Product Information

SE5-CLUB

U.2 NVMe® SSD Carrier Board

Option M.2 SATA - USB - GbE

CompactPCI® Serial Peripheral Card

Preliminary Edition

General

The SE5-CLUB is a peripheral card for CompactPCI® Serial systems, for use as a mass storage solution by means of an U.2 type NVMe® SSD, available with up to 30TB capacity as of current. The board is equipped with an SFF-8639 receptacle, which can accommodate a PCIe® Gen4 based 2.5-inch U.2 or U.3 drive up to 15mm height.

The SE5-CLUB fits into any peripheral slot which is PCI Express® enabled. For best performance a PCIe® x4 backplane slot is recommended (e.g. fat pipe slot).

As an option, the SE5-CLUB can be equipped in addition with an M.2 SATA SSD, and/or USB3 Type-A and RJ45 2.5GBASE-T front panel connectors.

Features

Feature Summary

General

- Peripheral board for PICMG® CompactPCI® Serial (CPCI-S.0) systems
- Form factor single size Eurocard (board dimensions 100x160mm^2)
- Mounting height 3U
- Front panel width 4HP
- Backplane communication via PCI Express® x4 or x1 enabled slot (J1/P1 connector)

U.2 Storage

- SFF-8639 Receptacle
- Mounting holes for 2.5-inch U.2 NVMe® drive (SSD not included w/o explicitly ordered)
- Maximum U.2 height 15mm
- Suitable also for U.3 type SSD w/o user intervention
- 12V Main power, 3.3V auxiliary power
- PCI Express® Gen4 x 4
- PCIe® Gen4 Redrivers on-board for optimum signal integrity
- Theoretical transfer speed up to 64Gbps (with PCIe® Gen4 enabled CPU card & backplane x4 slot only)
- Typical transfer speed up to 32Gbps (with PCIe® Gen3 enabled CPU card & backplane x4 slot only)
- Board Hot-Plug procedure supported (tbd)

Option M.2 SATA Storage

- Option M.2 B-Key socket
- Up to 2280 size module style
- Suitable for an SATA 6G module (not suitable for PCIe® NVMe®)
- Requires an SATA enabled J1/P1 backplane slot
- M.2 SATA SSD not included w/o explicitly ordered

Feature Summary

Option Front Panel I/O

- Option RJ45 Ethernet front panel jack w. integrated transformer magnetics
- 2.5GBASE-T, 1000BASE-T, 100BASE-TX, 10BASE-T compliant data transfer rate (NBASE-T 2.5GE)
- Requires a Gigabit Ethernet enabled backplane slot (J6/P6)
- 2.5GBASE-T with a 2.5G capable CPU card only

- Option Type-A USB3 receptacle
- Requires an USB enabled backplane slot (at least USB 2.0 via J1/P1)
- Up to 10G USB 3.1 Gen2 transfer speed (10G with a suitable CPU card only)

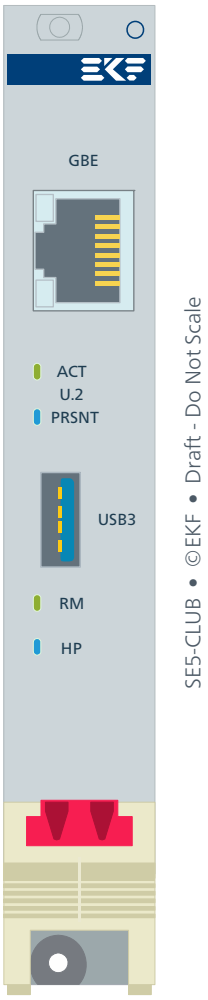
Applications

- Rugged mass storage for demanding industrial computing, edge computing, IIoT
- Enterprise and data center performance and reliability for industrial use conditions
- Scalable solution - up to 30TB capacity per drive, up to 8 carrier cards in a CompactPCI® Serial system

