Atek Alfa

JOYSTICK

AJS 600 Series

"Dual Axis, Non-Contact Hall-effect Technology"

- Non contact – Hall effect measurement technology
- Dual axis
- Special design for mobile machines
- Robust structure, long service life
- Configurable button and grip options
- Optional Dead man switch
- 5 million cycles mechanical life
- Resistant to electromagnetic field
- 0-10V, 0-5V, 0.5-4.5V, 0-20mA, 4-20mA, Analog + Relay or CANopen output options
- IP67 protection class

AJS 600 series joysticks have a mechanical structure similar to hydrolic joysticks. However, it has more precise measurement, high performance and long operating life with non-contact hall-effect technology. With its robust structure, it is suitable for use in mobile vehicles operating in the field. Analog and CANopen interface options are available for easy integration.

AJS 600 series joysticks offer easy installation and use with its precise control and ergonomic structure. In addition, thanks to its maintenance-free structure and high protection class, it works perfectly in harsh ambient conditions.

MECHANICAL SPECIFICATIONS

Angle of movement	±20° (from center) ±1 tolerance
Operating force (X, Y axis)	6N±1N
Life	5 million life cycle
Material	Shaft: Stainless steel
	Boot: NBR
	Handle: Delrin® POM-C EN 10204
	Housing: Zamak

ENVIRONMENTAL SPECIFICATIONS

Protection Class	IP67
Operating Temperature	-40°C…+85°C
Storage Temperature	-40°C…+85°C
Relative Humidity	%10…%90 RH

ELECTRICAL SPECIFICATIONS

Analog Version

Sensor Type	Hall-effect, 2axis
Resolution	11 bit
Supply Voltage	15 … 30 VDC
Supply Current	≤40 mA (per axis)
Reverse Polarity Protection	Yes (supply)
Short-Circuit Protection	Yes
Overvoltage Protection	Up to 33V
Electrical Interface	4-20 mA, 0-20 mA, 0-10V, 0-5V, 0.5-4.5V
Return to Center Accuracy	±%2
Load Resistance	For current output; min 250 Ω For voltage output; min 1 KΩ

