

Release Note for AIC SAS 6G 4U60swap Expander

Jun 8, 2015

Changelog

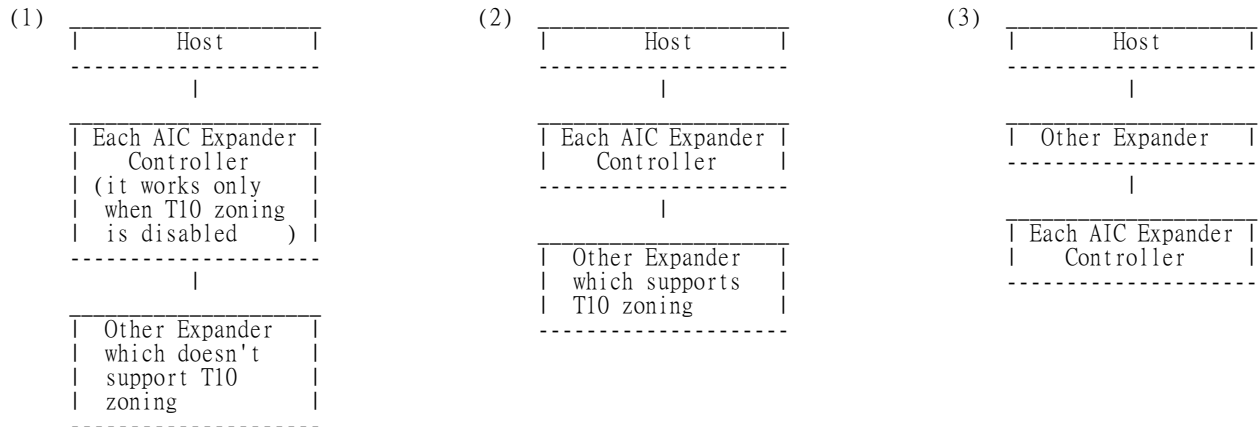
- 06/08/2015 (firmware 1.11.9.5 + mfg 1.9.0.2 + firmware 1.11.10.2 + mfg 1.10.0.4 + mfg 1.10.1.4) - Part Number (B98-004U60E0110905 + B98-004JS6G0090002 + B98-004U60E0111002 + B98-004JS6G0100004 + B98-004JS6G0100104)  
Old Part Number B98-004U60E0110904 is replaced by B98-004U60E0110905.  
1. Add a serial console command "subtractive" to support multiple "up" ports
- 04/16/2015 (firmware 1.11.9.4 + mfg 1.9.0.2 + firmware 1.11.10.2 + mfg 1.10.0.4 + mfg 1.10.1.4) - Part Number (B98-004U60E0110904 + B98-004JS6G0090002 + B98-004U60E0111002 + B98-004JS6G0100004 + B98-004JS6G0100104)  
Old Part Number B98-004U60E0110903 is replaced by B98-004U60E0110904.  
1. Resolve the email alert issue for PSU failure on LSI MegaRAID
- 07/01/2014 (firmware 1.11.9.3 + mfg 1.9.0.2 + firmware 1.11.10.2 + mfg 1.10.0.4 + mfg 1.10.1.4) - Part Number (B98-004U60E0110903 + B98-004JS6G0090002 + B98-004U60E0111002 + B98-004JS6G0100004 + B98-004JS6G0100104)  
Old Part Number B98-004JS6G0090001 is replaced by B98-004JS6G0090002.  
Old Part Number B98-004JS6G0100003 is replaced by B98-004JS6G0100004.  
Old Part Number B98-004JS6G0100103 is replaced by B98-004JS6G0100104.  
1. Resolve the drive mapping issue in Windows with SAS 12G HBA
- 04/30/2014 (firmware 1.11.9.3 + mfg 1.9.0.1 + firmware 1.11.10.2 + mfg 1.10.0.3 + mfg 1.10.1.3) - Part Number (B98-004U60E0110903 + B98-004JS6G0090001 + B98-004U60E0111002 + B98-004JS6G0100003 + B98-004JS6G0100103)  
Old Part Number B98-004JS6G0100002 is replaced by B98-004JS6G0100003.  
Old Part Number B98-004JS6G0100102 is replaced by B98-004JS6G0100103.  
1. Improve signal for SATA drives.
- 01/07/2014 (firmware 1.11.9.3 + mfg 1.9.0.1 + firmware 1.11.10.2 + mfg 1.10.0.2 + mfg 1.10.1.2) - Part Number (B98-004U60E0110903 + B98-004JS6G0090001 + B98-004U60E0111002 + B98-004JS6G0100002 + B98-004JS6G0100102)  
Old Part Number B98-004U60E0110902 is replaced by B98-004U60E0110903.  
Old Part Number B98-004JS6G0100001 is replaced by B98-004JS6G0100002.  
Old Part Number B98-004JS6G0100101 is replaced by B98-004JS6G0100102.  
1. Add the console command "power\_setting" to configure restoring on AC power loss.  
2. Improve signal for SATA drives.
- 11/14/2013 (firmware 1.11.9.2 + mfg 1.9.0.1 + firmware 1.11.10.2 + mfg 1.10.0.1 + mfg 1.10.1.1) - Part Number (B98-004U60E0110902 + B98-004JS6G0090001 + B98-004U60E0111002 + B98-004JS6G0100001 + B98-004JS6G0100101)  
Old Part Number B98-004U60E0110901 is replaced by B98-004U60E0110902.  
Old Part Number B98-004U60E0111001 is replaced by B98-004U60E0111002.  
1. Add the console command "serial\_number" to configure Expander serial number and Enclosure serial number.
- 08/21/2013 (firmware 1.11.9.1 + mfg 1.9.0.1 + firmware 1.11.10.1 + mfg 1.10.0.1 + mfg 1.10.1.1) - Part Number (B98-004U60E0110901 + B98-004JS6G0090001 + B98-004U60E0111001 + B98-004JS6G0100001 + B98-004JS6G0100101)  
1. Initial revision

