



## Laboratory Controller UPC – The Hardware



The universal proportional controller UPC is intended for use as a platform for measurement and monitoring devices which are used to control proportional valves and solenoids.

The analogue interfaces are equipped with a 14 bit analogue-digital converter. The drivers for the solenoids are suitable for very high clock frequencies. The UPC receives its function via the software.

The hand terminal MT and the PC program ConDoc - Control&Document® serve to adapt and input the machine-specific data.

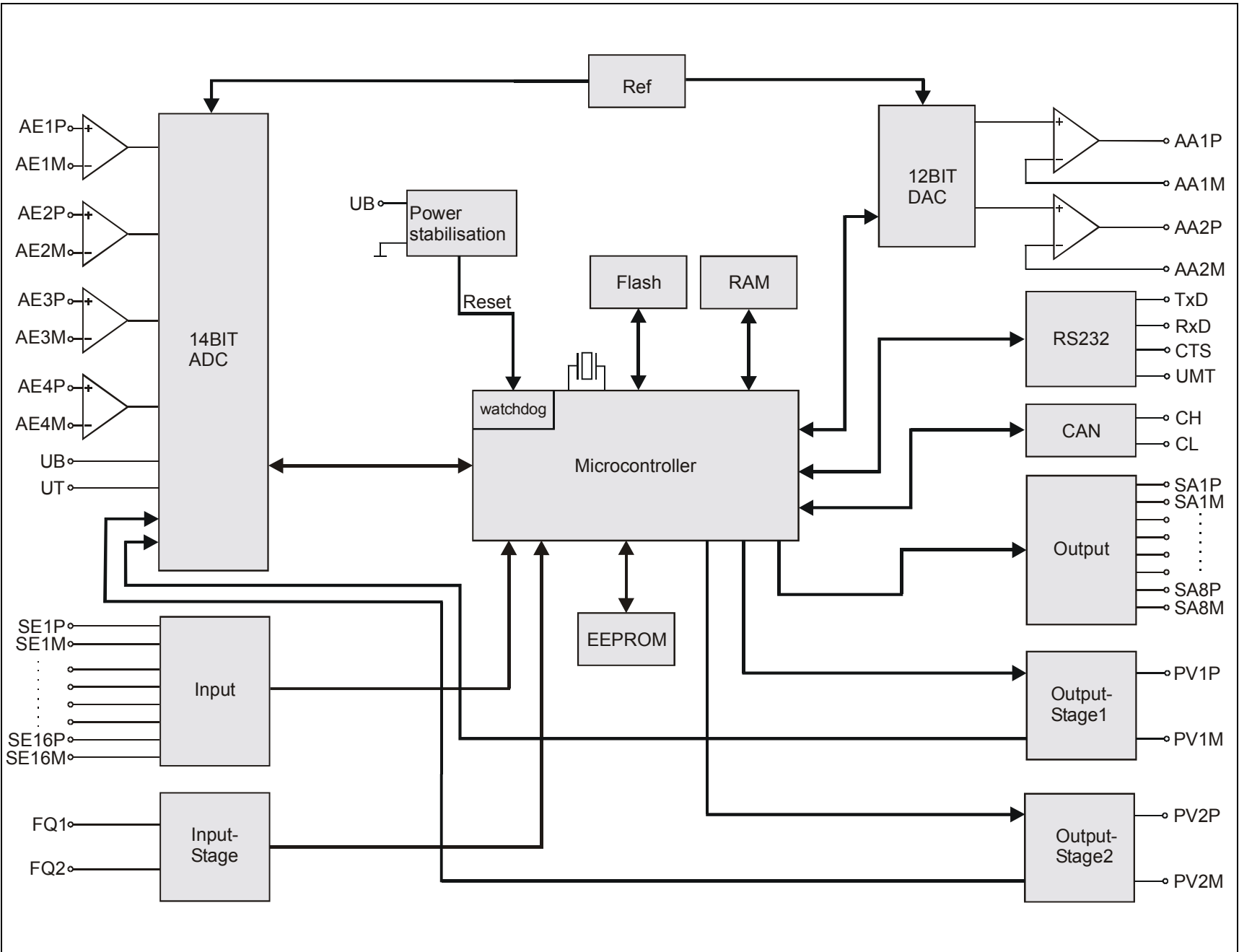
The CAN field bus enables communication with other electronics systems and the interconnection of several UPC controllers.

