

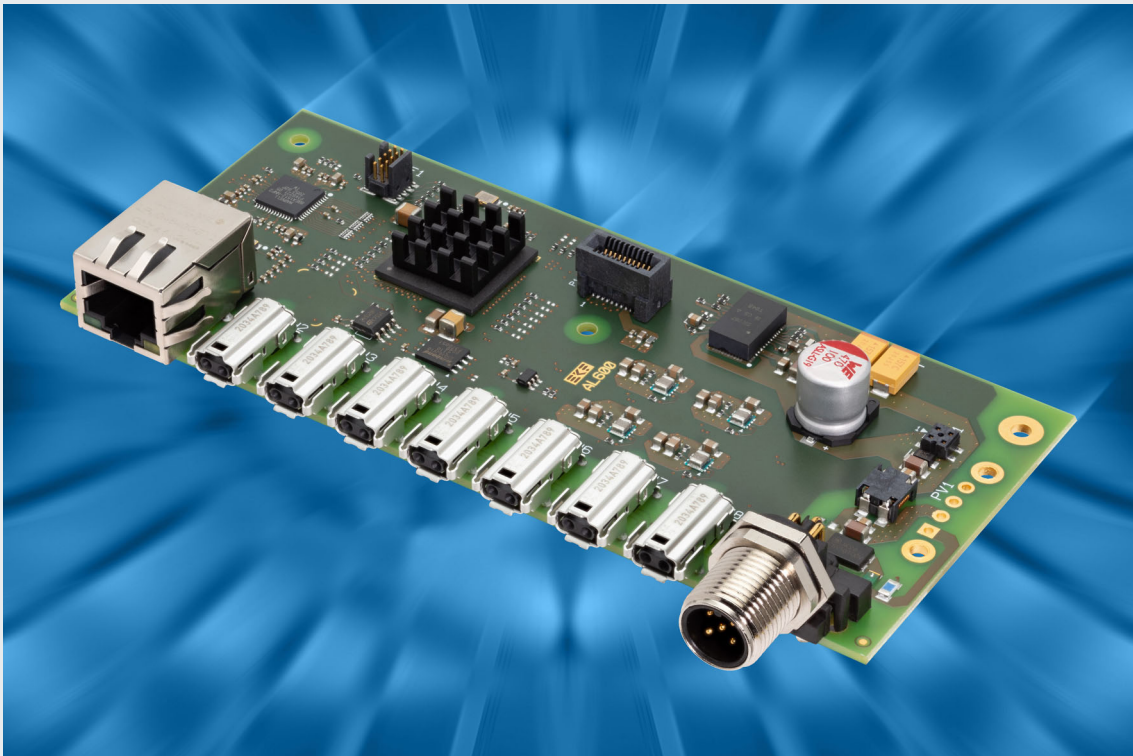


## GL600 • *Embedded Gold*

### Single Pair Ethernet Switch

7 x 100BASE-T1 • 1 x 1000BASE-T

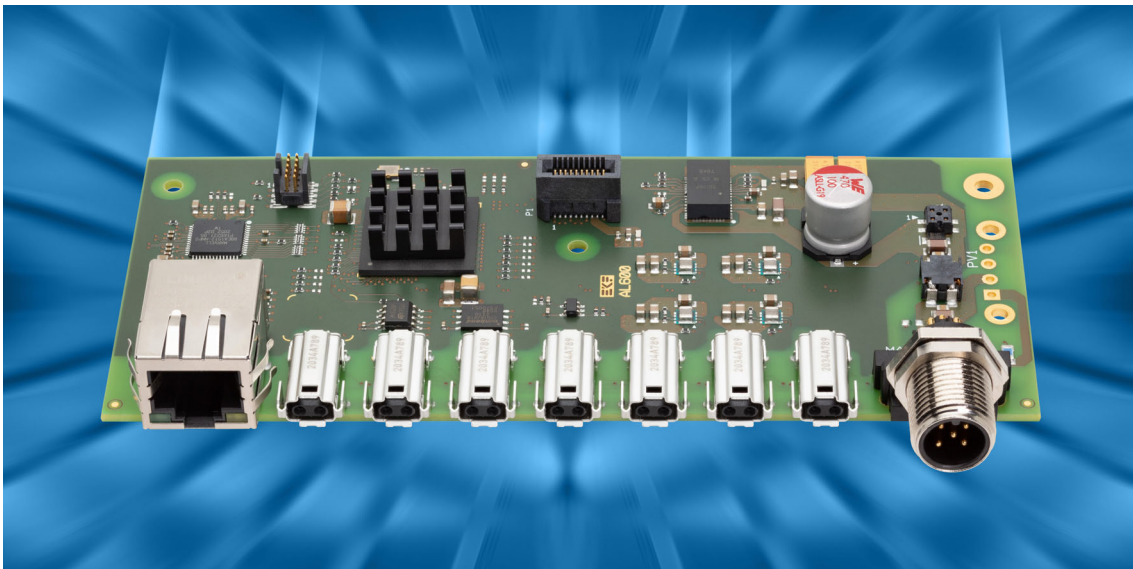
Automotive Ethernet • Industrial Ethernet • BroadR-Reach®



## Overview

*The GL600 is a Single Pair Ethernet (SPE) switch board designed for rugged industrial applications. The card is provided with seven 100BASE-T1 (IEEE 802.3bw) ports and in addition a 1000BASE-T uplink. The SPE receptacles conform to the IEC 63171-6 industrial style mating face.*

The GL600 is equipped with the Marvell® 88Q5072 Automotive Ethernet switch, and is configured by default for self-managed operation. Its SPE PHYs are fully inter-operable with the Open Alliance BroadR-Reach® (OABR) standard for automotive connectivity.