Definition of the visual LED indicators (blue and red) associated with a disk drive

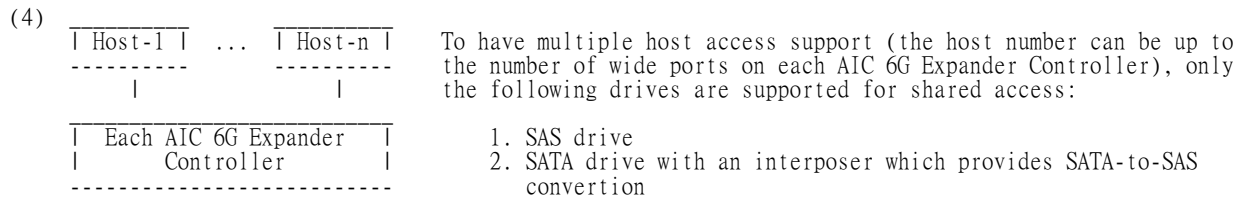
Host Control Bit	Blue LED	Red LED
OK	ON	OFF
RSVD DEVICE	ON	OFF
HOT SPARE	ON	OFF
CONS CHECK	ON	Fast blink
IN CRIT ARRAY	ON	Slow blink
IN FAILED ARRAY	ON	Slow blink
REBUILD/REMAP	ON	Fast blink
R/R ABORT	ON	Slow blink
ACTIVE	ON	OFF
DO NOT REMOVE	ON	OFF
MISSING	ON	ON
INSERT	ON	Slow blink

REMOVE	ON	Slow blink
IDENT	Slow blink	Slow blink
FAULT	ON	ON
DEVICE OFF	ON	OFF

#### Supported Configuration



Most 3G Expanders don't support T10 zoning.



