



MU-x6E LED Troubleshooting Guide

G025.0.0

Warrior MU-x6E LED Troubleshooting Guide

This document is the property of Cervis, Inc. and cannot be copied, modified, e-mailed, or reproduced without the express prior written consent of Cervis, Inc. Cervis, Inc. reserves the right to change this manual or edit, delete, or modify any information without prior notification.

Table of Contents

Table of Contents	i
List of Figures	i
List of Tables	i
1.0 MU-x6E LEDs.....	1
2.0 Hardware LED indications	3
3.0 Software LED Indications.....	4
4.0 Application Fault LED Indications.....	6

List of Figures

Figure 1. MU-x6E LEDs on Logic Board PCB.....	1
---	---

List of Tables

Table 1. LED Key	2
------------------------	---

1.0 MU-x6E LEDs

The MU-x6E contains 10 red diagnostic LEDs and one bright-white strobe LED. The LEDs are arranged in a row in the center of the logic board printed circuit board (PCB).



Figure 1. MU-x6E LEDs on Logic Board PCB

The following table illustrates the LED locations and their identification.

LED14 *	LED15 *	LED01	LED02	LED03	LED04	LED05	LED06	LED07	LED08	LED09
Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe

* – Only present on Logic Board PCB rev 1.0 and greater

- LED14 – Armed
 - Illuminates when the sledgehammer circuit is armed
- LED15 – Reset
 - Illuminates when the sledgehammer circuit is resetting the board
- LED01 – 12V0
 - Illuminates when the 12V0 rail is energized
- LED02 – 3V7
 - Illuminates when the 3V7 rail is energized
- LED03 – M_1
 - Master processor LED 1
- LED04 – M_2
 - Master processor LED 2
- LED05 – M_3
 - Master processor LED 3
- LED06 – S_1
 - Slave processor LED 1
- LED07 – S_2
 - Slave processor LED 2
- LED08 – S_3
 - Slave processor LED 3
- LED09 – Strobe
 - Not present on any assembly revision

Table 1. LED Key

Symbol	Indication
X	Don't care
0	LED off
1	LED on
SB	Slow blink
FB	Fast blink
nB	Step <i>n</i> of a blink sequence

2.0 Hardware LED indications

The following LED combinations indicate hardware-based system states.

Off / 12V0 Rail Fault:

In this state, there is no power on the 12V0 rail. It indicates that either:

- The system is off
- A fault is present on the 12V0 rail

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	X	0	X	X	X	X	X	X	X	X

3V7 Rail Fault:

In this state, there is no power on the 3V7 rail. This is an atypical state that indicates a hardware failure.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	X	1	0	X	X	X	X	X	X	X

Sledgehammer Fault / Stuck in Reset:

This state indicates that the sledgehammer circuit is continually commanding a system reset. It indicates a fault with the sledgehammer circuit.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	1	1	0	X	X	X	X	X	X	X

Slave Processor Latch-up:

This state indicates that the power rails and master processor are all operating normally but the slave processor has hung. The sledgehammer circuit was added to rectify this condition and should never be seen on a system with a sledgehammer. The only way to clear this fault is to remove power from the system.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	X	X	X	0	0	0	X

Normal Power:

This state indicates that the power hardware is working as expected.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	X	X	X	X	X	X	X

3.0 Software LED Indications

The following LED combinations indicate software-based system states.

✓ **Note:** *M_1 through M_3 are not synchronized with S_1 through S_3. So, it is possible that—for example—M_1 SB and S_1 SB flash at different times but at the same rate.*

Bootloader Active:

This state indicates that the bootloader is active. This state is only visible when a terminal cable is present and the system resets.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	SB	0	0	SB	0	0	X

Bootloader ROM Update Active:

This state indicates that the bootloader is copying files from the read-only memory (ROM) module to the system (M_1 blinks, then M_2 blinks, then M_3 blinks, then back to M_1, etc.) This state is only visible when a ROM module is inserted and the terminal cable is not present.

✓ **Note:** *Only present in software REV_91 on.*

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	1B	2B	3B	SB	0	0	X

Bootloader ROM Update Complete:

This state indicates that the bootloader has completed copying files from the ROM module to the system. This state is only visible following the ROM update active state.

✓ **Note:** *Only present in software REV_91 on.*

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	FB	FB	FB	SB	0	0	X

Bootloader Fault:

This state indicates that the bootloader has prevented the system from running. The bootloader has detected an invalid serial number or corrupt/missing software. This fault requires intervention to correct.

✓ **Note:** *Only present in software REV_91 on.*

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
X	0	1	1	SB	SB	SB	SB	0	0	X

Application Active (Normal):

This state indicates that the application is active and operating normally. In this state, M_2 = radio TX, M_3 = radio RX, S_2 = expansion card TX, and S_3 = expansion card RX.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
1	0	1	1	FB	X	X	FB	X	X	X

Application Detected Invalid Serial Number:

This state indicates that the application has detected an invalid serial number. A serial number must be entered to proceed past this point. This state is present in software REV_80 on.

✓ **Note:** *This condition is caught by the bootloader in REV_91 on and should not be seen on those systems.*

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
1	0	1	1	SB	SB	SB	FB	X	X	X

4.0 Application Fault LED Indications

The following LED combinations indicate software-based fault states.

✓ **Note:** The MU-x6E attempts to automatically recover from a detected fault. Once a fault is detected and briefly displayed on the LEDs, the system automatically resets via the sledgehammer circuit. The system attempts this cycle three times. After the third fault, the system does not automatically reset and holds the last fault on the LEDs.

✓ **Note:** Due to the nature of the system resetting, the initial fault may be masked. For example: An expansion card fails. The first fault will display the failed card and then reset. On the next boot, the card is now missing and the system will display the “not enough cards” fault.

Fault on Master:

This state indicates that the master application has detected a fault during start-up while the slave is running normally. A terminal connection is necessary to determine which fault has occurred.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
1	0	1	1	1	1	1	FB	X	X	X

Fault on Slave:

This state indicates that the slave application has detected a fault during start-up and has signaled the master application to halt. A terminal connection is necessary to determine which fault has occurred.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
1	0	1	1	1	1	1	1	1	1	X

Fault on Slave – Expansion Card Timeout:

This state indicates that the slave application has detected a fault communicating with an expansion card and has signaled the master application to halt. The LEDs illuminated on the slave processor (S_1 through S_3) indicate the faulty slot in binary, where S_3 is the 1’s bit, S_2 is the 2’s bit, and S_3 is the 4’s bit.

✓ **Note:** The slot count shown starts at 1; so at least one LED is illuminated.

✓ **Note:** On an automatic reset, this fault will likely be masked and become a standard Fault on slave.

Armed	Reset	12V0	3V7	M_1	M_2	M_3	S_1	S_2	S_3	Strobe
1	0	1	1	1	1	1	n	n	n	X



Visit our Web site at: www.cervisinc.com

©2019 Cervis, Inc. All rights reserved. Content is subject to change without notice.