The GL600 is provided with a wide range DC/DC converter for an input voltage of 9-57VDC. Power can be applied via an M12-A connector, or screw locking terminal block.

In order to increase the port count, several boards can be stacked via 5G SerDes. For protocol support, the GL600 can be combined with the GC370 CPU.

## Technical Features

### General

- ▶ 100BASE-T1 IEEE 802.3bw Ethernet switch card
- ▶ PCB assembly, intended for rugged applications, ready-for-use (*Embedded Gold*)
- ▶ 7 x T1 industrial jacks IP20 according to IEC 63171-6
- ▶ 1 x RJ45 1000BASE-T Gigabit Ethernet connector
- ▶ Intended for industrial and automotive use
- ▶ Self-managed operation
- ▶ PCB Dimensions: 133mm (W) x 58mm (D) w/o connector overlap
- ▶ M12-A DC power connector
- ▶ Sales option terminal block power connector
- ▶ 9-57VDC Wide range power input operation
- ▶ GL600 Boards can be stacked for switch expansion
- ▶ GC370 CPU card can be stacked for protocol support

### Front I/O

- ▶ 1 x RJ45 connector 1000BASE-T, 100BASE-TX, 10BASE-T compliant
- ▶ 7 x 100BASE-T1 SPE front ports IEC 63171-6, Hi-Pot isolated by transformers
- ▶ 1 x M12-A 5-pin DC power input

### Single Pair Ethernet Switch

- ▶ Marvell® 88Q5072 11-port Automotive Ethernet switch AEC-Q100 Grade 2 qualified
  - ▶ 802.1Qat SR Aware 20Gbps switching engine
  - ▶ 2 Mbit packet memory +16 MAX addresses
  - ▶ Queue controller 8-Level QoS per port
  - ▶ 256 entry TCAM (ingress & egress)
  - ▶ 3 color ingress policy
  - ▶ Hardware support for Layer 3 static routing
  - ▶ AVB/TSN per queue shaping 802.1Qav/Qbv
  - ▶ 802.1AS & IEEE 1588/PTP
  - ▶ Advanced security features including deep packet inspection engine (DPI)
  - ▶ DoS (Denial of Service engine)
  - ▶ On-Board EEPROM up to 512kb for switch configuration
  - ▶ Integrated high-performance ARM® Cortex® M7 CPU 350MHz w. 1MB SRAM
  - ▶ 7 integrated IEEE 802.3bw 100BASE-T1 PHYs Single Pair Ethernet SPE
  - ▶ SPE PHYs configured as Master by default
  - ▶ Fully inter-operable w. Open Alliance BroadR-Reach® (OABR) PHYs
- 
- ▶ 1 x front port RJ45 connector GbE 1000BASE-T (88EA1512 RGMII PHY)
  - ▶ 7 x front port connectors 100BASE-T1 SPE IEC 63171-6 (88Q5072 integrated PHYs)
  - ▶ 2 x 5Gbps SerDes internal mezzanine connectors for custom specific hardware expansion
  - ▶ Stacking of GL600 boards via SerDes connectors (increases port count), or GC370 CPU protocol support

## Technical Features

### *Power Requirements*

- ▶ DC Input, 9-57V (12VDC, 24VDC, 48VDC)
- ▶ Absolute maximum input voltage 65VDC
- ▶ Power consumption 2.5W max.
- ▶ Fast acting chip fuse (PCB soldered type)
- ▶ Protected against reverse polarity
- ▶ ESD protection (TVS)
- ▶ Common mode input filter
- ▶ Sales option terminal block 3.5mm pitch 4-position screw lock power input

