

VariStroke-I Actuator Change Announcement

Change

Woodward has added a new feature to its latest VariStroke-I actuator models, which allows users to select the desired action (Alarm or Shutdown) upon detection of specific internal faults.

Description

All VariStroke-I model actuators shipped after May 27th, 2024, or any VariStroke-I model actuator with firmware program 5418-7897 revision C or later, are capable of configuring the VariStroke-I actuator to either issue an Alarm or Shutdown action upon detecting each of the faults listed below:

- Internal 2.5VDC Voltage low or high fault (SENSE_2V5_ERR)
- Internal 5VDC Voltage low or high fault (SENSE_5V_ERR)
- Internal 15VDC Voltage low or high fault (SENSE_15V_ERR)
- Internal Discrete Input Isolated Voltage low fault (FEEDBACK_DI_ISO_VOLT_ERR)
- Internal Servo Position Sensor fault (SERVO_POSITION_SENSOR_ERR)

Previously, these internal status parameters were set to Shutdown by default and were not configurable by the customer.

VariStroke-GI Trip and Throttle Valve variant does not allow configuration to any internal status diagnostics. They are set and fixed to result in Shutdown. Such an approach is needed to ensure fail-safe behavior of the actuator positioning the trip valve when the electronic malfunction is detected.

The VariStroke-DX duplex servo variant does not allow configuration to any internal status diagnostics. They are set and fixed to result in Shutdown. Such an approach is needed to ensure proper control switchover between operating (in control) and standby servo when the electronic malfunction is detected.

For safety purposes, all VariStroke-I actuators are shipped from the factory configured to perform a Shutdown action upon detecting the above listed faults. The purpose of these diagnostics and the selected action is to detect electronics malfunctions which may result in an unstable and/or out-of-control actuator event.

It has been noted that the diagnostics listed above are sometimes triggered when the electrical power supply decreases below the desired voltage (input voltage at VariStroke terminals outside product specifications range). An event upset lasting more than 20ms may trigger diagnostics to occur and shut down the unit. It is the responsibility of the user to investigate the electrical power supply and ensure an uninterrupted voltage supply within the required specified range.

With these new configuration parameters, and at the customer's risk and responsibility, it is now possible to switch the internal status diagnostics to result in Alarm-only until the issue with the power supply is completely rectified. This will temporarily alleviate the electrical supply issues from shutting down the VariStroke. These configuration changes are to only be used as a temporary solution for the purpose of troubleshooting. These configuration parameters must be configured back to the default Shutdown as soon as the power supply issues are rectified.

WARNING

Unsafe Position if Electrical Power Supply Fails

If the internal status diagnostics are changed to Alarm-only and the electrical power supply is outside the specified operational range, the VariStroke-I may enter an uncontrollable state. The hydraulic cylinder could go full open, full close, any position in between, or potentially even keep changing positions uncontrollably until the electrical supply voltage returns to a steady state level within the specified range.

WARNING

Unsafe Position if Electronics Fail

The main purpose of the VariStroke's internal diagnostics is to detect electronic malfunctions, such that users can be notified, and the actuator and system can be taken to a safe position. By configuring an Alarm-only action for a specific fault, the VariStroke actuator may operate in an unsafe state (unstable or out-of-control) until this issue is corrected. Fail-safe action might not be executed.

Note that Woodward's latest VariStroke-I Customer Service Tool 9927-2177 revision M or greater must be used with this new VariStroke firmware to access the above listed settings. The configuration method is provided within Customer Service Tool manual 35148 revision C or greater.

The screenshot displays the 'INTERNAL STATUS' screen of the Woodward ToolKit. The top navigation bar includes 'Main', 'View', 'Settings', and 'Tools'. Below this, there are icons for 'Open', 'Close', 'Connect', 'Disconnect', 'Load Application', 'Communication Statistics', and 'Save Values'. The main content area is divided into several sections:

- INTERNAL STATUS:** Includes 'Status Overview' (Shutdown/Alarm), 'Operating Mode' (ANALOG_DMD), 'Demand' (49.66%), and 'Feedback' (49.66%).
- Action Buttons:** A prominent red 'SHUTDOWN' button.
- Navigation Buttons:** A grid of buttons for 'System Information', 'Redundancy', 'Config/Calibrate', 'Trip and Throttle Valve', 'Manual Operation', 'Dump Valve', 'Input Configuration', 'Output Configuration', and 'Alarms/Shutdowns'.
- Status Flags:** A list of flags such as 'Shutdown Servo', 'Shutdown Spring', 'Shutdown Current', and 'Startup Reading Parameters'.
- Error Codes Table:** A table with columns for 'Logged Alarm Shutdown', 'Disabled/Enabled Shutdown/Alarm Non Latched/Latched', and 'Logged Alarm Shutdown'. It lists various error codes like EEPROM_WRITE_ERR, SENSE_2V5_ERR, INTERNAL_ADC_ERR, etc.
- Warning Message:** A large yellow warning icon and text stating: 'WARNING The settings on Internal Status page should NOT be changed. All the settings need to be and stay configured to E S L (Enabled, Shutdown, Latched), except WATCHDOG_RESET_ERR that needs to stay E A L (Enabled, Alarm, Latched). Changing these settings constitutes a misuse and may lead to unforeseeable damage. When configured differently (A - Alarm) in the event of electrical failure there is a risk of positioning malfunction.'
- Footer:** 'Copyright © 2013-2024 - Woodward, Inc. All rights reserved.' and 'Alarms/Shutdowns' button.

Figure 1. Service Tool – Internal Status Screen

WARNING

The settings on the Internal Status page should NOT be changed. All settings must remain configured to E S L (Enabled, Shutdown, Latched), except WATCHDOG_RESET_ERR, which should remain E A L (Enabled, Alarm, Latched).

Changing these settings constitutes a misuse and may lead to unforeseeable damage. When configured differently (A- Alarm), there is a risk of position malfunction in the event of electrical failure, including unintentional full-open position of the controlled valve.

Affected Units

Affected units include all VariStroke-I model actuators shipped after May 27th, 2024, (as they include firmware program 5418-7897 revision C or greater) or any VariStroke-I model actuator with embedded driver module firmware program 5418-7897 revision C or greater installed. VariStroke-GI Trip and Throttle Valve variant and redundant VariStroke-DX are excluded as they do not allow configuration of the internal status faults, even if furnished with the firmware 5418-7897 revision C.

Recommended Action

Owners of VariStroke actuators shipped before May 27th, 2024, and who desire to obtain the above listed features, can send their VariStroke-I actuator to Woodward's Fort Collins, Colorado, USA facility to have their VariStroke's driver module firmware updated.

Optionally, VariStroke-I actuator owners can contact Woodward's field service team or one of Woodward's regionally located Authorized Independent Service Facilities (AISF) to schedule a special service trip for an authorized field service engineer to perform the firmware update at the user's site. Note that the VariStroke actuator is required to be in shutdown mode during the firmware update procedure.

Download Woodward's latest VariStroke-I Customer Service Tool 9927-2177 revision M or greater from Woodward's software download website (www.woodward.com/software) and install it on a computer connected to the respective VariStroke-I actuator(s). Refer to VariStroke-I Service Tool manual 35148 for usage instructions.

Customers who do not wish to obtain the above listed features do not require any further action.

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