

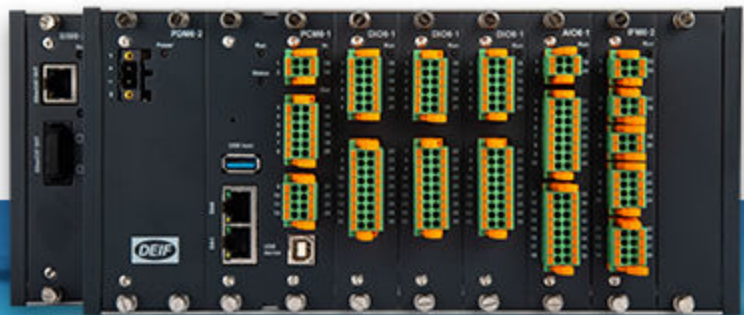
AMC 600

Programmable Automation Controller with EtherCAT based I/O modules

Data sheet



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1. AMC 600

1.1 About the AMC 600

The AMC 600 is designed as a highly flexible, modular PLC and I/O system covering the special demands of for example wind power plants in terms of reliability, robustness and flexibility.

EtherCAT is used as native communication protocol, as the backplane communication, and as interconnection between multiple AMC 600 racks via electrical or fibre optical connections. Other DEIF EtherCAT I/O modules or third party EtherCAT I/O modules can also be connected.



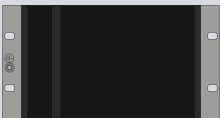
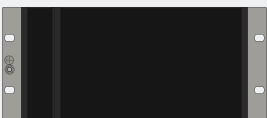
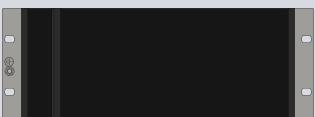
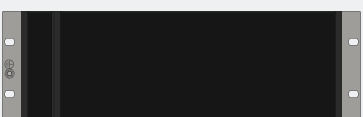
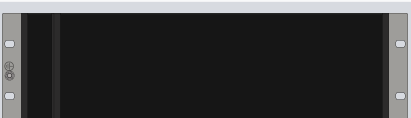
More information

See www.deif.com/documentation/amc-600/ for the AMC 600 documentation.

2. Technical specifications

2.1 System specifications

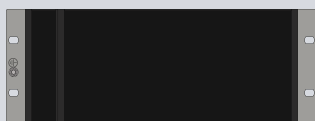
Rack sizes

Rack	Slots	Ground plate dimensions HxDxW (mm)	Weight (g)	Rack
Rack6-4	4	122.0 x 113.9 x 182.4 mm	715	
Rack6-6	6	122.0 x 113.9 x 233.2 mm	870	
Rack6-8	8	122.0 x 113.9 x 284.4 mm	1020	
Rack6-10	10	122.0 x 113.9 x 334.8 mm	1175	
Rack6-12	12	122.0 x 113.9 x 385.6 mm	1335	
Rack6-14	14	122.0 x 113.9 x 436.4 mm	1500	



Example

Rack6-10:



The rack has:

- 1x slot for SIM6-1, SIM6-2 or SIM6-3
- 1x slot for PDM6-1 or PDM6-2
- 8x slots for I/O modules

NOTE The PCM6-1 uses 2 slots (3 and 4) and requires PDM6-2 as Power Supply Module in Slot 2.

Environment

Category	Specification	Standard
Operating temperature	-40 to 70 °C	IEC 60068-2-1 IEC 60068-2-2
Storage temperature	-40 to 85 °C	
Reference temperature	15 to 30 °C	
Altitude	Up-to 4000 m without de-rating (for deployment above 4000 m, contact Product Management).	
Climate	All modules are conformal coated, hence protected against moisture, mold, dust, corrosion and other environmental stresses.	IEC 60068-2-30 test Db
	55 °C at 97 % relative humidity, condensing	
	Dry heat test	IEC 60068-2-2
	Cold test	IEC 60068-2-1

Tests

Category	Specification		Standard
Performance test and performance check	Criteria/standard: All inputs, outputs and interfaces are functional.		
Radiated E-field emission	30 to 230 MHz: 50 dB (μV/m) Qp 10 m 230 to 1,000 MHz: 57 dB (μV/m) Qp 10 m 1 to 3 GHz: 76 dB (μV/m) Q peak 3 m 1 to 3 GHz: 56 dB (μV/m) average 3 m 3 to 6 GHz: 80 dB (μV/m) Q peak 3 m 3 to 6 GHz: 60 dB (μV/m) average 3m		IEC 61000-6-4 IEC 60255-26
Conducted emission			IEC 61000-6-4 IEC 60255-26
Electrical fast transients test (EFT)	Criteria B	Levels extended to: - DC-power port: ±4 kV - Functional Earth port: ±4 kV - Signal input and output ports: ±2 kV - Communication ports: ±2 kV - Repetition frequencies: 5 KHz and 100 KHz - Duration each polarity: 1 min.	EN 61000-4-4 EN 61000-6-2
RF E-Field immunity	Criteria: A	80 to 2,000 MHz: 12 V/m 2 to 3 GHz: 10 V/m	EN 61000-4-3 EN 61000-6-2
Electrostatic discharge (ESD)	Criteria: B	Level extended to: Contact 6 kV	EN 61000-4-2 EN 61000-6-2
Slow transients test, surge	Criteria: B	Levels extended to: - Digital inputs: ±1 kVp DM and ±2 kVp CM - Digital outputs: ±1 kVp DM and ±2 kVp CM - Analogue inputs: ±3 kVp DM and ±3 kVp CM - Analogue outputs: ±1 kVp DM and ±2 kVp CM - Temperature inputs: ±3 kVp DM and ±3 kVp CM - Main power supply: ±3 kVp DM and ±3 kVp CM - Dig output power supply: ±3 kVp DM and ±3 kVp CM - RS-422, RS-485, Profibus DP, CAN, Ethernet, SSI: ±2 kVp CM	EN 61000-4-5 EN 61000-6-2

Category	Specification		Standard
RF common mode conducted test	Criteria: A	0.15 to 80 MHz: 12 VRMS	EN 61000-4-6 EN 61000-6-2
Power frequency H-field (magnetic) immunity	Criteria: A	Field: 30 A/m	EN 61000-4-8 EN 61000-6-2
Vibration Test	Operational	3 to 13.2 Hz 2.85 mm peak-peak 13.2 to 100 Hz 1 g	DNV-GL test A
		3 to 15 Hz 5 mm peak-peak 15 to 50 Hz 2.3 g	DNV-GL test C
	Response	10 to 58.1 Hz 0.15 mm peak-peak 58.1 to 150 Hz 1 g	IEC 60255-21-1 class 2
	Endurance	10 to 150 Hz 2 g	IEC 60255-21-1 class 2
	Seismic	3 to 8.15 Hz 15 mm peak-peak 8.15 to 35 Hz 2 g	IEC 60255-21-3 class 2
Shock (Base mounted)	10 g, 11 ms, half sine		IEC 60255-21-2 Response class 2
	30 g, 11 ms, half sine		IEC 60255-21-2 Endurance class 2
	50 g, 11 ms, half sine		IEC 60068-2-27
	Tested with 3 impacts in each direction in all 3 axes, a total of 18 impacts per test		
Bump	25 g, 16 ms, half sine		IEC 60255-21-2 class 2
	1,000 bumps in each direction, 2 directions in each axis, a total of 6,000 bumps		

NOTE g = gravitational force (g-force).

Safety and protection

Category	Specification	Standard
Safety	Installation (over-voltage) category III, 600 V, pollution degree 2	EN 61010-1
Protection	IP30	IEC/EN 60529/A1/A2
Materials	Aluminium case and cover plates (all plastic parts are self-extinguishing)	UL94 (V1)

Approvals

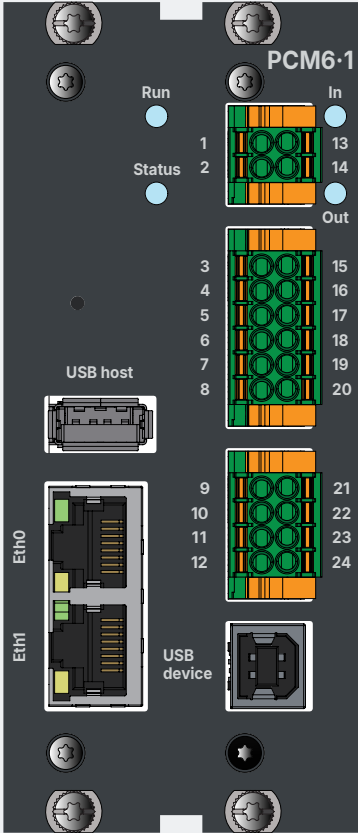
These approvals apply to the controller rack (with all the modules properly installed).

Standards
CE
UKCA
UL/ULC Listed to UL6200:2019 1 st edition controllers for use in Power Production
LR approval
DNV approval
Others available on request

2.2 Computer modules

2.2.1 PCM6·1 computer module specifications

The PCM6·1 module offers a powerful dual core 1.2 GHz CPU, well suited for demanding C/C++ and CODESYS applications.

