



AC370 • *Embedded Blue*[®]

DIN Rail ARM[®] v8 Microcomputer • Marvell[®] Armada[®] 3700 Family SoC

Preliminary

Overview

The AC370 is a DIN Rail boxed microcomputer for general industrial applications, equipped with a low power Marvell® ARMADA® 3700 SoC (ARM® v8 Cortex-A53).

Networking is provided through wireless (WiFi 6, Bluetooth), and by cable (RJ45 GbE).

External devices can be attached to the USB3 receptacle. As an option, an isolated UART interface is available, either RS-232 or RS-485.

The AC370 has a wide-range 9-57VDC power input, via either an M12-A style or terminal block power connector (option).

Customer programming is hardware supported by means of the USB Type-B receptacle and the MicroSD card slot. Typical applications of the AC370 are router, gateway, data conversion, device controller, fog computing.

The AC370 has an internal mezzanine interface (SerDes 2.5GbE, MDIO) which can be used for mounting an Ethernet switch PCB. This allows switch management and/or protocol stacks e.g AVB/TSN, by the ARMADA® CPU.

Technical Features

General

- ▶ Microcomputer box, for DIN rail mount or wall mount
- ▶ Marvell® ARMADA® 3700 SoC family
- ▶ 88F3710 single-core
- ▶ 88F3720 dual-core
- ▶ Low power consumption under different workloads
- ▶ Optimal performance-per-Watt in the embedded markets
- ▶ Box dimensions 30mm (W) x 140mm (H) x 90mm (D) w/o DIN rail brackets
- ▶ Option 45mm (W) as assembly with eight port GbE switch (AL210, AL230)
- ▶ Metal case, DIN rail bracket or wall mount plate
- ▶ M12 and/or terminal block power connector
- ▶ Wide input voltage range 9-57VDC

Front Panel I/O

- ▶ RJ45 Gigabit Ethernet connector 1000BASE-T, 100BASE-TX, 10BASE-T compliant
- ▶ Micro SDHC Card slot
- ▶ SMA antenna connectors Wi-Fi 6 & Bluetooth® 5
- ▶ USB 3.0 Type-A connector 5Gbps maximum speed
- ▶ USB 2.0 Type-B receptacle (diagnostic & programming I/F)
- ▶ M12-A 5-pin male connector DC power input
- ▶ Optional terminal block 3.5mm pitch 4-position screw lock (bottom of box) power input

Option

- ▶ Isolated RS-232 or RS-485 I/F, RJ-45 jack (replaces Type-B receptacle)

Technical Features

CPU

- ▶ Marvell® Armada® 88F3720 dual-core or 88F3710 single-core SoC
- ▶ ARM® v8 Cortex-A53
- ▶ Up to 1GHz for industrial temperature range
- ▶ 32 KB-instruction / data (4-way) set associative L1 cache with parity/ECC protection
- ▶ Integrated power switches for dynamic shut down of CPU cores and unused functions
- ▶ Optimal performance-per-Watt
- ▶ High-performance security offload engine including IPSec, SSL, DTLS, and IKE
- ▶ Hardware compliance with ARM Trustzone® architecture for DRM
- ▶ Enhanced Secure-Boot flow using integrated one time programmable (OTP) memory
- ▶ FIPS-140 certified
- ▶ DDR4 2400 2GB, high-speed DRAM memory controller
- ▶ e•MMC 5.1 Flash 16GB (up to 64GB)
- ▶ SPI Flash 64Mb
- ▶ 1 x 2.5 Gigabit Ethernet (SERDES) in use for mezzanine connector (switch host management)
- ▶ 1 x 1 Gigabit Ethernet (RGMII) front panel I/O usage 1000BASE-T
- ▶ 1 x USB 3.0 front panel I/O
- ▶ 1 x PCIe Gen2 & USB 2.0 in use for M.2 socket (2230 Wi-Fi/BT)
- ▶ 1 x SDIO 3.0 for Micro SDHC card front I/O
- ▶ 2 x UART for Debug/Programming and optional RS-232 or RS-485

