

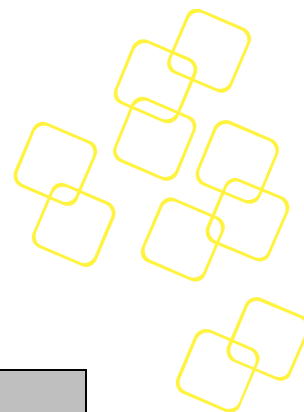
ADVANTECH USER MANUAL

SERVER IMANAGER-ENABLER KIT

PSU-STATUS

REVISION 5.00

DATE 2023/06/20



Revision History

Date [mm/dd/yyyy]	Revision	Modifications
06/20/2023	5.00	Official release edition 5
06/09/2023	4.01	Add -j usage
03/29/2021	4.00	Official release edition 4
02/20/2021	3.01	Update usage
06/16/2020	3.00	Edition 3 official release
05/20/2020	2.01	Update usage
08/23/2019	2.00	Official release edition 2
05/22/2019	1.01	Add note about mutex
03/11/2019	1.00	Official release edition 1
02/27/2019	0.11	Updated parameter description
07/12/2018	0.10	Added AC-155A sensor list Supports i2c driver mode
05/10/2018	0.07	Updated YM-2301 sensor list
05/05/2018	0.06	Add YM-2301 appendix Updated PSU table
04/28/2018	0.05	English version and format
04/20/2018	0.04	Updated content
03/18/2018	0.03	Updated CLI usage
11/13/2017	0.02	Added temperature reading
10/09/2017	0.01	Initial draft

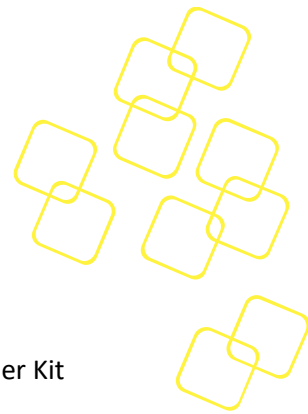
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About This Manual

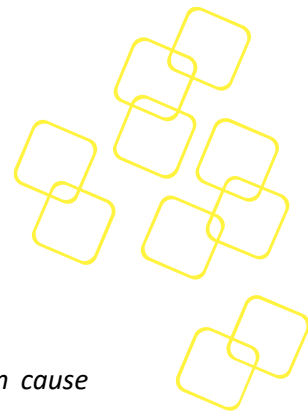
The target audience of this manual includes users, developers, and technicians. This document describes the features, functions, and operations of Server iManager-Enabler Kit PSU-Status.

This manual is organized as follows:

- Section 1 introduces the PSU-Status.
- Section 2 outlines how to install and run.
- Section 3 introduces the PSU-Status sensors.
- Section 4 describes the naming of sensors.
- Section 5 provides access limitations.
- The appendix provides supplemental information referenced in the other sections of this manual.

This document covers:

- Server iManager-Enabler Kit PSU-Status version 0.16 and later.



Warnings, Cautions, and Notes



Warning! Warnings indicate conditions, which, if not observed, can cause personal injury.



Caution! Cautions are included to help you avoid damaging your hardware or losing data.



Note! Notes provide additional information.

We appreciate your input

Please let us know of any aspect of this product—including this manual—that could use improvement or correction. We appreciate your valuable input in helping make our products and documentation better.

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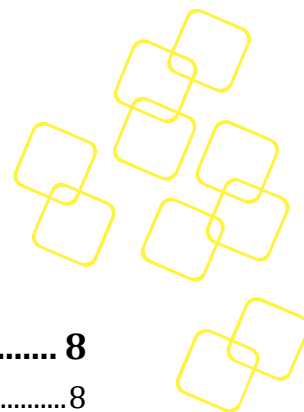
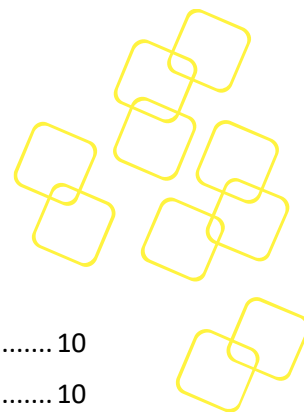