Computer module	
	Power supply
	From backplane
	Backplane interfaces
	1 x EtherCAT OUT (Port 1) – LVDS 1 x EtherCAT OUT (Port 2) – LVDS
	Digital input (In)
	High: 13 to 30 V Low: -30 to +5 V with reference to common Load: Typically, 6 mA ($V_{in} > 7\text{ V}$) Isolation: Optically isolated from other potentials, 500 V DC
	Digital output (Out)
	Solid State Relay with external watchdog, 24 V, maximum 1 A resistive
	Interface, Ethernet
	2 x Ethernet (Eth1 and Eth2): 1000BASE-T, 8P8C ("RJ45"), shielded Cat 5e, $>0.76\text{ }\mu\text{m}$ gold plating
	Interface, CAN
	2 x CAN (CAN 1, CAN 2): ISO 11898, shielded twisted copper cable, 50 to 1,000 kbit/s, software controllable 120 Ω termination resistor
	Interface, UART
	2 x RS-422/485 (COM1, COM2) : ANSI/TIA/EIA-422-B and TIA/EIA-485, shielded twisted copper cable 4.8 to 921.6 kbit/s (full duplex), software controllable 120 Ω termination resistor and 500 Ω bias resistor
	Processor
	1.2 GHz dual-core industrial grade ARM Cortex-A7 32 bit CPU (ARMv7) with ECC protected cache
	Operating system
	DEIF OS, based on real-time embedded Linux® Fail-safe remote SW update Power fail-safe, self-monitoring and error-correcting file system (EXT-4)
	PLC run-time
	CODESYS V3 runtime : CODESYS V3 SP15 or later
	Programming
	ANSI C/C++ via PCM6·1 SDK and IEC 61131-3 via CODESYS V3 UL/ULC : Make sure Functional testing is part of the end application.
	Protocols
	See section Supported software features
	Memory
	1 GB DDR3 RAM 64 bit ECC protected Industrial grade
	Internal storage
	Non-volatile data storage: 4 GB industrial grade flash (pseudo SLC mode)
	Persistent storage
	128 kB user available from CODESYS (requires PDM6·2 power supply for hold-up)
	Real-Time Clock (RTC) battery
	Real-time clock with replaceable coin-cell battery (replacement recommended every 5 years). CR2430 3V battery, rated for operation at -40 to 85 °C (-40 to 185 °F). This is not a standard CR2430 battery. The CR2430 battery is an available accessory. Contact DEIF for ordering.
	USB host
	USB 3.0, Mass Storage Class
	USB device
	USB 2.0, console on virtual COM port, 115.2 kbit/s (D:8,S:1,P:N,F:N)
	Weight
	292 g (incl. connectors)
	Power consumption
	Max 16.6 W, hereof 5.6 W reserved for USB3.0 host

Computer module		
Connector, grip (included by default)		2 x 2 terminals: 1790483 2 x 6 terminals: 1790522 2 x 4 terminals: 1790506
Connector, screw		2 x 2 terminals: 1790292 2 x 6 terminals: 1790331 2 x 4 terminals: 1790315

LED specifications

Run LED		Description
OFF		Initialisation.
Green blinking		Pre-operational.
Single green blink		Safe-operational.
Green		Operational.
Green flickering		Boot loader.

Status LED		Description
OFF		Off.
Red		Booting.
Red flickering		Push the reset button to reset PCM6-1. The module resets in rescue mode. Push and hold the reset button to perform a factory reset.
Orange flickering		Factory reset in progress.
Orange		Initialisation.
Orange blinking		Rescue mode.
Green flickering		Updating with an update file (.dupdate).
Single green blink		Application mode is not enabled.
Green blinking		Initialisation.
Green		In operation.

In LED		Description
OFF		The digital input is not activate.
Green		The digital input is activate.

Out LED		Description
OFF		The digital output is not activate.
Green		The digital output is activate.

Ethernet

The two independent Ethernet ports Eth0 and Eth1 are connected directly to the CPU module. They are configured via the System web page. The use case is, for example, as a gateway between upper plant-wide network segments and local network segments. Both Ethernet ports have broadcast storm filters enabled. These protect the real-time capabilities of the CPU.



More information

See **Communication protocols** in the [Supported software features](#) section for details about the supported Ethernet protocols, for example Modbus TCP, OPC UA, and PROFINET.

CAN

The two independent CAN ports provide CAN (layer II) support. CANopen Master/Slave communication is done using the CODESYS protocol stacks. The ports are configured using the CODESYS applications. The applications also provide the CAN layer II and CANopen Master/Slave protocol stacks. Enable the termination resistors using the software, mapped to the Linux device interface.

UART

The two UART serial ports can be configured as RS-422 or RS-485. Enable the termination and bias resistors using the software, mapped to the Linux device interface.

USB host

The host supports the connection of USB 3.0 mass storage devices. Use the Linux operating system to add support for other USB devices.

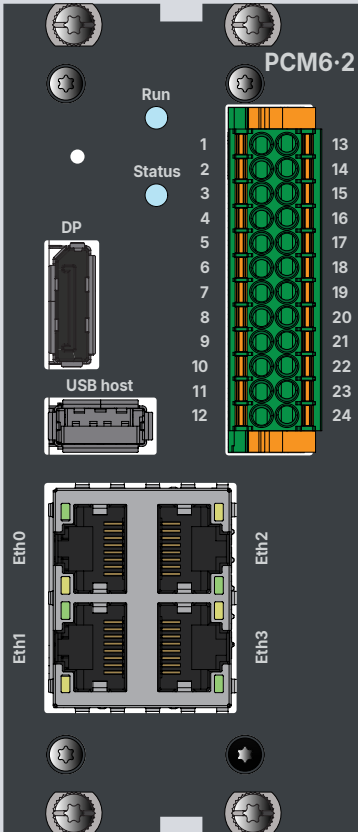
2.2.2 PCM6-2 computer module specifications

NOTE Order this module as an **IE 650 PLC**.

The PCM6-2 module comes with a powerful 1.6 GHz quad-core (64 bit) CPU, well suited for demanding C/C++ and CODESYS applications. Use the network functions for energy and power applications, for example, wind turbines, power parks, hybrid solutions, and battery storage.

The module has a 1 Gbps TSN network interface port for power management networks that are plant-wide and real-time. The module also features a managed 10/100 Mbps switch with 3 ports for local networks.

The DisplayPort connector allows you to connect standard LED/LCD monitors. CAN/CANopen and RS-422/485 connections are available as on-module interfaces using the common snap-locked (or screw-locked) connector.

Computer module		
	Power supply	From backplane using PDM6-1 module or PDM6-2 module
	Backplane interfaces	1 x EtherCAT OUT (Port 1) – LVDS 1 x EtherCAT OUT (Port 2) – LVDS
	Digital input (In)	1 x DI 24 V DC High: 13 to 30 V Low: -30 to +5 V with reference to common Load: Typically 6 mA ($V_{in} > 7\text{ V}$) Isolation: Optically isolated from other potentials, 500 V DC
	Digital output (Out)	1 x DO 24 V DC Solid State Relay with external watchdog, 24 V, maximum 1 A resistive
	Ethernet	1 x Ethernet with TSN support (Eth0): 100/1000BASE-T, 8P8C ("RJ45"), shielded Cat5e, gold plating 3 x Ethernet, managed switches (Eth1, Eth2, Eth3): 10/100BASE-T, 8P8C ("RJ45"), shielded Cat5e, gold plating
	CAN	2 x CAN (CAN 1, CAN 2): ISO 11898, shielded twisted copper cable, 50 to 1,000 kbit/s, software controllable 120 Ω termination resistor
	UART	2 x RS-422/485 (COM1, COM2): ANSI/TIA/EIA-422-B and TIA/EIA-485, shielded twisted copper cable, 4.8 to 921.6 kbit/s (full duplex), software controllable 120 Ω termination resistor and 500 Ω bias resistor
	Display port	1 x DisplayPort (DP) v1.3 1080 p (full-size connector)
	USB host	1 x USB 3.0 (Type-A connector), mass storage class power, delivery up to 4.5 W
	LED	RUN: Green, EtherCAT in operation STATUS: Red/Blue/Green, software controllable
	Pin-hole switch	Factory reset or provisioning of module (software configurable)
	Processor	1.6 GHz quad-core industrial grade ARMv8 64 bit CPU with ECC protected cache
	Memory	4 GB LPDDR4 with inline Error Code Correction (ECC)

Computer module	
Internal storage	32 GB 3D TLC NAND flash running in pseudo SLC mode. ~8 GB available for user application data
Persistent storage	128 kB user available from CODESYS (256 kB FRAM installed)
Expandable storage	MicroSD slot: High speed (max. 25 MB/s). The MicroSD slot is accessible when the PCM6-2 is not mounted in the rack.
Real-Time Clock (RTC) battery	Real-time clock with replaceable coin-cell battery (replacement recommended every 5 years). CR2430 3V battery, rated for operation at -40 to 85 °C (-40 to 185 °F). This is not a standard CR2430 battery. The CR2430 battery is an available accessory. Contact DEIF for ordering.
Cooling	Passive
Temperature	CPU junction temperature measurement Software reset when the CPU temperature is too high
Operating system	GNU/Linux customized with PREEMPT real-time patch and system drivers C/C++ and CODESYS applications operate in user space mode Fail-safe remote SW update Power fail-safe, self-monitoring and error correcting file system (EXT-4)
System configuration	On-device, web-based configuration System information Host name configuration: The serial number is the default User access management: Operator, service, or administrator. Rights and credentials. Switch configuration: IPv4 address (static/dynamic) Fail-safe software update method (active / fall-back OS image) Simplified update procedures: No special tools, and the procedure is the same for OS and firmware Secure certificate-based access using standard protocols
System network protocols	- Secure/SSH File Transfer Protocol (SFTP), server - Secure Shell (SSH) TLS1.2 and TLS1.3 server and client - Network Time Protocol (NTP), client - Dynamic Host Configuration Protocol (DHCP), client - EtherCAT master (native for C/C++ applications/system network scan)
PLC run-time	CODESYS V3 runtime : CODESYS V3 SP18 or later
Programming	IEC 61131-3: LD, SFC, FBD, CFC, ST (CODESYS V3.5 SP18+ IDE) ANSI C/C: + ANSI C/C using Linux SDK Python: As containerised software component
Visualisation	CODESYS web visualisation
Application protocols	See section Supported software features
Size	50.80 mm (2 slots)
Weight	241 g (incl. connectors)
Power consumption	Max 17.5 W, hereof 5.6 W reserved for USB3.0 host
Connector, grip (included by default)	2 x 12 terminals: DFMC 1.5/12-ST-3.5-LR – 1790580
Connector, screw	2 x 12 terminals: DFMC 1.5/12-STF-3.5 – 1790399

