



Compact 32-point Solid-state 24V dc Source Output Module

Catalog Number 1769-OB32T

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About This Publication

Use this document as a guide when installing a Compact 32-point Solid-state 24V dc Source Output Module.

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://literature.rockwellautomation.com>) 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.

| | |
|--|--|
| <p>WARNING</p>  | <p>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.</p> |
| <p>IMPORTANT</p> | <p>Identifies information that is critical for successful application and understanding of the product.</p> |
| <p>ATTENTION</p>  | <p>Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you to identify a hazard, avoid a hazard, and recognize the consequences.</p> |
| <p>SHOCK HAZARD</p>  | <p>Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.</p> |
| <p>BURN HAZARD</p>  | <p>Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that surfaces may be at dangerous temperatures.</p> |

Prevent Electrostatic Discharge

ATTENTION

Electrostatic discharge can damage integrated circuits or semiconductors if you touch bus 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 bus 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.
-

Remove Power

ATTENTION

Remove power before removing or inserting this module. When you remove or insert a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices, causing unintended machine motion.
- causing an explosion in a hazardous environment.

Electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

Hazardous Location Considerations

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or nonhazardous locations only. The following WARNING statement applies to use in hazardous locations.

WARNING

Explosion Hazard



- Substitution of components may impair suitability for Class I, Division 2.
 - Do not replace components or disconnect equipment unless power is switched off or the area is known to be nonhazardous.
 - Do not connect or disconnect components unless power is switched off or the area is known to be nonhazardous.
 - This product must be installed in an enclosure.
 - All wiring must comply with N.E.C. article 501-4(b).
-

Environnements dangereux

Cet équipement est conçu pour être utilisé dans des environnements de Classe 1, Division 2, Groupes A, B, C, D ou non dangereux. La mise en garde suivante s'applique à une utilisation dans des environnements dangereux.

AVERTISSEMENT

Danger D'explosion

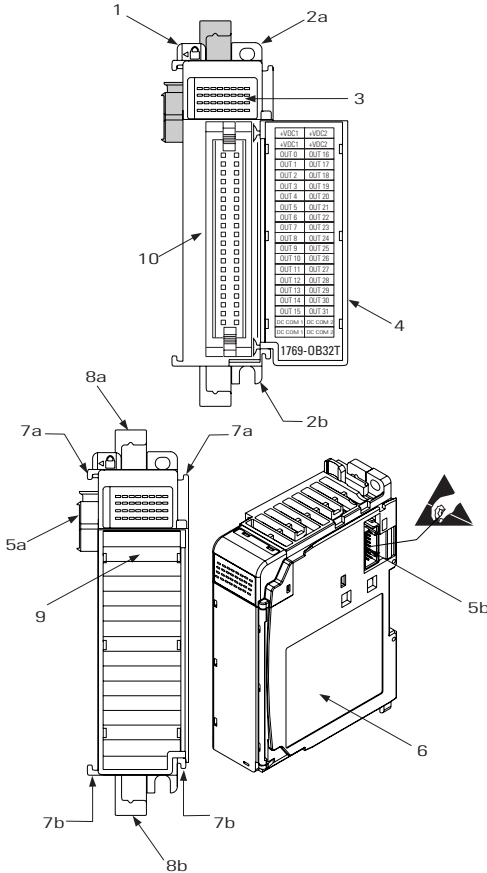


- La substitution de composants peut rendre cet équipement impropre à une utilisation en environnement de Classe 1, Division 2.
 - Ne pas remplacer de composants ou déconnecter l'équipement sans s'être assuré que l'alimentation est coupée et que l'environnement est classé non dangereux.
 - Ne pas connecter ou déconnecter des composants sans s'être assuré que l'alimentation est coupée ou que l'environnement est classé non dangereux.
 - Ce produit doit être installé dans une armoire.
-

About the 1769-OB32T Module

Compact I/O is suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2⁽¹⁾) and to circuits not exceeding Over Voltage Category II⁽²⁾ (IEC 60664-1)⁽³⁾.

Module Description



Labels

| Item | Description |
|------|--|
| 1 | Bus lever (with locking function) |
| 2a | Upper-panel mounting tab |
| 2b | Lower-panel mounting tab |
| 3 | I/O diagnostic LED indicators |
| 4 | Module door with terminal identification label |
| 5a | Movable bus connector with female pins |
| 5b | Stationary bus connector with male pins |
| 6 | Nameplate label |
| 7a | Upper tongue-and-groove slots |
| 7b | Lower tongue-and-groove slots |
| 8a | Upper DIN-rail latch |
| 8b | Lower DIN-rail latch |
| 9 | Write-on label (user ID tag) |
| 10 | MIL-C-83503 connector |

31563A-M

(1) Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected.