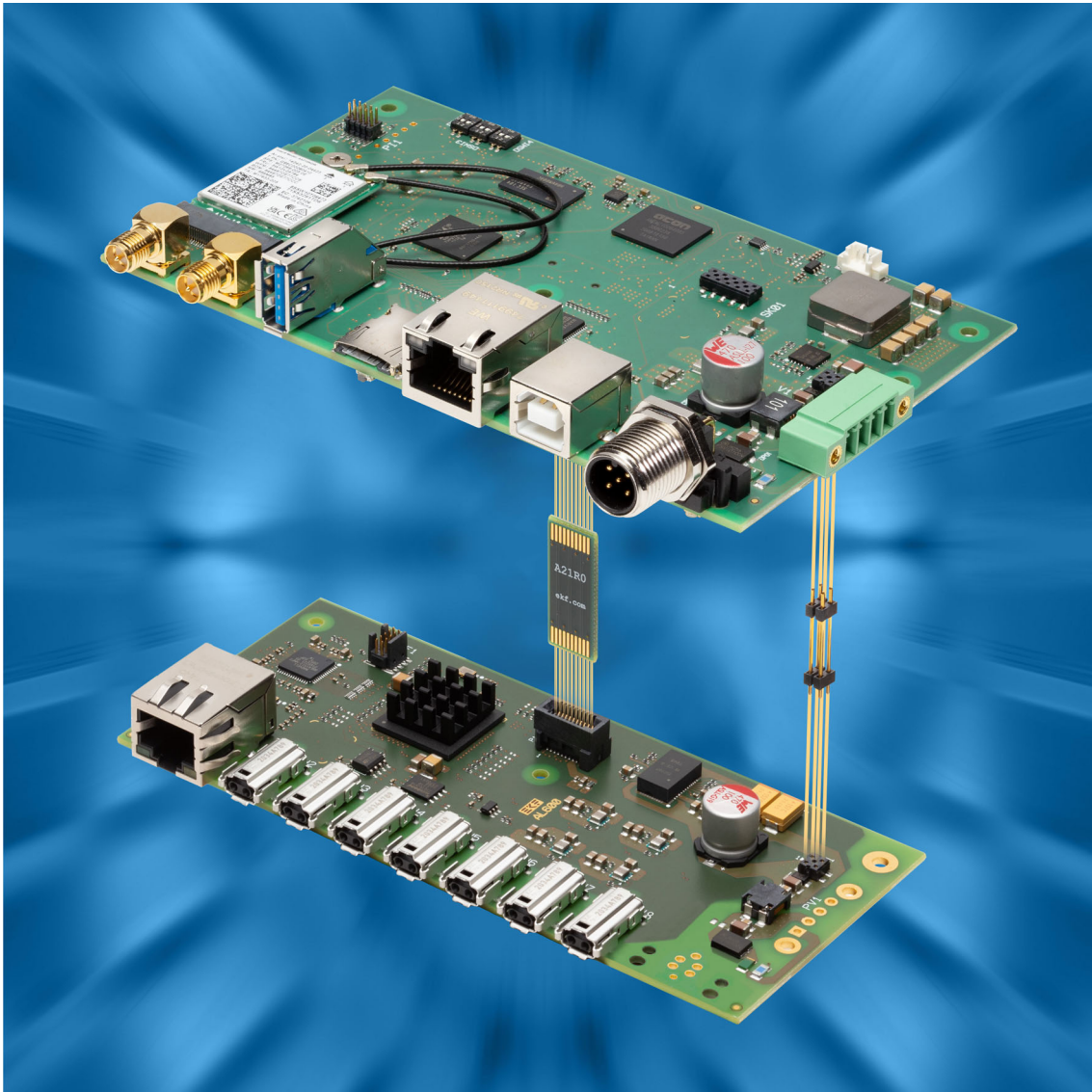
### *Applications*

- ▶ Industrial networks - IIoT
- ▶ Automotive gateway
- ▶ In-vehicle networking
- ▶ Automotive test equipment
- ▶ Rugged environments
- ▶ Edge computing
- ▶ Transportation
- ▶ Construction vehicles
- ▶ Harvester

### *Environmental, Regulatory*

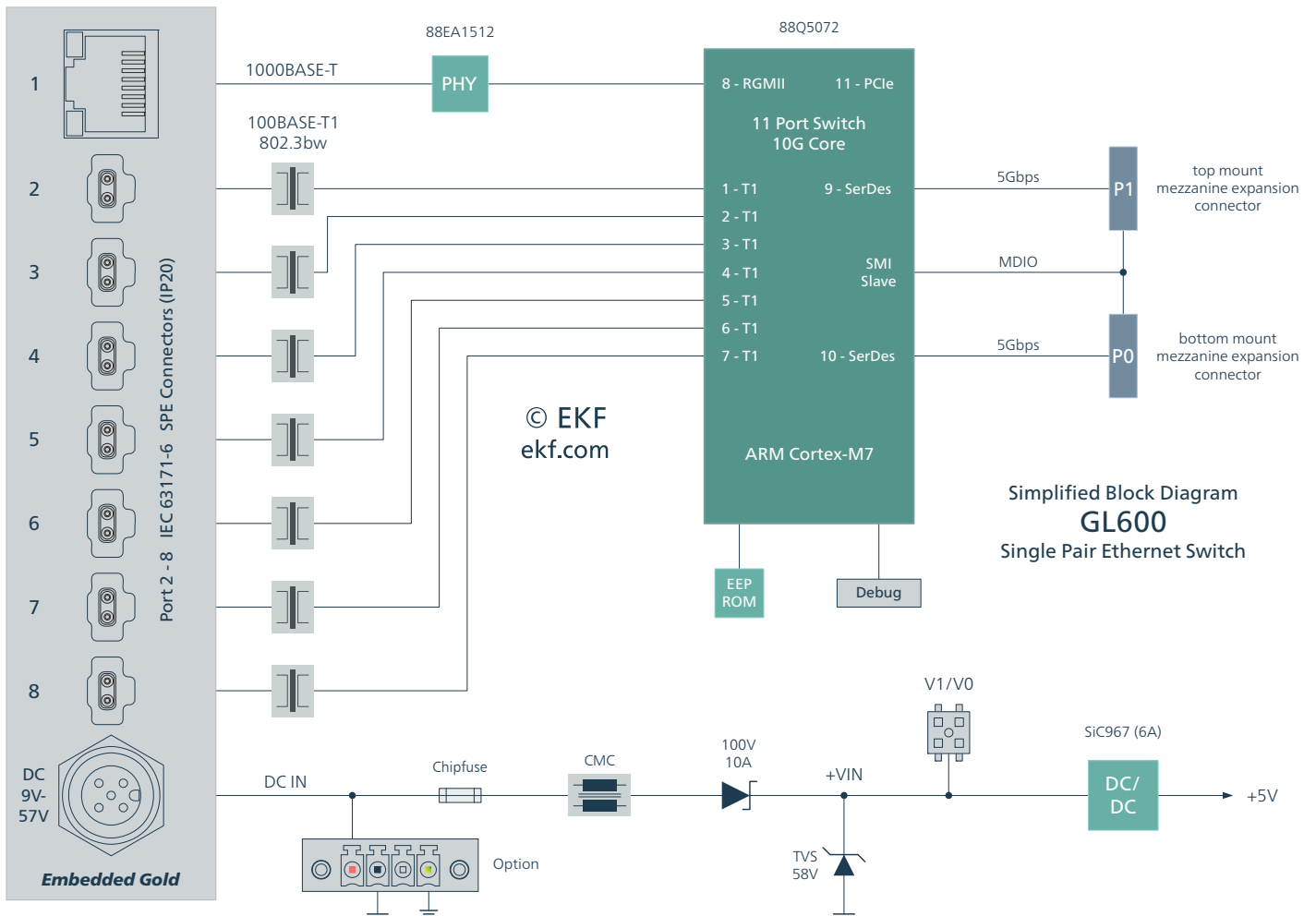
- ▶ Designed & manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ Long term availability
- ▶ Rugged solution
- ▶ RoHS compliant
- ▶ Coating, sealing, underfilling on request
- ▶ Operating temperature -40°C to +85°C (industrial temperature range)
- ▶ Storage temperature -40°C to +85°C, 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 Regulatory EN55035, EN55032, EN62368-1 (CE)
- ▶ MTBF 134.4 years

