GuardPLC 16-Digital Inputs and 8-Digital Outputs Module

Catalog Number 1753-IB16XOB8

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

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, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary we use notes to make you aware of safety considerations.

WARNING	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence
SHOCK HAZARD	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.
BURN HAZARD	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.

Related Documentation

The table below provides a listing of publications that contain important information about GuardPLC systems.

For	Read this document	Publication number
Detailed information regarding the safety certification of the GuardPLC System	GuardPLC Controller Systems Safety Reference Manual	1753-RM002
Detailed information on installing, wiring, configuring, operating, maintaining, and troubleshooting GuardPLC systems	GuardPLC Controller Systems User Manual	1753-UM001
Detailed information on programming your GuardPLC system using RSLogix Guard PLUS! software	Using RSLogix Guard PLUS! Software with GuardPLC Controllers Programming Manual	1753-PM001
Information on installing GuardPLC 1600 controllers	GuardPLC 1600 Controller Installation Instructions	1753-IN001
Information on installing GuardPLC 1800 controllers	GuardPLC 1800 Controller Installation Instructions	1753-IN002
Information on installing GuardPLC 1753-IB20XOB8 Digital Input/Output Modules	GuardPLC Digital Input/Output Module	1753-IN003
Information on installing GuardPLC 1753-IB16 Digital Input Modules	GuardPLC Digital Input Module Installation Instructions	1753-IN004
Information on installing GuardPLC 1753-OB16 Digital Output Modules	GuardPLC Digital Output Module Installation Instructions	1753-IN005
Information on installing GuardPLC 1753-IB8XOB8 Digital Input/Output Modules	GuardPLC 8-Digital Inputs and 8-Digital Outputs Modules Installation Instructions	1753-IN010
Information on installing GuardPLC 1753-OW8 Relay Output Modules	GuardPLC 8-Relay Output Module Installation Instructions	1753-IN012
Information on installing GuardPLC 1753-IF8XOF4 Analog Input/Output Modules	GuardPLC Analog Input/Output Module Installation Instructions	1753-IN013
Planning information	Industrial Automation Wiring and Grounding Guidelines	1770-4.1

To view and download pdfs, go to Literature Library at http://www.rockwellautomation.com/literature.

To order printed copies, contact your Allen-Bradley Distributor or Rockwell Automation Sales Office.

Description

The 1753-IB16XOB8 digital input/output module is a distributed I/O module for use with GuardPLC controllers. The module features 16 digital inputs, 8 two-pole (8 positive-switching and 8 negative-switching) digital outputs, and 2 pulsed outputs as shown below.
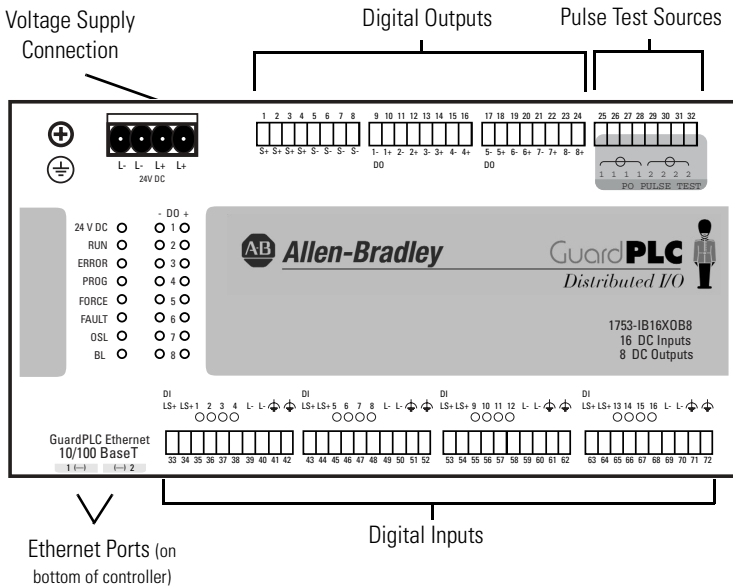
General Safety

ATTENTION	Personnel responsible for the application of safety-related Programmable Electronic Systems (PES) shall be aware of the safety requirements in the application of the system and shall be trained in using the system.

