

User's Manual

HarshIO 600 eIP IP67 Digital I/O Modules for EtherNet/IP

BradControl™ from Molex

Version 1.7
January 13th, 2011



Revision History

Date	Author	Changes	Revision
06 th Jul. 2007		First version	1.1
15 th Nov. 2009	-		1.5
01 th Jan. 2011	Eric GORY	<ul style="list-style-type: none">▪ Add revision history▪ Correction of 4-PIN power assignment	1.6
06 th July.2015	S.Savary	<ul style="list-style-type: none">▪ Add PNP/NPN information for TCDEI-8YYX-D1U and TCDEI-8YYX-DYU p 6/46/53▪ Change Technical support information	1.7

Although every effort has been made to ensure the accuracy of this document, all information is subject to change without notice. Molex takes no liability for any errors in this document or for direct, indirect, or consequential damage resulting from the use of this manual.

STATEMENT OF LIMITED WARRANTY

BradControl™ from Molex, manufacturer of **HarshIO** products, warrants to Buyer that products, except software, manufactured by BradControl™ will be free from defects in material and workmanship. BradControl™ obligation under this warranty will be limited to repairing or replacing the defective parts within one year of the date of installation. Products may be returned by Buyer only after permission has been obtained from BradControl™. Buyer will prepay all freight charges to return any products to the repair facility designated by BradControl™.

BradControl™ further warrants that any software supplied as part of a product sale, except obsolete products, will be free from non-conformances with BradControl™ published specifications for a period of 90 days from the time of delivery. While BradControl™ endeavours to improve the features and performance of software associated with its products, no effort on the part of BradControl™ to investigate, improve or modify **HarshIO** blocks firmware at the request of a customer will obligate BradControl™ in any way.

For the convenience of existing customers, BradControl™ continues to supply certain products that are classified as obsolete. No warranty on the software features of these products is stated or implied and BradControl™ specifically is not obligated to improve the design of these products in any way. Information about the status of any product is available upon request and customers are advised to inquire about the status of older products prior to making a purchase.

This limited warranty does not cover losses or damages which occur in shipment to or from Buyer or due to improper installation, maintenance, misuse, neglect or any cause other than ordinary commercial or industrial applications. In particular, BradControl™ makes no warranties whatsoever with respect to implied warranties of merchantability or fitness for any particular purpose. All such warranties are hereby expressly disclaimed. No oral or written information or advice given by BradControl™ or BradControl™'s representative shall create a warranty or in any way increase the scope of this warranty. This limited warranty is in lieu of all other warranties whether oral or written, expressed or implied. BradControl™'s liability shall not exceed the price of the individual units, which are the basis of the claim. In no event shall BradControl™ be liable for any loss of profits, loss of use of facilities or equipment, or other indirect, incidental or consequential damages.

Although every effort has been made to ensure the accuracy of this document, all information is subject to change without any notice. BradControl™ takes no liability for any errors in this document or for direct, indirect, or consequential damage resulting from the use of this manual.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, BradControl™ cannot assume responsibility or liability for actual use based on the examples and diagrams.

COPYRIGHTS and TRADEMARKS

Reproduction of the contents of this manual, in whole or in part, without written permission of BradControl™ is prohibited.

Mini-Change®, Ultra-Lock™, BradControl™ are all registered trademarks of Molex, Inc. All other products or trademarks are the property of their respective owners.



Table of contents

1.	General description	6
	Introduction.....	6
2.	Hardware characteristics	8
	Dimensions.....	8
	Pin assignment.....	9
	Port wiring type.....	11
	LED assignment.....	12
	I/O assignment.....	13
	Hardware address (MAC Address).....	13
	Display Information.....	13
3.	Getting started	15
	Packaging content.....	15
	Accessories.....	16
	Getting Started.....	17
	Network Address setting.....	20
4.	Web server interface.....	21
	Login and password.....	21
	IP and Physical information.....	22
	Password setup.....	23
	IP Configuration.....	24
	IN/OUT Configuration.....	25
	I/O Value.....	27
	Watchdog and IDLE behavior.....	28
	I/O Status.....	29
	Ethernet.....	30
	Network Interface.....	32
	EtherNet/IP.....	33
5.	EtherNet/IP object classes	34
	CIP Classes services.....	34
	Connections Consideration.....	34
	RPI Consideration.....	35
	CIP Object Classes.....	35
	Configuration by scanner.....	35
	EDS Files.....	36
	EtherNet/IP Profile.....	37
	I/O Messaging.....	38
	Input Mapping.....	39
	Output Mapping.....	39
	Configuration Object (0x300).....	40
	General Diagnosis Object (0x301).....	41
	I/O Diagnosis Object (0x302).....	42
6.	Configuration using RSLogix 5000	43

	Add an EtherNet/IP I/O Block.....	43
	EtherNet/IP I/O Block configuration	44
7.	Specific behavior	48
	Watchdog behavior	48
	DHCP behavior	49
	IDLE behavior.....	49
	Duplicate IP address	50
8.	Technical specifications	51
	PNP-type Inputs	51
	NPN-type Inputs	52
	Configurable Points (Output or PNP-type Input).....	53
9.	Earth connection	54
10.	Cables and cordsets.....	56
11.	Product support.....	58

1. General description

Introduction

The **HarshIO 600 eIP** for EtherNet/IP is a robust range of Ethernet devices, for harsh environment, providing EtherNet/IP connectivity to sensors/actuators. It also includes a 2-ports unmanaged Ethernet switch with cross-over capability.

The **HarshIO 600 eIP** design integrates the Ultra-Lock™ connector system.

The modules are available in various combinations:

- 16 Inputs
- 8 Inputs / 8 Outputs
- 12 Inputs / 4 Outputs
- 14 Inputs / 2 Outputs
- 16 Input/Output points configurable

For each combination, the format of inputs can be specified as NPN or PNP, except for the configurable I/O model* where the inputs can only be used as PNP.

IMPORTANT: After power-on, the HarshIO 600 eIP is ready to operate within 8s (Power On Self Test procedure including Address Conflict Detection).

4 Pins modules:

Model reference	Description
TCDEI-8D0N-DYU	IP67 EtherNet/IP, 8 digital ports, 16 NPN Inputs
TCDEI-8C2N-DYU	IP67 EtherNet/IP, 8 digital ports, 14 NPN Inputs & 2 Outputs
TCDEI-8B4N-DYU	IP67 EtherNet/IP, 8 digital ports, 12 NPN Inputs & 4 Outputs
TCDEI-888N-DYU	IP67 EtherNet/IP, 8 digital ports, 8 NPN Inputs & 8 Outputs
TCDEI-8D0P-DYU	IP67 EtherNet/IP, 8 digital ports, 16 PNP Inputs
TCDEI-8C2P-DYU	IP67 EtherNet/IP, 8 digital ports, 14 PNP Inputs & 2 Outputs
TCDEI-8B4P-DYU	IP67 EtherNet/IP, 8 digital ports, 12 PNP Inputs & 4 Outputs
TCDEI-888P-DYU	IP67 EtherNet/IP, 8 digital ports, 8 PNP Inputs & 8 Outputs
TCDEI-8YYX-DYU	IP67 EtherNet/IP, 16 self-configuring* PNP Input / Output points

5 Pins modules:

Model reference	Description
TCDEI-8D0N-D1U	IP67 EtherNet/IP, 8 digital ports, 16 NPN Inputs
TCDEI-8C2N-D1U	IP67 EtherNet/IP, 8 digital ports, 14 NPN Inputs & 2 Outputs
TCDEI-8B4N-D1U	IP67 EtherNet/IP, 8 digital ports, 12 NPN Inputs & 4 Outputs
TCDEI-888N-D1U	IP67 EtherNet/IP, 8 digital ports, 8 NPN Inputs & 8 Outputs
TCDEI-8D0P-D1U	IP67 EtherNet/IP, 8 digital ports, 16 PNP Inputs
TCDEI-8C2P-D1U	IP67 EtherNet/IP, 8 digital ports, 14 PNP Inputs & 2 Outputs
TCDEI-8B4P-D1U	IP67 EtherNet/IP, 8 digital ports, 12 PNP Inputs & 4 Outputs
TCDEI-888P-D1U	IP67 EtherNet/IP, 8 digital ports, 8 PNP Inputs & 8 Outputs
TCDEI-8YYX-D1U	IP67 EtherNet/IP, 16 self-configuring* PNP/NPN Input / Output points

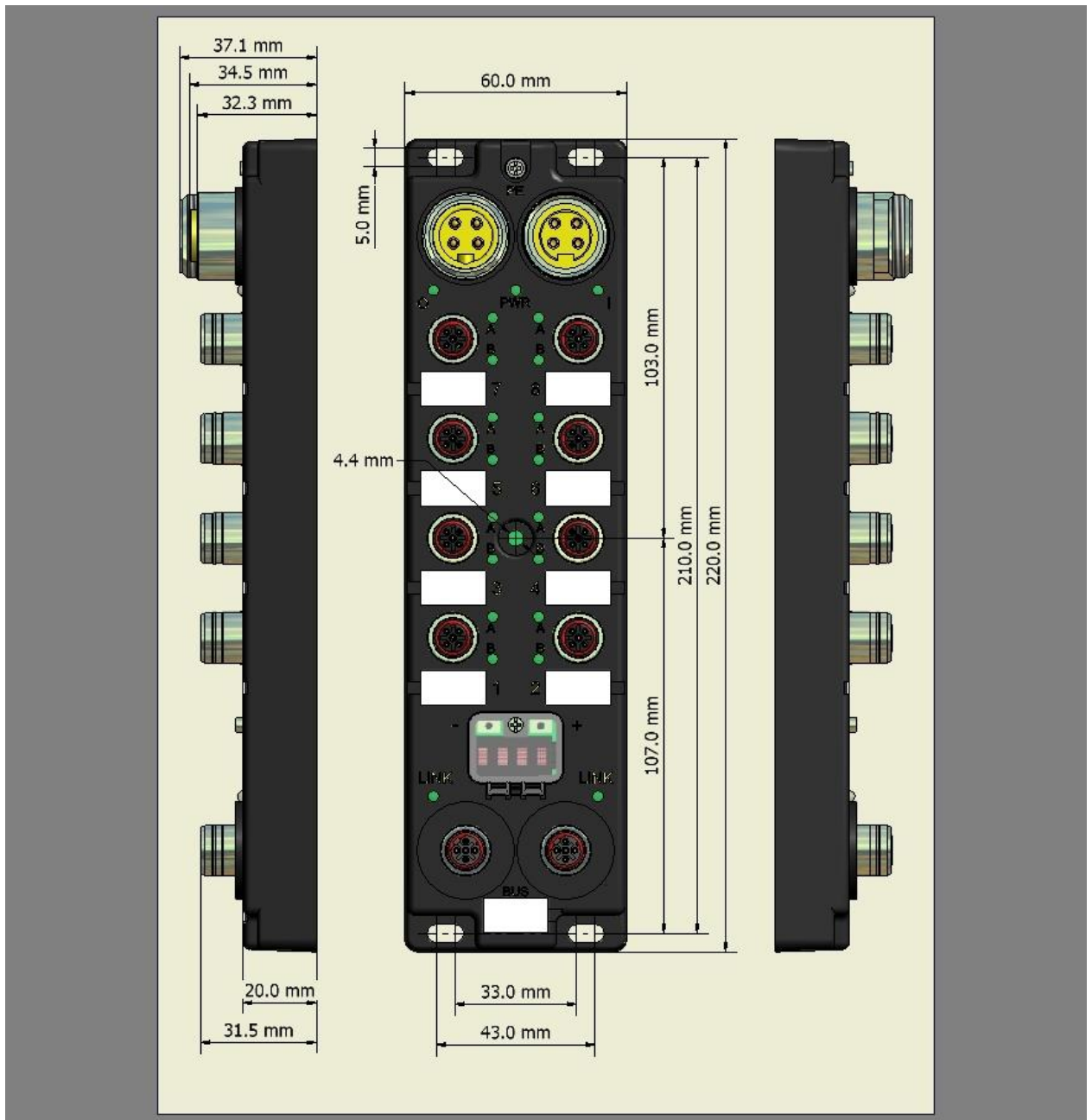
(*) The configurable type (a point can be either an Input or an Output) allows the user to define a specific behavior of the I/O point. Thus, user can connect either a sensor or an actuator. Please note that if you choose to use a port with 1 I/O configured as an output, and the other as an Input, then the Input must be configured as PNP only. Each point, defined as an Input or an Output, appears in both process image (input and output).

In case of defining an I/O as an Input AND Output, then:

- 1 – If the point is used for an actuator, the output state is mirrored in the corresponding input bit in the Input Process image.
- 2 – If the point is used for a sensor, do not write in the corresponding output bit of the process image, as it can conflict with the current state of the sensor.
- 3 – The input shall be configured as PNP only.

