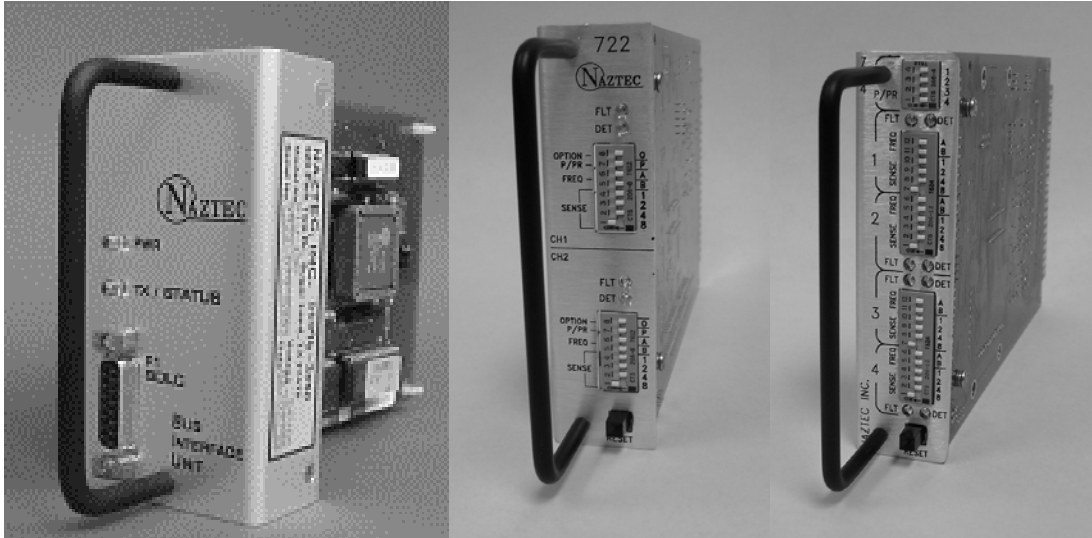


TecNote 6002 - TS1 vs. TS2 Detectors as related to BIU's

The purpose of this TecNote is to explain the differences between TS1 and TS2 detectors as related to BIU's.



Differences between TS1 and TS2 Detectors

Both a TS1 and TS2 detector have call and status outputs. The call output operates the same on both detectors -- a call for normal operation, and a call during a failure mode. Typical failure modes are open, short, etc. Keep in mind that even though the front panel LED on the Detector does not indicate a call, but instead a fault condition, the call is implied.

The main difference between the TS1 and TS2 detectors is in the status outputs. For TS1, you have two states. First, it can be un-asserted for no fault, and then it can be asserted for every other fault. For TS2, you have multiple states. It is asserted for no fault (yes, this is opposite), and has various pulse widths of assertion for the various fault conditions.

The status line is brought into the BIU, which reads the fault condition on the status line, and reports it back to the controller over the SDLC link.

Monitored vs. reported alarms

Det#	Call	Switch	Delay	Extend	Queue	>
1	1	0	0.0	0.0	0	
2	2	0	0.0	0.0	0	
3	3	0	0.0	0.0	0	
4	4	0	0.0	0.0	0	
5	5	0	0.0	0.0	0	
6	6	0	0.0	0.0	0	
7	+	7	0	0.0	0	

<	Det#	NoAct	MaxPres	ErrCnt	FailTime
	1	0	0	0	2
	2	0	0	0	2
	3	0	0	0	2
	4	0	0	0	2
	5	0	0	0	2
	6	0	0	0	2
	7	+	0	0	2

In both a TS1 and TS2 cabinet there are monitored alarms. Monitored alarms are the diagnostics that are set in the detector menus, such as the no-activity, max-presence, and erratic-counts settings. Only TS2 cabinets have reported alarms. Reported alarms are the alarms that come from the BIU that indicate the fault condition on a given detector's status line.

Detector calls and alarms and the usage of fail time

Each detector channel basically has a non-alarm and alarm state. When the detector is not in an alarm state, the call output drives phase call inputs in the controller. When the detector is in an alarm state, then the 'fail time' parameter determines how the phase call inputs should be handled.

For example, if you are in a TS1 cabinet, and the detector has an 'open fault', then there is no means for this information to come into the controller. The controller does not know why the detector is giving the constant call. The detector, as expected, would apply a constant call. Since there is no alarm condition, the fail time has no bearing -- so the controller just sees a constant call. However, if in that same cabinet, the user set a max-presence time, then once that constant call was active in excess of the max-presence time, that would generate an alarm, and then the fail time would determine what type of call the controller would see.

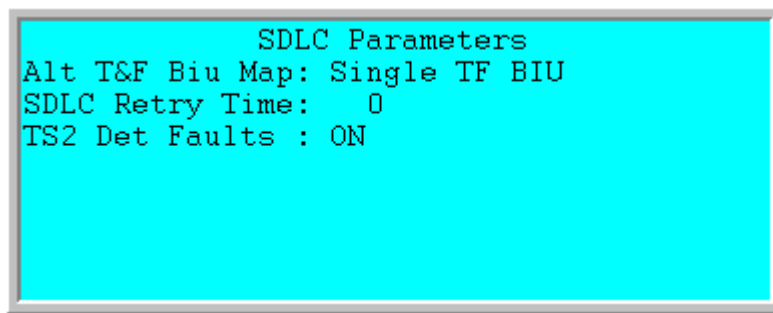
As another example, if the detectors were TS2 style detectors coming into BIUs, then an 'open fault' would generate a reported alarm, and the fail time would immediately affect how the controller sees the input. The constant call from the detector itself would be ignored.

For this reason, always make a mental connection between 'fail time' and 'detector alarms'; because without an alarm condition, the fail time is meaningless.

Fail time itself is a parameter, set in seconds, that determines how long into the green interval a call would be held. So, a setting of 15 would mean that once the phase turns green, a call would be applied for 15 seconds. The value 0 has a special meaning of no-call, and the value 255 has a special meaning of max-recall. If, for example, you use a setting of 200" for a phase that has a max time of 50", then the phase would max out at 50" as expected. For all practical purposes, any setting greater than the max time would be a max recall.

The default value for the fail time parameter is 2". This means that if a detector has an alarm condition it will hold a call for 2" into green. Since this is less than the typical min green time, the result of this setting is a min recall. The default setting of 255" was not used, because many customers have requested that they did not want a max recall.

TS2 Faults Unit Parameter



It is very common for a user to place TS1 detectors in a TS2 cabinet. When this happens, the BIU immediately generates an alarm for that detector channel, because TS1 and TS2 'no fault' status line values are inverted. For this reason, Naztec provides a unit parameter that allows the user to turn off the reporting of the BIU detector alarms. If you disable the reporting of the detector alarms by the BIU, you will in essence have no operational difference between a TS1 and TS2 detector. This was the original purpose of this parameter.

A second function of this parameter could be of use when the user wants their TS2 cabinet to operate like their TS1 cabinet in regard to detector faults. With this parameter they can simply disable reporting of the alarms. The consequence of this is that when a detector goes into fault, they will receive a constant call, and as long as no monitor settings are made, then the ultimate effect would be a max recall. This would be a much easier change per controller then changing all fail times to 255.

Summary

Either a TS1 or TS2 detector can be placed in a rack that communicates to the controller via a BIU. Noting the differences on how they operate will assist the user in the process of analyzing and debugging "failures" as related to these detectors.
