



AL100 • *Embedded Blue*®

Industrial Gigabit Ethernet Switch

Preliminary - Prototype Series Photos



Technical Features

General

- ▶ 1000BASE-T Ethernet Switch box, for DIN rail mount or wall mount
- ▶ Intended for industrial use
- ▶ Self-managed operation
- ▶ Scalable 5 to 15 ports (stacked construction)
- ▶ Dimensions: ~30/60/90mm (W) x 132mm (H) x 60mm (D) w/o DIN rail brackets
- ▶ Metal case
- ▶ M12 X-coded Gigabit Ethernet connectors, 4 to 12 ports
- ▶ RJ45 Gigabit Ethernet connectors 1 to 3 ports
- ▶ M12-A front power connector
- ▶ Terminal block power connector (option)
- ▶ Option desktop power adapter connector
- ▶ Wide DC power input operation 9-57V

Front Panel I/O

- ▶ M12-X front panel GbE receptacles, rail approved connector system, Cat6A, IEC 61076-2-109
- ▶ 1000BASE-T, 100BASE-TX, 10BASE-T compliant data transfer rate front ports
- ▶ Future proof investment into cabling infrastructure - up to 10Gbps with M12-X Cat6A
- ▶ M12 X-coded to RJ45 connector Cat6A cable assemblies available from several suppliers
- ▶ Additional RJ45 connector(s), for general usage
- ▶ M12-A 5-position male connector for DC power input

Power Requirements

- ▶ DC Input, 9 - 57V (12VDC, 24VDC, 48VDC)
- ▶ Power consumption 3W/6W/9W max. (5 - 10 - 15 ports)
- ▶ Fast acting chip fuse (PCB soldered type - no replacement on-site)
- ▶ Protected against reverse polarity
- ▶ TVS ESD protection
- ▶ Common mode input filter
- ▶ M12-A 5-position male connector for DC power input
- ▶ Pigtail cable assemblies available M12-A 5-pos. female plug
- ▶ Option 4-position terminal block power connector, 3.50mm pitch, screw lock removable cable plug
- ▶ Option rear power connector (desktop supply 4-pos. circular connector)

Technical Features

Gigabit Ethernet Switch(es)

- ▶ Marvell® 88E6390 (Peridot) based Gigabit Ethernet switch(es)
- ▶ 1 to 3 switches for 5 - 10 - 15 front ports
- ▶ Switches connected via 2.5Gbps SERDES (mezzanine stacking connectors)
- ▶ IMP - integrated management processor
- ▶ In use 5 (10 - 15) x front port GbE MAC/PHY 1000BASE-T
- ▶ 1 (2 - 3) x RJ45 connector(s) w. integrated magnetics
- ▶ 4 (8 - 12) x M12 X-coded connectors (isolated by magmods)
- ▶ High performance, non-blocking, Gigabit Ethernet
- ▶ Support for up to 16K MAC addresses, 10KByte Jumbo Frames
- ▶ Supports 802.1 Audio Video Bridging (AVB) Gen 2*
- ▶ Time Sensitive Networking (TSN) Standards*, IEEE 1588v2 one-step PTP
- ▶ Synchronous Ethernet*
- ▶ Quality of Service (QoS) support with 8 traffic classes
- ▶ Supports 4096 802.1Q VLANs, three levels of 802.1Q security
- ▶ Unmanaged solution (managed solution with additional mezzanine CPU card)
- ▶ Up to two internal mezzanine stacking connectors for communication to adjacent internal switch (10 - 15 port solutions)
- ▶ Internal switch communication via SERDES 2.5Gbps ports
- ▶ Two and three internal switch versions (10 - 15 ports) are virtually combined into a single switch with aggregated performance
- ▶ Internal communication via SERDES 2.5Gbps port and MDIO to stacked management processor (required for AVB/TSN*)

Applications

- ▶ Industrial networks - IIoT - TSN/AVB*
- ▶ Rugged environments
- ▶ Transportation vehicles
- ▶ Construction and harvesting machinery
- ▶ Railway
- ▶ Customized design on request

