28 to120 VDC Supervised Digital Output Modules

This figure is a simplified schematic for Models 3613E, 3614E, 3615E, and 3617E, which are 8-point TMR Supervised Digital Output Modules.

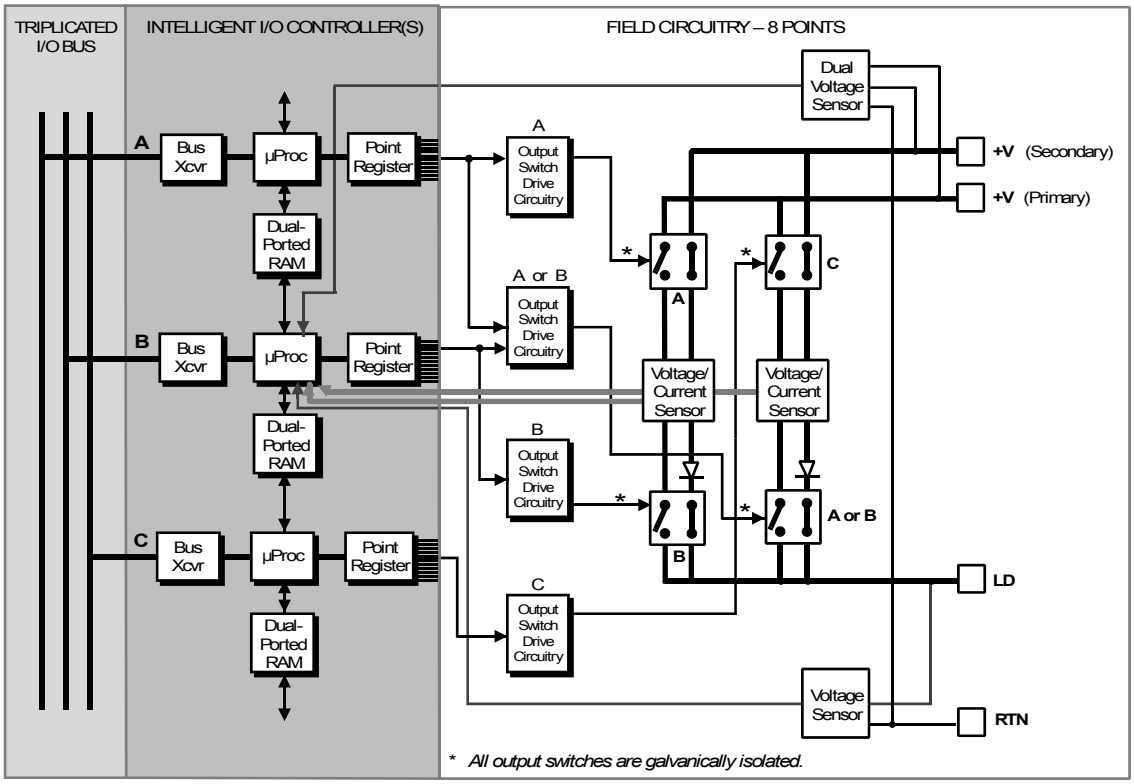

Figure 51 3613E, 3614E, 3615E, and 3617E Simplified Schematic

This figure shows the front panels of Models 3613E, 3614E, 3615E, and 3617E.