#### Unsupported Configuration

1. This only applies to the enclosure which supports dual AIC 6G Expander Controllers. The enclosure with dual AIC 6G Expander Controllers attached is inserted with a SATA drive without any interposer. It will cause the drive LEDs behaves incorrect.

#### Power on/off the enclosure via RS232

The RS232 setting - baud rate: 9600 bps, data bits: 8, parity: odd, stop bits: 1, flow control: none  
 The power-on command is "RemoteStart\n" where "\n" means Carriage Return and Linefeed. The power-off command is "RemoteStop\n". When the host RS232 receives "RemoteStart\n" or "RemoteStop\n" from the enclosure after the same command was sent to the enclosure, that means the enclosure accepts the command sent by the host. The reference script below runs on Linux.

```
#####
#!/bin/bash

PORT="/dev/ttyS0"
BAUDRATE="9600"
NOFLOW="-ixon -ixoff -crtsets"
SOFTFLOW="ixon ixoff -crtsets"
DEFAULT="-inpk clocal -istrip ignbrk ignpar opost onlcr -iexten"

if [ $# -eq 0 ] ; then
    echo "Usage: $0 start/stop"
    exit 1
fi

[ ! -e "$PORT" ] && echo "Console closed..."
```

```

stty -F $PORT $BAUDRATE cs8 parenb parodd -cstopb $NOFLOW opost onlcr

case $1 in
  start)
    echo "RemoteStart"
    echo -e "\n" > $PORT
    echo -e "RemoteStart\n" > $PORT
    echo -e "RemoteStart\n" > $PORT
    echo -e "RemoteStart\n" > $PORT
    echo -e "RemoteStart\n" > $PORT
    echo -e "RemoteStart\n" > $PORT
    ;;
  stop)
    echo "RemoteStop"
    echo -e "\n" > $PORT
    echo -e "RemoteStop\n" > $PORT
    echo -e "RemoteStop\n" > $PORT
    echo -e "RemoteStop\n" > $PORT
    echo -e "RemoteStop\n" > $PORT
    echo -e "RemoteStop\n" > $PORT
    ;;
esac
#####

```

## Command Line Interface Operation

### 1. How to configure zone count

Remove the SAS cable between the HBA/RAID card and the 4U60swap before configuring zone count. Power off the 4U60swap after configuring zone count. Power on the 4U60swap, then insert the SAS cable.

Three zone configurations supported are one zone with 60 drives, two zones with 30 drives per zone, and four zones with 15 drives per zone. The default configuration is one zone of which T10 zoning configuration is disabled. T10 zoning configuration of the other configurations (two zones and four zones) is enabled.

Each of three COM ports (COM for Hub, COM for Left Edge, and COM for Right Edge) should be applied with the respective configuration. Each host can access via each down link.

#### (A) Check the current zone configuration

```

cmd> zonecount
Zone count = 1

```

#### (B) One-zone configuration supports four-down links or one-up/three-down links. Each host can access up to 60 drives in this 4U60swap.

=> Hub, four-down links:

```

cmd> zonecount 1
cmd> reset

```

=> Hub, one-up/three-down links:

```

cmd> zonecount 1-1
cmd> reset

```

=> Left Edge and Right Edge:

```

cmd> zonecount 1
cmd> reset

```

#### (C) Two-zone configuration supports two-down links or one-up/one-down links per zone. Each host can access up to 30 drives in this 4U60swap.

=> Hub, two-down links per zone:

```

cmd> zonecount 2
cmd> reset

```

=> Hub, one-up/one-down links per zone:

```

cmd> zonecount 2-2
cmd> reset

```

=> Left Edge and Right Edge:

```

cmd> zonecount 2
cmd> reset

```

#### (D) Four-zone configuration supports one-down link or one-up link per zone. Each host can access up to 15 drives in this 4U60swap.