(2) Over Voltage Category II is the load level section of the electrical distribution system. At this level, transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.

(3) Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

Spare/Replacement Module Parts

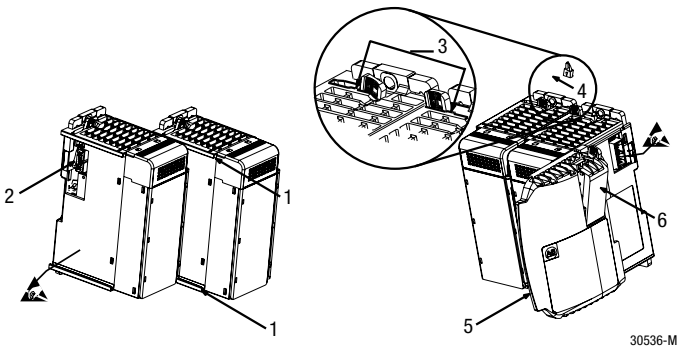
You can order the 1746-N3 connector kit, which contains one connector and 40 terminals.

Install the 1769-OB32T Module

Attach the module to the controller or an adjacent I/O module before or after mounting.

For mounting instructions, see Mount Module to Panel Using the Dimensional Template on page 9, or Mount Module to DIN Rail on page 10.

Refer to Replace a Single Module Within a System on page 7 to work with a system that is already mounted.



The following procedure shows you how to assemble the Compact I/O system.

1. Disconnect power.
2. Check that the bus lever of the module to be installed is in the unlocked (fully-right) position.
3. Use the upper and lower tongue-and-groove slots (1) to secure the modules together (or to a controller).
4. Move the module back along the tongue-and-groove slots until the bus connectors (2) line up with each other.

5. Use your fingers or a small screwdriver to push the bus lever back slightly to clear the positioning tab (3).
6. To allow communication between the controller and module, move the bus lever fully to the left (4) until it clicks, making sure it is locked firmly in place.

ATTENTION

When attaching I/O modules, it is very important that the bus connectors are securely locked together to be sure of proper electrical connection.

7. Attach an end-cap terminator (5) to the last module in the system by using the tongue-and-groove slots as before.
8. Lock the end-cap bus terminator (6).

IMPORTANT

You must use a 1769-ECR or 1769-ECL right or left end cap to terminate the end of the serial communication bus.

Replace a Single Module Within a System

The module can be replaced while the system is mounted to a panel (or DIN rail).

1. Remove power.
Refer to Remove Power on page 3.
2. Remove the upper and lower mounting screws from the module (or open the DIN latches using a flat-blade or Phillips-style screwdriver).
3. Move the bus lever to the right to disconnect (unlock) the bus.
4. On the right-side adjacent module, move its bus lever to the right (unlock) to disconnect it from the module to be removed.
5. Gently slide the disconnected module forward.

If you feel excessive resistance, check that the module is disconnected from the bus and that both mounting screws are removed (or DIN latches opened).

TIP

It may be necessary to rock the module slightly from front to back to remove it, or, in a panel-mounted system, to loosen the screws of adjacent modules

6. Be sure that the bus lever on the module and on the right-side adjacent module are in the unlocked (fully-right) position before installing the replacement module.
7. Slide the replacement module into the open slot.
8. Connect the modules by locking (fully-left) the bus levers on the replacement module and the right-side adjacent module.
9. Replace the mounting screws (or snap the module onto the DIN rail).

Mount Expansion I/O

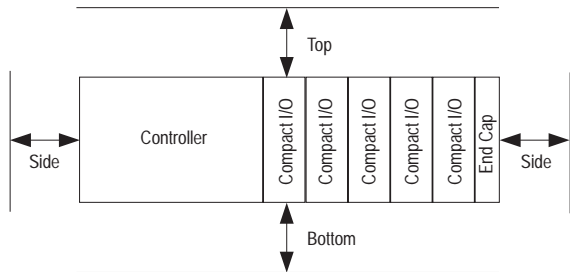
ATTENTION



During panel or DIN rail mounting of all devices, be sure that all debris, including metal chips or wire strands, is kept from falling into the module. Debris that falls into the module could cause damage when cycling power.

