

4.3 PT16DO - DIGITAL OUTPUTS

4.3.1 Description

This module has 16 open collector (NPN) digital outputs. The outputs may be used to drive lamps or external relays when more drive capability is required. The outputs are isolated from the logic and they share a common negative terminal.

The outputs are written to by the Modbus master device such as a PC or PLC. Each output can be individually switched on or off, or all outputs can be set up at the same time by writing a single number to the output register which represents the status of all outputs.

An output watchdog timer can be configured to switch off all the outputs if there has been no communications with the module for up to 255 seconds. A value of 0 seconds will disable this timer and the outputs will remain in the last programmed state.

Each PT16DO Module has a unique Ethernet IP address which must be programmed into the PC or PLC. The IP address in the PT16DO Module is configured via the Web Server. Any standard Web browser such as Internet Explorer can be used to access the web pages where configuration is carried out. The modules are factory programmed with a default IP address of 169.254.111.111. This address must be changed before the module is added to an existing network.

The web page address for viewing the digital output status parameters is <http://169.254.111.111/index.htm>

The web page address for configuring the module is <http://169.254.111.111/ip.htm>

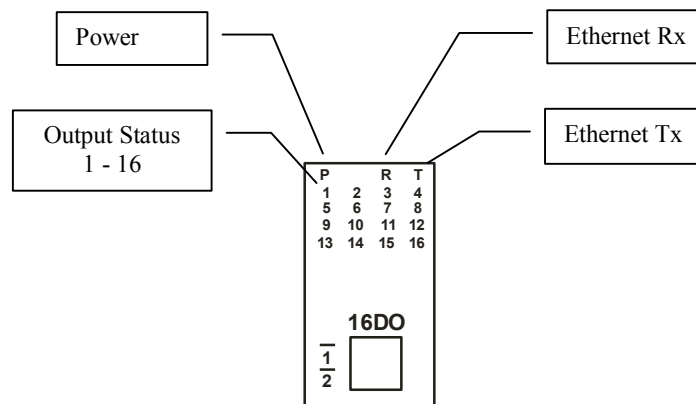


4.3.2 Technical Specification of PT16DO

Power Supply	Logic Supply Voltage	12 -24 Vdc
	Logic Supply Current	75mA @ 12V / 39mA @ 24V
	Field Supply Voltage	12 -24 Vdc
	Field Supply Current	6mA @ 12V / 6mA @ 24V
Digital Outputs	Output Points	16
	Maximum Voltage	36 Vdc
	Maximum Current	100 mA per output
	Vceon	1.1V Max.
Ethernet	Isolation	1500Vrms between field and logic
	10/100Mbps/s	Twisted pair.
	Operating Temperature.	-40°C to + 80°C
	Storage Temperature	-40°C to + 85°C
Connectors	Logic Power and Comms.	4 Pin Connector on underside of unit
	Inputs	18 Way screw connector on front
	Ethernet	RJ45 on top side of unit.

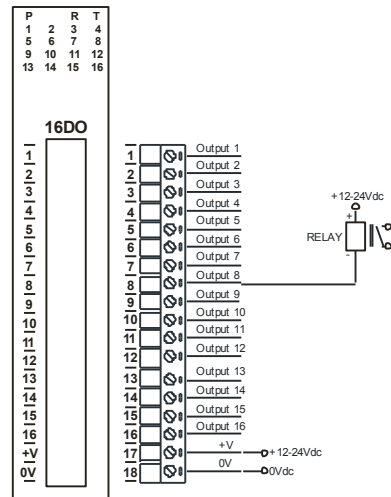
4.3.3 Status Indicators

Power: Flashes to indicate the CPU is running.
RS485 Rx: Flashes to indicate the unit has received a valid Modbus message.
RS485 Tx: Flashes to indicate the unit has sent a Modbus message.
Output Status: "OFF" when the output is off.
"ON" when the output is on.

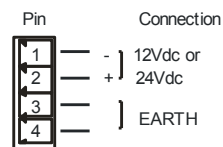


4.3.4 Wiring

The following diagram shows how the digital outputs are connected to the coil of a relay. The coil is connected to positive and switched to negative.



The following diagram shows the wiring for the power.



