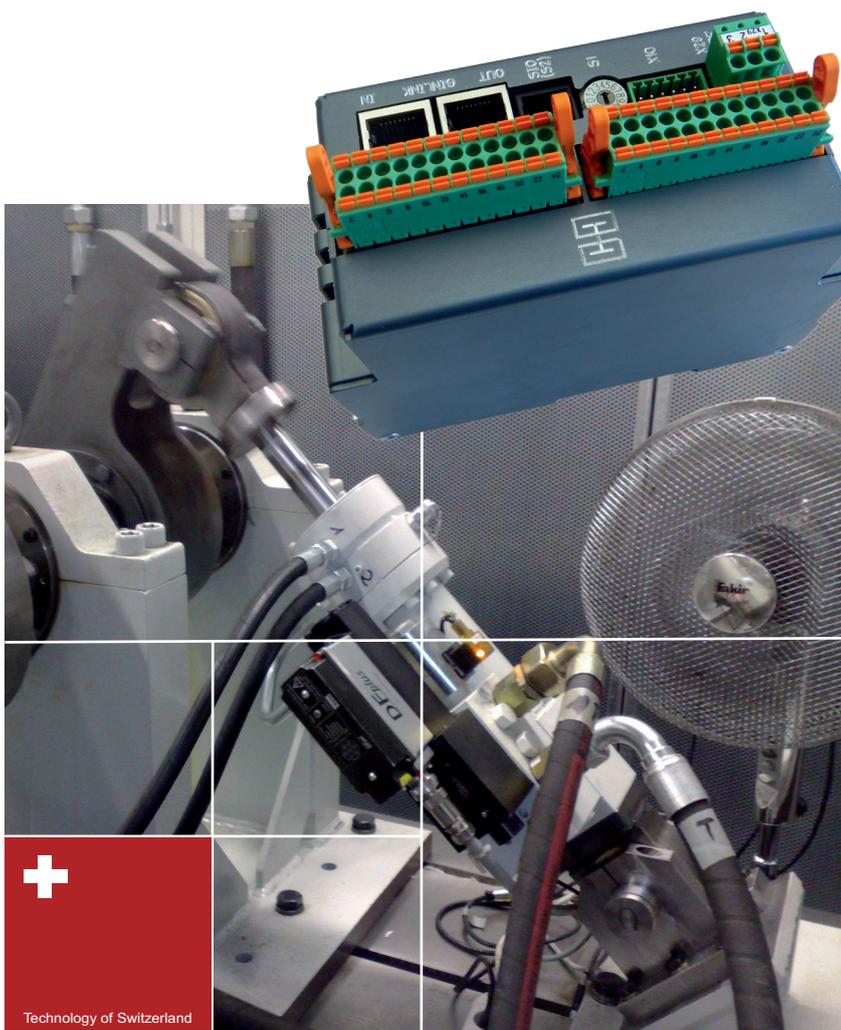


# MACSmini



- flexible control electronics for hydraulic drive equipment
- up to 6 axes
- Interrupt-time up to 2 kHz
- Expansion slots for more I/O cards



## MACSmini

The goal was to design most versatile control electronics for hydraulic drive equipment. Because in the long run customer requirements are generally individual, both hard- and software should be easily adaptable.

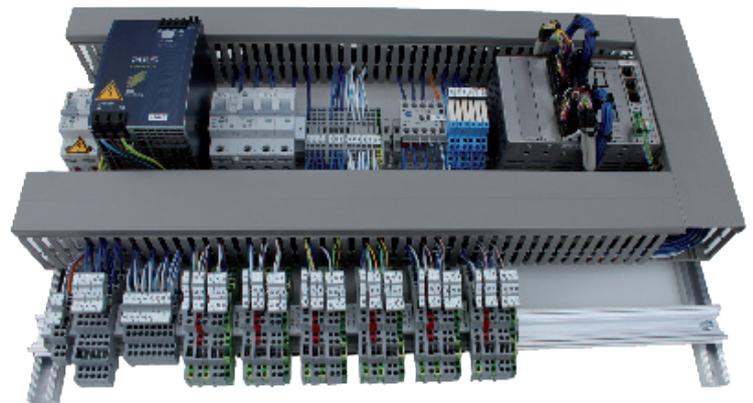
MACSmini system's great advantage is its compact but versatile software. Most of all, it is adapted to characteristic hydraulic circuits - made by hydraulics experts for hydraulic experts!

MACSmini system provides this kind of flexibility without forfeiting the simplicity aspired. Apart from the processor-board, as many as maximum 4 more interface boards can be deployed.

The electronics provide an Ethernet LAN interface and can be integrated with a network. For standard applications, a Windows user interface is included and offers numerous control, configuration and diagnosis options.