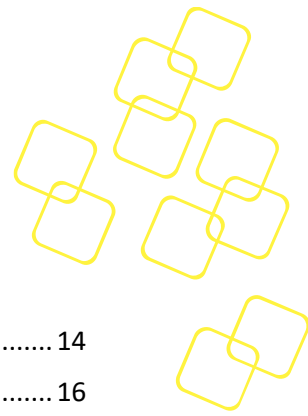
Table of Contents

1. GETTING STARTED	8
1.1 INTRODUCTION	8
1.2 PLATFORMS AND PSUs SUPPORTED.....	8
1.3 OS REQUIREMENTS.....	8
2. INSTALLATION AND USAGE.....	9
2.1 INSTALL FROM SOURCE PACKAGE.....	9
2.2 INSTALL FROM BINARY PACKAGE.....	9
2.3 USAGE	9
2.4 EXAMPLE	10
3. PSU-STATUS SENSORS.....	13
4. NAMING OF SENSORS	15
5. ACCESS LIMITATION	17
A. APPENDIX: SENSORS LIST	18
B. APPENDIX: OTHER NOTES	22



List of Figures

Figure 1: List all supported platforms with “-p”	10
Figure 2: List all supported PSUs with “-s”	10
Figure 3: PSU work fine	11
Figure 4: PSU1 AC lost	11
Figure 5: PSU1 not present.....	11
Figure 6: PMBUS gone	12
Figure 7: MFR version.....	12
Figure 8: PSU Sensors	13



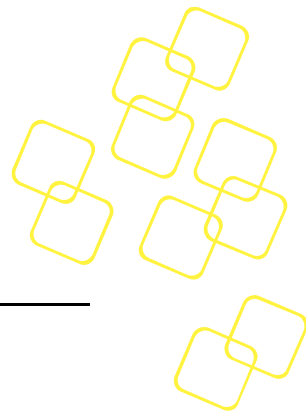
List of Tables

Table 1: PSU sensors 14

Table 2: Naming of sensors 16

Table 3: Appendix Table YM-2301 Status Sensors 20

Table 4: Appendix Table AC-155A Status Sensors..... 21



1. GETTING STARTED

1.1 Introduction

The Power Supply Unit (PSU) is an important hardware component in Advantech NCG products, which integrate many sensors for monitoring the status of PSUs. In products with BMC, sensors are accessed through the Intelligent Platform Management Interface (IPMI). In products without BMC, utility “PSU-Status” will access the sensors if PMBus is supported in the PSU and connected to PCH. The document will introduce the utility “PSU-Status”.

PSU-Status monitors PSU information and health, such as voltage, current, temperature, and FAN speed. Keep in mind that these PSU features will be read only when a PSU exists.

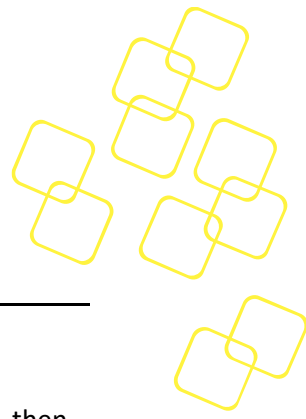
1.2 Platforms and PSUs Supported

Please refer to the README file for which platforms and PSU are supported, or use the utility “PSU-Status” to show the list with specific parameters. For more information about the above parameters, see Chapter 2.3

1.3 OS Requirements

PSU-Status is developed for Linux. It supports PSU sensor access via the i2c driver interface.

Please make sure I²C drivers (i2c_i801 and i2c-dev or i2c-zhaoxin or i2c-mcp2221) are loaded before the utility runs. Please refer to the README file to check which driver is needed for your platform. Also refer to the notes in the README file for getting special drivers.s



2. INSTALLATION AND USAGE

2.1 Install from Source Package

Please extract the source package of PSU-Status and switch to the extracted directory, then follow the instructions to complete the installation.

```
#> make
#> cp aps /usr/local/bin
```

NOTE: Before installation, please make sure the basic development component is installed in Linux, such as gcc, make, glibc.