LED specifications

Run LED		Description
OFF		Initialisation
Green blinking		Pre-operational
Single green blink		Safe-operational
Green		Operational
Green flickering		Boot loader

Status LED		Description
OFF		Off.
Green		Normal operation

Ethernet

The CPU module can be used as a gateway between the network segments for plant-wide power management and the local network segments. To do this, two independent network interfaces must be made. Eth0 is an Ethernet port connected directly to the CPU, and Ethernet ports Eth1, Eth2, and Eth3 are connected to the CPU using a managed switch. The Eth0 port supports TSN on hardware level.

The module also supports PROFINET controllers (master) and PROFINET devices (slave) with CODESYS stacks.

CAN

The two independent CAN ports provide CAN (layer II) support. CANopen Master/Slave communication is done using the CODESYS protocol stacks. The ports are configured using the CODESYS applications. The applications also provide the CAN layer II and CANopen Master/Slave protocol stacks. Enable the termination resistors using the software, mapped to the Linux device interface.

UART

The two UART serial ports can be configured as RS-422 or RS-485. Enable the termination and bias resistors using the software, mapped to the Linux device interface.

DisplayPort

The DisplayPort connector standard for the graphical display port supports LED/LCD monitors. The standard is very robust in on-site operations in comparison to other commodity standards.

NOTICE



External third-party non-DEIF displays

External third-party non-DEIF displays should be configured to fixed DisplayPort input mode instead of Automatic detection.

USB host

The USB host is needed to export data, log files, and so on. The host supports the connection of USB 3.0 mass storage devices. Use the Linux operating system to add support for other USB devices.

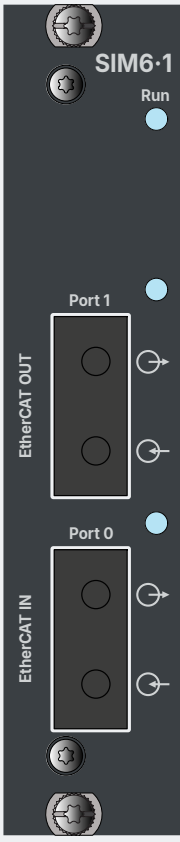
2.2.3 EtherCAT interface

The PCM6·1 and PCM6·2 modules have an EtherCAT connection to local I/O modules in the rack through the backplane. You can expand the EtherCAT network with the SIM6·2, SIM6·4, or SIM6·5, which allows you to connect to remote or distributed I/O racks. It is also possible to access the digital inputs and outputs in the PCM6·1 and PCM6·2 modules with the EtherCAT slave interface.

The digital output can be used as a CPU watchdog. If the EtherCAT network in your application is not controlled by the EtherCAT Master, then the watchdog function automatically opens the digital output after 100 ms. The watchdog function is applicable to all EtherCAT Slave modules. If the EtherCAT Master is not in operation, then the slave modules go to a default state (EtherCAT: SAFEOP). Digital outputs are set to LOW and analogue outputs are set to 0 mA or 0 V.

2.3 Station interface modules

2.3.1 SIM6·1 module specifications

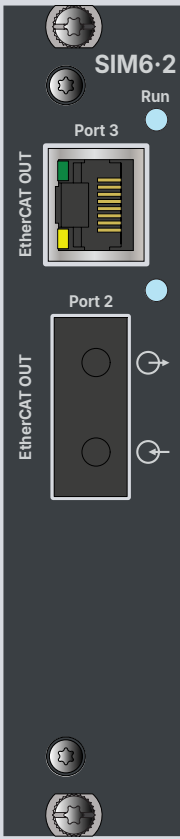
EtherCAT interface		
	Power supply	From backplane
	Backplane interfaces	1 x EtherCAT OUT (Port 3) - LVDS
	Interfaces	1 x EtherCAT IN (Port 0) Optical: 100BASE-FX, SC connectors, multimode fibre glass 50 µm (OM2,OM3,OM4, 1310 nm)
		1 x EtherCAT OUT (Port 1) Optical: 100BASE-FX, SC connectors, multimode fibre glass 50 µm (OM2,OM3,OM4, 1310 nm)
	Size	25.40 mm
	Weight	83 g
	Power consumption	Typical 3.5 W (2 active fibre channels)

Terminal specifications

Configuration: Slave station

Terminal	Description
EtherCAT IN	EtherCAT Logic Port 0
EtherCAT OUT	EtherCAT Logic Port 1

2.3.2 SIM6-2 module specifications

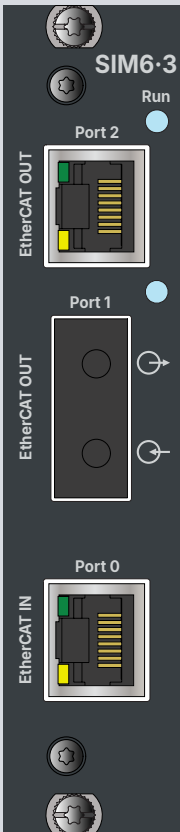
EtherCAT interface		
	For rack holding EtherCAT master	
	Power supply	From backplane
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS
	Interfaces	1 x EtherCAT OUT (Port 2) Electrical: 100Base-TX, 8P8C ("RJ45"), shielded Cat 5, >0.76 µm gold plating
		1 x EtherCAT OUT (Port 1) Optical: 100BASE-FX, SC connectors, multimode fibre glass 50 µm (OM2,OM3,OM4, 1310 nm)
	Size	25.40 mm
	Weight	83 g
	Power consumption	Typical 2.5 W (1 active fibre channel)

Terminal specifications

Configuration: Master station

Terminal	Description
EtherCAT OUT	EtherCAT Logic Port 2
EtherCAT OUT	EtherCAT Logic Port 1

2.3.3 SIM6-3 module specifications

EtherCAT interface		
	Power supply	From backplane
	Backplane interfaces	1 x EtherCAT OUT (Port 3) - LVDS
	Interfaces	1 x EtherCAT IN (Port 0) Electrical: 100Base-TX, 8P8C ("RJ45"), shielded Cat 5, >0.76 µm gold plating
		1 x EtherCAT OUT (Port 1) Optical: 100BASE-FX, SC connectors, multimode fibre glass 50 µm (OM2,OM3,OM4, 1310 nm)
		1 x EtherCAT OUT (Port 2) Electrical: 100Base-TX, 8P8C ("RJ45"), shielded Cat 5, >0.76 µm gold plating
	Size	25.40 mm
	Weight	83 g
	Power consumption	Typical 2.5 W (1 active fibre channel)

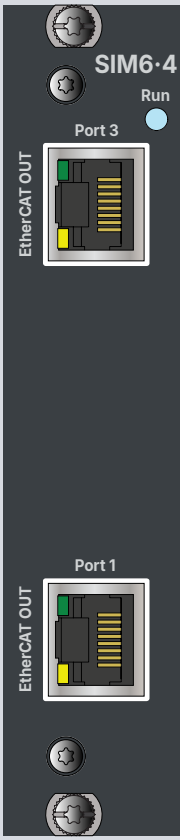
Terminal specifications

Configuration: Slave station

Terminal	Description
EtherCAT IN	EtherCAT Logic Port 0
EtherCAT OUT	EtherCAT Logic Port 1 EtherCAT Logic Port 2

2.3.4 SIM6-4 module specifications

The SIM6-4 module allows EtherCAT redundancy for the interconnection of multiple racks in a system via electrical connections. The Network Interface (NIC) is used for the EtherCAT master.

EtherCAT interface		
	For rack holding EtherCAT master	
	Power supply	From backplane
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS
	Interfaces	1 x EtherCAT OUT (Port 3) Electrical: 100Base-TX, 8P8C ("RJ45"), shielded Cat 5, >0.76 µm gold plating
		1 x EtherCAT OUT (Port 1) Electrical: 100Base-TX, 8P8C ("RJ45"), shielded Cat 5, >0.76 µm gold plating
	Size	25.40 mm
	Weight	83 g
	Power consumption	Typical 1.1 W

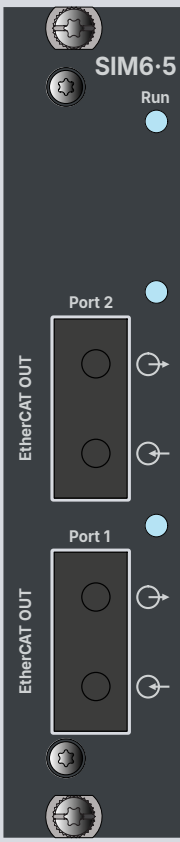
Terminal specifications

Configuration: Master station

Terminal	Description
EtherCAT OUT	EtherCAT Logic Port 3
EtherCAT OUT	EtherCAT Logic Port 1

2.3.5 SIM6-5 module specifications

The SIM6-5 module allows EtherCAT redundancy for the interconnection of multiple racks in a system via fibre optical connections. The Network Interface (NIC) is used for the EtherCAT master.