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

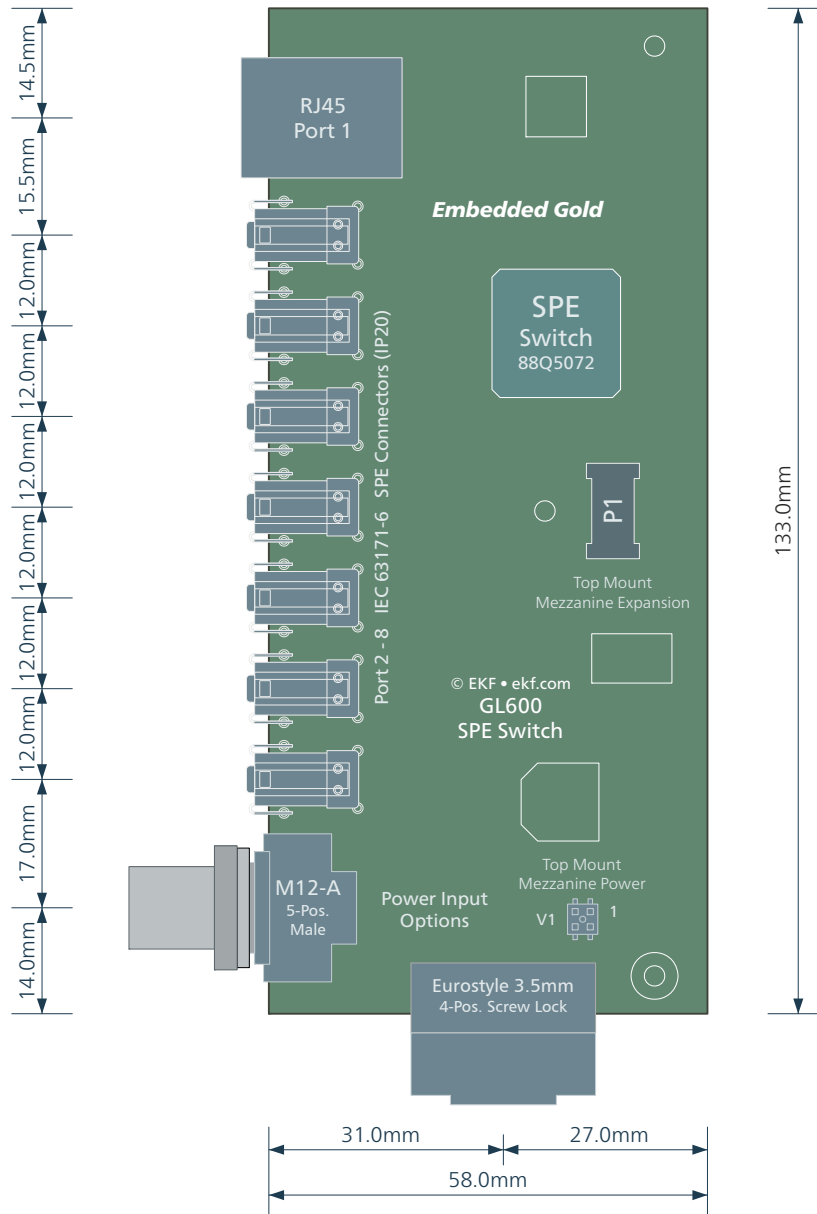


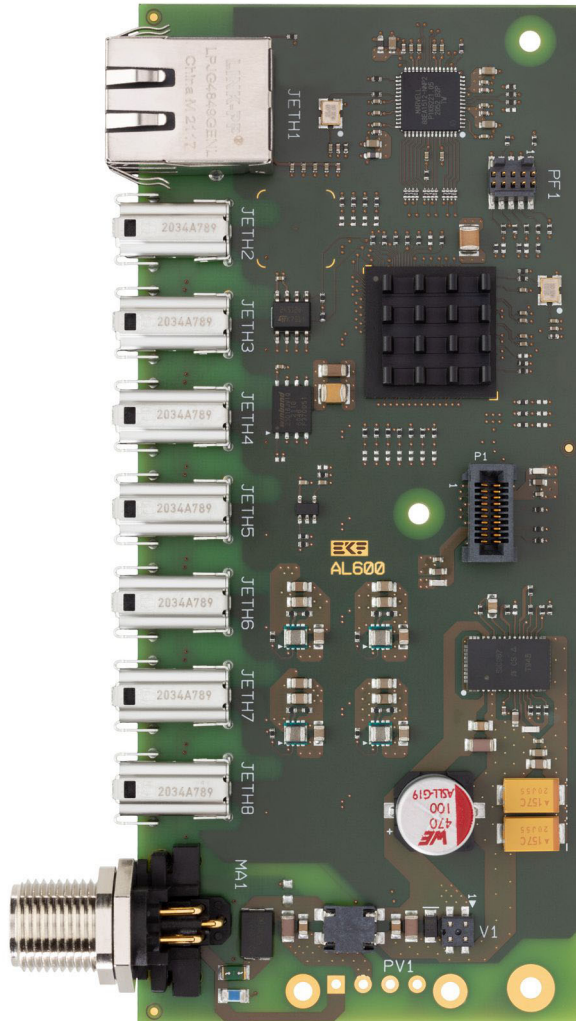
GL600 w. GC370 (CPU Card e.g. for AVB Protocol Support)

