

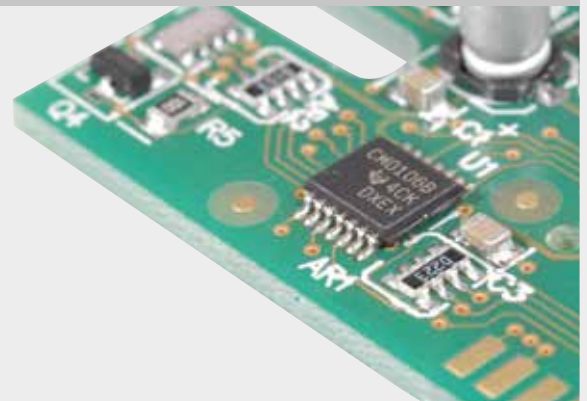
THE VALVE IN DETAIL

Clever Multimach valves can be used to form autonomous and intelligent valve island subsystems. Each valve has a microchip that performs a series of functions connected with operation and dialogue with the valves before and after it. Valves communicate via serial transmission. CM refers to the communication protocol patented by Metal Work. It is a field-bus in its own right, designed specifically for very easy control of islands of pneumatic solenoid valves. CM valves have a diagnosis system that detects electrical faults. It can also be used to verify during installation that all connections are correct. Multi-pole connections and field buses with different communication protocols are available for controlling the valve distribution island. Addressing of single outputs is not required as the connection number of each solenoid pilot is assigned automatically based on the position occupied by the valve.



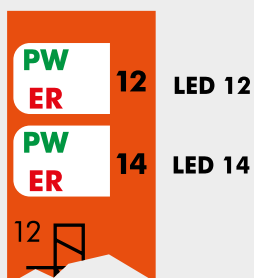
SMART VALVE

Each valve comes with a microchip that controls operation and dialogue with the other valves.



LOCAL DIAGNOSTICS

Each Clever Multimach valve has a LED diagnostic system that identifies immediately whether a pilot is energized, the contact is interrupted or there is a short-circuit.



LED 14	LED 12	DESCRIPTION OF THE FAULT
OFF ○	OFF ○	No fault, EV1-EV2=OFF
ON (green) ●	OFF ○	No fault, EV1=ON - EV2=OFF
ON (green) ●	ON (green) ●	No fault, EV1-EV2=ON
OFF ○	ON (green) ●	No fault, EV1=OFF - EV2=ON
RED (flashing) ⦿	OFF ○	Solenoid pilot EV1 interrupted or disconnected
OFF ○	RED (flashing) ⦿	Solenoid pilot EV2 interrupted or disconnected
ON (red) ●	OFF ○	Solenoid pilot EV1 short circuit
OFF ○	ON (red) ●	Solenoid pilot EV2 short circuit
GREEN (flashing) ⦿	OFF ○	Data update time out, communication faulty

INPUT MODULES

With a suitably arranged Clever Center, you can insert add-on modules.

When connecting buses, the add-on modules can only be used for PNP INPUTs.

With a multi-pole connection, the following INPUTs and OUTPUTs can be used:

- DIGITAL INPUTs, as cylinder sensors for example
- DIGITAL OUTPUTs
- ANALOGUE INPUTs (but the LEDs do not light up)
- ANALOGUE OUTPUTs (but the LEDs do not light up)

They can be combined, even on the same module. You can choose between PNP or NPN connections via a dip switch-type selector.

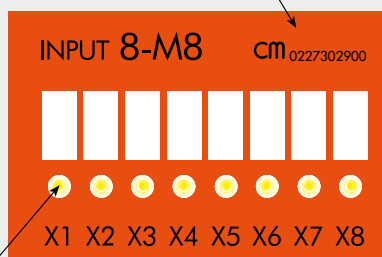
All the INPUTs/OUTPUTs must be the same type, i.e. all PNP or NPN.



MAXIMUM EXTENSION OF ADD-ON MODULES

Up to 4 modules can be connected, giving a total of 32 input signals.

