Parker Automation Controller PAC120

Electrohydraulic Controller Module PACHC

ENGINEERING YOUR SUCCESS.

Our answer to the challenges of

In hydraulics, modern control technology and motion control systems are opening up new possibilities in system planning and are increasing both the productivity and the availability of applications. Through digitalization, system performance can be raised significantly and cost-effectively.
A user-friendly development environment is required, with which even users without any programming knowledge can not only design hydraulic axes with ease, but also put them quickly into operation.

To this end, Parker has developed a new generation of electrohydraulic controllers. It brings together technical know-how in a compact shape, yet simultaneously in a user-friendly manner, in an innovative system solution: with the PAC120 Parker Automation Controller and the electrohydraulic PACHC controller module. This combination is especially well-suited for applications in press, die casting, and injection molding machines. It is effortlessly scalable: from the controlling of individual axes to highly complex electrohydraulic control systems.

tomorrow

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In addition to the performance of hardware and software, user-friendliness was the focus when developing this modular system. The integrated development environment CODESYS and a Web-based graphical display make programming as convenient as never before. Pre-configured software packages shorten set-up, simulation, and commissioning times to a minimum. PAC120 and PACHC: a modular, easy-to-use system for the most demanding of hydraulic controls!

Your advantages with modern electrohydraulics from Parker:

- **Faster cycle times**
- **Higher process accuracy**
- **Less waste**
- **Lower power consumption**
- **Simple connectivity to other systems**

Parker's complete hydraulics kn

The PAC120 is a programmable automation controller with CODESYS V3 software and multiple communication interfaces. In conjunction with the PACHC controller module, it enables the positional and force/pressure control of two hydraulic axes per PACHC module. By lining up additional modules, this allows for expansion by up to 20 axes per PAC120 controller. The modular controller can be combined with different PACIO modules in order to use a variety of different digital and analog inputs and outputs, depending on requirements.

The PAC120 is connected to the user PC via a LAN interface for parameterization. It can communicate with the higher-level PLC through different fieldbus interfaces. Use as a standalone solution is also possible.

PAC120, PACHC, and PACIO are easily electrically connected by stringing the modules together on the DIN top-hat rail, and they communicate through the internal, pre-configured EtherCAT E-Bus Interface. ProfiNet IRT/IO, OPC UA, Modbus TCP, and EtherNet/IP are supported for external communication. Also, the PAC120 can be integrated into the machine control as an EtherCAT slave.

By using an additional PACIO bus extender module, the PAC120 can directly control other EtherCAT slaves, such as a Parker Drive Controlled Pump or EtherCAT valves.

ow-how in the smallest space

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This is what PAC120 and PACHC offer you:

- **IEC61131-3 and PLCopen Motion – standardized programming**
- **An integrated development environment for programmable logic, IO, visualization, and motion**
- **Pre-configured software modules for e.g. 2 and 4-axis synchronous motion or simple motion control**
- **Customized software solutions upon request**
- **Position, force, and pressure control and release control**
- **PACHC sampling time 250 µs – enables fast controller cycle times**
- **Modular system – can be optimally adapted to the respective application with additional modules**
- **Compact dimensions – reduces installation space requirements in the control cabinet**
- **Hardware and software from a single source – simplifies purchasing and servicing**
- **IIoT-ready – different interfaces for the networking of machines**

Ready for IoT: Parker Automatio

The programmable automation controller PAC120 combines standardized PLC logic with real-time control and various customer-specific visualization options. The integrated development environment CODESYS for programming logic, IO, visualization, and motion reduces the time involved in application development. Another advantage is the Web-based graphical user interface, which provides all the important information – such as regarding controller applications, data logging, or memory status – at a glance when required.

Common fieldbus types and OPC UA are supported for cross-machine data communication. Single or multi-axial movements through to cams can be projected into the familiar IEC 61131-3 development interface – together with the logic application (SoftMotion only with option PAC120-Mxx01-3X-xx-xx).

