



GuardPLC 2000 Digital Input/Output Module

(Catalog number 1755-IB24XOB16)

The 1755-IB24XOB16 digital input/output module provides 24 digital inputs and 16 digital outputs. The status of each I/O signal is displayed with an LED located on the right side of the front plate connectors.

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Package Contents

This package contains:

- GuardPLC 2000 module 1755-IB24XOB16
- 2 mounting screws
- 5 terminal plugs
- installation instructions

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION



Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

European Communities (EC) Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet the Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part:

- EN 50081-2 EMC — Generic Emission Standard, Part 2 — Industrial Environment
- EN 50082-2 EMC — Generic Immunity Standard, Part 2 — Industrial Environment
- EN 61131-2 — Programmable Controllers, Part 2 — Equipment Requirements and Tests
- EN 61000-6-2 EMC — Part 6-2, Generic Standards — Immunity for Industrial Environments

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is not required to meet Council Directive 73/23/EEC Low Voltage because it is rated less than 50V ac and 75V dc.

General Safety

Open style devices must be provided with environmental and safety protection by proper mounting in enclosures designed for specific application conditions. See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

Rockwell Automation Technical Support

If you need any assistance with the information found in this Quick Start, first call your local Rockwell Automation representative, then:

- Post-sales Technical Support, 440.646.5800
- Web Links: <http://www.ab.com> — as a registered member, open to <http://www.ab.com/mem/technotes/techmain.htm>

Inserting the Module

These procedures assume that you have installed the GuardPLC 2000 Chassis (1755-A6), Power Supply Module (1755-PB720), and Controller (1755-L1). If you have not done so, see the installation instructions for these modules, 1755-IN001, 1755-IN002, and 1755-IN007, respectively.

IMPORTANT

For planning information, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

ATTENTION

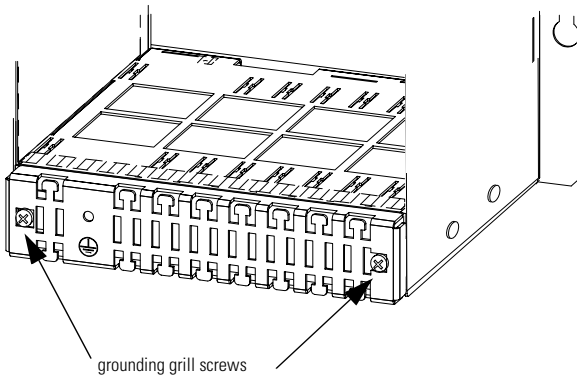
Electrostatic discharge can damage integrated circuits or semiconductors if you touch backplane connector pins. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential.
 - Wear an approved wrist-strap grounding device.
 - Do not touch the backplane connector or connector pins.
 - Do not touch circuit components inside the module.
 - If available, use a static-safe work station.
 - When not in use, keep the module in its static-shield box.
-

IMPORTANT

Disconnect the power supply module, 1755-PB720, from the 24V dc supply voltage before you insert the module.

1. Before you insert the module, you must detach the grounding grill. To do this, remove the grounding grill screws (see figure below).



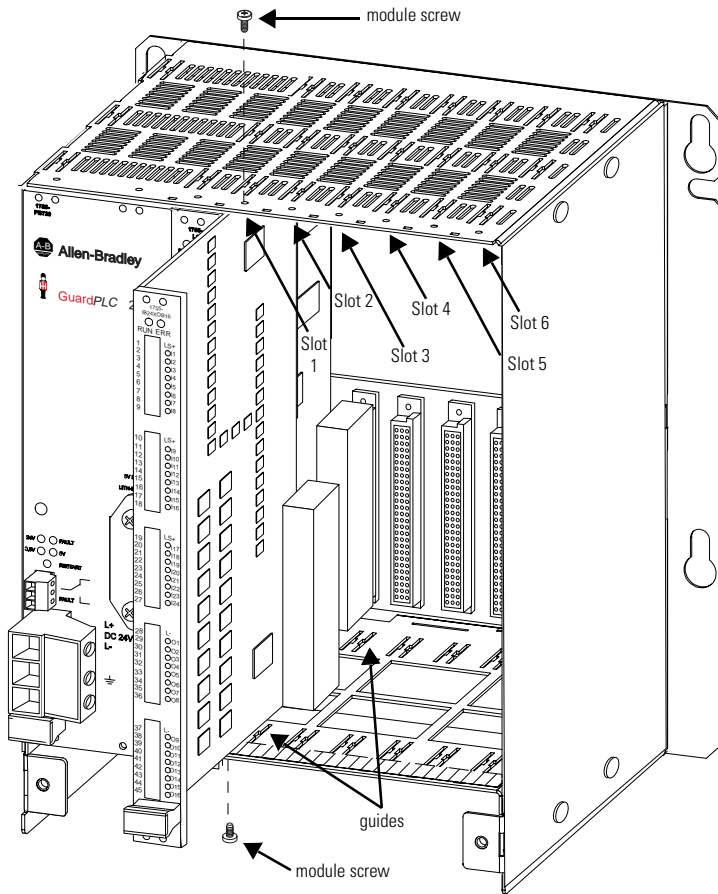
2. Remove the lower panel of the chassis and disconnect the fans.
3. Insert the module into any unused slot from 1 to 6 (see figure on page 6).