> ⚠️ **ATTENTION**
>
> **Environment and Enclosure**
>
> This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.
>
> This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.
>
> This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.
>
> See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

Preventing Electrostatic Discharge

> ⚠️ **ATTENTION**
>
> This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle the module:
>
> - Touch a grounded object to discharge static potential.
> - Wear an approved wrist-strap grounding device.
> - Do not touch connectors or pins on component boards.
> - Do not touch circuit components inside the equipment.
> - If available, use a static-safe workstation.
> - When not in use, store the equipment in appropriate static safe packaging.
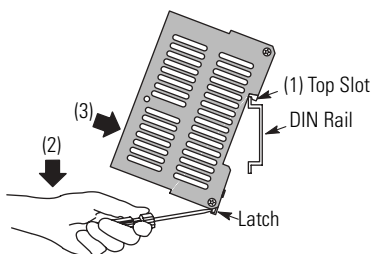
Mount the Module

IMPORTANT	For effective cooling:

- Mount the module horizontally.
- Provide a gap of at least 100 mm (3.94 in.) above and below the module.
- Select a location where air flows freely or use an additional fan.
- Do not mount the module over a heating device.

The module cannot be panel-mounted. Mount the module to a DIN rail by following the four steps below.

1. Hook the top slot over the DIN rail.

2. Insert a flathead screwdriver into the gap between the housing and the latch and pull the latch downward.

3. Hold the latch down as you push the housing back onto the DIN rail.

4. Release the latch to lock the device onto the rail.

(3)

(2)

(1) Top Slot

DIN Rail

Latch

TIP	To remove the module from the DIN rail, insert a flathead screwdriver into the gap between the housing and the latch and pull the latch downward as you lift the module off of the rail.

IP Address Label

A transparent label shipped with the module can be used to note the IP address and system ID (SRS).

IMPORTANT	If you attach the label to the module, make sure you do not cover any of the ventilation slots.

Wire the Module

The following sections describe how to wire the module.

Ground the Module

You must also provide an acceptable grounding path for each device in your application. For more information on proper grounding guidelines, refer to the Industrial Automation Wiring and Grounding Guidelines, publication number 1770-4.1.

The module is functionally grounded through its DIN rail connection. A protective earth ground connection is required and is provided through a separate grounding screw, located on the upper left of the housing and marked with the grounding symbol ⏚ .

ATTENTION	This product is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (e.g. aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

Connections for Safety-Related Communications

Ethernet Switch

The module has two 10/100BaseT, RJ-45 connectors to provide communications via GuardPLC Ethernet to GuardPLC controllers, and with the programming software. The connectors are located on the bottom side on the left. The connectors and the module are connected together by an internal Ethernet switch. The switches are auto-detect. Either cross-over or straight-through shielded Ethernet cabling can be used.

Star or line configurations are available. Make sure that a network loop is not generated. Data packets must only be able to reach a node via a single path.

MAC Address

The Media Access Control (MAC) Address of the module can be found on the label positioned over both lower RJ-45 connections.

Connect the Voltage Supply

The 24V dc voltage supply must feature galvanic isolation (in accordance with EN 60950 or UL 1950) since inputs and outputs are not electrically isolated from the processor. In order to comply with CE Low Voltage Directives (LVD), you must use either a NEC Class 2, a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter. An SELV supply can't exceed 30V rms, 42.4V peak or 60V dc under normal conditions and under single fault conditions. A PELV supply has the same rating and is connected to protected earth.

IMPORTANT	Protect the module with a 12 A slow-blow fuse.

The supply voltage is connected via a 4-pin connector. See page 22 for the appropriate wire size. You only need to connect one wire to L+ and one wire to L-. Both L+ and L- terminals are internally connected, so you can daisy-chain 24V dc power from the module to other devices in the panel using the remaining terminal.

ATTENTION	Do not reverse the L+ and L- terminals or damage to the module will result. There is no reverse polarity protection.

Safety-Related Digital Inputs

The module has 16 digital inputs whose status is indicated via LED indicators when the controller or module is in the RUN mode. Refer to page 4 for location of digital inputs and LED indicators.

