



# UDC 3500 Application Note





## Introduction

When required, the results of these tests can be checked to determine the reason the controller has gone to Failsafe.

## How to check the status tests

The procedure in tells you how to display the results of the status tests.

### Procedure for Displaying the Status Test Results

Step	Operation	Press	Result
1	Select STATUS Set Up Group		<i>Upper Display = READ</i> <i>Lower Display = STATUS</i>
2	Read the test results		You will see: <i>Upper Display = NO or YES</i> YES indicates a failure <i>Lower Display = FAILSAFE</i>
			<i>Upper Display = PASS or FAIL</i> <i>Lower Display = TEST</i>
3	Cycle through all STATUS Set Up Group prompts		Continue through the rest of the prompts until you see: <i>Upper Display = READ</i> <i>Lower Display = STATUS</i>

## Background Tests

### Introduction

This instrument performs ongoing background tests to verify data and memory integrity. If there is a malfunction, a diagnostic message will be displayed (blinking) in the lower display.


In the case of simultaneous malfunctions, the messages will appear in sequence in the lower display. Table 1 lists these background tests in order by their priority, the reason for their failure, and how to correct the problem.

Diagnostic messages may be suppressed (stop the blinking) by pressing the RUN/HOLD key. The messages will still be available for viewing by pressing the LOWER DISPLAY key. If the underlying condition has not been corrected, then the next time the instrument is powered-down/powered-up, the diagnostic message will return.



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Table 1 Background Tests

Lower Display	Reason for Failure	How to Correct the Problem
<b>RAM FAIL</b>	RAM test failed at start up.	<ol style="list-style-type: none"> <li>1) Run through STATUS check to determine the reason for the failure.</li> <li>2) Power cycle the instrument. If the message reappears, replace the instrument.</li> </ol>
<b>CAL ERR</b>	Calibration test failed at start up.	<ol style="list-style-type: none"> <li>1) Run through STATUS check to determine the reason for the failure.</li> <li>2) Restore factory settings</li> <li>3) Power cycle the instrument.               <ol style="list-style-type: none"> <li>a) If the message reappears, replace the instrument.</li> <li>b) If the instrument passes its Power Up tests, then reconfigure the instrument per your application.</li> </ol> </li> </ol>
<b>EE FAIL</b>	Unable to write to non-volatile memory. Anytime you change a parameter and it is not accepted, you will see EE FAIL.	<ol style="list-style-type: none"> <li>1) Check the accuracy of the parameter and re-enter.</li> <li>2) Try to change something in configuration.</li> <li>3) Run through Read STATUS tests to re-write to EEPROM.</li> </ol>
<b>FAILSAFE or FAILSF 2</b>	<p>This error message shows whenever the controller goes into a failsafe mode of operation. This will happen if:</p> <ul style="list-style-type: none"> <li>• RAM test failed</li> <li>• Configuration test failed</li> <li>• Calibration test failed</li> <li>• Burnout for input(s) used for PV is configured for "None" and input has failed.</li> </ul>	<ol style="list-style-type: none"> <li>1) Run through STATUS check to determine the reason for the failure.</li> <li>2) Run through the STATUS check a second time to see if the error cleared.</li> <li>3) Press the  key to see if an input is failing. If an input failure message is found, take steps to correct the problem.</li> </ol>
<b>INP1 RNG</b>	Input 1 out of range.	<ol style="list-style-type: none"> <li>1) Make sure the range and actuation are configured properly.</li> <li>2) Check the input source.</li> <li>3) Restore the factory calibration.</li> <li>4) Field calibrate. See Input Calibration.</li> </ol>



