FLEX I/O 8 Relay Output Module
Cat. No. 1794-OW8, 1794-OW8K, 1794-OW8XT

(Modules with catalog numbers that end in K are conformally coated to meet noxious gas requirements of ISA/ANSI-71.040 1985 Class G3 Environment.)

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.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.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual 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, or recognize the consequence.

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 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/IEEE 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbances.

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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of S5A, V0, V1, V0 (or equivalent) if non-metallic. 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.

In addition to this publication, see:
- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

FLEX I/O 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 (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately.

**ATTENTION**
Preventing Electrostatic Discharge
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

**WARNING**
If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

** 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**
Do not remove or replace a Terminal Base unit while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

**ATTENTION**
To comply with the CE Low Voltage Directive (LVD), this equipment must be powered from a source compliant with the following:
- Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

**European Hazardous Location Approval**
The following applies when the product bears the Ex Marking.

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in Zone 2 potentially explosive atmospheres, given in Annex II to this Directive.

Compliance with the Essential Health and Safety Requirements has been assured by product safety certifications.

Publication 1794-IN019H-EN-P - January 2011
North American Hazardous Location Approval

The 1794-OW8, 1794-OW8K, 1794-OW8XT modules are Hazardous Location approved.

The following information applies when operating this equipment in hazardous locations:

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with the product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

Installing Your Relay Output Module

1. Rotate the keyswitch (3) on the terminal base (4) clockwise to position 9 as required for this type of module.
2. Make certain the flexbus connector (1) is pushed all the way to the left to connect with the neighboring terminal base and adapter. You cannot install the module unless the connector is fully extended.
3. Make sure the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base.

Allow 25.4 mm (1 in.) of space between adjacent equipment for adequate ventilation.

If you remove or insert the module while the backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

4. Position the module (7) with its alignment bar (6) aligned with the groove (5) on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base unit. The module is seated when the latching mechanism (4) is locked into the module.

Exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relay K1 through KB, Epoxy. It is recommended that the User periodically inspect these devices for any degradation of properties and replace the module if degradation is found.

Simplified Schematic of the Relay Module

Load power can be obtained from a variety of sources, and can range from +5V...240V AC. Make certain that only 24V DC is applied to the module power terminals on the module terminal base unit.

If you are using 220/240V AC power, you must use the 1794-TBN or 1794-TBNF terminal base unit. Maximum voltage allowed is shown below.
Wiring to a 1794-TB2, 1794-TB3 or 1794-TB3S Terminal Base Unit

1. Connect individual output relay contact (customer load) wiring to numbered terminals on the **0…15** row (A) as indicated in the table below. The even numbered terminals are one pole of the relay contacts; the odd numbered terminals are the other pole of the relay contacts.

2. Connect 24V DC return to terminal 16 on the **16…33** row (B).

3. Connect +24V DC power to terminal 34 on the **34…51** row (C).

4. If daisychaining power to the next terminal base, connect a jumper from terminal 51 (+V DC) on this base unit to terminal 34 on the next base unit.

5. If continuing DC common to the next base unit, connect a jumper from terminal 33 (common) on this base unit to terminal 16 on the next base unit.

Wiring to a 1794-TBN or 1794-TBNF Terminal Base Unit

1. Connect individual output relay contact (customer load) to even numbered terminals 0…14 on row (B) and odd numbered terminals 1…15 on row (C) as indicated in the table below. The even numbered terminals are one pole of the relay contacts; the odd numbered terminals are the other pole of the relay contacts.

2. Connect 24V DC return to terminal 16 on the **16…33** row (B).

3. Connect +24V DC power to terminal 34 on the **34…51** row (C).

4. If daisychaining power to the next terminal base, connect a jumper from terminal 51 (+V DC) on this base unit to terminal 34 on the next base unit.

5. If continuing DC common to the next base unit, connect a jumper from terminal 33 (common) on this base unit to terminal 16 on the next base unit.

**ATTENTION**

If multiple power sources are used, do not exceed the specified isolation voltage.

Apply only 24V DC power to the power terminals on the terminal base unit. Make certain that all relay wiring is properly connected before applying any power to the module.

Total current through the terminal base unit is limited to 10 A. Separate power connections to the terminal base unit may be necessary.

Do not attempt to increase load current or wattage capability beyond the maximum rating by connecting 2 or more outputs in parallel. The slightest variation in relay switching time may cause one relay to momentarily switch the total load current.