2.2 Install from Binary Package

Please extract the binary package of PSU-Status and switch to the extracted directory, then follow the instructions to complete the installation.

```
#> cp aps /usr/local/bin
```

2.3 Usage

The executable program of PSU-Status is called “aps”. The syntax of aps command is as follows:

```
#> aps
#> aps -p $platform_name
#> aps -s $power_supply_name
#> aps -p $platform_name -s $power_supply_name
```

For detailed usage of the tool, please refer to the following subsections.

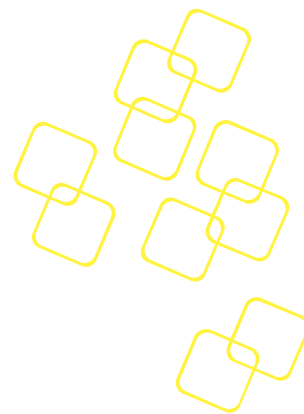
parameters:

[-h], shows the help message

[-p] Platform name. Sets which platform is in use. If unset, list all supported platform names

For example: -p FWA-3270

Without a platform name, this parameter could be used to list all supported platforms.



```
[root@localhost aps]# ./aps -p
The platform list:
FWA-3270
FWA-4130
FWA-4030
FWA-3270A
FWA-2330
FWA-4000
```

Figure 1: List all supported platforms with “-p”

If -p is not used, it will run with auto detected platform name.

[-s] Power Supply name. Sets which power supply in use. If unset, list all supported psu names

For example: -s AC-155A

Without power_supply_name, this parameter could be used to list all supported PSUs.

```
[root@localhost aps]# ./aps -s
The power list:
AC-155A
M1Y2-5300G2H
YH-5301E
YH-2081B
R1S2-5300V4V
R1S2-5300K0V
```

Figure 2: List all supported PSUs with “-s”

If -s is not used, it will run with auto detected power supply name.

[-f], Read MFR version of the power supply. It should be after the power supply name

Note: not all power supplies support the read MFR version

[-j], show json string instead of standard output

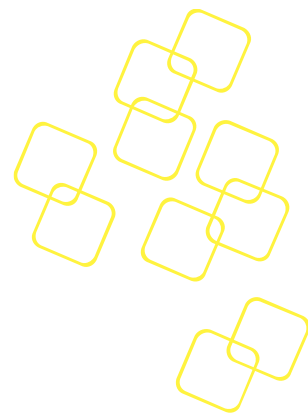
[-v], shows version of aps

NOTE: Please contact Advantech if you are not sure which model of platform and PSU you are using.

2.4 Example

Here is an example that shows you how to get status from the DELTA-AC-155A on the FWA-4130 platform.

```
#> aps -p "FWA-4130" -s "AC-155A"
```



Following show output in different cases:

Case 1: Both PSUs work fine

NAME	VALUE	STATUS	TYPE
PSU1	1	RUN	DEV
PSU2	1	RUN	DEV
PSU_12_OUT-VOL	11.9	OK	VOL
PSU_12_OUT-CUR	2.5	REF	CUR
PSU_5_OUT-VOL	5.0	OK	VOL
PSU_5_OUT-CUR	0.4	REF	CUR
PSU_3_3_OUT-VOL	3.4	OK	VOL
PSU_3_3_OUT-CUR	1.9	REF	CUR
PSU_OUT-POWER	37.8	REF	POW
PSU_TEMP1-TMP	25.0	OK	TEMP

Figure 3: PSU work fine

Case 2: PSU1's AC is lost

NAME	VALUE	STATUS	TYPE
PSU1	0	OFF	DEV
PSU2	1	RUN	DEV
PSU_12_OUT-VOL	11.9	OK	VOL
PSU_12_OUT-CUR	2.4	REF	CUR
PSU_5_OUT-VOL	5.0	OK	VOL
PSU_5_OUT-CUR	0.4	REF	CUR
PSU_3_3_OUT-VOL	3.4	OK	VOL
PSU_3_3_OUT-CUR	1.9	REF	CUR
PSU_OUT-POWER	37.0	REF	POW
PSU_TEMP1-TMP	26.0	OK	TEMP

