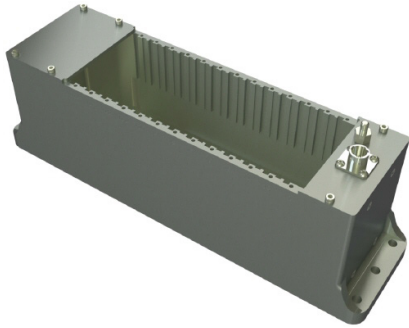


KAM/CSB/12U

Smart backplane with Single Event Latch-Up protection

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Key Features

- Power supply unit and 12 user-slots
- 18 to 40 VDC isolated power supply
- Backplane designed using rad-tolerant components allowing re-use of COTS plug-in modules, minimizing cost
- Detects Single Event Latch-Up (SEL) and temporarily disables power for affected module, ensuring reliability
- Allows slots to be independently powered on/off which can be used to minimize power consumption through different mission stages

Applications

- Data handling subsystems for: launch vehicles; re-entry vehicles; low earth orbit satellites

Overview

The smart backplane chassis (KAM/CSB/12U) is a rugged 12 user-slot chassis that has been designed specifically with space-related data acquisition, data processing and recording in mind.

Its smart radiation-tolerant backplane design allows the use of 100+ plug-in COTS modules in a radiation-intensive environment without the need for those modules to have any built-in radiation protection. In the event of a Single Event Latch-Up (SEL) on a module, the backplane detects this phenomenon and resets the operation of the module. This reset ensures that the potential harmful effects of ionizing radiation (module electronic circuit malfunction) are eliminated.

The backplane design provides the ability to individually switch on and off chosen modules in the chassis, thereby helping to minimize the power requirements of the unit at any time during different phases of a spacecraft mission.

The backplane provides continuous health status information to the on-board mission computer as well as a watchdog capability to ensure the correct operation of modules on the backplane.

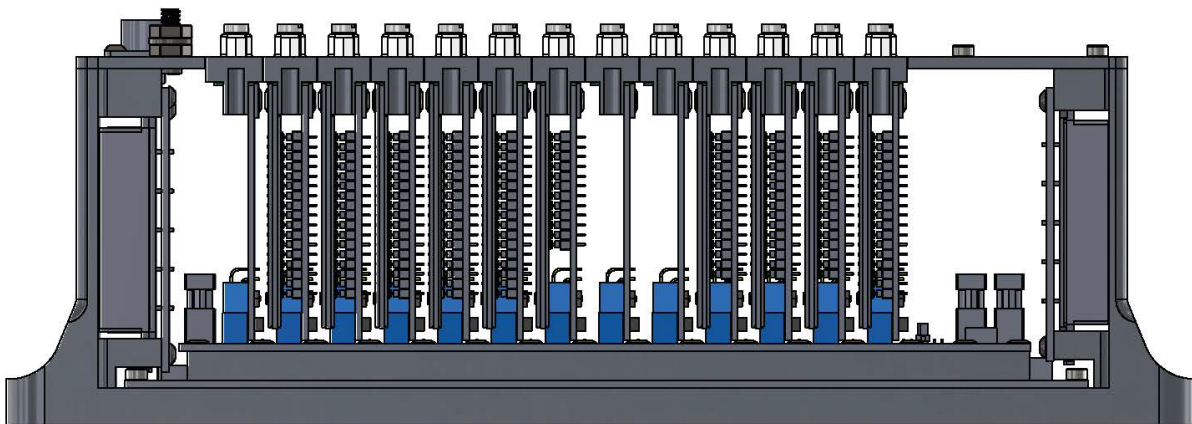


Figure 1: KAM/CSB/12U with PSU and twelve user-slots

Specifications

All values provided in the following specification tables are valid within the operating temperature range specified under “Environmental ratings” in the “General specifications” table.