Technical Features

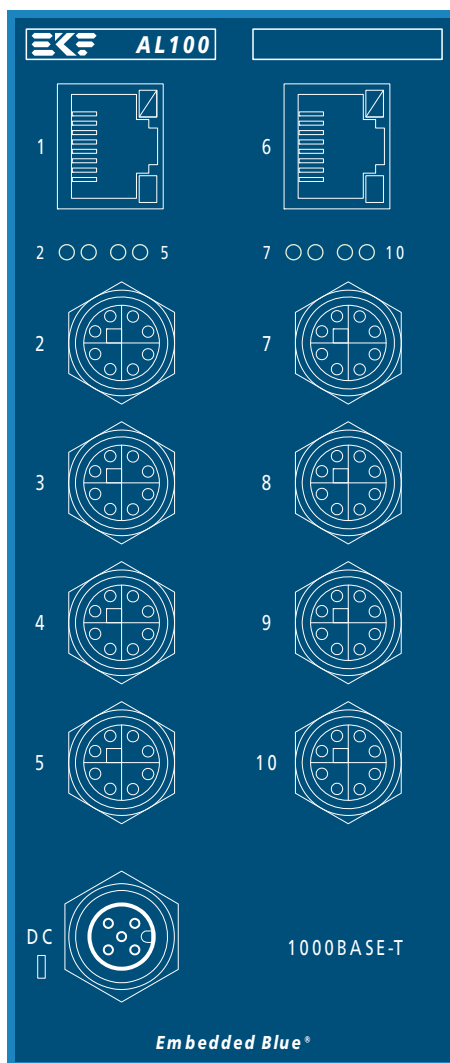
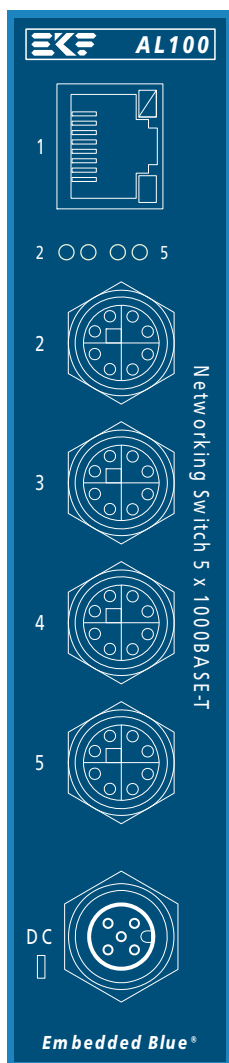
Environmental, Regulatory

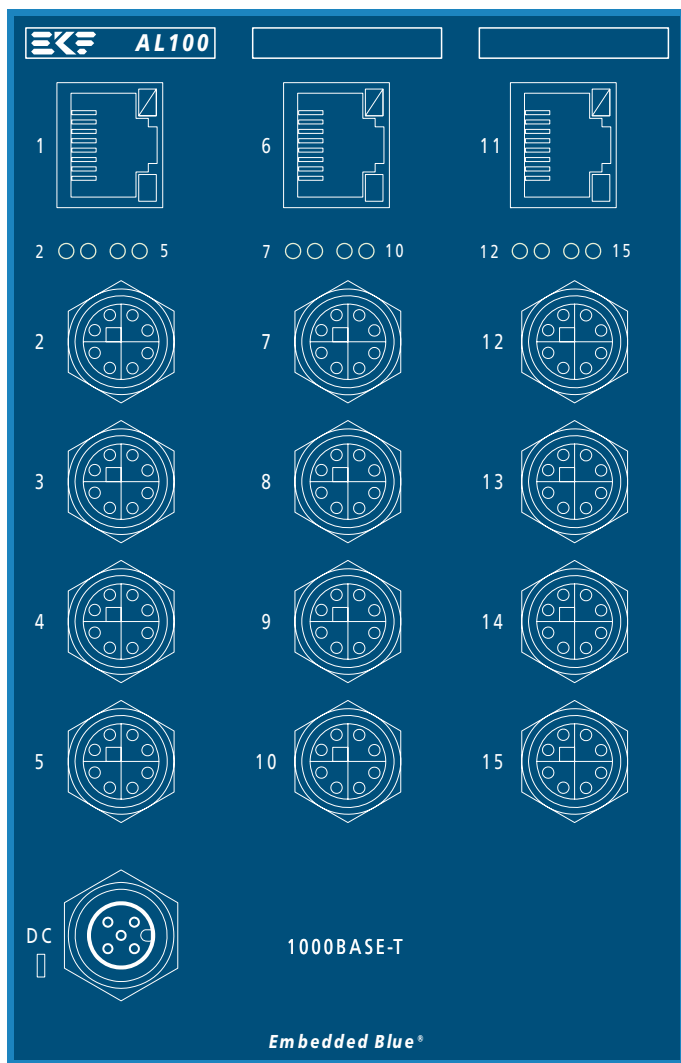
- ▶ Designed & manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ Long term availability
- ▶ Rugged solution
- ▶ RoHS compliant
- ▶ Operating temperature -40°C to +85°C (industrial temperature range)
- ▶ Storage temperature -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)
- ▶ MTBF 216.8 years (5-port switch)