Ordering code

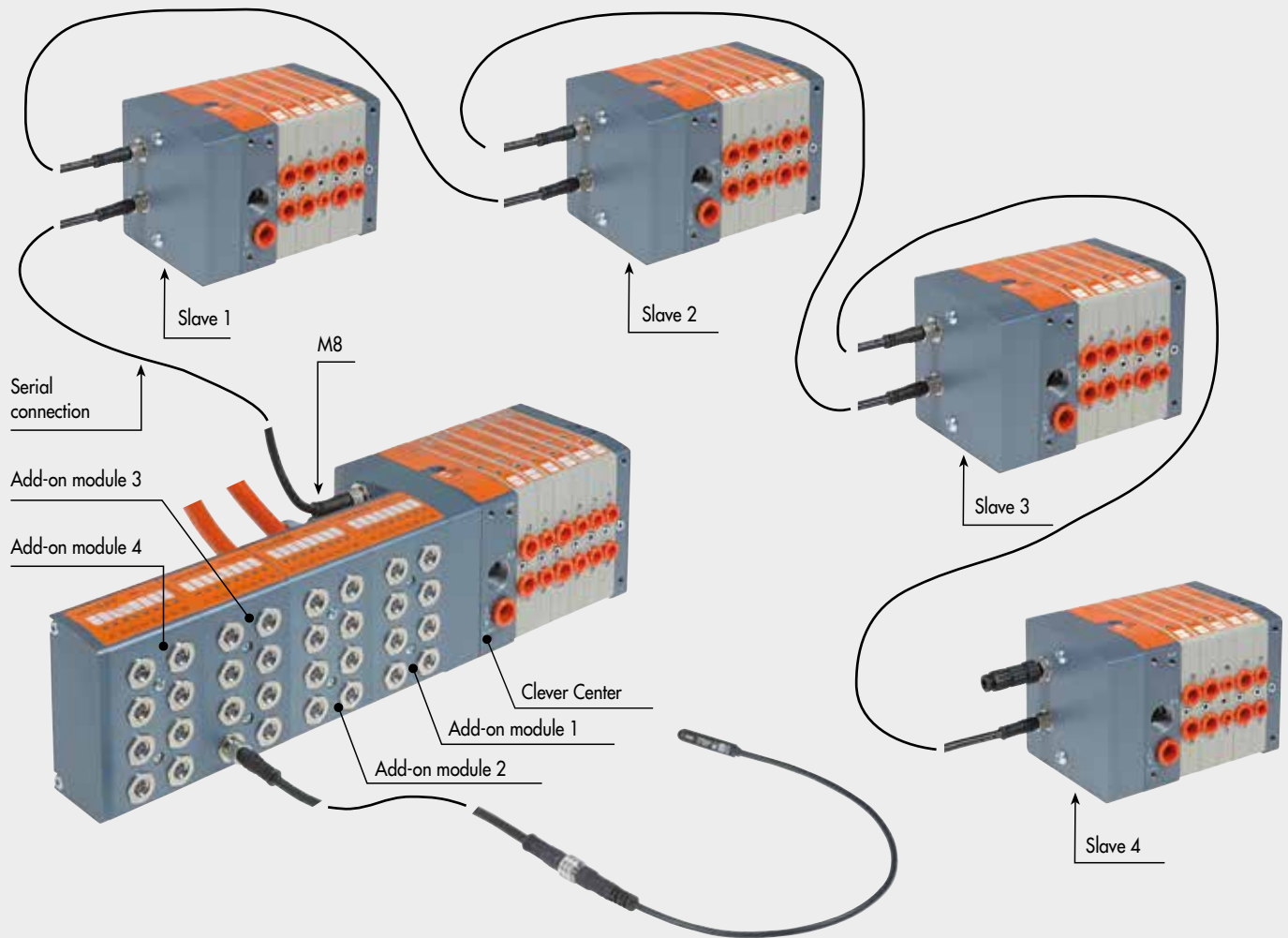


A yellow LED for each input/output
(visible for digital types)



EXAMPLE OF A CM LAYOUT

The Clever Center can relay command signals to other islands of "slaves". Transmission, in serial mode, is via a cable with M8 connectors. Commands can be sent from the first slave island to other slave islands in cascade, again via cables with M8 connectors. Addresses are assigned automatically, based on intuitive sequential logic. This means that other slaves can be added downstream at any time, until all available outputs are in use.