TABLE 1		General specifications				
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS	
User slots	-	-	12	-		
Dimensions					Design metric is millimeters.	
height	-	109.20	-	mm	Includes module retention screws and ground bolt.	
height	-	4.24	-	in.	Includes module retention screws and ground bolt.	
length	-	310.50	-	mm	Includes mounting lugs.	
length	-	11.8	-	in.	Includes mounting lugs.	
width	-	80	-	mm		
width	-	3.15	-	in.		
Mass					Design metric is kilograms.	
no modules	-	2.35	-	kg	Including power supply.	
no modules	-	5.18	-	lb	Includes power supply.	
fully populated	-	3.33	-	kg	Typical module weight of 75 g.	
fully populated	-	7.34	-	lb	Typical module weight of 2.61 oz.	
Environmental ratings					See <i>Environmental Qualification Handbook</i> .	
operating temperature	-40	-	85	°C	Chassis base/side plate temperature.	
storage temperature	-55	-	125	°C		
Finish					Electroless nickel-plated.	

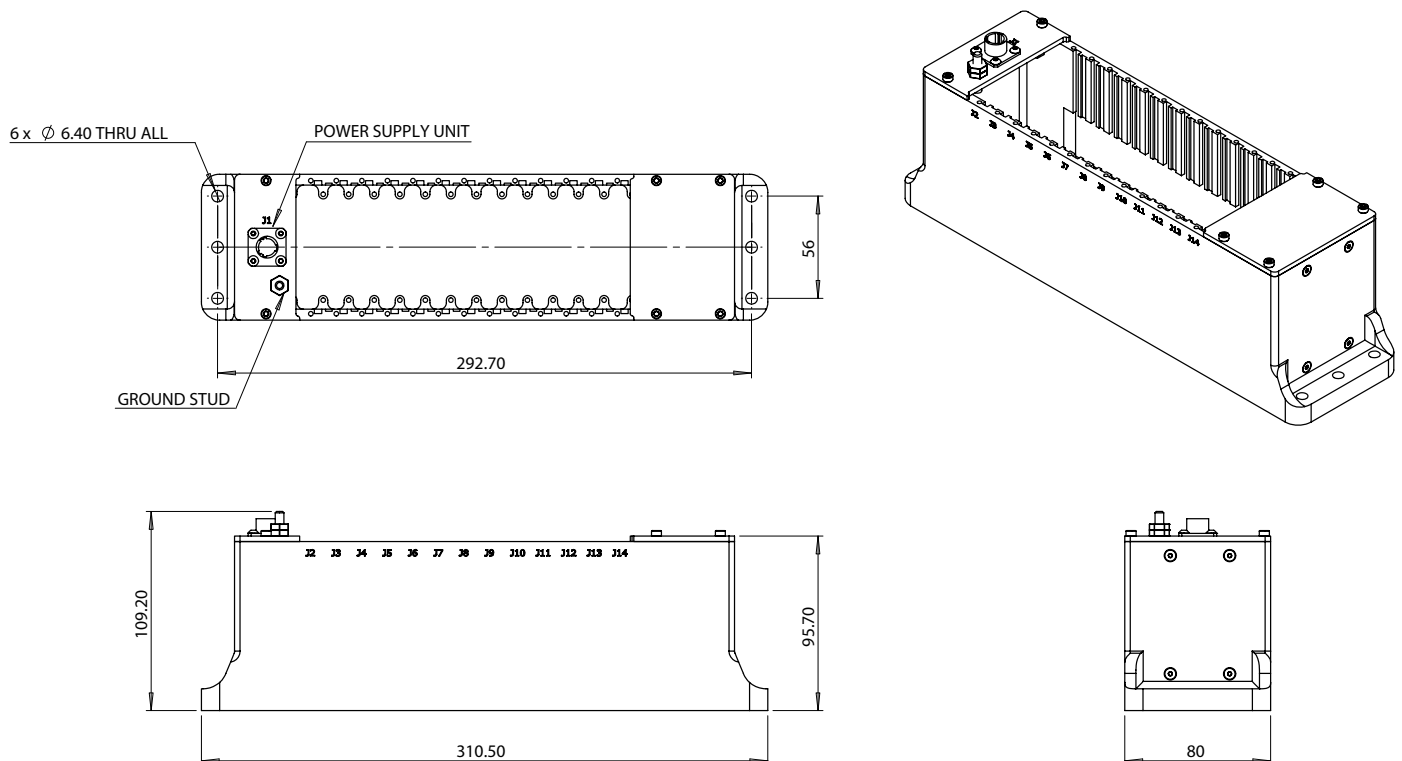


Figure 2: KAM/CSB/12U mechanical drawing

TABLE 2		+5V current sensing lines			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	13	-	
Sampling rate					Per channel.
5VoltCurrent	10	-	20	sps	
Input voltage					
operating range	0	-	800	mA	
DC error			20	mA	

TABLE 3		+7V current sensing lines			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	12	-	
Sampling rate					Per channel.
7VoltCurrent	10	-	20	sps	
Input voltage					
operating range	0	-	800	mA	
DC error			20	mA	

TABLE 4		+12V current sensing lines			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	12	-	
Sampling rate					Per channel.
12VoltCurrent	10	-	20	sps	
Input voltage					
operating range	0	-	600	mA	
DC error			20	mA	

TABLE 5		-7V current sensing lines			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	12	-	