EtherCAT interface	
 The diagram shows the SIM6-5 module with a 'Run' indicator light. It features two 'EtherCAT OUT' ports labeled 'Port 2' and 'Port 1'. Each port has two circular connectors and a circular status indicator. The module is shown in a rack-mounting context with screws visible.	For rack holding EtherCAT master
	Power supplyFrom backplane
	Backplane interfaces1 x EtherCAT IN (Port 0) - LVDS
	Interfaces1 x EtherCAT OUT (Port 2) Optical: 100BASE-FX, SC connectors, multi-mode fibre glass 50 μm (OM2, OM3, OM4, 1310 nm)
	1 x EtherCAT OUT (Port 1) Optical: 100BASE-FX, SC connectors, multi-mode fibre glass 50 μm (OM2, OM3, OM4, 1310 nm)
	Size25.40 mm
	Weight83 g
	Power consumptionTypical 3.0 W (2 active fibre channels)

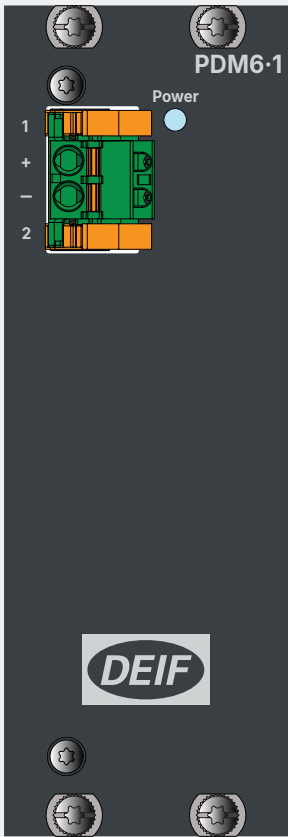
Terminal specifications

Configuration: Master station

Terminal	Description
EtherCAT OUT	EtherCAT Logic Port 2
EtherCAT OUT	EtherCAT Logic Port 1

2.4 Power modules

2.4.1 PDM6-1 module specifications

Power module		
	Power supply	30 W power supply Input level: 24 V (18 to 32 V) Black-out hold-up for 10 ms Polarity protection
	Backplane power source	Power output to backplane
	Backplane interfaces	Not used
	Size	40.64 mm
	Weight	201 g (incl. connectors)
	Power consumption	Standby typical 1.25 W
	EMI filter	Common mode EMI input filter
	Isolation	Input galvanic isolated from other potentials, 500 V DC
	Connector, grip (included by default)	2 terminals: 1792517
	Connector, screw	2 terminals: 1873207

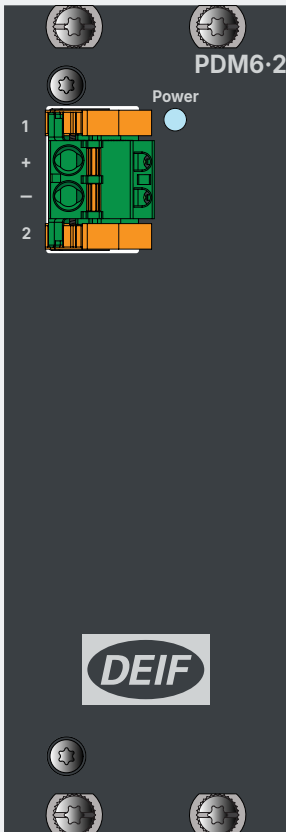
LED specifications

Power LED		Description
Green		The voltage is above the operating threshold and power is sourced from this input.

Terminal specifications

Terminal		Description
1	Power supply +	Power supply input, 24 V (18 to 32 V)
2	Power supply -	Power supply input, common

2.4.2 PDM6-2 module specifications

Power module		
	Power supply	30 W power supply Input level: 24 V (18 to 32 V) Black out: 10 ms + 300 ms hold up time (128 kB persistent storage on PCM6-1 from CODESYS) Polarity protection
	Backplane power source	Power output to backplane
	Backplane interfaces	Not used
	Size	40.64 mm
	Weight	250 g (incl. connectors)
	Power consumption	Standby typical 1.25 W
	EMI filter	Common mode EMI input filter
	Isolation	Input galvanic isolated from other potentials, 500 V DC
	Connector, grip (included by default)	2 terminals: 1792517
	Connector, screw	2 terminals: 1873207

LED specifications

Power LED	Description
Green 	The voltage is above the operating threshold and power is sourced from this input.

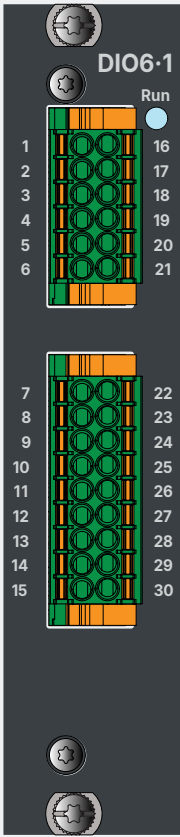
Terminal specifications

Terminal	Description
1	Power supply + Power supply input, 24 V (18 to 32 V)
2	Power supply - Power supply input, common

2.5 Digital input and output modules

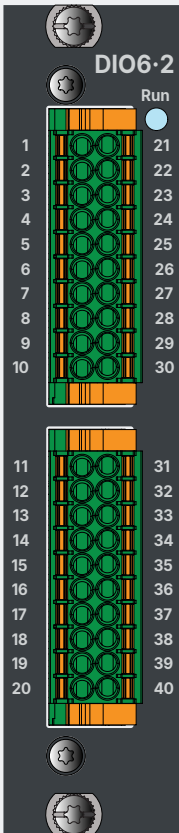
2.5.1 DIO6-1 module specifications

DIO6-1 is designed for the rough environment in a wind turbine, and all inputs and outputs are protected and isolated from other potentials.

Digital input and output module			
	Power supply	From backplane Output from external supply	
	Backplane interfaces	1 x EtherCAT IN (Port 0) – LVDS 1 x EtherCAT OUT (Port 1) – LVDS	
	10 digital outputs	Supply	External supply 24V (12 to 32 V)
		Type	Solid-state high side driver
		Voltage	High > Supply voltage -1 V
		Current	Max. 0.5 A per channel (UL: Max. 0.25 A per channel) Maximum total for all outputs: 2 A per group
		Response time	Max. 1 ms
		Isolation	10 outputs in one group Isolated from other potentials, 500 V DC
		Protection	Short circuit protection Inverse supply voltage protection
	16 digital inputs	Input	High: 13 to 30 V Low: -30 V to +5 V Reference to common
		Load	Typically 6 mA ($V_{in} > 7\text{ V}$)
		Bandwidth	~3 ms filter (200 Hz hardware low pass)
		Isolation	16 Inputs in 2 groups (8+8) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	91 g (incl. connectors)	
	Power consumption	Typical 0.75 W	
	Connector, grip (included by default)	2 x 6 terminals: 1790522 2 x 9 terminals: 1790551	
	Connector, screw	2 x 6 terminals: 1790331 2 x 9 terminals: 1790360	

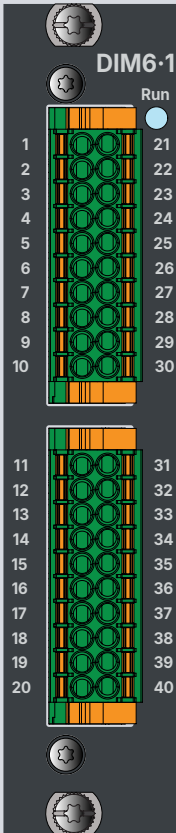
2.5.2 DIO6-2 module specifications

DIO6-2 has 16 x digital inputs and 16 x digital outputs. All the inputs and outputs are protected and isolated from other potentials.

Digital input and output module			
	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	16 digital outputs	Supply	External supply 24 V (12 to 32 V)
		Type	Solid-state high side driver
		Voltage	High > Supply voltage -1 V
		Current	Max. 0.5 A per channel Maximum total for all outputs: 2 A per group
		Response time	Max. 1 ms
		Isolation	16 outputs in 2 groups (8+8) Isolated from other potentials, 500 V DC
		Protection	Short circuit protection with feedback signal from each group Inverse supply voltage protection
	16 digital inputs	Input	High: 13 to 30 V Low: -30 V to +5 V Reference to common
		Load	Typically 6 mA ($V_{in} > 7\text{ V}$)
		Bandwidth	~3 ms filter (200 Hz hardware low pass)
		Isolation	16 inputs in 2 groups (8+8) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	93 g (incl. connectors)	
	Power consumption	Typical 0.75 W	
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

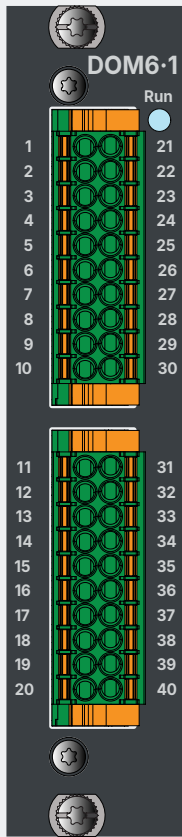
2.5.3 DIM6-1 module specifications

DIM6-1 has 32 x digital inputs. All the inputs are protected and isolated from other potentials.

