Section 12. Digital Output Module

12-1. Description

The Ovation digital output module provides a means to switch up to 60 VDC at moderate currents (for example, relay coils and lamps). The digital output module contains 16 current sinking transistor outputs capable of switching 60 VDC loads at up to 500mA.

The digital output module provides configurable communication timeout periods and LEDs to indicate the status of each output.

The Digital Output Module is applicable for CE Mark Certified Systems.

Note

See **Section 3. I/O Modules** for environmental, installation, wiring, and fuse information.

12-2. Module Groups

12-2.1. Electronics Module

There is one Electronics module group for the Digital Output Module:

- 1C31122G01 provides for switching 60 VDC loads.

12-2.2. Personality Modules

There are three Personality module groups for the Digital Output Module:

- 1C31125G01 is used to interface the digital output module to the field through the terminal blocks.
- 1C31125G02 is used to interface the digital output module to the relay modules when power is supplied locally (from the I/O backplane auxiliary power supply). It can also can be used to interface the digital output module to the field through the terminal blocks.

- 1C31125G03 is used to interface the digital output module to the relay modules when power is supplied remotely (from the relay modules). It can also can be used to interface the digital output module to the field through the terminal blocks.

Caution

When 1C31125G03 is used, the returns for the remote power supply and the local power supply are connected together. Therefore, to avoid problems with differences in earth ground potentials, ensure that the power supply return lines are earth grounded at only ONE point.

Table 12-1. Digital Output Subsystem

Description	Channels	Electronic Module or Panel Kit	Personality Module
0-60 VDC Single ended Direct	16	1C31122G01	1C31125G01
Relay Panel Interface:			
Local Power Supply	16	1C31122G01	1C31125G02
Field Power Supply	16	1C31122G01	1C31125G03
Relay Panels:			
Solid State Relay Panel (AC)	16	5A22410G01	
Solid State Relay Panel (DC)	16	5A22410G02	
G2R Relay Panel (Low Power Electromechanical)	16	5A22411G01	
KU Relay Panel [1] (High Power Electromechanical)	16	5A22412G01, G02, G03	

[1] Two panels (8 relays each) are included in the KU Relay Panel kit 5A22412G01, G02, and G03.

All configurations are CE Mark certified, except AC/DC Solid State Relay Panels.

12-3. External Power Supplies

The Digital Output module may obtain voltage from the internal auxiliary power supply (backplane) or from an external power supply.

If an external power supply is used, see Appendix D for the steps to be undertaken before connecting the external power supply to the Digital Output module base unit terminal block. The external power supply DC output voltage level depends on the Digital Output module application.

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12-4. Specifications

Electronics Module (1C31122)
Personality Module (1C31125)

Table 12-2. Digital Output Module Specifications

Description	Value
Number of channels	16
Output voltage Off voltage (maximum) On voltage (maximum)	 60 VDC 1.0 V @ 500mA 0.2 V @ 100mA
Output current Off current (maximum) On current for all 16 outputs combined (max) Personality module Group 1 Personality module Group 2 [1] Personality module Group 3 [1] On current for individual output (max)	 25µA @ TA = 25°C, VDS = 60 VDC 250µA @ TA = 60°C, VDS = 60 VDC Limited by fuse rating 890mA maximum for all 16 outputs 2.2A maximum for all 16 outputs Limited by the fuse located on the relay module 500 mA
Blown fuse detection [2] Operating voltage range	 15V ≤ field supply voltage ≤ 60V
Maximum propagation time	2.5 mSec for Rload=500Ω
Dielectric isolation: [3] Channel to logic	 1000V AC/DC
Module power	Main: 2.2 W typical, 3.3 W maximum Aux used with no relay panels: 8 outputs on @ 100mA each 19.2 W (24V) typical 38.4 W (48V) typical Aux used with the following relay panels: Solid State panel with 16 relays: 5.9 W (24V) typical G2R panel with 16 relays: 10.87 W (24V) typical KUEP panel with 8 Form C relays: 15.84 W (24V) typical 2 KUEP panels with 16 Form C relays: 31.68 W (24V)typical KUEP panel with 8 Form X relays: 11.28 W (24V) typical 2 KUEP panels with 16 Form X relays: 22.56 W (24V)typical
Operating temperature range	0 to 60°C (32°F to 140°F)
Storage temperature range	-40°C to 85°C (-40°F to 185°F)
Humidity (non-condensing)	0 to 95%