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<b>INP1FAIL</b>	Two consecutive failures of input 1 integration; i.e., cannot make analog to digital conversion. This will happen if: <ul style="list-style-type: none"> <li>Upscale or Downscale burnout is selected and the input is open</li> <li>Input not configured correctly for the sensor being used</li> <li>Input source is grossly out of range.</li> </ul>	<ol style="list-style-type: none"> <li>1) Make sure the actuation is configured correctly.</li> <li>2) Make sure the input is correct and that it has not burned-out (opened).</li> <li>3) Check for gross over-ranging with a multimeter.</li> <li>4) Restore factory calibration.</li> </ol>
<b>INP2 RNG</b>	Input 2 out of range.	Same as INP1RNG above.
<b>INP2FAIL</b>	Two consecutive failures of input 2 integration. I.e., cannot make analog to digital conversion.	Same as INP1FAIL above.
<b>INP3 RNG</b>	Input 3 out of range.	Same as INP1RNG above.
<b>INP3FAIL</b>	Two consecutive failures of input 3 integration. I.e., cannot make analog to digital conversion.	Same as INP1FAIL above.
<b>INP4 RNG</b>	Input 4 out of range.	Same as INP1RNG above.
<b>INP4FAIL</b>	Two consecutive failures of input 4 integration. I.e., cannot make analog to digital conversion.	Same as INP1FAIL above.
<b>INP5 RNG</b>	Input 5 out of range.	Same as INP1RNG above.
<b>INP5FAIL</b>	Two consecutive failures of input 5 integration. I.e., cannot make analog to digital conversion.	Same as INP1FAIL above.
<b>CONF ERR</b>	<ul style="list-style-type: none"> <li>PV low limit is &gt; PV high limit</li> <li>SP low limit is &gt; SP high limit</li> <li>Output low limit is &gt; Output high limit</li> </ul>	Check the configuration for each item and reconfigure as necessary.
<b>PV LIMIT</b>	PV out of range. $PV = INP1 \times RATIO1 + INP1 \text{ BIAS}$	<ol style="list-style-type: none"> <li>1) Make sure the input signal is correct.</li> <li>2) Make sure the Ratio and Bias settings are correct.</li> <li>3) Recheck the calibration. Use Bias of 0.0</li> </ol>
<b>RV LIMIT</b>	The result of the formula shown below is beyond the range of the remote variable. $RV = INP2 \times RATIO + BIAS$	<ol style="list-style-type: none"> <li>1) Make sure the input signal is correct.</li> <li>2) Make sure the Ratio2 and Bias2 settings are correct.</li> <li>3) Recheck the calibration. Use a Ratio2 of 1.0 and a Bias2 of 0.0.</li> </ol>



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<b>SEGERR</b>	Setpoint Program start segment number is less than ending segment number.	Check SP Program configuration, subsection <b>Error! Reference source not found.</b> Set up Group SPPROG function prompts "STRSEG" and "ENDSEG".
<b>CAL MTR</b>	Slidewire calibration never performed.	Field Calibrate the slidewire. See Section <b>Error! Reference source not found.</b>
<b>SW FAIL</b>	Position Proportional slidewire input failure.	See the Trouble Shooting Procedure in Section <b>Error! Reference source not found.</b>
<b>SOOTING</b>	Percent Carbon falls outside sooting boundary	Check process for correct operation.
<b>TCx WARN</b>	Thermocouple on Input x (1 or 2 or 3) is starting to burnout.	This diagnostic message means that the controller has detected that the thermocouple is starting to burnout. This error message may also be created if the resistance of the wires used to connect the thermocouple to the instrument is above 100 ohms (50 ohms per leg).
<b>TCxFAIL</b>	The Thermocouple on Input x (1 or 2 or 3) is in imminent danger of burning out.	This diagnostic message means that the controller has detected that the thermocouple will soon fail. User should consider replacing the thermocouple as soon as possible. This message will also be generated if the resistance of the wires used to connect the thermocouple to the instrument is above 180 ohms (90 ohms per leg).
<b>OUT1FAIL</b>	First Current Output is less than 3.5 mA.	First Current Output is open circuit. Check the field wiring. See <b>Error! Reference source not found.</b>  All Output Fail diagnostic messages may be suppressed via the DIAGNOST configuration in the Alarm Setup Group. See Section <b>Error! Reference source not found.</b>
<b>OUT2FAIL</b>	Second Current Output is less than 3.5 mA.	Second Current Output is open circuit. Check the field wiring. See <b>Error! Reference source not found.</b> Also see OUT1FAIL.
<b>OUT3FAIL</b>	Third Current Output is less than 3.5 mA.	Third Current Output is open circuit. Check the field wiring. See <b>Error! Reference source not found.</b> Also see OUT1FAIL.
<b>CLOCKERR</b>	Real Time Clock values are invalid.	Check the Real Time Clock Settings. See Section <b>Error! Reference source not found.</b> Entering "YES" to "SET CLOCK?" will clear the error flag.
<b>BATT LOW</b>	Battery Voltage has fallen to unsafe levels.	Replace the Battery Module. See Section <b>Error! Reference source not found.</b>



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