**DESCRIPTION**

The HandyDrive handheld control system, composed of the handheld remote control and the electronic control unit, is designed to make simple and intuitive the control of an hydraulic driven machine. Moving the mini/joystick on the handle the system controls directly the four PWM outputs for the crawler tracks: left forward/backward and right forward/backward. A single or double Dump Valve is also commanded at every movement.

**CHARACTERISTICS**

- proportional speed adjustment and proportional steering
- separate DV for each crawler track or single DV output, with delayed turn off.
- deadman trigger.
- emergency stop button.
- limited range for mini-joystick reference signals to survey every failure.
- Individual adjustments for each PWM output:
  - I min current
  - I max current
  - I raise ramp
  - I fall ramp
- adjustable output frequency (from 50 to 300 Hz)
- unique supply voltage from 10 to 30 Vdc;
- card resin-encapsulated against vibrations and humidity
- serial port to adjust calibration with PRG2 keyboard or PC (with specific adapter).

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>10Vdc ÷ 30Vdc</td>
</tr>
<tr>
<td>Current absorption</td>
<td>60 mA ÷ load on outputs</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>-20 ÷ +70 °C</td>
</tr>
<tr>
<td>PWM output minimum current</td>
<td>from 100 to 2500 mA</td>
</tr>
<tr>
<td>PWM output maximum current</td>
<td>from 100 to 2500 mA</td>
</tr>
<tr>
<td>Available PWM frequency</td>
<td>50-60-70-85-100-125-150-200-250-300 Hz</td>
</tr>
<tr>
<td>Time ramp up/down independently adjustable</td>
<td>from 0.1s to 10s</td>
</tr>
<tr>
<td>DV outputs maximum current</td>
<td>2.5 A</td>
</tr>
<tr>
<td>Overall dimensions (+ connector)</td>
<td>138 x 110 (+37) x 38 mm</td>
</tr>
<tr>
<td>Drilling interaxis</td>
<td>119 x 99 mm (no. 4 M5 screws)</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP68</td>
</tr>
</tbody>
</table>
YMANP ONE AXIS POTENTIOMETRIC JOYSTICK

**TECHNICAL SPECIFICATIONS**

- Min. starting thrust: 9N [2 lbf]
- Max. applicable thrust: 80N [18 lbf]
- Max contact switch current (microswitch): 1A (28V DC)
- POTENTIOMETER
  - Resistance: 10 Kohm
  - Life: 10 million cycles
  - Electrical angle (reduced): 100°
  - Max output current (central terminal): 1mA
  - Max. power: 1W
  - Insulating resistance (500V DC): >1000 Mohm
- BIDIRECTIONAL VERSION
  - Mechanical angle: 40° + 40° approx.
  - Vout = 80% Vin (40% + 40%)
- UNIDIRECTIONAL VERSION
  - Mechanical angle: 60° approx.
  - Vout = 60% Vin
- BELLOW:
  - Protection level: IP54

**WIRED VERSION AVAILABLE**

- (12V or 24V power supply):
  - with resistance and 10V Zener diode
  - UNIDIRECTIONAL version: 1.8V - 7V standard output
  - BIDIRECTIONAL version: 5V ± 3.5V output
  - supplied with three wires 500 [19.7] length
YMANP2 TWO AXIS POTENTIOMETRIC JOYSTICK

Potentiometers electrical features
- Overall resistance: 0.5 kOhm (between pins 1 and 2)
- Max power supply (Vin): 30 Vdc
- Middle output voltage (Vout): 50% Vin (± 1%)
- Min output voltage (Vout) = 27% Vin (± 1%)*
- Max output voltage (Vout) = 73% Vin (± 1%)*
* Values achieved with a load of 7.5K towards Vin/2

NO contact electrical features
- Max current: 200mA (resistive load)
- ON/OFF contact activation angle: 2° (in each direction)
- Life: 10 cycles (with a 200 mA current)
  5x10 cycles (with a 10 mA current)

Physical features
- Breakout force: 2.3N [0.51 lbf]
- Maximum operating force: 6 N [1.35 lbf]
- Mechanical operating angle: ±18°
- Insulation resistance at 50°DC: > 50 MOhm
- Weight: 120g [0.26 lbs]
- Operating temperature range: -40 °C ÷ +70 °C
  -140°F ÷ 158°F
- Environmental rating: IP65
- Connector: Panduit Mascon 2.54mm 8p