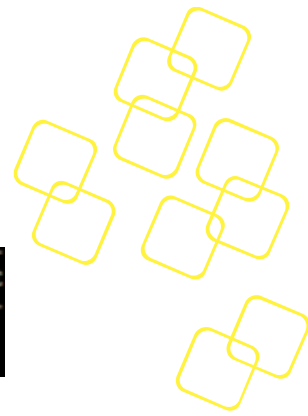
Figure 4: PSU1 AC lost

Case 3: PSU1 is not present

NAME	VALUE	STATUS	TYPE
PSU1	-1	N/A	DEV
PSU2	1	RUN	DEV
PSU_12_OUT-VOL	11.9	OK	VOL
PSU_12_OUT-CUR	2.4	REF	CUR
PSU_5_OUT-VOL	5.0	OK	VOL
PSU_5_OUT-CUR	0.4	REF	CUR
PSU_3_3_OUT-VOL	3.4	OK	VOL
PSU_3_3_OUT-CUR	1.9	REF	CUR
PSU_OUT-POWER	37.0	REF	POW
PSU_TEMP1-TMP	25.0	OK	TEMP

Figure 5: PSU1 not present

Case 4: The PMBus connection is gone but the PSU still works, here PSU0 means no PSU detected



NAME	VALUE	STATUS	TYPE
PSU0	-1	N/A	DEV
PSU0	-1	N/A	DEV

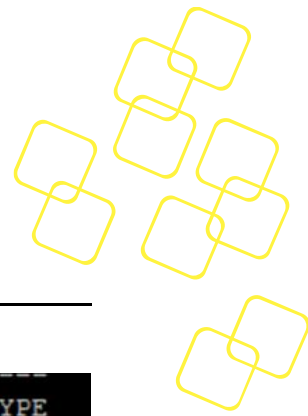
Figure 6: PMBUS gone

Here is an example shows how to get MFR version from AC-148H on FWA-4130.

#> *aps -p "FWA-4130" -s "AC-148h" -f*

```
PSU  FW version: 00
PSU1 FW version: 00
PSU2 FW version: 00
```

Figure 7: MFR version

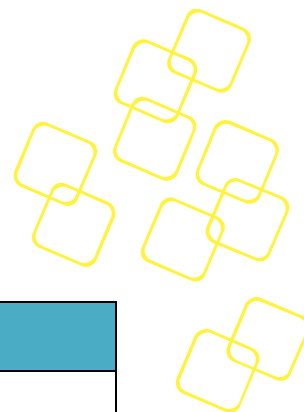


3. PSU-STATUS SENSORS

The following will specify PSU-Status sensor values, status, and type.

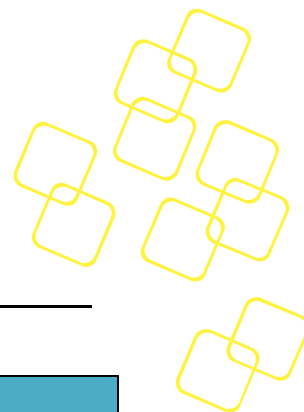
NAME	VALUE	STATUS	TYPE
PSU1	1	RUN	DEV
PSU2	1	RUN	DEV
PSU_12_OUT-VOL	11.9	OK	VOL
PSU_12_OUT-CUR	2.5	REF	CUR
PSU_5_OUT-VOL	5.0	OK	VOL
PSU_5_OUT-CUR	0.4	REF	CUR
PSU_3_3_OUT-VOL	3.4	OK	VOL
PSU_3_3_OUT-CUR	1.9	REF	CUR
PSU_OUT-POWER	37.8	REF	POW
PSU_TEMP1-TMP	25.0	OK	TEMP

