



**7L600**

***ModBlox7® Open Modular Computing***

Single Pair Ethernet Switch

7 x 100BASE-T1 • 2 x 1000BASE-T

Automotive Ethernet • Industrial Ethernet • BroadR-Reach®

Preliminary Edition

## Overview

*The 7L600 ModBlox7® module is a Single Pair Ethernet (SPE) switch designed for rugged industrial applications. The assembly is provided with seven 100BASE-T1 (IEEE 802.3bw) ports and in addition two 1000BASE-T RJ45 jacks. The SPE connectors conform to the IEC 63171-6 industrial style IP20 mating face.*

*The 7L600 was designed according to the new PICMG® ModBlox7® standard for open modular computing. This innovative concept does not require a backplane, and allows either DIN rail or wall mounting, and 19-inch sub-rack box mounting as well.*

The 7L600 is equipped with the Marvell® 88Q5072 Automotive Ethernet switch and is configured by default for self-managed operation. Its PHYs are fully inter-operable with the Open Alliance BroadR-Reach® (OABR) standard for automotive connectivity. Via the RJ45 jacks, 7L600 modules can be easily cascaded and connected to the enterprise network.

As an option, the switch module is available with an ARM based mezzanine controller card, suitable e.g. for additional protocol support and switch management, and even custom specific additions.

## Technical Features

### General

- ▶ PICMG® ModBlox7® I/O module 14HP (71mm width)
- ▶ Typical use in ModBlox7® systems for DIN rail or wall mount
- ▶ Option stand-alone box
- ▶ 100BASE-T1 IEEE 802.3bw Single Pair Ethernet switch module
- ▶ 7 x T1 latching receptacles IP20 according to IEC 63171-6 (2-way data)
- ▶ 2 x RJ45 1000BASE-T Gigabit Ethernet receptacles
- ▶ Intended for industrial and automotive use
- ▶ Self-managed operation
- ▶ Option ARM controller support
- ▶ 12VDC ModBlox7® system power

### Front Panel I/O

- ▶ 2 x RJ45 connector 1000BASE-T, 100BASE-TX, 10BASE-T compliant
- ▶ RJ45 recommended for uplink or cascading
- ▶ 7 x 100BASE-T1 SPE front ports IEC 63171-6, Hi-Pot isolated by transformers
- ▶ SPE ports configurable for M/S operation by switches (default M)
- ▶ 1 x Type-C optional (USB 2.0 device, programming port to the optional ARM CPU)

### 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
- 
- ▶ 2 x front port RJ45 connector GbE 1000BASE-T (88EA1512 PHY)
  - ▶ 7 x front port connectors 100BASE-T1 SPE IEC 63171-6 (88Q5072 integrated PHYs)
  - ▶ 1 x SERDES port wired to an on-board Intel® I210-IS 1GbE NIC (connects to a ModBlox7® PCIe® lane, for ModBlox7® system CPU control)
  - ▶ 1 x SERDES port available for an optional internal ARM controller mezzanine card

## Technical Features

*Power Requirements*

- ▶ DC Input 12V via ModBlox7® board-to-board connector J2
- ▶ Power consumption 3.5W max. (w/o ARM controller option)
- ▶ Option 3.5mm pitch inverted header power input (Phoenix Contact 1830566) for stand-alone use

*Applications*

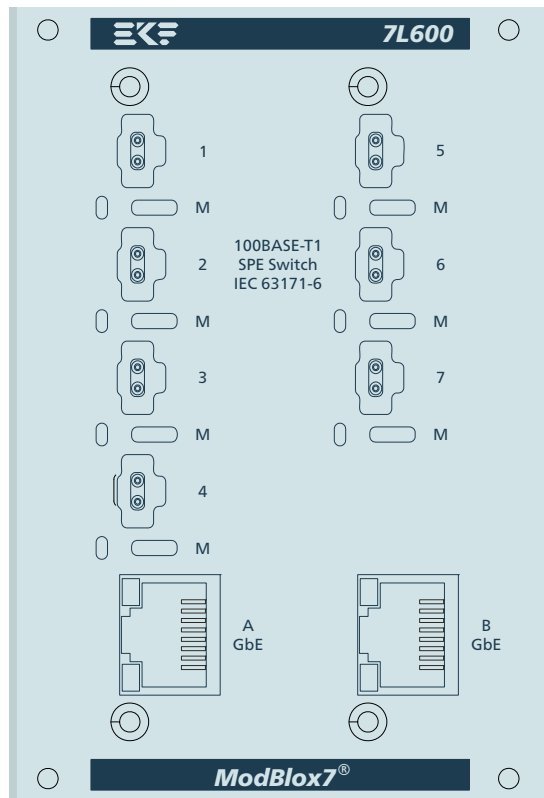
- ▶ Industrial networks - IIoT
- ▶ Automotive gateway
- ▶ In-vehicle networking
- ▶ Automotive test equipment
- ▶ Rugged environments
- ▶ Edge computing
- ▶ Transportation
- ▶ Construction vehicles
- ▶ Harvester