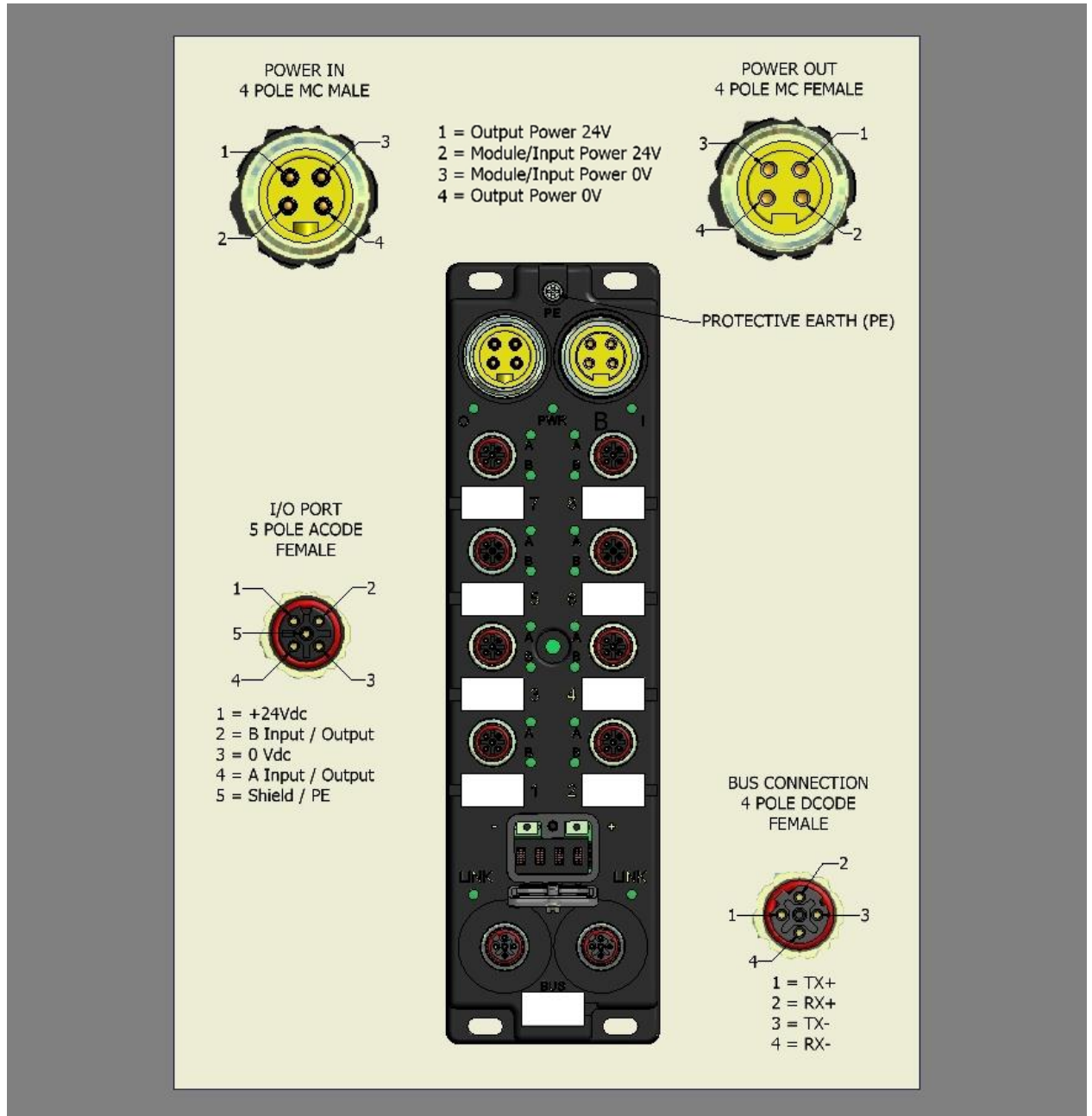
2. Hardware characteristics

Dimensions

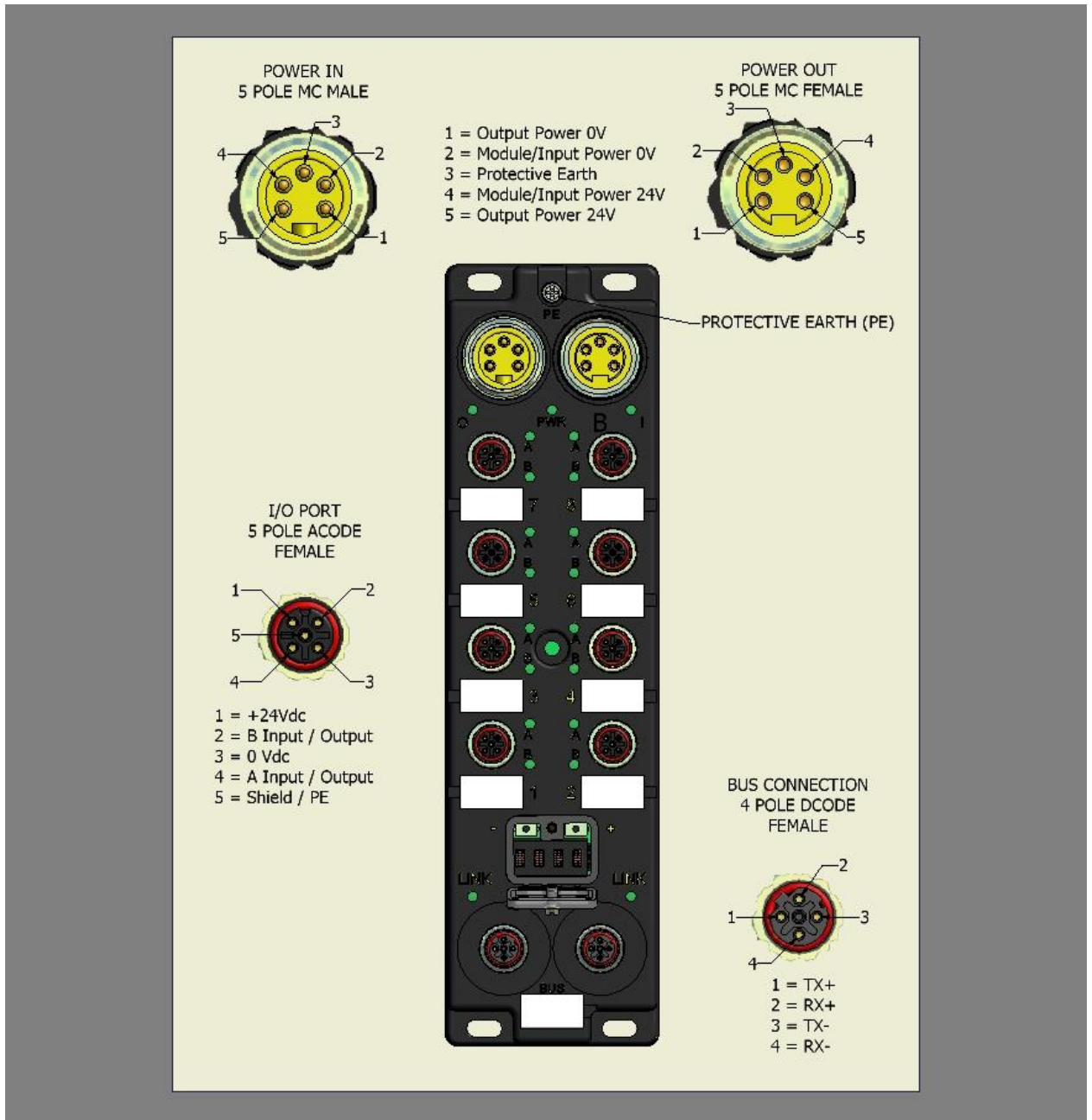


Pin assignment

4 Pins power:



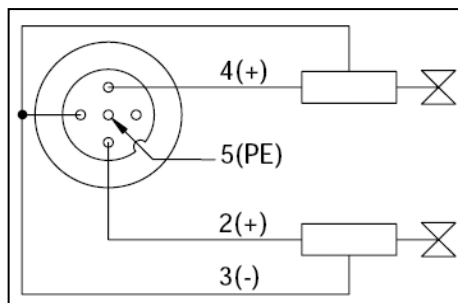
5 Pins power:



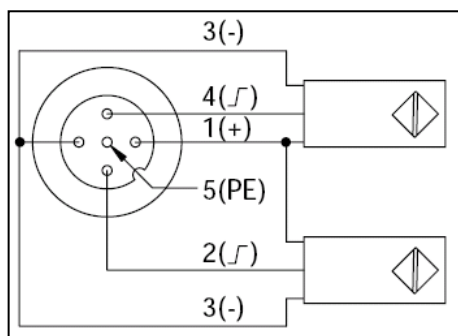
Protective Earth (PE) is provided for the grounding of field devices.

Port wiring type

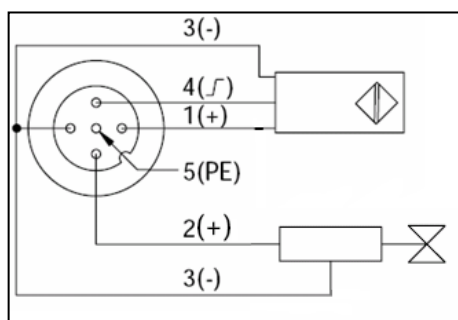
2 Outputs – Twin wired



2 Inputs – Twin wired



1 Input and 1 Output – Complementary Wired



LED assignment

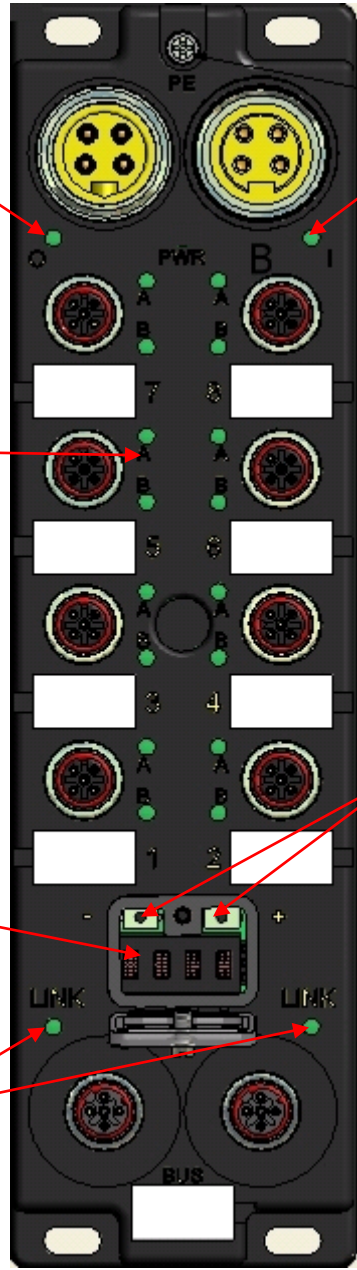
Output Power LED
● Green: External source present
The outputs of the module operate only if the LED is ON.

I/O LED:
● Green: Input or Output active
● Red: Fault diagnostic (Short circuit ...)

4 scrolling digit Display:
➤ IP Address
➤ I/O Fault
➤ Watchdog Status
➤ Ping Information
➤ EtherNet/IP Status

LINK LED:
● Green (100 Mbps)
- Solid ON: link without activity
- BLINK: link with activity

● Yellow (10 Mbps)
- Solid ON: link without activity
- BLINK: link with activity



Module and Input Power LED
● Green: External source present
The module operates only if this LED is ON.

Push button for IP Address mode and setting.

I/O assignment

Each port supports two I/O points which can be either 2 inputs, 2 outputs or 1 input and 1 output, depending on the type of I/O Block.

The following I/O assignment diagram is available for all **HarshIO 600 eIP** – excepted configurable type.

Type of I/O Block	Port 1		Port 2		Port 3		Port 4		Port 5		Port 6		Port 7		Port 8	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
16 In	I#1	I#2	I#3	I#4	I#5	I#6	I#7	I#8	I#9	I#10	I#11	I#12	I#13	I#14	I#15	I#16
14 In / 2 Out	I#1	I#2	I#3	I#4	I#5	I#6	I#7	I#8	I#9	I#10	I#11	I#12	I#13	I#14	O#1	O#2
12 In / 4 Out	I#1	I#2	I#3	I#4	I#5	I#6	I#7	I#8	I#9	I#10	I#11	I#12	O#1	O#2	O#3	O#4
8 In / 8 Out	I#1	I#2	I#3	I#4	I#5	I#6	I#7	I#8	O#1	O#2	O#3	O#4	O#5	O#6	O#7	O#8

Note: For configurable I/O Block, the different points (A and B) can be either Input or Output.

Thus a port can be configured as followed:

	A	B
Inputs only	Input	Input
Outputs only	Output	Output
Input and output	Input	Output
	Output	Input

Hardware address (MAC Address)

Each **HarshIO 600 eIP** has a unique Ethernet MAC address figured on the attached label. This address has a fixed length of 6 bytes (48 bits) including the manufacturer's ID and the serial number of the I/O Block.

The MAC address will be defined as the following:

Manufacturer ID	Family	Serial Number
00A091	3	XXXXXX

Display Information

The 4-digit LED display shows the Ethernet configuration and the global state of the block.

Information present into the display:

- Ethernet Configuration Mode :
 - Static Address
 - DHCP Address
 - BOOTP Address
 - Factory default Address

- I/O Status:
 - **IO:ERR** : I/O error detection (short circuit on output or input power supply).
 - **IO:WD_ACTIV** : watchdog status.
- Ethernet information :
 - **PING**: the resulting information of a ping command is shown.
 - **IP CONFLICT on xxx.xxx.xxx.xxx**: The module has detected an IP address conflict on the displayed address (IP address is visible only if it has been set manually).
 - **WLNK**: No link has been detected on both Ethernet port.
 - If IP address is configured as static or factory, then the IP address will be displayed.
 - **DEFx**: The module has detected an IP conflict, and defends its own IP address.
- EtherNet/IP Information :
 - State of EtherNet/IP :
 - **RUN**: Module exchange data with scanner.
 - **IDLE**: A connection is established, but I/O are not exchanged.
 - **OPERAT**: Connection in progress: An I/O connection was opened, but I/O data are not yet exchanged with the scanner.
 - **NO_CNX**: Connection has been lost with Scanner.
 - **NO_CONF**: No Implicit connection has been established (So, no configuration received from the Scanner).
 - **BAD_CONF**: Implicit connection received, but configuration parameters have bad values.
 - **RST**: The module has received a "reset" command on the Identity Object and will reboot in 1 second.