Sampling rate					Per channel.
-7VoltCurrent	10	-	20	sps	
Input voltage					
operating range	0	-	800	mA	
DC error			20	mA	

TABLE 6 -12V current sensing lines

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	12	-	
Sampling rate					Per channel.
-12VoltCurrent	10	-	20	sps	
Input voltage					
operating range	0	-	600	mA	
DC error			20	mA	

TABLE 7 +5V voltage sensing

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	1	-	
Sampling rate					Per channel.
+5V	10	-	20	sps	
Input voltage					
operating range	2.5	-	7	V	
DC error			1	%FSR	

TABLE 8 +7V voltage sensing

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	1	-	
Sampling rate					Per channel.
+7V	10	-	20	sps	
Input voltage					
operating range	4	-	12	V	
DC error			1	%FSR	

TABLE 9 +12V voltage sensing

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	1	-	
Sampling rate					Per channel.
+12V	10	-	20	sps	
Input voltage					
operating range	0.7	-	18	V	
DC error			1	%FSR	

TABLE 10 -7V voltage sensing

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	1	-	
Sampling rate					Per channel.
-7V	10	-	20	sps	
Input voltage					
operating range	-10.5	-	-4.5	V	
DC error			1	%FSR	

TABLE 11 -12V voltage sensing

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	1	-	
Sampling rate					Per channel.
-12V	10	-	20	sps	
Input voltage					
operating range	-17	-	-7	V	
DC error			1	%FSR	

TABLE 12 Switch off time during Latch-Up event

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
All voltage rails					
switch off time	-	80	-	μs	For peak current values of 2.5 to 6 times the threshold setting.

Setting up the KAM/CSB/12U

All module setup can be defined in XML using XidML® schemas (see <http://www.xidml.org>).