[1] The personality module Groups 2 and 3 are used to interface with the relay modules. See Section 12-6.
[2] The user can configure the card to disable the blown fuse detection function.
[3] All 16 channels have a common return which is isolated from the logic ground.

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12-5. Digital Output Terminal Block Wiring Information

Each Personality module has a simplified wiring diagram label on its side, which appears above the terminal block. This diagram indicates how the wiring from the field is to be connected to the terminal block in the base unit. The diagram for the digital output Personality module is illustrated in Figure 12-1. The following table lists and defines the abbreviations used in that diagram.

Abbreviation	Definition
+	Digital output positive terminal connections
-	Digital output negative terminal connections
⏚	Earth Ground terminals
PS+, PS-	Auxiliary power supply terminals
SH	Shield (non-CE Mark certified systems)

Notes

1. Do **not** use unmarked terminal block locations.
2. Shield terminals (SH) are **not** connected in CE Mark systems.

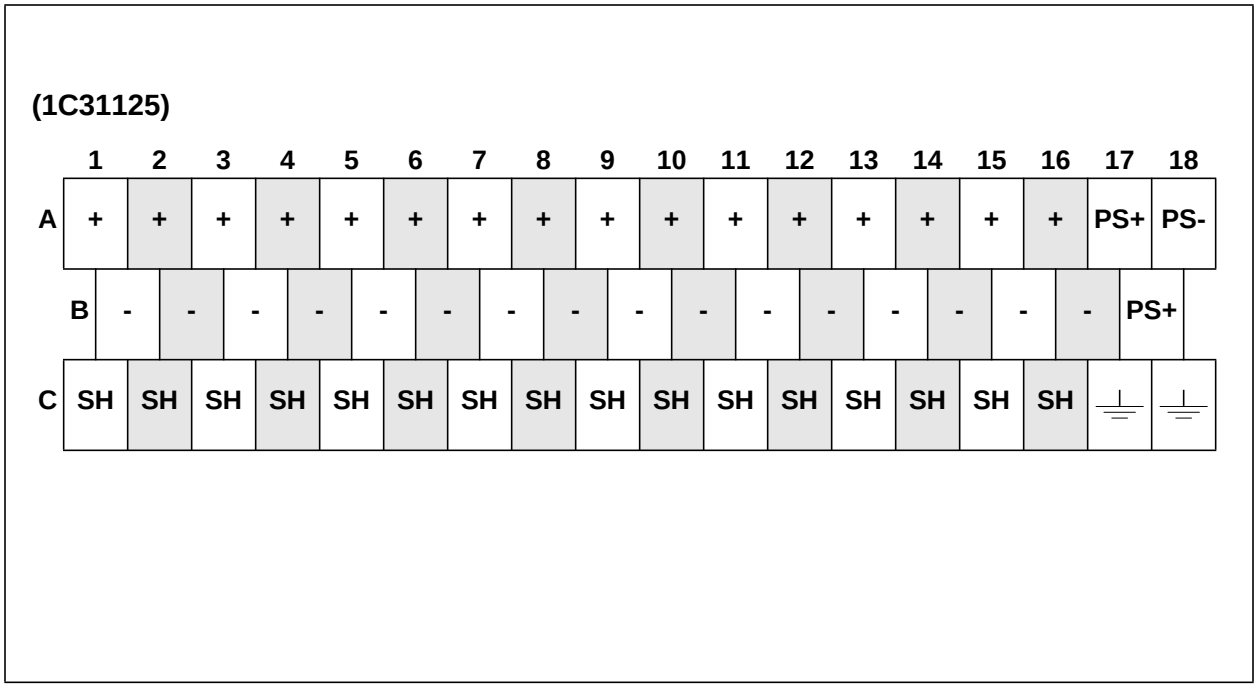

Figure 12-1. Terminal Block Connections for the Digital Output Personality Modules

