device Type	Ethernet M12, d-coded	IN M12, a-coded	Out M12, a-coded	Power (7/8“)
TBEN-LG-8DIP-8DOP	 **P1** **P2** **1 = TD+** **1 = RD+** **2 = RD+** **2 = TD+** **3 = TD-** **3 = RD-** **4 = RD-** **4 = TD-** **(see „Note 1“)**	 **C0 … C3** **1 = VAUX1 (+)** **2 = Second input** **3 = V1 (-)** **4 = First input** **5 = FE**	 **C4 … C7** **1 = VAUX2 (+)** **2 = Second output** **3 = V2 (-)** **4 = First output** **5 = FE**	
TBEN-LG-16DOP	 **P1** **P2** **1 = TD+** **1 = RD+** **2 = RD+** **2 = TD+** **3 = TD-** **3 = RD-** **4 = RD-** **4 = TD-** **(see „Note 1“)**		 **C0 … C7** **1 = VAUX2 (+)** **2 = Second output** **3 = V2 (-)** **4 = First output** **5 = FE**	

Device Type	Ethernet M12, d-coded	IN M12, a-coded	Out M12, a-coded	Power (7/8“)
TBEN-LG-16DXP	 **P1** **P2** **1 = TD+** **1 = RD+** **2 = RD+** **2 = TD+** **3 = TD-** **3 = RD-** **4 = RD-** **4 = TD-** **(see „Note 1“)**	 **C0 … C7** **1 = VAUX1 (+)** **2 = Second input** **3 = V1 (-)** **4 = First input** **5 = FE** DXP allows for any combination of IO per single connector	 **C0 … C7** **1 = VAUX2 (+)** **2 = Second output** **3 = V2 (-)** **4 = First output** **5 = FE**	

Note 1:

The pin-out of P1 and P2 are “crossed over”. P1 has a “NIC-Type” connection and P2 has a “Switch-Type” connection. The TBEN devices are configured with Auto-MDIX enabled when not used for fast startup / quick connect. In that case the switch detects the cabling type itself.

With the crossed connection of P2 it is possible to connect multiple devices in a row without Auto-MDIX with 1:1 EtherNet cables. This ensures that the switch could establish a link quickly for fast start-up devices.

Note 2:

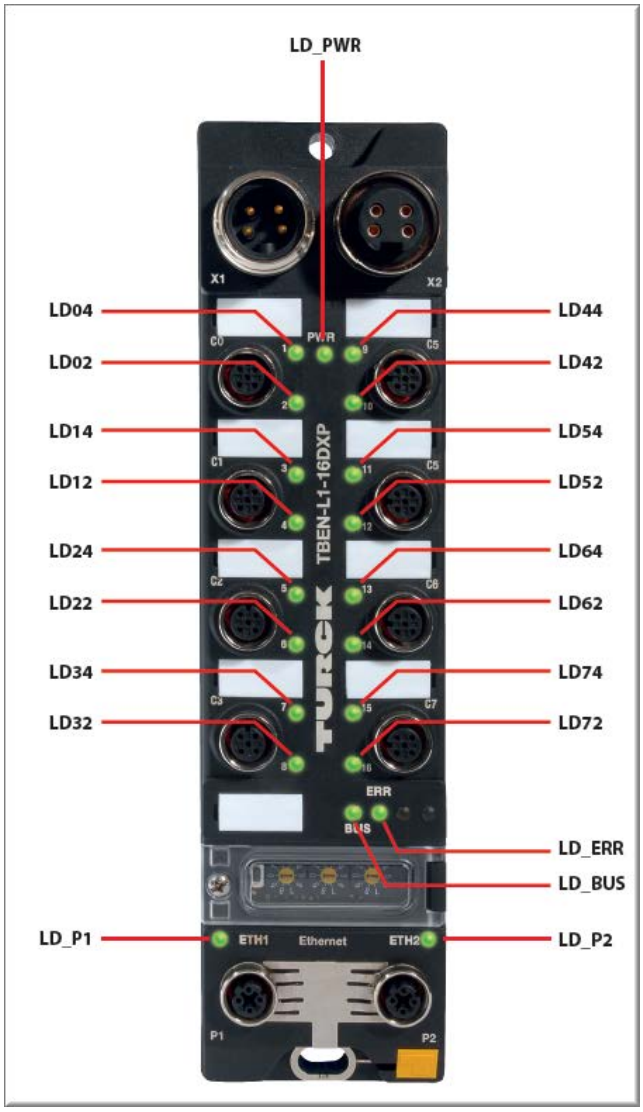
VAUX1 = V1 – 0.2 VDC (voltage drop over protective circuit)
VAUX2 = V2 – 0.2 VDC (voltage drop over protective circuit)

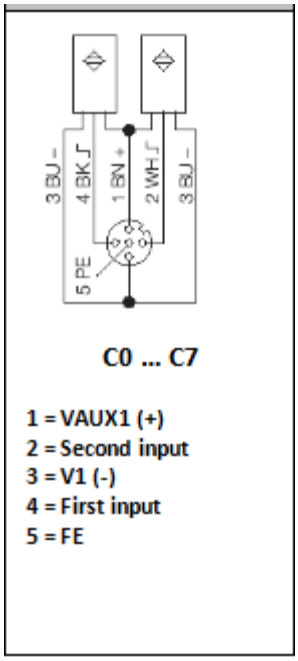
LED Diagnostics

The notation of the IO LEDs (LD04 … LD72) is “LDxy”. It is linked to the appropriate channel and is coded as follows:

LDxy key:

- x: connector number: 0, 1,…, 7 (C0, C1, …, C7)
- y: signal pin number of the appropriate connector (2, 4)
- LD24: connector 2, pin 4





Ethernet Ports and Device Fault LEDs

LED	Status	Description
LD_P1 and LD_P2 (same functionality for all device types)		
LD_P1 , LD_P2 (yellow / green)	off	No Ethernet link
	green on	Link 100MBit. The LED flashes during data transfer.
	yellow on	Link 10MBit. The LED flashes during data transfer.
	yellow on / green on	Not valid state
LD_BUS (same functionality for all device types)		
LD_BUS (red / green)	off	No supply voltage
	green on	Active connection to a master
	green blinking	Ready for operation
	red on	IP address conflict is detected or restore mode (0 / 900 switch position),
	red flashing	Blink / Wink is active (command sent from the IO assistant, IP address tool)
	alternating red on / green on	Auto-negotiation and/or DHCP/BOOTP waiting for IP address assignment
LD_ERR (same functionality for all device types)		
LD_ERR (red / green)	off	No supply voltage
	green on	Normal operation
	red on	Diagnostics active
	red on / green on	Not valid state

Power LED

LED	Status	Description
LD-PWR (device powered by V1 only) TBEN-LG-16DIP		
LD_PWR (green)	off	V1 power off or undervoltage < 18V
	on	V1 and V2 power on
LD_PWR (device powered by V1 and V2) TBEN-LG-8DIP-8DOP TBEN-LG-16DOP TBEN-LG-16DXP		
LD_PWR (green)	off	V1 power off or undervoltage < 18V
	green on	V1 and V2 power on
	flashing	V1 power on V2 power off or undervoltage < 18V

IO LEDs TBEN-LG-16DIP

LED	Status	Description
Input Channel I0,…,I15 LEDs Channel LEDs: LD02 … LD74 (Channel CH02 … Channel CH74) TBEN-LG-16DIP		
LD02,...,LD72 LD04,…,LD74 (red / green)	off	Input inactive
	green on	Input active
	red flashing	Power overload at the connector “x”, both LEDs of the input channels CHx2 and CHx4 are flashing.

IO LEDs TBEN-LG-16DOP

LED	Status	Description
Output Channel O0,…,O15 LEDs Channel LEDs: LD02 … LD74 (Channel CH02 … Channel CH74) TBEN-LG-16DOP		
LD02,...,LD72 LD04,…,LD74 (red / green)	off	Output inactive
	green on	Output active
	red on	Power overload at the corresponding output channel CHxy

IO LEDs TBEN-LG-8DIP-8DOP

LED	Status	Description
Input Channel I0,…,I7 LEDs Channel LEDs: LD02 … LD34 (Channel CH02 … Channel CH34) TBEN-LG-8DIP-8DOP		
LD02, LD04, LD12, LD14, LD22, LD24, LD32, LD34, (red / green)	off	Input inactive
	green on	Input active
	red flashing	Power overload at the connector “x”, both LEDs of the input channels CHx2 and CHx4 are flashing.
Output Channel O0,…,O7 LEDs Channel LEDs: LD42 … LD74 (Channel CH42 … Channel CH74) TBEN-LG-8DIP-8DOP OUTPUTS		
LD42, LD44, LD52, LD54, LD62, LD64, LD72, LD74, (red / green)	off	Output inactive
	green on	Output active
	red on	Power overload at the corresponding output channel CHxy.

IO LEDs TBEN-LG-16DXP

LED	Status	Description
IO Channel IO0,…,IO15 LEDs Channel LEDs: LD02 … LD74 (Channel CH02 … Channel CH74) TBEN-LG-16DXP		
LD02,...,LD72 LD04,…,LD74 (red / green)	off	IO inactive (input or output)
	green on	IO active (input or output)
	2 x red flashing	Power overload at the connector “x”, both LEDs of the input channels CHx2 and CHx4 are flashing.
	red on	Power overload at the corresponding output channel CHxy.
	green on / flashing red e.g. LD22	Output channel CH22 active (solid green / flashing red). Power overload at the input channel CH24 (flashing red)

IO Data Format

Abbreviations:

I0…I15:	Inputs
O0…O15:	Outputs
FCE:	Force mode active
CFG:	I/O configuration error
COM:	Communication lost on the internal bus
V1:	V1 too low
V2:	V2 too low
DiagWarn:	Summarized diagnostic of the device
EM0:	Summarized diagnostic of the device
ECx :	Error Code bit x in error-code bit area
SRO0…15:	Short circuit recovery mode of outputs 0…15
Err Vaux0…7:	Auxiliary supply error on connector 0…7
Err Out0…15:	Short circuit output 0…15
Inv.I0…I15:	Inverted input signal 0…15

TBEN-LG-16DIP

TBEN-LG-16DIP																	
Type	**Word Nr**	**Bit 15**	**Bit 14**	**Bit 13**	**Bit 12**	**Bit 11**	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Output (scanner -> station)																	
GW Command Word	1																
Input (station -> scanner)																	
GW Status Word(*)	1		FCE			CFG	COM	V1		V2							Diag Warn
Input	2	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Diagnostic Word 1 (*)	3			EC 5													EM 0
Diagnostic Word 2 (*)	4									Err Vaux 7	Err Vaux 6	Err Vaux 5	Err Vaux 4	Err Vaux 3	Err Vaux 2	Err Vaux 1	Err Vaux 0

Note: a blank field means reserved or not used.

TBEN-LG-8DIP-8DOP

TBEN-LG-8DIP-8DOP																	
Type	**Word Nr**	**Bit 15**	**Bit 14**	**Bit 13**	**Bit 12**	**Bit 11**	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Output (scanner -> station)																	
GW Command Word	1																
Output	2									O7	O6	O5	O4	O3	O2	O1	O0
Input (station -> scanner)																	
GW Status Word(*)	1		FCE			CFG	COM	V1		V2							Diag Warn
Input	2									I7	I6	I5	I4	I3	I2	I1	I0
Diagnostic Word 1 (*)	3			EC 5													EM 0
Diagnostic Word 2 (*)	4	Err Out 7	Err Out 6	Err Out 5	Err Out 4	Err Out 3	Err Out 2	Err Out 1	Err Out 0	Err Vaux 7	Err Vaux 6	Err Vaux 5	Err Vaux 4	Err Vaux 3	Err Vaux 2	Err Vaux 1	Err Vaux 0

TBEN-LG-16DOP

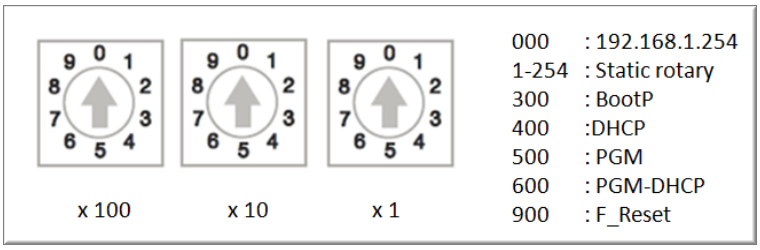
TBEN-LG-16DOP																	
Type	**Word Nr**	**Bit 15**	**Bit 14**	**Bit 13**	**Bit 12**	**Bit 11**	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Output (scanner -> station)																	
GW Command Word	1																
Output	2	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
Input (station -> scanner)																	
GW Status Word(*)	1		FCE			CFG	COM	V1		V2							Diag Warn
Diagnostic Word 1 (*)	2			EC 5													EM 0
Diagnostic Word 2 (*)	3	Err Out 7	Err Out 6	Err Out 5	Err Out 4	Err Out 3	Err Out 2	Err Out 1	Err Out 0								
Diagnostic Word 3 (*)	4									Err Out 15	Err Out 14	Err Out 13	Err Out 12	Err Out 11	Err Out 10	Err Out 9	Err Out 8

TBEN-LG-16DXP

TBEN-LG-16DXP																	
Type	**Word Nr**	**Bit 15**	**Bit 14**	**Bit 13**	**Bit 12**	**Bit 11**	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Output (scanner -> station)																	
GW Command Word	1																
Output	2	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
Input (station -> scanner)																	
GW Status Word(*)	1		FCE			CFG	COM	V1		V2							Diag Warn
Input	2	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Diagnostic Word 1 (*)	3			EC 5													EM 0
Diagnostic Word 2 (*)	4	Err Out 7	Err Out 6	Err Out 5	Err Out 4	Err Out 3	Err Out 2	Err Out 1	Err Out 0	Err Vaux 7	Err Vaux 6	Err Vaux 5	Err Vaux 4	Err Vaux 3	Err Vaux 2	Err Vaux 1	Err Vaux 0
Diagnostic Word 3 (*)	5									Err Out 15	Err Out 14	Err Out 13	Err Out 12	Err Out 11	Err Out 10	Err Out 9	Err Out 8

Setting up IP Address

TBEN has three rotary switches which are used to set either the last octet of the device IP address or device mode of operation. Valid address range and mode of operation are:



The address switches are pre-set out of box to 600 (PGM-DHCP mode). IP address can be assigned immediately using DHCP server.
General procedure for IP address setup is:

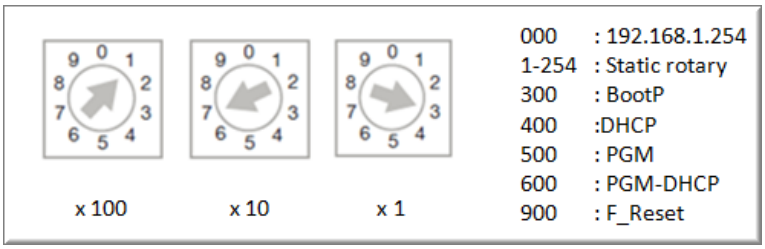
- Set rotary switches to desired mode (300, 400, 500, 600)
- Cycle power to the station
- Run IP address utility to assign IP address
- Set address switches to static rotary position or PGM mode
- Cycle power to the station

The TBEN station IP address can be configured and/or changed in following ways:

- Using static rotary mode
- BootP Server utility
- DHCP Server utility
- TBEN Web page
- IP Address tool

Address Switches in Static Rotary

When address switches are in static mode, the last octet may be dialed in 1-254 range. Addresses 0 and 255 are reserved and cannot be used.
Following example shows the last octet set to of address xx.xxx.xxx.**173**

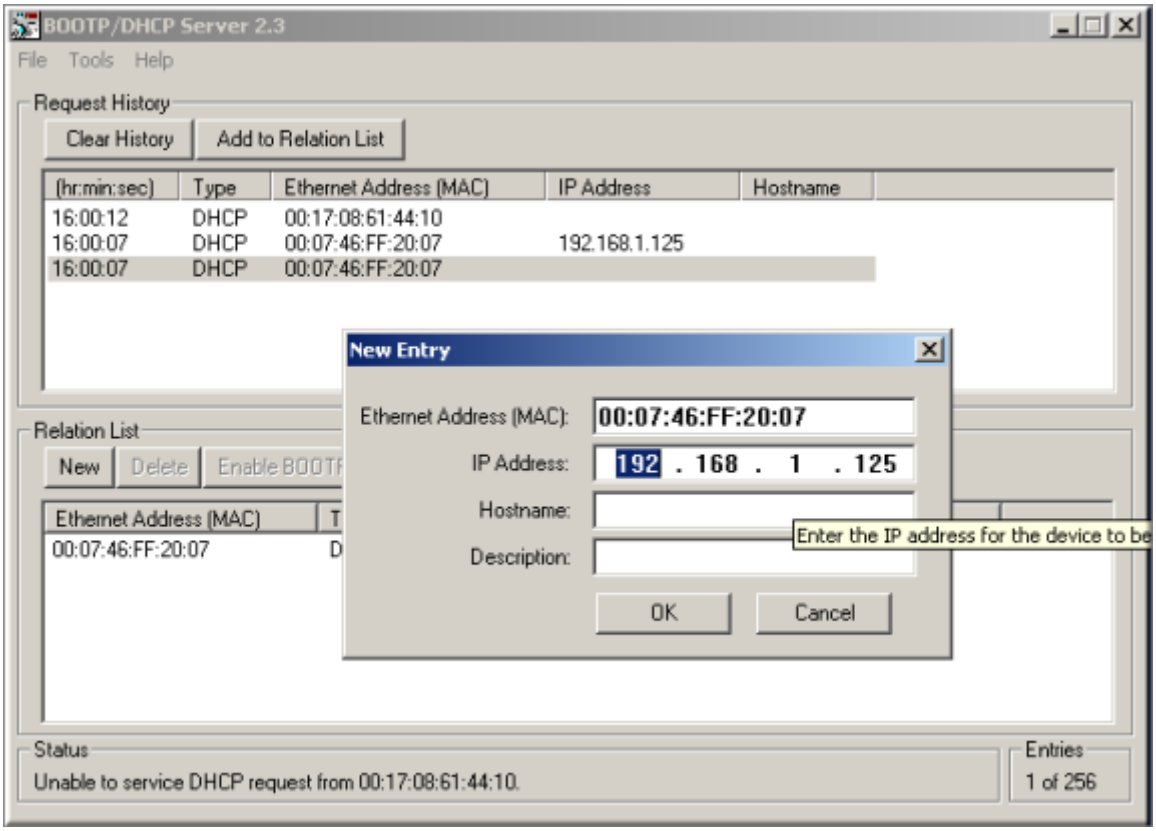


Setting rotary switches to any other position not listed on the device or data sheet sets device into DHCP mode and bus LED flashes green / red.