Minimum Spacing

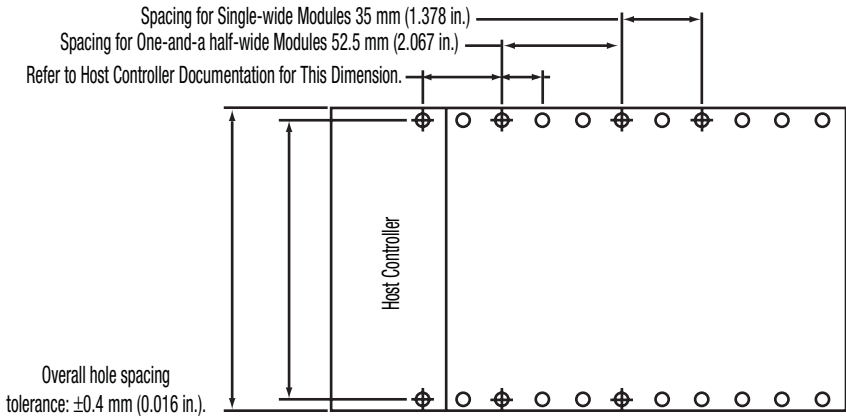
Maintain spacing from enclosure walls, wireways, or adjacent equipment. Allow 50 mm (2 in.) of space on all sides for adequate ventilation, as shown.



Mount Module to Panel

Mount the module to a panel using two screws per module. Use M4 or #8 panhead screws. Mounting screws are required on every module.

Mount Module to Panel Using the Dimensional Template



Locate holes every 17.5 mm (0.689 in.) to allow for a mix of single-wide and one-and-a-half-wide modules (for example, the 1769-OA16 module).

Mount Module to Panel Procedure Using Modules as a Template

This procedure lets you use the assembled modules as a template for drilling holes in the panel. Due to module-mounting hole tolerance, it is important to follow this procedure.

Refer to Mount Module to Panel Using the Dimensional Template on page 9 if you have sophisticated panel-mounting equipment.

1. On a clean work surface, assemble no more than three modules.
2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.
3. Return the assembled modules to the clean work surface, including any previously mounted modules.
4. Drill and tap the mounting holes for the recommended M4 or #8 screws.
5. Place the modules back on the panel, and check for proper hole alignment.

6. Attach the modules to the panel using the mounting screws.

TIP

If mounting more modules, mount only the last one of this group and put the others aside. This reduces the remounting time during drilling and tapping of the next group.

7. Repeat steps 1 to 6 for any remaining modules.

Mount Module to DIN Rail

The module can be mounted using these DIN rails.

- 35 x 7.5 mm (EN 50 022 - 35 x 7.5)
- 35 x 15 mm (EN 50 022 - 35 x 15)

Before mounting the module on a DIN rail, close the DIN-rail latches. Press the DIN-rail mounting area of the module against the DIN rail. The latches will momentarily open and lock into place.

Output Wiring

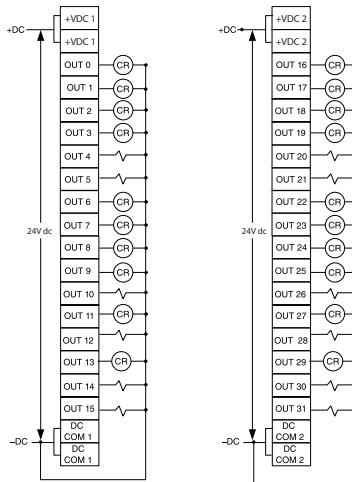
ATTENTION



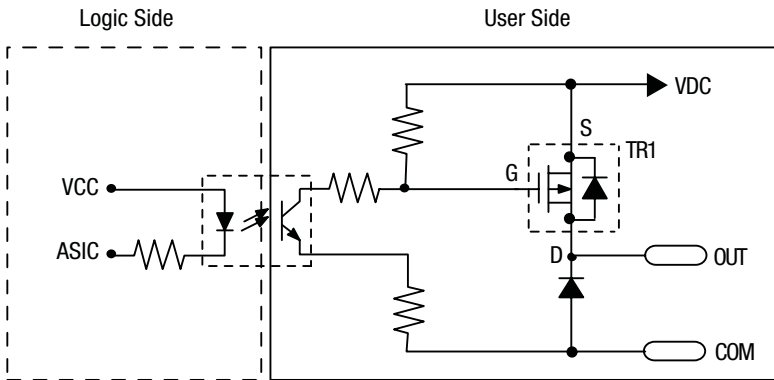
Accidentally wiring the module to an ac power source or applying reverse polarity will damage the module.