12-6. Relay Panels

Relay panels are used to switch high currents and high voltages as required by various field devices. The Digital Output module interfaces to the relay modules through Groups 2 and 3 of the Personality modules and a standard cable.

The following table provides information about the three standard relay modules. Figure 12-2 through Figure 12-8 provide illustrations of wiring terminations for the relay panels.

Relay Contact Ratings must be adhered to when utilizing the Digital Output Relay Panel Assemblies. The application must include external current limiting protection for the Digital Output Relay Panel Assemblies.

Table 12-3. Digital Output Relay Panels

Relay Module	Applicable to CE Mark Certified Systems	Size	Number of Channels	Contact Type	Contact Rating	Input Power	Connect. Cable
5A22410G01 Solid State See Figure 12-2 and Figure 12-3	No	35.86 cm L (14.12 in) 7.75 cm W (3.05 in) 10.46 cm H (4.12 in)	16	Solid State (1 normally open)	3.5 amps @250 VAC at 25 °C 1.65 amps @250 VAC at 60 °C	246mA typ 310mA max @26.4V	5A26148
5A22410G02 Solid State See Figure 12-2 and Figure 12-3	No	35.86 cm L (14.12 in) 7.75 cm W (3.05 in) 10.46 cm H (4.12 in)	16	Solid State (1 normally open)	1.0 amps @200 VDC at 60 °C	246mA typ 310mA max @26.4V	5A26148
5A22411G01 G2R Style (Low Power Electromechanical)	Yes	45.09 cm L (17.75 in) 7.75 cm W (3.05 in) 6.05 cm H (2.38 in)	16	Mechanical (1 Form C)	10 amps @250 VAC 10 amps @30 VDC	453mA typ 610mA max @26.4V	5A26148
5A22412G01 [1] KUEP Style (High Power Electromechanical) Contains two 5A22412H01 panels and 16 4960A71H16 relays.	Yes	49.5 cm L (19.5 in) 7.75 cm W (3.05 in) 9.53 cm H (3.75 in)	16 (using two panels)	Mechanical (2 Form C)	10 amps @250 VAC 3 amps @150 VDC	1.32A typ 1.8A max @26.4V (for 2 relay panels) [2]	5A26149

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Table 12-3. Digital Output Relay Panels (Cont'd)

Relay Module	Applicable to CE Mark Certified Systems	Size	Number of Channels	Contact Type	Contact Rating	Input Power	Connect. Cable
5A22412G02 [1] KUEP Style (High Power Electromechanical) Contains two 5A22412H01 panels and 16 4960A71H05 relays.	Yes	49.5 cm L (19.5 in) 7.75 cm W (3.05 in) 9.53 cm H (3.75 in)	16 (using two panels)	Mechanical (Form X)	10 amps @250 VAC 10 amps @150 VDC	940mA typ 1.27A max @26.4V (for 2 relay panels) [2]	5A26149
5A22412G03 [1] KUEP Style (High Power Electromechanical) Contains two 5A22412H01 panels and up to 16 project specific relays.	Yes	49.5 cm L (19.5 in) 7.75 cm W (3.05 in) 9.53 cm H (3.75 in)	16 (using two panels)	Project Specific	Project Specific	Project Specific	5A26149

[1] Two panels required for sixteen outputs.
[2] If one panel is used, half the power is needed.