*Environmental, Regulatory*

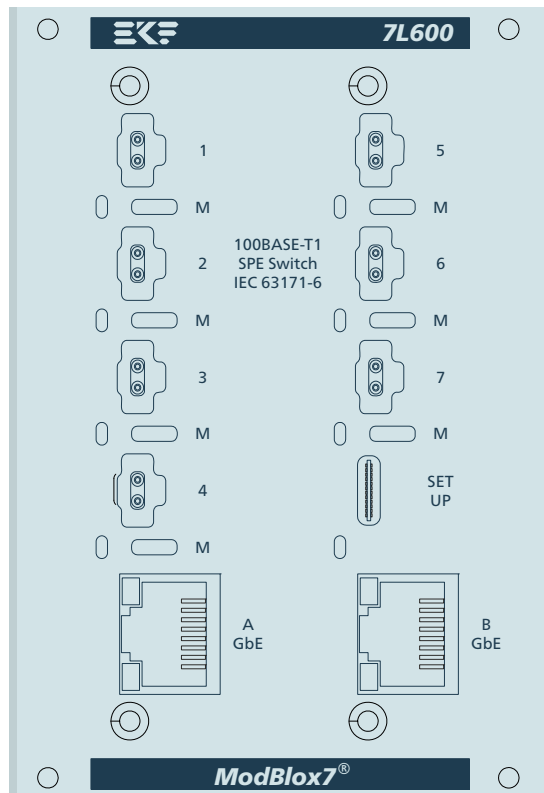
- ▶ Designed & manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ Long term availability
- ▶ Rugged solution
- ▶ RoHS compliant
- ▶ Operating temperature -40°C to +85°C (industrial temperature range)
- ▶ Storage temperature -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 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 tbd years (MIL-HDBK-217F, SN29500 @+40°C)

