



Multifunctional Digital Control Joystick MDC Series

Introduction

MDC Series Electrical Proportional joystick is the latest born in the wide range of Hydraulics pilot controls.

The MDC joystick combines the extensive experience in Hydraulics and the latest electronic technologies based on SMD Hall effect sensors and microcontroller's architecture.

The product has a new design meant to provide a comfortable and fine control of mobile and industrial applications. It's a single lever with single/dual axis control, supported by an extensive range of handle options.

MDC versatility and flexibility of use satisfies the most demanding customer's requirements, offering a complete range of output versions: CANopen, 0-5Volt, PWM, Ratiometric.

Our engineers can offer specialist support to optimize the solution suits each application.

Features

- Compact, light weight and robust PA66 body with glass fiber
- Low effort control and smooth movements
- Reliable embedded electronics and strong mechanical structure for long operating life
- Suitable for arm rest of console mounting
- Stylish good looks suitable for modern cabs
- Wide range of electrical options in multifunctional ergonomic handles
- Optional Friction and Detent functions available on single axis version
- IP65 Protection degree
- Available for the different output versions of the joystick
- PC Software environment to set CANopen and PWM joystick's parameters.

Model code

MDC - XXX - X - XXX - XX - XXXXX - XXXXX

MDC = Multifunctional Digital Control Joystick

Basic model type

- C01** = Double Axis return to spring
- S01** = Single Axis return to spring
- S02** = Single Axis lever detented in any position
- S03** = Single Axis lever detented in any position with neutral sensor
- S04** = Single Axis lever detented at both stroke ends
- S05** = Single Axis lever detented in neutral position
- S06** = Single Axis lever detented in neutral and frictioned in any position

Handle typ

- W** = Without handle
- S** = Straight Series (Handle Catalogue)
- E** = MFE Handle
- EX** = Multifunctional EXM Handle
- M** = MFE2 Handle

Joystick version

- A5V** = 0,5 - 4,5 V Output voltage
- PWM** = PWM currents Output
- CAN** = CAN OPEN Output
- RTM** = Ratiometric Output

Return spring

- F0** = Standard: 1,2 - 2,5 daN
- F1** = Medium: 1,7 - 3,2 daN

Firmware Version

SXXXX = Firmware code

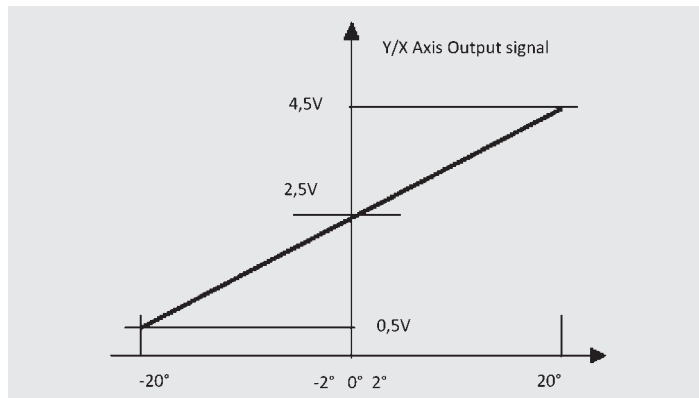
Handle reference

XXXXX = Reference Code for handle

MDC Series - CAN OPEN or 0-5 V outputs

0-5 V Version general technical features

| | |
|------------------------------------|--------------------------|
| Voltage Supply: | 9V to 32 V |
| Output voltage range on X/ Y axis: | 0.5 ÷ 4,5 V |
| Tolerance on output signal: | ± 0,03 V |
| Out of central position: | 2 digital out 0-5 V@15mA |
| Mechanical Life: | > 5 million cycles |
| IP Protection degree: | IP65 |
| Operating temperature: | -40 °C + 85 °C |