3. Getting started

Packaging content

Each product packaging includes:

- **HarshIO 600 eIP** – I/O Block
- 9 x plastic labels (for point labeling)
- 4 x M12 male closure cap (for sealing unused port)
- User's Manual

Accessories

Required devices, accessories and cordsets:

Reference	Description	Quantity	Manufacturer
Devices			
	Programmable controller processor with EtherNet/IP scanner port	1	
TCDEI-8D0N-DYU TCDEI-8C2N-DYU TCDEI-8B4N-DYU TCDEI-888N-DYU TCDEI-8D0P-DYU TCDEI-8C2P-DYU TCDEI-8B4P-DYU TCDEI-888P-DYU TCDEI-8YYX-DYU TCDEI-8D0N-D1U TCDEI-8C2N-D1U TCDEI-8B4N-D1U TCDEI-888N-D1U TCDEI-8D0P-D1U TCDEI-8C2P-D1U TCDEI-8B4P-D1U TCDEI-888P-D1U TCDEI-8YYX-D1U	HarshIO 600 eIP	N	BradControl from Molex
Network communication			
EWWA06003Mxy0* + ER1PADAPTER	<u>From Scanner to I/O Block</u> M12 Ultra-Lock™ (male D-coded) straight double-ended cordset + M12-to-RJ45 bulkhead adapter	1	BradControl from Molex
EWWA06003Mxy0*	<u>For I/O Block network chaining</u> M12 Ultra-Lock™ (male D-coded) straight double-ended cordset	N-1	BradControl from Molex
Power supply			
-	24 VDC Power supply	1	-
104006A01Mxy0*	<u>From Power supply module to I/O Block</u> Mini-Change® 4-pole female straight single-ended cordset	1	BradControl from Molex
114030A01Mxy0*	<u>For I/O Block power chaining</u> Mini-Change® 4-pole female straight / Mini-Change 4-pole male straight double-ended cordset	N-1	BradControl from Molex
Inputs / Outputs			
-	Field device (actuator or sensor)	N*16 (max.)	-
	M12 Ultra-Lock™ (male A-coded) straight single-ended cordset	N*8	BradControl from Molex

(*) xy represents the length of the cordset in meter (M). For instance, "05" indicates a cordset of 5M. Available length 1M, 2M, 3M, 4M, 5M or 10M according to cordset reference ([see Cables and Cordsets](#)).

Getting Started

1. I/O wiring and connect

Wire the inputs and/or outputs according to the drawings of chapter "Port wiring type" by using M12/Ultra_Lock (A-code) connectors. Depending on the model reference, the same I/O port supports two I/O channels (2 inputs, 2 outputs or 1 input and 1 output) according to I/O assignment. Only one M12/Ultra_Lock (A-code) connector is needed for two I/Os. Plug I/O's on their corresponding Ports.

2. Power connect

Make DC power connection from the 24 VDC power supply to the Power connector (IN) of the **HarshIO 600 eIP**.

If several **HarshIO 600 eIP** are used, chain the Power connector (OUT) of the first module with the Power connector (IN) of the next one.

3. Communication connect

Connect the first **HarshIO 600 eIP** to the Scanner with the appropriate network cable.

If several **HarshIO 600 eIP** are used, chain the network with the appropriate network cable.

4. Apply Power

Power up the power supply module and observe the status LED on each unit.

Module and Input Power Status LED - I			
State	Status	Description	Recommended action
OFF	No external power source	No external power source	Apply power to the I/O block Check power cable
Green – Solid ON	External power present	The power is applied to the I/O block	None

Output Power Status LED - O			
State	Status	Description	Recommended action
OFF	No external power source	No external power source	Apply power to the I/O block Check power cable
Green – Solid ON	External power present	The power is applied to the I/O block	None

Network Link Status LED - LINK			
State	Status	Description	Recommended action
OFF	No network link	No network link	Check the network link and set network link if not existing Check wire pinning
Green – Solid ON	100 Mbps network link present	The I/O block is correctly connected to the network	None
Green - BLINKING	100 Mbps network active	The I/O block is in communication with the network	None
Yellow – Solid ON	10 Mbps network link present	The I/O block is correctly connected to the network	None
Yellow - BLINKING	100 Mbps network active	The I/O block is communicating with the network	None

I/O Status LED – A or B (Port 1 to 8)			
State	Status	Description	Recommended action
OFF	Output not powered and no valid input	Output is not powered or input is not valid	None if not used Check I/O wire pinning
Green – Solid ON	Output powered and valid input	Output is powered and input is valid	None
Red – Solid ON	Fault diagnostic	<ul style="list-style-type: none"> - Short circuit occurred on I/O - Open load detection (output not set though voltage > 3V detected on this port) - Output set though output power not present 	Check I/O wiring

IMPORTANT: After power-up, the HarshIO 600 eIP is ready to operate within 8s. This includes the mechanism of Address Conflict Detection.

Typically, the module is correctly wired with the following status:

LINK LED:	Green or yellow	– solid ON or BLINK	=> Network OK
OUTPUT POWER:	Green	– solid ON	=> Power output OK
INPUT POWER:	Green	– solid ON	=> Power input OK
I/O LED:	Green	– solid ON	=> I/O activated

Network Address setting

Each **HarshIO 600 eIP** is configured in DHCP mode by default. When connecting to a network with a DHCP server, an IP address is automatically assigned to the block.

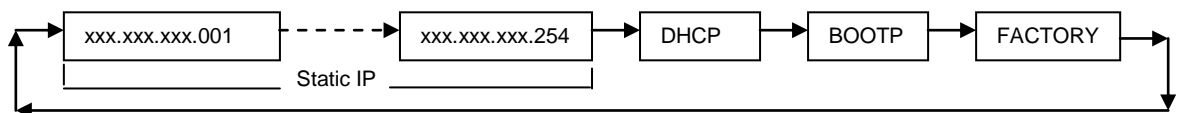
You can stop the DHCP procedure (in case of no DHCP server on the network) by touching the push-buttons to choose another mode (BOOTP, Factory, Static).

The Factory default IP Address is **192.168.1.1**

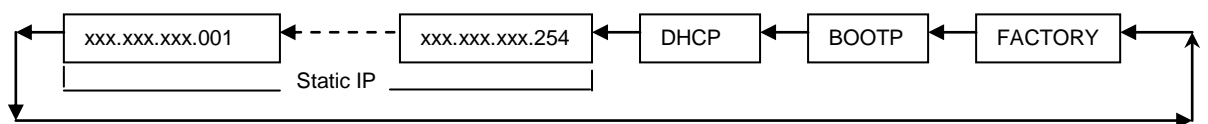
To change the network address, one of the following methods can be used:

➔ The push-buttons under the clear window of the I/O Block.

- Right button behavior (clockwise) :



- Left button behavior (counterclockwise) :



When an IP address mode is selected, it will be validated after 5 seconds of inactivity of the push-button.

When changing DHCP or BOOTP mode into Static IP mode, the mask of the Static IP address (xxx.xxx.xxx.) will be the same as it was in DHCP or BOOTP mode (given by the DHCP or BOOTP server).

For instance:

Factory mode: xxx.xxx.xxx. = **192.168.1.**

1st change from Factory mode to DHCP mode: xxx.xxx.xxx. = **200.100.2.**

2nd change from DHCP mode to Static IP mode: xxx.xxx.xxx. = **200.100.2.**

➔ The Built-in Web server. Menu "IP Configuration"

➔ EtherNet/IP functions: This is done by sending a specific command (explicit messaging on object 0xF5, Inst #1, Attr #3 & #5).

Note: If an I/O connection is active with a scanner, it will not be possible to change the IP address.

4. Web server interface

The web server interface offers the user a convenient and simple method for the diagnosis of **HarshIO 600 eIP** thru a web browser (Internet Explorer, Firefox, etc...).

To do so:

- Plug a computer with a web browser on the Ethernet switch.
- Enter the **HarshIO 600 eIP** IP address in the address box of the web browser.

A dialog window box will open and prompt for a User name and Password.

Login and password

The factory default settings for User name and Password are:

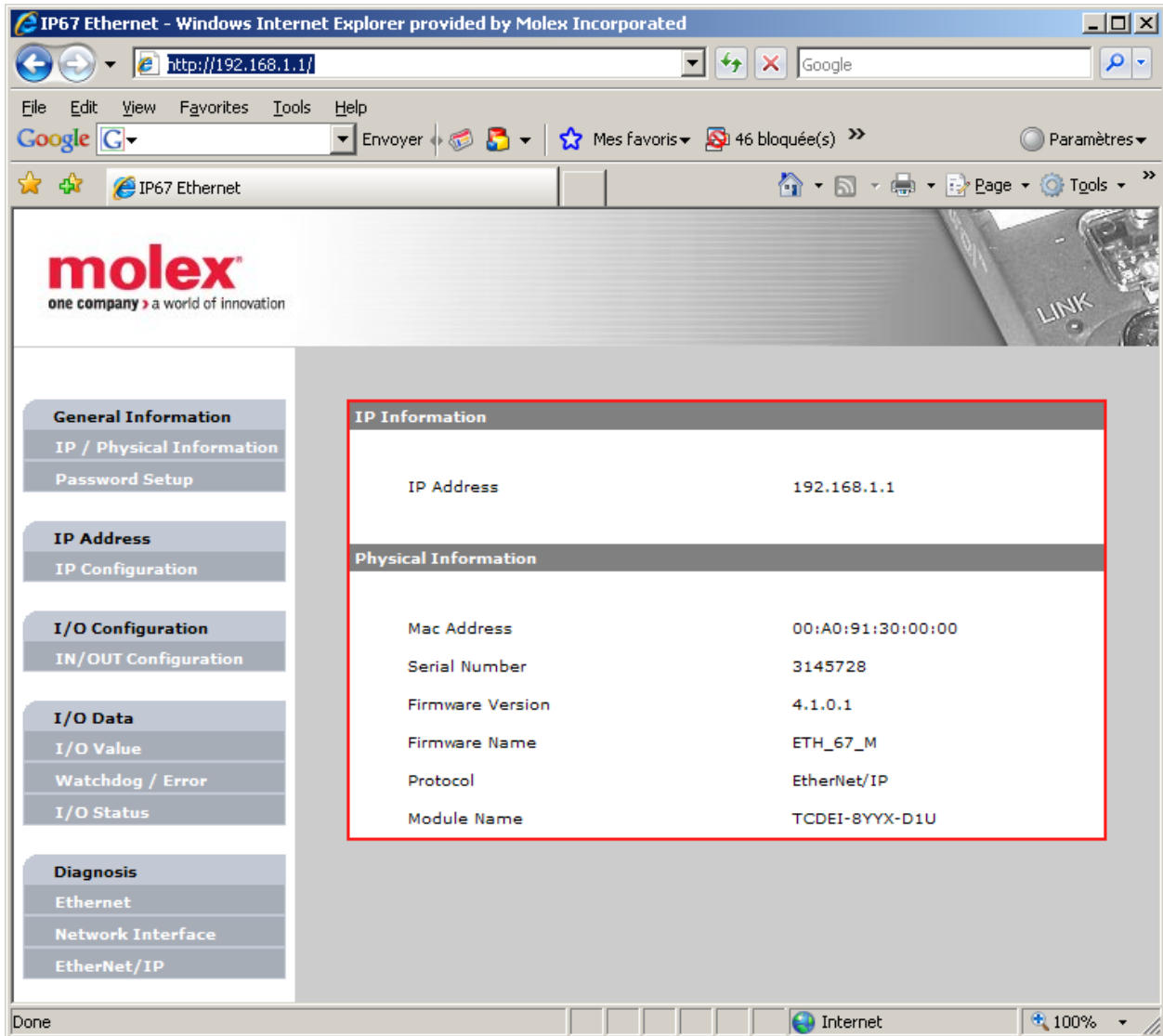
User name: **admin**

Password: **admin**



IP and Physical information

This page shows the main information about the selected EtherNet/IP I/O Block: IP Address, Mac Address, Serial Number, Firmware information, Protocol and Module Name.



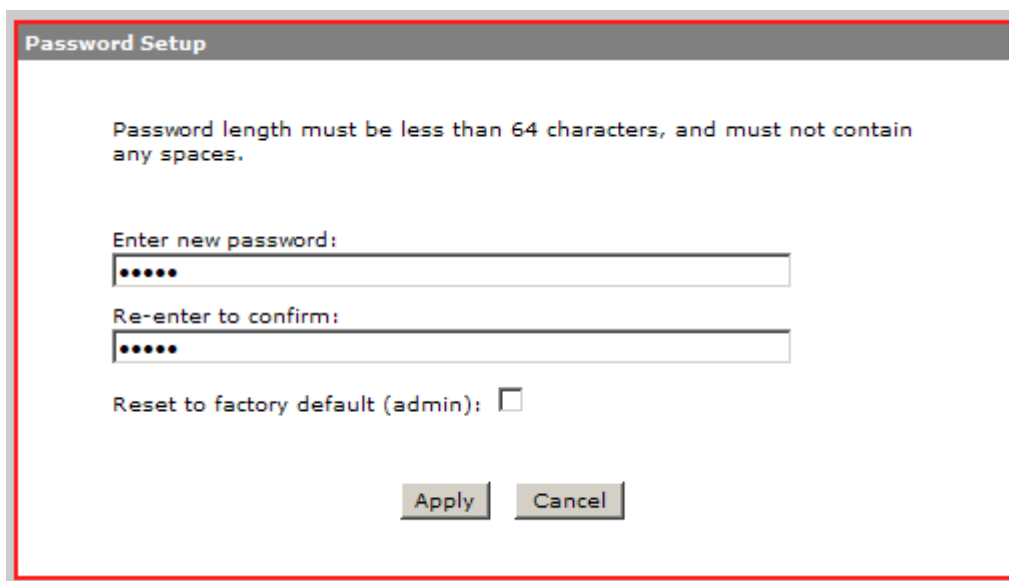
The screenshot shows a web browser window titled "IP67 Ethernet - Windows Internet Explorer provided by Molex Incorporated". The address bar shows "http://192.168.1.1/". The browser interface includes a search bar with "Google" and a navigation menu with "File", "Edit", "View", "Favorites", "Tools", and "Help". The main content area features the Molex logo and a sidebar with navigation options: "General Information", "IP Address", "I/O Configuration", "I/O Data", and "Diagnosis". The main content area displays two tables of information, both highlighted with a red border:

IP Information	
IP Address	192.168.1.1

Physical Information	
Mac Address	00:A0:91:30:00:00
Serial Number	3145728
Firmware Version	4.1.0.1
Firmware Name	ETH_67_M
Protocol	EtherNet/IP
Module Name	TCDEI-8YYX-D1U

Password setup

This page enables the modification of the password for the web server access.
The login Name cannot be changed.