Order code:
A1000380401 without wires
A1000380404 with 500 [19.6] wires
YMANP3 THREE AXIS POTENTIOMETRIC JOYSTICK

Potentiometers electrical features
- Overall resistance: 0.330 kOhm (between pins 1 and 2)
- Max power supply (Vin): 30 V\text{dc}
- Middle output voltage (30Vdc): 50% Vin (± 1%)
- Min output voltage (Vout) = 27% Vin (± 1%)*
- Max output voltage (Vout) = 73% Vin (± 1%)*
* Values achieved with a load of 7.5K towards Vin/2

NO contact electrical features
- Max current: 200mA (resistive load)
- ON/OFF contact activation angle: +/- 1° (X and Y axis)
- ON/OFF contact activation angle: +/- 2° (rotating handle)
- Life: 10⁶ cycles (with a 200 mA current)
  5x10⁶ cycles (with a 10 mA current)

Physical features
- Breakout force: 2.3N [0.51 lbf]
- Maximum operating force: 6 N [1.35 lbf]
- Environmental rating: IP65
- Mechanical lever operating angle: ±13°
- Mechanical handle operating angle: ±27°
- Insulation resistance at 50Ω: > 50 MOhm
- Weight: 120g
- Operating temperature range: -40 °C ÷ +70 °C
  -140°F ÷ 158°F
- Connector: Panduit Mascon 2.54mm 8p

Order code:
A1000380402 without wires
A1000380403 with 500 [19.6] wires
YMAS ONE AXIS JOYSTICK WITH SIGNAL OUTPUTS

**DESCRIPTION**

YMAS is a single axis electronic joystick with signal outputs. Joystick commands are derived from the measurement of the magnetic field produced by permanent magnets; the measurement is taken through Hall effect probes. This kind of probes are not subject to wear and tear.

**Main characteristics:**
- sturdiness;
- parabolic output signal for a better sensitivity;
- output signal stroke customizable;
- available with uni directional output (5V-0-5V) or bidirectional output (0-5V-10V);
- “position hold” hand-grip available;
- rocker switch (unstable) on the hand-grip available;
- on/off directional outputs;
- supplied with extractable connector with screw;
- available version with two separate outputs 0-5V.

**Available versions:**

<table>
<thead>
<tr>
<th>YMASH</th>
<th>xxx</th>
<th>x</th>
<th>x</th>
<th>[- Cxx]</th>
</tr>
</thead>
</table>

- Signal travel (in Volt tenths) compared to rest value.
- Default value - C50 (5.0 Volt)

R = Back to the center  
F = Frictioned  
A = Simple rod  
M = Handgrip with balanced buttons

505 = output with 0V rest value  
5F5 = floating on rest - two 0-5V outputs on distinct wires  
010 = output with 5V rest value

Ex: YMAS-010-AR-C35, with simple rod, not frictioned, centered to 5V and 3.5V travel

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply voltage</td>
<td>10 ÷ 28 Vdc</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>-20 ÷ 50 °C [ -60 ÷ 122 °F]</td>
</tr>
<tr>
<td>Proportional output</td>
<td>+5 ÷ 0 ÷ +5 Vdc or 0 ÷ 5V ÷ 10 Vdc (max 10 mA)</td>
</tr>
<tr>
<td>Maximum output voltage</td>
<td>Power supply - 2.5V</td>
</tr>
<tr>
<td>ON-OFF directional signal</td>
<td>Positive outputs of 500 mA (max)</td>
</tr>
<tr>
<td>Connector type</td>
<td>Extractable conn. with screw (1.5 mm² max section)</td>
</tr>
<tr>
<td>Mechanical stroke</td>
<td>± 26 degrees</td>
</tr>
<tr>
<td>Force on handle at stroke end</td>
<td>20 N [4.5 lbf]</td>
</tr>
</tbody>
</table>
YMAP ONE AXIS JOYSTICK WITH POWER OUTPUTS

DESCRIPTION

MAP is a single axis electronic joystick with PWM outputs, able to directly control a couple of solenoid valves with PWM outputs proportional to handle movements. Joystick commands are derived from the measurement of the magnetic field produced by permanent magnets; the measurement is taken through Hall effect probes. This kind of probes are not subject to wear and tear.