LS+ is a voltage source that provides 24V dc for a group of four inputs.
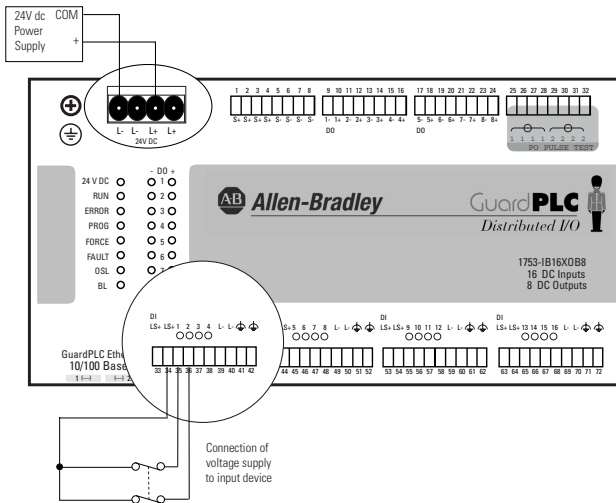
If devices require 24V dc to operate and use the same power source as the GuardPLC, wire the outputs of the device directly to inputs on the GuardPLC.
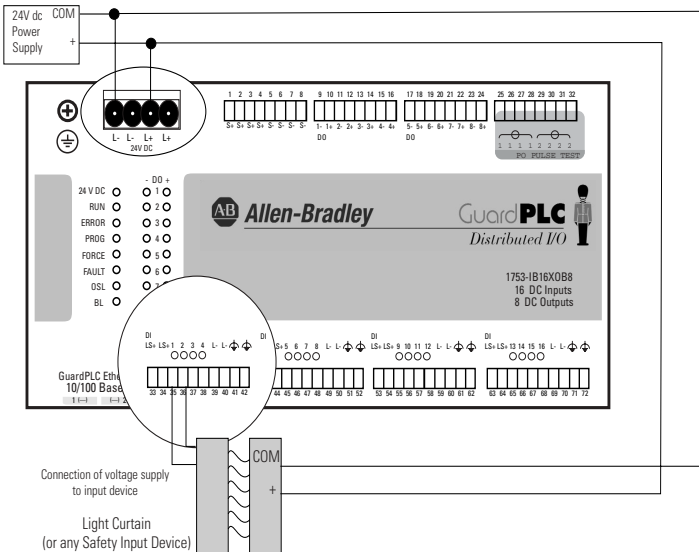
Devices with their own dedicated power supply can also be connected instead of contacts. Connect the reference pole of the signal source to the L- reference pole of the input.
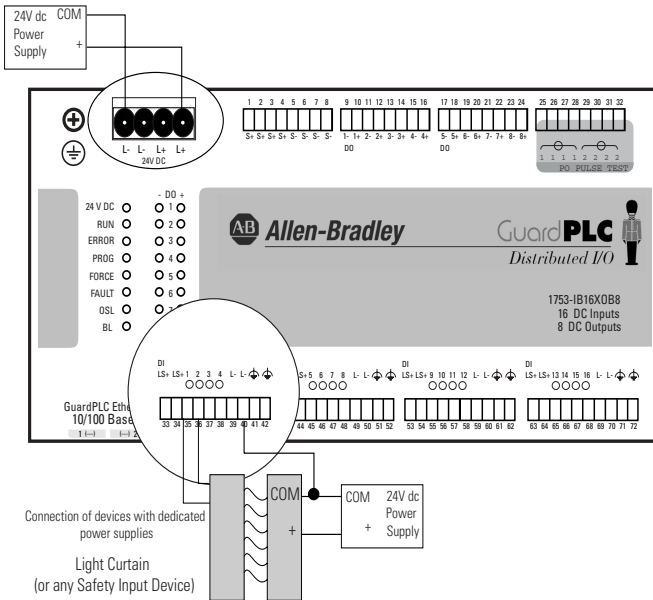
The safety state of an input is indicated by a 0 signal being passed to the user program logic. If the test routines detect a fault in the digital inputs, a 0-signal is processed in the user program for the defective channel. When a fault occurs, the inputs are switched off (0) and the fault LED indicator is activated.