Digital input module			
	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	32 digital inputs	Input	High: 13 to 30 V Low: -30 V to +5 V Reference to common
		Load	Typically 6 mA ($V_{in} > 7\text{ V}$)
		Bandwidth	~3 ms filter (200 Hz hardware low pass)
		Isolation	32 inputs in 4 groups (8+8+8+8) Isolated from other potentials, 500 V DC
	Size	25.40 mm (1 slot)	
	Weight	89 g (incl. connectors)	
	Power consumption	Typical 1.1 W	
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

2.5.4 DOM6·1 module specifications

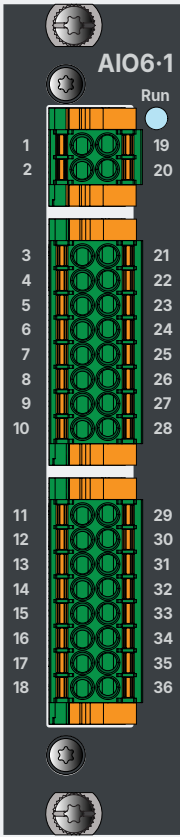
DOM6·1 has 32 x digital outputs. All the outputs are protected and isolated from other potentials.

Digital output module				
	Power supply	From backplane using PDM6·1 module or PDM6·2 module		
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS		
	32 digital outputs	Supply	External supply 24 V (12 to 32 V)	
		Type	Solid-state high side driver	
		Voltage	High > Supply voltage -1 V	
		Current	Max. 0.5 A per channel Maximum total for all outputs: 2 A per group	
		Response time	Max. 1 ms	
		Isolation	32 outputs in 4 groups (8+8+8+8) Isolated from other potentials, 500 V DC	
		Protection	Short circuit protection with feedback signal from each group Inverse supply voltage protection	
	Size	25.40 mm		
	Weight	97 g (incl. connectors)		
	Power consumption	Typical 0.5 W		
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564		
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373		

2.6 Analogue input and output modules

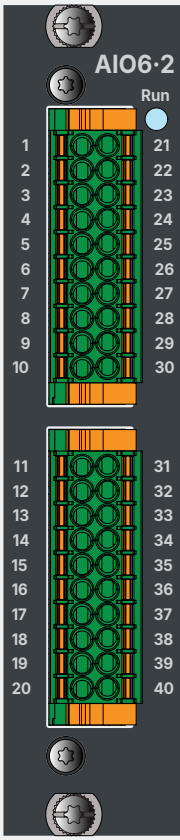
2.6.1 AIO6-1 module specifications

AIO6-1 is designed for the rough environment in a wind turbine, and all inputs and outputs are protected and isolated from other potentials.

Analogue input and output module			
	Power supply	From backplane	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	2 analogue outputs	Output type	Current mode : 0 to 20 mA, 4 to 20 mA Voltage mode : 0 to 10 V, -10 to 10 V. Software selectable.
		Output range	Current mode: 0 to 20 mA, 4 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V
		Load	Current mode: < 500 Ω Voltage mode: $\geq$ 1000 Ω
		Resolution	16 bit
		Accuracy	0.2 % of full range output (20 mA/10 V) at reference temperature 0.4 % of full range output (20 mA/10 V) at operational temperature
		Isolation	2 outputs in one group Isolated from other potentials, 500 V DC
	16 analogue inputs	Input type	Current mode: -20 to 20 mA, 0 to 20 mA, 4 to 20 mA Voltage mode: -10 to 10 V, 0 to 10 V Software selectable.
		Impedance	Current mode: Max. 50 Ω Voltage mode: Min. 10 k Ω
		Filter	250 Hz hardware low-pass filter
		Sampling	< 2 ms
		Resolution	16 bit
		Accuracy	0.2 % of full range input (20 mA/10 V) at reference temperature 0.4 % of full range input (20 mA/10 V) at operational temperature
		Isolation	16 inputs (8+8) in 2 groups Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	96 g (incl. connectors)	
	Power consumption	Typical 2.75 W (2 analogue outsourcing 20 mA)	
	Connector, grip (included by default)	2 x 2 terminals: 1790483 2 x 8 terminals: 1790548	
	Connector, screw	2 x 2 terminals: 1790292 2 x 8 terminals: 1790357	

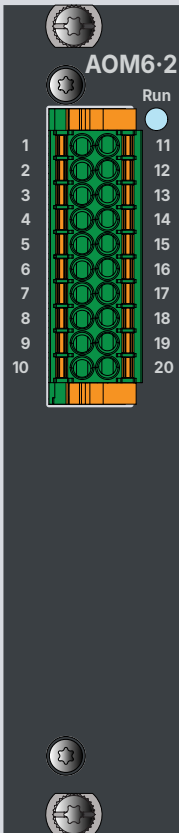
2.6.2 AIO6-2 module specifications

AIO6-2 has 8 analogue inputs and 8 analogue outputs. The voltage and current modes for the inputs and outputs are individually software configurable. All the inputs and outputs are protected and isolated from other potentials.

Analogue input and output module			
	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	8 analogue outputs	Output type	Current mode: 0 to 20 mA, 4 to 20 mA, -20 to 20 mA Voltage mode: 0 to 10 V, -10 V to 10 V Software selectable.
		Output range	Current mode: 0 to 20 mA, 4 to 20 mA, -20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V
		Load	Current mode: < 500 Ω Voltage mode: $\geq$ 1000 Ω
		Resolution	16 bit
		Accuracy	0.2 % of full range output (20 mA/10 V) at reference temperature 0.4 % of full range output (20 mA/10 V) at operational temperature
		Isolation	8 outputs in 2 groups (4+4) Isolated from other potentials, 500 V DC
	8 analogue inputs	Input type	Current mode: 0 to 20 mA, 4 to 20 mA, -20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V Software selectable.
		Impedance	Current mode: Max. 50 Ω Voltage mode: Min. 10 k Ω
		Filter	250 Hz hardware low-pass filter
		Sampling	< 2 ms
		Resolution	16 bit
		Accuracy	0.2 % of full range input (20 mA/10 V) at reference temperature 0.4 % of full range input (20 mA/10 V) at operational temperature
		Isolation	8 inputs in 2 groups (4+4) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	118 g (incl. connectors)	
	Power consumption	Typical 5.1 W (8 analogue outsourcing 20 mA)	
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

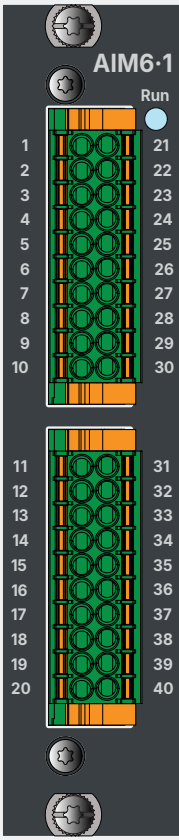
2.6.3 AOM6-2 module specifications

AOM6-2 has 8 analogue outputs. The voltage and current modes for the outputs are individually software configurable. The outputs are protected and isolated from other potentials.

Analogue output module			
	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	8 analogue outputs	Output type	Current mode: 0 to 20 mA, 4 to 20 mA, - 20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V Software selectable.
		Output range	Current mode: 0 to 20 mA, 4 to 20 mA, - 20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V
		Load	Current mode: < 500 Ω Voltage mode: ≥ 1000 Ω
		Resolution	16 bit
		Accuracy	0.2 % of full range output (20 mA/10 V) at reference temperature 0.4 % of full range output (20 mA/10 V) at operational temperature
		Isolation	8 outputs in 2 groups (4+4) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	100 g (incl. connectors)	
	Power consumption	Typical 2.7 W (8 analogue outsourcing 20 mA)	
	Connector, grip (included by default)	1 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	1 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

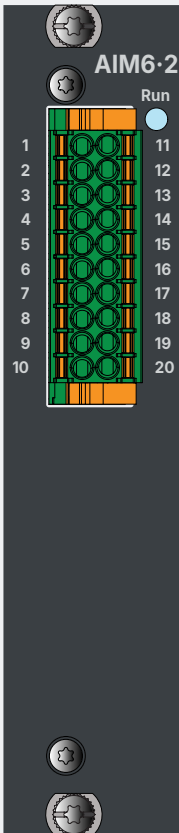
2.6.4 AIM6·1 module specifications

AIM6·1 has 16 analogue inputs. The voltage and current modes for the inputs are individually software configurable. All the inputs are protected and isolated from other potentials.

Analogue input module			
	Power supply	From backplane using PDM6·1 module or PDM6·2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	16 analogue inputs	Input type	Current mode: 0 to 20 mA, 4 to 20 mA, -20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V Software selectable.
		Impedance	Current mode: Max. 50 Ω Voltage mode: Min. 10 k Ω
		Filter	250 Hz hardware low-pass filter
		Sampling	< 2 ms
		Resolution	16 bit
		Accuracy	0.2 % of full range input (20 mA/10 V) at reference temperature 0.4 % of full range input (20 mA/10 V) at operational temperature
		Isolation	16 inputs in 4 groups (4+4+4+4) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	115 g (incl. connectors)	
	Power consumption	Typical 2.3 W	
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

2.6.5 AIM6-2 module specifications

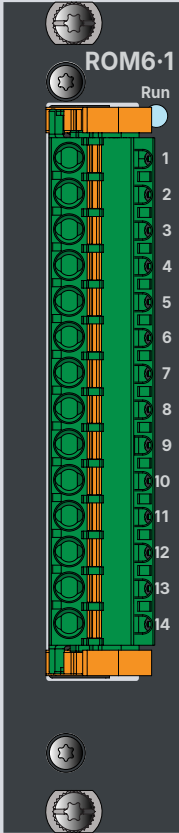
AIM6-2 has 8 analogue inputs. The voltage and current modes for the inputs are individually software configurable. All the inputs are protected and isolated from other potentials.