Be careful when stripping wires. Wire fragments that fall into a module could cause damage at power up. Once wiring is complete, ensure the module is free of all metal fragments.

Basic Wiring⁽¹⁾ of Output Devices⁽²⁾ to the 1769-OB32T Module



Simplified Output Circuit Diagram



⁽¹⁾ Recommended Surge Suppression. Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V dc inductive loads. For additional details, refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1.

⁽²⁾ Sourcing Output. Source describes the current flow between the I/O module and the field device. Sourcing output circuits source current to sinking field devices. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. **Europe:** dc sinking input and sourcing output module circuits are the commonly used options.

Wiring Options for the I/O Module

Included with your 32-point I/O module is a keyed 40-pin female connector and crimp-type pins. These components let you wire I/O devices to the module using a 40-conductor cable or individual wires.

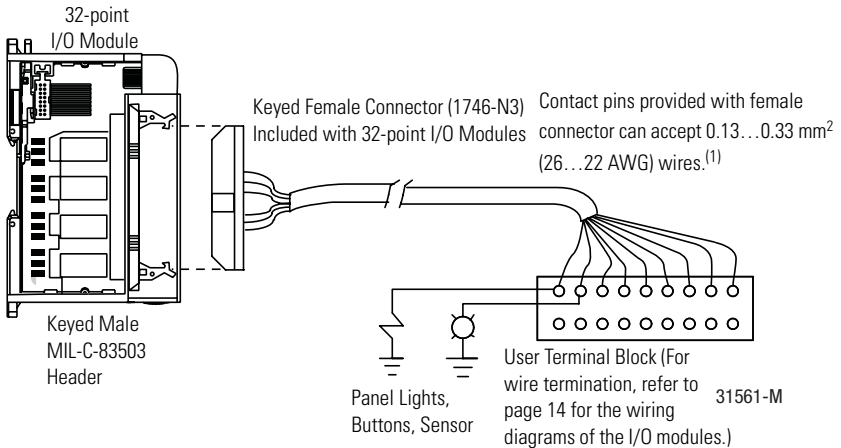
Refer to page 15 for connector/pin assembly instructions.

When assembled, align the female connector over the module's male header using the keying slot as a guide. Firmly lock them together with the upper and lower retaining arms. 1492 pre-wired cables and interface modules can be used for connecting external I/O.

There are two options for wiring the 32-point I/O module.

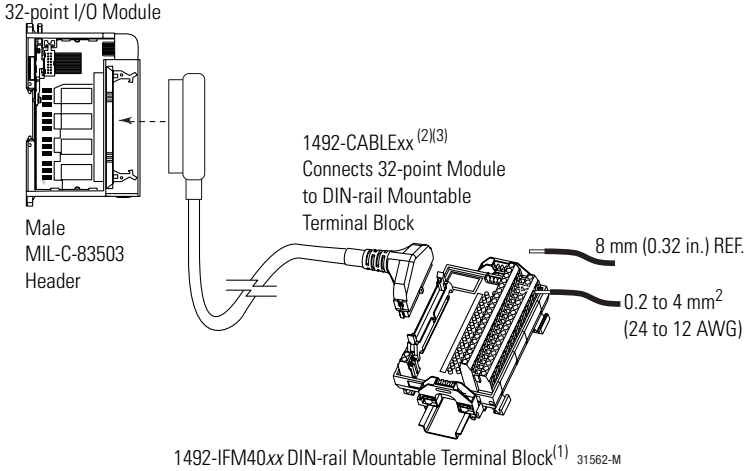
- Option 1 - Wire the 1746-N3 Connector
- Option 2 - Use Allen-Bradley 1492 Wiring Systems

Option 1 - Wire the 1746-N3 Connector



(1) Maximum cable length is dependent on how much voltage drop (current x (ohms/ft.) x (feet)) your system can tolerate. Your system should take into account the minimum turn-on voltage required by external loads connected to the 32-point output module, the minimum turn-on voltage required by the 32-point input module, and all of the voltage drops associated with wiring to and from the load, sensors, terminal blocks, power sources and the module itself.

Option 2 - Use Allen-Bradley 1492 Wiring Systems



Allen-Bradley 1492 wiring systems are available for connecting 32-point I/O modules to external I/O. These wiring systems include a pre-wired cable available in four lengths: 0.5 m (1.6 ft), 1.0 m (3.3 ft), 2.5 m (8.2 ft), 5.0 m (16.4 ft). An interface module for connecting external devices is also available. Cables are equipped with keyed connectors at both ends for proper connections. Interface modules are DIN-rail mountable and available with or without field-side status indicating LED indicators. Stick-on labels are provided with the interface modules to identify I/O-wiring termination points.