Technical Features

Networking

Connectivity

- ▶ RJ45 front port w. integrated magnetics, triple speed 1000BASE-T, 100BASE-TX, 10BASE-T, Energy Efficient Ethernet (EEE)
- ▶ Optional isolated RS-232 or RS-485 interface RJ45 front panel jack (mezzanine modules SUG or SUH)

Wireless

- ▶ Wi-Fi 6 IEEE 802.11ax up to 2.4Gbps dual band 2x2 160MHz (SMA antenna front connectors)
- ▶ Bluetooth® 5 (SMA antenna front connectors)

Switching

- ▶ 1 x 2.5 Gigabit Ethernet (SERDES) in use for mezzanine connector
- ▶ Switch host management for unmanaged Embedded Blue® GbE switch solutions
- ▶ Option AVB/TSN protocol stacks (AVNU certified) available

- ▶ Available as stacked assembly in a common box:
 - ▶ AL110 (5 port M12-X GbE switch with AC370)
 - ▶ AL210 (8 port GbE switch with AC370)
 - ▶ AL230 (8 port PoE+ switch with AC370)

Ecosystem

- ▶ Complete SDK available including U-Boot, Mainline Linux BSP
- ▶ OpenWrt, Yocto, Linaro Open Data Plane (ODP) support
- ▶ KVM and Containers support (planned)
- ▶ AVB/TSN support (available)

- ▶ JTAG port (on-board pin header) suitable for deep hardware/software debugging
- ▶ UART1 wired to USB Type-B front receptacle via FT234XD for diagnosis and programming
- ▶ USB UART drivers suite (FTDI website)

Technical Features

Applications

- ▶ Industrial networks - IIoT
- ▶ Industrial, factory and building automation
- ▶ Rugged environments
- ▶ Edge or fog computing
- ▶ Transportation
- ▶ AP routers
- ▶ Multi-protocol gateways
- ▶ Host management for networking (AVB/TSN)
- ▶ AC370 can be combined with unmanaged Embedded Blue® switch solutions via 2.5GbE I/F

Power Requirements

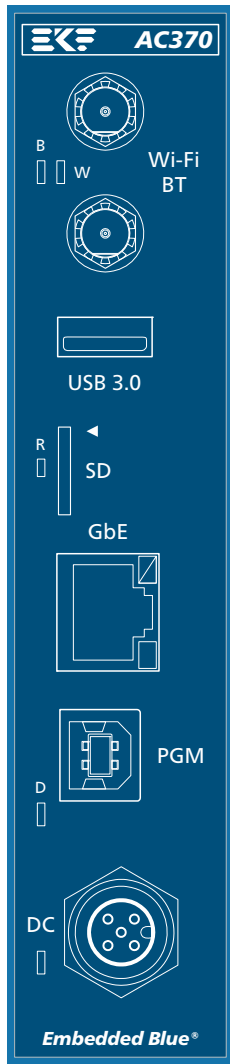
- ▶ DC Input, 9V-57VDC (12/24/48VDC)
- ▶ Rated power consumption 15W
- ▶ Fast acting chip fuse (PCB soldered type - no replacement on-site)
- ▶ Protected against reverse polarity
- ▶ ESD protection (TVS)
- ▶ Common mode input filter
- ▶ M12 front power connector
- ▶ Option 4-position terminal block 3.50mm pitch screw locked for DC power input

Environmental, Regulatory

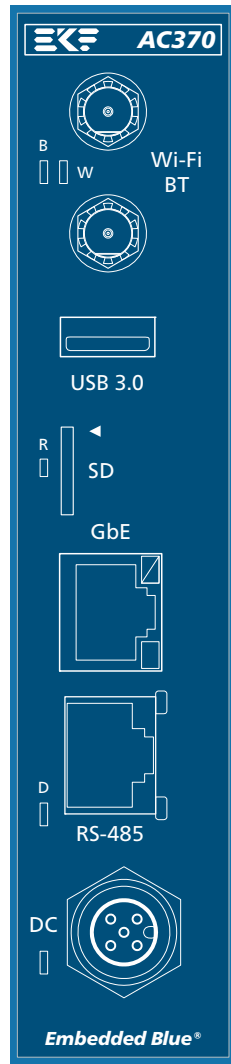
- ▶ Designed & manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ Long term availability
- ▶ Rugged solution
- ▶ RoHS compliant
- ▶ Operating temperature -40°C to +85°C (industrial temperature range)
- ▶ Storage temperature -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ EC Regulatory EN55024, EN55032, EN62368-1 (CE)
- ▶ International Protection EN60529 IP20
- ▶ MTBF tbd years