Analogue input module			
	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	8 analogue inputs	Input type	Current mode: 0 to 20 mA, 4 to 20 mA, -20 to 20 mA Voltage mode: 0 to 10 V, -10 to 10 V Software selectable.
		Impedance	Current mode: Max. 50 Ω Voltage mode: Min. 10 k Ω
		Filter	250 Hz hardware low-pass filter
		Sampling	< 2 ms
		Resolution	16 bit
		Accuracy	0.2 % of full range input (20 mA/10 V) at reference temperature 0.4 % of full range input (20 mA/10 V) at operational temperature
		Isolation	8 inputs in 2 groups (4+4) Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	95 g (incl. connectors)	
	Power consumption	Typical 1.4 W	
	Connector, grip (included by default)	2 x 10 terminals: DFMC 1.5/10-ST-3.5-LR – 1790564	
	Connector, screw	2 x 10 terminals: DFMC 1.5/10-STF-3.5 – 1790373	

2.7 Relay output modules

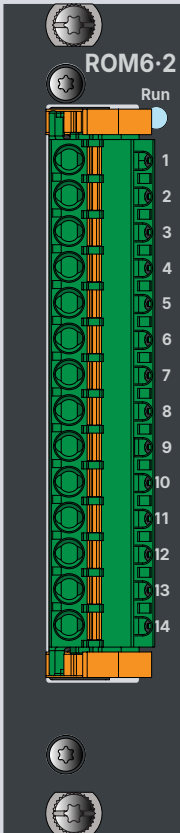
2.7.1 ROM6·1 module specifications

ROM6·1 has 8 x normally open relays.

Relay output module			
 ROM6·1 Run 1 2 3 4 5 6 7 8 9 10 11 12 13 14	Power supply	From backplane using PDM6·1 module or PDM6·2 module	
	Backplane interfaces	1 x EtherCAT OUT (Port 1) - LVDS 1 x EtherCAT OUT (Port 2) - LVDS	
	8 relay outputs (normally open NO)	Type	Electromechanical
		Electrical rating	Resistive load (continuously): 250 VAC @ 2 A 120 VAC @ 2 A 48 VAC @ 2 A 24 VAC @ 2 A
			220 VDC @ 0.2 A 110 VDC @ 0.3 A 48 VDC @ 1 A 24 VDC @ 2 A 12 VDC @ 2 A
			Inductive load: (AC:B300, DC:R300) Altitude derating 2,000-4,000 m Max. 150 VAC
			⚠ CAUTION: Relays with working voltages >150 V AC must be operated within the same relay group and not next to relays with 30 V DC working voltage.
		Load type	Resistive, Inductive B300/R300 (power limit specification for inductive loads), Pilot duty
		Operating cycles	Mechanical: >1 x 10 ⁷ cycles Electrical: >50,000 cycles (depending of load)
		Response time (contact on/brake off)	Operate time (typical): 10 ms Release time (typical): 7 ms
		Isolation	Between relays: 2200 V 50 Hz for 1 minute Between relays and chassis: 3250 V 50 Hz for 1 minute
	Size	25.40 mm	
	Weight	165 g (incl. connectors)	
	Power consumption	Typical 2.6 W (all relays ON)	
	Connector, grip (included by default)	14 pole connector, push-in terminals, with snap lock 1810913 - FKC 2.5/14-ST-5.08-LR	
	Connector, screw	14 pole connector, push-in terminals, with snap lock 1873320 - FKC 2.5/14-ST-5.08-LR	

2.7.2 ROM6-2 module specifications

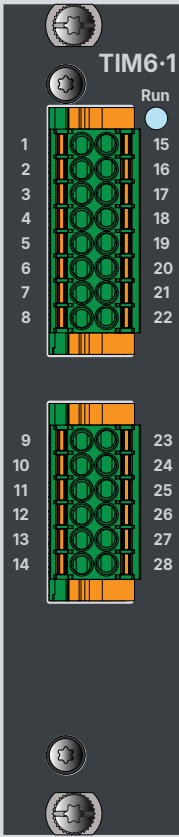
ROM6-2 has 4 x changeover relays.

Relay output module			
 ROM6-2 Run 1 2 3 4 5 6 7 8 9 10 11 12 13 14	Power supply	From backplane using PDM6-1 module or PDM6-2 module	
	Backplane interfaces	1 x EtherCAT OUT (Port 1) - LVDS 1 x EtherCAT OUT (Port 2) - LVDS	
	4 Relay outputs (changeover)	Type	Electromechanical
		Electrical rating	Resistive load (continuously): 250 VAC @ 2 A 120 VAC @ 2 A 48 VAC @ 2 A 24 VAC @ 2 A 220 VDC @ 0.2 A 110 VDC @ 0.3 A 48 VDC @ 1 A 24 VDC @ 2 A 12 VDC @ 2 A Inductive load: (AC:B300, DC:R300) Altitude derating 2,000-4,000 mMax. 150 VAC ⚠ CAUTION: Relays with working voltages >150 V AC must be operated within the same relay group and not next to relays with 30 V DC working voltage.
		Load type	Resistive, Inductive B300/R300 (power limit specification for inductive loads), Pilot duty
		Operating cycles	Mechanical: >1 x 10 ⁷ cycles Electrical: >50,000 cycles (depending of load)
		Response time (contact on/brake off)	Operate time (typical): 10 ms Release time (typical): 7 ms
		Isolation	Between relays: 2200 V 50 Hz for 1 minute Between relays and chassis: 3250 V 50 Hz for 1 minute
	Size	25.40 mm	
	Weight	131 g (incl. connectors)	
	Power consumption	Typical 1.5 W (all relays ON)	
	Connector, grip (included by default)	14 pole connector, push-in terminals, with snap lock 1810913 - FKC 2.5/14-ST-5.08-LR	
	Connector, screw	14 pole connector, push-in terminals, with snap lock 1873320 - FKC 2.5/14-ST-5.08-LR	

2.8 Temperature input modules

2.8.1 TIM6-1 module specifications

TIM6-1 is designed for the rough environment in a wind turbine, and all inputs and outputs are protected and isolated from other potentials.

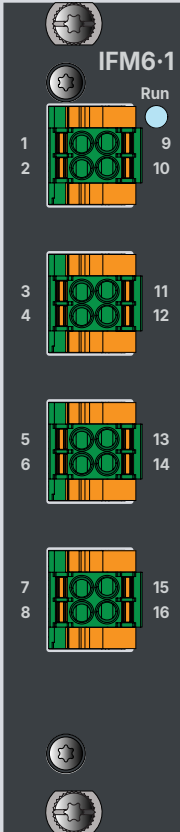
Temperature input module			
	Power supply	From backplane	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	14 (6) temperature inputs	Sensor type	Pt100
		Range	-50 to 200 °C
		Wire	14 (2) x Pt 100 2-wire connection or 0 (6) x Pt 100 3-wire connection, selectable mix
		Sampling	≤ 100 ms
		Cable error	Open input and short-circuit are detected
		Resolution	0.1 °C (16 bit ADC)
		Accuracy	1.0 °C at reference temperature 2.5 °C at operational temperature (2-wire cables must be shorter than 1 m)
		Isolation	14 (6) inputs in one group Isolated from other potentials, 500 V DC
	Size	25.40 mm	
	Weight	90 g (incl. connectors)	
	Power consumption	Typical 1.0 W (all inputs connected)	
	Connector, grip (included by default)	2 x 8 terminals: 1790548 2 x 6 terminals: 1790522	
	Connector, screw	2 x 8 terminals: 1790357 2 x 6 terminals: 1790331	

2.9 Communication interface modules

2.9.1 IFM6-1 module specifications

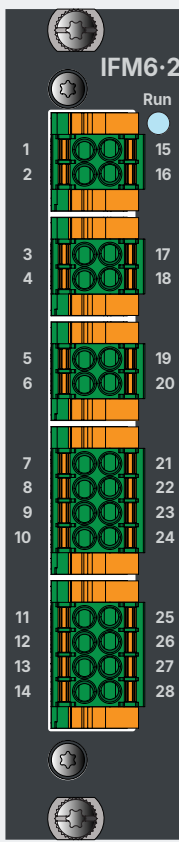
IFM6-1 is designed for the rough environment in a wind turbine, and all inputs and outputs are protected and isolated from other potentials.

The interface and Fieldbus module offer 2 x Profibus DP master and 2 x RS-485 ports.

Communication interface module			
 IFM6-1 Run 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Power supply	From backplane	
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) - LVDS	
	Processor	196 MHz industrial grade 32 bit microcontroller	
	2 x Profibus DP Master	Supported baud rates	9600, 19200, 45450, 93750, 187500, 500000, 1.5M, 3.0M, 6.0M, 12.0M < 1% error
		Biasing and termination	On or off (software select)
		Standards	PROFIBUS DP-V0 (cyclic data and diagnostics)
		Slaves	Max. 5 per Profibus DP Master
	Com 2 x RS-485 interfaces	Standards	TIA/EIA-485 shielded twisted copper cable
		Baud rate	2400, 4800, 9600, 19200, 38400, 45450, 57600, 115200, 230400 and 460800 < 1 % error
		Word length	7 or 8 bits
		Parity	None, even, odd
		Stop bits	1 or 2
		Flow control	None
		Communication lines	2 wire half duplex
		Biasing and termination	On or off (software selected)
	Isolation	Each communication port isolated from other potentials, 500 V DC	
	Size	25.40 mm	
	Weight	90 g (incl. connectors)	
	Power consumption	Typical 3.25 W (4 ports active)	
	Connector, grip (included by default)	2 x 2 terminals: 1790483	
	Connector, screw	2 x 2 terminals: 1790292	

2.9.2 IFM6-2 module specifications

IFM6-2 is designed for the rough environment in a wind turbine, and communication ports are protected and isolated from other potentials. The IFM6-2 interface and Fieldbus module offer 2 x CAN, 2 x SSI and 2 x High speed counter input.

