



Modular Control System Hydraulic Controller

The Hydraulic Controller of the Robot Makers GmbH is suitable for **closed-loop control of hydraulic cylinders and drives**. The system especially allows **synchronous closed-loop control of multi-axe hydraulic arms**, based on **joint angles**. Therefore, it is predestined for the realization of **assistance functions** or the **automation of mobile machines**.

The integrated power amplifier controls the valve coils directly. Every coil current is controlled separately. The superimposed **dither frequency minimizes static friction effects** in the valve spool. To realize **fast reaction times**, **offset values** help keeping the valve in the operating point. The controller includes a three-stage **cascaded control structure**, which enables a **dynamic, sensitive and exact movement**. By defining positions and the corresponding velocities, a **trajectory control for hydraulic arms** can be realized. Thus, hydraulic drives are able to perform **high-precision movements**, which were previously reserved for servo motors. The position control helps to initiate exact positions and to realize an **electronic end-cushioning** with the help of minimum and maximum bounds.



The Hydraulic Controller is managed by the real-time capable bus system **EtherCAT**. A higher-level control system like the **Generic Control Box** or another EtherCAT-Master (e.g. with TwinCAT or CODESYS) allows aligning many actuators or sensors with each other. Typical movement profiles or the generation of trajectories is taken over by the higher-level control system. The higher-level control system further offers the possibility for the realization of an **electronic load-sensing system**. Thus, simple hydraulic systems can be used to save costs.

Further combinations of the interface-plug-in-cards and alternative enclosures are **available on request**.

Technical Data

Attributes	RM-MCS-HYD-BOX-001
Processor	FPGA with NIOS II (Altera) processor
Hardware functions (FPGA)	periphery, synchronous closed-loop control up to 4 axes
Fieldbusinterface	EtherCAT Slave
Nominal voltage / operating voltage	24 V / 12 V - 42 V
Power output stage / current max.	8 (4 axes) / 1.5 A per channel
PWM frequency / dither	20 kHz / yes
Position / speed control / cycle time	yes / yes / 1ms
Sensor interface SSI / analog / BISS	4 / 16 / on request
Housing / protection	aluminium box / IP 67
Dimensions / Weight	259 mm x 128 mm x 90 mm / ~0.5 kg

Model Description

RM-MCS-HYD-BOX-001	hydraulic control, box, 8x amplifier, 4x SSI, 16x analog
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technical changes reserved