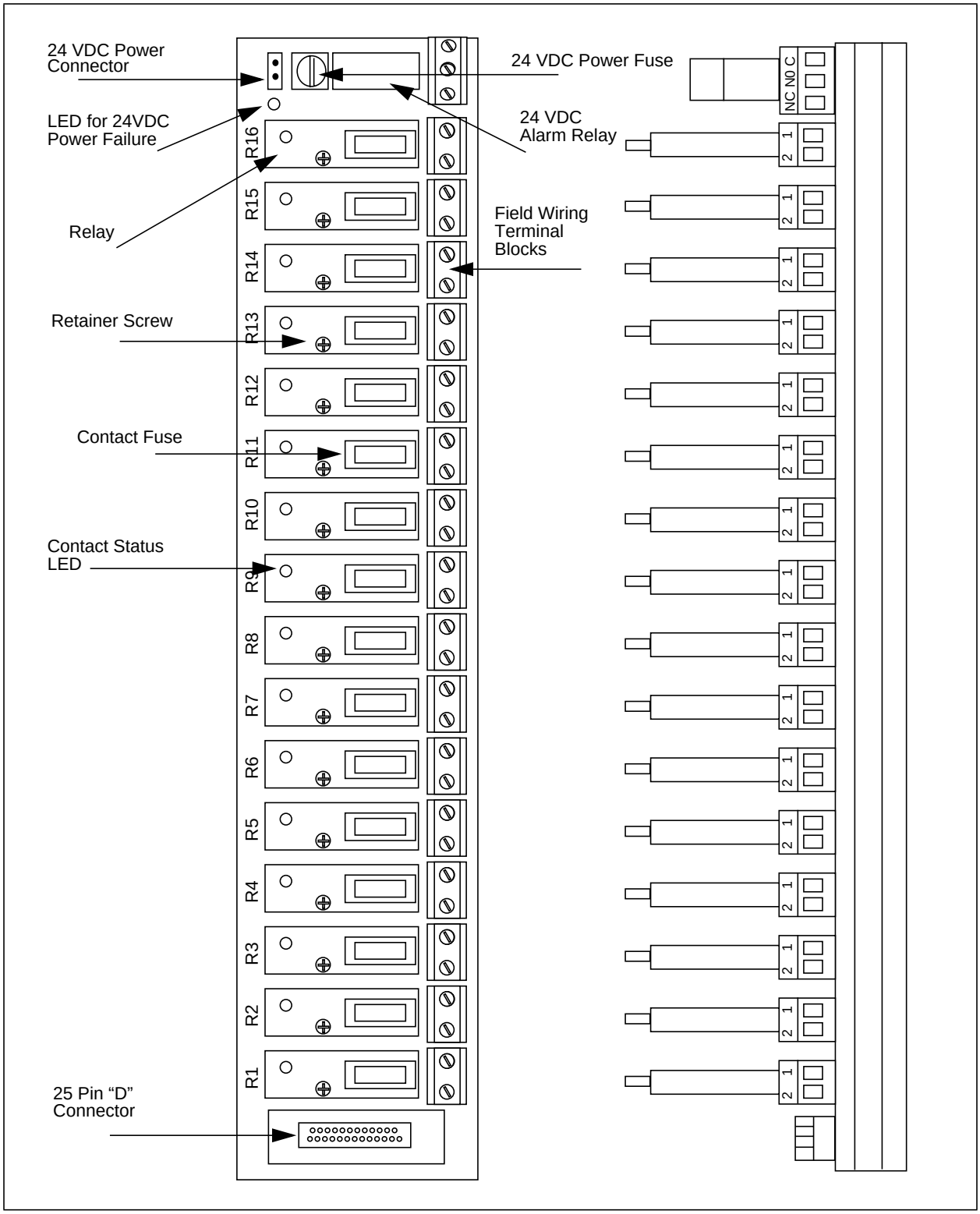

Figure 12-2. Solid State Relay Module for DIN Rail Layout (5A22410H01/5A22410H02) (Not Applicable for CE Mark Certified Systems)