- (1) To maintain group isolation provided by 32-point I/O modules, use a 1492 terminal block that provides group isolation. Consult 1492 documentation or your Allen-Bradley Sales Office for additional information.
- (2) Maximum cable length is dependent on how much voltage drop (current x (ohms/ft) x (ft)) your system can tolerate. Your system should take into account the minimum turn-on voltage required by external loads connected to the 32-point output module, the minimum turn-on voltage required by the 32-point input module, and all of the voltage drops associated with wiring to and from the load, sensors, terminal blocks, power sources and the module itself. See the table on page 13 for voltage drop values for the 1492 cables shown above.
- (3) When using 1492-CABLExx, you won't be able to close the I/O module door. Leave it open or detach the removable door.

Voltage Drop

| Cat. No. | Voltage Drop at 30 °C | | Voltage Drop at 60 °C | |
|----------------|----------------------------------|-------------------------------------|-----------------------|----------------------|
| | V dc/dc com wires ⁽¹⁾ | Output channel wires ⁽²⁾ | V dc/dc com wires | Output channel wires |
| 1492-CABLE005H | 127 mV | 34 mV | 144 mV | 38 mV |
| 1492-CABLE010H | 173 mV | 45 mV | 196 mV | 51 mV |
| 1492-CABLE025H | 334 mV | 83 mV | 388 mV | 95 mV |
| 1492-CABLE050H | 574 mV | 147 mV | 686 mV | 169 mV |

(1) Voltage drop at max rated current of 2 A per conductor.

(2) Voltage drop at max rated current of 0.5 A per output channel.

Ground the 1769-OB32T Module

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the module's mounting tabs or DIN rail (if used) are not required unless the mounting surface cannot be grounded.

Refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional information.

Label for the 1492 Interface Module

Several different stick-on label sets are provided on a single card with 1492 interface modules. Each label set is identified with an I/O module catalog number and words upper and lower to identify to which terminal strip the label should be affixed.

The Terminal Block Labels table identifies the 1769-OB32T 32-point labels and their location on the interface module. Peel off the appropriate label and apply it to the interface module.

Terminal Block Labels

| Bottom Terminal Block | Top Terminal Block |
|-----------------------|--------------------|
| +V1 | +V2 |
| +V1 | +V2 |
| 0 | 16 |
| 1 | 17 |
| 2 | 18 |
| 3 | 19 |
| 4 | 20 |
| 5 | 21 |
| 6 | 22 |
| 7 | 23 |
| 8 | 24 |
| 9 | 25 |
| 10 | 26 |
| 11 | 27 |
| 12 | 28 |
| 13 | 29 |
| 14 | 30 |
| 15 | 31 |
| CM1 | CM2 |
| CM1 | CM2 |

The 1492 interface module stick-on labels are abbreviated as follows: +V1 = V dc 1, +V2 = V dc 2, CM1 = Com 1, and so on.

TIP

If you decide to build your cable using another 1746-N3 to terminate the cable at the 1492 interface-module end, wire it in the following manner: Pin 1 to Pin 1, Pin 2 to Pin 2, Pin 3 to Pin 3, and so on.

If the 1769-OB32T stick-on label set is not available, use the 1492 interface module stick-on label set for 1746-OB32 modules.

Assemble the Wire Contacts

1. Strip the wire insulation (1).

Refer to the graphic under Step 4. Crimp pins can accept 0.13...33 mm² (26...22 AWG) wire.

2. Insert the wire up to the wire stop (2).

3. Crimp with DDK crimp tool 357J-5538.

Equivalent Amp part numbers are: pin - #87666-2, connector - #102387-9, and crimp tool - #90418-1.