=> Hub, one-down link per zone:

```

cmd> zonecount 4
cmd> reset

```

=> Hub, one-up link per zone:

```

cmd> zonecount 4-4
cmd> reset

```

```
=> Left Edge and Right Edge:
cmd> zonecount 4
cmd> reset
```

2. How to get all revisions in AIC SAS 6G Expander

- (A) Expander firmware revision  
cmd> rev
- (B) Expander configuration revision  
cmd> showmfg
- (C) Microchip firmware for managing sensors (Only the COM for Hub supports this command)  
cmd> sensor

3. How to configure temperature sensor

Four temperature settings in Celsius are T1, T2, warning threshold, and alarm (critical) threshold. Only the COM for Hub supports this command.

- (A) Get the current temperature settings  
cmd> temperature  
Temperature in Celsius (t1=20 C, t2=55 C, warning=50 C, alarm=55 C)
- (B) Set temperature with new T1=18 C, T2=52 C, warning threshold=48 C, and alarm threshold=54 C. The new setting will take effect after reset.  
cmd> temperature 18 52 48 54  
cmd> reset

4. How to enable/disable the enclosure alarm by your software

The "REQUEST FAILURE" and "REQUEST WARNING" for Enclosure are defined in the bit1, byte3 and bit0, byte3 of the "Enclosure control element" in the SES-3 specification. Setting either one can enable the enclosure alarm. Clearing both settings disables the enclosure alarm. Please install a software package "sg\_utils" on your host computer, and have a SAS HBA and a cable to connect your host with the 4U60swap. We use Linux for example.

- (A) Show the device for AIC Expander Controller (canister)  
\$ sg\_map -i  
  
/dev/sg60 AIC CORP 4U60swap: Hub 0b09  
/dev/sg64 AIC CORP 4U60swap: L-Edge 0b0a  
/dev/sg65 AIC CORP 4U60swap: R-Edge 0b0a
- (B) Enable the enclosure alarm (Only Hub should be applied)  
\$ sg\_ses --descriptor=EnclosureElement01 --set=3:1:1 /dev/sg60  
or  
\$ sg\_ses --descriptor=EnclosureElement01 --set=3:0:1 /dev/sg60
- (C) Disable the enclosure alarm (Only Hub should be applied)  
\$ sg\_ses --descriptor=EnclosureElement01 --clear=3:1:1 /dev/sg60  
\$ sg\_ses --descriptor=EnclosureElement01 --clear=3:0:1 /dev/sg60

5. How to identify AIC Expander Controller (canister) in the enclosure

The canister LED is used for the canister identity. The "RQST IDENT" for Enclosure is defined in the bit7, byte1 of the "Enclosure control element" in the SES-3 specification. Please install a software package "sg\_utils" on your host computer, and have a SAS HBA and a cable to connect your host with the 4U60swap. We use Linux for example.

- (A) Show the device for AIC Expander Controller (canister)  
\$ sg\_map -i  
  
/dev/sg60 AIC CORP 4U60swap: Hub 0b09  
/dev/sg64 AIC CORP 4U60swap: L-Edge 0b0a  
/dev/sg65 AIC CORP 4U60swap: R-Edge 0b0a
- (B) Enable the canister identity (Only Hub should be applied)  
\$ sg\_ses --descriptor=EnclosureElement01 --set=1:7:1 /dev/sg60
- (C) Disable the canister identity (Only Hub should be applied)  
\$ sg\_ses --descriptor=EnclosureElement01 --clear=1:7:1 /dev/sg60

6. How to power off the enclosure via inband SAS

The "RQST ON" for Power Supply is defined in the bit5, byte3 of the "Power Supply control element" in the SES-3 specification. Clear the bit to power off the enclosure. Please install a software package

"sg\_utils" on your host computer, and have a SAS HBA and a cable to connect your host with the 4U60swap. We use Linux for example.