Instrument settings

SETUP DATA	CHOICE	DEFAULT	NOTES
Manufacturer	-	-	-
Name	ACRA CONTROL	ACRA CONTROL	Name of manufacturer.
PartReference	KAM/CSB/12U/B	KAM/CSB/12U/B	The instrument part reference.
SerialNumber	AB1234	AB1234	Unique name for each module.
Settings	-	-	-
Inrush Current Time	2 to 1023	200	Time during which latching protection will be disabled (in milliseconds) to allow inrush current when a slot is powered on. Applies to all slots when any slot is powered on.
Power Down Interval	2 to 1000	10	Time during which module will be switched off after latching detection (in 100 milliseconds)
Power Up Retry Count	1 to 1023	3	Maximum number of retries to power up a module, before it will be permanently disabled
Critical Module Power Up Retry Count	1 to 1023	3	Maximum number of retries to power up a critical module, before it will be permanently disabled
Power Up Retry Interval	6.4 to 5497.6	320	Interval in seconds during which backplane will try to power back up a module up to the retry count. Limits are 6.4 to 5497.6 in steps of 3.2 seconds.
Enable Bitwalk Check	True False	False	Enable continuous built in bitwalk test on user modules.
Critical Module Location	0 to 111111111111	000000000011	Mask defining critical modules locations, where LSB is J2 and MSB is J14.
Settings Power	-	-	Defines which modules will be active in Current Mode
J3 Power	On Off	On	Enables power on module in J3 slot
J4 Power	On Off	On	Enables power on module in J4 slot
J5 Power	On Off	On	Enables power on module in J5 slot
J6 Power	On Off	On	Enables power on module in J6 slot
J7 Power	On Off	On	Enables power on module in J7 slot
J8 Power	On Off	On	Enables power on module in J8 slot
J9 Power	On Off	On	Enables power on module in J9 slot
J10 Power	On Off	On	Enables power on module in J10 slot
J11 Power	On Off	On	Enables power on module in J11 slot
J12 Power	On Off	On	Enables power on module in J12 slot

SETUP DATA	CHOICE	DEFAULT	NOTES
J13 Power	On Off	On	Enables power on module in J13 slot
J14 Power	On Off	On	Enables power on module in J14 slot
Settings Threshold 5 Volt	-	-	Specifies the maximum current above which a module is powered off
J2 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J2 is powered off
J3 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J3 is powered off
J4 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J4 is powered off
J5 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J5 is powered off
J6 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J6 is powered off
J7 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J7 is powered off
J8 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J8 is powered off
J9 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J9 is powered off
J10 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J10 is powered off
J11 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J11 is powered off
J12 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J12 is powered off
J13 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J13 is powered off
J14 5V Current	10 to 1000	1000	Specifies the maximum current in mA on 5V line above which a module in J14 is powered off
Settings Threshold 7 Volt	-	-	Specifies the maximum current above which a module is powered off
J3 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J3 is powered off
J4 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J4 is powered off
J5 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J5 is powered off
J6 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J6 is powered off
J7 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J7 is powered off
J8 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J8 is powered off
J9 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J9 is powered off
J10 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J10 is powered off

SETUP DATA	CHOICE	DEFAULT	NOTES
J11 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J11 is powered off
J12 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J12 is powered off
J13 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J13 is powered off
J14 7V Current	10 to 1000	1000	Specifies the maximum current in mA on 7V line above which a module in J14 is powered off
Settings Threshold -7 Volt	-	-	Specifies the maximum current above which a module is powered off
J3 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J3 is powered off
J4 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J4 is powered off
J5 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J5 is powered off
J6 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J6 is powered off
J7 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J7 is powered off
J8 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J8 is powered off
J9 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J9 is powered off
J10 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J10 is powered off
J11 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J11 is powered off
J12 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J12 is powered off
J13 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J13 is powered off
J14 -7V Current	10 to 1000	1000	Specifies the maximum current in mA on -7V line above which a module in J14 is powered off
Settings Threshold 12 Volt	-	-	Specifies the maximum current above which a module is powered off
J3 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J3 is powered off
J4 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J4 is powered off
J5 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J5 is powered off
J6 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J6 is powered off
J7 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J7 is powered off
J8 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J8 is powered off
J9 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J9 is powered off

