



Product Information

SD4-SWEEP • *CompactPCI*[®] Serial • M.2 SATA RAID

Document No. 7626 • 17 February 2015



General

The SD4-SWEEP is a peripheral slot card for CompactPCI® Serial systems, equipped with a quad-channel PCI Express® to SATA 6Gbps controller, and four on-board sockets for M.2 type 2280 SATA solid state drives (SSD). With a capacity available of 512MB as of current, M.2 is a fast emerging embedded storage module form factor. The Marvell® SATA 3.0 controller allows RAID or non RAID operation.

The SD4-SWEEP fits into any CompactPCI® Serial peripheral slot that is PCIe enabled. For optimum performance a fat pipe slot may be chosen. Hardware RAID operation is supported, running with an enhanced ARM-based processor to offload the host CPU. Thanks to the four M.2 sockets provided on the SD4-SWEEP, a JBOD or hardware RAID level 0/1/10 system can be easily configured.



Feature Summary

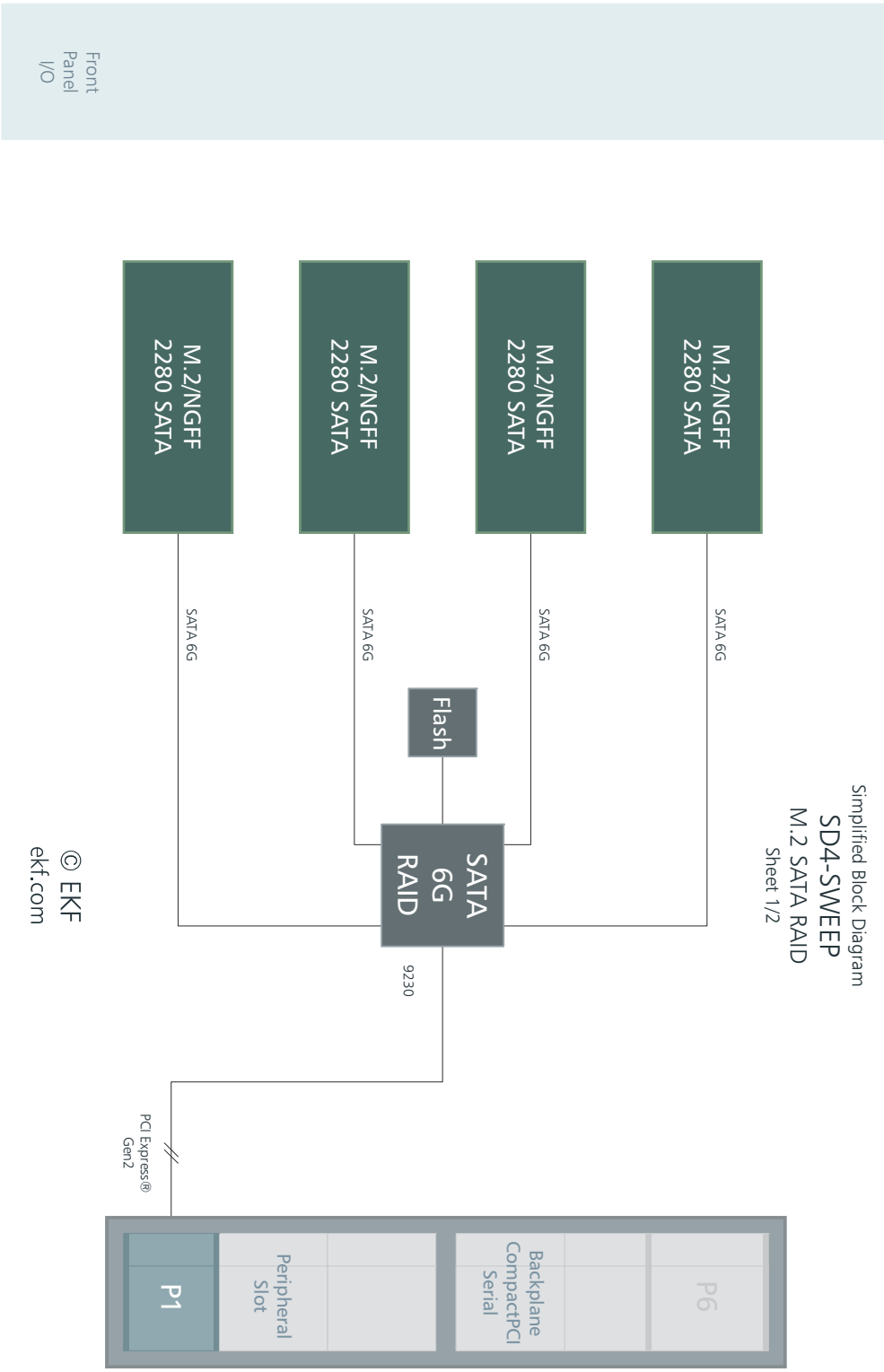
- ▶ PICMG® CompactPCI® Serial standard (CPCI-S.0)
- ▶ Single size Eurocard 3U 4HP 100x160mm²
- ▶ Suitable for CompactPCI® Serial peripheral slot (PCI Express® enabled)
- ▶ CompactPCI® Serial fat pipe slot (PCIe x 8) or peripheral slot (PCIe x 4) recommended
- ▶ cPCI-S backplane connector P1 for PCI Express®, single or dual lane link