Communication interface module				
	Power supply	From backplane		
	Power supply, SSI	Input level: 24 V (18 to 32 V) Note 1 : SSI power input must be left unconnected if SSI is unused. Note 2 : SSI power input has a TVS (Transient Voltage Suppression) diode of 33V to shield to protect the connected SSI encoder from damage during surge and burst test. Therefore, the SSI interface is not galvanic isolated from shield.		
	Backplane interfaces	1 x EtherCAT IN (Port 0) - LVDS 1 x EtherCAT OUT (Port 1) – LVDS		
	Processor	240 MHz industrial grade 32 bit microcontroller		
	2 x CAN interfaces	Standards	ISO 11898	
		Baud rate	20, 50, 100, 125, 250, 500, 800 or 1000 kbit/s Sample point at 70 to 85 % < 1% error	
		Isolation	Isolated from other potentials, 500 V DC	
		Termination	Open/120 Ω (software select)	
		Protection	24 V DC resistant data lines	
	2 x SSI	Standards	TIA/EIA-422 shielded twisted copper cable	
		Bit rate	250 kbps and 1000 kbps	
		Word length	16 - 32 bit (default 25 bit). Binary or Gray-code configurable in SW	
		Termination	Fixed	
		Communication lines	4 wire (clock and data)	
		Protection	24 V DC resistant data lines	
		Isolation	Isolated from other potentials, 500 V DC	
		Isolation, SSI	SSI power input has a TVS diode of 33V to shield to protect the connected SSI encoder from damage during surge and burst test. Therefore, the SSI interface is not galvanic isolated from shield.	
	2 x digital input with frequency measurement	Input	High: 13 to 30 V Low: -30 V to +5 V	
		Load	Typically 6mA (Vin >7V)	
		Bandwith	125 kHz hardware low-pass filter	
		Isolation	Isolated from other potentials, 500 V DC	
	Size	25.40 mm		
	Weight	92 g (incl. connectors)		
	Power consumption	Typical 3.0W		
	Connector, grip (included by default)	2 x 2 terminals: 1790483 2 x 4 terminals: 1790506		
	Connector, screw	2 x 2 terminals: 1790292 2 x 4 terminals: 1790315		

2.10 Condition monitoring modules

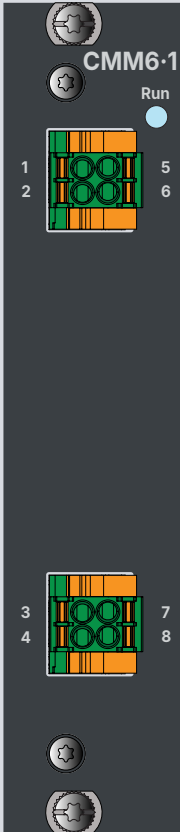
2.10.1 CMM6·x module specifications

Contact DEIF for availability

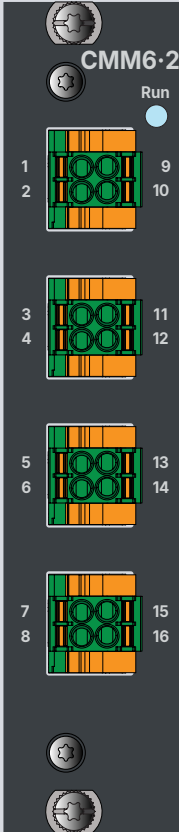
The module has built-in current excitation and all inputs are optically isolated from other potentials. CMM6·1 and CMM6·2 provide up to 4 high frequency analogue inputs. Use the inputs for:

- Measuring voltage signals up to 20 kHz
- Interfacing IEPE vibration sensors

CMM6·1 specifications

2 x high frequency analogue input module			
 CMM6·1 Run 1 2 5 6 3 4 7 8	Power supply	From backplane	
	Backplane interfaces *	1 x EtherCAT® OUT (Port 0) – LVDS 1 x EtherCAT® OUT (Port 1) – LVDS	
	2 High frequency analogue inputs	Sensor type	IEPE or Voltage input
		Excitation	Current: Selectable 0, 2, 4 and 6 mA Voltage: 24 V (minimum)
		Input range	Selectable range: • DC-mode: -10 to 20, ±10 to ±5, 2.5, 1.25, 0.62, 0.31, 0.16, 0.08, 0.40, 0.20 V (11 steps) • IEPE (AC)-mode: ±10, 5, 2.5, 1.25, 0.62, 0.31, 0.16, 0.08, 0.40, 0.20 V (10 steps)
		Impedance	300 kOhm
		Frequency range	DC- mode: 0.05 to 20.000 Hz (3dB) Anti-aliasing filter (DC/AC mode): Low pass -3 dB, 20 kHz butterworth, 3rd order, 77 dB in stop band @ >30 kHz AC- mode (IEPE): High pass is 0.05 Hz
		Sample rate	Up to 57kHz, 2 channels simultaneous Software selectable sample rate : 57594, 29297, 14648 or 7324 Hz Selectable down sampling : 1:2, 1:5, 10, 25, 50, 100, 250, 500, 1000, 2500, 5000
		Resolution	24 bit delta-sigma $\Delta\Sigma$ (including sign) 300 nV (gain 1, Range ±2,5Vp) ENOB = 19 @ OSR=256, 29297 sps
		SNR	Typical > 100 dB @ Range ±2.5 Vp
		Accuracy	± 0.5 % of selected range
		Diagnostic	Wire-break and short circuit
		Isolation	2 inputs in 2 groups, each optically isolated from other potentials, 500 V DC
	Connector, grip	CMM6·1: 2 x 2 terminals: 1790483 (included by default)	
	Size	25.4 mm	
	Weight	110 g (incl. connectors)	
	Power consumption	Max. 4 W	

CMM6-2 specifications

4 x high frequency analogue input module			
 CMM6-2 Run 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Power supply	From backplane	
	Backplane interfaces *	1 x EtherCAT® OUT (Port 0) – LVDS 1 x EtherCAT® OUT (Port 1) – LVDS	
	4 High frequency analogue inputs	Sensor type	IEPE or Voltage input
		Excitation	Current: Selectable 0, 2, 4 and 6 mA Voltage: 24 V (minimum)
		Input range	Selectable range: - DC-mode: -10 to 20, ±10 to ±5, 2.5, 1.25, 0.62, 0.31, 0.16, 0.08, 0.40, 0.20 V (11 steps) - AC- mode (IEPE):±10, 5, 2.5, 1.25, 0.62, 0.31, 0.16, 0.08, 0.40, 0.20 V (10 steps)
		Impedance	300 kOhm
		Frequency range	DC- mode: 0.05 to 20.000 Hz (3dB)Anti-aliasing filter DC/AC mode: Low pass -3 dB, 20 kHz butterworth, 3rd order, 77 dB in stop band @ >30 kHz IEPE (AC)-mode: High pass is 0.05 Hz
		Sample rate	Up to 57kHz, 4 channels simultaneous (Max 20kHz via EtherCAT for 4 channels) Software selectable sample rate : 57594, 29297,14648 or 7324 Hz Selectable down sampling : 1:2, 1:5, 10, 25, 50, 100, 250, 500, 1000, 2500, 5000
		Resolution	24 bit delta-sigma $\Delta\Sigma$ (including sign) 300 nV (gain 1, Range ±2,5Vp) ENOB = 19 @ OSR=256, 29297 sps
		SNR	Typical > 100 dB @ Range ±2.5 Vp
		Accuracy	± 0.5 % of selected range
		Diagnostic	Wire-break and short circuit
		Isolation	4 inputs in 4 groups, each optically isolated from other potentials, 500 V DC
	Connector, grip	CMM6-2: 2 x 2 terminals: 1790483 (included by default)	
	Size	25.4 mm	
	Weight	110 g (incl. connectors)	
	Power consumption	Max. 6 W	

NOTE * Data is buffered and transferred continuously via EtherCAT® to the EtherCAT® master. Use of data transfer bandwidth on the EtherCAT® bus has to be considered. The number of high speed analogue channels, down sampling rate and collecting intervals, and CPU power of EtherCAT® master has influence on bandwidth used for data transfer.

Available on request:

- Sample CODESYS application and library for Basic Signal processing, Frequency Analysis, Statistics, Level detection for Warning and Alarms.
- CMM6-3 and CMM6-4: 2- and 4-channel variants with shielded M12 connectors.

