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/literature/) describes some important differences between solid-state and 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 the 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, when necessary, 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.

**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, and recognize the consequences.

**IMPORTANT:** Identifies information that is critical for successful application and understanding of the product.
ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating. This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. 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 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

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

ATTENTION: 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.
ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated chromate-passivated steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that are 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. Be sure to ground the DIN rail properly. Refer to Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1 for more information.

ATTENTION: If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

ATTENTION: Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

ATTENTION: In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.

ATTENTION: Use only a soft dry anti-static cloth to wipe down equipment. Do not use any cleaning agents.
WARNING: When you insert or remove the module while backplane power is on, an electric 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. Repeated electric arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

WARNING: If you insert or remove the module while backplane power is on, an electric 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.
North American Hazardous Location Approval

The following modules are North American Hazardous Location approved: 1794-IB16D, 1794-OB16D.

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

Products marked "1794-IB16D, 1794-OB16D" are suitable for use in Class I Division 2 Groups A, B, C, D, nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment within the system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.

Informations sur l'utilisation du matériel en environnements dangereux:

Les produits marqués "1794-IB16D, 1794-OB16D" sont utilisables pour les environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

WARNING:

Explosion Hazard

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 connections, or other means provided with this product.

Substitution of components may impair suitability for Class I, Division 2.
Install the Isolated Analog Output Module

Component Identification

<table>
<thead>
<tr>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Flexbus connectors</td>
<td>5 Groove</td>
</tr>
<tr>
<td>2 Latching mechanism</td>
<td>6 Alignment bar</td>
</tr>
<tr>
<td>3 Keyswitch</td>
<td>7 Module</td>
</tr>
<tr>
<td>4 Terminal base</td>
<td></td>
</tr>
</tbody>
</table>


1. Rotate the keyswitch (3) on the terminal base (4) clockwise to position 4 as required for this type of module.
2. Make sure the Flexbus connector (1) is pushed all the way to the left to connect with the neighboring terminal base/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.
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 (2) is locked into the module.
1794-TB32 and 1794-TB32S Terminal Base Wiring for 1794-IB16D

Wiring Connections for the 1794-IB16 Module
(use with 1794-TB32 or 1794-TB32S terminal base units)

<table>
<thead>
<tr>
<th>Input</th>
<th>Terminal</th>
<th>Sensor Power Terminal</th>
<th>Common</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN 00</td>
<td>0-0</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 01</td>
<td>0-1</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 02</td>
<td>0-2</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 03</td>
<td>0-3</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 04</td>
<td>0-4</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 05</td>
<td>0-5</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 06</td>
<td>0-6</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 07</td>
<td>0-7</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 08</td>
<td>0-8</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 09</td>
<td>0-9</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 10</td>
<td>0-10</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 11</td>
<td>0-11</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 12</td>
<td>0-12</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 13</td>
<td>0-13</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 14</td>
<td>0-14</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
<tr>
<td>IN 15</td>
<td>0-15</td>
<td>1-1</td>
<td>2-2</td>
<td>3-3</td>
</tr>
</tbody>
</table>

- **IN 00 and IN 15 terminals are not used.**
- **V1 = Terminals 35, 37, 39 and 41 (not used).**
- **COM1 = Terminals 36, 38, 40, 42, 44, 46, 48 and 50 - Common for Inputs 0…15 and Sensor power 0…15.**
- **COM2 = Terminals 36, 38, 40, 42, 44, 46, 48 and 50 - Common for Inputs 0…15 and Sensor power 0…15.**
- **NC = No connections (terminals 16, 33, 34 and 51).**
- Voltage applied to Inputs 0…15 and Sensor power 0…15.

**Notes:**
1. 5-wire devices only.
2. 2-wire devices are input and sensor power terminals. 3-wire devices are input, sensor power and common terminals.