The image shows a 'Password Setup' dialog box with a red border. It contains the following elements:

- Header:** Password Setup
- Instructions:** Password length must be less than 64 characters, and must not contain any spaces.
- Input Fields:**
 - Enter new password: [password field with 5 dots]
 - Re-enter to confirm: [password field with 5 dots]
- Checkbox:** Reset to factory default (admin):
- Buttons:** Apply, Cancel

IP Configuration

This page enables the modification of TCP/IP address of the EtherNet/IP I/O Block.

There are 4 possibilities:

- Manually assign a static IP address.
- The EtherNet/IP I/O Block can obtain its IP address from a DHCP server.
 - Optional: You can affect a Device Name to each module. This name will be used by the DHCP server to send the IP address based on this name and not on the MAC address. This feature is used, in case of maintenance, as you can change your module (so the MAC address) without changing the configuration of your DHCP server.
- The EtherNet/IP I/O Block can obtain its IP address from a BOOTP server.
- Set the IP address back to the factory default IP address 192.168.1.1.

The screenshot shows the IP Configuration interface with the following details:

- Static IP:** IP Address: 192.168.1.1, Subnet Mask: 255.255.255.0, Gateway Address: . . .
- DHCP Client:** Device Name: BRAD_0001
- BOOTP Client:** (Not selected)
- Factory IP (192.168.1.1):** (Selected)
- Buttons:** Apply, Refresh

Note: If Implicit Messaging (IO) is on track, it will not be possible to change the IP address.

IN/OUT Configuration

This page shows the configuration of the I/O ports:

- Input type: PNP or NPN.
- Input filter delay in ms.
- I/O ports configuration.

If the field “State of Configuration from EtherNet/IP Scanner” is:


- **“NOT CONFIGURED BY THE SCANNER”** it is the default configuration of the **HarshIO 600 eIP**.
- **“CONFIGURED BY THE SCANNER”**, then the configuration shown comes from the EtherNet/IP Scanner. In this case, all I/O ports of this module (with the reference TCDEI-8YYX-DYU) are configured in universal mode (Input and Output) by the scanner (See chapter [“Configuration by scanner”](#))

IN/OUT Configuration

Module Name
TCDEI-8YYX-D1U

I/O Type

Port	IN	OUT	IN/OUT
7.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
7.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
5.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
5.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
3.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
3.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
1.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
1.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>



Port	IN	OUT	IN/OUT
8.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
8.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
6.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
6.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
4.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
4.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
2.B	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
2.A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Input Circuit

Input Type PNP NPN

Input Filter ms

State of Configuration from EtherNet/IP Scanner

NOT CONFIGURED BY THE SCANNER

Depending on the scanner capabilities, the configuration of the block via the Web site will only be used if the Forward Open command does not contain any configuration data (Please refer to your Scanner User Manual).


If the Scanner sends Configuration Data into the Forward Open, then the block will be initialized in accordance to the data values sent, ignoring the Web site configuration.

I/O Value

This page shows the I/O values. However, it's not possible to change the value of outputs in this Web page.

It also displays the state of the configuration of the module (**CONFIGURED** / **NOT CONFIGURED**) by the EtherNet/IP scanner.

I/O Value



Port	IN	OUT
7.B	0	0
7.A	0	0
5.B	0	0
5.A	0	0
3.B	0	0
3.A	0	0
1.B	0	0
1.A	0	0

Port	IN	OUT
8.B	0	0
8.A	0	0
6.B	0	0
6.A	0	0
4.B	0	0
4.A	0	0
2.B	0	0
2.A	0	0

State of Configuration from EtherNet/IP Scanner

NOT CONFIGURED

Refresh


Watchdog and IDLE behavior

This page shows the status of watchdog which indicates if the watchdog is active or inactive. It also displays the state of the configuration of the module (**CONFIGURED BY THE SCANNER** / **NOT CONFIGURED BY THE SCANNER**) by the EtherNet/IP scanner. The fallback values define the outputs state if Watchdog or IDLE is activated.

Watchdog / Error

Fallback Values - changes have no effect if ports are configured as inputs

Port	Fallback Value*
7.B	0
7.A	0
5.B	0
5.A	0
3.B	0
3.A	0
1.B	0
1.A	0



Port	Fallback Value*
8.B	0
8.A	0
6.B	0
6.A	0
4.B	0
4.A	0
2.B	0
2.A	0

Watchdog Behavior

Watchdog Timeout: 0 x 100 ms

Apply Output Fallback Value
 Hold Output Value

Watchdog Management

Watchdog Status: **INACTIVE**

State of Configuration from EtherNet/IP Scanner

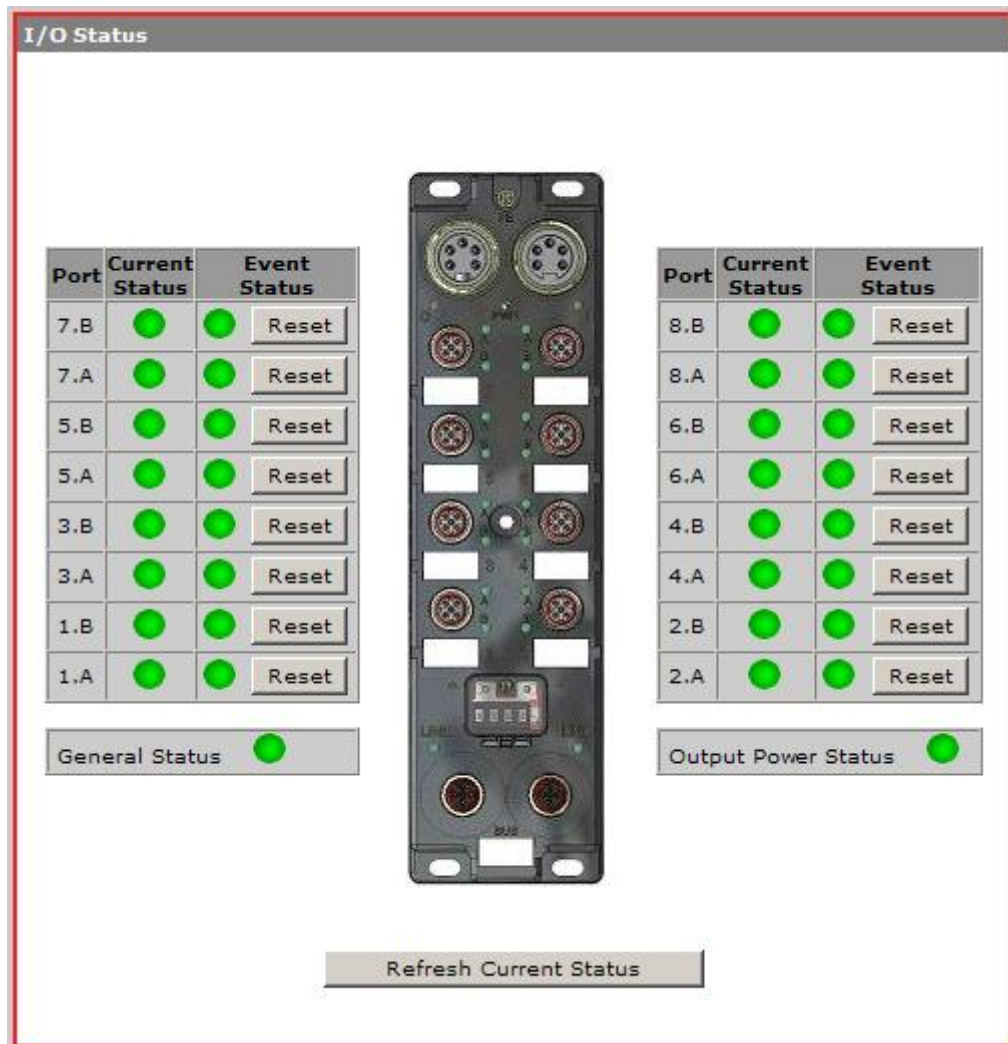
NOT CONFIGURED BY THE SCANNER

Apply Refresh

Note: See chapter [“Watchdog behavior”](#) and [“IDLE Behavior”](#) status for more details.

I/O Status

This page displays the I/O status.



Current Status: Each I/O point has a dedicated current status which informs if there is a problem on the I/O point in real time. The green LED means the I/O point works fine. The red LED means there is a problem on the I/O point.

A problem can be short circuit, overload or setting an output while Output Power is not present.

Event status: Each I/O point has a dedicated Event status which allows triggering a volatile error on the I/O point. (Typically a sporadic short-circuit). The button "Reset" allows resetting this information.

Power Status: The green LED indicates that the output power is present, while the red LED indicates that the output power is not present.

General Status: The green LED indicates that all I/O work fine while the red LED indicates that there is at least one problem on the I/O (short-circuit ...)

Ethernet

The Ethernet Diagnosis page displays different counters, in order to diagnose the 2 Ethernet ports:

Ethernet Statistics

	Interface Counters				Media Counters			
	Port0	In Octets	472	In Ucast Packets	434	Alignment Errors	0	Single Collisions
In NUcast Packets		0	In Discards	0	Multiple Collisions	0	Deferred Trans.	0
In Errors		0	In Unknown Protos	0	Excessive Collisions	0	Frame Too Long	0
Out Octets		368879	Out Ucast Packets	553	-	-	-	-
Out NUcast Packets		0	Out Discards	0	-	-	-	-
Out Errors		0	-	-	-	-	-	-

	Interface Counters				Media Counters			
	Port1	In Octets	0	In Ucast Packets	0	Alignment Errors	0	Single Collisions
In NUcast Packets		0	In Discards	0	Multiple Collisions	0	Deferred Trans.	0
In Errors		0	In Unknown Protos	0	Excessive Collisions	0	Frame Too Long	0
Out Octets		0	Out Ucast Packets	0	-	-	-	-
Out NUcast Packets		0	Out Discards	0	-	-	-	-
Out Errors		0	-	-	-	-	-	-

Interface Counters	
In Octets	Number of packets received (between 64 and 1522 octets in length)
In Ucast Packets	Number of unicast packets received
In NUCast Packets	Number of non-unicast packets received
In Discards	Number of inbound packets discarded
In Errors	Number of incoming packets including errors. (Undersize, Fragments, Oversize, Jabbers, Symbol Error, CRC Error, Alignment Error)
In Unknown Protos	Inbound packets discarded due to unknown or unsupported protocol
Out Octets	Number of output packets transmitted (between 64 and 1522 octets in length)
Out Ucast Packets	Number of unicast output packets transmitted
Out NUCast Packets	Number of non-unicast output packets transmitted
Out Discards	Number of outbound packets discarded
Out Errors	Number of outbound packets that could not be transmitted due to errors

Media Counters	
Alignment Errors	Number of alignment errors in Rx packets
Single Collisions	Successfully transmitted frames on a port for which transmit is inhibited by exactly one collision
Multiple Collisions	Successfully transmitted frames on a port for which transmit is inhibited by more than one collision
Deferred Transmissions	Transmitted packets by a port for which the 1st transmit attempt is delayed due to the busy medium
Excessive Collisions	Count of frames for which transmit fails due to excessive collisions
Frame Too Long	Received oversize packets with good CRC (max: 1536 or 1522 bytes)

Network Interface

This page shows information about Ethernet connection for each port:

- Speed : 10 Mbps or 100 Mbps
- Negotiation: Manual or Auto-negotiate.
The negotiation mode (so the speed and duplex) is settable through the EtherNet/IP object 0xF6 Inst #2 (Port 0) or #3 (Port 1) Attr #3.
- Duplex mode: Half or Full.