SETUP DATA	CHOICE	DEFAULT	NOTES
J10 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J10 is powered off
J11 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J11 is powered off
J12 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J12 is powered off
J13 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J13 is powered off
J14 12V Current	10 to 1000	1000	Specifies the maximum current in mA on 12V line above which a module in J14 is powered off
Settings Threshold -12 Volt	-	-	Specifies the maximum current above which a module is powered off
J3 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J3 is powered off
J4 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J4 is powered off
J5 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J5 is powered off
J6 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J6 is powered off
J7 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J7 is powered off
J8 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J8 is powered off
J9 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J9 is powered off
J10 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J10 is powered off
J11 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J11 is powered off
J12 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J12 is powered off
J13 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J13 is powered off
J14 -12V Current	10 to 1000	1000	Specifies the maximum current in mA on -12V line above which a module in J14 is powered off
Settings Status Packet	-	-	-
Transmit	True False	False	Enables automatic generation and transmission of status packet
Rate	1 to 100	10	Number of status packets per second
Destination MAC Address	00-00-00-00-00-00 to FF-FF-FF-FF-FF-FF	00-00-00-00-00-00	Destination MAC Address for status packet
Destination IP Address	0.0.0.0 to 255.255.255.255	0.0.0.0	Destination IP Address for status packet
Destination Port	10 to 65535	1023	Destination UDP port for status packet
Processes	-	-	-
ManualModeMask	-	-	-

Parameter definitions

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
Global Parameters				
5VoltCurrent(14:2) Represents a current drawn by module from +5V supply line	BitVector	BitVector	16	R[15:0] R[15:10] Reserved - Reserved for future use R[9:0] Current - Current in mA
7VoltCurrent(14:3) Represents a current drawn by module from +7V supply line	BitVector	BitVector	16	R[15:0] R[15:10] Reserved - Reserved for future use R[9:0] Current - Current in mA
-7VoltCurrent(14:3) Represents a current drawn by module from -7V supply line	BitVector	BitVector	16	R[15:0] R[15:10] Reserved - Reserved for future use R[9:0] Current - Current in mA
12VoltCurrent(14:3) Represents a current drawn by module from +12V supply line	BitVector	BitVector	16	R[15:0] R[15:10] Reserved - Reserved for future use R[9:0] Current - Current in mA
-12VoltCurrent(14:3) Represents a current drawn by module from -12V supply line	BitVector	BitVector	16	R[15:0] R[15:10] Reserved - Reserved for future use R[9:0] Current - Current in mA
NumberOfLatchupsDe- tected(14:2) Represents a number of latchups in module since power up	BitVector	BitVector	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] LatchupsDetected - Number of latchups detected
Temperature(2:0) Temperature sensors data (2 - Chassis, 1 - PCB secondary PSU side, 0 - PCB primary PSU side).	Celsius	OffsetBinary	16	R[15:0] R[15:0] TemperatureCode - if R(15) = 0 then Positive Temperature = TemperatureCode(dec)/128, else Negative Temperature = (TemperatureCode(dec) - 65,536)/128
ExpectedSlotsStatus Indicates which modules should be switched on in current mode	BitVector	BitVector	16	R[15:0] R[15:13] Reserved - Reserved for future use R[12:0] ModuleEnabled - Module is enabled by Mode (LSB = J2 to MSB = J14)
ActualSlotsStatus Indicates which modules are actually switched on in current mode	BitVector	BitVector	16	R[15:0] R[15:13] Reserved - Reserved for future use R[12:0] ModuleStatus - Current enabled modules (LSB = J2 to MSB = J14)
DisabledAfterRetriesStatus Indicates which modules have been switched off after number of retries was exceeded	BitVector	BitVector	16	R[15:0] R[15:13] Reserved - Reserved for future use R[12:0] ModulesDisabledByRetries - Disabled Modules (LSB = J2 to MSB = J14)
BitWalkStatus Indicates which modules have been switched off after failing bitwalk test	BitVector	BitVector	16	R[15:0] R[15:13] Reserved R[12:0] ModuleBitWalkStatus - Module passed bitwalk test (LSB = J2 to MSB = J14)
EventsCounter Count of SEL detected on CSB critical components	Count	OffsetBinary	16	R[15:0] R[15:12] Reserved - Reserved for future use R[11:0] GlobalEventsCounter - Global events counter
Report Reports the status of the chassis	BitVector	BitVector	16	R[15:0] R(15) NewError - New error since last read R[14:1] Reserved - Reserved R(0) TemperatureSensorError - Temperature Sensor SPI error detected