The sensor supplies, LS+, supply a default current of 40 mA that is buffered for 20 ms in case of a power failure. If a higher current is needed, two unbuffered supplies of 1 A can be switched on using the **DI Supply [xx]** system signal in the application program. This supply feeds the neighboring input channel group. Th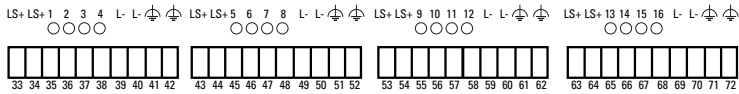e status of this supply is read and the supply is switched off if an overcurrent condition occurs. This supply is protected by a current limiting device. The following illustration shows two digital input supplies for four different input groups.
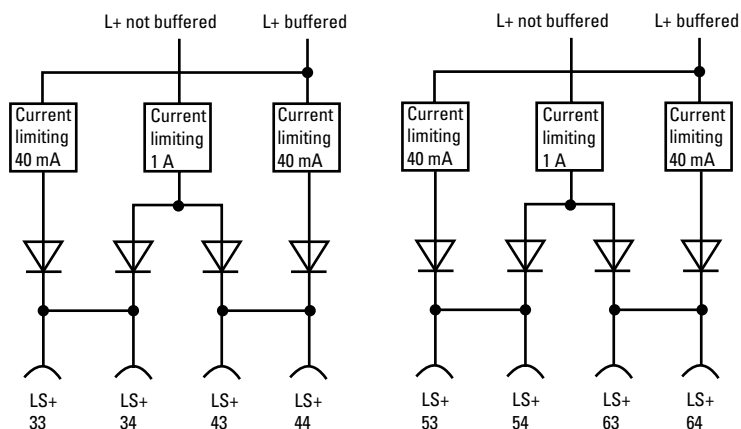
Follow the closed-circuit principle for external wiring when connecting sensors. To create a safe state in the event of a fault, the input signals revert to the de-energized state (0). Although the external line is not monitored, a wire break is interpreted as a safe 0-signal. Unused inputs must not be terminated.

> **TIP**   For more information on input wiring, see the GuardPLC System User Manual, publication number 1753-UM001.

Digital Input Terminals

LS+ LS+ 1 2 3 4 L- L- ⏚ ⏚   LS+ LS+ 5 6 7 8 L- L- ⏚ ⏚   LS+ LS+ 9 10 11 12 L- L- ⏚ ⏚   LS+ LS+ 13 14 15 16 L- L- ⏚ ⏚

33 34 35 36 37 38 39 40 41 42   43 44 45 46 47 48 49 50 51 52   53 54 55 56 57 58 59 60 61 62   63 64 65 66 67 68 69 70 71 72

See page 22 for the appropriate wire size. Digital inputs are connected to the following terminals:

Terminal Number	Designation	Function
33	LS+	Sensor supply for inputs 1 to 4, 40 mAbuffered/1 A non-buffered
34	LS+	Sensor supply for inputs 1 to 4, 40 mAbuffered/1 A non-buffered
35	1	Digital input 1
36	2	Digital input 2
37	3	Digital input 3
38	4	Digital input 4
39	L-	Reference pole
40	L-	Reference pole
41	Ground	Shield
42	Ground	Shield
43	LS+	Sensor supply for inputs 5 to 8, 40 mA buffered/1 A non-buffered
44	LS+	Sensor supply for inputs 5 to 8, 40 mA buffered/1 A non-buffered
45	5	Digital input 5
46	6	Digital input 6
47	7	Digital input 7
48	8	Digital input 8
49	L-	Reference pole
50	L-	Reference pole
51	Ground	Shield
52	Ground	Shield
53	LS+	Sensor supply for inputs 9 to 12, 40 mA buffered/1 A non-buffered
54	LS+	Sensor supply for inputs 9 to 12, 40 mA buffered/1 A non-buffered
55	9	Digital input 9
56	10	Digital input 10

Terminal Number	Designation	Function
57	11	Digital input 11
58	12	Digital input 12
59	L-	Reference pole
60	L-	Reference pole
61	Ground	Shield
62	Ground	Shield
63	LS+	Sensor supply for inputs 13 to 16, 40 mA buffered/1 A non-buffered
64	LS+	Sensor supply for inputs 13 to 16, 40 mA buffered/1 A non-buffered
65	13	Digital input 13
66	14	Digital input 14
67	15	Digital input 15
68	16	Digital input 16
69	L-	Reference pole
70	L-	Reference pole
71	Ground	Shield
72	Ground	Shield

Surge on Digital Inputs

An EN 61000-4.5 surge impulse can be read as a short duration HI signal. To avoid an error:

- install shielded input lines to prevent effects of surges in the system, or
- implement software filtering in the user program. A signal must be present for at least two cycles before it is used by the rest of the logic in the user program.