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Connecting Wiring for the 1794-OB16D Module

use with 1794-TB2, 1794-TB3, or 1794-TB3S Terminal Base

1. Connect individual output wiring to numbered terminals on the 0-15 row (A) as indicated in the Wiring Connections for 1794-OB16D table.
2. Connect the associated common for each output to the corresponding terminal on the 16-33 row (B) as indicated in the Wiring Connections for 1794-OB16D table. The common terminals of row (B) are internally connected together.
3. Connect +V DC power to terminal 34 on the 34-51 row (C). The power terminals of row (C) are internally connected together.
4. Connect DC common (COM) to terminal 16 on the 16-33 row (B).
5. 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.
6. 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.

1794-TB32 and 1794-TB32S Terminal Base Wiring for 1794-OB16D

---

**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.
Wiring Connections for the 1794-OB16D Output Module

<table>
<thead>
<tr>
<th>Output</th>
<th>Output Terminal</th>
<th>Common Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>A-0</td>
<td>B-17</td>
</tr>
<tr>
<td>01</td>
<td>A-1</td>
<td>B-18</td>
</tr>
<tr>
<td>02</td>
<td>A-2</td>
<td>B-19</td>
</tr>
<tr>
<td>03</td>
<td>A-3</td>
<td>B-20</td>
</tr>
<tr>
<td>04</td>
<td>A-4</td>
<td>B-21</td>
</tr>
<tr>
<td>05</td>
<td>A-5</td>
<td>B-22</td>
</tr>
<tr>
<td>06</td>
<td>A-6</td>
<td>B-23</td>
</tr>
<tr>
<td>07</td>
<td>A-7</td>
<td>B-24</td>
</tr>
<tr>
<td>08</td>
<td>A-8</td>
<td>B-25</td>
</tr>
<tr>
<td>09</td>
<td>A-9</td>
<td>B-26</td>
</tr>
<tr>
<td>10</td>
<td>A-10</td>
<td>B-27</td>
</tr>
<tr>
<td>11</td>
<td>A-11</td>
<td>B-28</td>
</tr>
<tr>
<td>12</td>
<td>A-12</td>
<td>B-29</td>
</tr>
<tr>
<td>13</td>
<td>A-13</td>
<td>B-30</td>
</tr>
<tr>
<td>14</td>
<td>A-14</td>
<td>B-31</td>
</tr>
<tr>
<td>15</td>
<td>A-15</td>
<td>B-32</td>
</tr>
<tr>
<td>-V DC</td>
<td>C-34...C-51</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>Terminal</td>
<td></td>
</tr>
</tbody>
</table>

Common B-16...B-33. Common terminals are internally connected in the terminal base unit.

Publication 1794-IN096D-EN-P - June 2018
## Diagnostics

See configuration information below for location of diagnostic bits.

**Note:** Each unused sensor port requires a dummy resistor to mask the channel diagnostic function.

### Diagnostic Functions for the 1794-IB16D

<table>
<thead>
<tr>
<th>Ext. Power</th>
<th>Wiring</th>
<th>Input Status</th>
<th>Channel LED Status</th>
<th>Open Wire Error Bit</th>
<th>Short Error Bit</th>
<th>Hex Error Bit</th>
<th>Module Error Bit/LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Open</td>
<td>ON</td>
<td>Red</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF/OFF</td>
</tr>
<tr>
<td></td>
<td>Short</td>
<td>OFF</td>
<td>Yellow/Red</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF/OFF</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>OFF</td>
<td>Yellow/Red</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF/OFF</td>
</tr>
</tbody>
</table>

The module monitors each sensor-power port for current and voltage. It turns on the channel red LED and sets (1) the error bit when 1) the module detects a short circuit (no voltage at the sensor-port), and 2) the module detects an open wire (no current at the sensor-port).
## Diagnostic Functions for the 1794-OB16D

<table>
<thead>
<tr>
<th>Ext. Power</th>
<th>Wiring Status</th>
<th>Channel LED Status</th>
<th>Open Wire Error Bit</th>
<th>Short Error Bit</th>
<th>Rev. Error Bit</th>
<th>Module Error Bit/LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>OFF</td>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Short</td>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>OFF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
</tr>
</tbody>
</table>

The module monitors each output channel. It turns on the channel red LED and sets (1) the error bit when:
1. The module detects a short circuit (the output signal is active at a channel and the corresponding output voltage is low).
2. The module detects an open wire (the output signal is inactive at a channel and the corresponding output voltage is high).
Sensor Diagram for the 1794-IB16D Module

- External Power Supply
- 3-Wire Sensor
- Dummy Resistor
- Shunt Resistor
- Sensor-power lines - Detect open wire
- Sensor-power lines - Detect short circuit

Unused input port - Dummy resistor needed or Fault LED remains lighted.

