Background
The Westinghouse original ex-core Nuclear Instrumentation System (NIS) has been protecting nuclear plants for over 40 years. Industry experience has proven the design to be robust, reliable and effective.

Westinghouse actively supports the original NIS with upgrades and replacements such as the redesigned bistable card. This card is a direct replacement for the original bistable cards. Westinghouse also continues to build and support the original bistable cards.

The redesigned bistable card provides substantial improvements to reduce the risk of false trips due to noise and power supply fluctuations. New status LEDs and diagnostic features facilitate calibration, testing and troubleshooting.

Description
The redesigned bistable card is a plug-in replacement for the original bistable cards, part numbers 3359C39G01, 3378C19G01 and 4256A55G02.

The redesigned bistable card duplicates all of the functionality of the original bistable cards but with modern components and manufacturing processes. The new design improves on the original with reliability enhancements, LED status indicators, and new test points. The new card is completely analog in design.

The redesigned bistable card is seismically and environmentally qualified as class 1E in accordance with the IEEE 323-1983 and 344-1987 requirements.

It is also qualified to the electromagnetic and radio frequency interference requirements of Regulatory Guide 1.180.

The redesigned bistable card is offered under two part numbers for latching or non-latching status LEDs.

The G01 card features latching status LEDs and an LED reset button.

The G02 card includes non-latching status LEDs that only show the present state of the card.
The 10010B94G01 card has latching status LEDs:
- Green for normal
- Red for currently abnormal/tripped
- Blinking red for past abnormal/tripped state that has returned to normal

Blinking LEDs can be reset by pressing the LED RESET button.
The 10010B94G02 card has non-latching status LEDs:
- Green for currently normal
- Red for currently abnormal/tripped

Benefits

Indicates trip status
The TRIP LED displays the state of the card. Green indicates that the card is currently not tripped. Red indicates that the card is currently tripped. For the G01 cards, flashing red indicates that the card has tripped but returned to normal.

Monitors onboard power
Both the main and the backup onboard power supply voltages are monitored to be within limits. Normally the PWR LED is green, indicating that the card is properly powered. Red indicates an abnormal voltage. For the G01 cards, flashing red indicates that an abnormal voltage occurred but returned to normal, which indicates potential power supply failure.

Reduces risk of false trips due to noise spikes
The new bistable cards include additional filtering to better protect against false trips due to noise. Transient voltage suppressors on all input, output and power supply lines protect the card from damage and degradation due to voltage spikes.

Improved immunity to power supply voltage changes
The original bistable card is susceptible to false trips if a drawer DC power supply drifts. The original bistable setpoint is directly dependent on the drawer power supply voltage.
The redesigned bistable card can withstand up to a ±40 percent change in drawer power supply voltage without a false trip. A precision voltage reference is used to make the bistable setpoint extremely stable.

Onboard redundancy
Onboard card power is supplied by two pairs of redundant voltage regulators with automatic failover. The original bistable cards have no voltage regulation or redundancy.

Set Point Resolution
The trip and loop adjustments are 20-turn foil potentiometers for finer resolution. The original bistable potentiometers are 10-turn wire wound.

Test Points
Convenient card edge test points are included for signal input, comparator output and onboard power supply monitoring.