Network Interface

SWITCH PORT 0

Speed: 10 Mbps 100 Mbps

Negotiation: Manual Auto

Duplex: Half Full

SWITCH PORT 1

Speed: 10 Mbps 100 Mbps

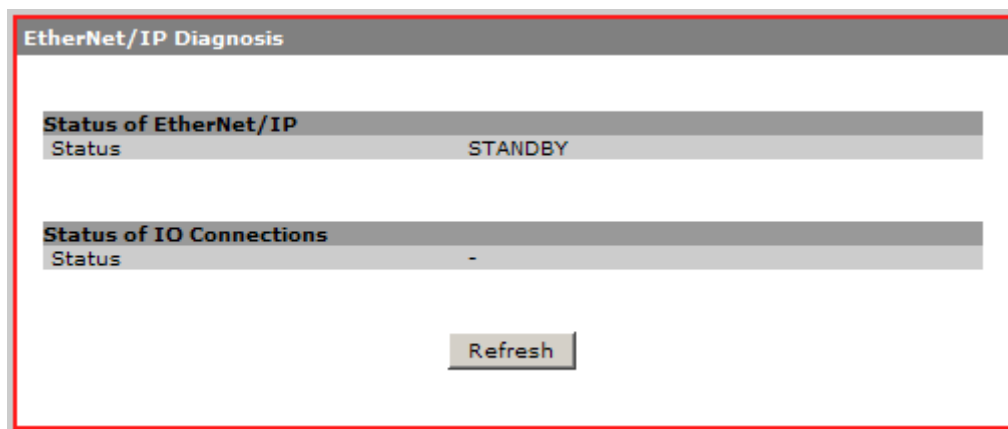
Negotiation: Manual Auto

Duplex: Half Full

EtherNet/IP

This page allows to diagnose EtherNet/IP:

- Status of EtherNet/IP:
 - **STANDBY**: The module is waiting for a connection from the EtherNet/IP scanner.
 - **NO CONNECTION**: Connection with the EtherNet/IP scanner lost.
 - **CONNECTED**: Connection is established with the EtherNet/IP scanner (Forward Open successful).
 - **OPERATIONAL**: Connection in progress: An I/O connection was opened, but I/O data are not yet exchanged with the scanner.
- Status of I/O Connections:
 - **RUN**: I/O exchange with the EtherNet/IP scanner is in progress.
 - **IDLE**: The module received the IDLE flag from the EtherNet/IP scanner. The output values consumed the scanner are still applied.



5. EtherNet/IP object classes

HarshIO 600 eIP supports CIP using ODVA “Communications Adapter Device” profile. Additional objects include user defined configuration (I/O configuration, Watchdog ...) and diagnosis objects.

CIP Classes services

HarshIO 600 eIP supports the following class services.

Service Code	Service Name
01 (0x01)	Get_Attribute_All
05 (0x05)	Reset
14 (0x0E)	Get_Attribute_Single
16 (0x10)	Set_Attribute_Single

Connections Consideration

The firmware embedded in the **HarshIO 600 eIP** supports up to a maximum of 128 connections (any mix implicit or explicit).

Fewer connections allow faster Data I/O update rates (RPI value). For a maximum I/O Performance the number of connections should be limited to 10 or less.

I/O Connections:

- Module supports 2 Transport Class 1 I/O connections:
 - o 1 Exclusive Owner
 - o 7 Listen Only

For Class 1 connection, the EtherNet/IP I/O Block:

- Supports bi-directional connections, i.e. accepts a Forward Open with non-null O=>T and T=>O connection types. The device also supports unidirectional connections (with a null connection type in either O=>T or T=>O).
- Supports Cyclic trigger type.
- Supports :
 - o Multicast and unicast (used for Listen Only connection) T=>O connection
 - o Unicast O=>T connection.
- Supports a Listen Only connection supporting more than 1 listener if the device has input data. Note that this is necessary regardless of whether the device has output data or not.
- Provides a "heartbeat" connection path to be used for connection pairs where application data is only flowing in one direction. Note: Connections to the heartbeat connect path are configured with 0 data length and do not include a 32-bit Real-Time Header (Run/Idle Header).
- Supports Electronic Keys in the Forward Open connection path. The device also supports a Null key segment and no key segment.
- Supports the 32-bit Real-Time Header (Run/Idle Header) in the O=>T connection data.

RPI Consideration

The module actually supports an RPI of 2 ms and higher.

CIP Object Classes

HarshIO 600 eIP supports the following object classes.

Class Code	Object Type
(0x01)	Identity
(0x02)	Message Router
(0x04)	Assembly
(0x06)	Connection Manager Object
(0xF5)	TCP/IP Interface Object
(0xF6)	Ethernet Link Object
(0x300)	Configuration Object
(0x301)	Diagnostic General Object
(0x302)	Diagnostic I/O Port Object

Configuration by scanner

HarshIO 600 eIP is configured by the EtherNet/IP scanner through a Forward Open by using Configuration Assembly Instance #103.

This is one way to configure the block. By this method it's easy to replace a block by a new one. Also, the new block will be automatically configured in the same way as the old one.

If your scanner does not support configuration data in the Forward Open, then the configuration can be alternatively done through the Web server (in case of Part Number TCDEI-8YYX-DYU). The Scanner then does not need to send any data during initialisation, and the module will start with the configured state (I/O, Watchdog, Output reply values).

In this case, the Configuration Assembly Instance is #104

EDS Files

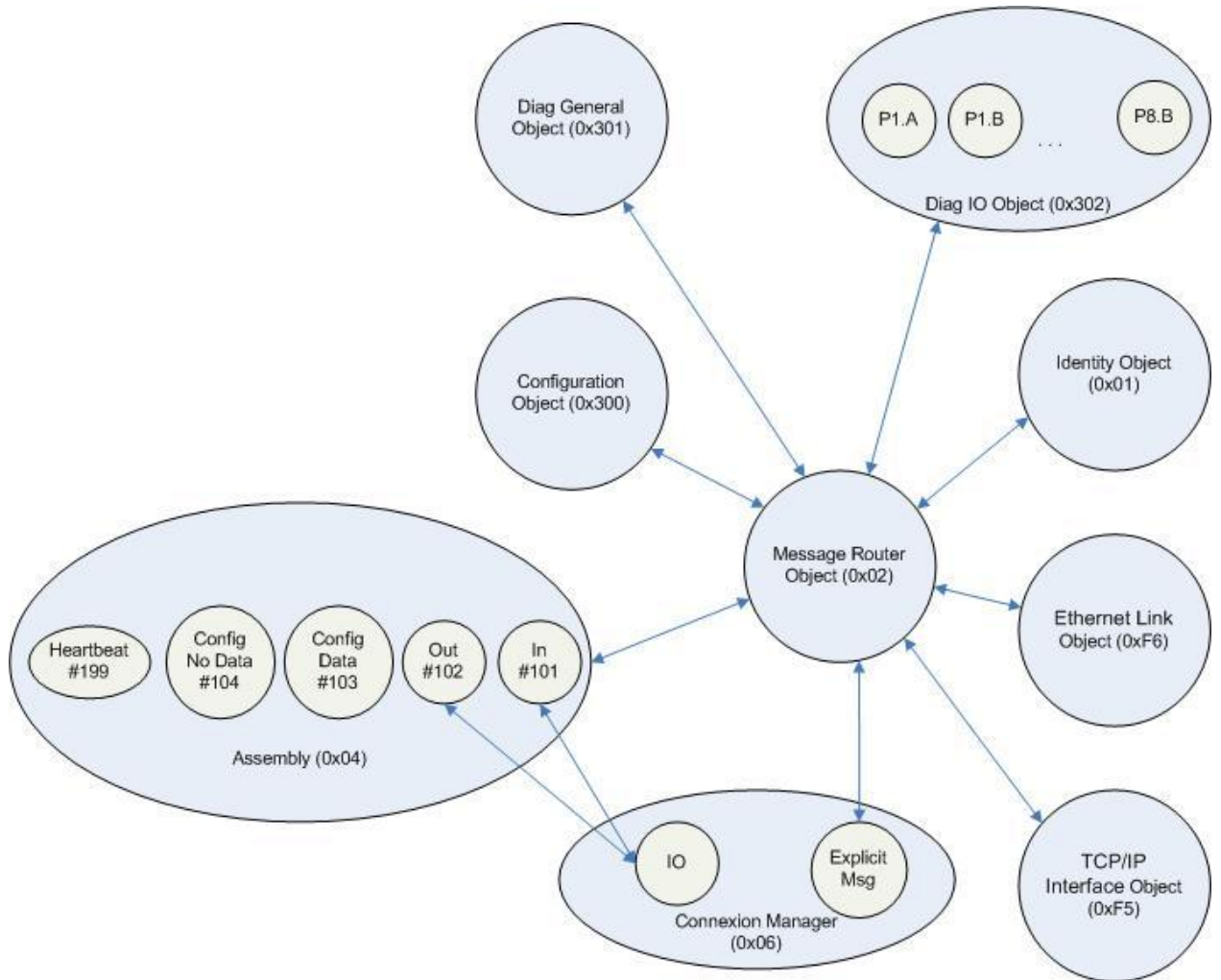
The EDS files can be downloaded from the Woodhead website.
Configure the **HarshIO 600 eIP** via the EDS file. In this EDS file, the **HarshIO 600 eIP** is implemented as standard device in your system.

EDS file list for **HarshIO 600 eIP** devices:

Name	EDS File	Product Code
TCDEI-8D0N-DYU	0008000C03140401.eds	0x314 (788)
TCDEI-8C2N-DYU	0008000C03150401.eds	0x315 (789)
TCDEI-8B4N-DYU	0008000C03160401.eds	0x316 (790)
TCDEI-888N-DYU	0008000C03170401.eds	0x317 (791)
TCDEI-8D0P-DYU	0008000C03100401.eds	0x310 (784)
TCDEI-8C2P-DYU	0008000C03110401.eds	0x311 (785)
TCDEI-8B4P-DYU	0008000C03120401.eds	0x312 (786)
TCDEI-888P-DYU	0008000C03130401.eds	0x313 (787)
TCDEI-8YYX-DYU	0008000C03180401.eds	0x318 (792)
TCDEI-8D0N-D1U	0008000C03040401.eds	0x304 (772)
TCDEI-8C2N-D1U	0008000C03050401.eds	0x305 (773)
TCDEI-8B4N-D1U	0008000C03060401.eds	0x306 (774)
TCDEI-888N-D1U	0008000C03070401.eds	0x307 (775)
TCDEI-8D0P-D1U	0008000C03000401.eds	0x300 (768)
TCDEI-8C2P-D1U	0008000C03010401.eds	0x301 (769)
TCDEI-8B4P-D1U	0008000C03020401.eds	0x302 (770)
TCDEI-888P-D1U	0008000C03030401.eds	0x303 (771)
TCDEI-8YYX-D1U	0008000C03080401.eds	0x308 (776)

EtherNet/IP Profile

HarshIO 600 eIP supports “Communications Adapter Device” profile and implements the following objects:

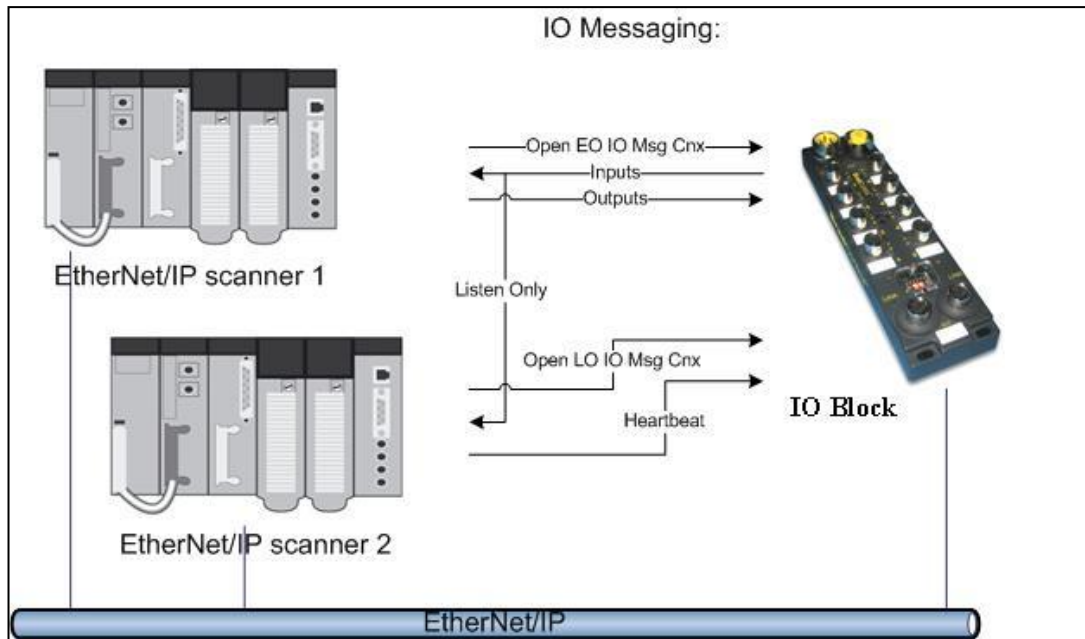


I/O Messaging

It is possible to Read and Write I/O on the block via Implicit Messaging (I/O messaging) through Exclusive Owner connection. The module supports only 1 Exclusive Owner (EO) connection.

A second connection (Listen Only) allows another EtherNet/IP scanner to listen to inputs. The module supports up to 7 Listen Only (LO) connection.

Also, in the two cases, current status, trace status and watchdog state will be available in the Input frame.



Input Mapping

Assembly Input Instance = 101 (0x65).
Size = 8 bytes.

Note: For each Part Number, the input mapping is always the same even if no input is configured.

Offset	Type	Description
0x00	UINT	Input Data
0x02	UINT	Status Current
0x04	UINT	Trace Status
0x06	UINT	Watchdog

Offset 0x00: Mapping for Input data buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1.A	P1.B	P2.A	P2.B	P3.A	P3.B	P4.A	P4.B	P5.A	P5.B	P6.A	P6.B	P7.A	P7.B	P8.A	P8.B

Offset 0x02: Mapping for Current Status data buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1.A	P1.B	P2.A	P2.B	P3.A	P3.B	P4.A	P4.B	P5.A	P5.B	P6.A	P6.B	P7.A	P7.B	P8.A	P8.B

Offset 0x04: Mapping for Trace Status data buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1.A	P1.B	P2.A	P2.B	P3.A	P3.B	P4.A	P4.B	P5.A	P5.B	P6.A	P6.B	P7.A	P7.B	P8.A	P8.B

Offset 0x06: Mapping for Watchdog state data buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0/1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Output Mapping

Assembly Output Instance =102 (0x66).
Size = 2 bytes.