20k Ω, ≥ 1/8W

Sensor Diagram for the 1794-OB16D Module

- External Power Supply
- 1794-OB16D
- Load
- Unused output port - Dummy resistor needed or Fault LED remains lighted.

10k Ω, ≥ 1/8W

Publication 1794-IN096D-EN-P - June 2018
FLEX I/O Digital Input and Output Modules with Diagnostics

Configuration

Configuring Your 1794-IB16D Input Module

Configure your input module by setting bits in the configuration word (word 3). This module is compatible with the Remote I/O network with 1794-ASB series E or later, DeviceNet network, and the ControlNet network. Note: You must use the Module Connection when used in a ControlNet system.

Image Table Memory Map for the 1794-IB16D Module

<table>
<thead>
<tr>
<th>Dec</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bit 2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bit 3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Where

Diagnostic Status:
- I = Input status
- FT = Filter Time
- Bit 00 = Module error;
- Bit 01 = External power reverse polarity error;
- Bit 02 = Sensor power short error;
- Bit 03 = Sensor power open wire error

At the end of its life, this equipment should be collected separately from any unsorted municipal waste.
### Setting the Input Filter Time

To set the input filter time, set the associated bits in the output image (complementary word) for the module.

### Input Filter Time

<table>
<thead>
<tr>
<th>Bit</th>
<th>Description</th>
<th>Filter Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Filter Time 0</td>
<td>0.25 ms</td>
</tr>
<tr>
<td>1</td>
<td>Filter Time 1</td>
<td>0.50 ms</td>
</tr>
<tr>
<td>2</td>
<td>Filter Time 2</td>
<td>1.00 ms</td>
</tr>
<tr>
<td>3</td>
<td>Filter Time 3</td>
<td>2.00 ms</td>
</tr>
<tr>
<td>4</td>
<td>Filter Time 4</td>
<td>4.00 ms</td>
</tr>
<tr>
<td>5</td>
<td>Filter Time 5</td>
<td>8.00 ms</td>
</tr>
<tr>
<td>6</td>
<td>Filter Time 6</td>
<td>16.00 ms</td>
</tr>
<tr>
<td>7</td>
<td>Filter Time 7</td>
<td>32.00 ms</td>
</tr>
</tbody>
</table>

### Configuring Your 1794-OB16D Output Module

Configure your output module by setting bits in the configuration word (word 3). This module is compatible with the Remote I/O network, with 1794-ASB series D or later.
**Specifications**

### Specifications – 16 Input Module w/ Diagnostics, 1794-IB16D

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>16, current, sinking</td>
</tr>
<tr>
<td>Meets IEC 61131 specifications</td>
<td></td>
</tr>
<tr>
<td>Input voltage, min</td>
<td>10V DC</td>
</tr>
<tr>
<td>Input voltage, nominal</td>
<td>24V DC</td>
</tr>
<tr>
<td>Input voltage, max</td>
<td>31.2V DC</td>
</tr>
<tr>
<td>Input current, min</td>
<td>2.0 mA</td>
</tr>
<tr>
<td>Input current, max</td>
<td>1.5 mA</td>
</tr>
<tr>
<td>Nominal input impedance</td>
<td>3.1 kΩ</td>
</tr>
<tr>
<td>Isolation voltage</td>
<td>50V (continuous), Basic Insulation Type</td>
</tr>
<tr>
<td>Input filter time (1)</td>
<td>Off to On, On to Off</td>
</tr>
<tr>
<td>EN61000-6-2</td>
<td>With Settling Time Filter, time between field side and system isolation between individual channels</td>
</tr>
</tbody>
</table>