### Overview of the inputs/outputs:

- 16 switch inputs via opto couplers
- 8 switch outputs via opto couplers
- 4 analogue inputs with differential inputs
- 2 analogue outputs
- 2 frequency inputs
- 2 outputs for proportional solenoids with current regulation and switchable quick discharge
- CAN interface
- RS232 interface

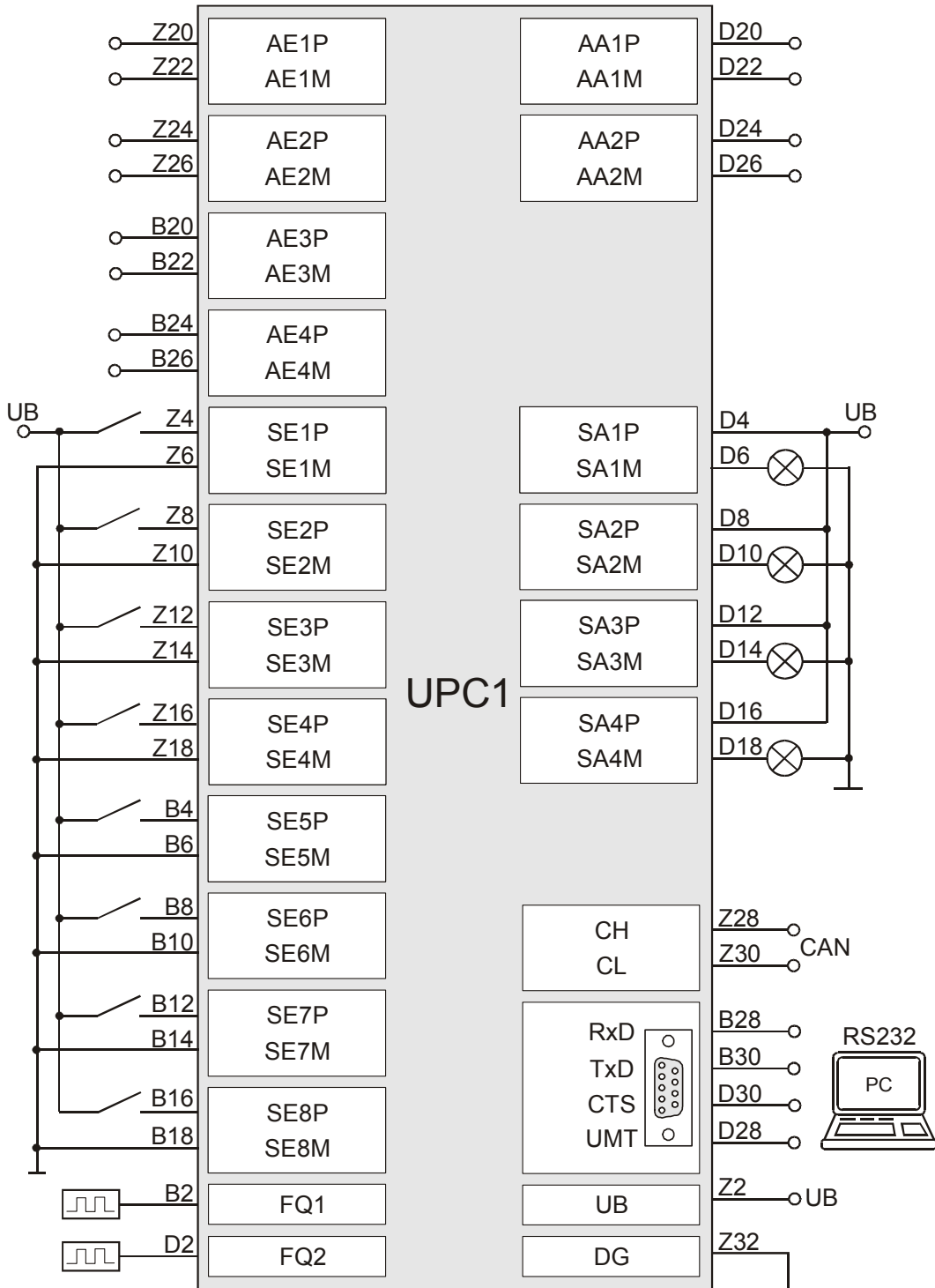


### UPC Block diagram



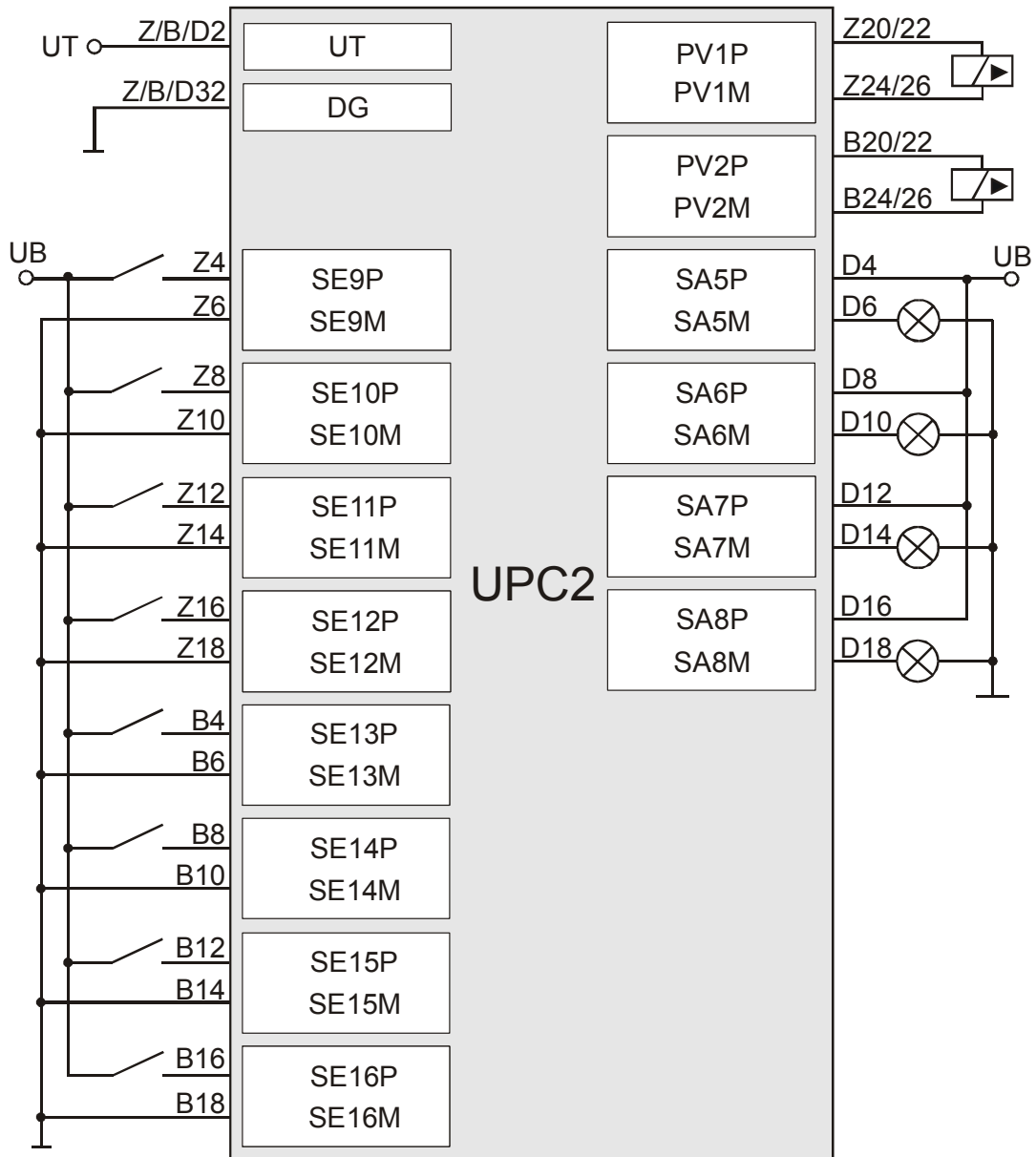


## UPC Connection diagram





## UPC Connection diagram 2



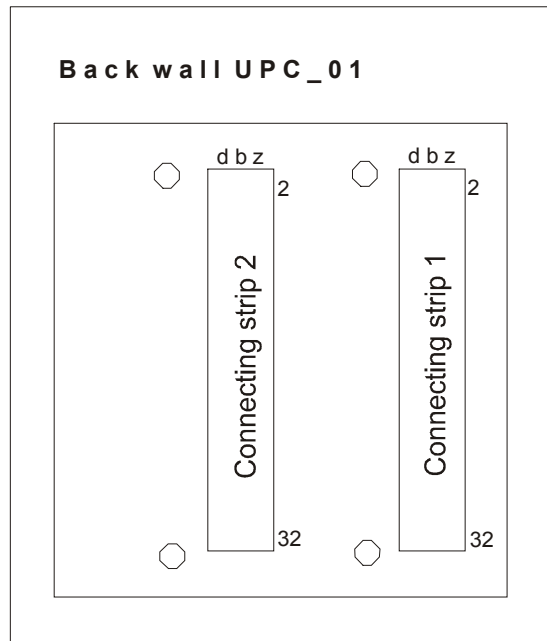


## UPC Interior view



## UPC Back wall

Plugs 1 and 2:  
multiple plug,  
DIN41612,  
type F, 48 contacts.



**UPC Pin assignment 1**

Z2	UB	Supply, plus (24V)