Line Control

Line control is a short-circuit and line break monitoring system (for example, E-Stop inputs) which can be configured for the GuardPLC system.

IMPORTANT   For information on how to configure inputs and outputs for line control, see the GuardPLC System User Manual, publication number 1753-UM001.
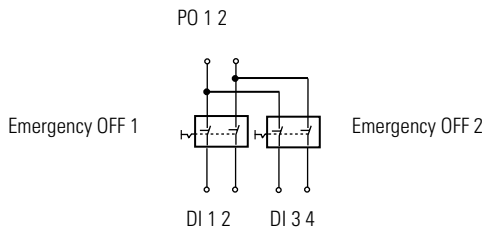
Pulse Test Sources

| ATTENTION	Pulse test sources must not be used as safety-related outputs.

The example shows 2 pulse test sources connected to the digital inputs (DI) of the same system. As a result, the connections to the digital inputs (DI) are monitored for line control.

When line control detects any of the following faults, inputs are set to 0, a fault code is generated, and the FAULT LED indicator is on.

- short-circuit between two parallel connections
- reversal of two connections
- earth fault on one of the lines (only with earthed reference pole)
- line break or opening of the contacts (e.g., when one of the E-stop off switches is pressed in the example above), the FAULT LED indicator is on and the fault code is generated.

Pulsed Output Terminals

25 26 27 28 29 30 31 32

1 1 1 1 2 2 2 2
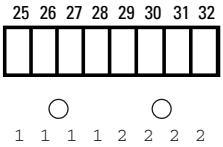
All PO1 and PO2 terminals are internally connected. Therefore all PO1 and PO2 terminals pulse together.

Terminal Number	Designation	Function
25	1	Pulsed output 1
26	1	Pulsed output 1
27	1	Pulsed output 1
28	1	Pulsed output 1
29	2	Pulsed output 2
30	2	Pulsed output 2
31	2	Pulsed output 2
32	2	Pulsed output 2

Safety-Related Digital Outputs

The module has 8 output pairs whose status is indicated via LED indicators. The digital outputs are not electrically isolated.

An output is in the safe state when it is de-energized. If a channel faults, the affected outputs are switched off. If the module faults or loses ethernet communications, all outputs are switched off.

An overload at an output causes the output to turn off. If the total current is greater then 9 A, all outputs are turned off. When the overload is eliminated, the outputs are activated according to their current software-driven state.

The digital outputs can be configured as:

- 1-pole switch without line monitoring
- 2-pole switch with or without line monitoring
- 3-pole switch (2-pole with common reference).

Refer to the GuardPLC Controller Systems User Manual, publication number 1753-UM001 for more information.

1-pole Connection

For 1-pole applications, all 8 DO+ and all 8 DO- outputs are available, for a total of 16 outputs. If you are using a positive-switching output, connect the other side of the output to S-. If you are using a negative-switching output, connect the other side of the output to S+.

The DO+ outputs must be connected to the supply S- and the DO- outputs must be connected to the supply S+.

Line monitoring with a 1-pole connection is not possible.

IMPORTANT	You must not connect the DO+ output directly to L- or connect the DO- outputs directly to L+. You must use the S+ and S- terminals.

For 1-pole connection, Inductive loads can be connected without a protection diode on the load because there is a protection diode located within the GuardPLC device. However, Rockwell Automation recommends that you attach a protection diode directly to the load to suppress any interference voltage. A 1N4004 diode is recommended.
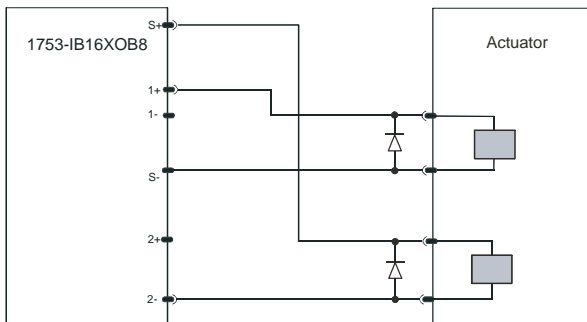
2-pole Connection

If the outputs are configured for 2-pole operation, 8 total outputs are available. Each of the 8 outputs switch both L+ and L-. 2-pole outputs (without line monitoring) are wired to both DO+ and DO- of a single channel, 2+ and 2- for example.