## Block Diagram

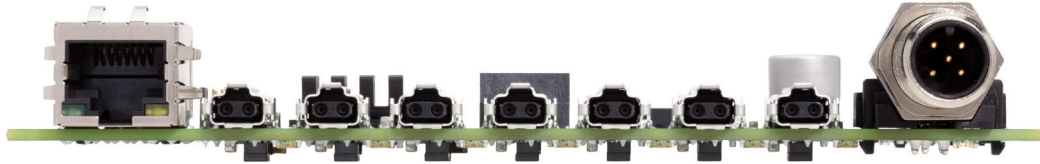


Dimensions





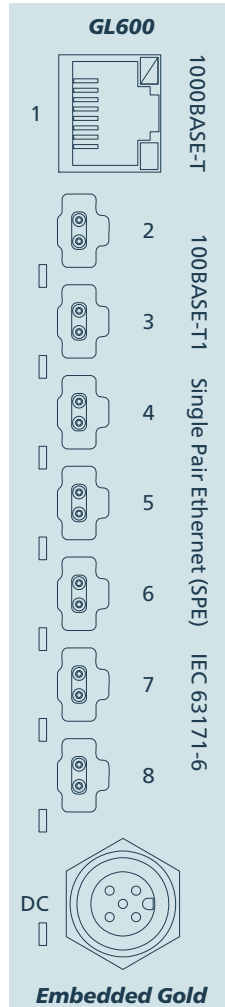


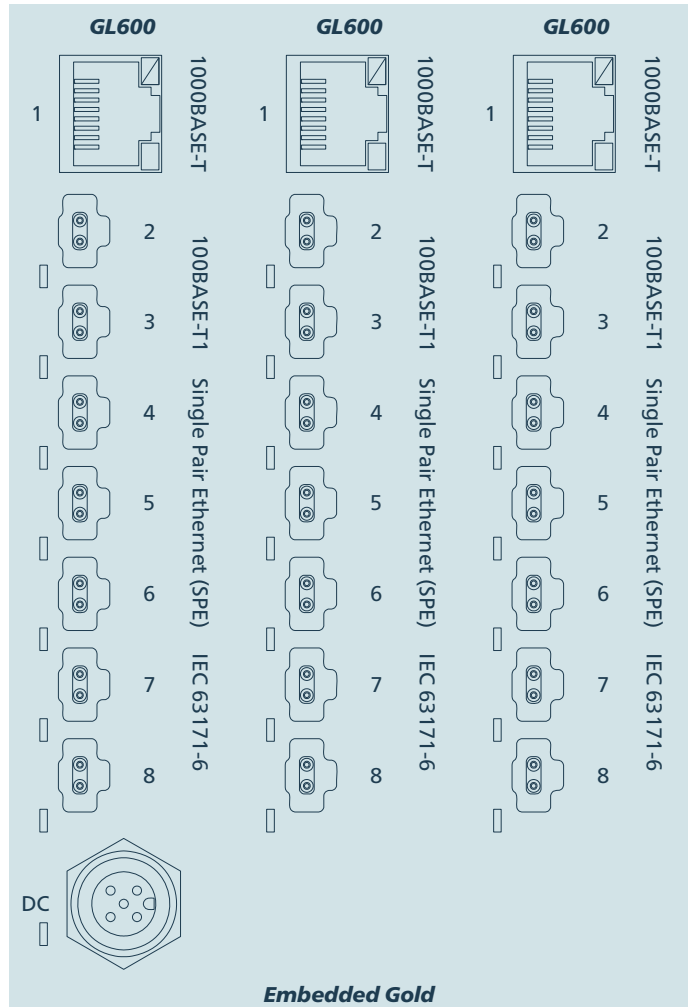
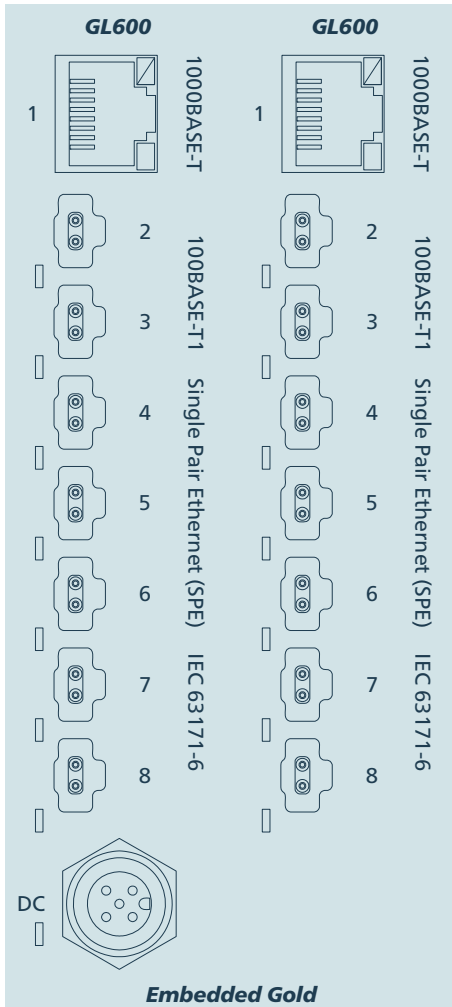