- ▶ Marvell® PCI Express® 2.0 to SATA III host controller
- ▶ Four SATA 6Gbps interface ports
- ▶ Native Command Queuing
- ▶ Hardware RAID 0/1/10
- ▶ On-the-fly AES encryption 128/256-bit
- ▶ AHCI driver support
- ▶ Marvell HyperDuo technology for automated SSD/HDD tiering

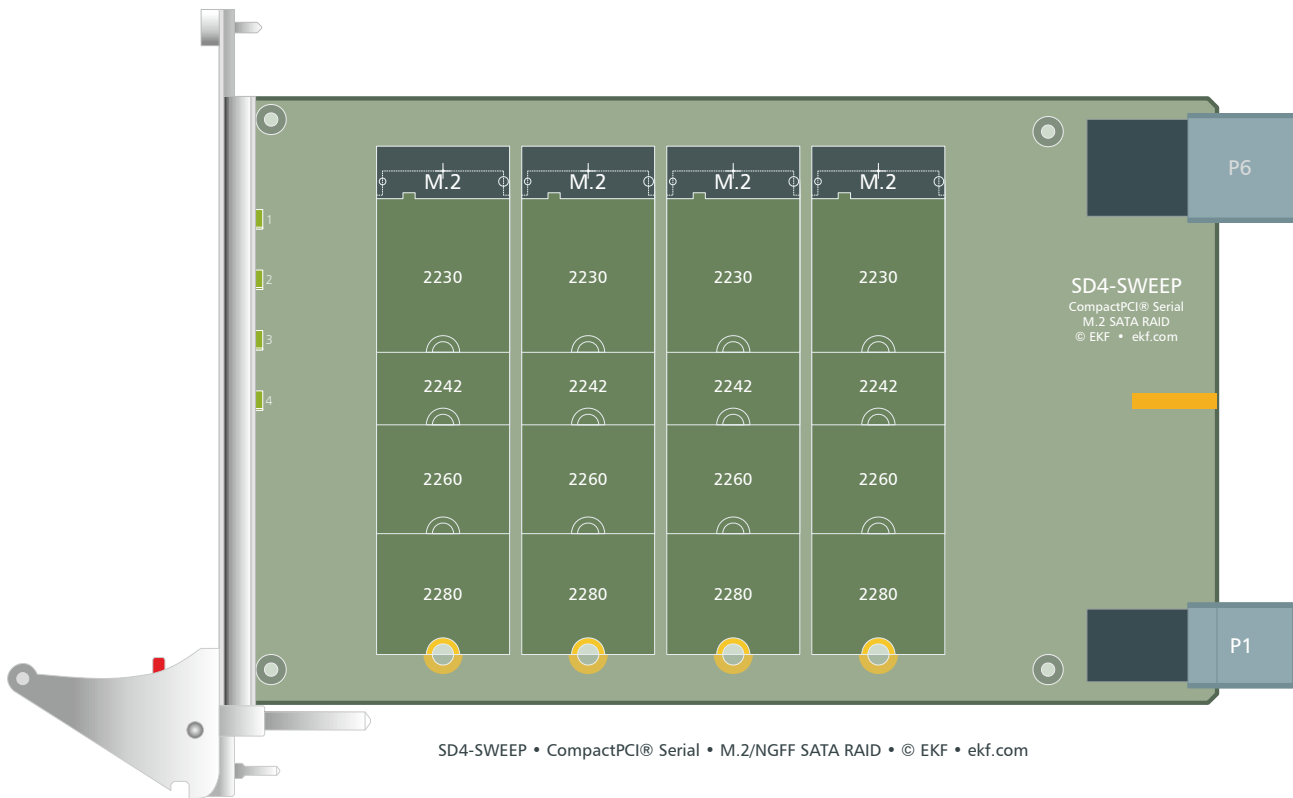
- ▶ Designed according to PCI Express® M.2 Specification (aka NGFF)
- ▶ Up to four on-board M.2 SATA SSD modules (must be ordered separately)
- ▶ M.2 module size 2280, 2260, 2242, typically B-M coded
- ▶ M.2 host connectors B-coded, 4.2H (accepts double-sided modules)
- ▶ Socket 2 pin-out for SATA based SSDs (configuration pins 0000)
- ▶ Various brands of M.2 SATA SSDs available (e.g. Intel, Micron, Samsung)
- ▶ Hardware RAID option for dual or triple/quad device configuration