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

Front Panel



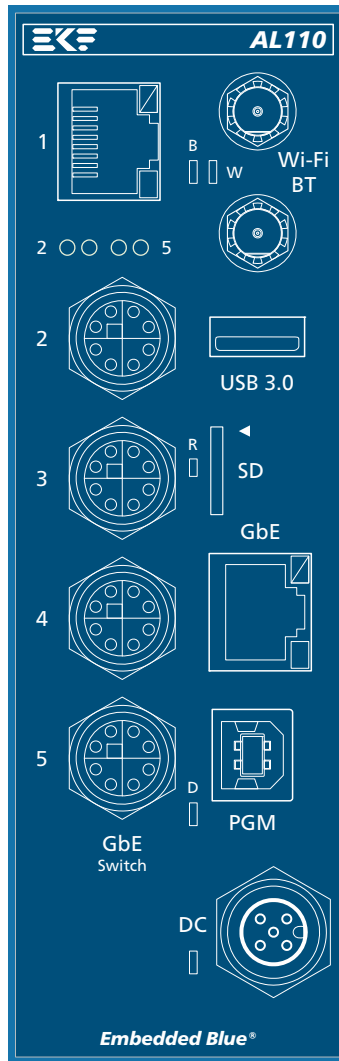
Standard



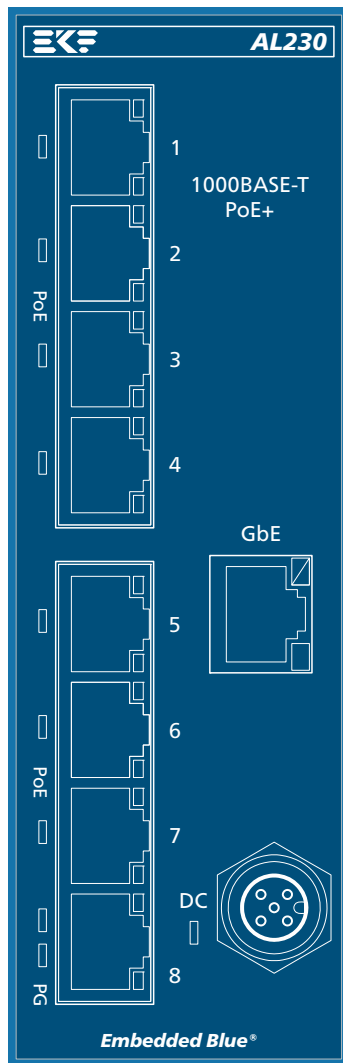
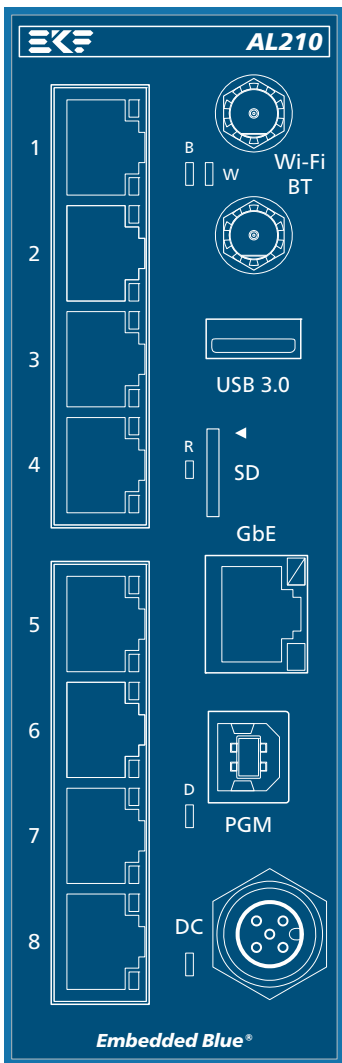
RS232/485

Wireless LEDs	
B green	Bluetooth active
W blue	Wi-Fi active
Push Button Switch	
R	CPU manual reset (pin tool required)
CPU LED	
D blue	CPU active
DC LED	
blue	DC input power present, internal power good
red	internal power not yet ready or external DC power out of range
off	DC input power faulty (reverse connection, wrong pins, external power supply off?)