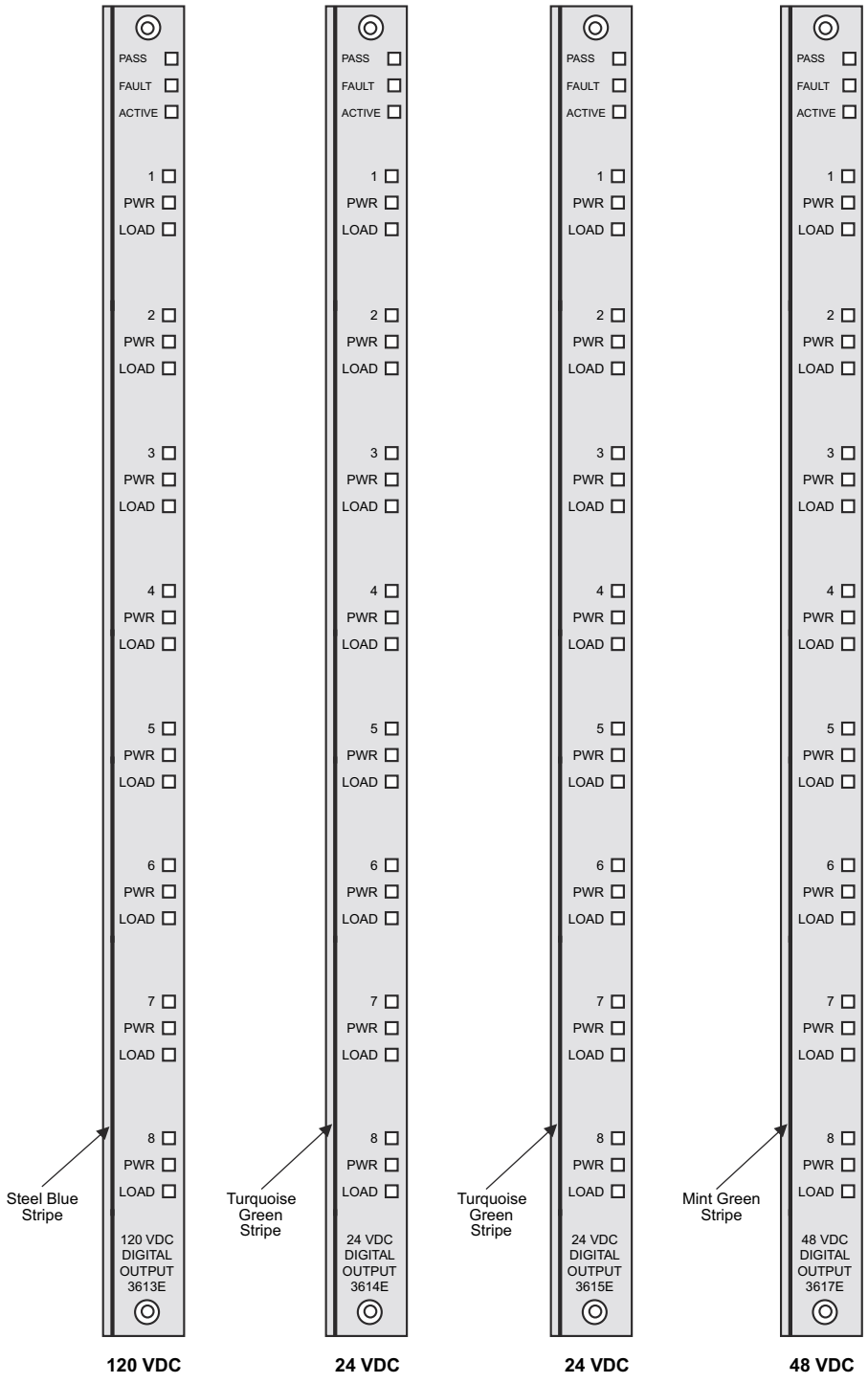

Figure 52 3613E, 3614E, 3615E, and 3617E Front Panels

3613E Specifications

This table lists the specifications for Model 3613E, which is a TMR Supervised Digital Output Module with a nominal range of 120 VDC.

Table 45 3613E Supervised Digital Output Specifications

Feature	Specification
Color code	Steel blue
Number of output signals	8, commoned
Voltage range	90 to 155 VDC
Carry current ratings, maximum	0.5 amps/point, 4 amps surge/10 ms
Switching power, maximum *See Switching Power on page 146*	150 watts (resistive)
Maximum output cycle rate	< 20 cycles per second
Expected life at maximum rated load	> 10,000 cycles
Minimum required load[a]	50 mA
Leakage current to load (Off state without secondary power supply)	4 mA maximum
Primary fuse on field termination module (2 per output)	1.0 amp, fast-acting
Secondary fuse on field termination module (2 per output)	0.125 amp, fast-acting
Status indicator: On or Off state per point	Point
Status indicator: Power alarm per point	Power
Status indicator: Load alarm per point	Load
Status indicator: Module status	Pass, Fault, Active
Point isolation	1,500 VDC, minimum
Logic power	< 15 watts
Short-circuit detection threshold in Off state[b]	< 24 Ω, with installation of secondary field power supply
Voltage range of secondary power supply	5.00 VDC ± 0.25 VDC
Current range of secondary power supply	3 amps minimum
Output diagnostic fault coverage[c]:	
Maximum output toggle rate	Every 100 ms plus one scan
Minimum output toggle rate	Not applicable
On-state voltage drop:	
With external termination, 10-foot cable	< 2 VDC typical @ 100mA, < 4 VDC maximum @ 0.5A
With external termination, 99-foot cable	< 3 VDC typical @ 100mA, < 6 VDC maximum @ 0.5A