An SD card slot and a USB interface enable the local saving of process data and the replacement of control programs. This means the loading and replacement of software solutions during commissioning is simplified.

n Controller PAC120

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Technical data:

Product type:	programmable automation controller
Mounting type:	35 mm DIN top-hat rail, protection rating IP20
Voltage supply:	24 V DC
Operating temperature:	0 °C to +55 °C
Programming language:	IEC 61131-3 via CODESYS V3
Number of axes:	up to 20 (2 per PACHC module)
Communication:	
PAC120 (slave):	- PROFINET IRT / IO - Ethernet, Ethernet / IP - EtherCAT - Modbus TCP - OPC UA
PAC120 (master):	- EtherCAT internal with PACHC/PACIO via integrated E-Bus interface - EtherCAT external via additional extender module - Modbus TCP - CANopen
Visualization:	Web server / Web visualization
IOs:	1x DI 1ms interrupt-capable
Cycle time:	1 ms
Memory:	256 MB RAM / memory in flash
Specifications:	CE, UL-listed

Highly dynamic and precise cont

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The new electrohydraulic controller module PACHC has been specially developed for the control of hydraulic axes and enables precise positional, force, and pressure controls, as well as release controls. Its exceptional dynamics are based on a very low controller cycle time of 250 µs.

Analog sensors, such as pressure and force sensors, as well as digital position sensors for determining actual values, are locally connected to the PACHC. Proportional hydraulic valves are controlled via the analog outputs. In order to reduce programming complexity, and to shorten commissioning times, pre-configured software packages are available for free download on the Parker website.

Together with the powerful hydraulic valves from Parker, the system is ideally well-suited for the precise designing of complex control tasks, such as in press and die casting machines.

trol: PACHC

Technical data:

Product type:	programmable controller module
Mounting type:	35 mm DIN top-hat rail, protection rating IP20
Voltage supply:	24 V DC
Operating temperature:	0°C to +55°C
Number of axes:	1–2 per module
Interfaces:	
	- 4 analog inputs: 0–10 V, 0–20 mA or 4–20 mA
	- 4 analog outputs: ±10 V, 0–20 mA or 4–20 mA
	- 2 digital encoder inputs SSI, encoder TTL/HTL or EnDAT 2.2
Controller cycle time:	250 µs
Specification:	CE, UL-listed

Tailor-made performance: PAC1

The combination of PAC120 and PACHC can be integrated simply and seamlessly in a wide variety of controller concepts and can be expanded almost indefinitely depending on requirements. We have outlined two basic types here from actual practice, which demonstrate the versatility of the modular system.

Version 1: higher-level PLC

The standard scenario: the PAC120 acts as an interface and communicates with the higher-level controller via a fieldbus.

Typical data exchange:
PLC towards PAC

- Control word
  - Controller on/off
  - Start positioning / force control
  - Error acknowledgment
- Target position
- Target velocity
- Target force
- Target force increase
- Operating mode

PAC towards PLC

- Status word
  - Controller switched on yes/no
  - Start performed yes/no
  - Error present yes/no
- Actual position
- Actual speed
- Actual force or actual pressures (pA + pB)
- Valve opening

Typical functions:

- Setpoint setting via bus
- Independent control of 1-2 axes per PACHC, releasing between position and force
- Synchronous control of 2 axes, only possible occasionally
- Traversing a motion sequence
  - Position, speed, and force profiles
- Press: rapid motion, creep speed from switchover position, pressing force build-up from force threshold, wait for control bit, pressing force release, approaching top home position
- Die casting: position-dependent speed profile with pressure-dependent switchover to pressure profile.
- Calender: move axes to start position, activate synchronous operation, positioning in synchronous operation, switchover to force control (synchronous operation is increased) with tilting monitoring, approaching coupling position, activate synchronous operation, approach home position in synchronous operation.
- Monitoring actual values and condition-dependent actions (freely programmable in IEC61131) e.g.
  - Actual pressure > threshold
  - Number of cycles > default

20 and PACHC in practice

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Version 2:
PAC120 as standalone solution

Despite its compact dimensions, the PAC120 has the potential to take on the tasks of the higher-level machine controller. Through the expansion with additional digital inputs/outputs and the integration into the network, the following options are possible:

- Automation of a complete machine or cell
- Control of EtherCAT devices, e.g.
  - Drive Controlled Pumps
  - Valves
  - Motors (via frequency/servo inverter)
- Loading and saving of configurations and process data
- IoT gateway
  - Reading and writing of data via OPC UA (passive, only slave)
  - Sending of data to cloud applications (via http, active)

HMI / Webserver

- Display of target and actual values
- User interface for application
- User entry for set values and parameters
- Free design in CODESYS editor, several websites possible

With additional PACIO modules

- Controlling of pumps, switch valves, lamps, etc.
- Reading of sensors, buttons, proximity switches, temperatures, etc.

www.parker.com

EMEA Product Information Centre
Free phone: 00 800 27 27 5374
(from AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PL, PT, RU, SE, SK, UK, ZA)
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