



1. Change list

Date and issue	Change
21/11/07, Iss 1	Initial issue
20 May 2008, Iss 2	Add steps to remove 312 300 J02 during test
1 July 2008 issue 3.0	Substitute the EGSE box a multimeter
7 July 2008 Issue 4.0	Changed connector numbering
24 July 2008	Was 275 ohms now 310 ohms, tolerance increased

2. Introduction and purpose

This document previously outlined the purpose and operational use of the SMEC Launch Latch status EGSE. This EGSE has now been substituted for a BreakOut Box (BOB) and standard multimeter.

- The SMEC has a launch latch to protect the SMEC from mechanical damage primarily during environmental vibe testing and launch as well as transport.
- As the latch is a bi-stable device, it is important that it is verified that the latch is engaged prior to any of these activities
- The SPIRE flight electronics are not capable of determining the status of the SMEC Launch Latch (engaged/ disengaged). Note: This function was not incorporated in to the SPIRE electronics design as powering on the instrument for this measurement is precluded under some of these scenarios
- A standard multimeter and break out box can be used to establish the state of the launch latch

3. Operational scenario

When SPIRE is integrated on the spacecraft (prior to launch and not under instrument test), the launch latch is left latched under nominal conditions.

If the SMEC is to be powered on and actuated, then latch must be disengaged. This is carried out by sending the appropriate telecommand sequence to the instrument. This procedure is verified by commanding the mechanism to move and observing the movement in the telemetry.

When the instrument is being prepared to be shut down, the latch is commanded to the engaged position. This can be verified by the fact that the mechanism no longer moves under command as it is restrained by the latch.

When the spacecraft is being prepared for transport or launch the correct status of the latch is verified by;

1. de-mating 312300 P01
2. de-mating 312300 P02
3. Connect dummy blank connector to 312 300 P02
4. Connecting the SPIRE supplied extension cable to 312300 P01
5. Connecting a breakout box to the 15 way connector on the other end of the extension cable.
6. connecting a multimeter between pins 3 and 10



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SPIRE SMEC LL Status EGSE
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7. Measuring the resistance between these pins.

If the reading is 310 Ohms (+/- 30 Ohms), then the latch is disengaged and the SMEC not in a safe mode.

If the reading is 173 Ohms (+/- 30 Ohms) then the latch is engaged and the SMEC is safe.

Nominal reading (Ohms)	Tolerance (Ohms)	status
310	+/- 30	disengaged
173	+/- 30	engaged

During environmental mechanical testing of the spacecraft, the multimeter will be used to monitor the status of the latch *during* the test. Under nominal conditions the latch will remain engaged during the test. If the test causes the latch to open (as occurred during the instrument cryogenic acceptance vbe), and an NCR raised.

The sequence for environmental test is as follows:

1. De-mate 312 300 P01
2. De-mate 312 300 P02
3. Connect dummy blank connector to 312 300 P02. Stake fasteners as necessary
4. Connect the SPIRE supplied extension lead into the 312300 P01. Stake the fasteners as necessary
5. Stow the extension lead on the SVM if the test is not to be carried out immediately
6. For final preparation for the test, the flying lead from the test connector will be run out away from the spacecraft to a safe distance away from the test environment and connected to the BOB. For the acoustic test, a feedthru connector will need to be used to pass the signals.
7. The multimeter is powered and the correct status of the latch verified
8. The LPU is commanded into the hold state using the same sequence used prior to launch
9. The test carried out and the status of the latch monitored constantly.
10. The LPU is un-powered
11. When all mechanical testing has been completed, then 312300 P01 is demated and the extension lead connector is removed from the SVM-CB
12. De-mate the extension lead from 312 300 P01 and de-integrate dummy connector from 312 300 P02.
13. 312300 P01 is re-mated to J01
14. 312300 P02 is re-mated to P02

Notes:

SPIRE has supplied two extension lead of different lengths. Either can be used for this procedure.