TIP

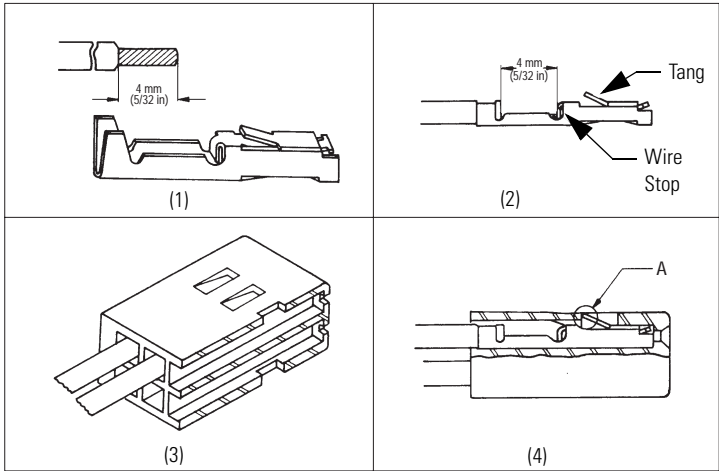
Pins and connectors from different manufacturers cannot be assembled together. For example, Amp pins cannot be used with a DDK connector.

If a crimp tool is not available, use the following crimping procedure:

- a. Crimp the wire barrel around the wire using small needle-nose pliers.
- b. Crimp the insulation barrel around the wire insulation using small needle-nose pliers.
- c. Solder wire and wire barrel together using rosin core (60% tin/40% lead) solder and soldering pencil.

4. Insert the wire contact into the socket (3) (4).

Make sure that the tang (4) is properly latched by lightly pulling on the wire.



Output Data File

For each module, slot x, words 0...1 in the output data file contain the control program's directed state of the digital output points.

Output Data File

| Word | Bit Position | | | | | | | | | | | | | | | |
|------|--------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0 | w | w | w | w | w | w | w | w | w | w | w | w | w | w | w | w |
| 1 | w | w | w | w | w | w | w | w | w | w | w | w | w | w | w | w |

w = write

Output Module's Input Data File

For each module, slot x, input data file words 0...1 contain the state of the module's output data (output data echo) file words 0...1. During normal operation, these input bits represent the logic state that the outputs are directed to by the control program. They are also dependent upon the:

- Program mode configuration (if supported by the controller).
- Fault mode configuration (if supported by the controller).

Output Module's Input Data File

| Word | Bit Position | | | | | | | | | | | | | | | |
|------|--------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0 | r | r | r | r | r | r | r | r | r | r | r | r | r | r | r | r |
| 1 | r | r | r | r | r | r | r | r | r | r | r | r | r | r | r | r |

r = read

IMPORTANT

The output module's input data file reflects the output data echo of the module, not necessarily the electrical state of the output terminals. It does not reflect shorted or open outputs.

It is important to use this input word if the controller adapter supports the Program mode or Fault mode function, and if it is configured to use them.

Configuration File

The read/writable configuration data file allows the setup of the hold last state and user-defined safe-state conditions.

Manipulate these bits with programming software, such as, RSLogix 500 or RSNetWorx for DeviceNet, during initial configuration of the system. In that case, graphical screens are provided via the programmer to simplify configuration. However, some systems, such as, 1769-ADN DeviceNet Adapter, also allow the bits to be altered as part of the control program using communication rungs. In that case, it is necessary to understand the bit arrangement.

Configuration File

| Word | Bit Position | | | | | | | | | | | | | | | |
|------|---------------------------------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|-----|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | PFE |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Program State for Output Array Word 0 | | | | | | | | | | | | | | | |
| 3 | Program State for Output Array Word 1 | | | | | | | | | | | | | | | |
| 4 | Program Value for Output Array Word 0 | | | | | | | | | | | | | | | |
| 5 | Program Value for Output Array Word 1 | | | | | | | | | | | | | | | |
| 6 | Fault State for Output Array Word 0 | | | | | | | | | | | | | | | |
| 7 | Fault State for Output Array Word 1 | | | | | | | | | | | | | | | |
| 8 | Fault Value for Output Array Word 0 | | | | | | | | | | | | | | | |

Configuration File

| Word | Bit Position | | | | | | | | | | | | | | | |
|------|-------------------------------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 9 | Fault Value for Output Array Word 1 | | | | | | | | | | | | | | | |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Program State Word

Word 1, the program state word, selects the hold last state or user-defined safe state condition for each individual output on a system transition from Run to Program.

| Condition | Bit Setting |
|-------------------------|-------------|
| User-defined safe state | 0 |
| Hold last state | 1 |

Program Value Word

The program value word, word 2, is used to program the user-defined safe state value (0=Off, 1=On). Each output is individually configurable for on or off.

| Value | Bit Setting |
|-------|-------------|
| Off | 0 |
| On | 1 |

Fault State Word

Word 3, the fault state word, selects the hold last state or user-defined safe state condition for each individual output on a system transition from Run to Fault.

| Condition | Bit Setting |
|-------------------------|-------------|
| User-defined safe state | 0 |
| Hold last state | 1 |

Fault Value Word

The fault value word, word 4, is used to program the fault state value (0=Off, 1=On). Each output is individually configurable for on or off.

| Value | Bit Setting |
|-------|-------------|
| Off | 0 |
| On | 1 |

Program to Fault Enable Bit (PFE)

Word 0, bit 0, allows the selection of which data value, the program or fault value, to apply to the output if a system in Program mode undergoes a system fault, resulting a change to Fault mode.

| Value Applied | Bit Setting |
|----------------------|--------------------|
| Program | 0 |
| Fault | 1 |

Module Default Condition

The module's default condition is all zeros, programming the conditions shown.