DC LED Status		
green	✓	DC input power present (9-44VDC, brightness varies w. input voltage)
blue	✓	DC input power present (44-57VDC)
red	⊗	DC input power overvoltage (>57VDC) !! absolute maximum input voltage 65VDC !!
red	⊗	DC input power reverse polarity - swap wires connected to M12-A pins 1/3
red	⊗ 1)	Internal fault (main chip fuse broken)
off	⊗	DC input power not present or very low voltage
off	⊗	DC input power not applied to M12-A connector pins 1/3

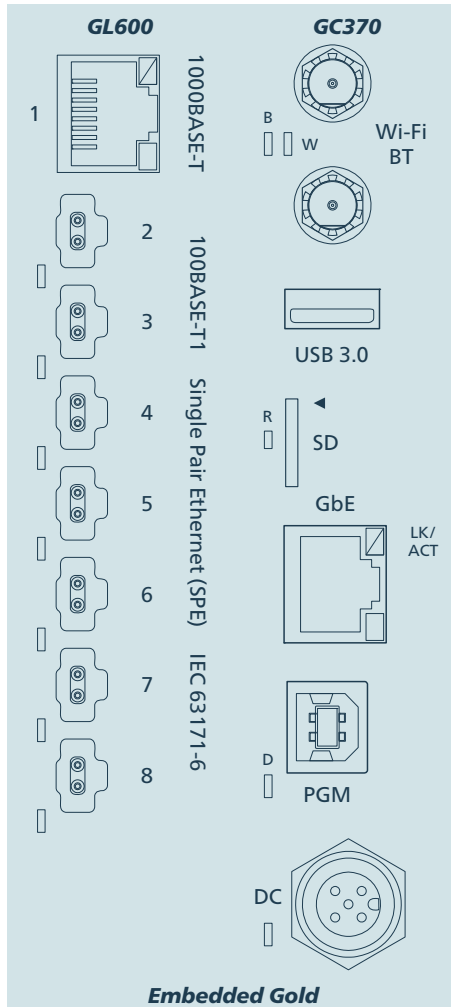
1) SMD component - no replacement on-site

## Recommended Panel Design





Stacking of Boards



### CPU Support

SPE Ethernet Connectors

IEC 63171-6 • Single Pair Ethernet Fully Shielded Latching PCB Connectors IP20 Switch Ports 2-8 100BASE-T1 IEEE 802.3bw		
	1	BI_DA+
	2	BI_DA-
	Housing	FE (Shield)

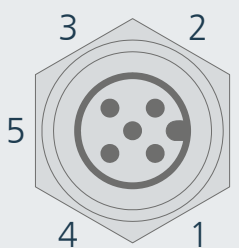
Mating Cable Assemblies IEC 63171-6 Cable Connectors at Both Ends		
EKF Part No.	279.21.030.0	3m
Harting	33 28 010 1001 030 33 28 010 1001 XXX	030 = 3m XXX = Length



