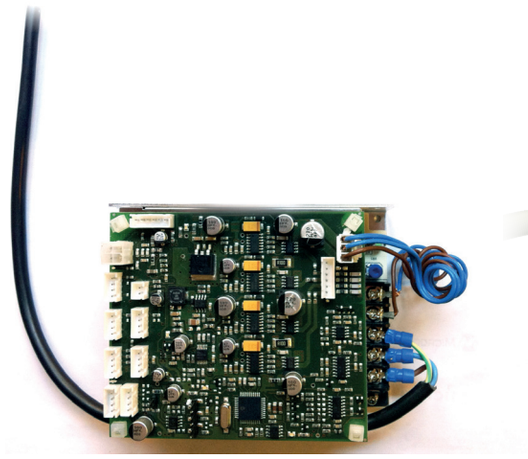
PPS

PERISTALTIC PUMP SUBSYSTEM

MediCon Stepper Motor Control Board for medical devices is an ultra low noise stepper motor control board particularly intended to drive **peristaltic pumps** in extra-corporeal blood circulation or in other medical devices that manage fluids.
It includes analog inputs for pressure sensors, used to monitor pressure on the blood lines, and input/test signals for air/bubble detector.
Safety features allow to implement redundant protective channels.



Key features include:

- Low noise and high torque control algorithm
- Up to 4 A peak current at 48V
- Input/output suited to drive peristaltic pumps on blood lines
- Designed to be tested in compliance with medical standards
- Equipped to implement redundant protective channels

TECHNICAL DATA

Power supply	24Vdc power supply for controller 24Vdc / 48Vdc power supply for power stage
Maximum motor current	3.3A peak current (available 4.5A peak current)

MediCon
Research, design and consulting

Motor winding connections	▪ Bipolar (Series, Parallel, 1 winding) ▪ Unipolar (with external cabling of winding COM terminal)
Auxiliary I/O	▪ 2 channels 24-bit Delta-Sigma ADC for bridge sensors (e.g. pressure sensors, etc...), supporting a full-scale differential input of ± 2.5V, ± 1.25V,± 39mV, or± 19.5mV *- sampling period: 12,5 ms single channel, 102ms alternating dual channel* ▪ 5 schmitt trigger inputs (3.3V logic levels / 5V tolerant) ▪ 1 open drain output (Output Accept Voltages up to 5.5V)
Data Interfaces	▪ RS-232 ▪ RS-485
Connectors	▪ JST connectors type XH for signal IO ▪ JST connector type VH for power supply
Environmental operative range	▪ Temperature -20 to +45 °C ▪ Humidity 5 to 95% non condensing
Motor control features	▪ Sinusoidal microstepping (1/16 step) ▪ Open loop position and speed control *- no encoder required: encoder can be used ad redundant channel on a protective system* ▪ Low noise control algorithm *- closed loop current control at PWM frequency (highest torque, silent operation)* *- closed loop current control at driving sine wave frequency (high torque, ultra silent operation)* ▪ Overcurrent hardware and software protection
Safety features	▪ Digital interface for air/bubble detectors with autotest functionality *- response time: < 1ms* *- test frequency: up to 1 Khz* *- decoupled redundant signals connector, to be connected to protective system* ▪ Motor shutdown on fault detection (including fault of data communication channel)
Input signal processing	Moving average filter on both analog and digital input signals, with settable period and samples number
Data/parameter storage	256 byte EEPROM (I2CBUS interface)
Host communication	MedBus propretary protocol on RS232/RS485 *- CRC16 data protection* *- data packet period: down to 10ms* *- protocol specifications available*
Standard references	Designed for use in devices to be tested according to the following standards: ▪ IEC 60601-1:2005+A1:2012+A2:2020 ▪ IEC 60601-1-2:2014+A1:2020 ▪ IEC 60601-2-16:2018 Operating software designed according to ▪ IEC 62304:2006+A1:2015 (Class C)