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**Working Voltage and Isolation Voltage Ratings**

<table>
<thead>
<tr>
<th>Terminal Base</th>
<th>24V</th>
<th>120V</th>
<th>230V</th>
<th>Isolation Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1794-TBN, 1794-TBNK, 1794-TBNFK</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td>Dependent upon installed module - refer to individual installation instructions for your specific module.</td>
</tr>
<tr>
<td>1794-TB2, 1794-TB3, 1794-TB3K, 1794-TB3S</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td></td>
</tr>
<tr>
<td>1794-TB3T, 1794-TB3TS</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1794-TB3G, 1794-TB3GK, 1794-TB3GS</td>
<td>AC/DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1794-TB32, 1794-TB32S</td>
<td>AC/DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1794-TBKD</td>
<td>DC</td>
<td>AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1794-TBN, 1794-TBNF</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td></td>
</tr>
</tbody>
</table>

When using 240V power to a relay, you must connect a snubber across the load. Failure to connect a snubber across the load (relay contacts) can result in generation of electromagnetic noise which could disrupt nearby electrical equipment, including your 1794 FLEX I/O chassis. Use Allen-Bradley part number 599-KA04 or 1401-NX1.
Installing or Changing a Fuse in the 1794-TBNF

This terminal base unit has fuse holders for 5 x 20 mm fuses on each of the 8 even-numbered I/O terminals 0…14 (row B). To install or change a fuse:

1. Press the fuse holder down toward the terminal strip. Press down to open.

2. If replacing a fuse, remove the fuse from the fuse holder.

3. Insert a known good 5 x 20 mm fuse (Littelfuse pt. no. 239003, 3.0 A, 250V AC slow-blow) into the fuse holder.

4. Replace the fuse holder by rotating the fuse holder back to vertical until it snaps into the locked position.
Environmental Specifications

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature, operating</td>
<td>IEC 60068-2-1 (Test Ac, Operating Cold), IEC 60068-2-2 (Test Bc, Operating Dry Heat), IEC 60068-2-14 (Test Nac, Operating Thermal Shock): -20...70 °C (-4...158 °F) (1794-OW8XT) -20...55 °C (-4...131 °F) (1794-OW8, 1794-OW8K)</td>
</tr>
<tr>
<td>Temperature, non-operating</td>
<td>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 Nab, Unpackaged Non-operating Thermal Shock): -40...55 °C (-40...131 °F) (1794-OW8K), -40...70 °C (-40...158 °F) (1794-OW8XT)</td>
</tr>
<tr>
<td>Temperature, surrounding air, max</td>
<td>55 °C (131 °F) max (1794-OW8, 1794-OW8K) 70 °C (158 °F) max (1794-OW8XT)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing</td>
</tr>
<tr>
<td>Vibration</td>
<td>IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz</td>
</tr>
<tr>
<td>Shock, operating</td>
<td>IEC 60068-2-27 (Test Ea, Unpackaged Shock): 12 g</td>
</tr>
<tr>
<td>Shock, non-operating</td>
<td>50 g</td>
</tr>
<tr>
<td>Emissions</td>
<td>IEC 61000-4-2: 8 kV contact discharges 8 kV air discharges</td>
</tr>
<tr>
<td>Radiated RF immunity</td>
<td>IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 2V/m with 1 kHz sine-wave 80% AM from 2000...1700 MHz</td>
</tr>
<tr>
<td>EFT/B immunity</td>
<td>IEC 61000-4-4: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports</td>
</tr>
<tr>
<td>Surge transient immunity</td>
<td>Oscillatory Surge Withstand: IEEE C37.90.1: 2.5 kV</td>
</tr>
<tr>
<td>Conducted RF immunity</td>
<td>IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz</td>
</tr>
</tbody>
</table>

Certifications (when product is marked)(1)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>European Union 2004/108/EC, EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B) European Union 2006/95/EC, EN 60079-15; Potentially Explosive Atmospheres, Protection “n” II 3 G Ex n A, EEx n.C T4 X (1794-OW8) II 3 G Ex n A, EEx n.C T5 X (1794-OW8K) European Union 2006/95/EC, EN 60079-15; Potentially Explosive Atmospheres, Protection “n” EN 60079-0; General Requirements II 3 G Ex n A, EEx n.C T5 X when used at or below 60V AC or 75V DC</td>
</tr>
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| Ex | European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15, Potentially Explosive Atmospheres, Protection “n” EN 60079-0; General Requirements II 3 G Ex n A, EEx n.C T4 X (1794-OW8) II 3 G Ex n A, EEx n.C T5 X when used at or below 60V AC or 75V DC (1794-OW8K) European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15, Potentially Explosive Atmospheres, Protection “n” EN 60079-0; General Requirements II 3 G Ex n A, EEx n.C T5 X when used at or below 60V AC or 75V DC (1794-OW8K) European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15, Potentially Explosive Atmospheres, Protection “n” EN 60079-0; General Requirements II 3 G Ex n A, EEx n.C T5 X when used at or below 60V AC or 75V DC (1794-OW8K) TÜV (1794-OW8, 1794-OW8K, 1794-OW8XT) TÜV Certified for Functional Safety. capable of SIL 2 (1) See the Product Certification link at http://www.ab.com for Declaration of Conformity, Certifications, and other certification details.

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