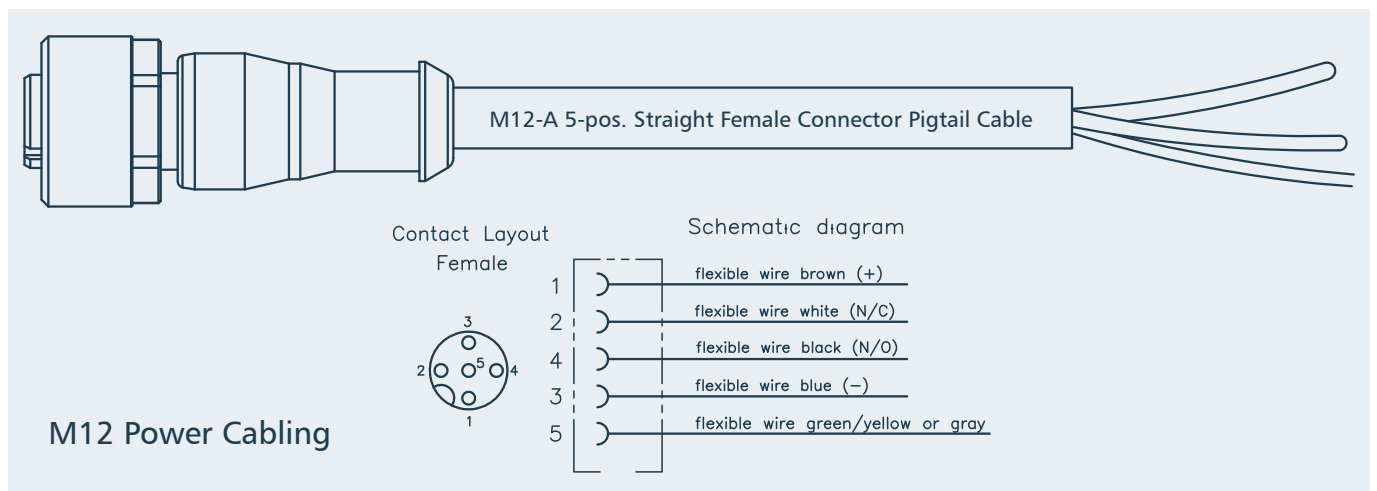
INDUSTRIAL<sup>®</sup>  
PARTNER  
NETWORK

EKF is a member of the Single Pair Ethernet Industrial Partner Network<sup>®</sup>

### M12-A Power Connector (Default Assembly)

M12-A 5-Position Male 4A/Pin		1	+V
 <p>271.10.005.10</p>	+V=9-57VDC	2	Reserved
		3	-V (GND)
		4	Reserved
		5	FE (Shield)

Mating Pigtail Cable Assemblies 1.5m w. Female Straight Plug	
EKF Part No.	271.10.505.22.015
Phoenix Contact	1669822
Tyco	2273035-1



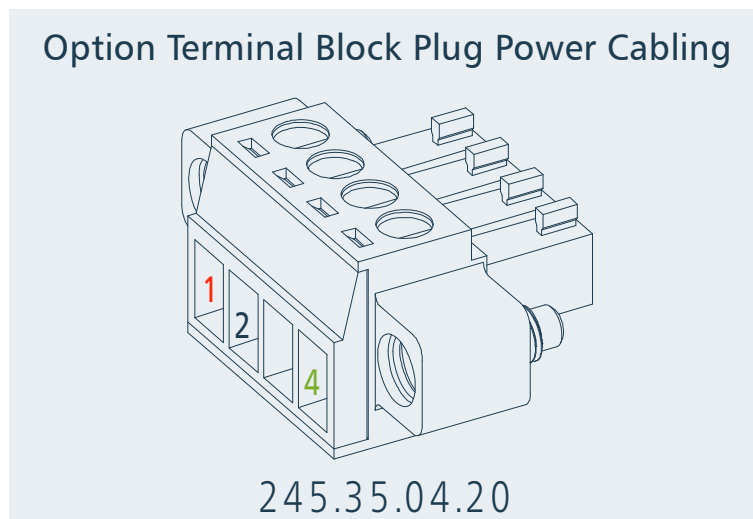
Mating DIN Rail Power Supply	
EKF	352.1.075.24.1
Meanwell	NDR-75-24, 75W 24VDC/3.2A

Placement of the M12 power connector by default

### Terminal Block Power Connector Pin Assignment (Sales Option)

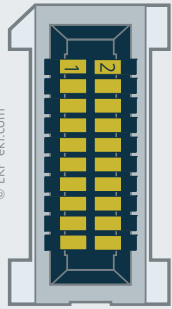
3.50mm 4-Position Terminal Block 8A/Contact			
<p>245.35.04.00</p> <p>1 2 3 4</p>	<p>+V=9-57VDC</p>	1	+V
		2	-V (GND)
		3	RSV
		4	FE (Shield)

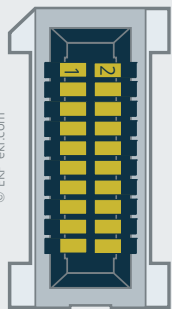
Mating Plugs w. Screw Lock	
EKF	245.35.04.20
FCI Amphenol	20020000-C041B01LF
Molex	39504-0004
Phoenix Contact	1847071
Tyco	284510-4



Placement of the terminal block is optional (consider before ordering)

