**Description**

The 3500/33 16-Channel Relay Module is a full-height module that provides 16 relay outputs. You can place any number of 16-channel relay modules in any of the slots to the right of the Transient Data Interface (TDI) Module.

Each output of the 3500/33 16-Channel Relay Module can be independently programmed to perform voting logic.

Each relay of the module includes Alarm Drive Logic. Programming for the Alarm Drive Logic uses AND and OR logic and may use the following:

- Alarming inputs (alert and danger statuses)
- Not-OK
- Individual Measured Variables from any monitor channel or any combination of monitor channels in the rack

You can program the Alarm Drive using the 3500 Rack Configuration Software.
## Specifications

### Inputs

| Power Consumption | 5.8 watts typical |

### Outputs

#### Front Panel LEDs

- **OK LED**: Illuminated when the 3500/33 16-Channel Relay Module is operating properly.
- **TX/RX LED**: Transmit and receive flashes when the 3500/3316-Channel Relay Module is communicating with other modules in the 3500 rack.
- **CH Alarm LED**: Illuminated when Relay channel is in an alarm state.
- **Relay Type**: Single-pole Double-throw (SPDT)
- **Relay Environmental Sealing**: Epoxy-sealed
- **Relay Arc Suppressor**: 250 Vrms Installed as standard
- **Relay Contact Life**: 10,000 cycles
- **Relay Operation**: Four groups of four channels are switch selectable for Normally De-energized (ND) or Normally Energized (NE) operation.

### Physical

- **Main Module**
  - Dimensions (height x width x depth): 241 mm x 24.4 mm x 242 mm (9.50 in x 0.96 in x 9.52 in)
  - Weight: 0.7 kg (1.6 lb)
- **I/O Module**
  - Dimensions (height x width x depth): 241 mm x 24.4 mm x 99.1 mm (9.50 in x 0.96 in x 3.90 in)
  - Weight: 0.4 kg (1.0 lb)

### Rack Space Requirements

- **Main Module**: 1 full-height front slot
- **I/O Modules**: 1 full-height rear slot

## Contact Ratings for Standard Systems

### Standard Relays

<table>
<thead>
<tr>
<th>Standard Relays</th>
<th>DC Specifications (Resistive Load)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Switched Current</td>
<td>100 mA @ 5 Vdc</td>
</tr>
<tr>
<td>Max Switched Power</td>
<td>70 W @ 24 Vdc</td>
</tr>
<tr>
<td>Max Switched Voltage</td>
<td>10 W @ 48 Vdc</td>
</tr>
</tbody>
</table>

### AC Specifications (Resistive Load)

| Max Switched Current | 3 A |
| Max Switched Power | 1200 VA |
| Max Switched Voltage | 250 Vac |

## Contact Ratings for Failsafe Systems and Hazardous Area Systems

### Standard Relays

<table>
<thead>
<tr>
<th>Standard Relays</th>
<th>DC Specifications (Resistive Load)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Switched Current</td>
<td>100 mA @ 5 Vdc</td>
</tr>
<tr>
<td>Max Switched Power</td>
<td>30 Vdc</td>
</tr>
</tbody>
</table>

- Minimum switched load for standard (silver) contacts is 100 mA @ 5 Vdc.
- Minimum switched load for Low Current (gold-plated) contacts is 1 mA @ 1 Vdc.
Low Current Relays

<table>
<thead>
<tr>
<th>DC Specifications (Resistive Load)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Switched Current</td>
<td>1 mA @ 1 Vdc</td>
</tr>
<tr>
<td>Max Switched Current</td>
<td>100 mA @ 48 Vdc</td>
</tr>
</tbody>
</table>

For relay contact selection See Front and Rear View of the 3500/33 16-Channel Relay Module on page 7.
Compliance and Certifications

FCC
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC
European Community Directive: EMC Directive 2014/30/EU
Standards:
  - EN 61000–6–2 Immunity for Industrial Environments
  - EN 61000–6–4 Emissions for Industrial Environments

Electrical Safety
Standards:
  - EN 61010–1

RoHS
European Community Directive: RoHS Directive 2011/65/EU

Maritime
ABS – Marine and Offshore Applications
DNV GL Rules for Classification – Ships, Offshore Units, and High Speed and Light Craft

Hazardous Area Approvals


CSA/NRTL/C
Class I, Zone 2: AEx/Ex nA nC ic IIC T4 Gc;
Class I, Zone 2: AEx/Ex ec nC ic IIC T4 Gc;
Class I, Division 2, Groups A, B, C, and D;

T4 @ Ta = -20°C to +65°C ( -4°F to +149°F)
When installed per drawing 149243 or 149244.