CAN Open Version general technical features

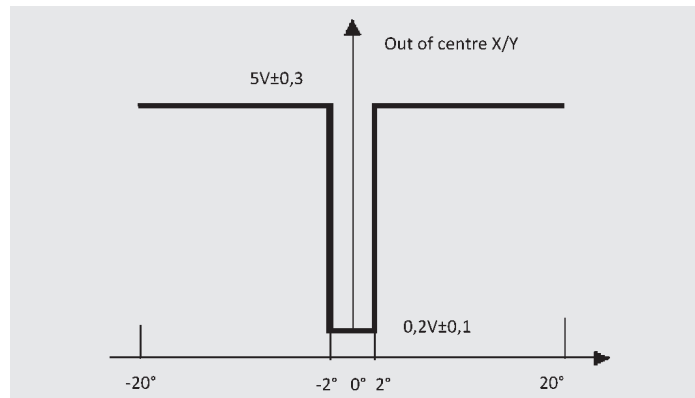
| | |
|-----------------------------|-------------------------|
| Voltage Supply: | 9 V to 32 V |
| Proportional axis: | Up to N.4 |
| Digital input: | 6 ON-OFF (0-5 V) |
| CAN OPEN Joystick Bit rate: | 125-250-500-1000 kBit/s |
| Message Frequency setting: | 20-60 ms |
| 120 Ohm terminator setting: | ON/OFF |
| Mechanical Life: | >5 million cycles |
| IP Protection degree: | IP65 |
| Operating temperature: | -40 °C + 85 °C |

CAN Open message content tx pdo

| Byte 0 | Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 |
|----------|----------|----------|----------|-----------------|---------------|--------|-----------|
| | | | | Bit 0 : Axis 1+ | Bit 0 : DIG_1 | | Bit 0 -3: |
| | | | | Bit 1 : Axis 1- | Bit 1 : DIG_2 | | Firmware |
| Position | Position | Position | Position | Bit 2 : Axis 2+ | Bit 2 : DIG_3 | | version |
| Axis 1 | Axis 2 | Axis 3 | Axis 4 | Bit 3 : Axis 2- | Bit 3 : DIG_4 | Zero | |
| 0->250 | 0->250 | 0->250 | 0->250 | Bit 4 : DIG_7 | Bit 4 : DIG_5 | | Bit 4-7 : |
| | | | | Bit 5 : DIG_8 | Bit 5 : DIG_6 | | Counter |
| | | | | Bit 6 : DIG_9 | Bit 6 : 0 | | 0->15 |
| | | | | Bit 7 : DM | Bit 7 : 0 | | |

Wiring table MDC 0-5 V

| Wire Colour | Function |
|-------------|-----------------|
| Red | 12/24 VBatt |
| Black | Gnd |
| Yellow | X Axis |
| Gray | Y Axis |
| Green | Y Out of centre |
| Orange | X Out of centre |



Wiring table MDC CAN OPEN JOY

| Wire Colour | Function |
|-------------|-------------|
| Red | 12/24 VBatt |
| Black | Gnd |
| Brown | CAN_L |
| Blue | CAN_H |

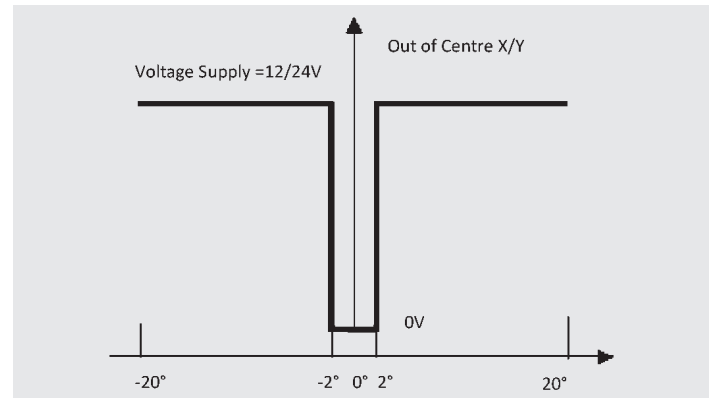
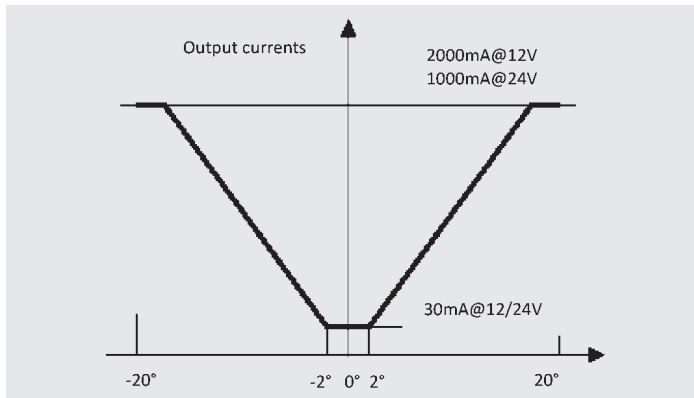
MDC Series - PWM currents outputs