4.3.5 Configuration

The Web page address "**169.254.111.111/ip.htm**" is entered into the address line of the browser window to access the configuration page. This page allows you to change the IP address of the PROMUX TCP Module and to enter a Module Description Name and Output Names for identification/maintenance purposes.

Ethernet Configuration Parameters				
Module IP	169	254	111	111
Default Gateway IP	169	254	111	1
Subnet Mask	0	0	0	0
Socket Time Out	90	X 1 second		
Module Compatibility	0	0=PT16DO, 1=MMTCP16DO		

Submit

Warning: The IP address will not be updated until the power on the module has been switched off and on again. After clicking on the Submit button check that the correct IP address has been entered. If you forget the IP address, refer to the user manual to reset the module back to the default IP value.

Module Name PT16DO Submit

Output 1 Name OUTPUT_1 Submit

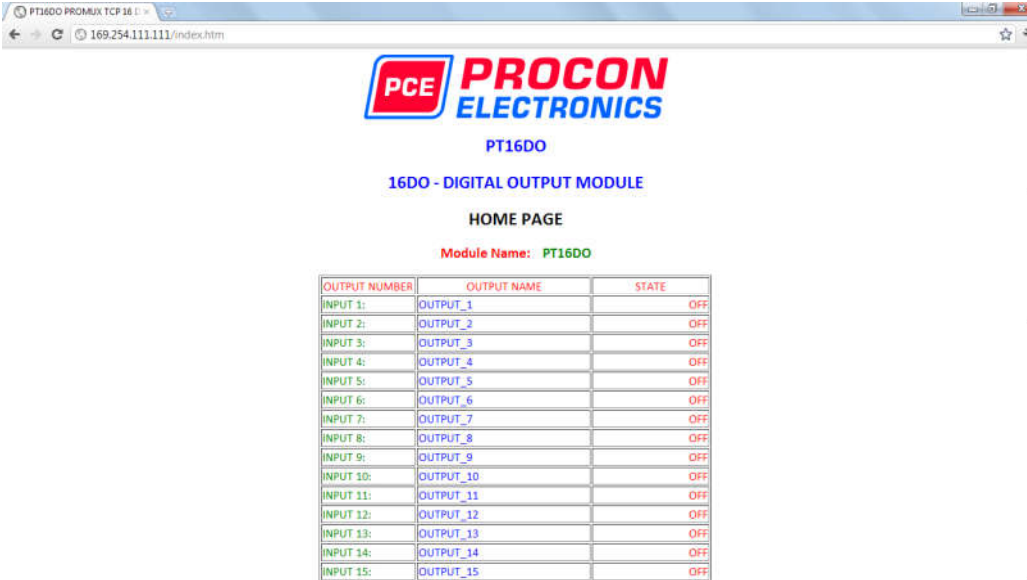
Output 2 Name OUTPUT_2 Submit

- **IP Address:** The new IP address can be entered into the web page as shown above. After this has been done, you must click the Submit button to send the values to the Module. The screen will now be updated and if successful will continue to display the new IP address. The new IP address will only be effective after the Module power has been switched off and on again. This feature allows you to check that the correct IP address has been entered before being activated. If the IP address has been entered incorrectly and the power has not been switched off, it is possible to re-enter the correct IP address. If the power has been switched off and back on again, the Module will not communicate until you enter the new IP address into the address line of the browser window.
- **Default Gateway IP Address:** A **default gateway** is a node (a router) on a computer network that serves as an access point to another network. In enterprises, however, the gateway is the computer that routes the traffic from a PC to the outside network that is serving the Web pages. It is only necessary to configure the default gateway IP address if the PC that is accessing the Module is on a different network.
- **Subnet Mask:** In computer networks, a **subnetwork** or **subnet** is a range of logical addresses within the address space that is assigned to an organization. The subnet mask is used to inform the Module that it must send its replies to the gateway if the IP address of the PC is on a different network. When the subnet mask is set to "0.0.0.0" then it is effectively disabled and the default gateway is not used. A typical subnet mask would be "255.255.255.0".
- **Socket Timeout:** If a socket connection is broken, say due to a network fault, it must timeout to free it up so that it can be used again. This timer is triggered by activity on the module, so if there is no communications activity for longer than the timeout period, the socket will close.
- **Module Compatibility:** When the value is zero "0", the Modbus registers are configured in the format for a PROMUX TCP module. When the value is set to one "1", the Modbus registers are reconfigured to match the format of the MOD-MUX TCP modules. This is useful if a new PROMUX TCP module is being used to replace an old MOD-MUX TCP module in an existing system.