Figure 8: PSU Sensors



NAME	VALUE	STATUS	TYPE
PSU1/PSU2	-1	N/A (Not Present)	DEV (Device)
	0	OFF (No AC)	
	1	RUN (On duty)	
PSU_12_OUT-VOL PSU2_5_OUT-VOL PSU1_3_3_OUT-VOL ...	raw value	OK (Output voltage ok)	VOL (Voltage)
		FAIL (Output voltage out of normal range in spec)	
PSU_OUT-CUR PSU_12_OUT-CUR PSU1_3_3_OUT-CUR PSU2_12_OUT-CUR ...	raw value	REF (Depends on loading so only for reference)	CUR (Current)
PSU_OUT-POW PSU1_12_OUT-POW ...	raw value	REF (Depends on loading so only for reference)	POW (Power)
PSU_TEMP1-TMP PSU_TEMP2-TMP PSU1_TEMP3-TMP ...	raw value	OK (Temperature in normal range)	TEMP (Temperature)
		FAIL (Temperature out of normal range)	
PSU_FAN1-SPEED PSU_FAN2-SPEED ...	raw value	OK (Speed in normal range)	SPEED
		FAIL (Speed out of normal range)	
...

Table 1: PSU sensors



4. NAMING OF SENSORS

Naming rule of sensors.

Pattern Name	PSUx_type_direction-TYPE			
	Definition			Note
PSUx	Indicates PSU module			
	x=""	Global status of PSUs		
	x="1"	Module 1		
	x="2"	Module 2		
TYPE	Sensor Type			
	TYPE="VOL"	Voltage		
	TYPE="CUR"	Current		
	TYPE="POW"	Power		
	TYPE="SPEED"	FAN Speed		
	TYPE="TMP"	Temperature		
Direction	direction="OUT"	Output		
	direction="IN"	Input		
	direction=""	None of input or output, for fan speed and temperature		
Sensor	TYPE="VOL"	type="12"	12V voltage	
		type="5"	5V voltage	
		type="3_3"	3.3V voltage	
	TYPE="CUR"	type="12"	12V current	
		type="5"	5V current	
		type="3_3"	3.3V current	
		type=""	Overall current	
	TYPE="POW"	type="12"	12V power	

Pattern Name	PSUx_type_direction-TYPE			
	Definition			Note
		type="5"	5V power	
		type="3_3"	3.3V power	
		type=""	Overall power	
	TYPE="SPEED"	type="FAN1"	Speed of FAN 1	Could be: FAN1/FAN2/FAN3/FAN4 Depends on how many FAN sensors are supported by the PSU
	TYPE="TMP"	type="TEMP1"	Temperature 1	Could be: TEMP1/TEMP2 Depends on how many temperature sensors are supported by the PSU

Table 2: Naming of sensors
Sensor naming examples:

PSU_12_OUT-VOL: PSU overall 12V output voltage

PSU1_12_OUT-VOL: PSU1 12V output voltage

PSU1_3_3_OUT-VOL: PSU1 3.3V output voltage

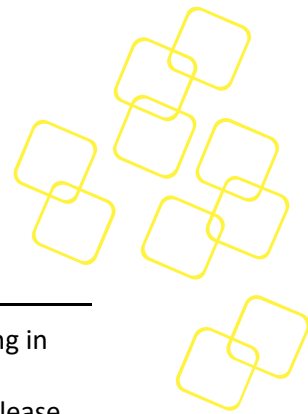
PSU2_12_OUT-CUR: PSU2 12V output current