Environmental, Regulatory

- Designed & manufactured in Germany
- ISO 9001 certified quality management
- Custom specific development available on request
- Long term availability
- Rugged solution
- Coating, sealing, underfilling on request
- RoHS compliant
- Operating temperature carrier board components -40°C to +85°C (industrial temperature range)
- Storage temperature -40°C to +85°C, max. gradient 5°C/min
- Actual operating temperature range depends on particular U.2 and M.2 SSD in use - please refer to manufacturer datasheets
- Humidity 5% ... 95% RH non condensing
- Altitude -300m ... +3000m
- Shock 15g 0.33ms, 6g 6ms
- Vibration 1g 5-2000Hz
- EC Regulatory EN55035, EN55032, EN62368-1 (CE)
- MTBF tbd years (MIL-HDBK-217F, SN29500 @+40°C)

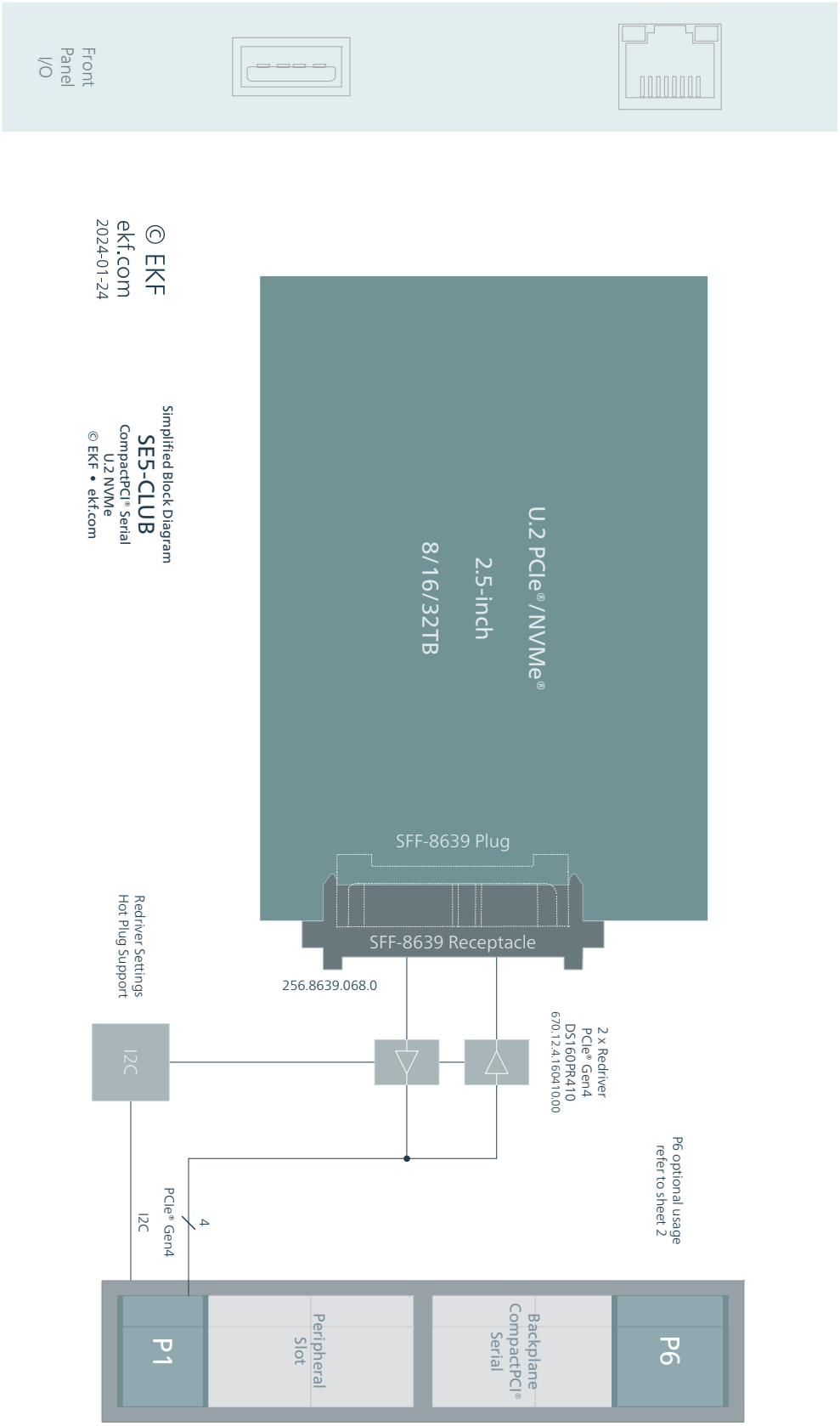
Front Panel

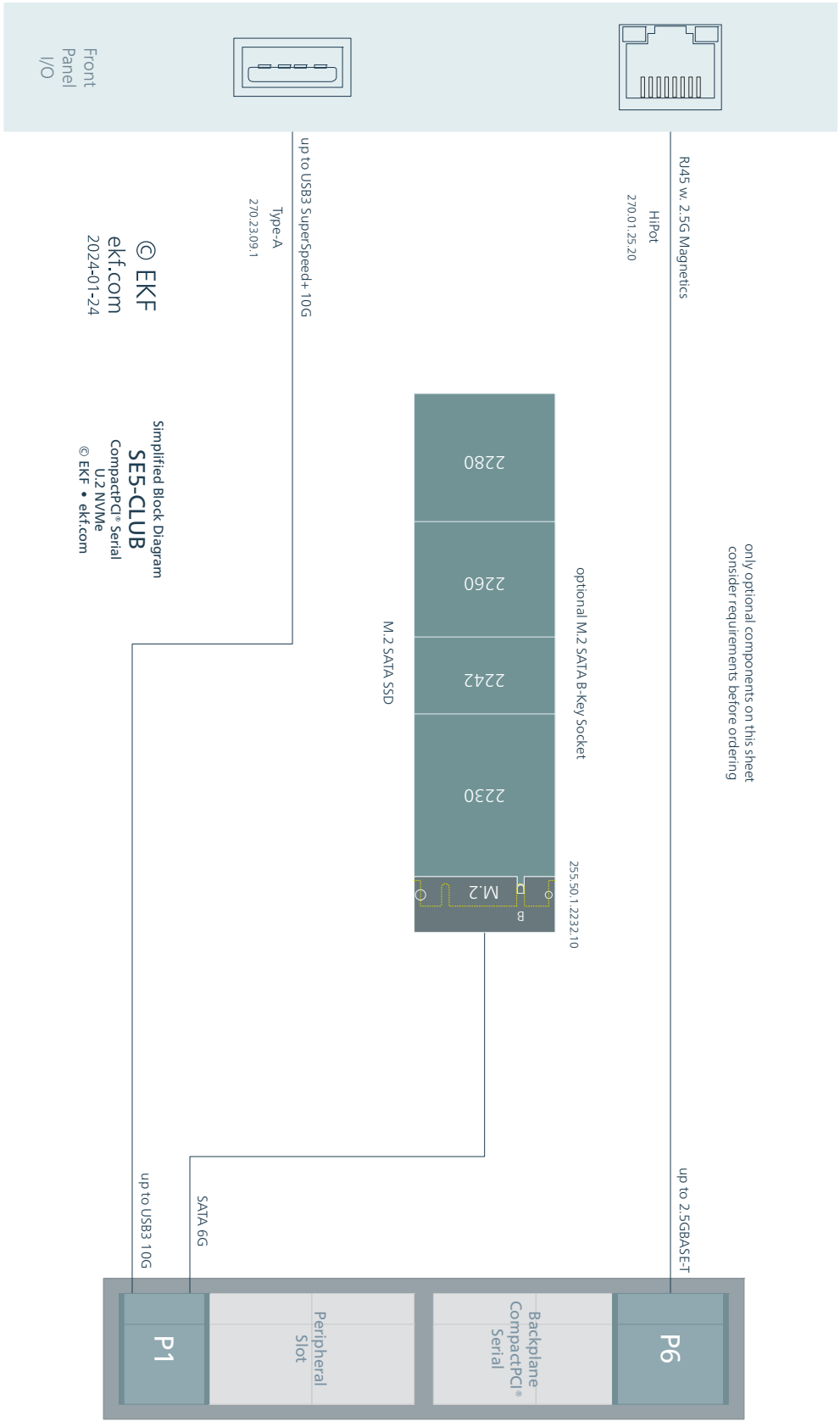


SE5-CLUB

Front LEDs	
ACT	U.2 SSD read or write activity
PRSNT	U.2 SSD mounted, PCB powered
RM	PCB ready to remove w/o U.2 data loss
HP	PCB Hot Plug procedure requested - waiting for RM LED

Block Diagram




Front Panel I/O
RJ45 w. 2.5G Magnetics
