



JHM SERIES
Heavy Duty Multi-Axis Hall
Effect Electronic Joysticks

JMF SERIES
Heavy Duty Multi-Axis
Potentiometric Joysticks

MAP SERIES
Heavy Duty Single-Axis PWM
output



Electronic Joysticks and Grips

Hall effect and
potentiometric joysticks for
mobile and industrial
applications

Cross Hydraulics



HM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)



FEATURES

The JHM joystick controller has been designed for use in mobile and industrial field applications. The use of the hall - effect sensors, which eliminates any contact between moving electrical parts, improves overall resolution, precision and life. Hall - effect sensors are better for position sensing than others like optical and electromechanical. A built in programmable electronic board provides proportional and on-off output signals to any kind of the most common electro-hydraulic components.

MECHANICAL SPECIFICATIONS

- Main body material: aluminium
- Boot material: NBR / Shore 50 – UV proof
- Lever deflection angle: $\pm 22^\circ \pm 1^\circ$
- Electrical angle: $\pm 22^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class (above panel): up to IP67, depending on grip
- Life: ≥ 5 million cycles

ELECTRICAL SPECIFICATIONS

- Sensor: hall effect contactless technology
- Supply voltage: $8 \div 32$ VDC
- Current consumption @ rest: 250mA
- Connector type: Deutsch DT04-12P
- PWM Output signal: 2Xdual proportional solenoid valves
- Current output range (PWM): 100 to 1600 mA
- Dither frequency: 60 to 250 Hz (100 Hz factory pre-set)
- Adjustable ramp time: 0.05 to 5 s
- Power digital outputs: 2 (3.5 A)

ADJUSTABLE PARAMETERS

The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool.



CONFIGURATION & CALIBRATION

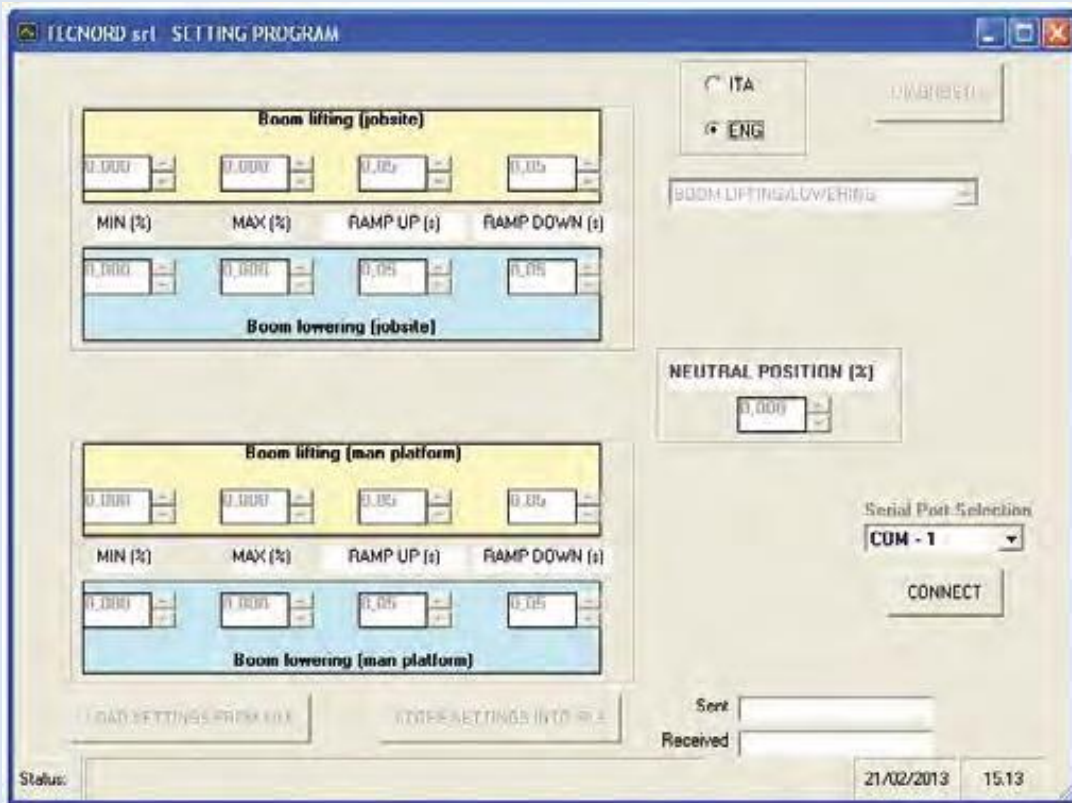
By use of the configuration window you can easily select and modify the following parameters:

- Operation mode
- Dead - man push button enable
- Joystick functions
- Set - point selection (for 360° movement only)
- Output assignment on-off auxiliary valves



By use of the calibration window you can easily select and modify the following operating parameters:

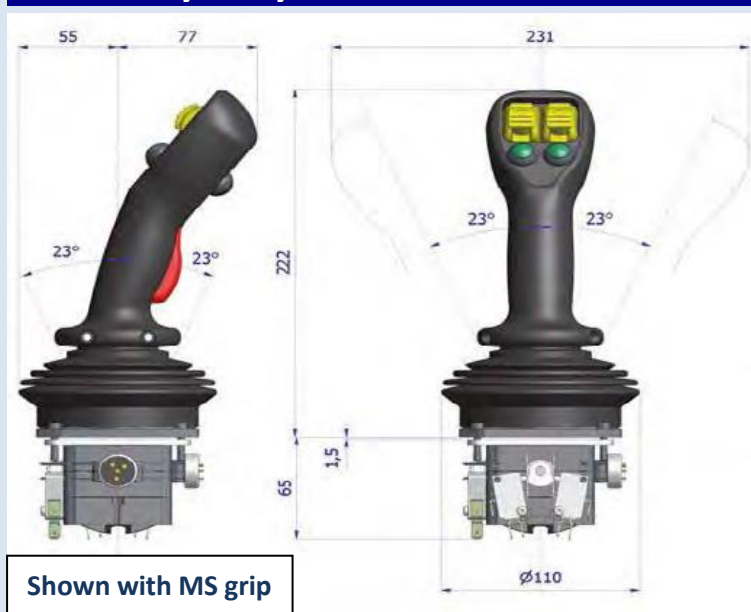
- I min
- I max
- Ramps
- Duty Cycle
- Dither



HOW TO ORDER

CODE 201001026A

DB9 CABLE ADAPTER WITH SOFTWARE CALIBRATION

JMF Heavy Duty Multi-Axis Potentiometric Joystick (joyst base only)

Option L2S	Single axis control / Bi-directional
Option L4D	Multi axis control / Bi-directional

FEATURES

The JMF joystick controller has been designed for use in mobile and industrial field applications. The potentiometer in use, available with 3-pins configuration, grants precision and a long working life. The output signals to electro hydraulic devices are managed by a separate driver (see electronic drivers product info).

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $\pm 25^\circ \pm 1^\circ$
- Electrical angle: $\pm 25^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class (above panel): up to IP67, depending on grip
- Life: 3 million cycles

DIRECTIONAL SWITCHES (electromechanical type) ELECTRICAL SPECIFICATIONS

- Contacts: silver plated
- Max operating input voltage: 125 / 250 VAC
- Max operating current: : 16 A
- Neutral position threshold angle: $\pm 10^\circ$
- Protection class: IP 55

ROTARY POTENTIOMETER ELECTRICAL SPECIFICATIONS

- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: /A =50% of Vin 1 K Ω \pm 20%
(3-pins version) /D = 90% of Vin 5 K Ω \pm 20%
- Ohmic resistance: /G=40% of Vin 10 K Ω \pm 20%
(4-pins version) /L = 90% of Vin 5 K Ω \pm 20%
- Min load impedance on pin 2 (signal): 50 K Ω
- Max operating current on pin 2: 1 mA
- Linearity (resistive track): 2%
- Protection class: IP 67

OUTPUT SIGNAL CONTROL CHARACTERISTICS (% OF Vin) vs LEVER DEFLECTION ANGLE

- 3-pins A @ 0÷2°: 50%
- 3-pins A @ 25°: +/- 75%
- 3-pins D @ 0÷2°: 50%
- 3-pins D @ 25°: +/- 95%
- 4-pins G @ 0÷2°: 0%
- 4-pins G @ 25°: 40%
- 4-pins L @ 0÷2°: 0%
- 4-pins G @ 23÷25°: 100%

MS Multi-Function Ergonomic Symmetric Grip



FEATURES

- Optimum ergonomic design for long working period of time
- Internal PWM driver for proportional roller switch

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip – IP 54 with dead man trigger
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A – Dead man push button (trigger)