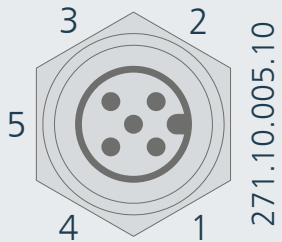
AC370 w. AL100 5-Port GbE Switch



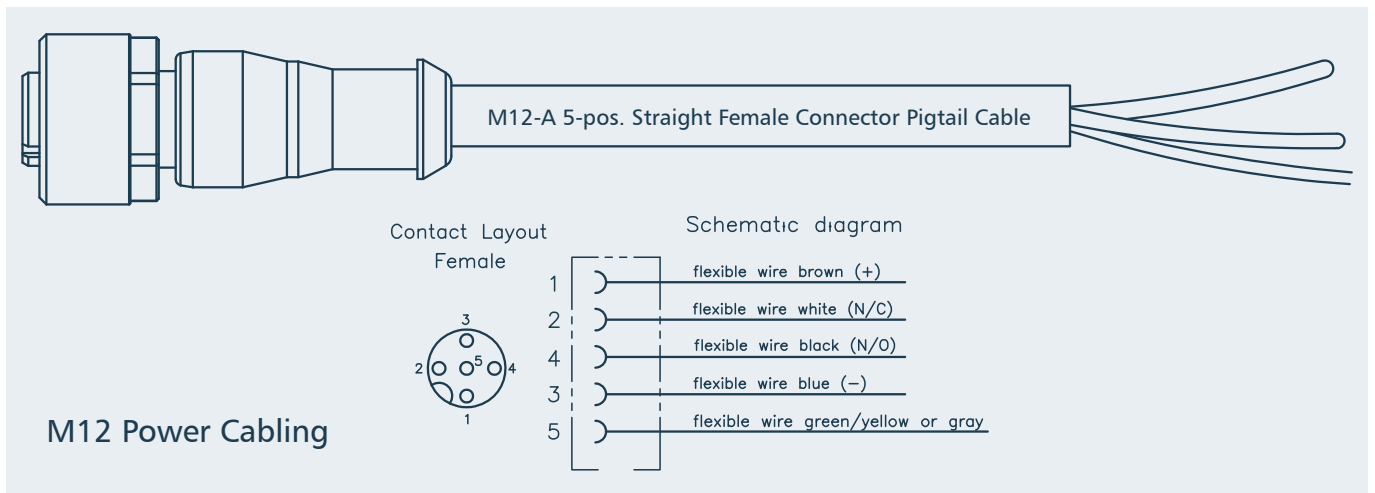
AC370 w. AL200 8-Port GbE Switch



M12 Power Connector Pin Assignment

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

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 (reserved)

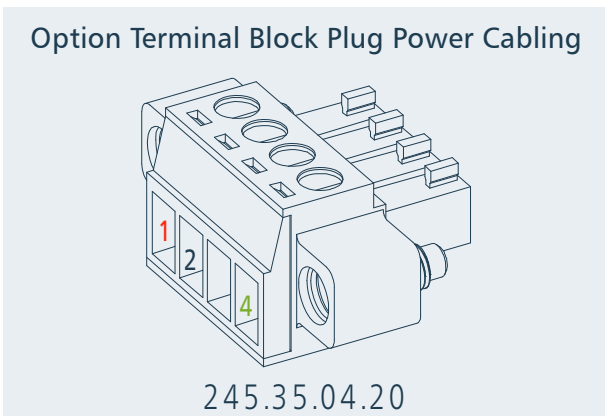


M12 Pigtail Cable

Option Terminal Block Power Connector Pin Assignment

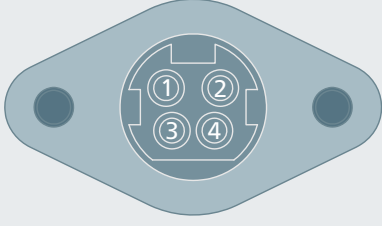
3.50mm 4-Position Terminal Block 8A/Contact			
<p>245.35.04.00</p> <p>1 2 3 4</p>	<p>+V=9-57VDC</p>	1	+V
		2	GND
		3	RSV
		4	FE (Shield)