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

Front View



w/o SLC-ARMADA Controller



with SLC-ARMADA Controller

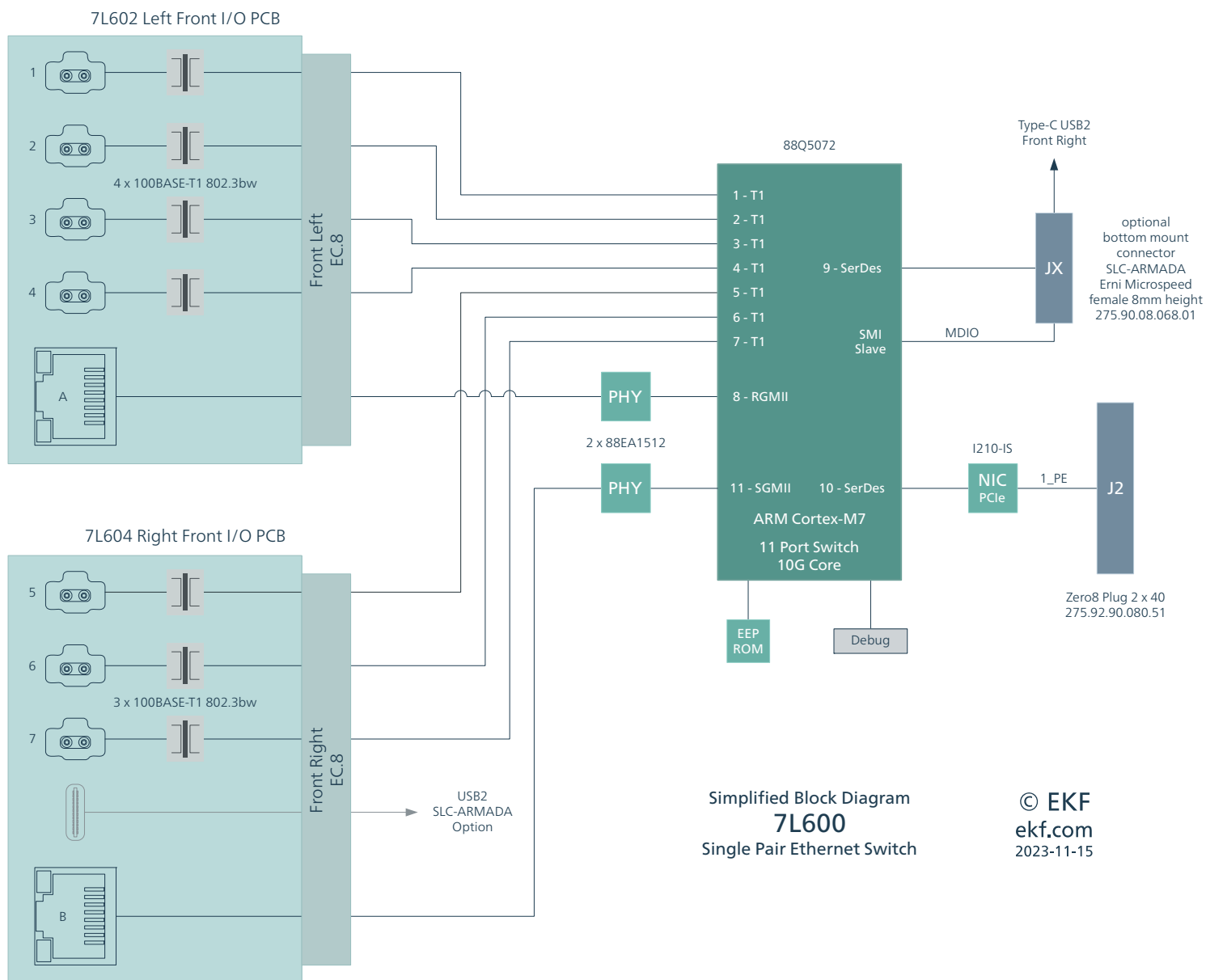
SPE Ethernet Connectors

IEC 63171-6 • Single Pair Ethernet Fully Shielded Latching PCB Connectors IP20 Switch Ports 1-7 100BASE-T1 IEEE 802.3bw		
<p>279.20.02.00</p>  <p>IEC 63171-6</p>	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



## Block Diagram



All 7L600 SPE Ethernet ports are typically configured as 'M'. They can be reconfigured to 'S' by individual switches integrated into the front panel. Changes however require a power up sequence in order to be effective.

For daisy-chaining of 7L600 modules via Single-Pair-Ethernet, the corresponding port of a downstream 7L600 module must be configured as 'S'. Since the SPE ports are only 100Mbps capable, consider upstream and downstream connections of any 7L600 module by their 1000Mbps RJ45 ports as a superior alternate.

## 88Q5072 Port Assignment

Front Connector Numbering vs. Switch Port Numbers				
F/P Connector	Ethernet	Ethernet Switch Internal Port	Type	PHY
1 - IEC63171-6	100BASE-T1	1	SPE	88Q5072
2 - IEC63171-6	100BASE-T1	2	SPE	88Q5072
3 - IEC63171-6	100BASE-T1	3	SPE	88Q5072
4 - IEC63171-6	100BASE-T1	4	SPE	88Q5072
5 - IEC63171-6	100BASE-T1	5	SPE	88Q5072
6 - IEC63171-6	100BASE-T1	6	SPE	88Q5072
7 - IEC63171-6	100BASE-T1	7	SPE	88Q5072
A - RJ45	1000BASE-T	8	RGMII	88EA1512
B - RJ45	1000BASE-T	11	SGMII	88EA1512
internal 1)	SerDes & SMI	9	to SLC-ARMADA mezzanine connector	
internal 2)	SerDes	10	on-board Intel® i210-IS 1GbE NIC	

- 1) Option Marvell® 3720 Armada SoC for future management and protocol support
- 2) Wired to ModBlox7® system CPU by internal PCIe® lane (ModBlox7® bus connector J2)



Ordering Information

For popular 7L600 SKUs please contact [sales@ekf.de](mailto:sales@ekf.de)



INDUSTRIAL<sup>®</sup>  
PARTNER  
NETWORK

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

# ***ModBlox7***®



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