## Stacking Connectors

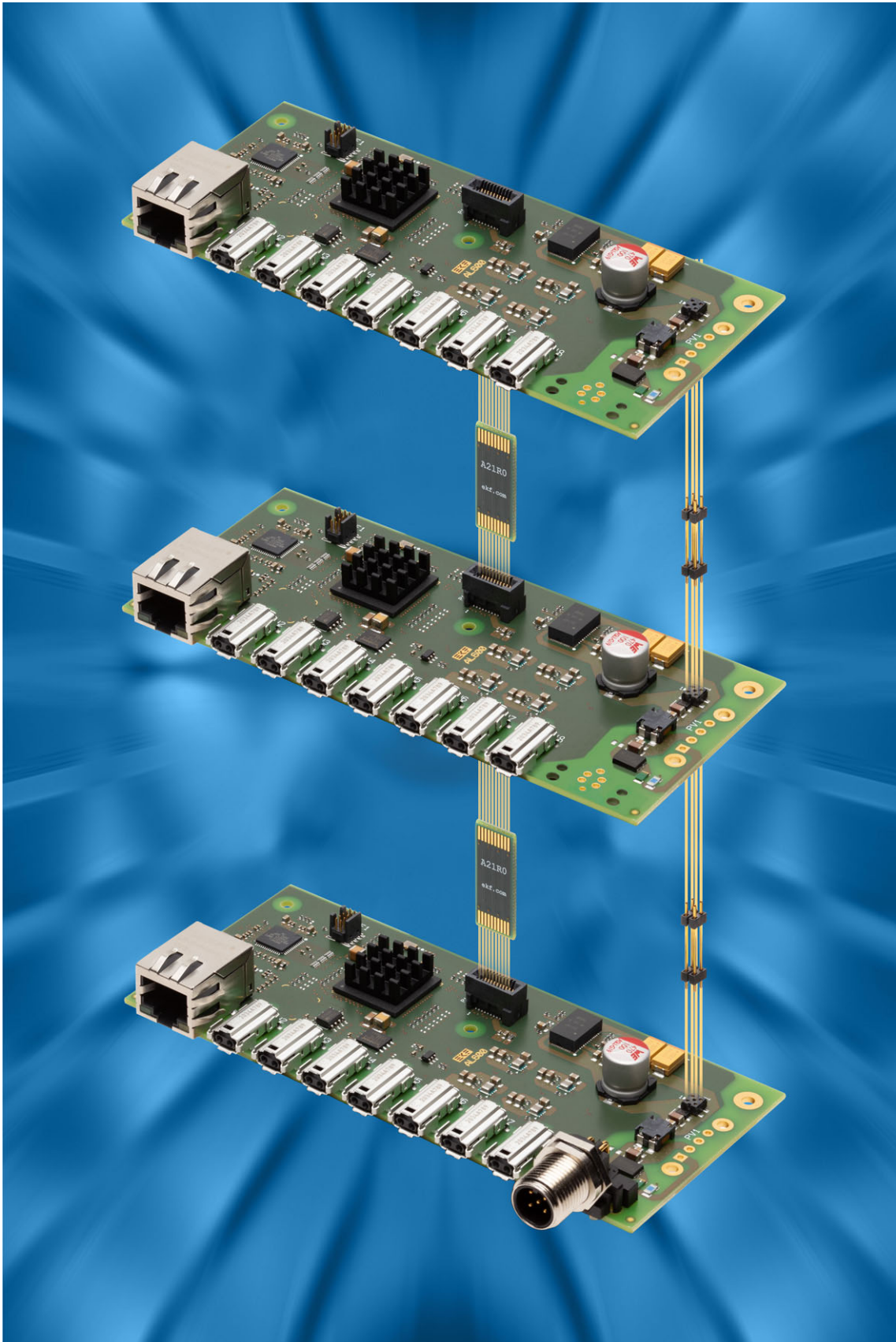
P1 (Top) 290.1.020.080				
	GND	1	2	GND
	SERDES (P9) RXN	3	4	+5V
	SERDES (P9) RXP	5	6	+5V
	GND	7	8	GND
	SERDES (P9) TXN	9	10	RSV
	SERDES (P9) TXP	11	12	RSV
	GND	13	14	GND
	+5V	15	16	MDC
	+5V	17	18	MDIO
	GND	19	20	GND

P0 (Bottom) 290.1.020.080				
	GND	1	2	GND
	SERDES (P10) TXN	3	4	+5V
	SERDES (P10) TXP	5	6	+5V
	GND	7	8	GND
	SERDES (P10) RXN	9	10	RSV
	SERDES (P10) RXP	11	12	RSV
	GND	13	14	GND
	+5V	15	16	MDC
	+5V	17	18	MDIO
	GND	19	20	GND

### Associated Mezzanine Interposer Card

A21	30mm PCB pitch
C21	20.32mm (4HP) PCB pitch





### Ordering Information

For popular GL600 SKUs please contact [sales@ekf.de](mailto:sales@ekf.de)

### Product Homepage

<https://www.ekf.com/g/gl600/gl600.html>

### Related Products

GC370	ARM® V8 Industrial Microcontroller
GJ100	PoE+ Injector M12-X
GJ200	PoE+ Injector RJ45
GL100	5 to 15 Port unmanaged GbE switch M12-X
GL200	8 Port unmanaged GbE switch RJ45
GL220	8 Port unmanaged PoE+ GbE switch RJ45
GL700	5 Port 100BASE-T1 SPE switch M8 Hybrid
GL900	9 Port PoE+ GbE switch RJ45 w. CPU for AVB protocol support

# ***Embedded Gold***

Ready-for-Use Industrial PCB Assemblies



Document No. 9995 • © EKF • 30 June 2023

EKF Elektronik GmbH  
Philipp-Reis-Str. 4 (Haus 1)  
Lilienthalstr. 2 (Haus 2)  
59065 HAMM  
Germany



Phone +49 (0)2381/6890-0  
Fax +49 (0)2381/6890-90  
Internet [www.ekf.com](http://www.ekf.com)  
E-Mail [sales@ekf.com](mailto:sales@ekf.com)