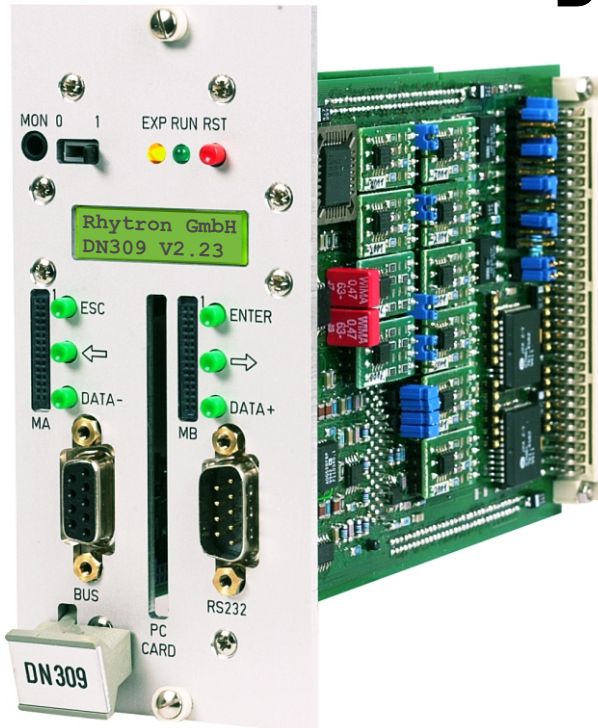


## Digital Controller DN309



The DN309 module is an extremely compact digital controller developed for very demanding drive applications. It can control electromechanical as well as hydraulic drives, whereby the special demands encountered in hydraulic applications have been taken into account. The module's hardware allows the control of systems using digital and/or analog sensors.

A typical application using *digital* sensors is the control of position and speed of two hydraulic cylinders operated in either synchronized or non-synchronized mode. The preferred displacement sensors for this application are absolute ultrasonic transducers with SSI interface, integrated in the cylinders and connected directly to the DN309. Auxilliary parameters like pressure and acceleration can be measured using analog sensors which are also fed directly into the system.

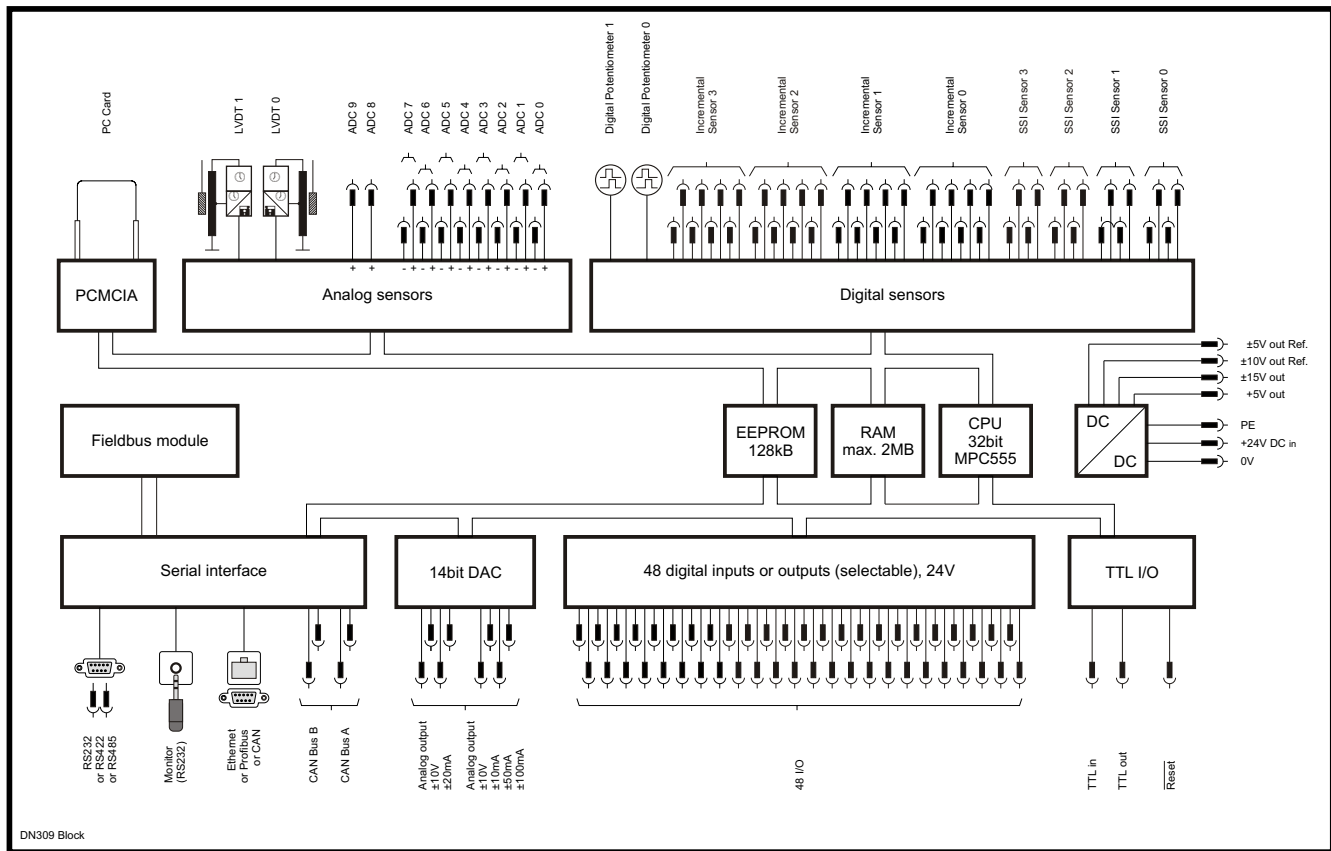
Another application is the p/Q control of a hydraulic displacement pump with analog sensors. In this application the mass flow, pressure and power control modes are combined with one another. System variables like rotation angle, power, pressure and their setpoints are entered over the analog sensor circuitry. As an option, the pulse encoder can be used for power calculation at variable rotational speed or for control of this rotational speed.