Keep the module in line with the guides so the module runs smoothly in the track.

4. Begin pushing the module into the chassis.

If there is resistance when you push the module into the backplane, do not force the module because the pins will bend. Remove the module and start again at step 3.

5. Continue pushing the module into the chassis until the front of the module is flush with the other modules in the chassis.
6. Secure the module with the module screws on the top and bottom of the module (see figure on page 6).



TIP



If you are installing other GuardPLC 2000 modules, follow their Installation Instructions up to this point before you complete the next 3 steps.

7. Reconnect the fans.
8. Replace the lower panel of the chassis, sliding it over the tabs on the sides of the chassis and under the tabs on the back of the chassis.
9. Use the grounding grill screws to attach the grounding grill.

Connecting the Module

To connect the module, you must complete the following:

- prepare the cables
- attach the terminal plugs
- attach and ground the cables
- connect the power supply

More detailed information about each of these steps follows.

IMPORTANT

Cable Requirements:

- One shielded and twisted pair cable is needed for each input or output.
 - The cross section of the cable leads must be not more than 1.5 mm² (AWG 15) to be able to insert them into the terminal plugs. The cross section of the cable leads, however, must be large enough to keep the voltage drop of the external wiring as low as possible.
 - The diameter of the bundle of cables must not exceed 12 mm.
-

Connection Information

Inputs

The sockets with pins 2 to 9, 11 to 18, and 20 to 27 provide the 24 digital inputs I1 to I24. Pins 1, 10, and 19 are the common positive poles (LS+) with an internal fuse of 8A to supply the sensors.

Output

The sockets with pins 29 to 36 and 38 to 45 provide the 16 digital outputs O1 to O16. Pins 28 and 37 are the common negative poles (L-) for the output loads.

Each output channel can be loaded with 2A, but the total load of all 16 outputs must not exceed 8A.

The output channels are periodically tested for overload. In case of a channel overload, this channel is switched off for 10 seconds. In case of a module overload, all outputs are switched off for 10 seconds.

Prepare the Cables

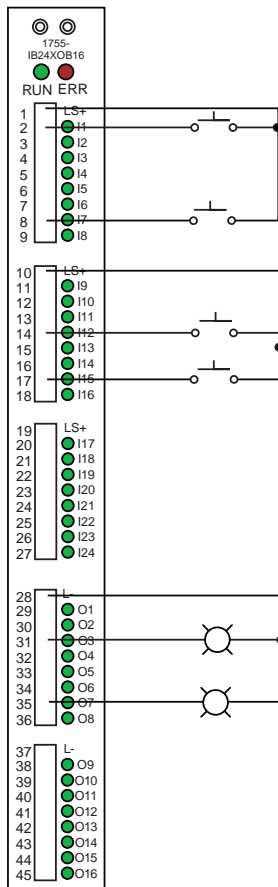
1. Remove enough of the cable insulation from the end of the bundle so that each cable can reach the terminal plug.
2. Strip about 10 mm of the insulation at the ends of the cable leads. Use end sleeves for flexible leads.
3. To ground the wires in each cable, the mesh must be in contact with the grounding grill. Remove about 2 cm of the outer cable insulation so that the mesh is exposed at the point where the cable is clipped to the grill (see Attach and Ground the Cables on page 10 for more information).

Attach the Terminal Plugs

IMPORTANT

Verify polarity of wiring before connecting.

Use the following drawing and the steps below to attach the terminal plugs:



1. Insert the stripped ends of the cable leads into the terminal plugs and tighten the screws using a 2.4 mm screwdriver or smaller.

Make sure that lead insulation is not fastened into the terminals plugs.