HiPot
270.01.25.20
only optional components on this sheet consider requirements before ordering
up to USB3 SuperSpeed+ 10G
Type-A
270.2309.1
optional M.2 SATA B-Key Socket
255.50.1.2232.10
2280
2260
2242
2230
M.2
B
M.2 SATA SSD
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2024-01-24
Simplified Block Diagram
SE5-CLUB
CompactPCI® Serial
U.2 NVMe
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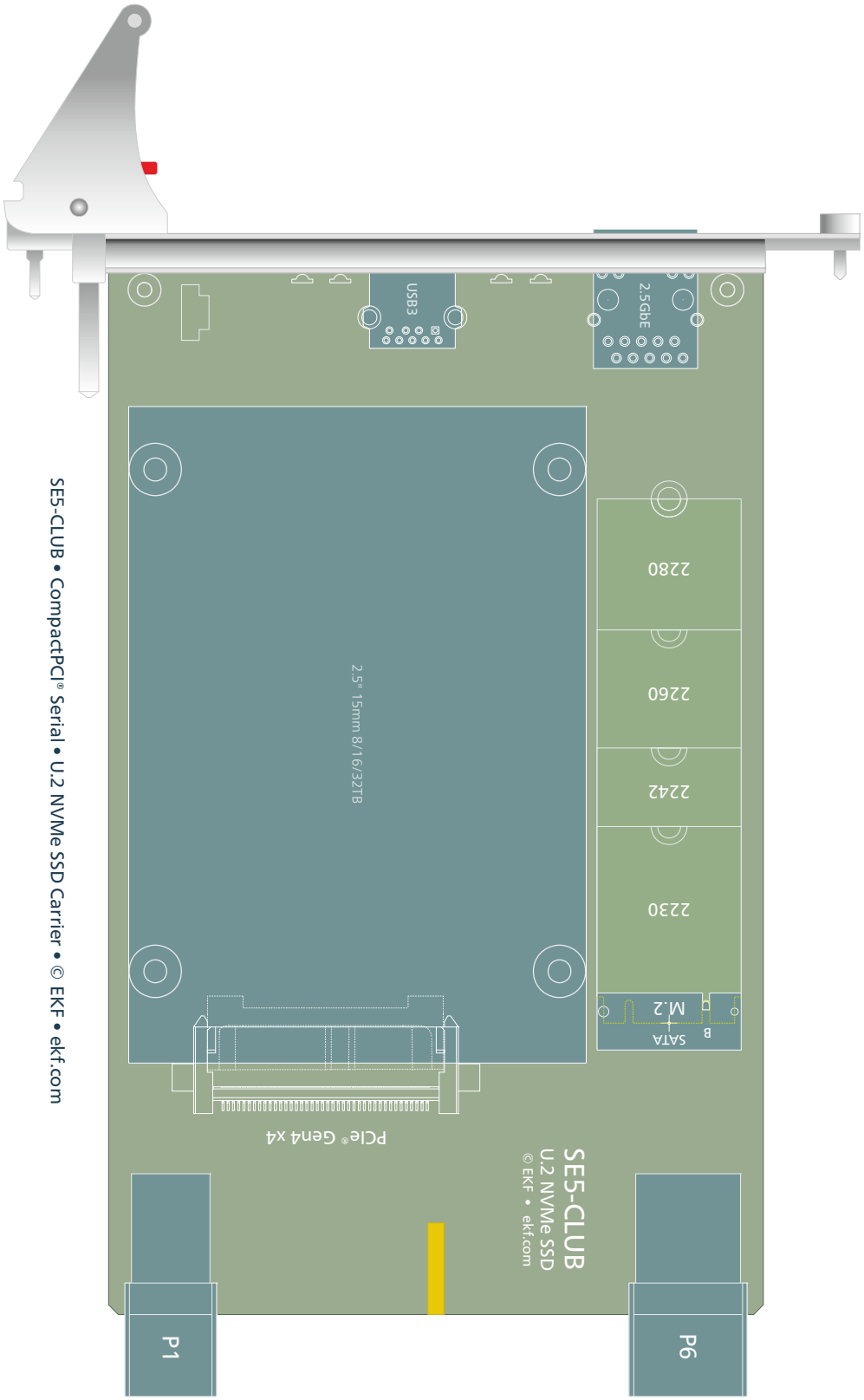
up to 2.5GBASE-T
SATA 6G
up to USB3 10G
P6
Backplane CompactPCI® Serial
Peripheral Slot
P1