* AVB/TSN protocols with additional mezzanine CPU card support

all items may be subject to technical changes w/o further notice

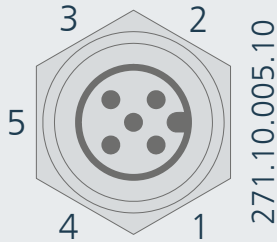
Front Panel





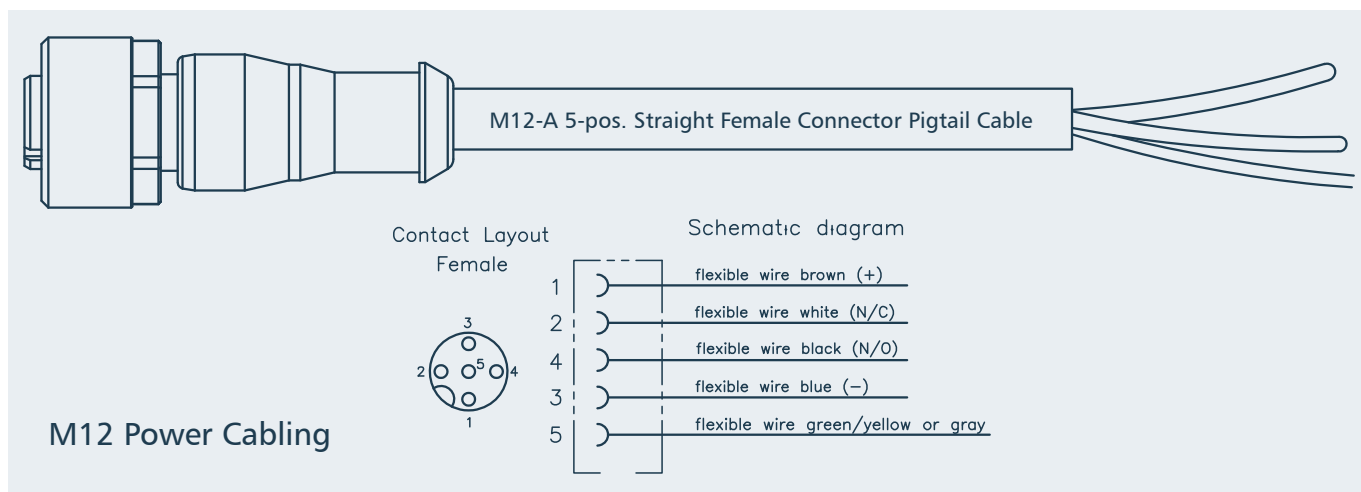


M12 Power Connector Pin Assignment

PCB Connector M12-A 5-Position Male 4A/Pin	
	V=9-57VDC
	1 +V
	2 RSV
	3 GND
	4 RSV
5 FE (Shield)	

FE (Functional Earth) is a connection to the metal case. Attachment e.g. to PE of a cabinet is not mandatory for functionality of the switch, but can improve the overall noise immunity under harsh conditions.