- Rated amperage: up to 3A inductive
- Micro switch protection class: IP 67

P9 – Push buttons

- Operational life: $\geq 100,000$ cycles
- Rated amperage: up to 5A resistive
up to 3A inductive
- Protection class: IP 64
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

FPR – PROPORTIONAL ROLLER

see FPR data sheet

- Output signal: 3-pins connection hall effect contactless sensor

ACCESSORIES



Rocker switch type – Switch Operation ON-OFF-ON – ORDERING CODE 501301500



Rocker switch type – Switch Operation FWD-NEU-REV – ORDERING CODE 501301504



Push button with led – Colour orange LED amber – ORDERING CODE 501301330



Sealing boot for raised dome switch – ORDERING CODE 501301326



Sealing boot for flush dome switch – ORDERING CODE 501301327



**FPR – PWM FINGERTIP PROPORTIONAL ROLLER SWITCH WITH BUILT - IN PWM
BIDIRECTIONAL DRIVER**

FEATURES

- Mini proportional roller switch with optimum ergonomic design for panel – mounting
- High performance hall effect sensor circuitry
- PWM electronic driver integrated into the roller for remote control of a dual – coil proportional solenoid valve

MECHANICAL SPECIFICATIONS

- Rotation angle: $\pm 30^\circ$
- Main body material: acetal resin / Teflon compound
- Colours available: yellow, grey, blue
- Rubber gaiter material: EPDM / 35-45 shore – A
- Operating temperature range: $-25^\circ\text{C} / +85^\circ\text{C}$
- Environmental protection: IP 68 (above panel)
- Life: $\geq 5.000.000$ cycles

ELECTRICAL SPECIFICATIONS

- Supply voltage: $8 \div 32$ VDC
- Current consumption with no load: 100 mA
- PWM dither frequency: 100 Hz
- Current output range: $100 \div 1500$ mA @ 12 VDC

IE Multi-Function Ergonomic Grip



MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
- Connecting hub: female thread / M10 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

P9 – Push buttons

- No. of push buttons on rear panel: up to 3
- Operational life: $\geq 100,000$ cycles
- Rated amperage: up to 5A resistive
up to 3A inductive
- Protection class: IP 64
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

A – Side dead man push button see above specifications for P9 push button

FPR – PROPORTIONAL ROLLER see FPR data sheet

- Output signal: 3-pins connection hall effect contactless sensor

PRS – PROPORTIONAL ROCKER SWITCH ask for PRS data sheet

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CONFIGURATION EXAMPLES

JHM	BASE CONFIGURATION	YY/XX AXES CONFIGURATION
JHM-L2S/PWM	SINGLE AXIS BIDIRECTIONAL	PWM
JHM-L4D/PWM	DUAL AXES ALL DIAGONALS	PWM

JMF	BASE CONFIGURATION	YY/XX AXES CONFIGURATION
JMF-L2S/N	SINGLE AXIS BIDIRECTIONAL	POTENTIOMETER & BIDIRECTIONAL SWITCHES
JMF-L4D/N	DUAL AXES ALL DIAGONALS	POTENTIOMETER & BIDIRECTIONAL SWITCHES

MS GRIP	D-man P/B	Front P/B	Front FPR
MS/01P9/1FPR/1PWM	NO	1 x P9	1 x FPR
MS/A2P9/1FPR/1PWM	YES	2 x P9	1 x FPR
MS/A3P9/1FPR/1PWM	YES	3 x P9	1 X FPR
MS/04P9/0000/0000	NO	4 x P9	NIL

IE GRIP	D-man P/B	Rear P/B
IE/0000/0000	NO	NO
IE/A000/0000	YES	NO
IE/A1P9/0000	YES	1 x P9
IE/02P9/0000	NO	2 x P9
IE/A3P9/0000	YES	3 x P9

HEAVY DUTY SINGLE-AXIS PWM OUTPUT JOYSTICK



FEATURES

- Hall Effect Sensor technology
- Digital output signals PWM output operation
- Adjustable ramp times
- Adjustable output current and PWM frequency by trimming potentiometers