Program Conditions

| Word or Bit Affected | | Condition Applied |
|-----------------------------|-------------------------|--------------------------|
| Word 0, Bit 0 | Program-to-fault Enable | Program value |
| Word 1 | Program state | User-defined safe state |
| Word 2 | Program value | Off |
| Word 3 | Fault state | User-defined safe state |
| Word 4 | Fault value | Off |

Transistor Output Transient Pulses

The maximum duration of the transient pulse occurs when minimum load is connected to the output. However, for most applications, the energy of the transient pulse is not sufficient to energize the load.

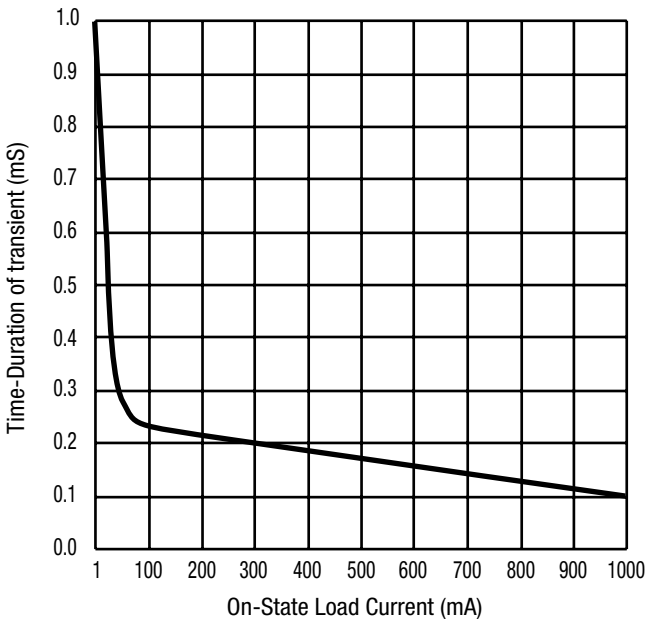
ATTENTION



A transient pulse occurs in transistor outputs when the external dc supply voltage is applied to the output common terminals (for example, via the master-control relay). The sudden application of voltage creates this transient pulse. This condition is inherent in transistor outputs and is common to solid state devices. A transient pulse can occur regardless of the controller having power or not. Refer to your controller's user manual to reduce inadvertent operation.

The Transient Pulse Duration as a Function of Load Current graph illustrates that the duration of the transient is inversely proportional to the load current. Therefore, as the on-state load current increases, the transient pulse decreases. Power-up transients do not exceed the time duration shown below, for the amount of loading indicated, at 60 °C (140 °F).

Transient Pulse Duration as a Function of Load Current



30519-M

Specifications

Compact 32-point Solid-state 24V dc Source Output Module - 1769-OB32T

| Attribute | Value |
|--|---|
| Voltage Category | 24V dc |
| Operating Voltage Range | 10.2...26.4V dc (source) ⁽³⁾ |
| Number of Outputs | 32 |
| Bus Current Draw, Max | 220 mA @ 5V dc (1.10 W) |
| Heat Dissipation | 4.76 Total W (The W per point, plus the min W, with all points energized.) |
| Signal Delay, Max – Resistive Load | Turn-on = 0.5 ms Turn-off = 4.0 ms |
| Off-state Leakage, Max ⁽¹⁾ | 0.1 mA @ 26.4V dc |
| On-state Current, Min | 1.0 mA |
| On-state Voltage Drop, Max | 0.3V dc @ 0.5 A |
| Continuous Current Per Point, Max | 0.5 A |
| Continuous Current Per Common, Max | 2.0 A |
| Continuous Current Per Module, Max | 4.0 A |
| Surge Current, Max ⁽²⁾ | 2.0 A (Repeatability is once every 2 s for a duration of 10 ms.) |
| Dimensions (HxDxW), Approx. | 118 x 87 x 35 mm (4.65 x 3.43 x 1.38 in.) Height including mounting tabs is 138 mm (5.43 in.) |
| Approximate Shipping Weight (with carton), Approx. | 230 g (0.51 lbs) |
| Power Supply Distance Rating | 8 (The module may not be more than 8 modules away from the power supply.) |
| Output Point to Bus Isolation | Verified by one of the following dielectric tests: 1200V ac for 2 s or 1697V dc for 2 s 75V dc working voltage (IEC Class 2 reinforced insulation) |
| Isolated Groups | Group 1: outputs 0...15 (internally connected to DC COM 1) Group 2: outputs 16...31 (internally connected to DC COM 2) |
| Vendor I.D. Code | 1 |
| Product Type Code | 7 |
| Product Code | 79 |