Mating Pigtail Cable Assemblies 1.5m w. Female Straight Plug	
EKF	271.10.505.22.015
Phoenix Contact	1669822
Tyco (TE)	2273035-1



pre-assembled standard pigtail cables - wires #2 and #4 not in use with AL100 (reserved)

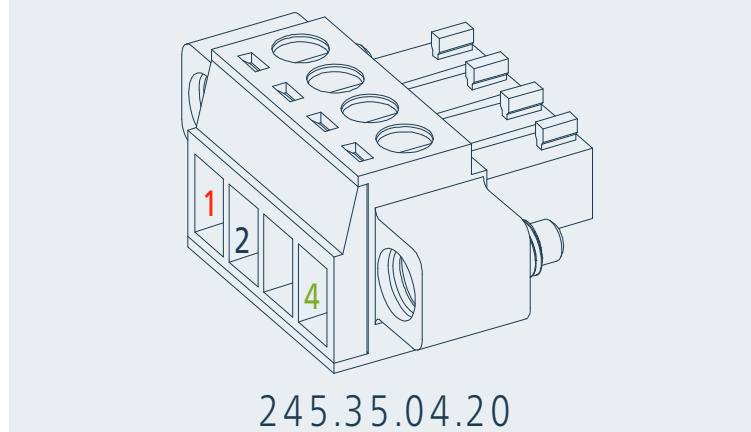
Mating DIN Rail Power Supply	
EKF	352.1.075.24.1
Meanwell	NDR-75-24, 75W 24VDC/3.2A

Option Terminal Block Power Connector Pin Assignment

3.5mm 4-Position Terminal Block 8A/Contact			
<p>245.35.04.00</p> <p>1 2 3 4</p>	<p>V=9-57VDC</p> <p>pin assignment valid from PCB Rev. 2 off</p>	1	+V
		2	GND
		3	RSV (GND PCB Rev. 1)
		4	FE (Shield)

Mating Plugs w. Screw Lock	
EKF	245.35.04.20
FCI Amphenol	20020000-C041B01LF
Molex	39504-0004
Phoenix Contact	1847071
Tyco	284510-4

Option Terminal Block Plug Power Cabling

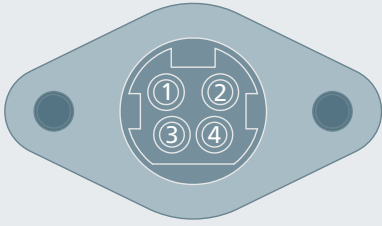


pin assignment valid from PCB Rev. 2 off

Warning:

Do not apply over-voltage e.g. 115/230V AC to any of the power connectors, since this will cause a PCB soldered chip fuse to break, which cannot be replaced on-site.