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



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

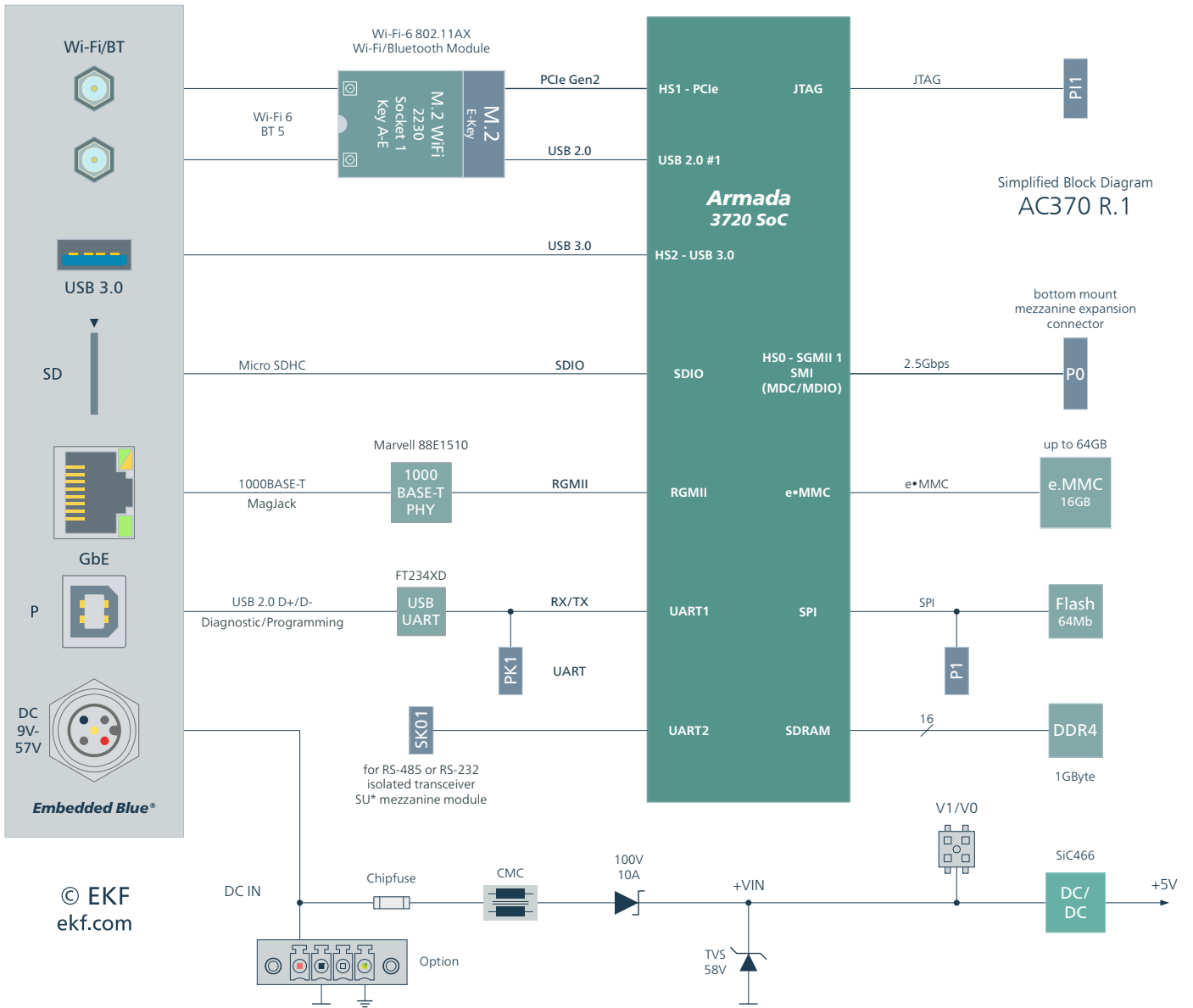
Option Rear Power Connector