---

### Image Table Memory Map for the 1794-OB16D Module

<table>
<thead>
<tr>
<th>Dec</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Read 1</td>
<td>Not used</td>
<td>Read Diagnostic Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where Diagnostics:
- O = Output
- Bit 00 = Module error
- Bit 01 = External power reverse polarity error
- Bit 02 = Output short error
- Bit 03 = Output open wire error
### Specifications – 16 Input Module w/ Diagnostics, 1794-IB16D

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>16, current, sourcing</td>
</tr>
<tr>
<td>Recommended terminal base units</td>
<td>1794-TB2, 1794-TB3, 1794-TB3S</td>
</tr>
<tr>
<td>Input voltage, min</td>
<td>10V DC</td>
</tr>
<tr>
<td>Input voltage, nom</td>
<td>24V DC</td>
</tr>
<tr>
<td>Input voltage, max</td>
<td>31.2V DC</td>
</tr>
<tr>
<td>Input current rating</td>
<td>8.0 A (16 outputs @ 0.5 A)</td>
</tr>
<tr>
<td>On-state current, min</td>
<td>1.0 mA per channel</td>
</tr>
<tr>
<td>On-state current, max</td>
<td>500 mA per channel</td>
</tr>
<tr>
<td>Surge current</td>
<td>2 A for 50 ms each, repeatable every 2 seconds</td>
</tr>
<tr>
<td>Off-state leakage, max</td>
<td>0.5 mA</td>
</tr>
<tr>
<td>Isolation voltage</td>
<td>50V (continuous), Basic Insulation Type Type tested at 850V DC for 60 s, between field side and system No isolation between individual channels</td>
</tr>
<tr>
<td>Isolation voltage</td>
<td>50V (continuous), Basic Insulation Type Type tested at 850V DC for 60 s, between field side and system No isolation between individual channels</td>
</tr>
<tr>
<td>Output signal delay, (^{(1)})</td>
<td>Off to On: 0.5 ms</td>
</tr>
<tr>
<td></td>
<td>On to Off: 0.5 ms</td>
</tr>
</tbody>
</table>

### Specifications – 16 Output Module w/ Diagnostics, 1794-OB16D

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of outputs</td>
<td>16, current, sourcing</td>
</tr>
<tr>
<td>Recommended terminal base units</td>
<td>1799-TB2, 1799-TB3, 1799-TB3S</td>
</tr>
<tr>
<td>Output voltage, min</td>
<td>10V DC</td>
</tr>
<tr>
<td>Output voltage, nom</td>
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</tr>
</tbody>
</table>

\(^{(1)}\) Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off filter time is the time from the valid signal dropping below the valid level to recognition by the module.
### Specifications – 16 Output Module w/ Diagnostics, 1794-OB16D

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlexBus current</td>
<td>60 mA @ 5V DC</td>
</tr>
<tr>
<td>Power dissipation, max</td>
<td>4.8 W @ 31.2 V DC</td>
</tr>
<tr>
<td>Thermal dissipation, max</td>
<td>16.4 BTU/hr @ 31.2 V DC</td>
</tr>
<tr>
<td>Short circuit protect and detection condition:</td>
<td>when external power active, output signal active, and output port voltage less than 2V.</td>
</tr>
<tr>
<td>Open wire detect off-state leakage current</td>
<td>0.1 mA – When external power active and output signal inactive.</td>
</tr>
<tr>
<td>Detect reverse polarity voltage</td>
<td>Minimum 10V. Module must detect if the reverse polarity external power supply voltage is greater than the value.</td>
</tr>
</tbody>
</table>