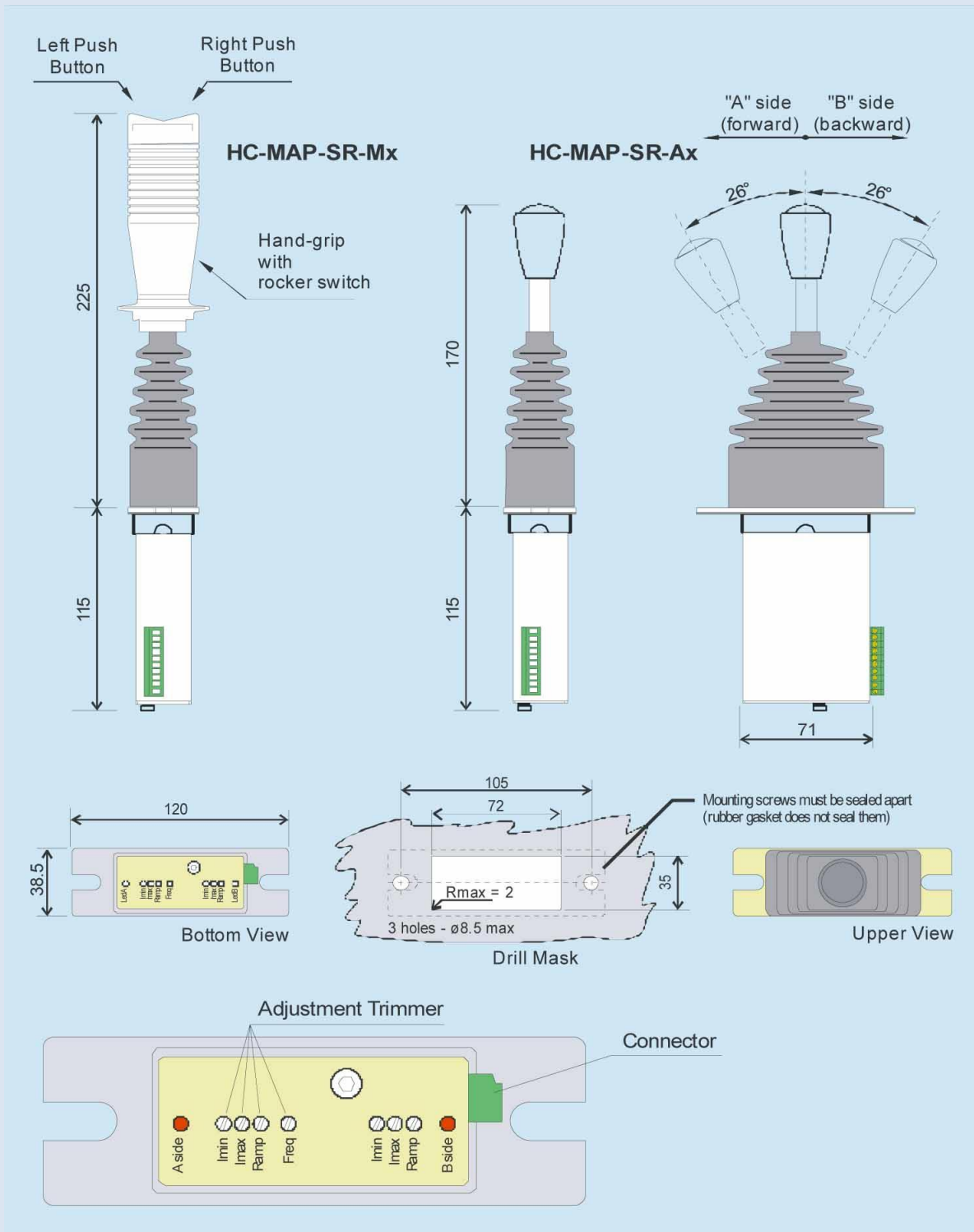
Options

- Centre return spring
- Friction detent
- Handle Grip with push button or rocker switch

SPECIFICATIONS

Power supply voltage	10 ÷ 28 VDC
Operating temperature	-20 °C ÷ +50 °C
PWM min out current	100 to 2500 mA (200 mA pre-set)
PWM MAX out current	100 to 2500 mA (800 mA pre-set)
PWM frequency	70 ÷ 350 Hz
Digital output MAC current	500 mA
Connections	Extractable screw connectors, 1.5 mm ² max sect
Mechanical stroke	± 26 degrees
Force on handle at stroke end	20 N
Ingress Protection Rating	IP55 (mounting screws must be sealed apart)
Ingress Protection Rating (over - mounting flange)	IP66-IP65 (simple knob - handgrip with rocker switch)

DIMENSIONS



See technical catalogue for control layout, wiring & connection layout, typical system configuration, dimensional data, adjustment procedure, calibration.

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