Z32	DG	Supply, minus
Z4	SE1P	Switch input 1, plus
Z6	SE1M	Switch input 1, minus
Z8	SE2P	Switch input 2, plus
Z10	SE2M	Switch input 2, minus
Z12	SE3P	Switch input 3, plus
Z14	SE3M	Switch input 3, minus
Z16	SE4P	Switch input 4, plus
Z18	SE4M	Switch input 4, minus
B4	SE5P	Switch input 5, plus
B6	SE5M	Switch input 5, minus
B8	SE6P	Switch input 6, plus
B10	SE6M	Switch input 6, minus
B12	SE7P	Switch input 7, plus
B14	SE7M	Switch input 7, minus
B16	SE8P	Switch input 8, plus
B18	SE8M	Switch input 8, minus
D4	SA1P	Switch output 1, plus
D6	SA1M	Switch output 1, minus
D8	SA2P	Switch output 2, plus
D10	SA2M	Switch output 2, minus
D12	SA3P	Switch output 3, plus
D14	SA3M	Switch output 3, minus
D16	SA4P	Switch output 4, plus
D18	SA4M	Switch output 4, minus
Z20	AE1P	Analogue input 1, plus
Z22	AE1M	Analogue input 1, minus
Z24	AE2P	Analogue input 2, plus
Z26	AE2M	Analogue input 2, minus
B20	AE3P	Analogue input 3, plus
B22	AE3M	Analogue input 3, minus
B24	AE4P	Analogue input 4, plus
B26	AE4M	Analogue input 4, minus
D20	AA1P	Analogue output 1, plus
D24	AA2P	Analogue output 2, plus
D26	AA2M	Analogue output 2, minus
B2	FQ1	Frequency input 1
D2	FQ2	Frequency input 2
Z28	CH	CAN High
Z30	CL	CAN Low
B28	RXD	RS232 Receive cable for the hand terminal on the PC
B30	TXD	RS232 Send cable for the hand terminal on the PC
D30	CTS	RS232 handshake line
D28	UMT	Supply current for the hand terminal