BOOTP/DHCP Mode (300/400)

The TBEN rotary switches, when set to 300 or 400, allow for IP address assignment as follows:

- Set the rotary switches to 300 to enable BOOTP mode and power cycle the device
- Set the rotary switches to 400 to enable DHCP mode and power cycle the device
- Run BOOTP or DHCP utility and assign IP address
- Set the rotary switches either to 500 (PGM mode) or to a number that matches the last octet of the assigned IP address (e.g. 125)
- Power cycle the device



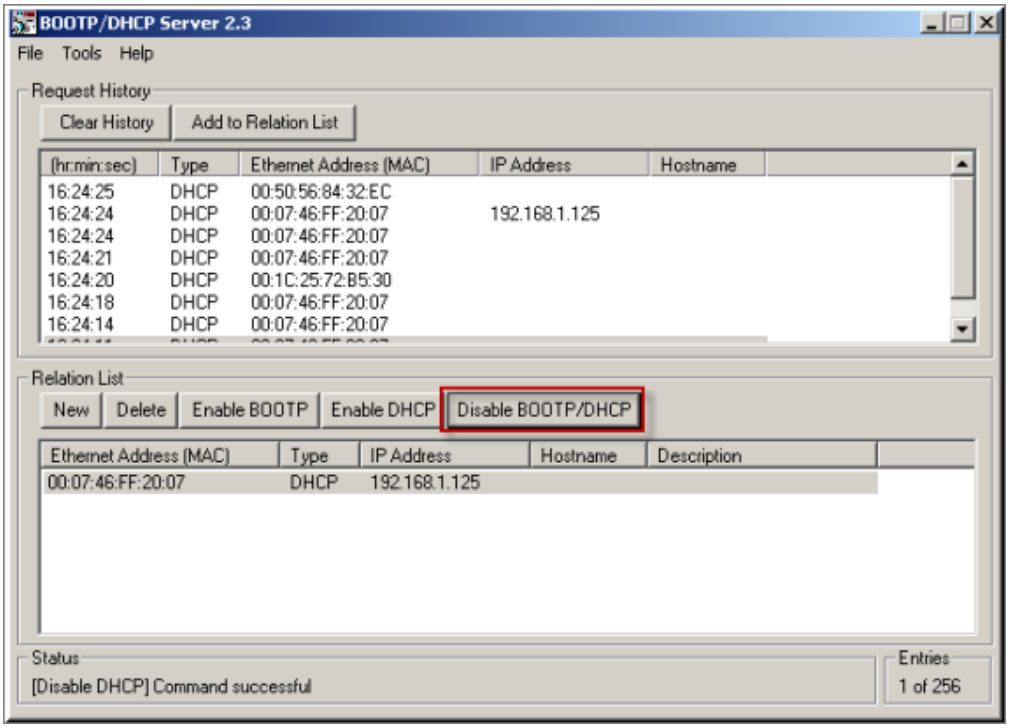
Note:

When the device is set to 500 (PGM) mode, its IP address can be further changed using either the IP Address Tool or WEB page.

PGM-DHCP Mode (600)

When rotary switches are set to 600, it enables PGM–DHCP mode of operation. It is the default, out-of-box setup mode of the device. To assign IP address the first time:

- Power up the device
- Run the DHCP utility and assign IP address
- Disable the DHCP request from the module by clicking the **Disable BOOTP/DHCP** button in the utility
- Leave the rotary switches in 600 (PGM-DHCP) position or set switches to a number that matches the last octet of the assigned IP address [1,…,254]
- Power cycle the device



Note:

When the device is set to 600 (PGM-DHCP) mode, its IP address can be further changed using either the IP Address Tool or WEB page.

PGM Mode (500, 600)

When the device rotary switches are set to 500 or 600, the device IP address can be changed using following tools:

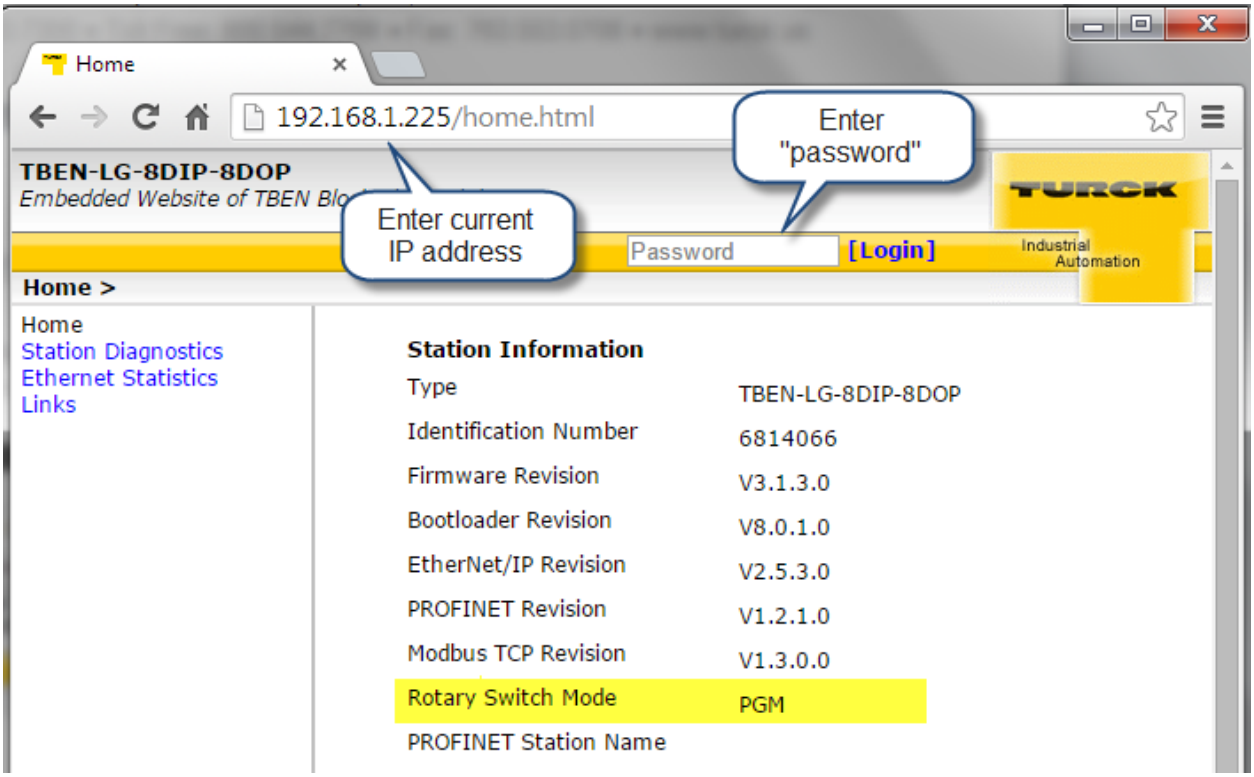
- Device WEB server
- TURCK IP address tool

While the rotary switches are set to 500, power up the device. It comes up with the last IP address that was saved in the EEPROM memory. It can be either the factory default IP address 192.168.1.254 or the last assigned IP address whatever it is.

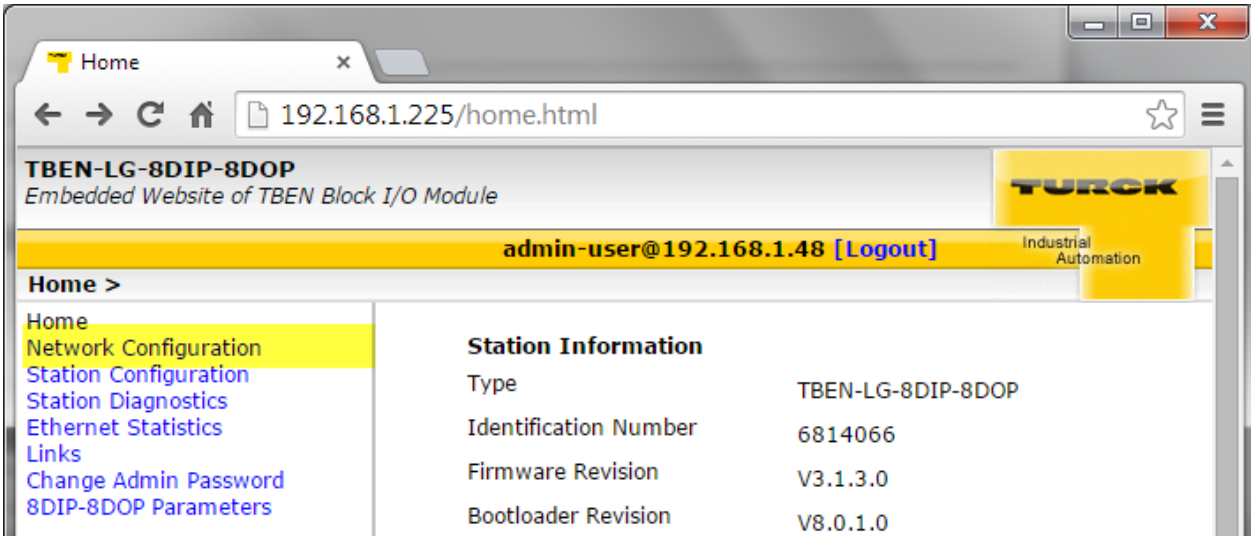
PGM (500) and Web Server

To login into the Web server as administrator use following procedure:

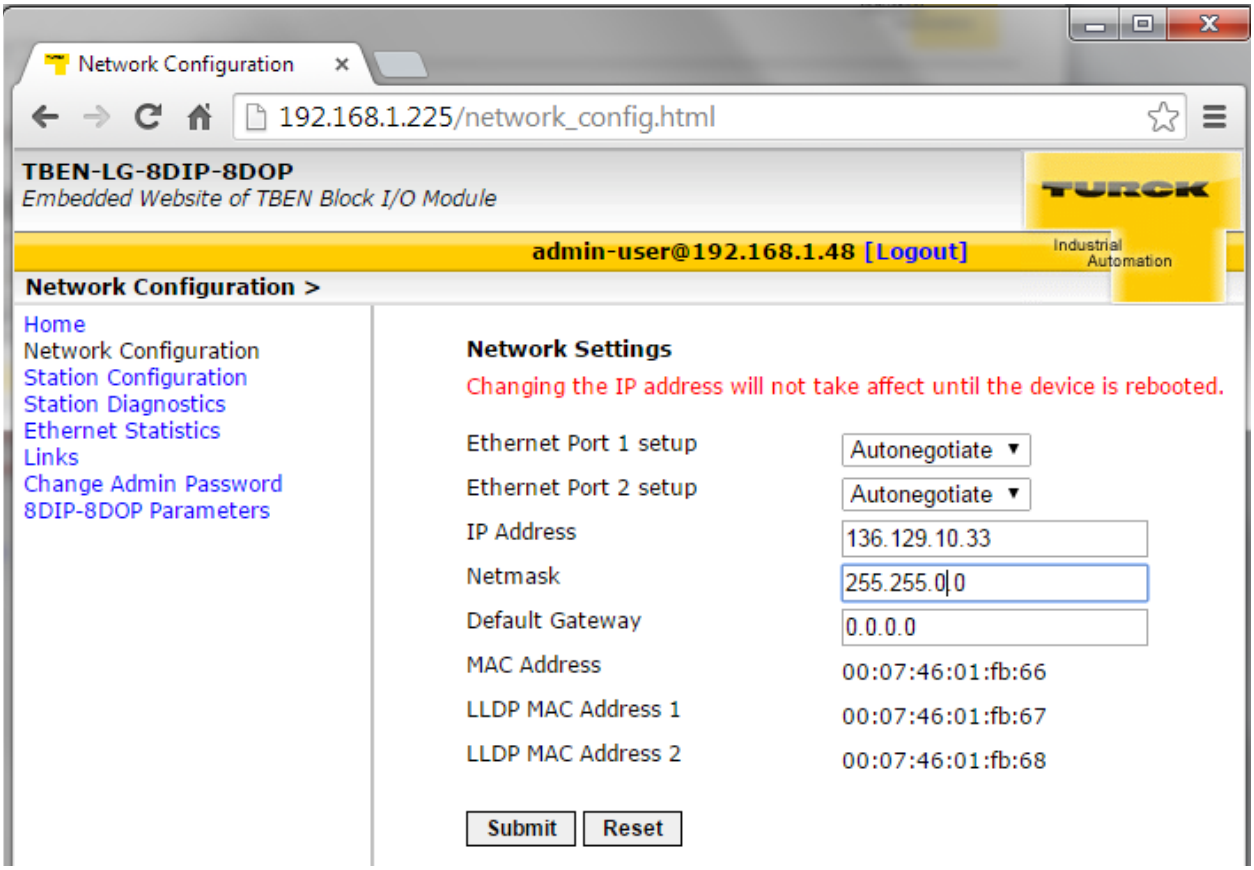
- Set rotary switches to 500 and power-up device
- If IP address has never been assigned before, enter 192.168.1.254 into Web browser
- If IP address is known, enter the device current IP address into Web browser
- If IP address is unknown, read the “Factory Reset Mode (900)” to reset device to factory default setup. IP address
- When device web server starts, enter “password” into “Password” field and click “Login”



- You will be logged-in to the extended home page as administrator
- Select “Network Configuration” at the left column



- Enter new IP address, Netmask and Default Gateway and press ***“Submit”***



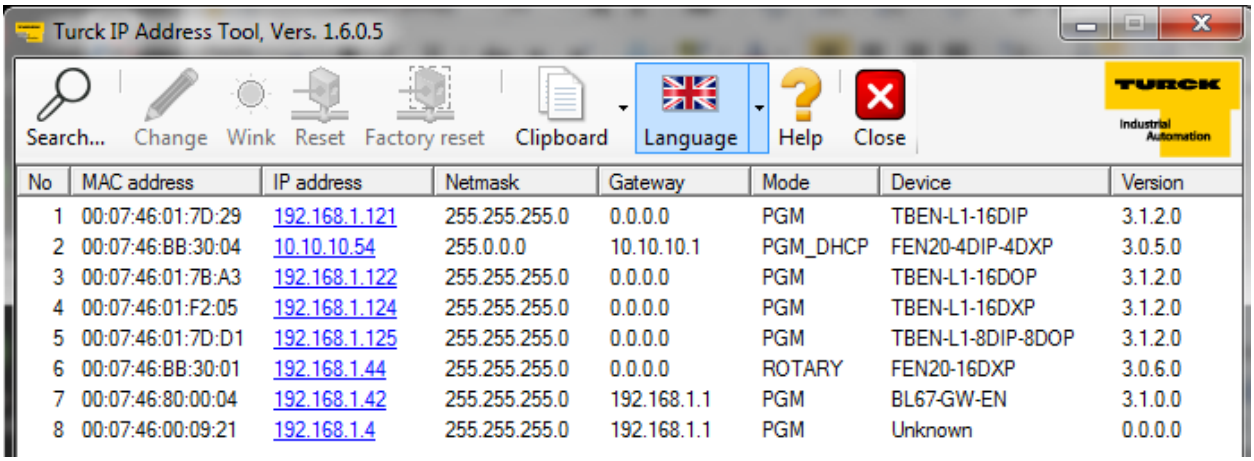
- To reboot device, leave rotary switches at 500 and cycle device power