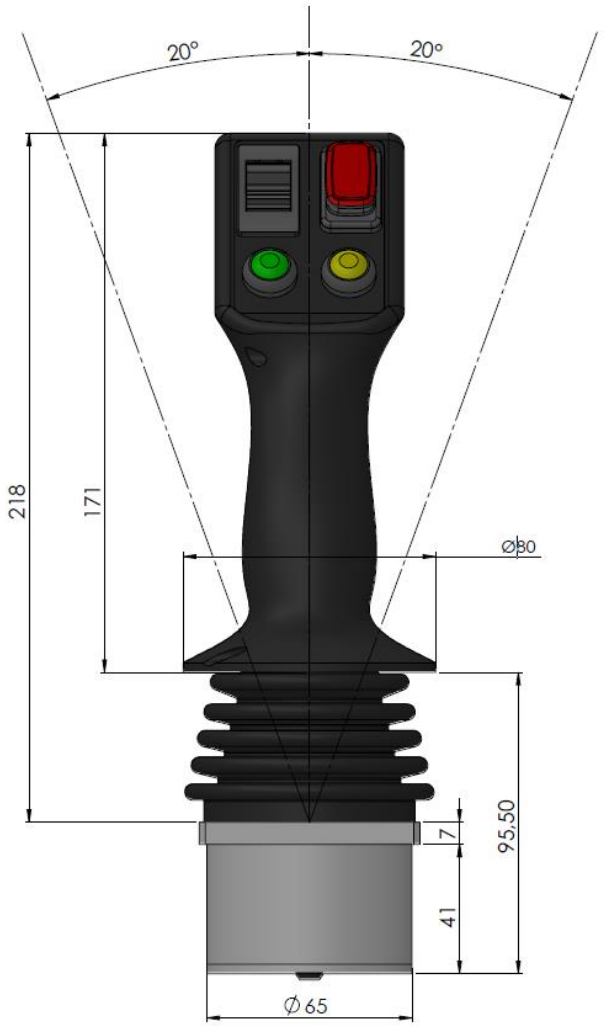
Relay Version

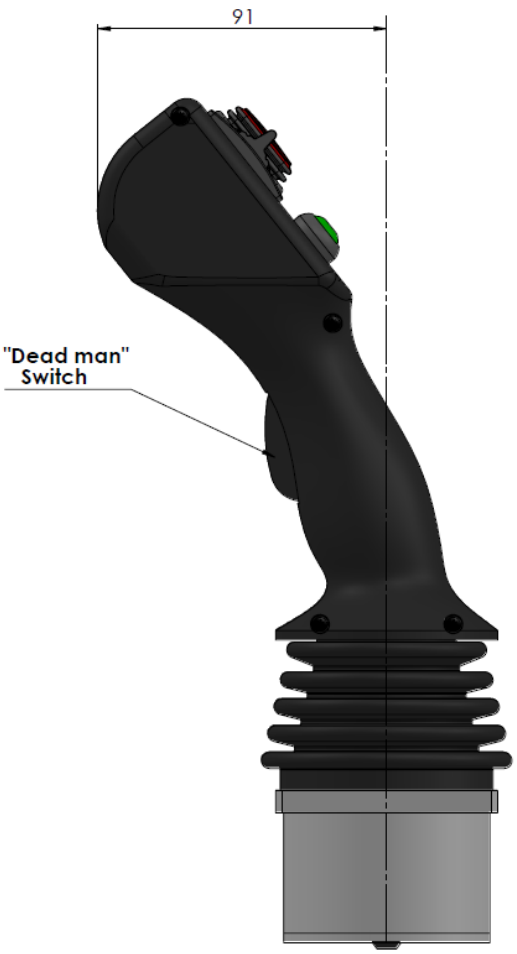
Contact Form	SPDT (1 Form C)
Rated Contact Current	1A
Maximum Contact Current	3A
Maximum Contact Voltage	120 VAC/24 VDC

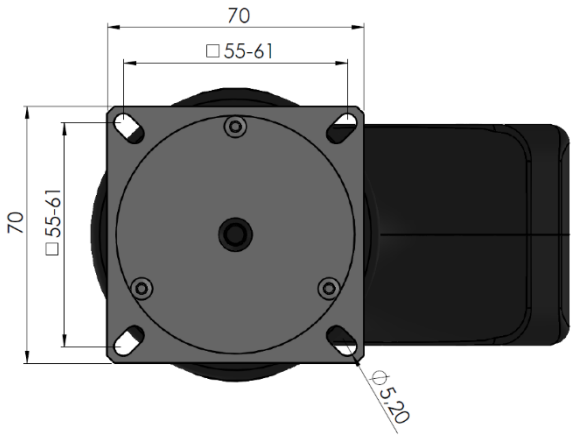
CANopen Version

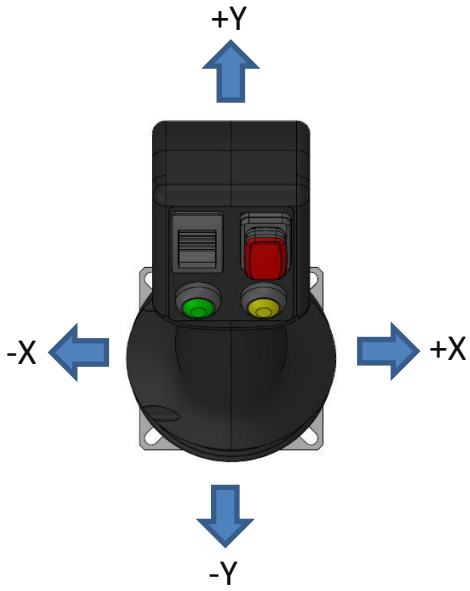
Sensor Type	Hall-effect, 2 axis
Resolution	11 bit
Supply Voltage	8 … 30 VDC
Supply Current	≤40 mA (per axis)
Reverse Polarity Protection	Yes (supply)
Short-Circuit Protection	Yes
Overvoltage Protection	Up to 33V
Protocol	CANopen protocol: CiA DS-301 V4.02 Device profile: DS-401 V3.0
Node ID	Can be set from 1 to 127 with LSS or SDO Default Node ID:1
Baud Rate	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
PDO Data Rate	100 ms
Error Check	Heartbeat, Emergency Message
PDO	3 Tx PDO
PDO Modes	Event/Time triggered, Synch/Asynch
SDO	1 server
Position Data	Object Dictionary 0x6020
Terminating Resistor	Optional

MECHANICAL DIMENSIONS (mm)