Note: For each Part Number, the output mapping is always the same even if no output is configured.

Offset	Type	Description
0x00	UINT	Output Data

Offset 0x00: Mapping in Output data buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1.A	P1.B	P2.A	P2.B	P3.A	P3.B	P4.A	P4.B	P5.A	P5.B	P6.A	P6.B	P7.A	P7.B	P8.A	P8.B

Configuration Object (0x300)

This object allows the access to the I/O configuration of the **HarshIO 600 eIP**. This object is updated after receiving a new I/O connection.

Supported Attribute Class:

Class Attribute ID	Name	Get	Set	Data Type	Value
1	Revision	●	○	UINT	1
2	Max Instance	●	○	UINT	1
3	Number of instance	●	○	UINT	1

Supported Instances:

Instances Attribute ID	Name	Get	Set	Data Type	Value
1	I/O configuration	●	○	ARRAY[16] of UINT	0: Input 1: Output 2: In/Out
2	Input Type	●	○	UINT	0: PNP, 1: NPN
3	Input Filter	●	○	UINT	0, 0.5, 1.0, 1.5, 2.0, 2.5, 5.0
4	Reply values for watchdog	●	○	ARRAY[16] of UINT	0: Off 1: On
5	Watchdog Time Out	●	○	UINT	Default: 0
6	Output apply mode	●	○	UINT	0: Output Reply Value 1: Hold Output Value
7	DHCP Device Name	●	●	SHORT_STRING	Default: ""

I/O Configuration buffer:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1.A	P1.B	P2.A	P2.B	P3.A	P3.B	P4.A	P4.B	P5.A	P5.B	P6.A	P6.B	P7.A	P7.B	P8.A	P8.B

The "Reply values for watchdog" buffer has the same mapping.

Supported Services for object (0x300):

Service Code	Name	Class	Instance
0x0E	Get_Attribute_Single	●	●
0x01	Get_Attribute_All	●	●
0x10	Set_Attribute_Single	○	●

General Diagnosis Object (0x301)

This object is used to know the general error status of **HarshIO 600 eIP**.

Supported Attribute Class:

Class Attribute ID	Name	Get	Set	Data Type	Value
1	Revision	●	○	UINT	1
2	Max Instance	●	○	UINT	1
3	Number of instance	●	○	UINT	1

Supported Instances:

Instances Attribute ID	Name	Get	Set	Data Type	Value
1	Global Status	●	○	UINT	0: No error 1: A least one error has been found
2	Power Status	●	○	UINT	0: OK 1: output power not present
3	Watchdog status	●	○	UINT	0: Watchdog inactive 1: Watchdog active
4	Displayed message	●	○	SHORT_STRING	Message displayed on the module

Supported Services for object (0x301):

Service Code	Name	Class	Instance
0x0E	Get_Attribute_Single	●	●
0x01	Get_Attribute_All	●	●

I/O Diagnosis Object (0x302)

This object is used to perform diagnosis on each I/O port. This object offers the possibility to reset I/O errors on each port.

Supported Attribute Class:

Class Attribute ID	Name	Get	Set	Data Type	Value
1	Revision	●	○	UINT	1
2	Max Instance	●	○	UINT	16
3	Number of instance	●	○	UINT	16

Supported Instances:

Instances Attribute ID	Name	Get	Set	Data Type	Value
1	I/O Name	●	○	SHORT_STRING	"1.A", "2.B"...
2	I/O status	●	●	UINT	0 : OK 1 : Error (overload, short circuit) 2 : No Output Power
3	I/O status Trace	●	●	UINT	0 : OK 1 : Error (overload, short circuit) 2 : No Output Power

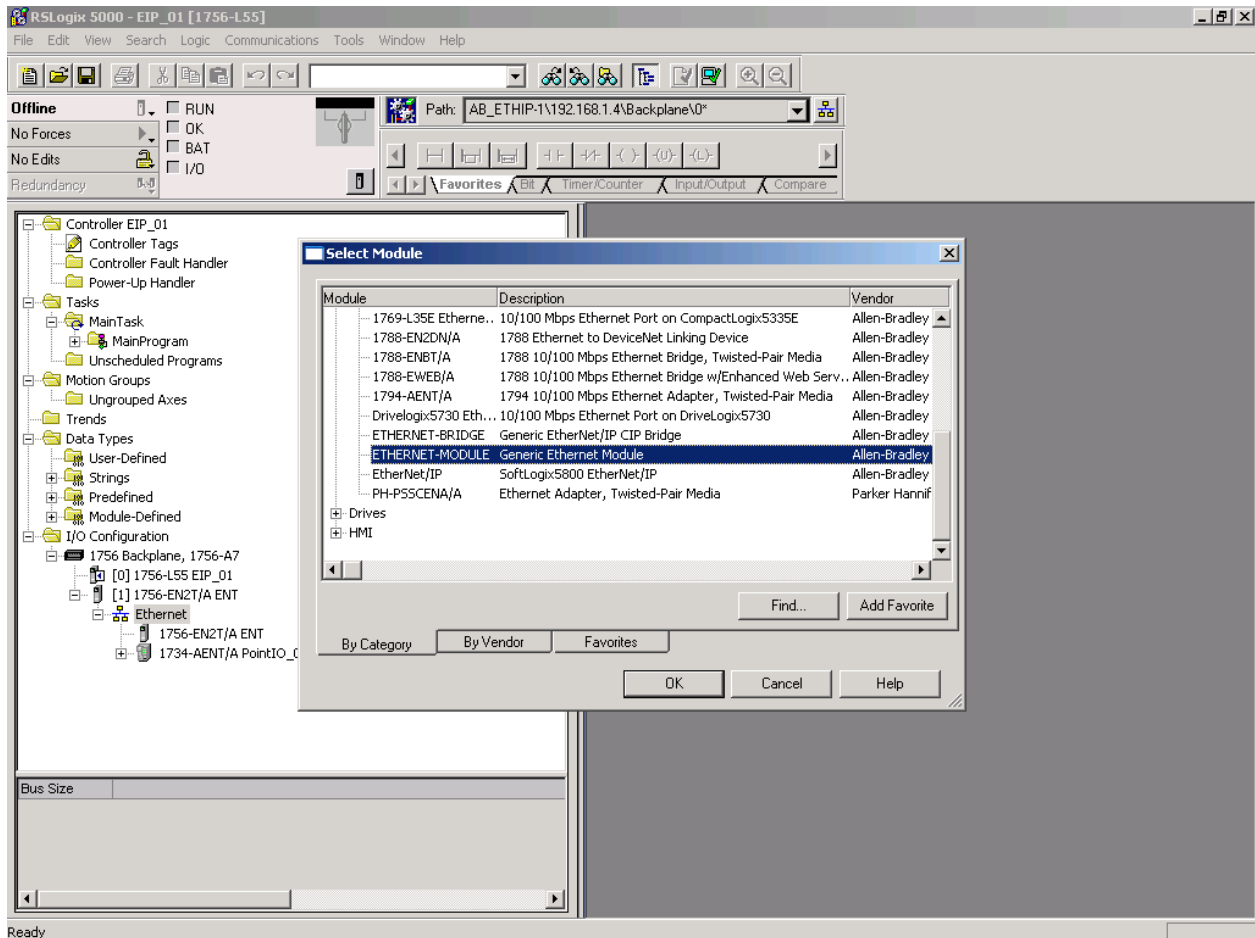
Supported Services for object (0x302):

Service Code	Name	Class	Instance
0x0E	Get_Attribute_Single	●	●
0x01	Get_Attribute_All	●	●
0x32	Reset Status	○	●

6. Configuration using RSLogix 5000

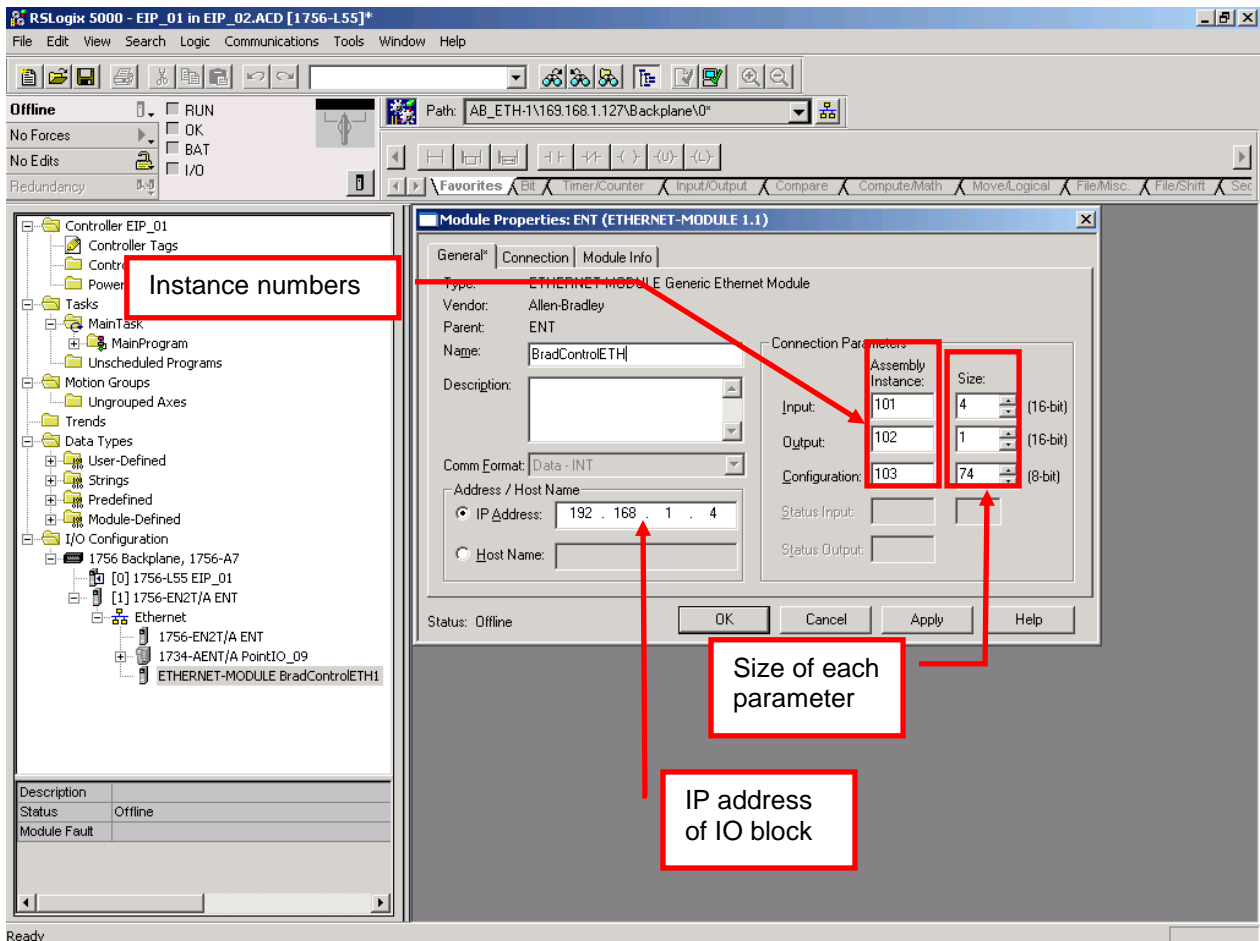
Add an EtherNet/IP I/O Block

The first step is to add a **HarshIO 600 eIP** in the configuration of a Rockwell Scanner supporting EtherNet/IP by selecting "ETHERNET-MODULE" (Generic Ethernet Module) device as shown here below.



EtherNet/IP I/O Block configuration

In the configuration of the "ETHERNET-MODULE", set the parameters of the **HarshIO 600 eIP** with the following properties:



Connection Parameters:

1 - Input:

The size (in 16-bit word) has to be set to 4, which represents:

- Word 1: Input values
- Word 2: Status for each I/O
 - o The value represents the I/O where a fault appears (if value = 1, a short circuit is on point 1, if value = 2, a short circuit is on point 2, if value = 3, a short circuit is on points 1 and 2, ...)
- Word 3: Status memory for each I/O
 - o The value represents the same information than Word 2, except that it will remain until, it has been reset by the user application (see [I/O Diagnosis Object](#))
- Word 4: Watchdog Status
 - o The value represents the status of the watchdog: 0 if the watchdog is not active, 1 if the watchdog is active.

2 – Output:

The size (in 16-bit word) has to be set to 1, which represents:

- Word 1 : Output values

3 – Configuration:

Those data are optional in case of:

- Fixed configuration block is used, and you do not need to use the watchdog or change the Input filter.
 - The configuration is done through the web server.
- In this case the size shall be set to 0.