**UPC Pin assignment, pin 2**

Z2	UT	Driver supply, plus
B2	UT	Driver supply, plus
D2	UT	Driver supply, plus
Z32	DG	Driver supply, minus
B32	DG	Driver supply, minus
D32	DG	Driver supply, minus
Z4	SE9P	Switch input 9, plus
Z6	SE9M	Switch input 9, minus
Z8	SE10P	Switch input 10, plus
Z10	SE10M	Switch input 10, minus
Z12	SE11P	Switch input 11, plus
Z14	SE11M	Switch input 11, minus
Z16	SE12P	Switch input 12, plus
Z18	SE12M	Switch input 12, minus
B4	SE13P	Switch input 13, plus
B6	SE13M	Switch input 13, minus
B8	SE14P	Switch input 14, plus
B10	SE14M	Switch input 14, minus
B12	SE15P	Switch input 15, plus
B14	SE15M	Switch input 15, minus
B16	SE16P	Switch input 16, plus
B18	SE16M	Switch input 16, minus
D4	SA5P	Switch output 5, plus
D6	SA5M	Switch output 5, minus
D8	SA6P	Switch output 6, plus
D10	SA6M	Switch output 6, minus
D12	SA7P	Switch output 7, plus
D14	SA7M	Switch output 7, minus
D16	SA8P	Switch output 8, plus
D18	SA8M	Switch output 8, minus
Z20	PV1P	Proportional output 1, plus
Z22	PV1P	Proportional output 1, plus
Z24	PV1M	Proportional output 1, minus
Z26	PV1M	Proportional output 1, minus
B20	PV2P	Proportional output 2, plus
B22	PV2P	Proportional output 2, plus
B24	PV2M	Proportional output 2, minus
B26	PV2M	Proportional output 2, minus

**UPC Technical data**

Dimensions:	190 x 128 x 116 mm (160 mm plug-in card, 21TE, 3HE in 19 inch housing)
Weight:	1200g
Plug connections:	Multiple plugs, DIN41612 type F, 48 contacts D sub-socket for RS232, 9 contacts
Power supply:	UB = 8 ... 32V
Driver supply:	UT = 0 ... 60V
Current consumption:	Approx. 180mA at 24V
Driver current input:	Load dependent, maximum 10A
Parameter settings:	Using hand terminal MT or PC (RS232)
Microcontroller:	C167CR / 25MHz
Program memory:	1MByte flash EPROM
Data memory:	256kByte RAM
Parameter memory:	64kBit EEPROM
Interfaces:	RS232, CAN
Inputs:	16 Switch entries, individually separated by electroplating, input resistance > 4k $\Omega$ , switch thresholds: 2.0 ... 4.0V, with reverse pole protection 4 Analogue inputs, 14 bit resolution, voltage range: -10 ... 10V input resistance > 100M $\Omega$ 2 Frequency inputs, pull down resistor: 4.7k $\Omega$ , switching thresholds U <sub>on</sub> = approx. 5.8V, U <sub>off</sub> = approx. 3V, suited for up to 4KHz, can also be used as switch inputs
Outputs:	8 Switch outputs, each for a maximum of 40mA, 32V, individually separated by electroplating, with reverse pole protection, protected against temporary overload 2 Analogue outputs, 12 bit resolution, voltage range -10 ... 10V, load resistance >= 1k $\Omega$ ; protected against short-circuits 2 Proportional solenoid outputs with a maximum of 5A, configurable protective circuit: recovery diode / 30V zener diode, current measurement with 14 bit resolution (6A range)
Safety:	Microcontroller watchdog Reverse pole protection at UB Protection system IP 30
Surrounding temperature:	0 ... 70°C
EMV:	Corresponds with the limit values according to - EN 50081-2 and EN 50082-2 for industrial application

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