

Digital Input Modules

Each TMR Digital Input Module has three isolated sets of electronics, called channels, which independently process field data to the module. Each channel places the processed data in an array and transmits this array, on request, to the MP associated with that channel. The MPs vote on the data before passing it to the application.

DI Modules include complete, ongoing diagnostics for each channel. If the diagnostics detect a failure on any channel, the Fault indicator turns on and activates the system alarm. The

Fault indicator identifies a channel fault, not a complete module failure. The DI Module continuously verifies the ability of the system to detect transitions to the opposite state. DI Modules are guaranteed to operate properly in the presence of a single fault and may continue to operate properly with multiple faults.

DI Modules support a hot-spare module. Each DI Module is mechanically keyed to prevent improper installation in a configured baseplate.

The Model 3311S2 DI Module reports Sequence of Events (SOE) with a reso-

lution of one millisecond or less and with an accuracy of one millisecond or less.

The Model 3301S2 and 3311S2 DI Modules can be used with these baseplates:

- Model 2301S2, which is used with typical applications.
- DI External Termination Baseplate, which is used with the Solid State Relay Input External Termination Panel in high-voltage applications, or the Model 9573-610F DI Hazardous Location External Termination Panel.

Digital Input Module Specifications

Model Number	3301S2	3311S2
Points	32, commoned	32, commoned
Nominal input voltage	24 VDC	24 VDC
Operational voltage range	19.2–30 VDC	19.2–30 VDC
Absolute maximum input voltage	33 VDC	33 VDC
Absolute maximum reverse input voltage	– 0.6 VDC	– 0.6 VDC
Input delay	ON to OFF or OFF to ON Time constant = 2.86 msec, - 3dB @ 55 Hz	ON to OFF or OFF to ON Time constant = 0.13 msec, - 3dB @ 1.2 kHz
Input impedance	>30 k Ω , without baseplate $\approx$ 3 k Ω , with baseplate	>30 k Ω , without baseplate $\approx$ 3 k Ω , with baseplate
Input power	0.2 W/pt, @ 24 VDC 0.5 W/pt, @ 33 VDC	0.2 W/pt, @ 24 VDC 0.5 W/pt, @ 33 VDC
Input threshold	0–5 VDC = Off region 6–14 VDC = transition region 15–30 VDC = On region	0–5 VDC = Off region 6–14 VDC = transition region 15–30 VDC = On region
Diagnostic (loss of view)	Force-to-value diagnostic (FVD), <2 ms/test	Force-to-value diagnostic (FVD), <2 ms/test Force-to-trigger diagnostic (FTD), <2 ms/test
Maximum input toggle rate to maintain diagnostic fault coverage	<20/sec	<20/sec
FVD Off state glitch		
Duration	<2 ms	<2 ms
Magnitude	$\approx$ 36% test voltage	$\approx$ 36% test voltage
Output Impedance	0–5 VDC, $\approx$ 100 k Ω	0–5 VDC, $\approx$ 100 k Ω
ADC scan time	<1 ms for all 32 points	<1 ms for all 32 points
Functional earth to protective earth isolation	500 VDC, minimum	500 VDC, minimum
Functional earth to functional earth (logic ground) isolation	800 VDC, minimum	800 VDC, minimum