In case of user configuration:

The size (**in byte**) has to be set to **74 (i.e. 37 words)**, which represents:

- Word 1 to 16: I/O configuration for each point
 - o Value = 0 : Input
 - o Value = 1 : Outputs
 - o Value = 2 : Output & Input (self-configuring)
- Word 17: Input Type
 - o Value = 0 : PNP (default)
 - o Value = 1 : NPN
- Word 18 : Input filter
 - o Value = 0 : no filter
 - o Value = 1 : filter set to 0.5 ms
 - o Value = 2 : filter set to 1 ms
 - o Value = 3 : filter set to 1.5 ms
 - o Value = 4 : filter set to 2 ms
 - o Value = 5 : filter set to 2.5 ms (default)
 - o Value = 6 : filter set to 5 ms
- Word 19 to 34: Reply value for each I/O set as an output. The watchdog is applied when a communication fault appears between the Scanner and the Device, or Scanner enters into IDLE state
 - o Value = 0 : The output will be set to 0 (default)
 - o Value = 1 : The outputs will be set to 1
- Word 35: Watchdog Time out
 - o The value represents the timeout in 100 ms steps
 - o If value = 0, the watchdog is not activated (default)
 - o If value = A, the watchdog is set to A x 100ms.
- Word 36: Output apply mode (IDLE & Watchdog)
 - o If value = 0, the watchdog applies output reply values. (default)
 - o If value = 1, the watchdog holds current output values.
- Word 37: Product code of the module (see table below)

Model reference	Product Code	Description
TCDEI-8D0N-DYU	788	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 16 NPN Inputs
TCDEI-8C2N-DYU	789	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 14 NPN Inputs & 2 Outputs
TCDEI-8B4N-DYU	790	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 12 NPN Inputs & 4 Outputs
TCDEI-888N-DYU	791	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 8 NPN Inputs & 8 Outputs
TCDEI-8D0P-DYU	784	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 16 PNP Inputs
TCDEI-8C2P-DYU	785	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 14 PNP Inputs & 2 Outputs
TCDEI-8B4P-DYU	786	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 12 PNP Inputs & 4 Outputs
TCDEI-888P-DYU	787	4 Pins Power IP67 EtherNet/IP, 8 digital ports, 8 PNP Inputs & 8 Outputs
TCDEI-8YYX-DYU	792	4 Pins Power IP67 EtherNet/IP, 16 self-configuring* PNP Input / Output points
TCDEI-8D0N-D1U	772	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 16 NPN Inputs
TCDEI-8C2N-D1U	773	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 14 NPN Inputs & 2 Outputs
TCDEI-8B4N-D1U	774	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 12 NPN Inputs & 4 Outputs
TCDEI-888N-D1U	775	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 8 NPN Inputs & 8 Outputs
TCDEI-8D0P-D1U	768	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 16 PNP Inputs
TCDEI-8C2P-D1U	769	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 14 PNP Inputs & 2 Outputs
TCDEI-8B4P-D1U	770	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 12 PNP Inputs & 4 Outputs
TCDEI-888P-D1U	771	5 Pins Power IP67 EtherNet/IP, 8 digital ports, 8 PNP Inputs & 8 Outputs
TCDEI-8YYX-D1U	776	5 Pins Power IP67 EtherNet/IP, 16 self-configuring* PNP/NPN Input / Output points

Note 1:

The configuration needs to have correct values. If not, the connection will be refused by the I/O block and the module will show **EIP:BAD CONF** in the display.

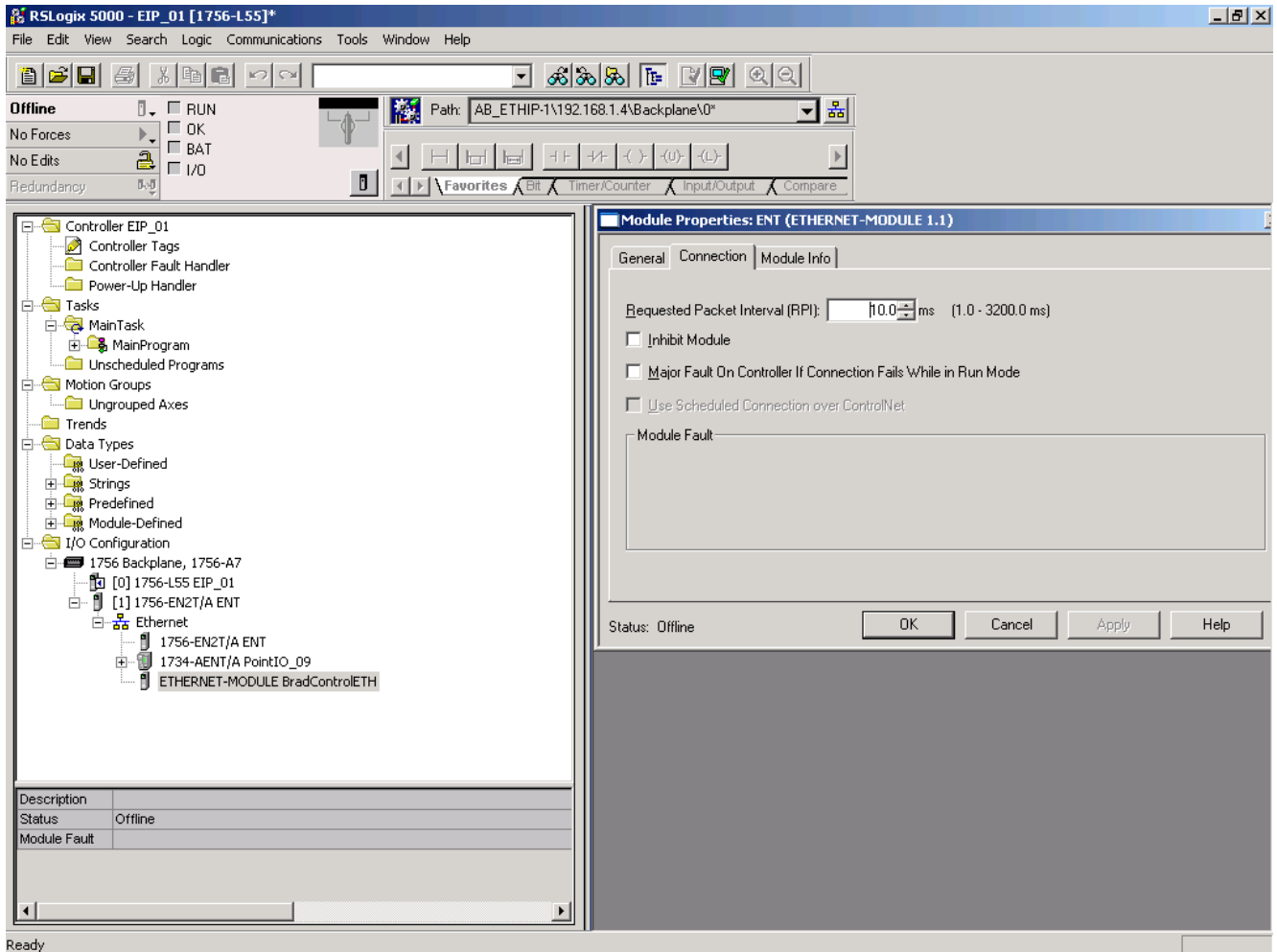
The module shows **EIP:RUN** in the display when the connection is accepted.

Note 2:

The format of data is Intel based (Little Endian). So the word value 0x0001 will be presented as 01 00, on a byte format.

The last step is to define the RPI (Requested Packet Interval) between the Scanner and the I/O block.

The minimum RPI is 2 ms.



7. Specific behavior

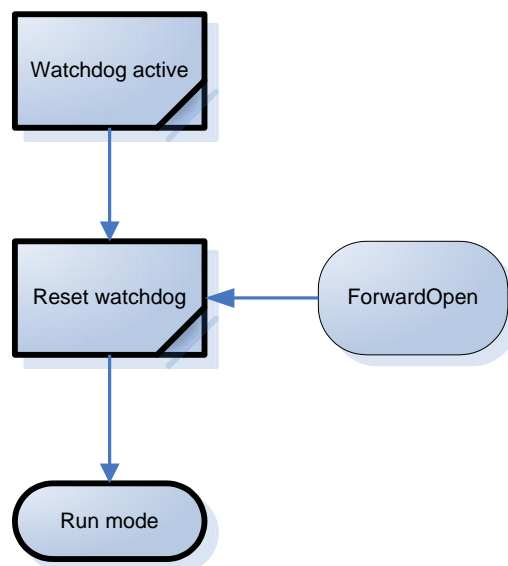
Watchdog behavior

When the Watchdog parameter (sent by the Scanner during the I/O connection) is different than 0 then the watchdog mechanism is activated. Reset this parameter disables the watchdog mechanism.

- If no access is made on Output Data (**write access**) during this period (Watchdog value * 100 ms) then the watchdog procedure is activated.
- When the watchdog is activated then output are not accessible.
- As long as the watchdog has not been activated each **write access** on the Output resets the scan time of this period.
- The watchdog procedure applies the Watchdog behavior state :
 - o hold last state output or
 - o apply Output Fallback

To reset the watchdog when it is activated, it will be necessary for the scanner to open a new I/O connection (Exclusive Owner).

The following diagram describes the procedure to follow, to start-up the module again:



DHCP behavior

HarshIO 600 eIP supports the DHCP (Dynamic Host Configuration Protocol) which is a communication protocol that lets network administrators centrally manage and automate the assignment of Internet Protocol (IP) addresses in an organization's network.

DHCP defines a client identifier (called "Device Name") option which is used to pass an explicit client identifier to a DHCP server. With this option, the DHCP server can assign an IP address by using the client identifier name instead of the MAC address used usually.

Be aware that not all DHCP servers support the client identifier option.

When the module is waiting for a DHCP server response, it can be interrupted at any time by the buttons to choose a static IP address for example.

IDLE behavior

The HarshIO 600 eIP behavior is configurable when the scanner produces I/O data with IDLE state active. The configuration of IDLE state behavior can be done through:

- Web interface
- During the connection initialization (Forward_Open)

You can select the following:

- Set specific outputs state
- Outputs remain in the last state.

The output behavior will remain in the selected state, while the scanner sets the IDLE bit, in the I/O data frame.

The configuration will be done through the Watchdog condition (see Watchdog configuration). This means that the IDLE behavior and Watchdog behavior are identical, except if the timeout is set to 0 (then the watchdog is inactive).

Duplicate IP address

The **HarshIO 600 eIP** performs a duplicate IP address checking.

The goal of this feature is, during boot up and after the IP address is set (from DHCP, BOOTP or manually set) to ensure that the IP address is not used by another device on the network.

If the module detects another equipment with the same IP address, it will:

- Defend its IP address 10 times.
- If conflict is confirmed
 - o The block will release its IP address
 - o The display will show the message : IP CONFLICT on xxx.xxx.xxx.xxx (IP address)

8. Technical specifications

PNP-type Inputs

Technical Data	Model reference			
	TCDEI-8D0P-D1U TCDEI-8D0P-DYU	TCDEI-888P-D1U TCDEI-888P-DYU	TCDEI-8B4P-D1U TCDEI-8B4P-DYU	TCDEI-8C2P-D1U TCDEI-8C2P-DYU
Number of Inputs	16	8	12	14
Number of Outputs	0	8	4	2
Ethernet Connector	M12/Ultra-Lock™ (female D-Coded)			
I/O Connector	M12/Ultra-Lock™ (female A-Coded)			
Power In Connector	Mini-Change® 5-Poles (male) for TCDEI-xxxx-D1U references Mini-Change® 4-Poles (male) for TCDEI-xxxx-DYU references			
Power Out Connector	Mini-Change® 5-Poles (female) for TCDEI-xxxx-D1U references Mini-Change® 4-Poles (female) for TCDEI-xxxx-DYU references			
Module & Input Power (L1)	24 VDC (13 –30V)			
Output Power (L2)	N/A	24 VDC (13 –30V)		
Output Current	N/A	2.0 A / point Total = 8A Max		
Short circuit current (typical)	N/A	6.5 A		
Output Switching frequency	N/A	200 Hz		
Output voltage	N/A	L2 (-1V)		
Output type	N/A	sourcing		
Input Signal voltage ("0")	-2V ... 5V			
Input Signal voltage ("1")	10V ... 30V			
Input filter	2.5 ms			
Input short circuit (per port)	600mA			
Input Voltage	L1			
Input Current (per port)	140 mA			
Input Type	PNP			
Operating temperature	-25°C ... +70°C (-13°F ... 158°F)			
Storage temperature	-40°C ... +90°C (-40°F ... 194°F)			
Vibration resistance	Up to IEC68-2-6			
EMC	EN 61000-6-2			
Protection Class	IP67			
MTBF	100,000 H			

NPN-type Inputs

Technical Data	Model reference			
	TCDEI-8D0N-D1U TCDEI-8D0N-DYU	TCDEI-888N-D1U TCDEI-888N-DYU	TCDEI-8B4N-D1U TCDEI-8B4N-DYU	TCDEI-8C2N-D1U TCDEI-8C2N-DYU
Number of Inputs	16	8	12	14
Number of Outputs	0	8	4	2
Ethernet Connector	M12/Ultra-Lock™ (female D-Coded)			
I/O Connector	M12/Ultra-Lock™ (female A-Coded)			
Power In Connector	Mini-Change® 5-Poles (male) for TCDEI-xxxx-D1U references Mini-Change® 4-Poles (male) for TCDEI-xxxx-DYU references			
Power Out Connector	Mini-Change® 5-Poles (female) for TCDEI-xxxx-D1U references Mini-Change® 4-Poles (female) for TCDEI-xxxx-DYU references			
Module & Input Power (L1)	24 VDC (13 –30V)			
Output Power (L2)	N/A	24 VDC (13 –30V)		
Output Current	N/A	2.0 A / point Total = 8A		
Short circuit current (typical)	N/A	6.5 A		
Output Switching frequency	N/A	200 Hz		
Output voltage	N/A	L2 (-1V)		
Output type	N/A	Sourcing		
Input Signal voltage ("0")	-2V ... 5V			
Input Signal voltage ("1")	10V ... 30V			
Input filter	2.5 ms			
Input short circuit (per port)	600mA			
Input Voltage	L1			
Input Current (per port)	140 mA			
Input Type	NPN			
Operating temperature	-25°c ... +70°c (-13°F ... 158°F)			
Storage temperature	-40°c ... +90°c (-40°F ... 194°F)			
Vibration resistance	Up to IEC68-2-6			
EMC	EN 61000-6-2			
Protection Class	IP67			
MTBF	100,000 H			

Configurable Points (Output or PNP/NPN -type Input)

Technical Data	Model reference
	TCDEI-8YYX-D1U TCDEI-8YYX-DYU
Number of Inputs and Outputs	16 configurable
Ethernet Connector	M12/Ultra-Lock™ (female D-Coded)
I/O Connector	M12/Ultra-Lock™ (A-Coded)
Power In Connector	Mini-Change® 5-Poles (male) for TCDEI-8YYX-D1U references Mini-Change® 4-Poles (male) for TCDEI-8YYX -DYU references
Power Out Connector	Mini-Change® 5-Poles (female) for TCDEI-8YYX -D1U references Mini-Change® 4-Poles (female) for TCDEI-8YYX -DYU references
Module & Input Power (L1)	24 VDC (13 –30V)
Output Power (L2)	24 VDC (13 –30V)
Output Current	2.0 A / point Total = 8A Max
Short circuit current (typical)	6.5 A
Output Switching frequency	200 Hz
Output voltage	L2 (-1V)
Output type	sourcing
Input Signal voltage ("0")	-2V ... 5V
Input Signal voltage ("1")	10V ... 30V
Input filter	2.5 ms
Input short circuit (per port)	600mA
Input Voltage	L1
Input Current (per port)	140 mA
Input Type	PNP / NPN
Operating temperature	-25°C ... +70°C (-13°F ... 158°F)
Storage temperature	-40°C ... +90°C (-40°F ... 194°F)
Vibration resistance	Up to IEC68-2-6
EMC	EN 61000-6-2
Protection Class	IP67
MTBF	100,000 H

9. Earth connection

At least one of the earth connections shown on the schematics must be ground connected to ensure the good operation of the module.