**Dimensions:**  
**height: 133 mm**  
**width: 59 mm**  
**depth: 100 mm**



Pre-mounted versions with terminals that facilitate integration with customer's control cabinet

## Features

- Distance, force, pressure: The controller is capable of controlling distance as well as force or pressure and can furthermore gently change between various reference variables. Force signals can also be realized via pressure measurements within the cylinder chambers. This feature facilitates interesting test station applications.
- Oscilloscope: Online presentation of any kind of signal source recordings in csv-text files.
- Safety: Safety circuit configurable with safety relays.
- Thresholds: Definition of numerous limit values for position, force, analogue inputs, etc.
- Logger: Recording large numbers of signals within any given time; also continuously, if requested.
- Auto-Controller Tuning: The controller automatically monitors the control circuit and defines the best control parameters.
- Harmonic wave compensation: In presence of sinus waves, the controller automatically compensates harmonic waves to create a nearly perfect time signal.
- Wave form generator: The integrated wave form generator facilitates signal forms like sinus, rectangle, triangle, trapezoid, etc.
- Hydraulic unit: Comprehensive hydraulic unit control can be integrated (pump, pressure-less circulation, cooling, level, etc.).
- Class-Library: Create your own control and user interface software with MACSmini.dll.

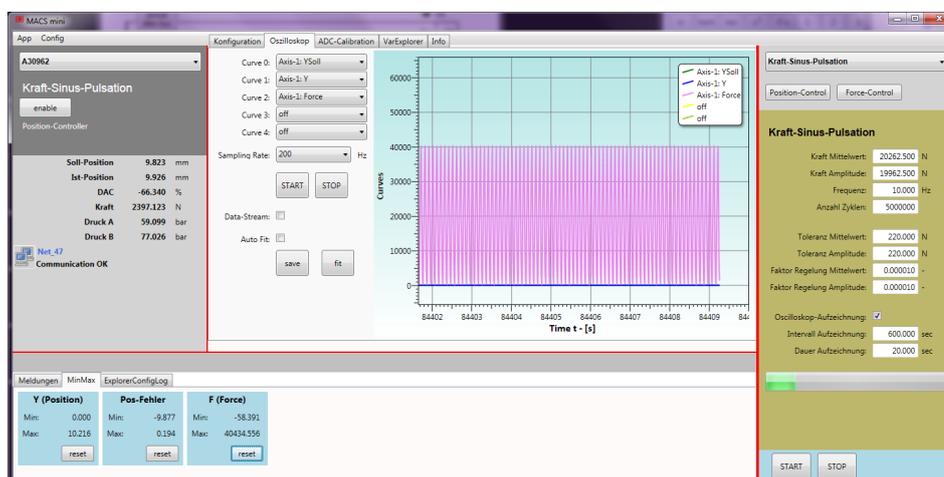
## Features

- Joystick: Controlling proportional valves with non-linear rising/falling values around zero. Loads that are delicate in terms of oscillation can thus be moved. The speed is defined via joystick.
- Force-pulsation: The force pulsates in a sinus curve between a defined minimum and maximum force. The peak values are optimized and continuously updated. An additional oscilloscope item allows for recording force and distance in freely selectable intervals.
- Teach pad: The drives can optionally be controlled via freely selectable digital inputs. Parameters for velocity, thresholds (displacement, force, pressure, etc.) can be set.
- Drive-Files: Load freely selectable signal curves for position, force, pressure, which the controller retraces.
- Path interpolation: Define freely selectable nominal values, which the controller approaches by path interpolation.
- Sweep: Program sinus waves of variable frequency.
- Open-Loop: Direct servo valve activation.
- Drive synchronization: Two or more axes can be synchronized (synchronous run control).
- Pretension mode: The drive follows the path in a controlled manner until the requested force has been achieved. It then switches to force-control.
- Force-distance curves: Automatically recorded distance-force- (or force-distance) curves. Distance, force or both (achieved first) can be defined as limit value.
- Messaging system: All events are logged and recorded. The message-log-files allow for tracking all events and their time of occurrence within the drive system easily and at any time.

## Software

The controller has been designed to function fully independent and for complex applications, such as e.g. in test facilities. Comprehensive software is

available to support respective tasks. The user interface of MACSmini-ControlStudio serves as key tool and allows for controlling all defined drives.



## Specifications

Processor:	Power-PC, 330 MHz, Single-Core
Cycle time controller:	1 kHz
Connection:	Indel GinLink Ethernet (1000 Mbit) RS232
Number of axes:	6 hydraulic drives (booster cylinder and rotary drive)
Memory:	32 MB RAM 4 MB Flash 512 kB NV-RAM
Bus-systems*:	Profibus DP, EtherCAT, Ethernet-IP, etc. (Hilscher modules deployable)
Interfaces per module:	
Option ADA	8 analogue inputs (+/- 10V, 16 Bit) 8 analogue outputs (+/- 10V, 16 Bit)
Option IO	16 digital inputs 24V 16 digital outputs 24V, short-circuit proof
Option SSI	6 universal encoder-inputs optionally incremental encoder, SSI, counter, etc.
Option HIL	Interface for Hilscher fieldbus-modules

\* Option HIL required

## Applications



### Carousel:

Cabin-control via joystick by passenger with integrated shock absorption.



### Test facility aircraft landing gear:

Automatic calculation of force-distance-curves for aircraft landing gear with test report issuance.



### Motion-controller for the film industry:

Joystick-controller for show effects with superimposed return to initial position.



### Strength tests for connections:

Force-pulsation with accurate amplitudes and number of load changes.



### Wood-processing machine for saw mill:

control for 6 axes, which are actuated via profibus-interface.



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