ATEX/IECEx

Ex II 3 G
Ex nA nC ic IIC T4 Gc
Ex ec nC ic IIC T4/T5 Gc

T4 @ Ta = -20°C to +65°C
( -4°F to +149°F)
When installed per drawing 149243 or 149244.
Ordering Information


3500/33 AA–BB

A: Output Module
01 16-Channel Relay Output Module
02 16-Channel Failsafe Relay Output Module
03 Low Current 16-Channel Relay Output Module
04 Low Current 16-Channel Failsafe Relay Output Module

B: Hazardous Area Approval Option
00 None
01 CSA / NRTL / C (Class I, Division 2)
02 ATEX / IECEx / CSA (Class I, Zone 2)

Spares

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>149986-01</td>
<td>Spare 16-Channel Relay Control Module</td>
</tr>
<tr>
<td>149992-01</td>
<td>Spare 16-Channel Relay Output Module</td>
</tr>
<tr>
<td>149992-02</td>
<td>Spare 16-Channel Failsafe Relay Output Module</td>
</tr>
<tr>
<td>149992-03</td>
<td>Spare 16-Channel Low Current Relay Output Module</td>
</tr>
<tr>
<td>149992-04</td>
<td>Spare 16-Channel Low Current Failsafe Relay Output Module</td>
</tr>
<tr>
<td>04425545</td>
<td>Grounding Wrist Strap (single use)</td>
</tr>
<tr>
<td>162291</td>
<td>16-Channel Relay Module User Guide</td>
</tr>
<tr>
<td>00580453</td>
<td>Connector Header Internal Termination 16-position Green</td>
</tr>
</tbody>
</table>
Ordering Considerations

- The 3500/33 16-Channel Relay Module requires the 3500 Rack Config, version 3.3 or later.
- The 3500/33 requires the 3500 Data Acquisition Software, version 2.40 or later.
- The 3500/33 16-Channel Relay Module requires the 3500 Data Display Software, version 1.40 or later.
- When ordered with the multiple approvals option (02), the 3500 monitor is certified to Zone 2 standards, including ATEX and North American zones.
- The Zone 2 standards specify increased spacing requirements at higher voltages. The 3500/33 16-Channel Relay Module does not meet these spacing requirements. Thus, the module ordered with the multiple approvals option is limited to a lower voltage than those with the other approvals options.
- Using higher voltages violates the hazardous area certificates associated with the multiple approvals option.
- The North American Division 2 standards associated with the CSA-only approvals option (-01) have been de-rated to 30 Vrms to comply with 61010-1 type test requirements.
- If the 3500/33 16-Channel Relay Module is part of a functional safety (SIL) system, the functional safety certificate requires the restricted voltage. Higher voltages are not allowed for functional safety (SIL) systems.
Graphs and Figures

1. Relay Module
2. I/O Module
3. Status LEDs
4. Relay Channel LEDs
5. Relay Contacts
6. Relay Mode Selection Switch

Figure 1: Front and Rear View of the 3500/33 16-Channel Relay Module
1. Low Current Output Modules (Ordering options A03 and A04) use gold-plated relay contacts.
2. Standard Output Modules (Ordering options A01 and A02) use silver relay contacts.

If the application is at the transition between the low current region and the high current region, the most appropriate choice is to select the Low Current option (with gold-plated contacts). If the gold plating is damaged by excessive load, the contacts will still behave as standard silver contacts.

*Figure 2: Relay Contact Selection for DC Loads*