IP Address Tool

Download IP address tool from: http://www.turck.de/en/index.php
Search > Downloads > Software > Service tool

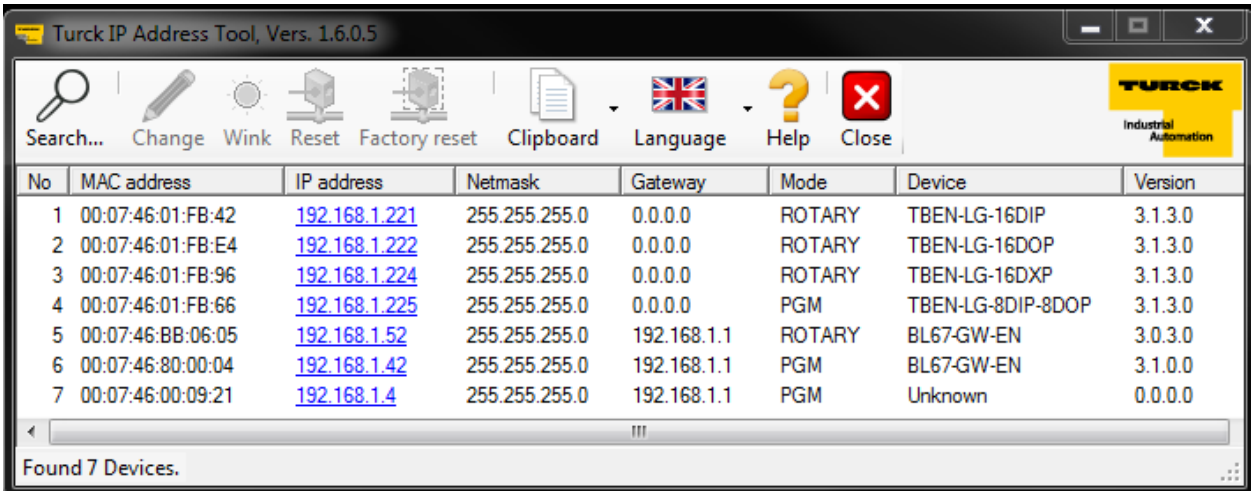
The tool is designed to:

- Search TURCK devices on different subnets
- Modify IP address when rotary switches are set to 500 / PGM mode
- Access device web page, when tool and device are on the same subnet

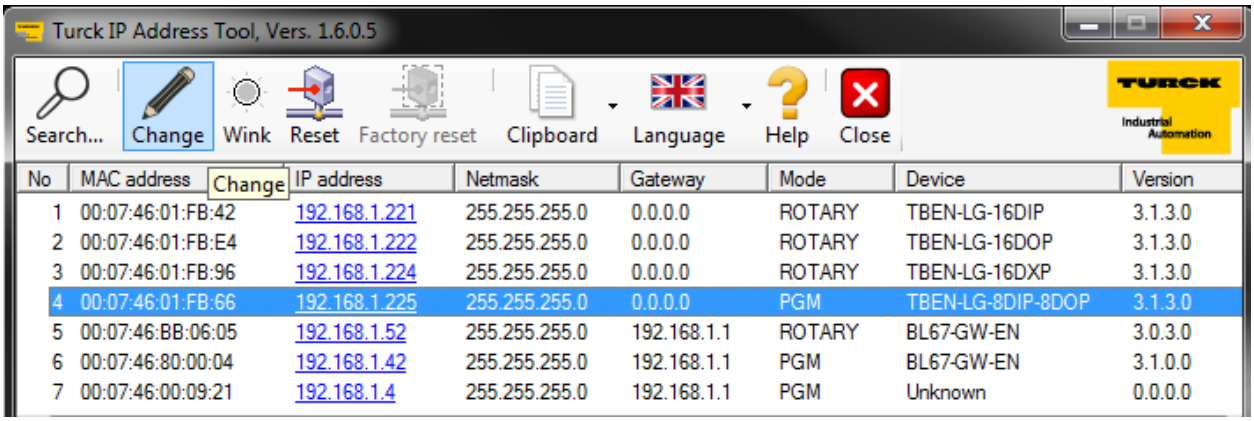


PGM (500) and IP address tool

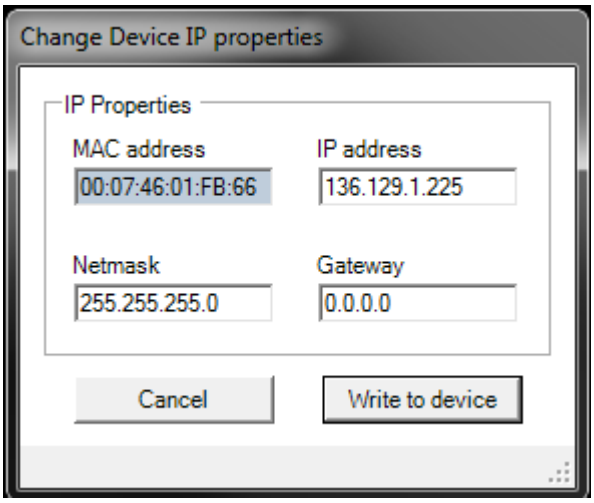
Start the IP address tool and click ***"Search"***:



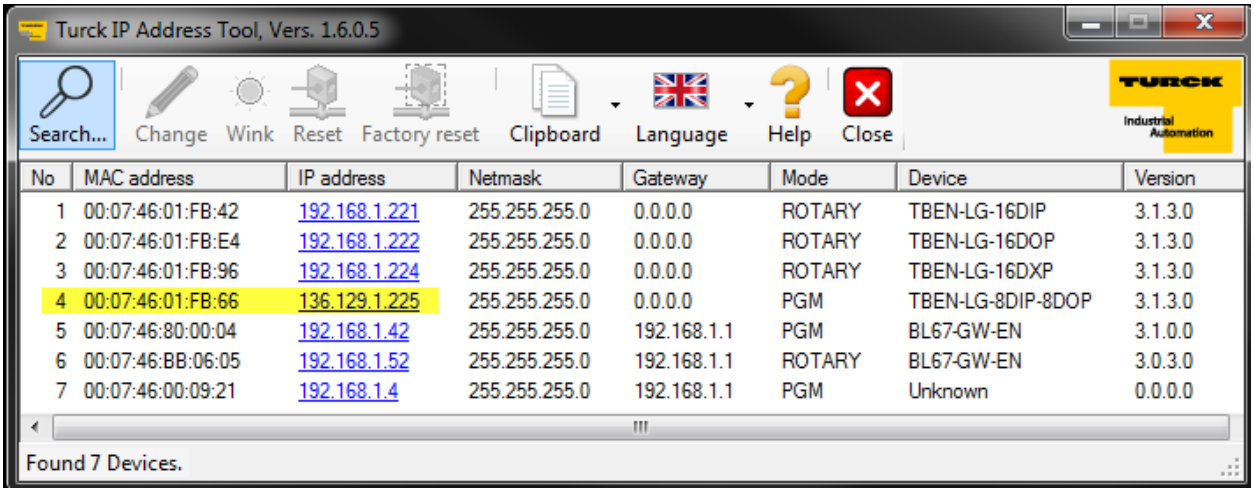
Highlight device which is in PGM mode and click ***"Change"***:



Enter new IP address and click ***"Write to device"***:



Search again and verify setup:



Restore Mode (0)

When rotary switches are set to 0 and device power cycled, the device recovers only IP address to factory default value:

- IP address: 192.168.1.254
- Mask: 255.255.255.0
- Gateway: 192.168.1.1

The device responds to PING command, but it does not operate when switches are set to 0. At this point it is necessary either, to assign new IP using address tools as described earlier, or simply dial rotary switches between xx=1,…, 253; to set address as 192.168.1.x.

Factory Reset Mode (900)

The device resets itself to factory default settings, as follows:

- Set the rotary switches to 900 position
- Power up the device (the BUS LED solid red) and wait 10 sec
- Set the rotary switches to 600 (PGM-DHCP mode)
- Cycle power to the device

TBEN EtherNet/IP Configuration

Following section provides information how to configure TBEN device with Rockwell Automation Logix controllers. There are two configuration methods which depend on a controller revision:

- Configuration using EDS file (Electronic Data Sheet):
  It is supported only by Logix controllers firmware revision 20.00.00 and above.
- Configuration using Ethernet Generic device profile:
  It is supported by all Logix controllers

TBEN Configuration Using EDS Files

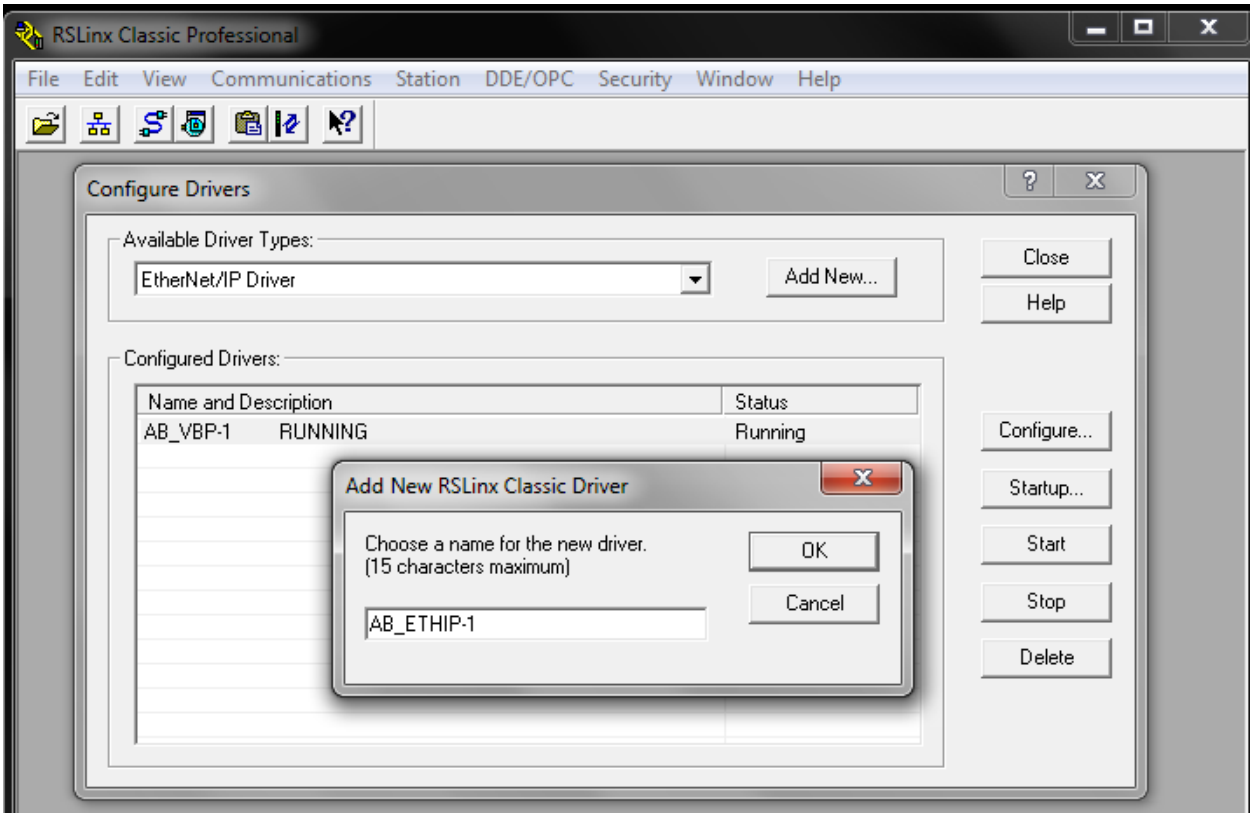
The EDS file which supports configuration assembly may be imported into RSLogix5000 project. The Logix Designer creates device profile based on EDS and saves device configuration in the project. The controller pushes configuration data to the device whenever connection between them is established.

The TBEN-LG configuration procedure includes following steps:

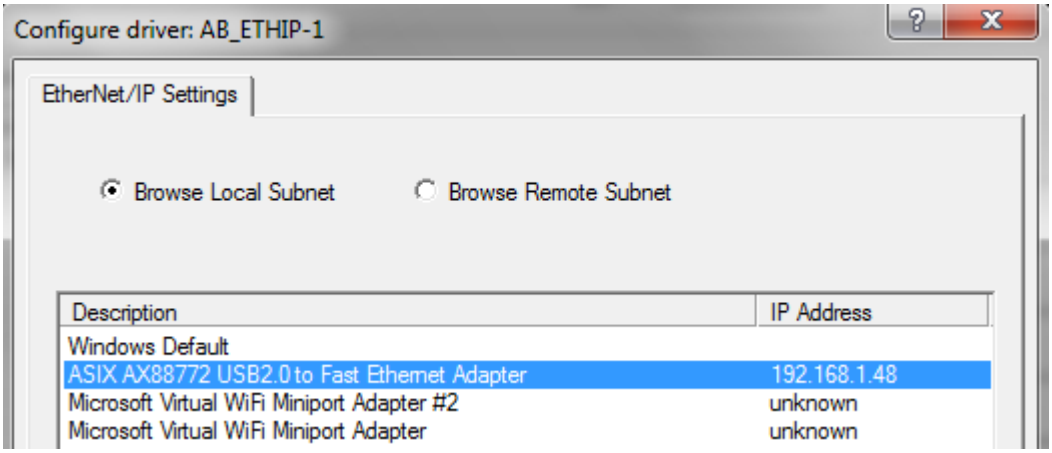
- Configure EtherNet/IP User Interface
- Create RSLogix5000 project
- Install Device EDS File(s)
- TBEN General Configuration
- TBEN Connection Configuration
- Module Definition Data Format
- Communication RPI, Multicast / Unicast
- TBEN Input, Output and Configuration Data Tags

Configure EtherNet/IP User Interface

Configure user interface to the ControlLogix platform using RSLinx communication software. Add new EtherNet/IP driver that is used to establish connection between programing PC and the Logix controller:

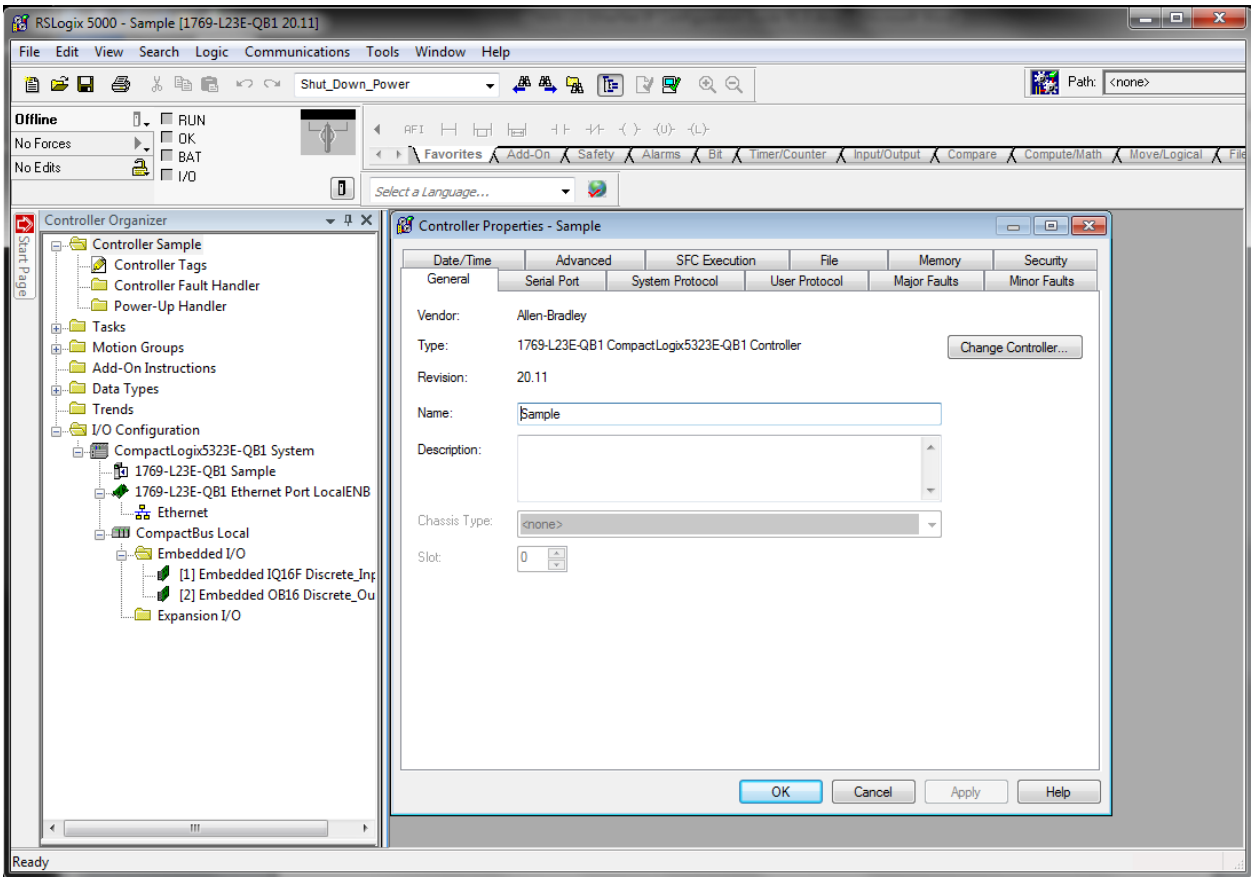


Select designated driver and click apply:



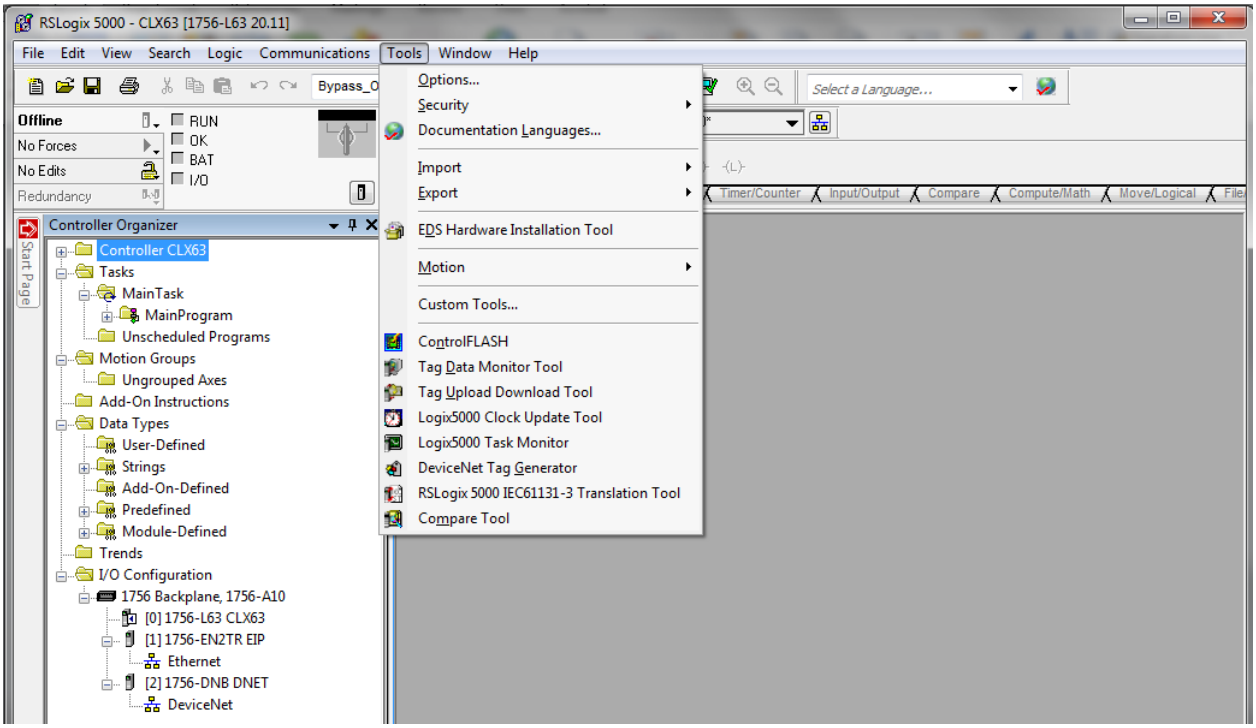
Create RSLogix5000 Project

Open new RSlogix5000 project and configure PLC resourced or open an existing project.



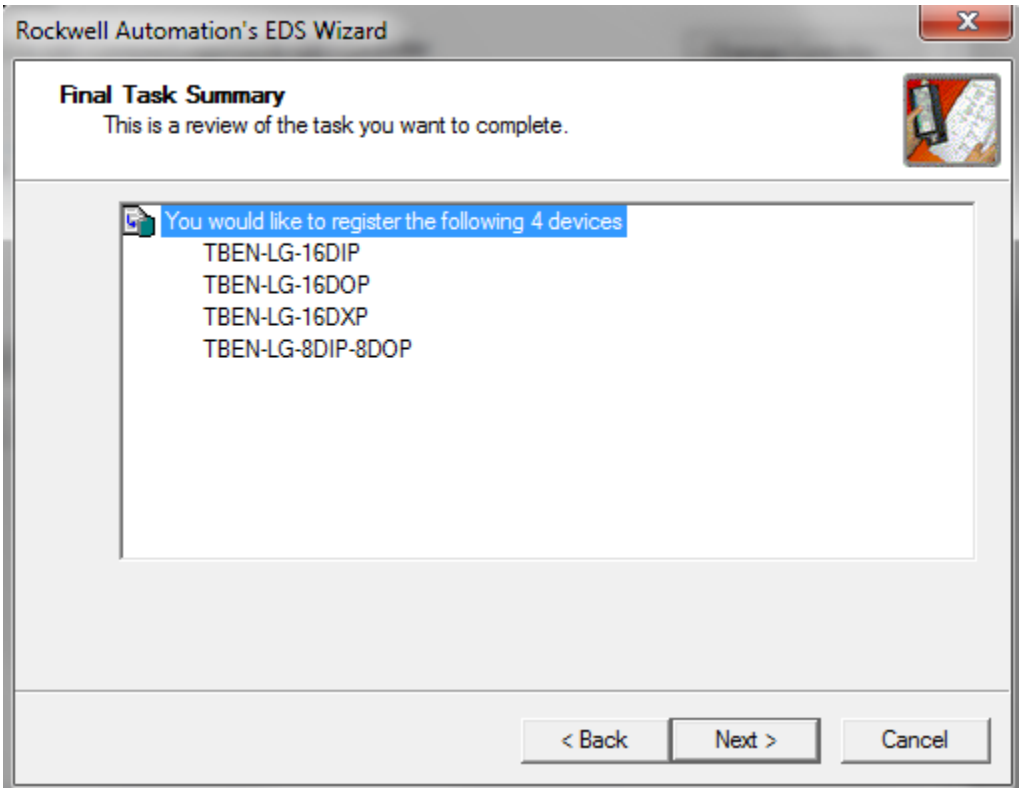
Install EDS File(s)

Tools > EDS Hardware Installation Tool



Follow the wizard instructions

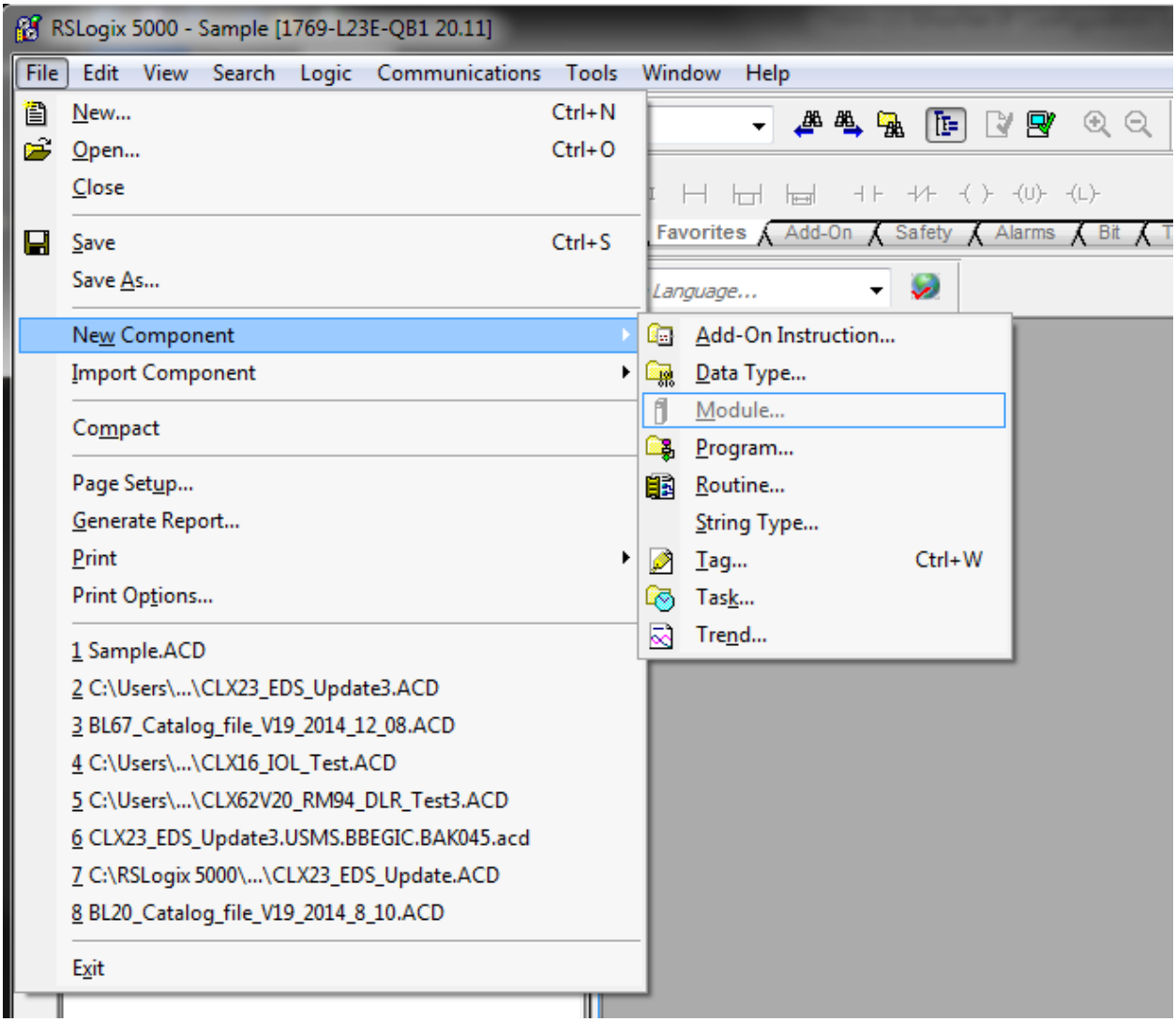
Register single file or directory of EDS files and follow registration dialog:



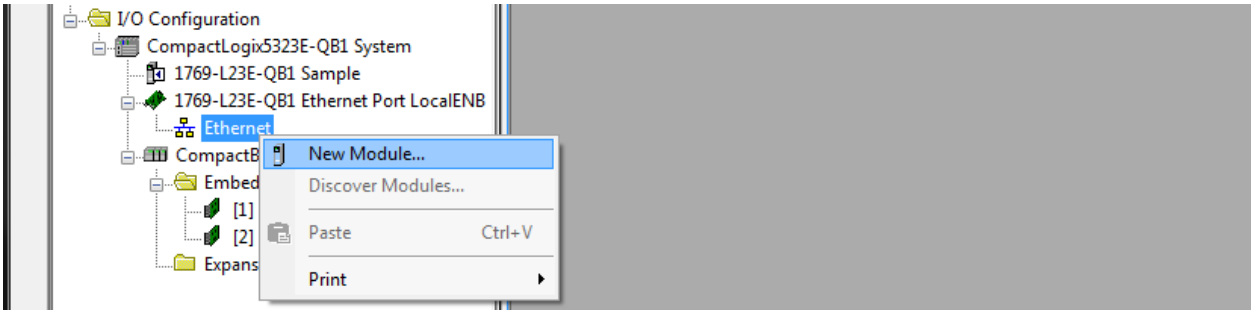
Create new TBEN Module

Configure new TBEN device in RSLogix5000:

- ***File > New Component > Module***

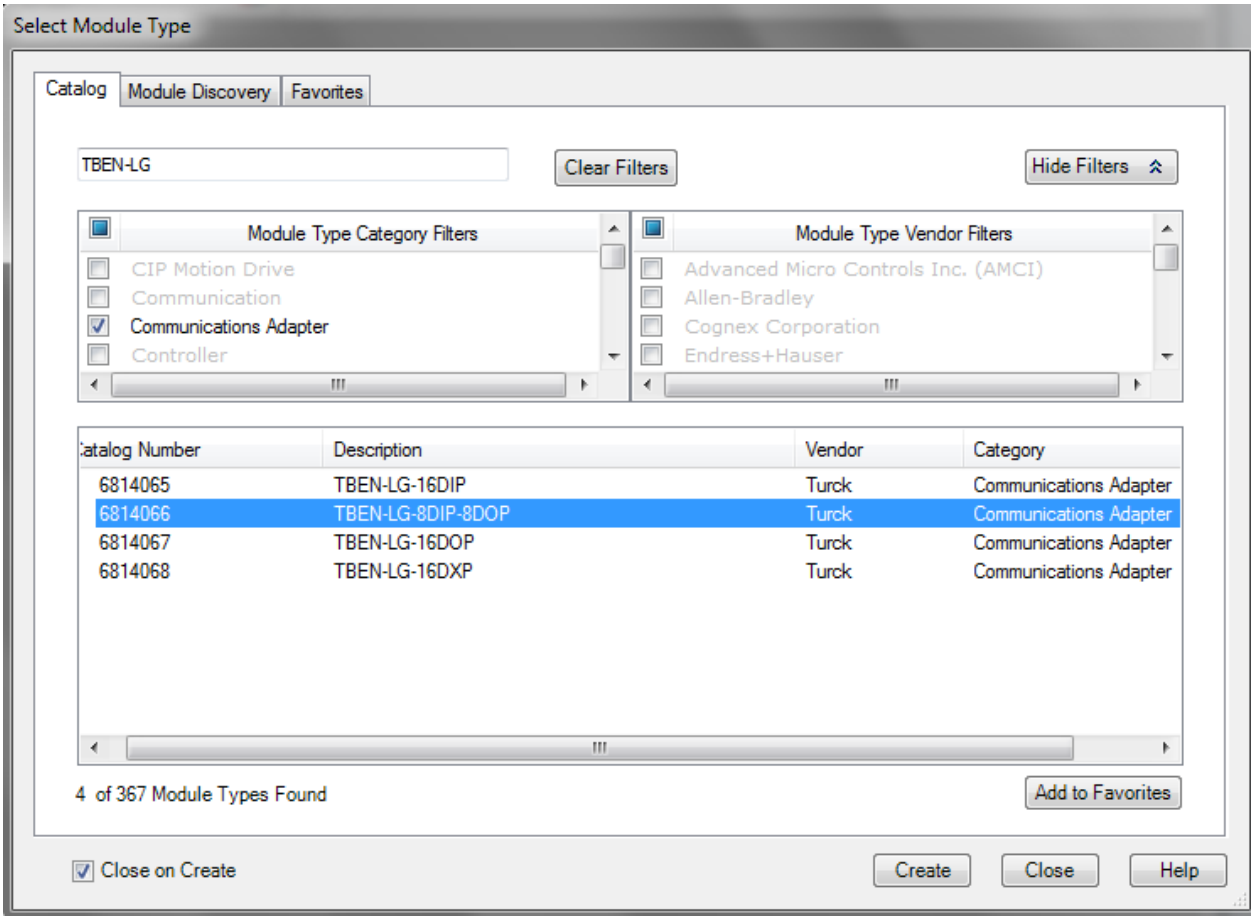


Or right-click at ***"Ethernet"*** and select ***"New module"***



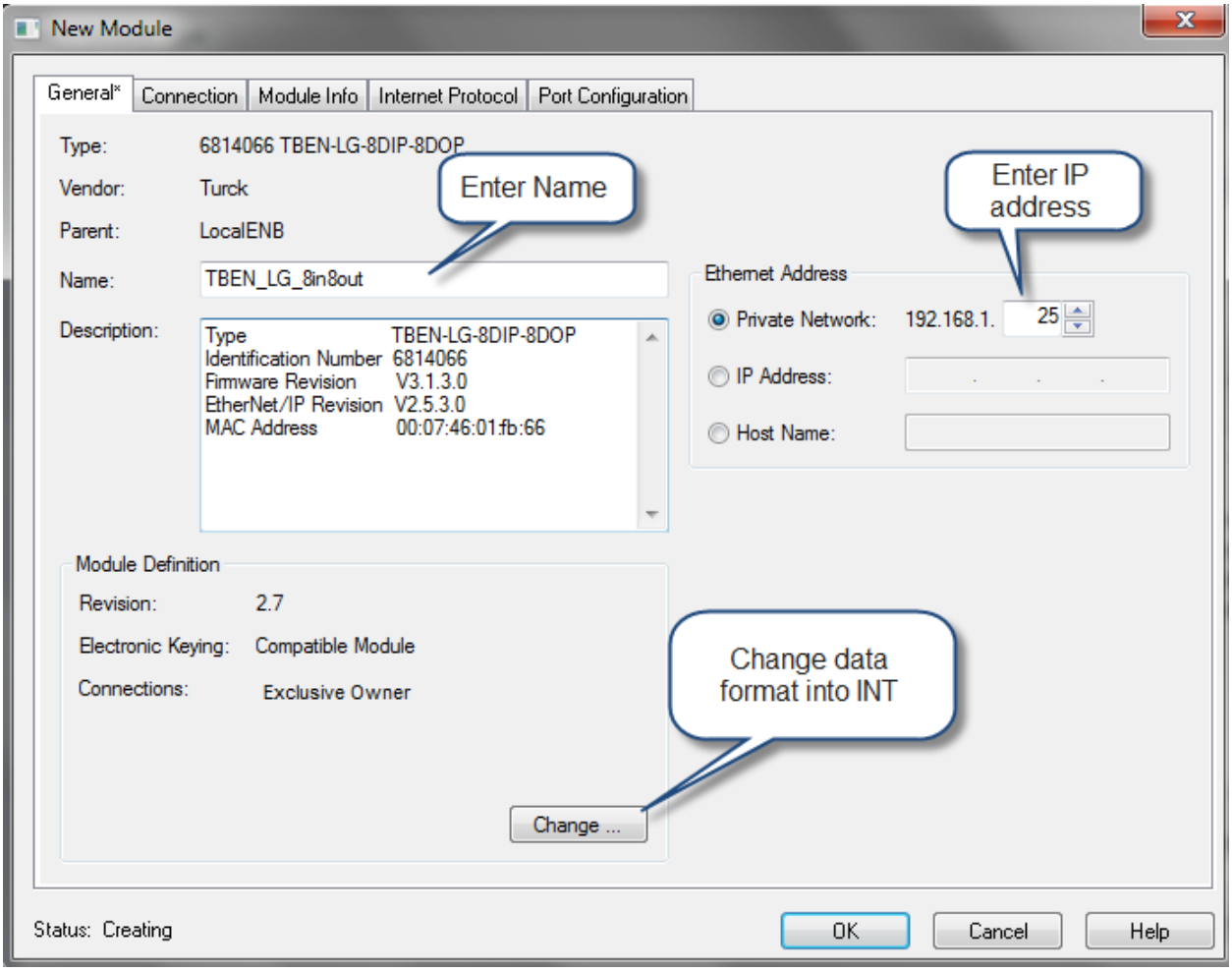
"Select Module Type" page provides a search box:

- Enter device name into search box
- Highlight device to be configured
- Click ***"Create"***



Enter required data into the **"New Module"** General page:

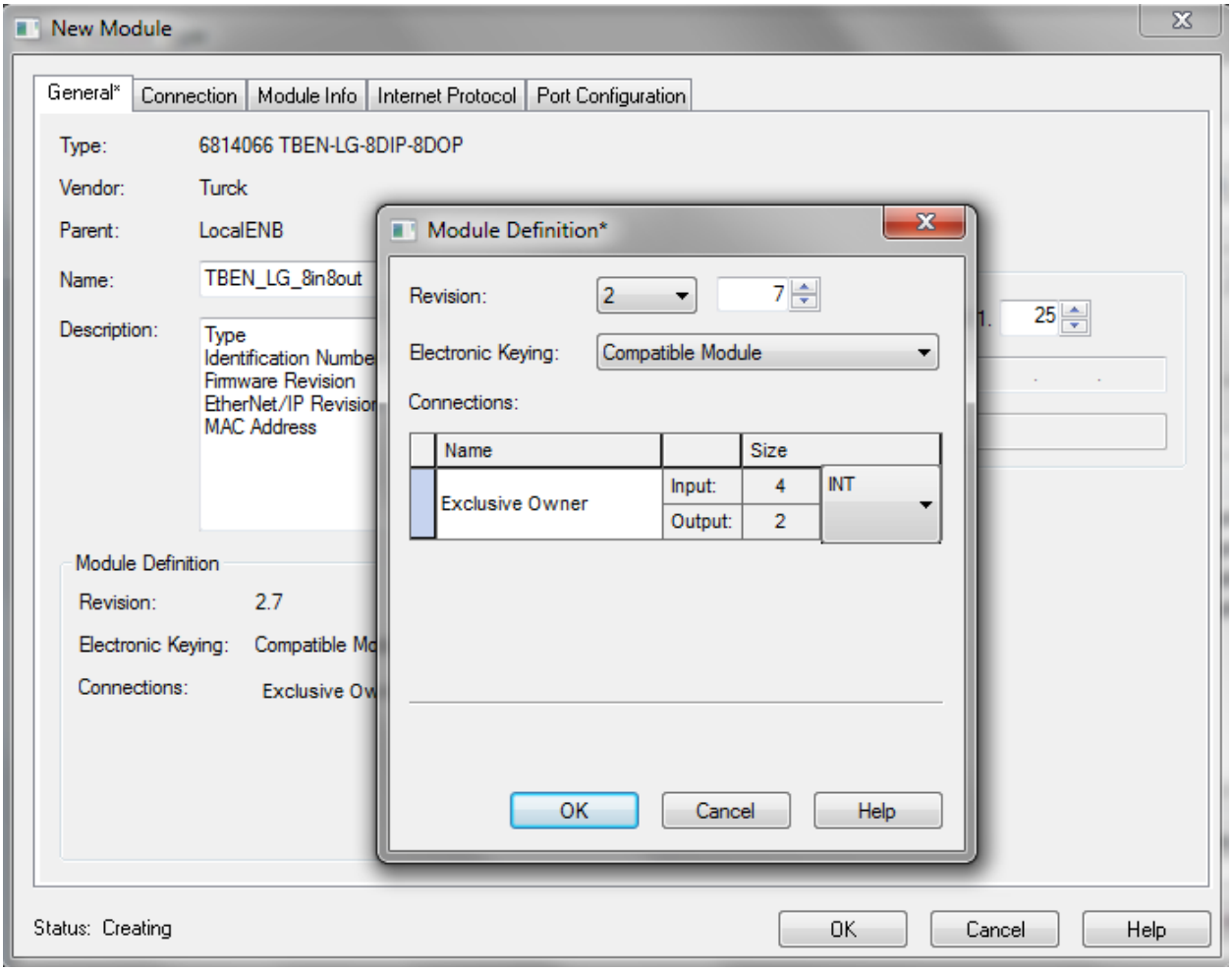
- Name (tag name)
- IP address
- Click ***"Change"*** to open Module Definition page



Configure Connection and data format

When Module Definition page is opened select:

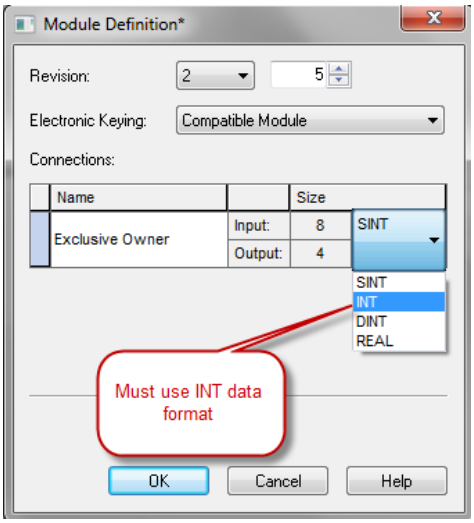
- Connection type = Exclusive Owner
- Data size format = INT



Click OK and follow dialog to complete device configuration.

Module Definition Data Format

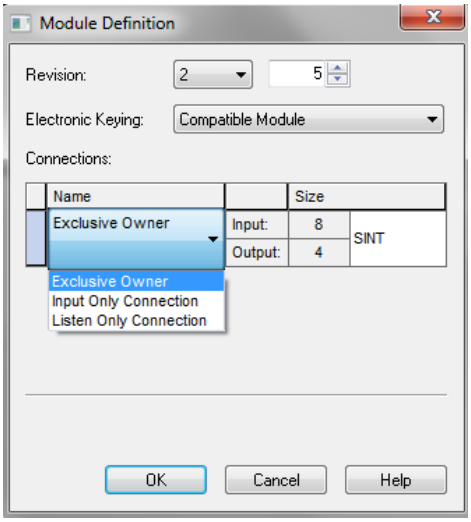
TBEN utilizes integer IO data format. It can be selected from drop down menu as follows:



TBEN supports following CIP connections:

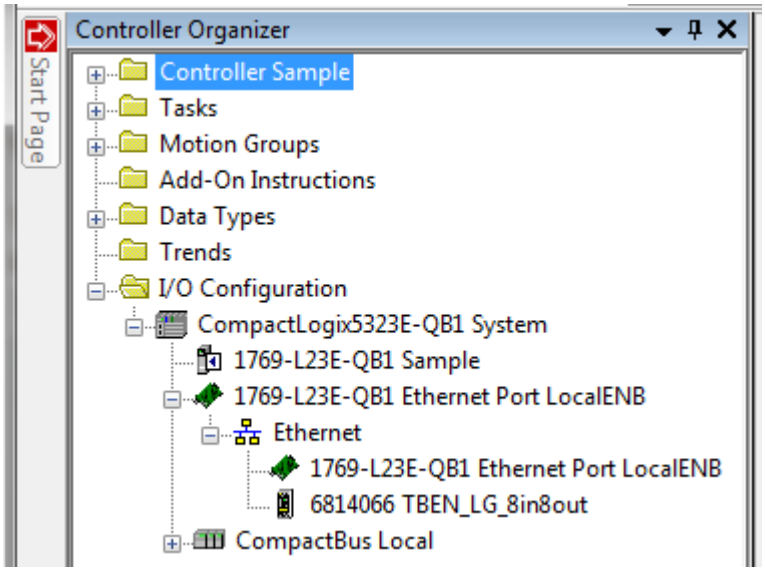
- Exclusive Owner
- Input Only
- Listen Only

The Exclusive Owner is preferred and default IO connection used by the device. It provides access to the input and output data, and configuration assembly.
The Input-Only and Listen-Only connections may be used to configure the device with multiple PLCs. The TBEN device supports up to 3 TCP sessions and 8 CIP connections.



TBEN Data Tags

Once the TBEN is configured and added to the Controller Organizer, the controller creates configuration, input and output data tags as shown hereafter:



.

Input data tag:

Device “Connection Faulted” flag is also attached to the input data by the controller.

Scope: Sample Show: All Tags

Name	Value	Style	Data Type	Description
TBEN_LG_8in8out:C	{...}		_0030:6...	
TBEN_LG_8in8out:I	{...}		_0030:6...	
TBEN_LG_8in8out:I.ConnectionFaulted	0	Decimal	BOOL	
TBEN_LG_8in8out:I.Data	{...}	Decimal	INT[4]	
TBEN_LG_8in8out:I.Data[0]	0	Decimal	INT	GW Status Word
TBEN_LG_8in8out:I.Data[1]	0	Decimal	INT	_Input data
TBEN_LG_8in8out:I.Data[2]	0	Decimal	INT	_Diagnostics
TBEN_LG_8in8out:I.Data[3]	0	Decimal	INT	_Diagnostics
TBEN_LG_8in8out:O	{...}		_0030:6...	

Output data tag:

Scope: Sample Show: All Tags

Name	Value	Style	Data Type	Description
TBEN_LG_8in8out:C	{...}		_0030:6...	
TBEN_LG_8in8out:I	{...}		_0030:6...	
TBEN_LG_8in8out:O	{...}		_0030:6...	
TBEN_LG_8in8out:O.Data	{...}	Decimal	INT[2]	
TBEN_LG_8in8out:O.Data[0]	0	Decimal	INT	GW Control Word
TBEN_LG_8in8out:O.Data[1]	0	Decimal	INT	_Output data

Configuration tags may be edited, which enables user to utilize device features such as:

- Enable QuickConnect
- Invert input signal
- Disable auto-recovery of outputs (requires user to turn-off and then-on an output that was previously faulted)
- Stretch input signal for specified time

Scope: Sample Show: All Tags

Name	Value	Style	Data Type	Description
TBEN_LG_8in8out:C	{...}		_0030:6...	
TBEN_LG_8in8out:C.Quick_Connect_0	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch0	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch1	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch2	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch3	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch4	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch5	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch6	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Input_inversion_Ch7	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch8	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch9	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch10	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch11	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch12	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch13	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch14	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Disable_Automatic_Recovery_Ch15	0	Decimal	BOOL	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch0	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch1	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch2	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch3	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch4	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch5	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch6	0	Decimal	SINT	
TBEN_LG_8in8out:C.Pulse_Stretching_Ch7	0	Decimal	SINT	
TBEN_LG_8in8out:I	{...}		_0030:6...	

The device configuration data consist of parameters that are read / write enabled. Parameters are set while the controller is in the program (offline) mode. Configuration is saved in the controller. The controller always pushes configuration data to the device during PLC download, or at device power-up, when connection between the controller and the device is in process of configuring (ForwardOpen).

TBEN-LG Configuration Parameters

Item	Parameter name	Description
TBEN Digital Inputs		
Pulse_stretching Trigger to an internal TOF timer, (available for input channels only)	IStx	It is an input signal OFF timer. The time base is 10ms. For example a value of 14 means 140ms. Pulse stretch range [0-127]. Default = 0 value [Pulse stretching is disabled].
Input_Inversion	Inv.Ix	Inversion of input signal. A 0 means that an activated input (green LED on) is transmitted as a logical 1 in the process data. A 1 means that an activated input (green LED on) is transmitted as a logical 0 in the process data. Default = 0

TBEN Digital Outputs		
Disable_Auto_Recovery Recovery mode of the outputs in case of short circuit	SROx	The behaviour of an output that recovers from short condition is controlled by this parameters: = 0, automatic recovery is enabled; Output turns ON after short condition = 1, automatic recovery is disabled; Output stays OFF after short condition. Default = 0
Output_Enable	Out Enable x	Only available on DXP devices. 0 = output driver is not be enabled. 1 = output driver is enabled Default = 1

Configuration Assembly Data Structure

The structure of the configuration data is different for each TBEN-LG device, as follows:

TBEN-LG-8DIP-8DOP								
	Bit7	BIt6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved							
Byte1								
Byte2								
Byte3								
Byte4								
Byte5								
Byte6								
Byte7								
Byte8								
Byte9	Reserved							QC
Byte10	Inv I7	Inv I6	Inv I5	Inv I4	Inv I3	Inv I2	Inv I1	Inv I0
Byte11	SRO 7	SRO 6	SRO 5	SRO 4	SRO 3	SRO 2	SRO 1	SRO 0
Byte12	Reserved							
Byte13								
Byte14								
Byte15	ISt0							
Byte16	ISt1							
Byte17	ISt2							
Byte18	ISt3							
Byte19	ISt4							
Byte20	ISt5							
Byte21	ISt6							
Byte22	ISt7							
Byte 23-45	Reserved							

Table 2.4 – TBEN-LG-8DIP-8DOP configuration data

Abbreviations:

- QC Quick Connect
- INVx Input Inversion
- SROx Output Short Recovery
- IStx Input pulse stretching
- OE Output enable

TBEN-LG-16DIP								
	Bit7	BIt6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved							
Byte1								
Byte2								
Byte3								
Byte4								
Byte5								
Byte6								
Byte7								
Byte8								
Byte9	Reserved							QC
Byte10	Reserved							
Byte11								
Byte12	Inv I7	Inv I6	Inv I5	Inv I4	Inv I3	Inv I2	Inv I1	Inv I0
Byte13	Inv I15	Inv I14	Inv I13	Inv I12	Inv I11	Inv I10	Inv I9	Inv I8
Byte14	Reserved							
Byte15	ISt0							
Byte16	ISt1							
Byte17	ISt2							
Byte18	ISt3							
Byte19	ISt4							
Byte20	ISt5							
Byte21	ISt6							
Byte22	ISt7							
Byte23	ISt8							
Byte24	ISt9							
Byte25	ISt10							
Byte26	ISt11							
Byte27	ISt12							
Byte28	ISt13							
Byte29	ISt14							
Byte30	ISt15							
Byte 31-45	Reserved							