2. Push the terminal plugs into their sockets on the front plate of the module.

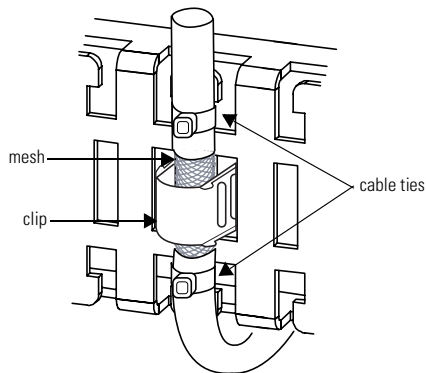
Attach and Ground the Cables

The cables are clipped to the grounding grill and are grounded by the contact made between the mesh and the grill. Use the steps below to attach and ground the cables:

IMPORTANT

Make sure that the mesh comes in direct contact with the grounding grill. If the mesh does not touch the grill, the cable is not grounded.

1. Use cable ties to attach the cable bundle to the grounding grill above and below the slots used by the clip.
2. With the mesh touching the grill, place the clip over the cables and pinch the sides until the clip is lined up with the slots (see figure below).
3. Insert the ends into the two slots; push the clip into the slots until it snaps in.



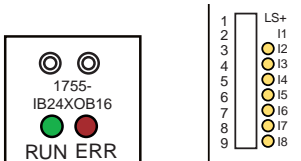
Connect the Power Supply

Connect the power supply unit, 1755-PB720, to the 24V dc supply voltage. The RUN indicator comes on steadily.

Troubleshooting with the Indicators

This module has the following indicators, shown in the figure below:

- Power supply indicator (RUN)
- Module status indicator (ERR)
- I/O status indicators



Power Supply Indicator (RUN)

Indication	Status
none	no power
green	correct operating voltage (24V dc)

Module Status Indicator (ERR)

Indication	Status
none	module operational
red	<p>if the system is in "run" mode, one or more of the inputs or outputs is faulty or the module is faulty</p> <p>Verify the location of the fault through your RSLogix Guard™ software. If a faulty module is indicated, the module must be replaced immediately or the safety-related operation of the GuardPLC 2000 is not maintained. Refer to the Replacing the Module section on page 13.</p>

I/O Status Indicators

Indication	Status
none	<ul style="list-style-type: none">• Input is low• output is de-energized
yellow	<ul style="list-style-type: none">• Input is high• output is energized

IMPORTANT

ERR is indicated continuously for both a module and a channel error. Depending on the type of error, the module switches off only a faulty output channel, but the operation of the other outputs continues, or all the output channels are switched off. The inputs are always in operation. A faulty input channel transmits Low-signal to the logic. If the entire module is switched off, all input and output channels are switched off.

Replacing the Module

ATTENTION

Electrostatic discharge can damage integrated circuits or semiconductors if you touch backplane connector pins. 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 the backplane connector or connector pins.
 - Do not touch circuit components inside the module.
 - If available, use a static-safe work station.
 - When not in use, keep the module in its static-shield box.
-

IMPORTANT

Disconnect the power supply module, 1755-PB720, from the 24V dc supply voltage before you replace the module.

If you need to replace the module, follow these steps:

1. Remove the terminal plugs from the sockets.
2. Detach the grounding grill, by removing the grounding grill screws.
3. Remove the lower panel of the chassis and disconnect the fans.
4. Remove the module screws.
5. Remove the module by pulling the handle.
6. Insert a new module as described in the Inserting the Module section on page 4.
7. Reinsert the terminal plugs into the sockets.
8. Send the faulty module to your nearest Rockwell Service Center for inspection and repair.

Specifications

1755-IB24XOB16 Specifications

Digital Inputs

Quantity of inputs	24
Nominal input voltage (1 signal)	24V dc (10 to 30V)
Off-state input voltage (0 signal)	max. 5V dc
ON state current	2 mA at 10V, 13 mA at 30V (3 groups of 8, each group limited to 100 mA)
OFF state current	1.5 mA at 5V

Digital Outputs

Quantity of outputs	16
Output voltage range	operating voltage minus 2V (depending on load)
Output current (30 °C)	2A per channel, overload protected, max. 8A per module

General Specifications

Current consumption	0.3A / 3.3V dc 0.5A / 24V dc
Operating voltage	24V dc, -15 to +20%, ripple \leq 5%
Operating temperature	0°C to +60°C (+32°F to +140°F)
Storage temperature	-40°C to +85 °C (-40°F to +185°F)
Weight	260g (0.57 lb)

Agency Certifications
(when product is marked)



UL Listed Industrial Control Equipment
UL Listed Industrial Control Equipment for use in Canada



Marked for all applicable directives



Functional Safety 1oo2D (AK 1–6, SIL 1–3,
according to DIN V 19250 and IEC 61508 respectively)



Marked for all applicable acts

N223

Notes:

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