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
GlobalEventReport Reports the status of the critical components in smart backplane	BitVector	BitVector	16	R[15:0] R[15:3] Reserved - Reserved for future use R(2) BackplaneBusSwitchesEventDetected - SEL detected on 5V supply for bus switches R(1) Csb5VLatchup - SEL on CSB 5V supply line detected R(0) Csb3V3Latchup - SEL on MRAM 3v3 supply line detected
AleChecksum Backplane ALE Checksum.	BitVector	BitVector	16	R[15:0] R[15:0] AleChecksum - Backplane ALE Checksum as calculated by the Smart Backplane
CurrentMode Indicates current mode / format	BitVector	BitVector	16	R[15:0] R[15:4] Reserved R[3:0] Mode - Mode / Format
+12V 11 bit value of +12V power line on chassis backplane.	Volt	OffsetBinary	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] Voltage - BCD value of +12V power line on chassis backplane where each count is equal to a centivolt. Example: 1200 counts is 12.00V.
-12V 11 bit value of -12V power line on chassis backplane.	Volt	OffsetBinary	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] Voltage - BCD value of -12V power line on chassis backplane where each count is equal to a centivolt. Example: 1200 counts is -12.00V.
+7V 11 bit value of +7V power line on chassis backplane.	Volt	OffsetBinary	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] Voltage - BCD value of +7V power line on chassis backplane where each count is equal to a centivolt. Example: 700 counts is +7.00V.
-7V 11 bit value of -7V power line on chassis backplane.	Volt	OffsetBinary	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] Voltage - BCD value of -7V power line on chassis backplane where each count is equal to a centivolt. Example: 700 counts is -7.00V.
+5V 11 bit value of +5V power line on chassis backplane.	Volt	OffsetBinary	16	R[15:0] R[15:11] Reserved - Reserved for future use R[10:0] Voltage - BCD value of +5V power line on chassis backplane where each count is equal to a centivolt. Example: 500 counts is 5.00V.
ManualModeMask Parameters				
ManualModeMaskRegister Mask register for manual disabling modules by command	BitVector	BitVector	16	R[15:0] R(15) Reserved - Reserved R[14:2] Slots - Bits 14:2 are mapped to J14 down to J2. If the bit is set (1) it shuts down the corresponding slot until the bit is cleared (0) to turn the slot back on. Bits set to shut down critical slots (as per Critical Module Location) are ignored. R[1:0] ReservedSlots - Reserved

NOTE: It is recommended that names are less than 20 characters, have no white space or contain any of the following five characters "/><.\.

Getting the most from the KAM/CSB/12U

Every user module slot in the KAM/CSB/12U has five built-in current threshold circuits for each rail (+5V, $\pm 7V$, $\pm 12V$), which are used to avoid excessive current being drawn during times of Single Event Latch-Up (SEL). The KAM/CSB/12U has the ability to measure current in mA, transmit values over the backplane to Ethernet, and allow you to set thresholds according to the measured current. Depending on the user module, different limits are allowed. Every slot has a fast current threshold circuit, with a programmable maximum current limit which switches off power to the slot if the measured current exceeds the predefined threshold. When the module has been powered on, the current threshold circuit will be disabled for a period of time that is set by the Inrush Current Time setting. This allows the current inrush on each of the modules to be ignored to avoid nuisance tripping when the modules are being powered on. The value of the Inrush Current Time must be sufficient to allow for modules that have secondary power supplies that are controlled by a sequencer, which may delay some of the inrush current drawn by the module.

For assistance in setting thresholds and inrush current ignore time, contact Curtiss-Wright support (acra-support@curtisswright.com).