Table 2.5 – TBEN-LG-16DIP configuration data

TBEN-LG-16DOP								
	Bit7	BIt6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved							
Byte1								
Byte2								
Byte3								
Byte4								
Byte5								
Byte6								
Byte7								
Byte8								
Byte9	Reserved							QC
Byte10	SRO 7	SRO 6	SRO 5	SRO 4	SRO 3	SRO 2	SRO 1	SRO 0
Byte11	SRO 15	SRO 14	SRO 13	SRO 12	SRO 11	SRO 10	SRO 9	SRO 8
Byte12	Reserved							
Byte13								
Byte 14-45	Reserved							

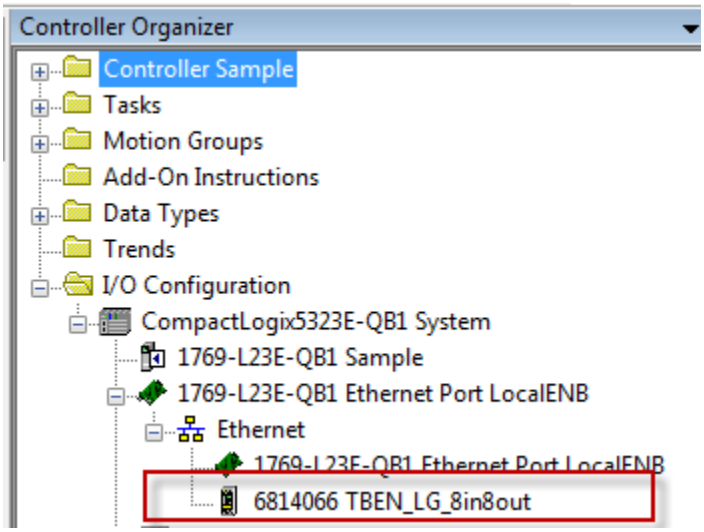
Table 2.6 – TBEN-LG-16DOP configuration data

TBEN-LG-16DXP								
	Bit7	BIt6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved							
Byte1								
Byte2								
Byte3								
Byte4								
Byte5								
Byte6								
Byte7								
Byte8								
Byte9	Reserved							QC
Byte10	Reserved							
Byte11								
Byte12	Inv I7	Inv I6	Inv I5	Inv I4	Inv I3	Inv I2	Inv I1	Inv I0
Byte13	Inv I15	Inv I14	Inv I13	Inv I12	Inv I11	Inv I10	Inv I9	Inv I8
Byte14	SRO 7	SRO 6	SRO 5	SRO 4	SRO 3	SRO 2	SRO 1	SRO 0
Byte15	SRO 15	SRO 14	SRO 13	SRO 12	SRO 11	SRO 10	SRO 9	SRO 8
Byte16	OE 7	OE 6	OE 5	OE 4	OE 3	OE 2	OE 1	OE 0
Byte17	OE 15	OE 14	OE 13	OE 12	OE 11	OE 10	OE 9	OE 8
Byte18	Reserved							
Byte19	ISt0							
Byte20	ISt1							
Byte21	ISt2							
Byte22	ISt3							
Byte23	ISt4							
Byte24	ISt5							
Byte25	ISt6							
Byte26	ISt7							
Byte27	ISt8							
Byte28	ISt9							
Byte29	ISt10							
Byte30	ISt11							
Byte31	ISt12							
Byte32	ISt13							
Byte33	ISt14							
Byte34	ISt15							
Byte 35-45	Reserved							

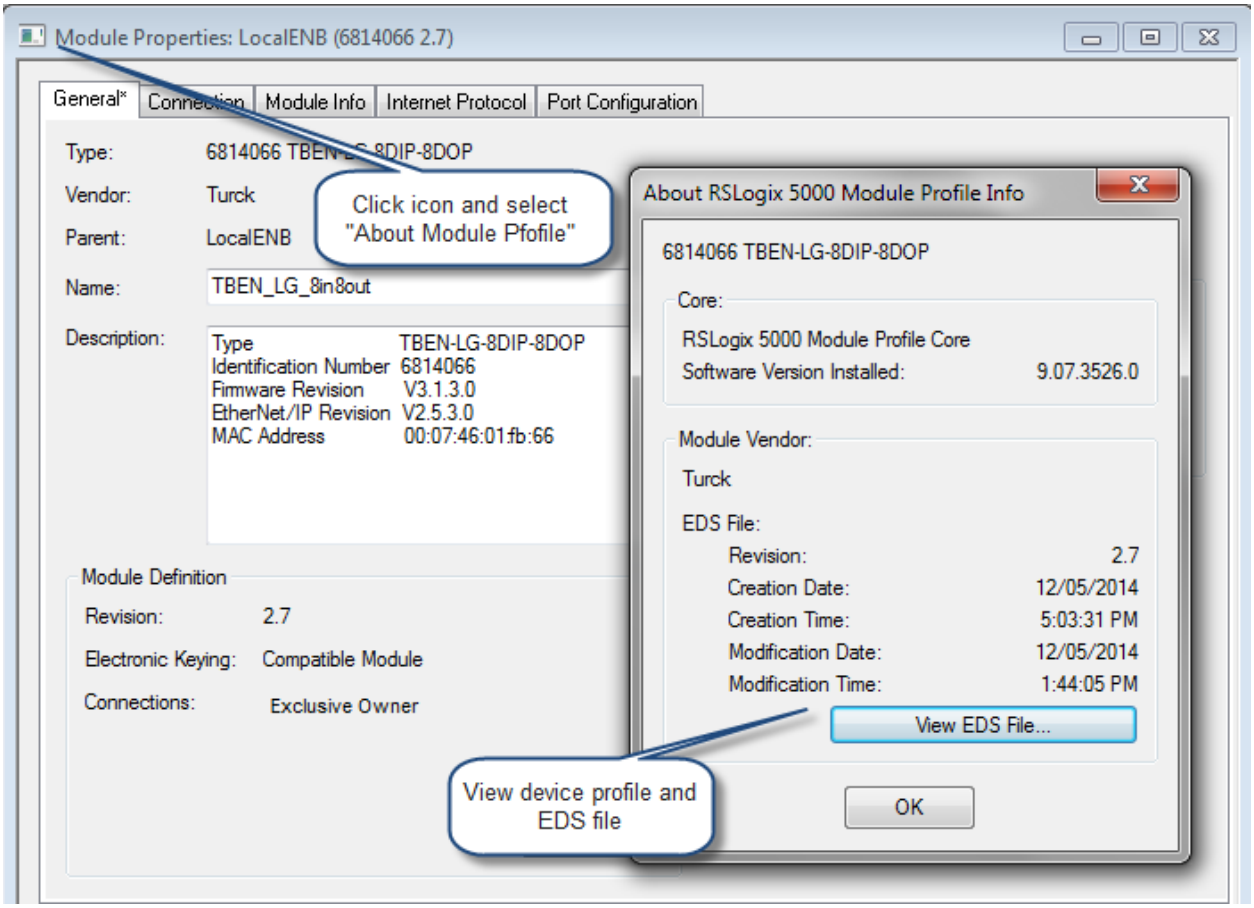
Table 2.7 – TBEN-LG-16DXP configuration data

TBEN-LG Profile Info

The device property is a subject to change. It provides path to view installed EDS file: right-click on the device and select ***"Properties"***:



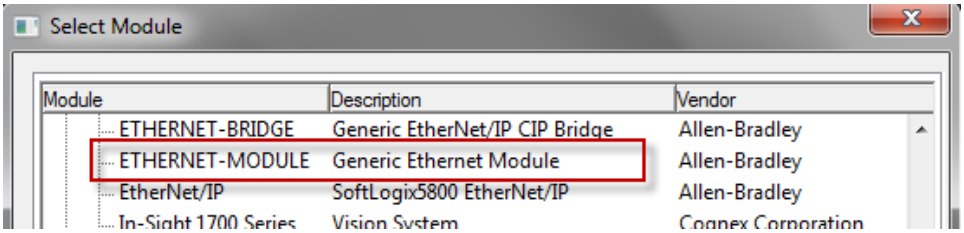
Click on marked icon and follow instructions:



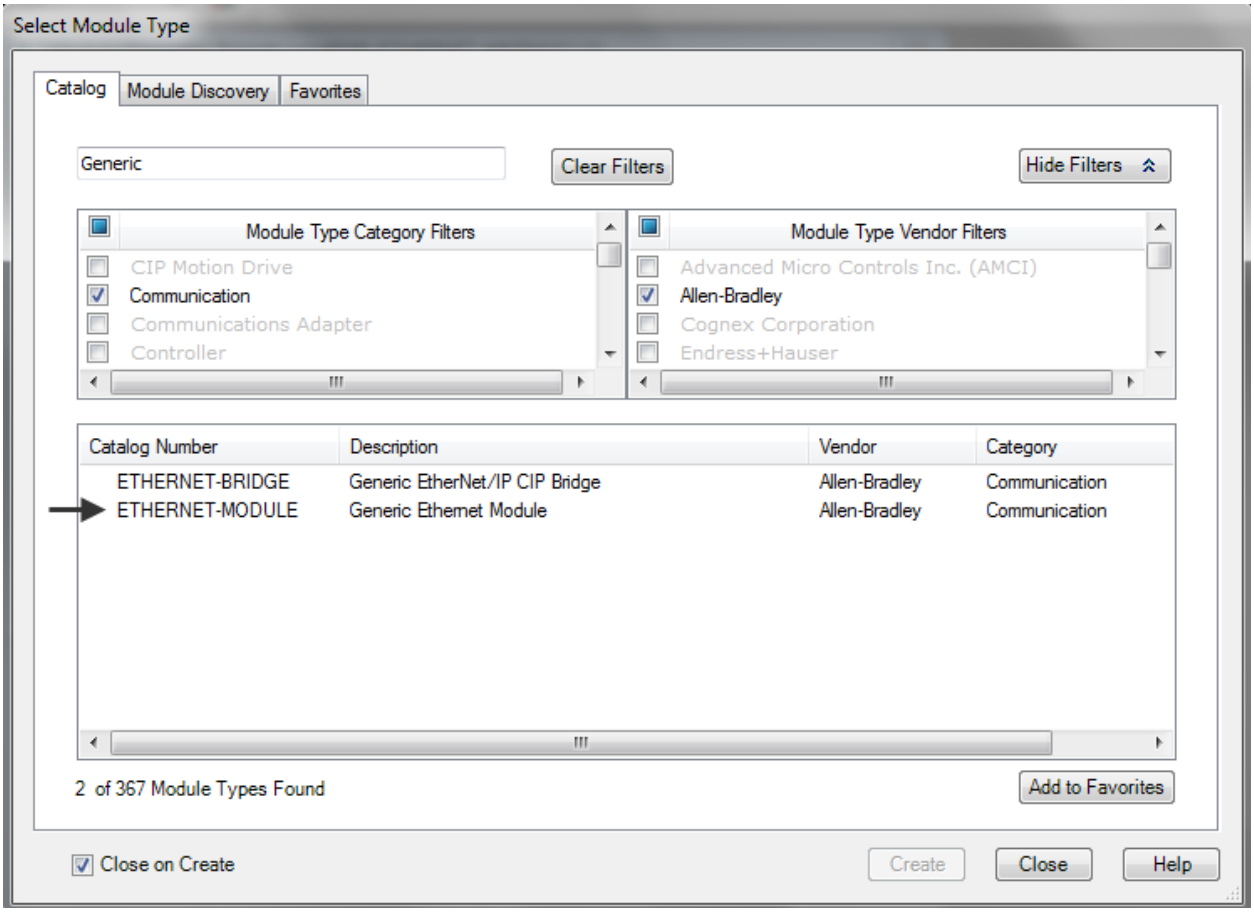
TBEN Configuration Using Generic Device

Earlier versions of RSlogix5000 Programming Software and Logix controllers, revision 19 or less do not support EDS files. In such case, TBEN may be configured using Ethernet Generic Module profile. The TBEN device configuration includes following steps:

- Create / open existing RSLogix5000 project
- Add Ethernet Generic device (as seen in RSLogix5000 rev 16)

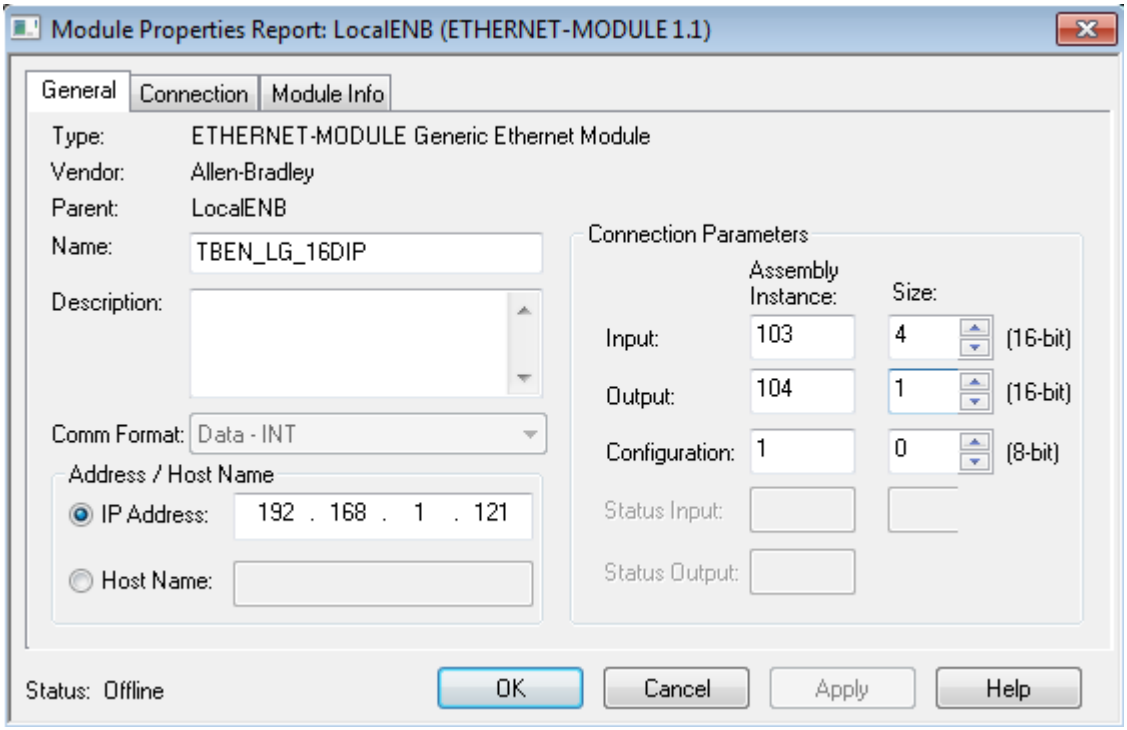


- Add Ethernet Generic device (as seen in RSLogix5000 rev 20 and up)



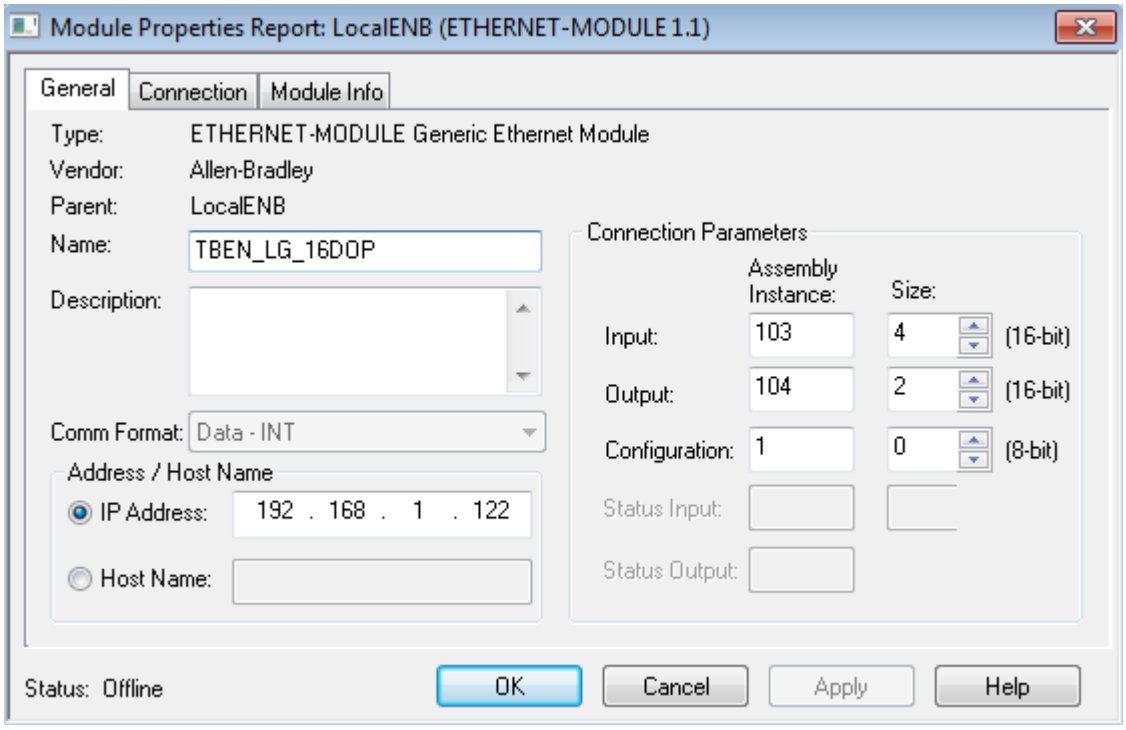
- Configure device by entering assembly instances and data size as follows:

Configure TBEN-LG-16DIP

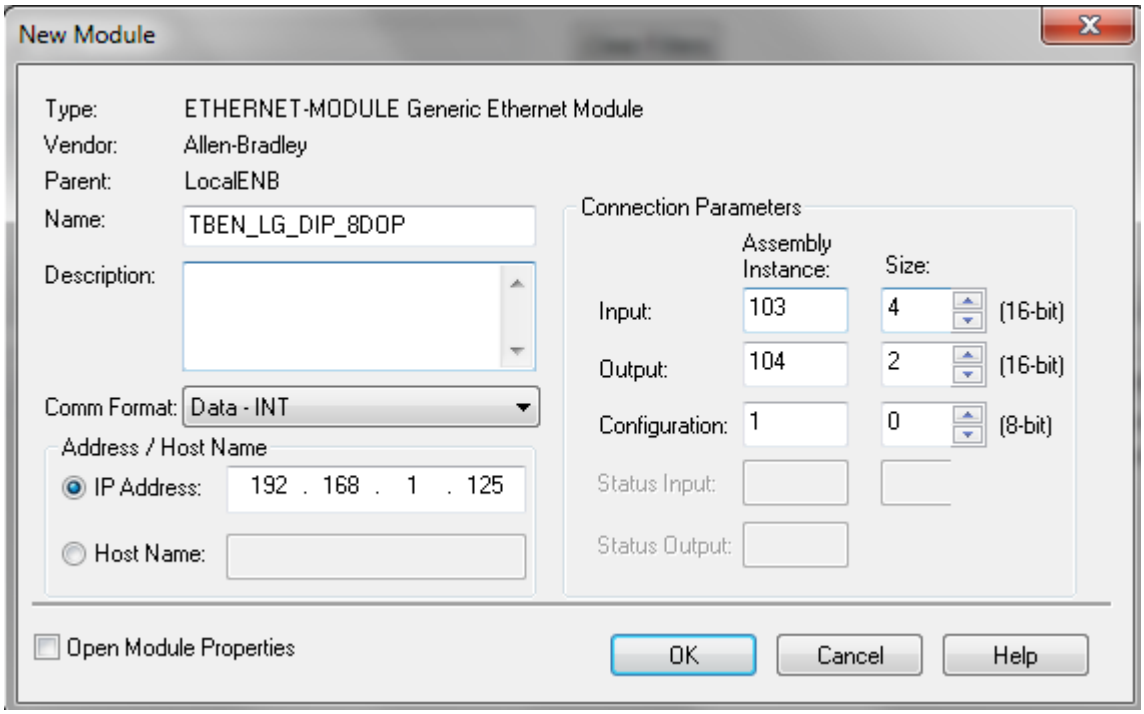


Note: "Comm Format" is always "Data – INT".

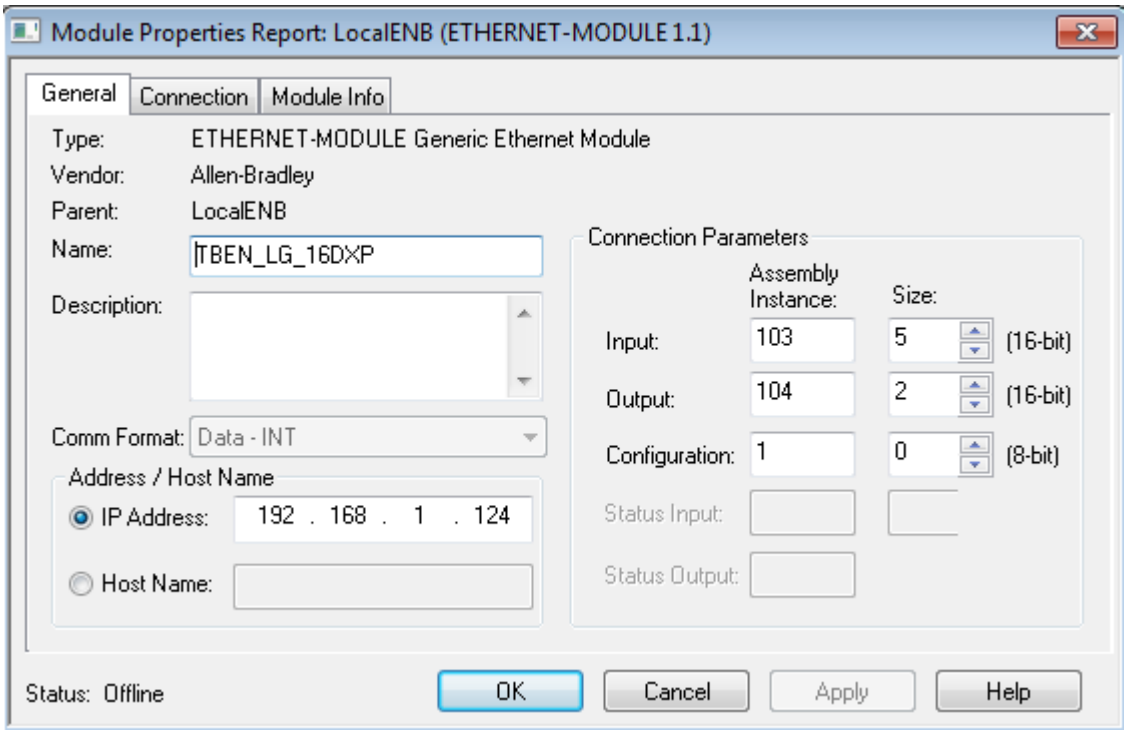
Configure TBEN-LG-16DOP



Configure TBEN-LG-8DIP-8DOP

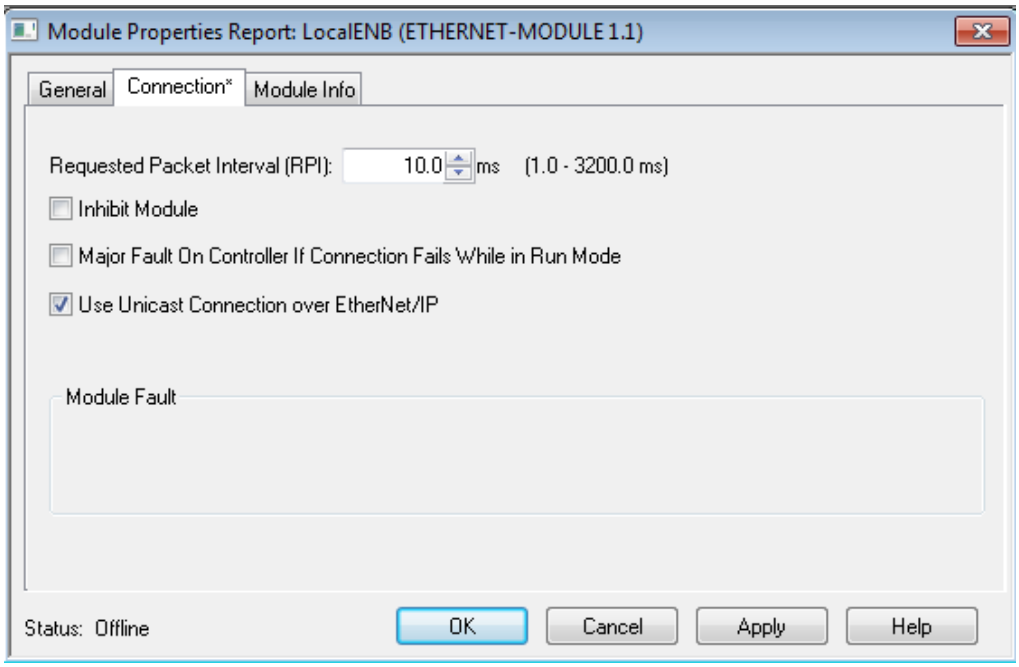


Configure TBEN-LG-16DXP

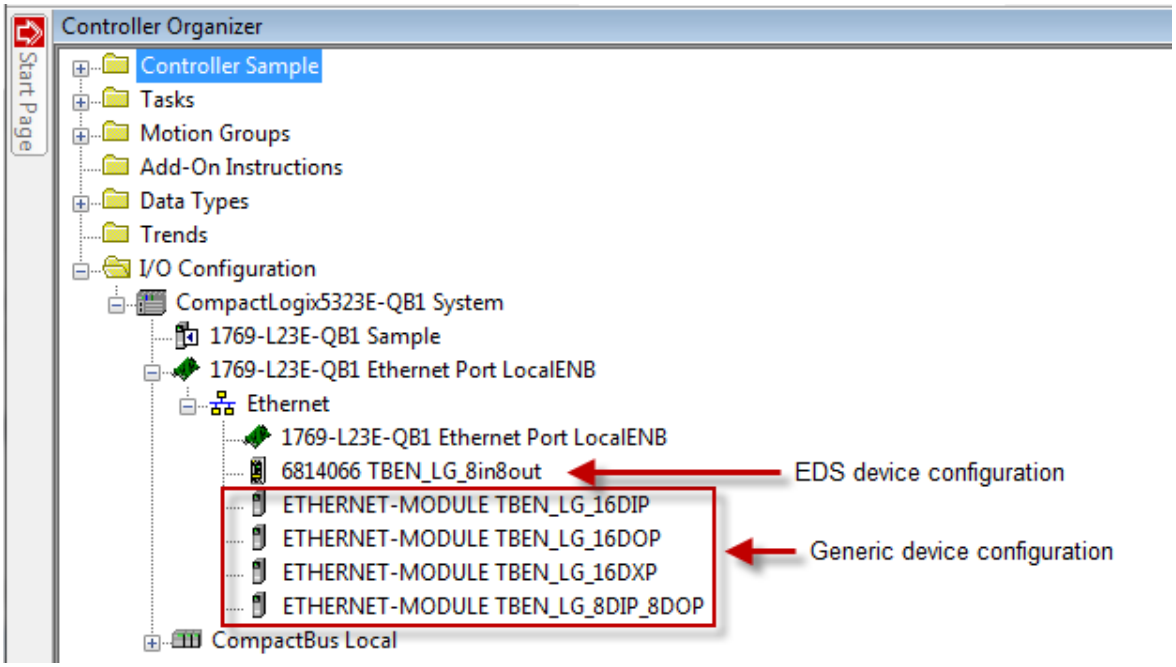


Configure Connection

The “Connection” page setup is identical for all TBEN devices as follows:



Controller organizer differentiates between EDS and Generic configured device by default icon.

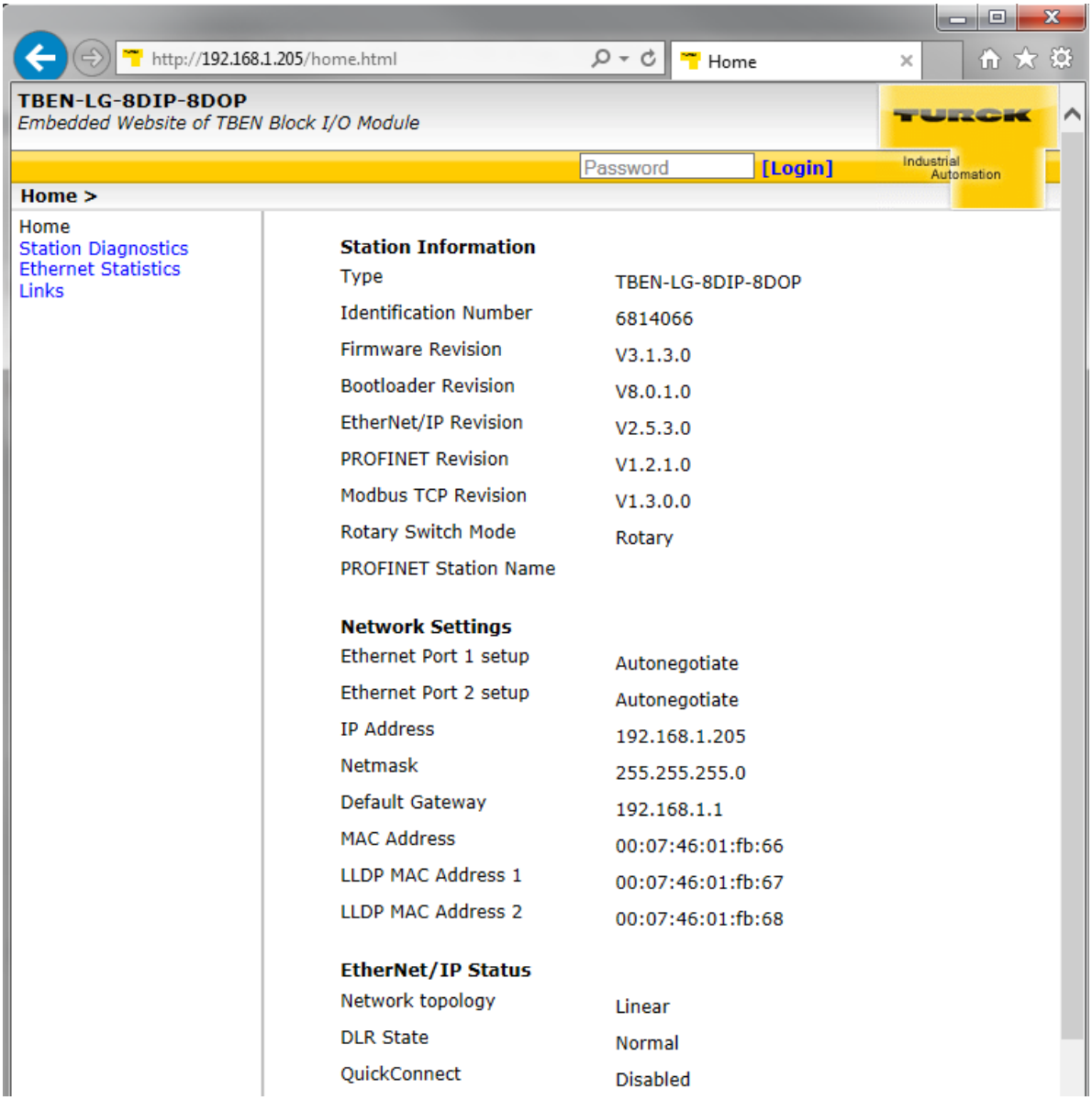


TBEN Web Server

Open the web server by entering the device IP address in a web browser.
If IP address is not assigned to the device (DHCP, BootP server etc.), it's the web server can be opened using the default IP address 192.168.1.254.