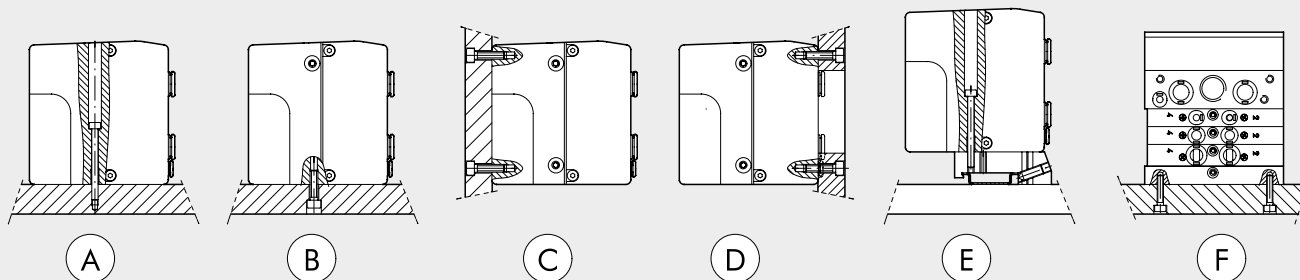


NOTES

TECHNICAL DATA

Valve port connections	Ø 4,6,8 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port		
Connection on the end-plate 1-11 for the supply of pilots	Automatic fitting Ø 4 mm		
Maximum number of pilots	See input end-plate technical data		
Maximum number of valves	See input end-plate technical data		
Operating temperature range	-10 to +60 °C		
Fluid	Filtered air without lubrication; lubrication, if used, must be continuous		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6
version 5/2 and 3/2	200	200	500
version 5/3	200	300	650
Pressure range	X (pilot supply)	1-11 (valve supply)	
end-plate 1-11	3 to 7 bar	vacuum at 10 bar	
end-plate 1			
Voltage range		3 to 7 bar	
		24 VDC ±10%	
Power for each pilot	W	(slave protected against overload and reverse polarity)	
Solenoid Pilot Insulation class		0.9	
Degree of protection		F155	
Diagnostics and protections		IP65 (with conveyed exhaust, and that - in case of no use)	
		Local via PC/PLC fault led. For defects signalled look at the manual.	
		Outlets protected against overload and short-circuit	
Solenoid rating		100% ED	
Maximum latency time of the serial transmission	ms	<10	
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45	
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33	
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20	
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20	
Note on use		Insert the pipes in the fittings, before passing air through the valves, otherwise the gasket may be pulled out of its seat by the flow of air.	
Compatibility with oils		See chapter Z1	
Add-on module			
Sensor supply voltage		24 VDC ±10%	
Maximum current for each single connector	mA	200	
Maximum current for each module	mA	400	
Maximum total current of all the modules	mA	1000	
Input impedance	KΩ	3.9	
Max input voltage	Vcc	-5 to +30	
Type of input		With field bus: PNP	
Protection		With multi-pole connection: PNP/NPN configurable via DIP SWITCH	
Active input signalling		Protected inputs against overload and short-circuit	
		One LED for each INPUT	

FIXING THE BASE



- Ⓐ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate.
- Ⓑ Ⓒ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate, using the M5 threads on the bottom and the rear of the end-plates.
- Ⓓ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate, using the M5 threads on the front of the end-plates.
An opening for the pipes is made in the plate.
- Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind end-plate, using the push-in bracket code 0227301600.
- Ⓕ Lateral fixing using the blind end-plate, and its the M4 threads on the side lateral.

Note: The sole fixing admitted is the one showed.

KEY TO CODES – CLEVER MULTIMACH **CM**

C M	2	I / O	M	I6 - W8 - W6 - O4 - L8 - 5	M8 - M8 - 15 - 16
VALVE	INPUT END-PLATE	FUNCTION	MANUAL TYPE	TYPE OF VALVE	FURTHER DETAILS
Clever Multimach	2 End-plate 1-11 3 End-plate 1	O Multi-pole connection, valves only I/O Multi-pole connection, valves and inputs ADD Additional (slave) valves only PN O Profinet IO, valves only PN I/O Profinet IO, valves and inputs EC O EtherCAT, valves only EC I/O EtherCAT, valves and inputs EN O EtherNet/IP, valves only EN I/O EtherNet/IP, valves and inputs CAN O CANopen, valves only CAN I/O CANopen, valves and inputs	M Monostable manual control B Bistable manual control	I n° 2 3/2 NC W n° 2 3/2 NO L 3/2 NO + 3/2 NC V 5/2 monostable K 5/2 bistable O 5/3 monostable 5 Blind end-plate 6 Passing-intermediate 7 Blind intermediate 20 Exhaust section 4 Cartridge 4 6 Cartridge 6 8 Cartridge 8	● M8 Module 8 input M8 * 14 Shell 44 pin * 15 Shell 44 + 44 pin 16 n° 2 brackets for DIN bar

- Not applicable with (add-on) ADD end-plate
- * For multi-pole connection only

NOTES