Proportional valves, control valves or servo valves can be used for the control of the hydraulic drives. The DN309 can output the usual  $\pm 10V$  as well as the  $\pm 100mA$  signals required for the direct control of servo valves.

The software is especially well suited for the operation of hydraulic cylinders. This is especially the case for their control systems and is extremely important for these applications where heavy loads are to be moved by very long cylinders and where, because of hydromechanical constraints, a very low system resonant frequency is demanded. Under these operating conditions, additional software modules will stabilise the control function:

- Positional condition controller with direction sensitive preemptive control action
- Integrated speed control using displacement differentiation or tachometer
- Integrated acceleration control using accelerometer or area corrected differential pressure
- Integration of the valve characteristics using adjustable linearizing
- Enabling or disabling of the I-parameter as a function of the operating conditions
- Combined positional control / force limiting control / pressure control / speed control

# Digital Controller DN309



## Technical specifications (incl. options)

Dimensions	28 x 60 x 202 mm (h x w x d) Front cover 3 HU x 12 DU	Analog inputs	Resolution of A/D converter: 16 bits 2 ground referenced inputs for $\pm 10V$ or $\pm 20mA$ 8 differential inputs (as plug-in modules: $\pm 10V$ , 4...20mA, etc.) of which 2 filter modules with hardware differentiation 2 MF channels for inductive position transmitters 2 pulse inputs for rpm counters
Connectors	2 x 96 contacts (DIN 41612 C96)	Analog outputs	Resolution of D/A converter: 14 bit 4 outputs for $\pm 10V$ , $\pm 10mA$ , $\pm 50mA$ or $\pm 100mA$ 4 additional outputs $\pm 10V$ or $\pm 20mA$
Power requirement	24V DC	Interfaces	1 serial interface RS232 over SubD9 on the front panel, or as RS422 or RS485 over the main connector 2 CAN interfaces
Auxiliary voltages	$\pm 10V$ (reference voltage, 10mA max.) $\pm 5V$ (reference voltage, 10mA max.) $\pm 15V \pm 5\%$ , 50mA max. $+5V \pm 5\%$ , 500mA max.	BUS systems	Profibus (DP), Ethernet (TCP/IP, UDP), or CAN (CAN OPEN) over plug-in connectors on the front panel
Microprocessor	Motorola MPC555 40MHz with integrated 448K FLASH, floating point arithmetic and time processing unit.	Integrated controls	1 backlit LCD screen, 2 x 16 characters 6 keys for menu driven inputs 2 30-pin connectors for diagnostics
Memory	512K static RAM 128K non-volatile memory 1 PCMCIA slot for battery powered RAM or FLASH	Digital I/O	48 inputs/outputs 24V 1 interrupt sensitive TTL input 1 TTL output
Digital sensors	2 channels for incremental setpoint potentiometers 1 incremental sensor with TTL strobe inputs 2 SSI sensors		