#### General Specifications

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal base screw torque</td>
<td>Determined by installed terminal base</td>
</tr>
<tr>
<td>Dimensions, approx. (H x W x D)</td>
<td>45.7 x 94 x 94 mm (1.8 x 3.7 x 3.7 in.) – 1794-IB16D</td>
</tr>
<tr>
<td></td>
<td>94 x 94 x 91 mm (3.7 x 3.7 x 3.6 in.) – 1794-OB16D</td>
</tr>
<tr>
<td>Weight, approx.</td>
<td>90 g (3.17 oz.) – 1794-IB16D</td>
</tr>
<tr>
<td></td>
<td>95 g (3.35 oz.) – 1794-OB16D</td>
</tr>
<tr>
<td>Indicators (field side)</td>
<td>16 yellow ON/OFF status indicators</td>
</tr>
<tr>
<td></td>
<td>16 red diagnostic status indicators</td>
</tr>
<tr>
<td></td>
<td>1 red module fault indicator</td>
</tr>
<tr>
<td>External DC power supply voltage</td>
<td>Nom 24V DC</td>
</tr>
<tr>
<td>External DC power supply voltage range</td>
<td>10…31.2V DC (includes 5% AC ripple)</td>
</tr>
<tr>
<td>North American temp code</td>
<td>T3C</td>
</tr>
<tr>
<td>Keyswitch position</td>
<td>2</td>
</tr>
<tr>
<td>Enclosure type rating</td>
<td>None (open-style)</td>
</tr>
<tr>
<td>Wiring category(1)</td>
<td>2 – on signal ports</td>
</tr>
</tbody>
</table>

(1) Delay time is the time from the receipt of an output on or off command to the output actually turning on or off.

(2) Use this conductor category information for planning conductor sizing as described in Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
### Environmental Specifications

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating temperature</strong></td>
<td>IEC 60068-2-1 (Test Aa, Operating Cold), IEC 60068-2-2 (Test Bb, Operating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock): 0 °C &lt; Ta &lt; +55 °C (+32 °F &lt; Ta &lt; +131 °F)</td>
</tr>
<tr>
<td></td>
<td>Temperature, surrounding air, max. 55 °C (131 °F)</td>
</tr>
<tr>
<td><strong>Storage temperature</strong></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 Na, Unpackaged Non-operating Thermal Shock): -40…85 °C (-40…185 °F)</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% non-condensing</td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz</td>
</tr>
<tr>
<td><strong>Shock, operating</strong></td>
<td>IEC 60068-2-27 (Test Ea, Unpackaged shock): 30 g</td>
</tr>
<tr>
<td><strong>Shock, non-operating</strong></td>
<td>IEC 60068-2-27 (Test Ea, Unpackaged shock): 50 g</td>
</tr>
<tr>
<td><strong>Emissions</strong></td>
<td>CISPR 11: Group 1, Class A (with appropriate enclosure)</td>
</tr>
<tr>
<td><strong>ESD immunity</strong></td>
<td>IEC 61000-4-2: 6 kV contact discharges, 8 kV air discharges</td>
</tr>
<tr>
<td><strong>Radiated RF immunity</strong></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 from 800...2000 MHz, 1V/m with 1 kHz sine-wave 80% AM from 2000...3000 MHz</td>
</tr>
<tr>
<td><strong>Surge transient immunity</strong></td>
<td>IEC 61000-4-4: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports</td>
</tr>
<tr>
<td><strong>Conducted RF immunity</strong></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

<table>
<thead>
<tr>
<th>Certification (when product is marked)(1)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE European Union 2014/30/EU EMC Directive, compliant with: EN 61131-2; Programmable Controllers (Clause 11) EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause E; Zones A &amp; B)</td>
<td>CE European Union 2014/30/EU EMC Directive, compliant with: EN 61131-2; Programmable Controllers (Clause 11) EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause E; Zones A &amp; B)</td>
</tr>
<tr>
<td>EAC Russian Customs Union TR CU 020/2011 EMC Technical Regulation</td>
<td>EAC Russian Customs Union TR CU 020/2011 EMC Technical Regulation</td>
</tr>
<tr>
<td>RCM Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions</td>
<td>RCM Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions</td>
</tr>
</tbody>
</table>

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(1) See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.
WARNING: When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.
Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support, 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://www.rockwellautomation.com/support.

Installation Assistance

If you experience a problem 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 product up and running.

United States or Canada 1.800.324.3634

Outside United States or Canada
Use the Worldwide Locator at http://www.rockwellautomation.com/worldwide_locator, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation 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, follow these procedures.

United States
Contact your distributor. You must provide a Customer Support case number (and the phone number above to obtain one) to your distributor to complete the return process.

Outside United States
Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us improve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature.

For more information, visit Rockwell Automation’s website at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

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