Main characteristics:
- one proportional section (A+B) direct control (2 PWM outputs);
- adjustable minimum/maximum current for each directions (A+B);
- adjustable rise/fall ramp time from 0.1 to 5 seconds;
- adjustable PWM frequency to 70 to 350 Hz;
- “position hold” hand-grip available;
- rocker switch (unstable) on the hand-grip available;
- “in progress manoeuvre” on/off output;
- extractable connector with screw.

Available versions:

<table>
<thead>
<tr>
<th>YMAPH</th>
<th>xx</th>
<th>x</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>With spring return</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Position Hold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Simple knob</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Hand-grip with rocker switch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SR = Coils OFF at neutral position
AR = Coils ON at neutral position
SA = Coils always ON

TECHNICAL SPECIFICATIONS

<table>
<thead>
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<tr>
<td>Power Supply Voltage</td>
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<tr>
<td>Working Temperature Range</td>
<td>-20 ÷ 50 °C [-60 ÷ 122 °F]</td>
</tr>
<tr>
<td>PWM Output Minimum Current</td>
<td>from 100 to 2500 mA (200 mA preset)</td>
</tr>
<tr>
<td>PWM Output Maximum Current</td>
<td>from 100 to 2500 mA (800 mA preset)</td>
</tr>
<tr>
<td>PWM Frequencies</td>
<td>from 70 to 350 (120 Hz preset)</td>
</tr>
<tr>
<td>ON/OFF Output Maximum Current</td>
<td>500 mA</td>
</tr>
<tr>
<td>Connections</td>
<td>Extractable conn. with screw (1.5 mm² max section)</td>
</tr>
<tr>
<td>Working Angle</td>
<td>± 26 degrees</td>
</tr>
<tr>
<td>Force on handle at stroke end</td>
<td>20 N [4.5 lbf]</td>
</tr>
</tbody>
</table>
Two and three axis proportional joysticks can be used in a large variety of applications where it is necessary to have a simple and reliable user interface to control construction machinery.

- **YJS** (with signal outputs, available also in ratiometric version) can only be used together with a logic control unit (PLC) or a power control device (PWM driver).
- **YJP** (with PWM outputs) can directly control hydraulic devices (pumps, distributors, dump valve) becoming often the only control unit of the whole machine.
- **YJC** thanks to its inputs, can collect a large numbers of control signals and transmit them through a CANbus network.

Designed and specifically conceived to reduce the amount of installation work, our joysticks are manufactured with top quality parts. The control electronics is located inside the housing and to assure extreme tightness.

Joystick movements are derived from the measurement of the magnetic field produced by permanent ferro magnets; the measurement is taken through redundant Hall effect probes. This kind of probes are not subject to deterioration.

The configuration and calibration easiness makes these joysticks suitable for different applications.

The push button panel is completely customizable.

Here are some of the **available options** for the three models:
- "virtual cross" to forbid diagonal movements.
- linear or parabolic output curve.
- standard or capacitive dead man switch.
- adjustable dead band, independently for each semi axis.
- THUMBWHEEL, to have third proportional axis.
- Outputs lock if the hand-grip is not in neutral position at joystick turn on.
- Dump valve output with delayed turn off, to avoid high pressure spikes in the hydraulic circuit.
- Offset to compensate the hydraulic distributor dead band.
- Auxiliary output activated with logic and command levels user defined (software configurable).
- Two or three speed sets allow to regulate speed according to the machine configuration.
- Combination with only one proportional PWM output with many directional ON/OFF outputs
- Tracked machines driving function, to directly control two pumps of an hydraulic driven machine with the up/down and left/right joystick movements (virtual 45° axis rotation).
- Dead man switch functionality active only with joystick in neutral position.
- Auxiliary inputs/outputs can be active high or active low (software configurable).

All the joystick have a FAULT output which is driven low if a failure occurs. The LEDs on the bottom side helps the user to check the correct joystick functionality and connections.

Analog current outputs are feedback controlled. ON/OFF outputs are protected against short-circuits.

All the joysticks have a serial port to connect PRG2 serial programming keyboard (provided apart) to configure and calibrate the product.

All the joysticks are provided by default with 50 cm upnppluggable cable but is possible to require a customized wiring.