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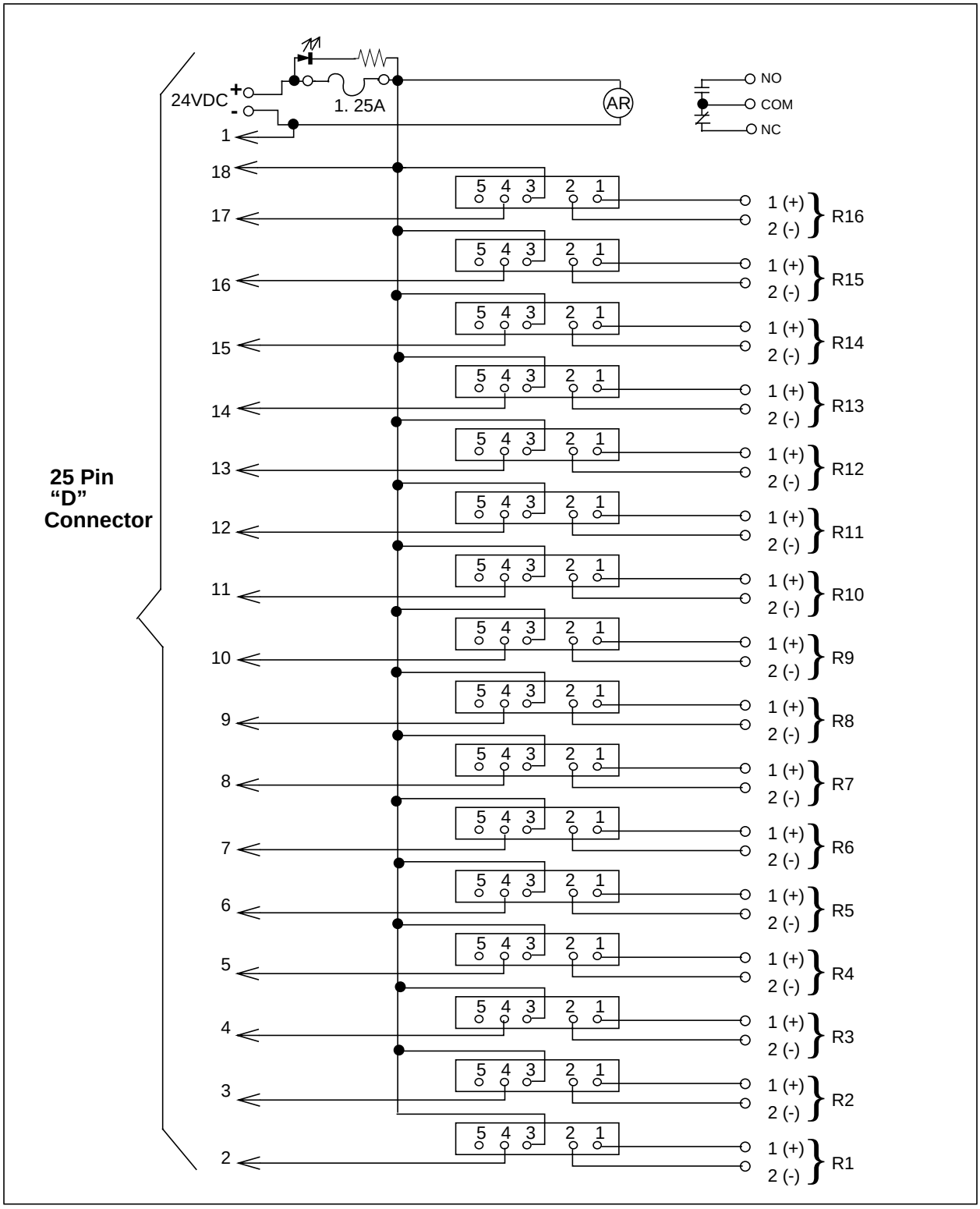

Figure 12-3. Solid State Relay Module Terminations (5A22410H01/5A22410H02) (Not Applicable for CE Mark Certified Systems)

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