

# PCM6-1

Computer module

**Data sheet**

4921240700-B



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# 1. About the 600 series

## 1.1 About the hardware modules

The 600 series is a PLC-based programmable automation controller (PAC) suitable for land, marine, and wind power control applications. It is class approved, designed to marine specifications and can withstand very harsh operating conditions.

The controller is a highly flexible, modular PLC and I/O system that is designed for usage across a wide range of industrial applications. It is reliable, robust and flexible.

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

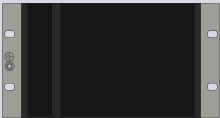
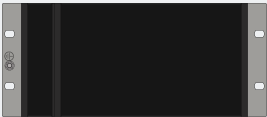
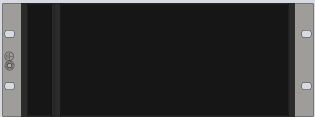
The hardware modules feature:

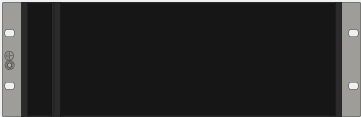
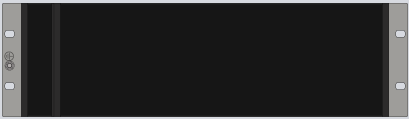
- Placement flexibility in the rack.
- Remove, replace, or add on-site.
- Automatically recognised.
- Configurable input and output functions (digital and analogue):
  - Digital input functions: Commands from operators or 3rd party equipment, changing configuration, operating information.
  - Digital output functions: Alarm status, commands to 3rd party equipment, operating information.
  - Analogue input functions: External set points, operating information, supervised binary inputs.
  - Analogue output functions: Operating information.

**NOTE** All slots must be covered during operation and blind modules can be used to cover unused slots.

### Rack sizes

The controller rack is available in six different sizes:

| Rack     | Slots | Ground plate dimensions<br>HxDxW (mm) | Weight (g) | Rack                                                                                 |
|----------|-------|---------------------------------------|------------|--------------------------------------------------------------------------------------|
| Rack6-4  | 4     | 122.0 x 113.9 x 182.4                 | 715        |  |
| Rack6-6  | 6     | 122.0 x 113.9 x 233.2                 | 870        |  |
| Rack6-8  | 8     | 122.0 x 113.9 x 284.4                 | 1020       |  |
| Rack6-10 | 10    | 122.0 x 113.9 x 334.8                 | 1175       |  |

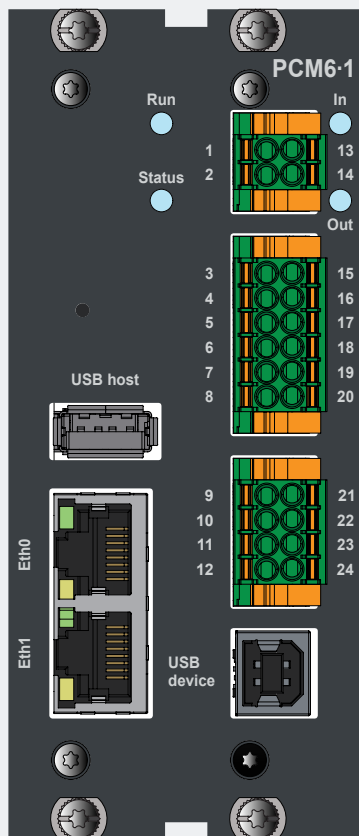
| Rack     | Slots | Ground plate dimensions<br>HxDxW (mm) | Weight (g) | Rack                                                                               |
|----------|-------|---------------------------------------|------------|------------------------------------------------------------------------------------|
| Rack6-12 | 12    | 122.0 x 113.9 x 385.6                 | 1335       |  |
| Rack6-14 | 14    | 122.0 x 113.9 x 436.4                 | 1500       |  |

## 2. Technical specifications

### 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<br>1 x EtherCAT OUT (Port 2) – LVDS                                                                                                                                                                                                                   |
| Digital input (In)            | High: 13 to 30 V<br>Low: -30 to +5 V<br>with reference to common<br>Load: Typically, 6 mA ( $V_{in} > 7\text{ V}$ )<br>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 $\Omega$ 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 $\Omega$ termination resistor and 500 $\Omega$ 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®<br>Fail-safe remote SW update<br>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<br>UL/ULC : Make sure Functional testing is part of the end application.                                                                                                                                                      |
| Protocols                     | See section <a href="#">Supported software features</a>                                                                                                                                                                                                                                |
| 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).<br>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<br>2 x 6 terminals: 1790522<br>2 x 4 terminals: 1790506 |
| Connector, screw                      |  | 2 x 2 terminals: 1790292<br>2 x 6 terminals: 1790331<br>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 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 webserver                                                                                                                 | 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. |                                                                              |

| Software                      | AMC 600 Linux SDK                                                                                                                                                                                                                                              | AMC 600 CODESYS (with Web visualization)                                                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device handling               | See separate Application Note<br><a href="https://docs.deif.com/secure/linux-sdk-examples/interface-local-io-pcm61-via-ethercat-vscode/index.html">https://docs.deif.com/secure/linux-sdk-examples/interface-local-io-pcm61-via-ethercat-vscode/index.html</a> | CODESYS Device handling (EtherCAT Master, CANOpen Manager, Profibus Master etc.)                                                                          |
| <b>Configuration</b>          |                                                                                                                                                                                                                                                                |                                                                                                                                                           |
| Visualisation designer        |                                                                                                                                                                                                                                                                | CODESYS V3.5 visualisation                                                                                                                                |
| Scope/trace                   |                                                                                                                                                                                                                                                                | Scope/trace                                                                                                                                               |
| <b>HMI visualisation tool</b> |                                                                                                                                                                                                                                                                | 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 |

## 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 -<br>Modbus TCP Server (CODESYS)<br>libModbus (DEIF)                                |
| Modbus TCP Client                   | -                 | Yes -<br>Modbus TCP Server (CODESYS)<br>libModbus (DEIF)                                |
| Modbus RTU Master                   | -                 | Yes -<br>Modbus TCP Server (CODESYS)<br>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                                                |

## 3. Legal information

### 3.1 Disclaimer and copyright

#### Third party equipment

DEIF takes no responsibility for the installation or operation of any third party equipment, for example, a **genset**. Contact the **manufacturer** or third party equipment company if you have any doubt about how to install or operate the third party equipment.

#### Open source software

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The product continuously monitors the operating temperature and stores this information in a log file on the device. DEIF uses this information for service purpose and to validate if issues with the product are covered by the warranty.

The software packages supplied are believed to be of the highest quality. Due to the nature of the software development process, it is possible that there are hidden defects in the software which may affect its use, or the operation of any software or device developed with this software package.

DEIF does not undertake responsibility for determining whether this package is suitable for the application, nor for ensuring the correct operation of the application software and hardware.

The warranty does not cover product wear parts, such as:

- Internal flash disc
- If applicable, SD card (purchased separately)
- Replaceable coil-cell battery, used for the real-time clock (available as a spare part)

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