2.11 Accessories

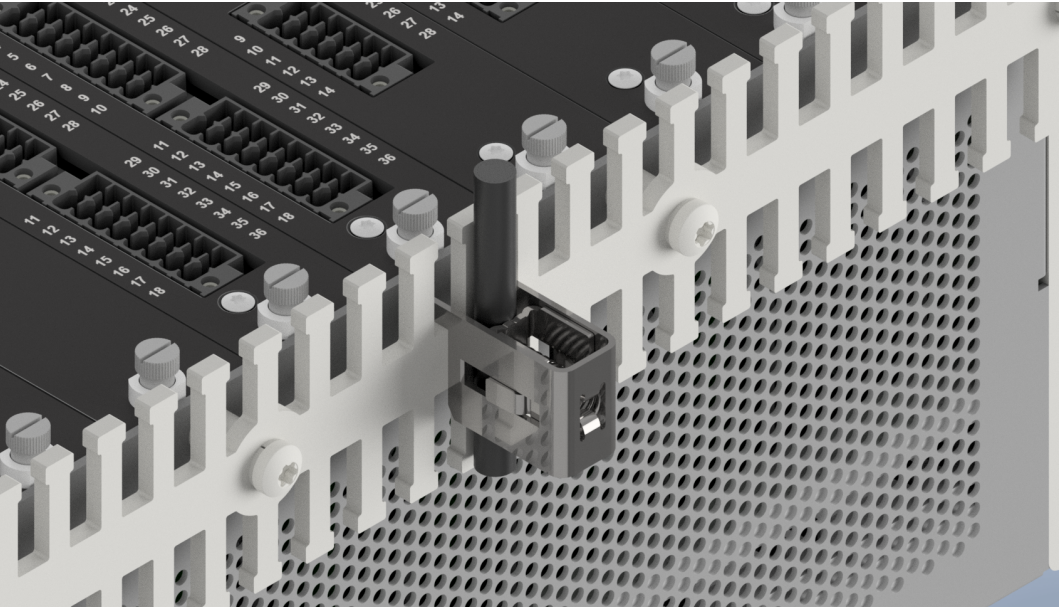
2.11.1 Wire support

The controller rack can be ordered with wire support brackets that are pre-mounted from the factory. The wire support is a 3 x 10 mm metal bar with hooks to secure and support wires, and is mounted at the top and bottom of the rack.

Shield clamps, typically used for communication cables (3 to 10 mm in diameter), can be mounted on the wire support bar. The clamps provide an EMC shield that is close to the input terminals.

Rack	Accessory
Rack6-10	Wiresupport, Rack6-10
Rack6-12	Wiresupport, Rack6-12
Rack6-14	Wiresupport, Rack6-14
Rack6-4	Wiresupport, Rack6-4
Rack6-6	Wiresupport, Rack6-6
Rack6-8	Wiresupport, Rack6-8

Wire support bracket mounted on a controller rack



2.11.2 Optional connector kits

Connector kit	Description
Conn. kit AIO6-1	Connector kit for AIO6-1
Conn. kit CMM6-1	Connector kit for CMM6-1
Conn. kit CMM6-2	Connector kit for CMM6-2
Conn. kit DIO6-1	Connector kit for DIO6-1
Conn. kit IFM6-1	Connector kit for IFM6-1
Conn. kit IFM6-2	Connector kit for IFM6-2
Conn. kit PCM6-1	Connector kit for PCM6-1
Conn. kit PCM6-2	Connector kit for PCM6-2

Connector kit	Description
Conn. kit PDM6·1	Connector kit for PDM6·1
Conn. kit PDM6·2	Connector kit for PDM6·2
Conn. kit TIM6·1	Connector kit for TIM6·1
Conn. kit 1..20	Connector kit for I/O module (1 pcs 2 x 20 pin)
Conn. kit 1..40	Connector kit for I/O module (2 pcs 2 x 20 pin)

2.11.3 Modules

Blank

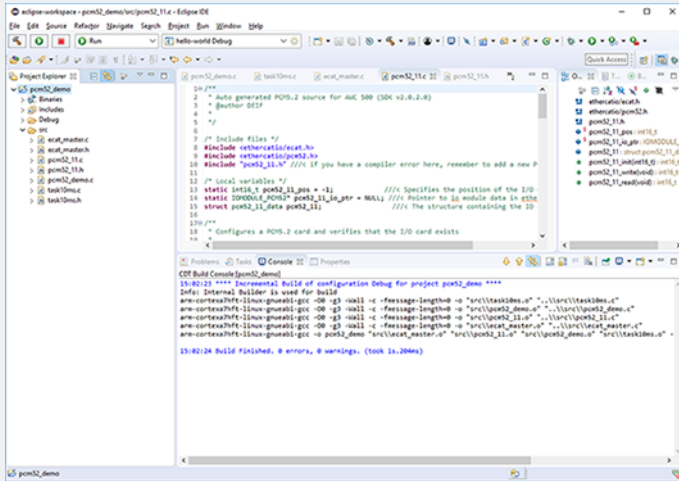
Specifications	
Size	25.40 mm
Weight	25 g

3. Application development

3.1 Software packages

3.1.1 C/C++ programming

Application development



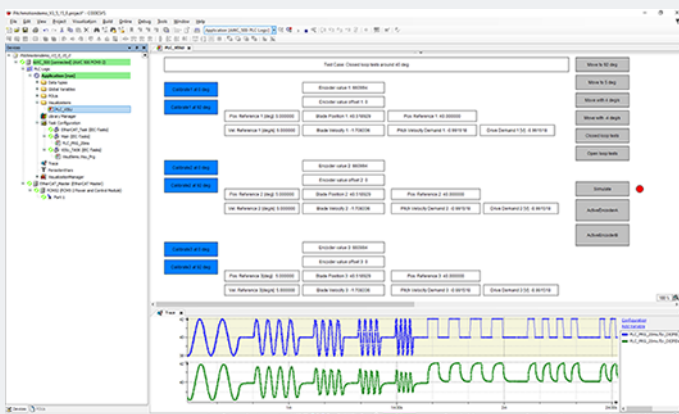
AMC 600 Linux SDK

Linux® SDK (Software Development Kit) available for use with for example Eclipse IDE, Visual Studio IDE or CODESYS IDE.

- Docker image with GNU gcc/gdb toolchain installed for remote compilation.

3.1.2 IEC61131-3 programming

Application Development



AMC 600 CODESYS package



IEC61131-3 PLC-programmed based on CODESYS V3 Programming languages:

- Sequential Function Chart (SFC)
- Function Block Diagram (FBD)
- Structured Text (ST)
- Ladder Diagram (LD)
- ANSI C/C++ (via AMC 600 Linux SDK)
- Multi-language help in Chinese, German and English
- Programmed via Ethernet connection (TCP/IP)
- Download of boot projects and source code
- Integrated PLC and task configuration
- Web visualisation on PanelPC or remote via Secure communication (HTTPS)
- Online debugging and sampling
- Trace-integrated simulation
- CODESYS V3.5 IDE
- DEIF AMC 600 TSP (Target Support Package) with EtherCAT device description files.

3.1.3 Supported software features

Software	AMC 600 Linux SDK	AMC 600 CODESYS (with Web visualization)
PLC runtime	-	CODESYS V3.5 SP18+
Programming		
IEC61131-3	-	LD, SFC, FBD, CFC, ST
	-	CODESYS V3.5 SP18+ IDE
C/C++	ANSI C/C++	Yes, as External Implemented libraries components and Components (.so files)
Network protocols		
	File Transfer Protocol (FTP), server and client (disabled by default)	
	Secure/SSH File Transfer Protocol (SFTP), server	
	Trivial File Transfer Protocol (TFTP), client	
	Secure Copy (SCP), server and client	
	Secure Shell (SSH), version 2, server and client	
	Network Time Protocol (NTP), client	
	Dynamic Host Configuration Protocol (DHCP), client	
	Access to cUrl from Linux OS	
Visualisation		
	HTML5/Javascript via build-in webservers	CODESYS Web visualisation
System Configuration		
	Webbased system configuration for IP address (static/dynamic), host name, change root, operator, admin, service user passwords, system information etc.	
Device handling	See separate Application Note https://docs.deif.com/secure/linux-sdk-examples/interface-local-io-pcm61-via-ethercat-vscode/index.html	CODESYS Device handling (EtherCAT Master, CANOpen Manager, Profibus Master etc.)
Configuration		
Visualisation designer		CODESYS V3.5 visualisation
Scope/trace		Scope/trace
HMI visualisation tool		CODESYS web visualisation
		Panel PC and remote HMI client (communication via HTTPS) Requires: Browser with HTML5/JavaScript support, such as Chrome, Firefox, Safari, Edge, and more
Controller redundancy	-	Yes - CODESYS Controller Redundancy (Option)

Communication protocols

Software	AMC 600 Linux SDK	AMC 600 CODESYS (with Web visualization)
OPC UA Server	-	Yes - CODESYS OPC UA Server
OPC UA Client	-	Yes - CODESYS OPC UA Client via Single License (purchase separately from CODESYS Store)
Modbus TCP Server	-	Yes - Modbus TCP Server (CODESYS)

Software	AMC 600 Linux SDK	AMC 600 CODESYS (with Web visualization)
		libModbus (DEIF)
Modbus TCP Client	-	Yes - Modbus TCP Server (CODESYS) libModbus (DEIF)
Modbus RTU Master	-	Yes - Modbus TCP Server (CODESYS) libModbus (DEIF)
Modbus RTU Slave	-	Yes - Modbus RTU Slave (CODESYS)
EtherCAT Master	Yes	Yes - EtherCAT Master (CODESYS)
CAN Layer II	-	Yes - via CODESYS library
CANopen Master	-	Yes - CANopen Master (CODESYS)
CANopen Slave	-	Yes - CANopen Slave (CODESYS)
PROFINET V2.3 Class A RT CONTROLLER	-	Yes - (CODESYS)
PROFINET V2.3 Class A RT DEVICE	-	Yes - (CODESYS)
Others		On request or via CODESYS Single License

4. Legal information

4.1 Disclaimer and copyright

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