

Resolving Issues causing TESLA to Enter Persistent Error Mode

Introduction

All TESLA recorders (models 2000, 3000, 4000, 4003 and TESLA LITE) have the ability to create ROC (rate of change) triggers for voltage, current and frequency on multiple channels.

The recorder can enter into a Persistent Error mode if the ROC trigger is configured without any value and triggering is enabled while any one or all of the following checkboxes are enabled:

- Fault
- Swing
- Log

TESLA Analog Input Configuration

Element: TSC2 Type: Ia Description: Ia Channel: 1 Module Type: 110739 5A HIMax

Units: 800 A/A Angle Offset: 0 Rate of Change Interval: 1.0 Cycle(s) Single Harmonic Number: 3 Nominal Level: A

Actions:

	Limit		Delay		Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Alarm Contact
High Magnitude	0	A	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Low Magnitude	0	A	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Negative Rate of Change	-0	A	0	sec	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Positive Rate of Change	0	A	0	sec	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Single Harmonic	1	%	1	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Total Harmonic Distortion	1	%	1	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Sag		%			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Swell		%			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Figure 1. ROC trigger config screen.

Figure 1 shows checkboxes enabled while having a 0 A value (for example purposes), which will indicate to the recorder that whenever it detects a 0A rate of change during the interval previously configured, it will create a record of the analog inputs.

As the 0A rate of change essentially means a constant current, this will cause the recorder to overload with record triggering and creation of records (when the current is constant), rendering the unit in Persistent Error Mode.

In Persistent Error mode, the Recorder Functional LED will be 'OFF', Alarm LED 'ON' and Failure Contact 'Closed'

To ensure this does not happen, if there is no value entered for the ROC of any channel, triggering should not be enabled.

If unit is already in Persistent Error Mode

If the recorder is already in Persistent Error Mode due to this issue, users should enter the unit into safe shut down mode and restore its factory settings through HyperTerminal (since communication with TESLA Control Panel will not be available for downloading of the configuration file). Only communication through HyperTerminal will be available.

- Enter the unit into safe shutdown mode

The unit will need to be accessed via HyperTerminal using the USB cable (USB serial connection required for security purposes).

As shown in Figure 2, once the unit has been connected through HyperTerminal using USB connection, select option 12 in order to enter the unit into Safe Shutdown Mode.

This will re-boot the unit, allowing the user to do perform the next step needed to eliminate the configuration of the ROC triggers causing the issue.

```
TESLA 4000 System Utilities v1.0

1 : *Modify IP Address, subnet mask and default gateway (if applicable)
2 : View system diagnostics
3 : Retrieve system diagnostics
4 : *Restore ALL default settings, including calibration
5 : *Restore only default recorder configuration settings (channel definitions)
6 : *Restore only default system setup (ports, time settings)
7 : *Force hardware reset
8 : Network utilities
9 : Monitor SCADA
10: Save Recent Trend Data
11: Storage memory utilities
12: *Enter Safe Shutdown Mode
13: *Modify Point-To-Point IP Addresses
14: Monitor PMU
15: *Calibrate DSP clock
16: Exit
    * port 450 access only
Please enter a command:
[1-16] #_
```

Figure 2. Hyperterminal screen; option No.12 Enter Safe ShutDown Mode.

- Restore default configuration settings

After the recorder has booted back up, another connection through HyperTerminal will be required to select option No. 5 (as shown in Figure 3) which will restore all the channels to default configurations in the unit.

Note: Restoring default settings will erase the configuration file, so if there is no backup of this file, the recorder's configuration will be lost. Calibration and system configuration will not be erased.

If the configuration file was previously saved, it can be used again while making the appropriate ROC trigger changes.

TESLA 4000 System Utilities v1.0

```
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8 : Network utilities
9 : Monitor SCADA
10: Save Recent Trend Data
11: Storage memory utilities
12: *Enter Safe Shutdown Mode
13: *Modify Point-To-Point IP Addresses
14: Monitor PMU
15: *Calibrate DSP clock
16: Exit
    * port 450 access only
Please enter a command:
[1-16] #_
```

Figure 3. HyperTerminal screen; option No. 5 Restore only default recorder configuration settings.

Now the unit should return to the Recorder Functional status LED, the Alarm LED will turn off and the ROC trigger without any values should be cleared, thus freeing the recorder from any unnecessary record creation.

If a previously saved configuration file is to be loaded, care must be taken to not enable recording wherever values have not been entered for ROC triggers.