- ▶ Long term availability
- ▶ Designed & manufactured in Germany
- ▶ Certified quality management according to ISO 9000
- ▶ Rugged solution (coating, sealing, underfilling on request)
- ▶ RoHS compliant 2002/95/EC
- ▶ Operation temperature 0°C to +70°C (commercial temperature range)
- ▶ Operation temperature -40°C to +85°C (industrial temperature range) on request
- ▶ Storage temperature -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ MTBF tbd
- ▶ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

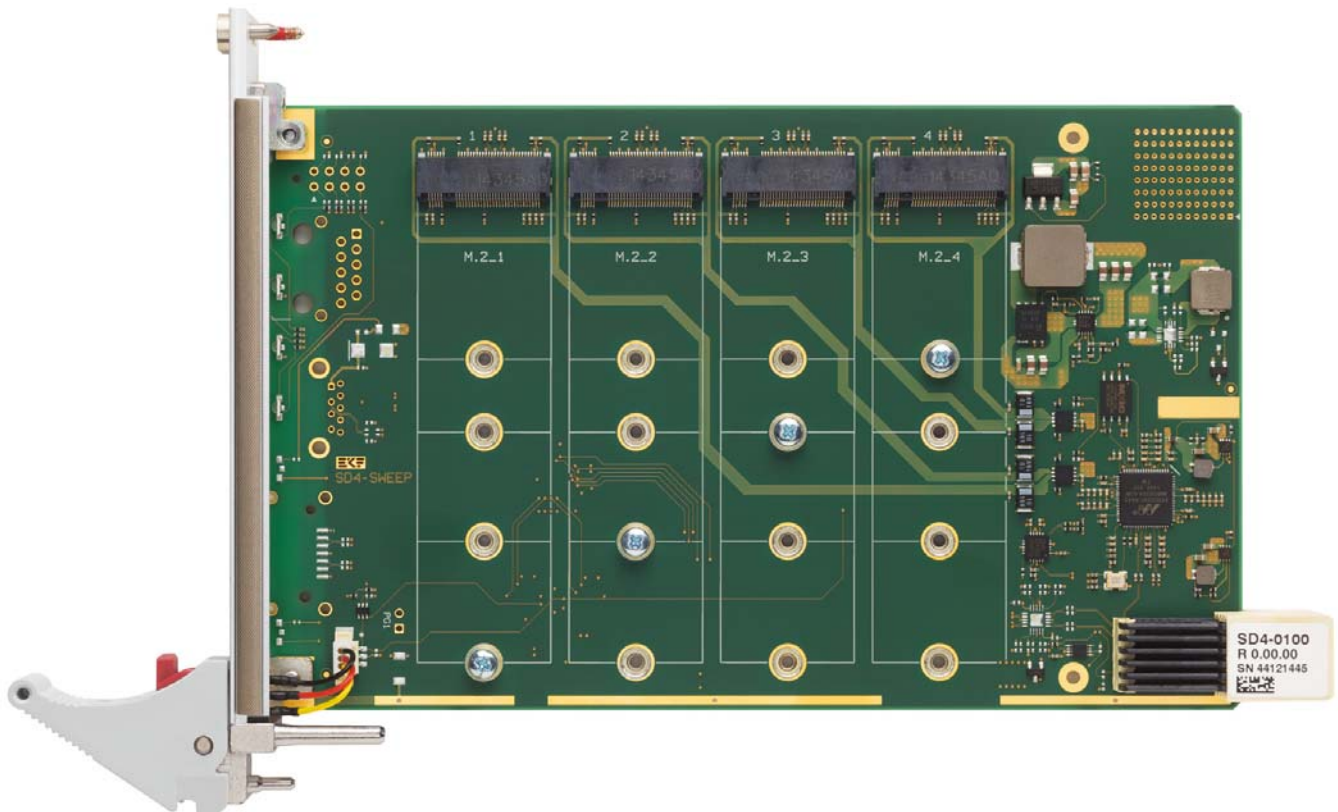
Block Diagram



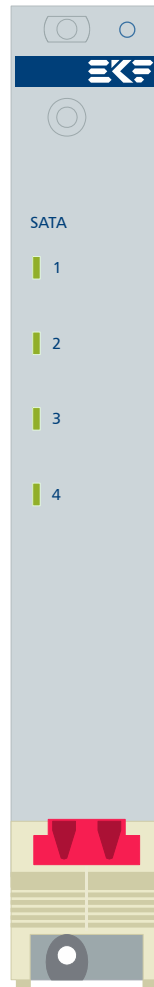
Component Orientation



P6 is not populated by default. This connector can be provided on request for even more mechanical stability, e.g. railway applications.



Front Panel



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SD4-SWEEP

SATA activity LEDs assigned to M.2 modules 1 - 4
LED on = mSATA module ready
LED blinking = mSATA module active

M.2 Connectors

The SD4-SWEEP is provided with four M.2 module host connectors Type B. After inserted, the M.2 module must be locked manually by a screw, in order to withstand shock and vibration. With two or more M.2 solid-state drives engaged, the SD4-SWEEP allows for hardware RAID level 0/1/10 operation.

M.2 1-4 • Pin 1 - 38 EKF Part #255.50.1.2242.10			
CFG-3 *	1	2	+3.3V
GND	3	4	+3.3V
GND	5	6	NC
NC	7	8	NC
NC	9	10	DA/DSS
GND	11	12	B Key
B Key	13	14	B Key
B Key	15	16	B Key
B Key	17	18	B Key
B Key	19	20	NC
CFG-0 *	21	22	NC
NC	23	24	NC
NC	25	26	NC
GND	27	28	NC
NC	29	30	NC
NC	31	32	NC
GND	33	34	NC
NC	35	36	NC
NC	37	38	DEVSLP