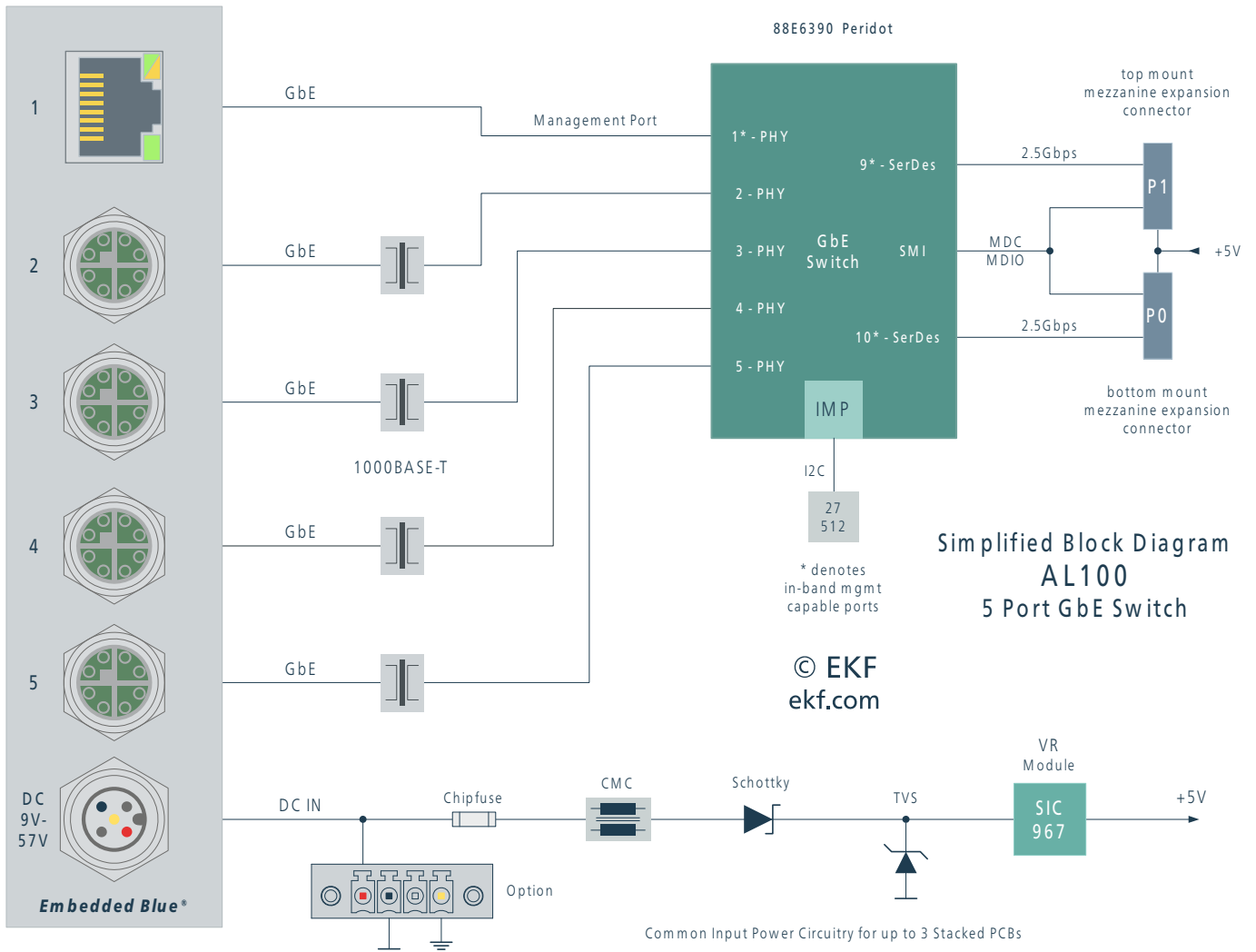
Option Rear Power Connector

Circular 4-Position Power Receptacle (7.5A/Pin)			
 <p>271.04.004.10</p>	<p>V=9-57VDC</p>	1	+V
		2	+V
		3	-V (GND)
		4	-V (GND)
		Shield	Reserved *

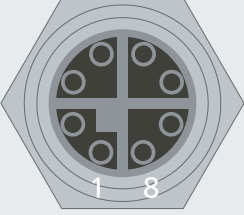
* power supply cable harness may connect GND to Shield

Mating Desktop Power Adapter w. Cable Assy	
EKF	353.1.120.24.1
FSP Technology	FSP120-AAAN3, 120W 24VDC/5A

Block Diagram



M12 X-Coded Receptacles

M12-X Receptacles • Gigabit Ethernet			
<p>271.12.008.00</p>  <p>F/P LEDs tbd</p> <p>© EKF • ekf.com Draft - Do Not Scale</p>	<p>Ports 2-5 7-10 12-15</p>	1	MDX0+
		2	MDX0-
		3	MDX1+
		4	MDX1-
		5	MDX3+
		6	MDX3-
		7	MDX2-
		8	MDX2+

The pin numbers of an M12 X-coded connector do not reflect the RJ45 Gigabit Ethernet signal assignment. For cross-over patch cables M12 to RJ45 please refer to the table below.

M12-X	Signal Colors T568B	RJ45
1	MDX0+ white/orange	1
2	MDX0- orange	2
3	MDX1+ white/green	3
4	MDX1- green	6
5	MDX3+ white/brown	7
6	MDX3- brown	8
7	MDX2- white/blue	5
8	MDX2+ blue	4

Mating Cable Assemblies

Gigabit Ethernet cable M12 to M12: #271.14.008.xx (xx=length/meter)
 Gigabit Ethernet cable M12 to RJ-45: #271.15.008.xx (xx=length/meter)



M12 to M12 Cable
Phoenix Contact



M12 Cable Connector
Phoenix Contact



M12 to RJ45 Cable
Phoenix Contact



M12 Gigabit Ethernet Cable Assembly



DIN Rail Mounting Options



Wall Mount Plate Options

Ordering Information

For popular AL100 SKUs please contact sales@ekf.de

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