PSU_OUT-POW: PSU overall output power

PSU1_OUT-CUR: PSU1 output current

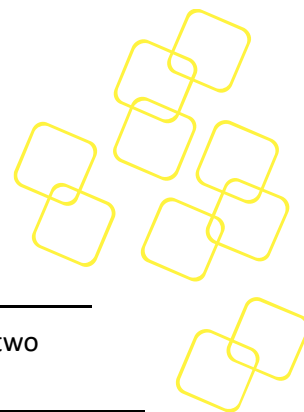
PSU_FAN1-SPEED: PSU FAN1 speed

PSU1_TEMP1-TMP: PSU1 temperature 1



5. ACCESS LIMITATION

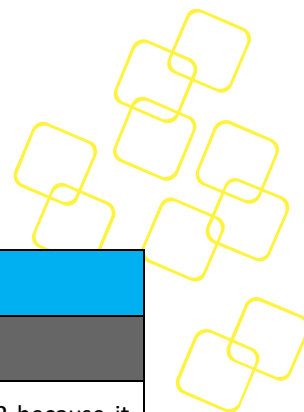
If PSU-Status accesses PMBus through I²C drivers (/dev/i2c-x), conflicts and interlocking in the application layer are avoided by the driver. However, there is still a risk if multiple applications access the same SMBus slave device. To avoid this device layer conflict, please make sure to avoid running multiple applications on the same device at the same time.




A. APPENDIX: SENSORS LIST

The following uses PSU modules YM-2301 and AC-155A as an example to explain the two types of PSU sensor lists.

YM-2301 Status Sensors					
Sensor Name	Value	Status	Min	Max	Description
PSU1	1	RUN	-	-	PSU1 power on and running
	0	OFF	-	-	PSU1 out of power
	-1	N/A	-	-	PSU1 not presence
PSU1_12_OUT-VOL	Raw Value	OK	11.4	12.6	PSU1-12V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU1-12V output voltage out of normal range (<MIN or >MAX)
PSU1_12_OUT-CUR	Raw Value	REF	-	-	PSU1-12V current, reference value only
PSU1_5_OUT-VOL	Raw Value	OK	4.75	5.25	PSU1-5V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU1-5V output voltage out of normal range (<MIN or >MAX)
PSU1_5_OUT-CUR	Raw Value	REF	-	-	PSU1-5V current, reference value only
PSU1_FAN1-SPEED	Raw Value	REF	-	-	PSU1 FAN speed, reference value only
PSU1_TEMP1-TMP	Raw Value	OK	0	59	PSU1-temp1 in normal range (>MIN and <MAX)
		FAIL			PSU1-temp1 out of normal range (<MIN or >MAX)
PSU1_TEMP2-TMP	Raw Value	OK	0	89	PSU1-temp2 in normal range (>MIN and <MAX)
		FAIL			PSU1-temp2 out of normal range (<MIN or >MAX)
PSU2	1	RUN	-	-	PSU2 power on and running
	0	OFF	-	-	PSU2 out of power



YM-2301 Status Sensors					
Sensor Name	Value	Status	Min	Max	Description
	-1	N/A	-	-	Shows PSU0 instead of PSU2 because it can't show which PSU is presence when one PSU is absent.
PSU2_12_OUT-VOL	Raw Value	OK	11.4	12.6	PSU2-12V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU2-12V output voltage out of normal range (<MIN or >MAX)
PSU2_12_OUT-CUR	Raw Value	REF	-	-	PSU2-12V current, reference value only
PSU2_5_OUT-VOL	Raw Value	OK	4.75	5.25	PSU2-5V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU2-5V output voltage out of normal range (<MIN or >MAX)
PSU2_5_OUT-CUR	Raw Value	REF	-	-	PSU2-5V current, reference value only
PSU2_FAN1-SPEED	Raw Value	REF	-	-	PSU2 FAN speed, reference value only
PSU2_TEMP1-TMP	Raw Value	OK	0	59	PSU2-temp1 in normal range (>MIN and <MAX)
		FAIL			PSU2-temp1 out of normal range (<MIN or >MAX)
PSU2_TEMP2-TMP	Raw Value	OK	0	89	PSU2-temp2 in normal range (>MIN and <MAX)
		FAIL			PSU2-temp2 out of normal range (<MIN or >MAX)
Note :	<div></div> <p>Reference to real PSU about PSU1/2 mapping. All MIN/MAX values are referenced from YM-2301 spec</p>				