DO 2+

DO 2-
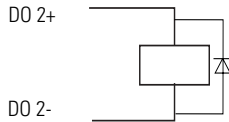
IMPORTANT	The corresponding channels for the 2-pole connection must be configured for 2-pole operation using the **DO[xx].2-pole** system variable. Refer to the GuardPLC Controller Systems User Manual, publication number 1753-UM001 for more information.

ATTENTION	The DO+ output must be connected to the corresponding DO- output of the same channel.

ATTENTION	Inductive loads must be connected with a protection diode on the load in 2-pole connection.

1753-IB16XOB8   Actuator

1+

1-

2+

2-
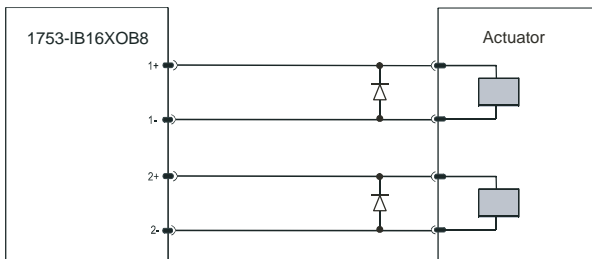
3-pole Connection With Line Monitoring

Two 2-pole channels can support dual channel devices with only a single reference connection. If line monitoring is required, the channels must be configured in pairs, using the **DO[xx][xx].in pairs** system parameter. There are four pairs allowed:

- channels 1 and 2,
- channels 3 and 4,
- channels 5 and 6,
- and channels 7 and 8.

Line monitoring is accomplished by switching off one channel while the second channel is tested for wiring faults.
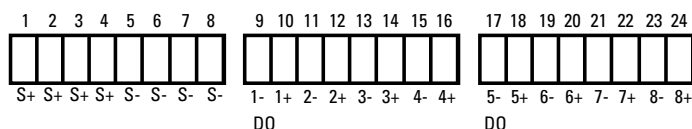
A detected line fault is reported by the module's error codes.
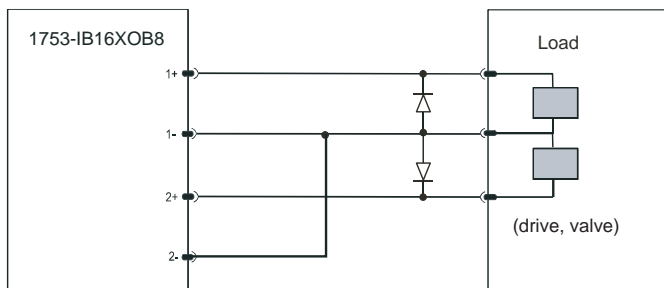
ATTENTION	Inductive loads must be connected with a protection diode on the load in 3-pole connection.

Digital Output Terminals

1	2	3	4	5	6	7	8		9	10	11	12	13	14	15	16		17	18	19	20	21	22	23	24

S+ S+ S+ S+ S- S- S- S-   1- 1+ 2- 2+ 3- 3+ 4- 4+   5- 5+ 6- 6+ 7- 7+ 8- 8+
                           DO   DO

See page 22 for the appropriate wire size. Digital outputs are connected to the following terminals:

Terminal Number	Designation	Function
1	S+	Reference pole for negative-switching digital outputs
2	S+	Reference pole for negative-switching digital outputs
3	S+	Reference pole for negative-switching digital outputs
4	S+	Reference pole for negative-switching digital outputs
5	S-	Reference pole for positive-switching digital outputs
6	S-	Reference pole for positive-switching digital outputs
7	S-	Reference pole for positive-switching digital outputs
8	S-	Reference pole for positive-switching digital outputs
9	1-	Digital output 1, negative-switching
10	1+	Digital output 1, positive-switching
11	2-	Digital output 2, negative-switching
12	2+	Digital output 2, positive-switching
13	3-	Digital output 3, negative-switching
14	3+	Digital output 3, positive-switching
15	4-	Digital output 4, negative-switching
16	4+	Digital output 4, positive-switching
17	5-	Digital output 5, negative-switching
18	5+	Digital output 5, positive-switching
19	6-	Digital output 6, negative-switching
20	6+	Digital output 6, positive-switching
21	7-	Digital output 7, negative-switching

Terminal Number	Designation	Function
22	7+	Digital output 7, positive-switching
23	8-	Digital output 8, negative-switching
24	8+	Digital output 8, positive-switching

Reset Pushbutton

You can use the reset button if you forget the password for connecting the programming software. The pushbutton is accessible through a small round hole at the top of the housing, approximately 4 to 5 cm (1.6 to 2.0 in.) from the left rim and recessed approximately 9.5 mm (0.375 in.).

IMPORTANT	Activate the reset pushbutton using an insulated pin to prevent short-circuits.

To reset, press and hold the pushbutton for 20 seconds while rebooting the device by cycling power. Pressing the Reset pushbutton during operation has no affect.

With activation of the reset button:

- All accounts are deleted except for the default account.
- IP address and system ID (SRS) are set to default values.

At the next power cycle, these settings will be restored to the last values stored into Flash. This means that either:

- the settings prior to the reset will be restored, or
- if any settings were changed after the reset, these new settings will still be in effect.

Troubleshoot with LED Indicators

Indicator	State	Condition
24V dc	On	24V dc operating voltage present.
	Off	No operating voltage.
RUN	On	This is the normal status of the module. A routine, which has been loaded into the module, is executed. The module processes input and output signals, carries out communication and performs hardware and software tests.
	Flashing	The module is in STOP mode and is not executing a routine. All system outputs are reset. STOP mode can be triggered by setting the *Emergency stop* system variable to TRUE in the routine, or by direct command from the programming software.
	Off	The module is in ERROR_STOP (see ERROR).
ERROR	On	• A hardware error has been detected by the module. The module goes to ERROR_STOP and the execution of the routine is halted. Hardware errors are errors in the module, errors in one or more of the digital input and output modules, or errors in the counters. • A software error in the operating system has been detected by the module. • The watchdog has reported an error due to exceeded cycle time. All system outputs will be reset and the module ceases all hardware and software tests. The module can only be restarted by a command from the programming software.
	Off	No errors are detected.
PROGress	On	The upload of a new module configuration is in progress.
	Flashing	The upload of a new operating system into the Flash ROM is in progress.
	Off	No upload of module configuration or operating system in progress.
FORCE	On	The module is executing a routine (RUN) and FORCE mode is activated by the user.
	Flashing	The module is in STOP, but Forcing has been initiated and will be activated when the module is started.
	Off	Forcing is OFF.
FAULT	On	• The routine (logic) has caused an error. • The module configuration is faulty. • The upload of a new operating system was not successful and the operating system is corrupted.
	Flashing	An error has occurred during a Flash ROM write cycle. One or more I/O errors have occurred.
	Off	None of the above errors has occurred.
OSL	Flashing	Emergency **O**perating **S**ystem **L**oader is active.
BL	Flashing	**B**oot **L**oader unable to load operating system or unable to start COMM operating system loader.

Module status can be interrogated through the programming software. For more information, refer to the GuardPLC System User Manual, publication number 1753-UM001.