- **Module Name:** This field allows you to enter a module description name into the PROMUX TCP Module. This is an identifier for diagnostic/maintenance purposes and is chosen to best describe the PROMUX TCP Module in the system by name or number.
- **Output Names:** These fields allow you to enter an output description name into the PROMUX TCP Module. This is an identifier for diagnostic/maintenance purposes and is chosen to best describe the particular output by name or number.

4.3.6 Viewing web pages

To view the default Web page in the PROMUX TCP Module, start the Web browser and type "169.254.111.111" into the address line of the browser window. The main page will now be displayed in the browser window.



The screenshot shows a web browser window with the address bar displaying "169.254.111.111/index.htm". The page features the PCE PROCON ELECTRONICS logo and the text "PT16DO 16DO - DIGITAL OUTPUT MODULE HOME PAGE". Below this, it says "Module Name: PT16DO". A table lists 16 digital outputs, each with an input number, an output name, and a state. All states are currently "OFF".

OUTPUT NUMBER	OUTPUT NAME	STATE
INPUT 1:	OUTPUT_1	OFF
INPUT 2:	OUTPUT_2	OFF
INPUT 3:	OUTPUT_3	OFF
INPUT 4:	OUTPUT_4	OFF
INPUT 5:	OUTPUT_5	OFF
INPUT 6:	OUTPUT_6	OFF
INPUT 7:	OUTPUT_7	OFF
INPUT 8:	OUTPUT_8	OFF
INPUT 9:	OUTPUT_9	OFF
INPUT 10:	OUTPUT_10	OFF
INPUT 11:	OUTPUT_11	OFF
INPUT 12:	OUTPUT_12	OFF
INPUT 13:	OUTPUT_13	OFF
INPUT 14:	OUTPUT_14	OFF
INPUT 15:	OUTPUT_15	OFF

- **Output Number:** This refers to the actual output number on the terminals of the module.
- **Output Name:** This is the name that was entered in the configuration page to best describe the outputs.
- **State:** This is the current state of the outputs. To get an updated reading it is necessary to refresh the browser window to upload the web page again.
- **Output Watchdog Timer:** This displays the watchdog time for the outputs.

4.3.7 PT16DO Data Registers (MODULE TYPE = 131)

Modbus Address	Register Name	Low Limit	High Limit	Access	Comments
00001	Digital Output 1	0	1	R/W	Status of Digital Outputs.
00002	Digital Output 2	0	1	R/W	"
00003	Digital Output 3	0	1	R/W	"
00004	Digital Output 4	0	1	R/W	"
00005	Digital Output 5	0	1	R/W	"
00006	Digital Output 6	0	1	R/W	"
00007	Digital Output 7	0	1	R/W	"
00008	Digital Output 8	0	1	R/W	"
00009	Digital Output 9	0	1	R/W	"
00010	Digital Output 10	0	1	R/W	"
00011	Digital Output 11	0	1	R/W	"
00012	Digital Output 12	0	1	R/W	"
00013	Digital Output 13	0	1	R/W	"
00014	Digital Output 14	0	1	R/W	"
00015	Digital Output 15	0	1	R/W	"
00016	Digital Output 16	0	1	R/W	"
30001	S/W Version / Module Type	N/A	N/A	R	High Byte = Software Version Low Byte = 131
40002	Digital Outputs	N/A	N/A	R/W	Digital Outputs in bits. 16(msb) – 1(lsb).
40101	Watchdog Timer	0	255	R/W	Timer in seconds. 0 = disabled. 1 - 255 = enabled.

4.3.7.1 Digital Output Register.

The digital outputs can be read/written in a single register as follows:

MSB		PT16DO DIGITAL OUTPUTS												LSB		ADDRESS
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
32768	16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2	1	40002
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

Digital Output

4.3.7.2 Output Watchdog Timer.

The watchdog timer is used to switch off all of the outputs in the event of a communications failure. When set to zero (register 40101) the watchdog timer is disabled.