Component Orientation



U.2 Connector

Pin#	Assignment	Pin#	Assignment
S1	GND	E7	REFCLK+
S2	NC	E8	REFCLK-
S3	NC	E9	GND
S4	GND	E10	PETp0
S5	NC	E11	PETn0
S6	NC	E12	GND
S7	GND	E13	PERn0
		E14	PERp0
		E15	GND
		E16	NC
		S8	GND
		S9	NC
		S10	NC
E1	NC	S11	GND
E2	NC	S12	NC
E3	3.3VAUX	S13	NC
E4	NC	S14	GND
E5	PERST#	S15	NC
E6	NC	S16	GND
		S17	PETp1
		S18	PETn1
		S19	GND
		S20	PERn1
		S21	PERp1
		S22	GND

Pin#	Assignment	Pin#	Assignment
P1	WAKE#	S23	PETp2
P2	NC	S24	PETn2
P3	NC	S25	GND
P4	IFDET#	S26	PERn2
P5	GND	S27	PERp2
P6	GND	S28	GND
P7	NC	E17	PETp3
P8	NC	E18	PETn3
P9	NC	E19	GND
P10	PRSNT#	E20	PERn3
P11	ACTIVITY#	E21	PERp3
P12	GND	E22	GND
P13	12V	E23	SMCLK
P14	12V	E24	SMDAT
P15	12V	E25	NC

signal direction with respect to the system side of the interface and not the module

please refer also to 'PCI Express SFF-8639 Module Specification' by PCI-SIG

Board Hot Plug

Ordering Information
For popular SE5-CLUB SKUs please refer to www.ekf.com/liste/liste_21.html#SE5

Please note that the SE5-CLUB is a carrier board that comes without an U.2/U.3 SSD and M.2 module populated - the drive(s) are not scope of delivery unless expressly ordered. Photos shown within this document and at other places may be equipped with an U.2 drive and M.2 module just for application demonstration. If you need a turnkey solution with an U.2 NVMe® drive and M.2 SATA SSD storage module populated, please contact sales@ekf.com before ordering. In addition, population of front panel connectors (Ethernet, USB) would be optional (ordering on request).

Related Documents CompactPCI® Serial	
Basics / Overview CompactPCI® Serial	www.ekf.com/s/smart_solution.pdf
CompactPCI® Serial Home	www.ekf.com/s/serial.html

Beyond All Limits:
EKF High Performance Embedded

50 Years
1972 - 2022
boards. systems. solutions.

Industrial Computers Made in Germany

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