In order to minimize inrush current of the KAM/CSB/12U itself, all user modules are switched on one by one with a 100-ms interval. This slot sequencing is used on initial power on. When more than one slot is powered off simultaneously, due to thresholds being exceeded, the slots are powered on individually with a delay equal to the programmed power down interval time (± 100 ms) between each power on. Lower numbered slots are powered on first.

Power control for chassis modules

Certain controller modules, such as the KAD/BCU/143, can pass a parameter received via SNMP to a smart backplane chassis (via the ManualModeMask register in the KAM/CSB/12U) in order to power off modules under control of the smart backplane. The value that is written to the smart backplane can be read by placing the ActiveModulesValue parameter from the KAD/BCU/143 in an acquisition packet (or by reading back the SNMP variable).

The ActiveModulesValue parameter contains a bitmap, where each bit represents a slot on the backplane. Bit 2 represents slot J2, bit 3 represents J3, and so on. A 1 in the bit for a module represents a request to power off that module. Therefore, writing the value 104 (binary 1101000) represents a request to power off slots J6, J5 and J3. The smart backplane can be configured to reject this request for certain slots using the Critical Module Location setting. In addition, the smart backplane always rejects a request to power down slot J2, because this slot contains the controller module, which controls the chassis. If ActiveModulesValue is subsequently set to 0, this represents a request to power on the modules.

ActiveModulesValue is set to 0 when the controller module powers on. It can be set to a different value by setting the [activeModules](#) SNMP variable (.1.3.6.1.4.1.33698.15.1.0). This variable is not set by DAS Studio 3 as it is intended to modify the behavior of the chassis during acquisition. This variable can be set with any SNMP management software.

Switch off delay during Latch-up event

The switch off delay is a function of the increase in current due to the Latch-Up event, and the relative value of the Latch-Up threshold setting to the quiescent current drain of the module in the slot in question.

Connector pinout of the KAM/CSB/12U

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	P+	Nominal 28V supply	Isolated internally; aircraft power
2	P+	Nominal 28V supply	Isolated internally; aircraft power
3	P-	Return for nominal 28V	Isolated internally; aircraft power
4	P-	Return for nominal 28V	Isolated internally; aircraft power
5	CHASSIS	Chassis	
6	GND	Internal ground	

Ordering information

PART NUMBER	DESCRIPTION
KAM/CSB/12U/B/SED	Smart backplane with Single Event Latch-Up protection (engineering unit)
KAM/CSB/12U/B/SEF	Smart backplane with Single Event Latch-Up protection (space flight unit)
KAM/CSB/12U/B/VG1/SED	Smart backplane with Single Event Latch-Up protection (engineering unit), GND and chassis connected internally
KAM/CSB/12U/B/VG1/SEF	Smart backplane with Single Event Latch-Up protection (flight unit), GND and chassis connected internally

By default, the standard mating connector, CON/PSU/010/SEC, is included with each chassis in the shipment. Its part number will be added to the Confirmation of Order unless an alternative option is specified (see the *Cables* data sheet).

Revision history

REVISION	DIFFERENCES	STATUS
KAM/CSB/12U/B	Improved accuracy and EMC	Recommended for new programs
KAM/CSB/12U	First release	Not recommended for new programs

Supporting software

SOFTWARE	DETAILS
DAS Studio 3	User interface for setup and management of data acquisition, network switches, recorders and ground stations in an integrated environment

Related products

MODULE	DETAILS
ACC/LID/001/SEC	Spare lid piece; must be ordered separately for any unused user-slots
KAD/BCU/143	Ethernet backplane controller - IENA/iNET-X compatible, SNMP support

Related documentation

DOCUMENT	DETAILS
DOC/DBK/001	Acra KAM-500 Databook
DOC/GBK/002	Environmental Qualification Handbook
DOC/MAN/030	DAS Studio 3 User Manual
TEC/NOT/016	Power dissipation
TEC/NOT/049	Power estimation

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