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 *

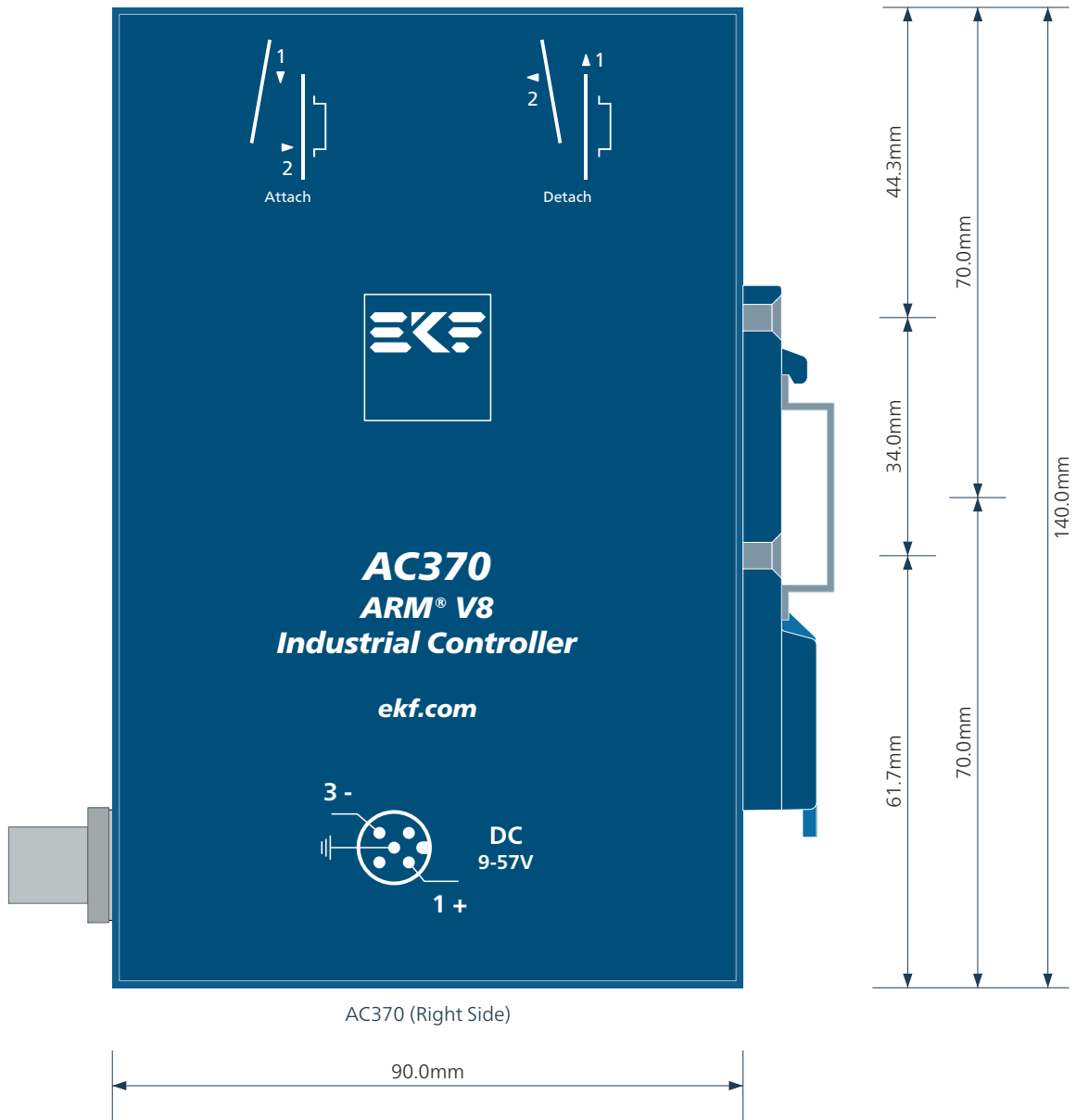
* power supply cable harness may connect GND to Shield