PVM Version technical features

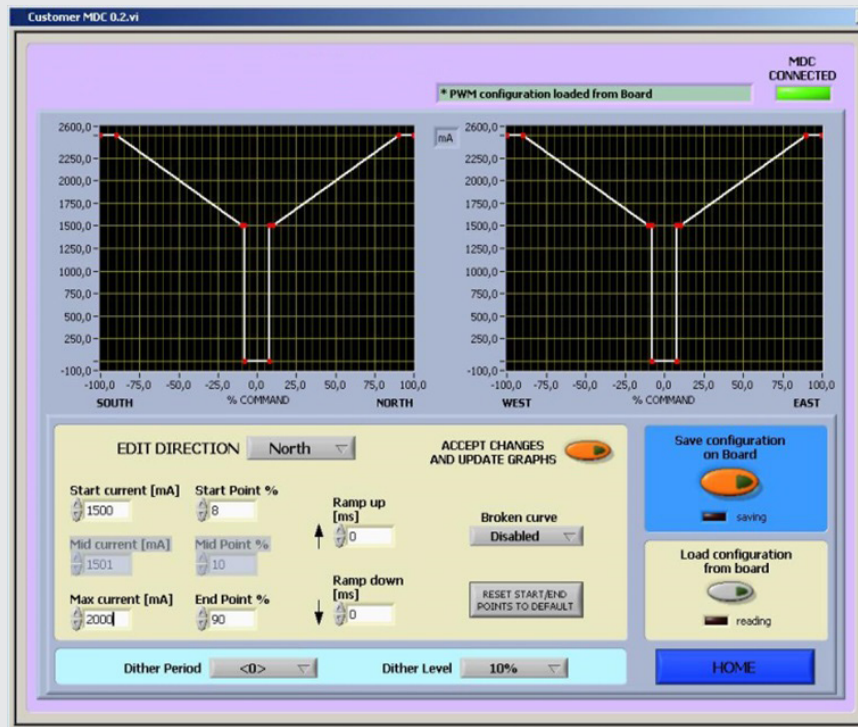
| | |
|--------------------------------|---|
| Voltage Supply: | 9 V to 32 V |
| Outputs: | 4 PWM currents signals on each semi-axis with 100 % duty cycle load |
| Digital out of center signals: | One for each semi-axis @500mA |
| Digital control: | Closed-loop digital controlled outputs |
| Output currents: | 30 ÷ 2000 mA@12 V; 30 ÷ 1000 mA@24 V |
| Ramps: | 0-2 sec |
| Dither: | 100 Hz, 150 Hz, 200 Hz, 250 Hz |
| Programming Software: | MDC Settings Environment with PC USB Windows Interface |
| Mechanical Life: | > 5 million cycles |
| IP Protection degree: | IP65 |
| Operating temperature: | -40 °C ÷ 85 °C |

Wiring table MDC PWM

| Wire Colour | Function |
|-------------|--------------------------------|
| RED | 12/24 VBatt |
| BLACK | Gnd |
| WHITE | X Axis Output Signal (East) |
| YELLOW | Y Axis Output Signal (South) |
| GREEN | Y Axis Output Signal (North) |
| GREY | X Axis Output Signal (West) |
| ORANGE | X Axis Common GND (West-East) |
| BROWN | Y Axis Common GND(North-South) |
| BLUE(1) | ON-OFF Out of centre(South) |
| BLUE(2) | ON-OFF Out of centre(North) |
| BLUE(3) | ON-OFF Out of centre(West) |
| BLUE(4) | ON-OFF Out of centre(East) |