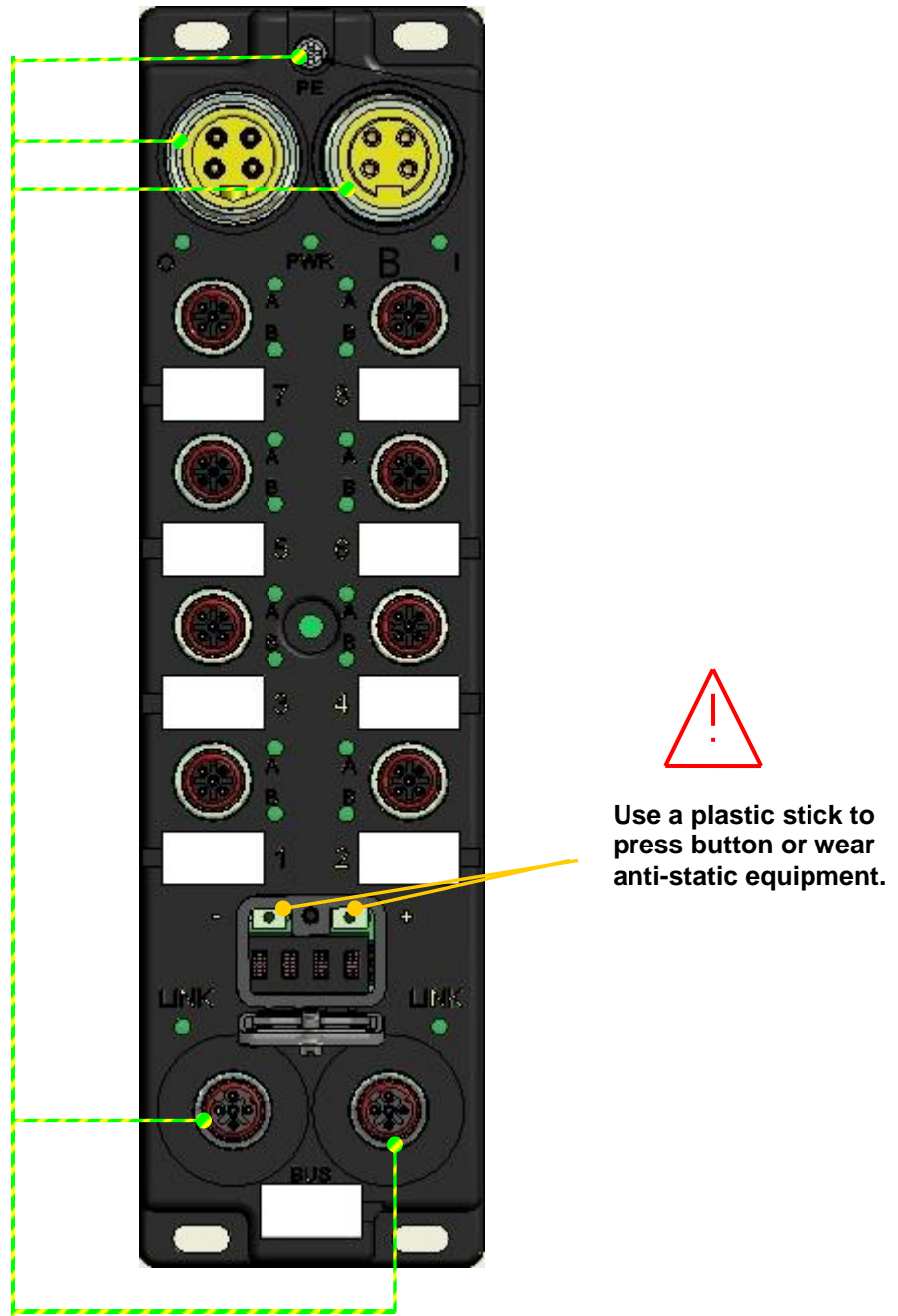


Figure 9_1

If the earth connection is done by one of the Ethernet cable it is important to avoid noise loop to not connect other earth connection of the module to the ground.
(See Figure 9_2)

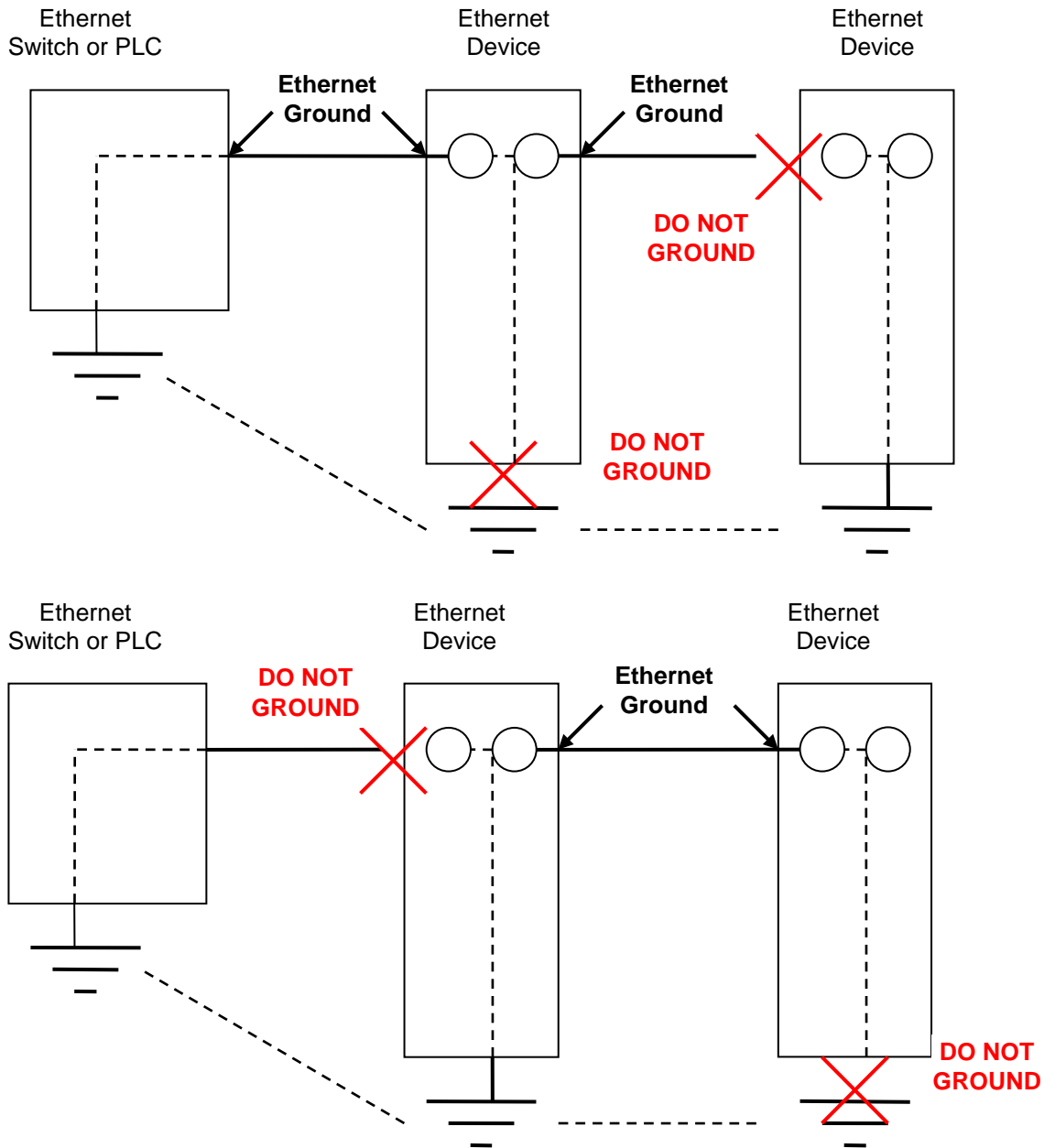


Figure 9_2

10. Cables and cordsets

BradConnectivity™ is part of Molex as well as BradControl™ and is specialized in the manufacturing of connectors, cordsets and distribution boxes for sensors, actuators and bus network applications.

BradConnectivity™ provides a wide range of product references among which:

Network Communication			
ULTRA-LOCK™ M12 DOUBLE-ENDED CORDSETS – Order Number			
Length	Male straight/ Male straight	Male straight/ Male 90°	Male 90°/ Male 90°
Unshielded / Stranded Conductor /PVC Jacket			
0.2M	-	-	
0.6M	EWWA06003M006	EWWA06203M006	EWWA06303M006
1M	EWWA06003M010	EWWA06203M010	EWWA06303M010
2M	EWWA06003M020	EWWA06203M020	EWWA06303M020
3M	EWWA06003M030	EWWA06203M030	EWWA06303M030
4M	EWWA06003M040	EWWA06203M040	EWWA06303M040
5M	EWWA06003M050	EWWA06203M050	EWWA06303M050
10M	EWWA06003M100	EWWA06203M100	EWWA06303M100
Shielded / Stranded Conductor / PVC Jacket			
0.2M	-	-	
0.6M	EWWA06015M006	EWWA06215M006	EWWA06315M006
1M	EWWA06015M010	EWWA06215M010	EWWA06315M010
2M	EWWA06015M020	EWWA06215M020	EWWA06315M020
3M	EWWA06015M030	EWWA06215M030	EWWA06315M030
4M	EWWA06015M040	EWWA06215M040	EWWA06315M040
5M	EWWA06015M050	EWWA06215M050	EWWA06315M050
10M	EWWA06015M100	EWWA06215M100	EWWA06315M100
Shielded / Stranded Conductor / PUR Jacket			
0.2M	-	-	
0.6M	EWWA06010M006	EWWA06210M006	EWWA06310M006
1M	EWWA06010M010	EWWA06210M010	EWWA06310M010
2M	EWWA06010M020	EWWA06210M020	EWWA06310M020
3M	EWWA06010M030	EWWA06210M030	EWWA06310M030
4M	EWWA06010M040	EWWA06210M040	EWWA06310M040
5M	EWWA06010M050	EWWA06210M050	EWWA06310M050
10M	EWWA06010M100	EWWA06210M100	EWWA06310M100

I/O communication			
ULTRA-LOCK™ M12 SINGLE-ENDED CORDSETS – Order Number			
Length	Male straight	Male 90°	
2M	W05006E03M020	W05007E03M020	
3M	W05006E03M030	W05007E03M030	
4M	W05006E03M040	W05007E03M040	
5M	W05006E03M050	W05007E03M050	
10M	W05006E03M100	W05007E03M100	

Power Supply				
MINI-CHANGE™ M12 SINGLE-ENDED CORDSETS – Order Number				
Length	Male straight	Male 90°	Female Straight	Female 90°
UL Stoow PVC Cable, NEC Color Code				
2M	104006A01M020	104007A01M020	104000A01M020	104001A01M020
4M	104006A01M040	104007A01M040	104000A01M040	104001A01M040
5M	104006A01M050	104007A01M050	104000A01M050	104001A01M050
10M	104006A01M100	104007A01M100	104000A01M100	104001A01M100
MINI-CHANGE™ M12 DOUBLE-ENDED CORDSETS – Order Number				
Length	Female straight/ Male straight	Female 90° / Male straight	Female straight / Male 90°	Female 90°/ Male 90°
UL Stoow PVC Cable, NEC Color Code				
0.5M	114030A01M005	114031A01M005	114032A01M005	114033A01M005
1M	114030A01M010	114031A01M010	114032A01M010	114033A01M010
2M	114030A01M020	114031A01M020	114032A01M020	114033A01M020
3M	114030A01M030	114031A01M030	114032A01M030	114033A01M030
4M	114030A01M040	114031A01M040	114032A01M040	114033A01M040
5M	114030A01M050	114031A01M050	114032A01M050	114033A01M050
10M	114030A01M100	114031A01M100	114032A01M100	114033A01M100

11. Product support

To assist users in using the products, Molex provides technical information on its web site

[Molex Support and Download](#)

They can find particularly:

- Downloads center
- Support Request Form
- Knowledge Base
- Worldwide technical support contacts