Table 45 3613E Supervised Digital Output Specifications *(continued)*

Feature	Specification
Inductive kick-back protection (reverse EMF)	Reverse diode on termination panel

a. Proper operation of this module can be assured only if all installation guidelines and restrictions are observed. For more information, see Application Note 8, *Supervised Digital Output Modules* available on the Global Customer Support (GCS) center website at http://support.ips.invensys.com.

b. To select short-circuit detection for an SDO module, you must select a module name which includes the abbreviation "SCD" must be included in the hardware configuration in the TriStation 1131 project.

c. The maximum output toggle rate allows proper operation of I/O diagnostics and detection of all normally detectable faults. The minimum toggle rate provides fault coverage of normally undetectable faults within 10 percent of the calculated mean-time-between-faults (MTBF) for the module.

Switching Power

When switching reactive loads, you should de-rate the switching power of the outputs to 25 percent of maximum, which is 37.5 watts for DC applications. When switching incandescent lamps, the inrush current can be 10 to 15 times the rated nominal load current of the lamp. For detailed specifications regarding inrush amplitude and duration, contact the lamp manufacturer. The inrush current must be used when calculating the required output switching power.

3614E Specifications

This table lists the specifications for Model 3614E, which is a TMR Supervised Digital Output Module with a nominal range of 24 VDC.

CAUTION The Model 3614E is not recommended for use with shunt-diode intrinsic safety barriers. For these applications, Invensys recommends the Model 3615E.

Table 46 3614E Supervised Digital Output Specifications

Feature	Specification
Color code	Turquoise green
Number of output signals	8, commoned
Voltage range	20 to 36 VDC
Carry current ratings, maximum	0.5 amps/point, 4 amps surge/10 ms
Switching power, maximum *See* Switching Power on page 147	150 watts (resistive)
Maximum output cycle rate	< 20 cycles per second
Expected life at maximum rated load	> 10,000 cycles
Minimum required load[a]	50 mA

Table 46 3614E Supervised Digital Output Specifications *(continued)*

Feature	Specification
Leakage current to load (Off state, without secondary power supply)	4 mA maximum
Primary fuse on field termination module (2 per output)	0.5 amp, fast-acting
Secondary fuse on field termination module (2 per output)	0.125 amp, fast-acting
Status indicator: On or Off state per point	Point
Status indicator: Power alarm per point	Power
Status indicator: Load alarm per point	Load
Status indicator: Module status	Pass, Fault, Active
Point isolation	1500 VDC, minimum
Logic power	< 15 watts
Short-circuit detection in Off state[b]	< 24 Ω, with installation of secondary field power supply
Voltage range of secondary power supply[2]	5.00 VDC ± 0.25 VDC
Current range of secondary power supply	3 amps, minimum
Output diagnostic fault coverage[c]:	
Maximum output toggle rate	Every 100 ms plus one scan
Minimum output toggle rate	Not applicable
On-state voltage drop:	
With external termination, 10-foot cable	< 2 VDC typical @ 100mA, < 4 VDC maximum @ 0.5A
With external termination, 99-foot cable	< 3 VDC typical @ 100mA, < 6 VDC maximum @ 0.5A
Inductive kick-back protection (reverse EMF)	Reverse diode on termination panel

a. Proper operation of this module can be assured only if all installation guidelines and restrictions are observed. For more information, see Application Note 8, *Supervised Digital Output Modules* available on the Global Customer Support (GCS) center website at http://support.ips.invensys.com.

b. To select short-circuit detection for an SDO module, you must select a module name which includes the abbreviation "SCD" in the hardware configuration in the TriStation 1131 project.

c. The maximum output toggle rate allows proper operation of I/O diagnostics and detection of all normally detectable faults. The minimum toggle rate provides fault coverage of normally undetectable faults within 10 percent of the calculated mean-time-between-faults (MTBF) for the module.

Switching Power

When switching reactive loads, you should de-rate the switching power of the outputs to 25 percent of maximum, which is 37.5 watts for DC applications. When switching incandescent lamps, the inrush current can be 10 to 15 times the rated nominal load current of the lamp. For detailed specifications regarding inrush amplitude and duration, contact the lamp