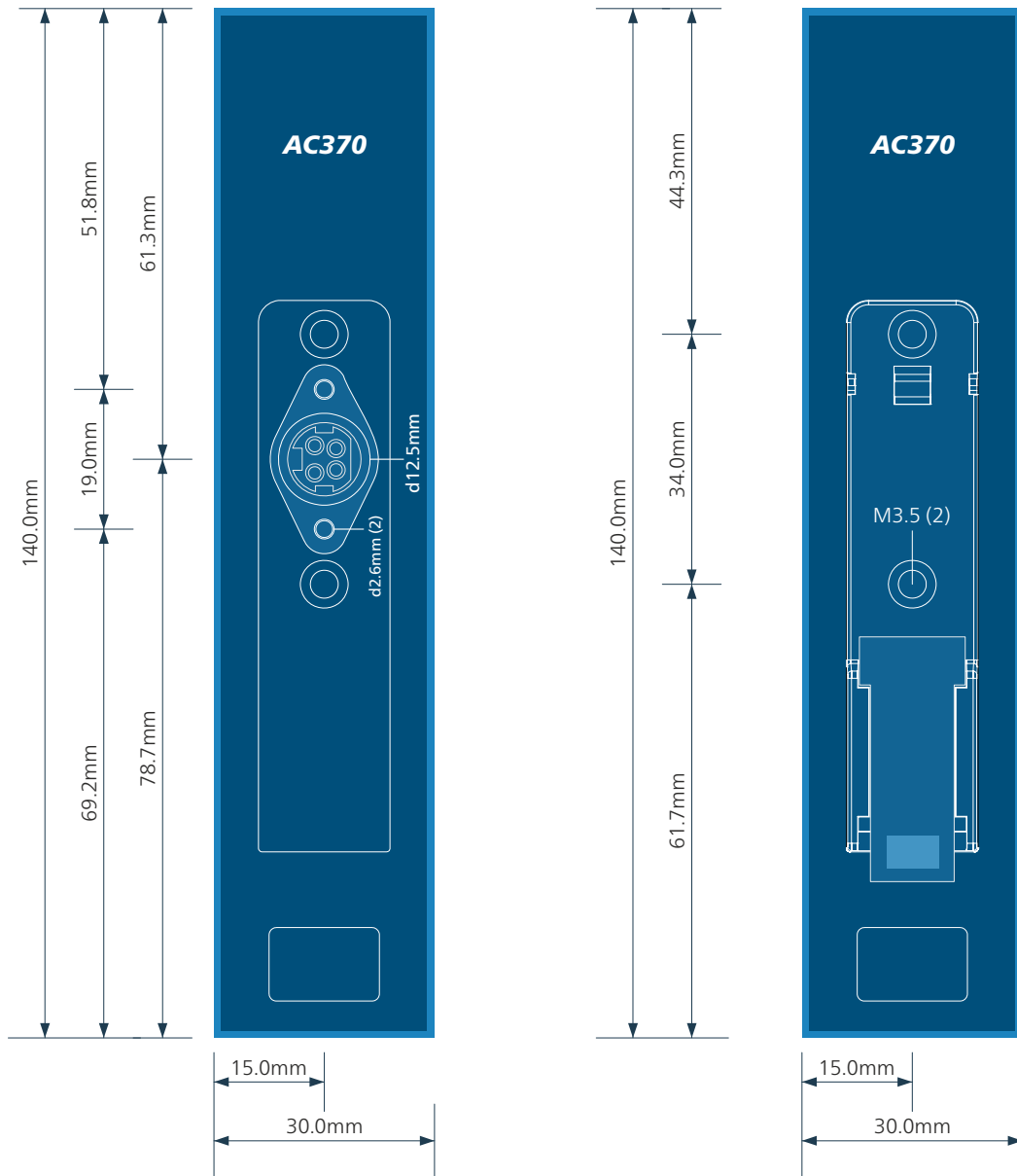
Mating Desktop Power Adapter w. Cable Assy	
EKF	353.1.120.24.1
FSP Technology	FSP120-AAAN3, 120W 24VDC/5A

Block Diagram



Dimensions







DIN Rail Mounting Option (Picture Similar)



Wall Mount Plate Option (Picture Similar)