22 Compact 32-point Solid-state 24V dc Source Output Module

- (1) Typical Loading Resistor - To limit the effects of leakage current through solid state outputs, a loading resistor can be connected in parallel with your load. Use a 56 k ohm, 1/4 W resistor for this module's outputs, 24V dc operation.
- (2) Recommended Surge Suppression - Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V dc inductive loads. For additional details, refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1.
- (3) Sourcing output - source describes the current flow between the I/O module and the field device. Sourcing output circuits source current to sinking field devices. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. **Europe:** dc sinking input and sourcing output module circuits are the commonly used options.

Environmental Specifications

| Attribute | Value |
|-------------------------------------|---|
| Storage temperature | -40...85 °C (-40...185°F) |
| Operating temperature | 0...60 °C (32...140 °F) |
| Operating humidity | 5...95% noncondensing |
| Operating altitude | 2000 m (6561 ft) |
| Vibration, operating | 10...500 Hz, 5 g, 0.030 in. max peak-to-peak |
| Shock, operating | 30 g panel mounted (20 g DIN-rail mounted) |
| Shock, nonoperating | 40 g panel mounted (30 g DIN-rail mounted) |
| Radiated and conducted emissions | EN50081-2 Class A |
| Electrical /EMC | The module has passed testing at the following levels |
| ESD immunity (IEC61000-4-2) | 4 kV contact, 8 kV air, 4 kV indirect |
| Radiated immunity (IEC61000-4-3) | 10V/m, 80...1000 MHz, 80% amplitude |
| Fast transient burst (IEC61000-4-4) | 2 kV, 5 kHz |
| Surge immunity (IEC61000-4-4) | 2 kV common mode, 1 kV differential mode |
| Conducted immunity (IEC61000-4-6) | 10V, 0.15...80 MHz ⁽¹⁾ |

(1) Conducted Immunity frequency range may be 150 kHz...30 MHz if the radiated immunity frequency range is 30...1000 MHz.

Certifications

| Certification | Value |
|-------------------------------------|---|
| Agency certification ⁽¹⁾ | <ul style="list-style-type: none">• C-UL certified (under CSA C22.2 No. 142)• UL 508 listed• CE compliant for all applicable directives |
| Hazardous environment class | Class I, Division 2, Hazardous Location, Groups A, B, C, D (UL 1604, C-UL under CSA C22.2 No. 213) |

(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, certificates, and other certification details.

Additional Resources

You can view or download publications at <http://literature.rockwellautomation.com>. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

Related Documentation

| For | Refer to This Document | Pub. No. |
|---|---|-----------------|
| A more detailed description of how to use your Compact I/O with MicroLogix 1200/1500 programmable controllers | MicroLogix 1200 and MicroLogix 1500 Programmable Controllers Reference Manual | 1764-RM001 |
| A more detailed description of how to install and use your Compact I/O system with the 1769-ADN DeviceNet adapter | 1769-ADN DeviceNet Adapter User Manual | 1769-UM001 |
| A more detailed description of how to install and use your Compact I/O system with the CompactLogix system | CompactLogix System User Manual | 1769-UM007 |
| More information on proper wiring and grounding techniques | Industrial Automation Wiring and Grounding Guidelines | 1770-4.1 |

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its products. At <http://support.rockwellautomation.com>, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

| | |
|-----------------------|--|
| United States | 1.440.646.3223 Monday – Friday, 8am – 5pm EST |
| Outside United States | Please contact your local Rockwell Automation representative for any technical support issues. |

New Product Satisfaction Return

Rockwell tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

| | |
|-----------------------|---|
| United States | Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process. |
| Outside United States | Please contact your local Rockwell Automation representative for return procedure. |

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