M.2 1-4 • Pin 39 - 75			
GND	39	40	NC
SATA B+ (SSD OUT)	41	42	NC
SATA B- (SSD OUT)	43	44	NC
GND	45	46	NC
SATA A- (SSD IN)	47	48	NC
SATA A+ (SSD IN)	49	50	NC
GND	51	52	NC
NC	53	54	NC
NC	55	56	NC
GND	57	58	NC
NC M-Key	59	60	NC M-Key
NC M-Key	61	62	NC M-Key
NC M-Key	63	64	NC M-Key
NC M-Key	65	66	NC M-Key
NC	67	68	NC
CFG-1 *	69	70	+3.3V
GND	71	72	+3.3V
GND	73	74	+3.3V
CFG-2 *	75		

* 10k pull-up +3.3V



CompactPCI® Serial Backplane Connector

P1 CompactPCI® Serial Peripheral Slot Backplane Connector												
EKF Part #250.3.1206.20.02 • 72 pos. 12x6, 14mm Width												
P1	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	PE TX02+	PE TX02-	GND	PE RX02+	PE RX02-	GND	PE TX03+	PE TX03-	GND	PE RX03+	PE RX03-
5	PE TX00+	PE TX00-	GND	PE RX00+	PE RX00-	GND	PE TX01+	PE TX01-	GND	PE RX01+	PE RX01-	GND
4	GND	USB2+	USB2-	GND	PE CLK+	PE CLK-	GND	SATA TX+	SATA TX-	GND	SATA RX+	SATA RX-
3	USB3 TX+	USB3 TX-	GA0	USB3 RX+	USB3 RX-	GA1	SATA SDI	SATA SDO	GA2	SATA SCL	SATA SL	GA3
2	GND	I2C SCL	I2C SDA	GND	RSV	RSV	GND	RST#	WAKE#	GND	PE EN#	SYS EN#
1	+12V	STBY	GND	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

pin positions printed white: not connected

The on-board PCI Express® to SATA controller is suitable for PCIe generation 1 and 2 (up to 5Gbps). Two PCI Express® lanes are provided over the backplane connector P1 as upstream link. It is recommended to position the SD4-SWEEP on a 'Fat Pipe' CompactPCI® Serial peripheral slot (if available on a backplane, the fat pipe slot(s) would be adjacent to the system slot). When inserted into a standard peripheral slot, there is frequently only a single PCI Express® lane available (depends on the CPU card capabilities), which may reduce the maximum data throughput of the SD4-SWEEP.

Ordering Information

For popular SD4-SWEEP SKUs please refer to
www.ekf.com/liste/liste_21.html#SD4

Related Links to CompactPCI® Serial SATA Cards

SD4-SWEEP Home	www.ekf.com/s/sd4/sd4.html
CompactPCI® Serial SATA Solutions	www.ekf.com/s/serial.html#SD

Related Documents CompactPCI® Serial & CompactPCI® PlusIO

Basics / Overview CompactPCI® Serial & CompactPCI® PlusIO	www.ekf.com/s/smart_solution.pdf
CompactPCI® Serial Home	www.ekf.com/s/serial.html
CompactPCI® PlusIO Home	www.ekf.com/p/plus.html

Recommended CPU Cards

P = PlusIO • PICMG® 2.30 CompactPCI® PlusIO
 S = Serial • PICMG® CPCI-S.0 CompactPCI® Serial

PC1-GROOVE	CompactPCI® PlusIO CPU Card • www.ekf.com/p/pc1/pc1.html
PC3-ALLEGRO	CompactPCI® PlusIO CPU Card • www.ekf.com/p/pc3/pc3.html
SC1-ALLEGRO	CompactPCI® Serial CPU Card • www.ekf.com/s/sc1/sc1.html
SC2-PRESTO	CompactPCI® Serial CPU Card • www.ekf.com/s/sc2/sc2.html

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boards. systems. solutions.

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