Specifications

Module	
Response Time	$\geq$ 10 ms
Interface: GuardPLC Ethernet	2 x RJ-45, 10/100BaseT (with 100 Mbps) with integrated switch
Operating Voltage	24V dc, -15% to +20%, w_{ss} $\leq$15%
Current Consumption	max. 10 A (with max. load) 0.6 A @ 24V idle current
Isolation Voltage	No isolation between circuits
Wiring Category[1]	category 2 on communications ports, signal ports, and power ports
Wire Size	I/O – 16 AWG (1.5 mm^2) to 26 AWG (0.14 mm^2) solid or stranded copper wire rated at 75 °C (167 °F) or greater with 3/64 inch (1.2 mm) insulation max. Power – 14 AWG (2.5 mm^2) to 22 AWG (0.34 mm^2) solid or stranded copper wire rated at 75 °C (167 °F) or greater with 3/64 inch (1.2 mm) insulation max.
Terminal Block Torque	0.51 Nm (4.5 in-lb)
Fuse (external)	12 A (slow blow)
Battery Backup	none
Digital Inputs	
No. of Inputs	16 (not electrically isolated)
On-state	Voltage: 15V to 30V dc Current Consumption: $\geq$ 2 mA @ 15V
Off-state	Voltage: max. 5V dc Current Consumption: max 1.5 mA (1.0 mA @ 5V)
Switching Point	typically 7.5V
Supply	4 supplies @ 24V dc/40 mA short-circuit proof, buffered for 20 ms 2 supplies @ 24V dc/1 A short-circuit proof, non-buffered
Digital Outputs	
No. of Outputs (L+)	8 (not electrically isolated), reference pole S-
No. of Outputs (L-)	8 (not electrically isolated), reference pole S+
Output Voltage	$\geq$L+ minus 2V
Output Current (L+) Output Current (L-)	Channels 2, 4, 5, and 7: 0.5 A @ 60°C (140°F) Channels 1 and 8: 1 A @ 60 °C (140 °F); 2 A @ 40 °C (104 °C) Channels 3 and 6: 1 A @ 60 °C (140 °F)
Max. lamp load	25 W
Max. inductive load	500 mH
Minimum Load	2 mA per channel
Internal Voltage Drop	max. 2.0V dc @ 2 A
Off-State Leakage Current	max. 1 mA @ 2V
Overload Response	Shut down of the concerned output with cyclic reconnection

Total Output Current	max. 8 A
Pulsed Outputs	
No. of Outputs	2 (not electrically isolated)
Output Voltage	≥L+ minus 4V
Output Current (L+)	Approx. 60 mA
Minimum Load	none
Switching Time	≤100 micro-seconds
Overload Response	2 x ≥ 19.2V, short-circuit current 60 mA @ 24V
Environmental Conditions	
Storage Temperature :	-40...+85 °C (-40...+185 °F) • IEC 60068-2-1 (Test Ab, Unpackaged non-operating cold) • IEC 60068-2-2 (Test Bb, Unpackaged non-operating dry heat) • IEC 60068-2-14 (Test Na, Unpackaged non-operating thermal shock)
Operating Temperature:	0...+60 °C (+32...140 °F) • IEC 60068-2-1 (Test Ad, operating cold) • IEC 60068-2-2 (Test Bd, operating dry heat) • IEC 60068-2-14 (Test Nb, operating thermal shock)
Vibration	1 g @ 10…150 Hz • IEC 60068-2-6 (Test Fc, operating)
Shock, Operating	15 g • IEC 60068-2-27 (Test Ea, unpackaged shock)
Relative Humidity	10 to 95% non-condensing • IEC 60068-2-30 (Test Db, unpackaged non-operating damp heat)
Emissions	Group 1, Class A
ESD Immunity	6 kV contact discharges 8 kV air discharges
Radiated RF Immunity	10V/m with 1kHz sine-wave 80% AM from 80 MHz to 2000 MHz
EFT/B Immunity	±2 kV @ 5 kHz on power ports ±1 kV @ 5 kHz on signal ports ±1 kV @ 5 kHz on communication ports
Surge Transient Immunity	±1 kV line-line (DM) and ±1 kV line-earth (CM) on DC power ports ±500V line-line (DM) and ±1 kV line-earth (CM) on signal ports ±1 kV line-earth (CM) on communication ports
Conducted RF Immunity	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz to 80 MHz
Enclosure Type Rating	meets IP20
Mechanical Dimensions	
Width	205 mm (8.07 in.) including housing screws
Height	114 mm (4.49 in.) including latch
Depth	88 mm (3.46 in.) including grounding bolt
Weight	1.3 kg (2.86 lb)

Certifications[2]
(when product is marked)

c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada
CE	European Union 89/336/EEC EMC Directive, compliant with: • EN 61000-6.2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
TÜV	TÜV Certified for Functional Safety

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication number 1770-4.1.

(2) See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

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