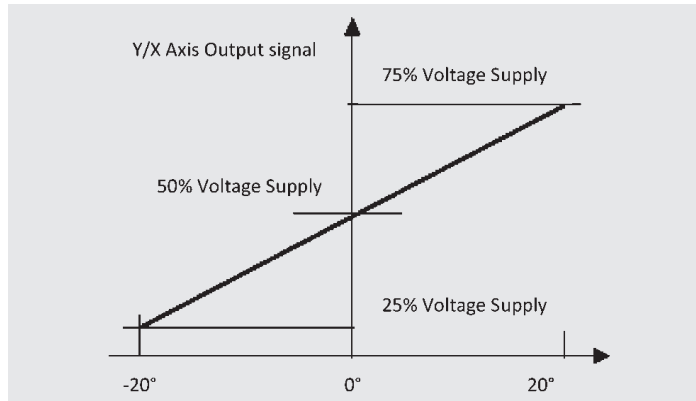
MDC Software environment



MDC Series - Ratiometric outputs

Ratiometric version technical features

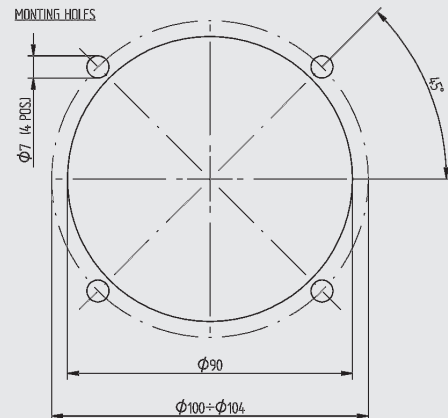
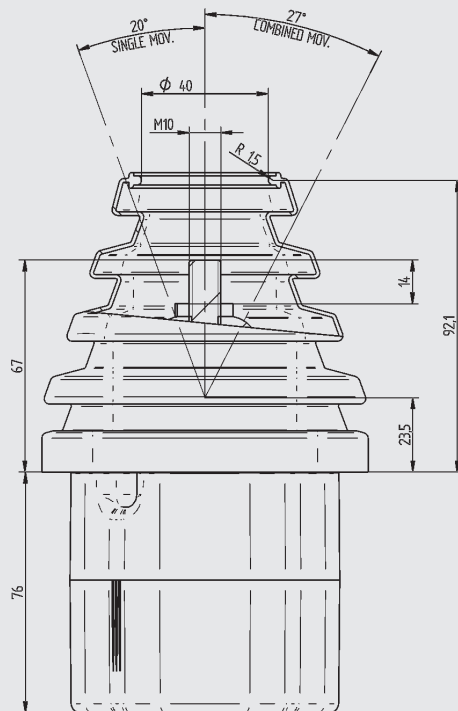
| | |
|------------------------|--|
| Voltage Supply: | 9 V to 32 V |
| Proportional Outputs: | 2 25 %V _{cc} -75 %V _{cc} |
| Digital outputs: | 1 for each semi-axis @500 mA |
| Power digital Outputs: | 2 Power digital outputs @5 A |
| Mechanical Life: | > 5 million cycles |
| IP Protection degree: | IP65 |
| Operating temperature: | -40 °C + 85 °C |



Wiring table MDC PWM

| Wire Colour | Function |
|-------------|-----------------------------------|
| RED | 12/24 VBatt |
| BLACK | Gnd |
| YELLOW | X Axis Output Signal |
| GREEN | Power ON-OFF Out of centre Y Axis |
| GREY | Y Axis Output Signal |
| ORANGE | Power ON-OFF Out of centre X Axis |
| BLUE(1) | ON-OFF Out of centre(South) |
| BLUE(2) | ON-OFF Out of centre(North) |
| BLUE(3) | ON-OFF Out of centre(West) |
| BLUE(4) | ON-OFF Out of centre(East) |

MDC Installation drawings



Note

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.



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