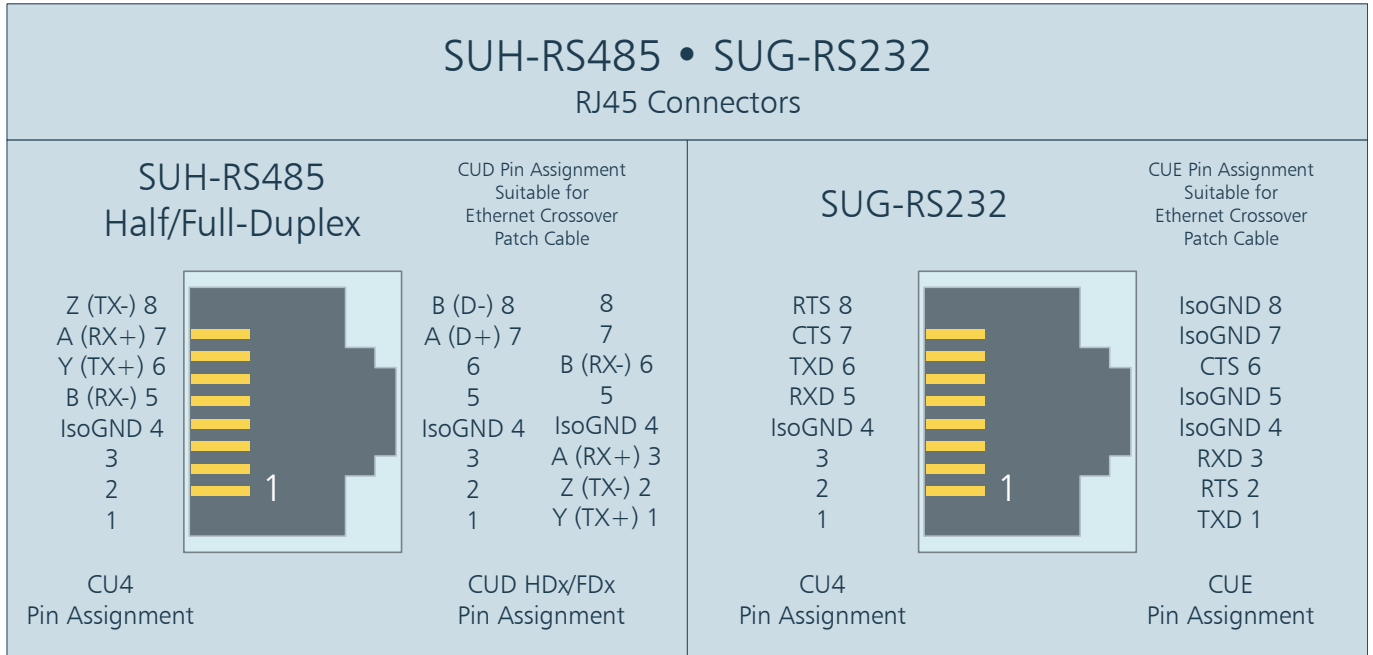
Ordering Information

For popular AC370 SKUs please contact sales@ekf.de

Related Products

AC370	ARM® V8 Industrial Microcontroller
AL100	5 port M12-X unmanaged GbE switch
AL110	5 port M12-X GbE switch w. AC370 ARM® V8 CPU
AL200	8 port RJ45 unmanaged GbE switch
AL210	8 port RJ45 GbE switch w. AC370 ARM® V8 CPU
AL220	8 port RJ45 unmanaged PoE+ GbE switch
AL230	8 port RJ45 PoE+ GbE switch w. AC370 ARM® V8 CPU
AL600	7 port Single Pair Ethernet switch 100BASE-T1
AL610	7 port SPE switch 100BASE-T1 w. AC370 ARM® V8 CPU
SUG-RS232	Mezzanine module, isolated RS-232, AC370 option
SUH-RS485	Mezzanine module, isolated RS-485, AC370 option

Option RS-232 RS-485



Documentation	
SUG-RS232	https://www.ekf.de/s/sue-suj/sue-suj.html
SUH-RS485	https://www.ekf.de/s/sue-suj/sue-suj_pi.pdf



https://www.ekf.com/a/DIN_Rail_on_off_500x280.mp4

Embedded Blue®



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