- (A) Show the device for AIC Expander Controller (canister)

```
$ sg_map -i

/dev/sg60  AIC CORP  4U60swap: Hub    0b09
/dev/sg64  AIC CORP  4U60swap: L-Edge  0b0a
/dev/sg65  AIC CORP  4U60swap: R-Edge  0b0a
```

- (B) Power off the enclosure (Only Hub should be applied)

```
$ sg_ses --descriptor=PowerSupply01 --clear=3:5:1 /dev/sg60
```

#### 7. How to configure SAS standby timer

This feature is applicable for SAS drives instead of SATA drives. SAS standby timer is in units of minutes. Setting SAS standby timer with 0 minute disables this feature. The COM ports for Left Edge and Right Edge support this command.

- (A) Get the current SAS standby timer

```
cmd> sas_standby_timer
SAS standby timer : 0 minutes
```

- (B) Set the SAS standby timer with 10 minutes. The new setting will take effect after reset.

```
cmd> sas_standby_timer 10
cmd> reset
```

#### 8. How to configure wide port checker

This feature is applicable for SAS drives instead of SATA drives. If there is no connection with any active SAS initiator by checking all wide ports, AIC Expander Controller stops all attached SAS drives to save power consumption of SAS drives. Otherwise, AIC Expander Controller starts all attached SAS drives to provide drive access service to any active SAS initiator. All COM ports support this command. Please apply the same setting on all COM ports.

- (A) Get the current state of wide port checker

```
cmd> check_wide_port
Checking wide port is OFF
```

- (B) Enable checking wide port. The new setting will take effect after reset.

```
cmd> check_wide_port on
cmd> reset
```

- (C) Disable checking wide port. The new setting will take effect after reset.

```
cmd> check_wide_port off
cmd> reset
```

#### 9. How to configure enclosure address

- (A) Get the current enclosure address

```
cmd> enclosure_addr
Enclosure Address: 0x500605B0000272BF
```

- (B) Set the enclosure address with 0x500605B0000272BF. The new setting will take effect after reset.

```
cmd> enclosure_addr 500605B0000272BF
cmd> reset
```

#### 10. How to configure serial number

- (A) Get the current serial number

```
cmd> serial_number
Expander number: 421-12021704510010
or
Expander number: 421-12021704510010   Enclosure number: 526-12071100500088
```

- (B) Only set Expander serial number with 421-12021704510010.

```
cmd> serial_number 421-12021704510010
```

- (C) Set both of Expander serial number (421-12021704510010) and Enclosure serial number (526-12071100500088).

```
cmd> serial_number 421-12021704510010 526-12071100500088
```

#### 11. How to configure power setting

This feature is for restoring on AC power loss. Three supported options are "keep off", "keep on", and "keep last state". The default setting is "keep off". Only the COM for Hub supports this command.

- (A) Get the current power setting  
cmd> power\_setting  
Power setting: keep off
- (B) Set "keep off"  
cmd> power\_setting keep\_off
- (C) Set "keep on"  
cmd> power\_setting keep\_on
- (D) Set "keep last state"  
cmd> power\_setting keep\_last\_state

12. How to configure multiple "up" ports

This feature can support multiple "up" ports when the zone count = 1. Only the COM for Hub supports this command.

- (A) Configure Port-1 and Port-2 to be "up" ports. Port-1 is composed of PHY 8 ~ 11, and Port-2 is composed of PHY 4 ~ 7.  
cmd> subtractive 8  
cmd> subtractive 9  
cmd> subtractive 10  
cmd> subtractive 11  
cmd> subtractive 4  
cmd> subtractive 5  
cmd> subtractive 6  
cmd> subtractive 7  
cmd> reset
- (B) Restore the default of the zone count = 1 after keeping the SAS address. The SAS address (500605B0:000272BF) is used for the Hub.  
cmd> reerase 4  
cmd> reerase 5  
cmd> sasaddr 500605B0000272BF  
cmd> reset