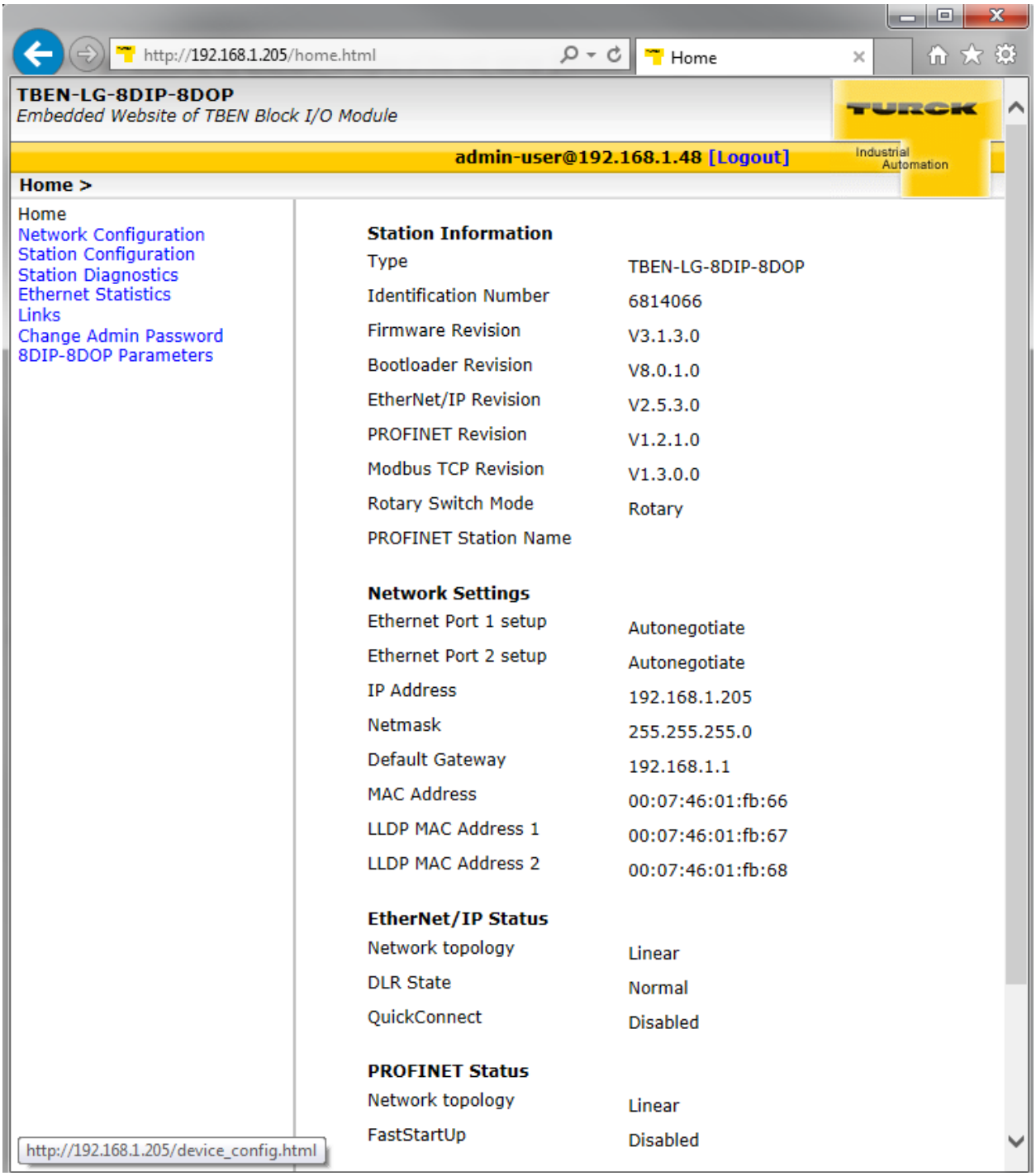
Home Page

The home or start page of the web server shows general device information, network settings and network status. There are several pages such as "Station Diagnostics", "Ethernet Statistics" and "Links" which can be accessed for viewing.



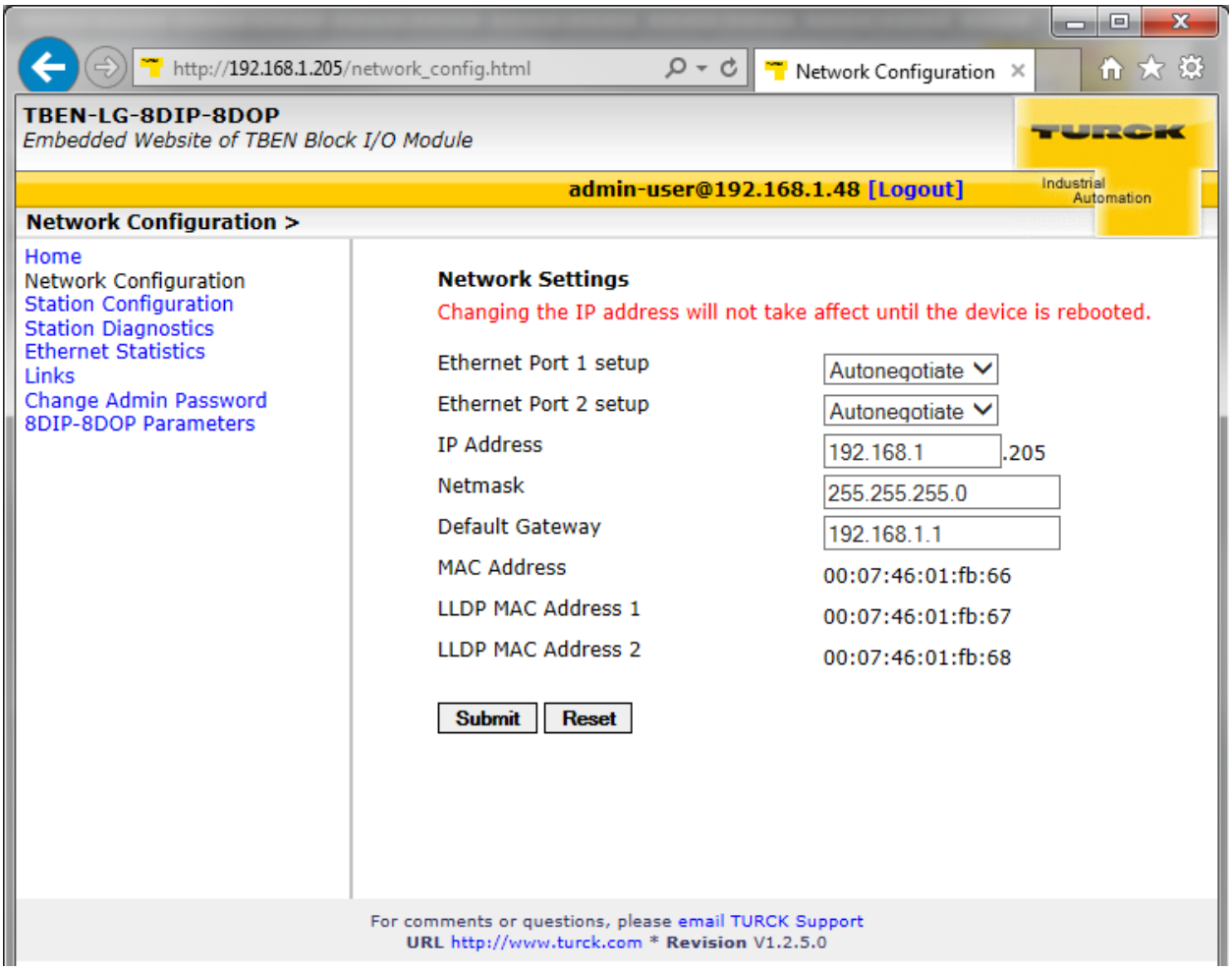
Login / password

In order to get access to the extended functions of the web server and access to device setup, login to the web server as administrator.
Enter initial password as “password” and click Login. The administrator privileges allow changing device setup using page links listed to the left. The home page shows the same information:



Network Configuration

The network configuration page is used to modify EtherNet port settings and device IP address.

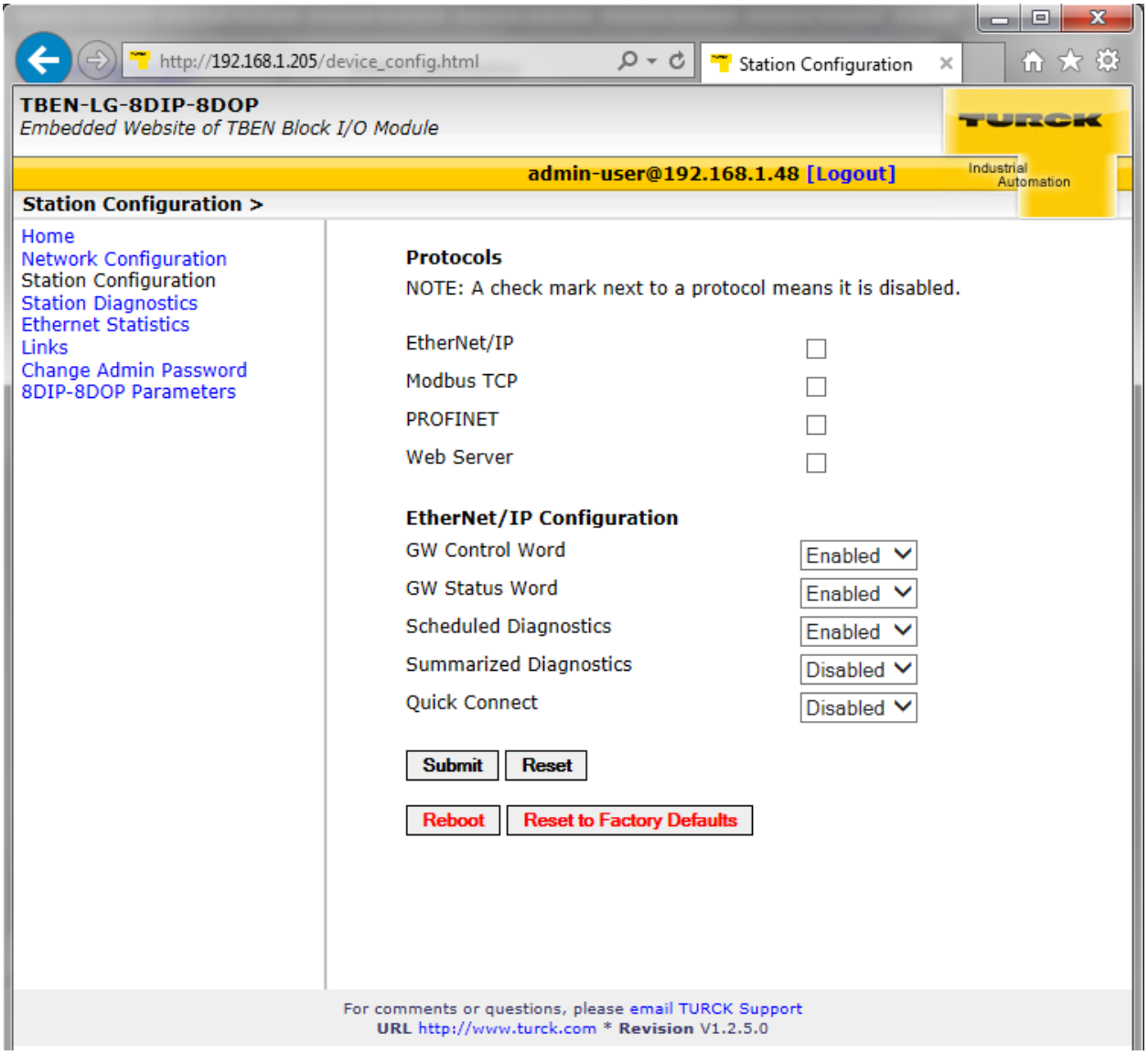


Station Configuration

The station configuration page is used for enabling / disabling listed features. It is recommended to keep default setup of the device.

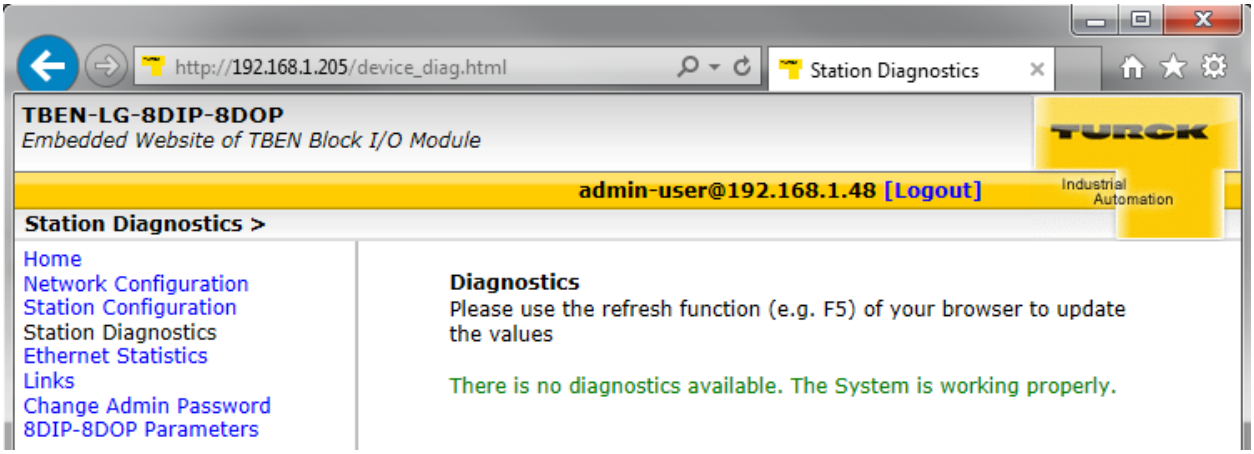
Notes:

- Disabling GW Status and/or Control word shifts the position of the IO data map. Do not change.
- “Submit” button applies changes to the device setup
- "Reset" only resets the changes done in the web server mask, back to the original values
- "Reboot" executes a power-cycle at the device.
- “Reset to Factory Defaults” corresponds to switch position 900 and it restores factory default setup, including password.



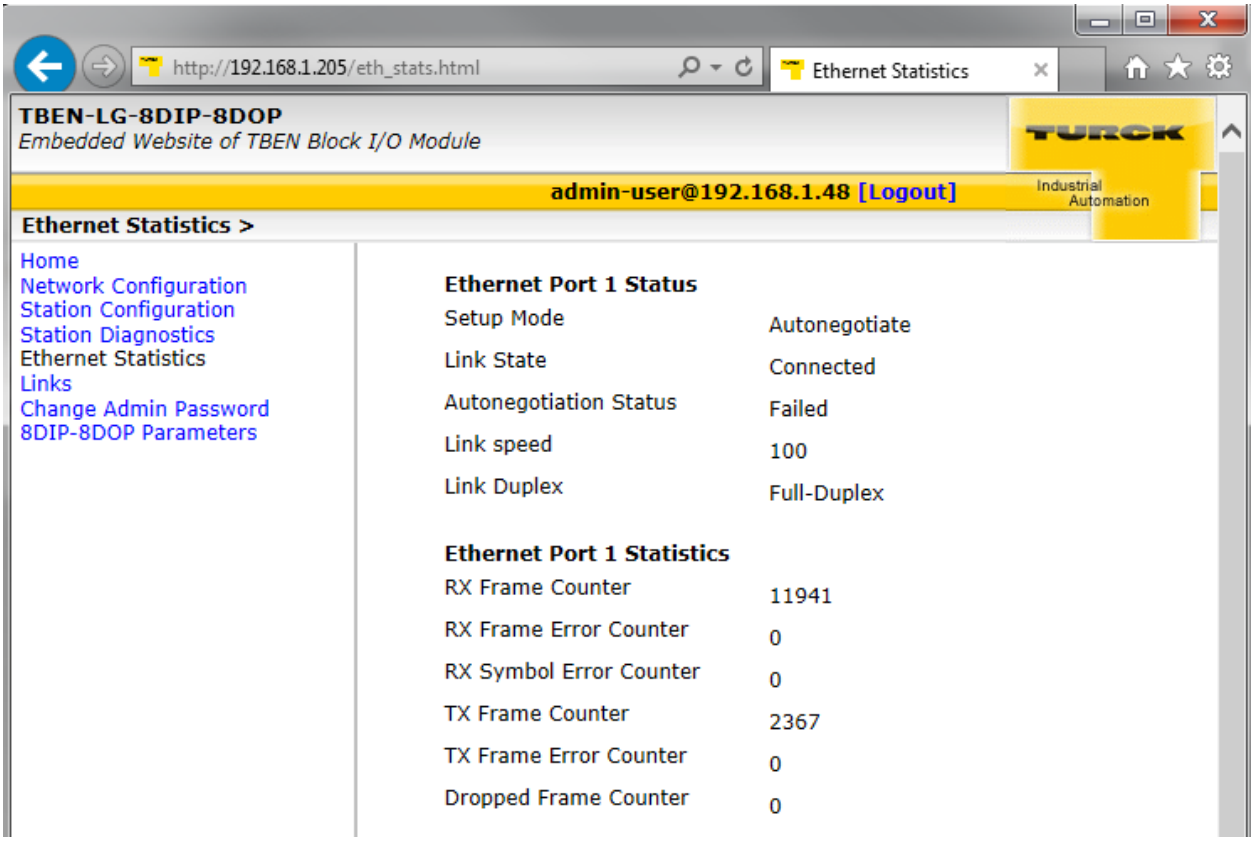
Station Diagnostics

The diagnostics page provides historical content of diagnostics from the last device power-up.



Ethernet Statistics

The Ethernet statictics page provide currrent status and statistics of Ethernet ports.



IO Parameters

The IO parameters page is used to change setup of device IO behavior such as:

- Invert state of discrete input
- Disable automatic recovery of an output upon recovery from a short condition
- Pulse stretching value is in range 0-127; input signal is extended in steps of 10msec from 0-1270 msec.