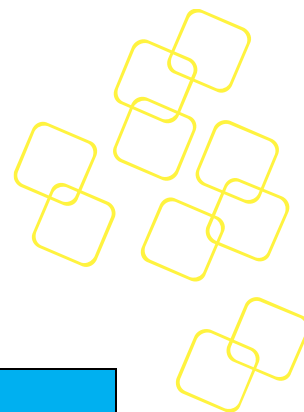
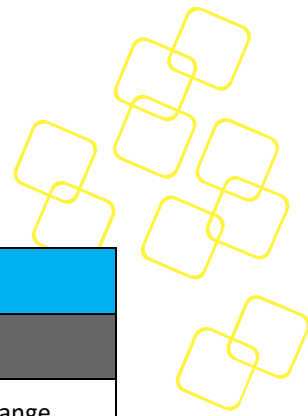


Table 3: Appendix Table YM-2301 Status Sensors

AC-155A Status Sensors					
Sensor Name	Value	Status	Min	Max	Description
PSU1	1	RUN	-	-	PSU1 power on and running
	0	OFF	-	-	PSU1 out of power
	-1	N/A	-	-	PSU1 not presence
PSU2	1	RUN	-	-	PSU2 power on and running
	0	OFF	-	-	PSU2 out of power
	-1	N/A	-	-	PSU2 not presence
PSU_12_OUT-VOL	Raw Value	OK	11.4	12.6	PSU overall 12V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU overall 12V output voltage out of normal range (<MIN or >MAX)
PSU_12_OUT-CUR	Raw Value	REF	-	-	PSU overall 12V current, reference value only
PSU_5_OUT-VOL	Raw Value	OK	4.75	5.25	PSU overall 5V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU overall 5V output voltage out of normal range (<MIN or >MAX)
PSU_5_OUT-CUR	Raw Value	REF	-	-	PSU overall 5V output voltage in normal range (>MIN and <MAX)
PSU_3_3_OUT-VOL	Raw Value	OK	3.135	3.465	PSU overall 3.3V output voltage in normal range (>MIN and <MAX)
		FAIL			PSU overall 3.3V output voltage out of normal range (<MIN or >MAX)
PSU_3_3_OUT-CUR	Raw Value	REF	-	-	PSU overall 3.3V output voltage in normal range (>MIN and <MAX)
PSU_OUT-POWER	Raw Value	REF	-	-	PSU overall output power, reference value only
PSU_TEMP1-TMP	Raw Value	OK	0	50	PSU temp1 in normal range (>MIN and <MAX)



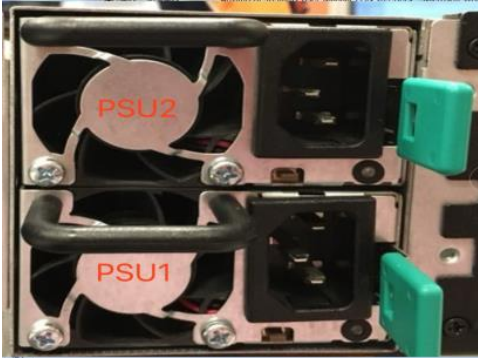
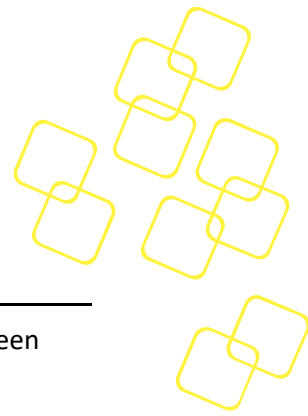
AC-155A Status Sensors					
Sensor Name	Value	Status	Min	Max	Description
		FAIL			PSU temp1 out of normal range (<MIN or >MAX)
Note :	 <p>Reference to real PSU with PSU1/2 mapping All MIN/MAX values are referenced from AC-155A spec.</p>				

Table 4: Appendix Table AC-155A Status Sensors



B. APPENDIX: OTHER NOTES

The program had created mutex to lock the read/write process to avoid conflict between different processes.

The Semaphore key is 0x8000, if a deadlock occurs, you can use the command "ipcrm -S 0x8000" to remove it. Supports PSU Status v0.32 and later versions.