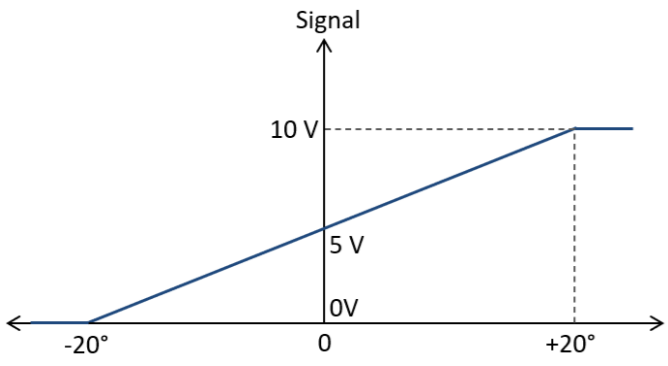


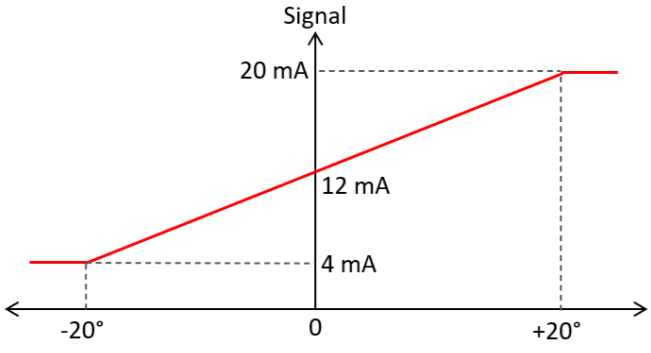






Joystick Output Signal





BUTTON OPTIONS AND TECHNICAL SPECIFICATIONS

Thumbwheel Button

Mechanical Data	
Travel angle	±42°
Operating type	Spring return
Breakout force	2N
Operating force	11N
Max. force	100N
Expecting life	>100,000 cycles
Electrical Data	
Operating type	Hall-effect
Supply voltage	5.0±0.5Vdc
Output signal	0.5…4.5V / 0…5V
Supply current	10mA
Max. overload voltage	30Vdc
Max. reverse voltage	-15Vdc
Output linearity tolerance	<±0.2V
Environmental Data	
Operating temp.	-30℃～+70℃
Storage temp.	-40℃～+85℃
Protection class	IP67 (only electronic parts)

Micro Joystick

Mechanical Data	
Travel angle	6° (3° each direction)
Switch mechanism	Tactile
Life cycles	100K minimum
Max. vertical load	60 IbF
Max. horizontal load	40 IbF
Electrical Data	
Min. contact rating	10μA @ 1V DC
Max. contact rating	50mA @ 24V DC
Initial contactresistance	100mΩ max.
Insulation resistance	100MΩ min. @ 100V DC
Dielectric strength	500V AC / minute
Thermal shock	PER EIA-364-32C
Environmental Data	
Operating temp.	-35℃～+85℃
Storage temp.	-35℃～+85℃
Protection class	IP67

Rocker Button

Mechanical Data	
Plug force of terminals	≤ 80 N
Material	Actuator: PA / PC Housing: PA Terminals: silver plated
Electrical Data	
Inrush current (capacitive)	120 A / 50 A
Contact resistance	< 100 mOhm (1 A 12 V DC)
Insulation resistance	> 100 MOhm (500 V DC)
Environmental Data	
Operating temp.	Terminal: -20 °C ～ +105 °C Actuator: -20 °C ～ +55 °C
Glow wire test temperature	850 °C
Flammability	UL 94 V-2
Protection class	IP67

Push Button

Mounting diameter	12mm
Terminal	2 pin
Current/voltage	1A / 250VAC

Push Button with LED

Mounting diameter	12mm
Terminal	2 pin
Current/voltage	3A / 220VAC
Protection class	IP65

ELECTRICAL CONNECTIONS

Analog

WITHOUT BUTTON

Signal	Cable
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
N/C	PINK

WITH BUTTON

JA1		JA2		JA3		JA4	
+V	RED	**+V**	RED	**+V**	RED	**+V**	RED
-V	BLACK	**-V**	BLACK	**-V**	BLACK	**-V**	BLACK
Analog X	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW
Analog Y	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN
P.Comm	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE
P1	WHITE	**P1**	WHITE	**P1**	WHITE	**P1**	WHITE
		P2	GREY	**P2**	GREY	**P2**	GREY
				P3	BROWN	**P3**	BROWN
						P4	PINK

JB1		JB2		JB3		JB4	
+V	RED	**+V**	RED	**+V**	RED	**+V**	RED
-V	BLACK	**-V**	BLACK	**-V**	BLACK	**-V**	BLACK
Analog X	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW
Analog Y	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN
P.Comm	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE
P1	WHITE	**P1**	WHITE	**P1**	WHITE	**P1**	WHITE
R.Comm	BLACK-WHITE	**R.Comm**	BLACK-WHITE	**P2**	GRİ	**P2**	GREY
R.up	GREEN-WHITE	**R1.up**	GREEN-WHITE	**R.Comm**	BLACK-WHITE	**R.Comm**	BLACK-WHITE
R.down	YELLOW-WHITE	**R1.down**	YELLOW-WHITE	**R.up**	GREEN-WHITE	**R1.up**	GREEN-WHITE
		R2.up	GREEN-BROWN	**R.down**	YELLOW-WHITE	**R1.down**	YELLOW-WHITE
		R2.down	YELLOW-BROWN			**R2.up**	GREEN-BROWN
						R2.down	YELLOW-BROWN

JC1		JC2		JC3		JC4	
+V	RED	**+V**	RED	**+V**	RED	**+V**	RED
-V	BLACK	**-V**	BLACK	**-V**	BLACK	**-V**	BLACK
Analog X	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW	**Analog X**	YELLOW
Analog Y	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN	**Analog Y**	GREEN
P.Comm	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE	**P.Comm**	BLUE
P1	WHITE	**P1**	WHITE	**P1**	WHITE	**P1**	WHITE
T.out	RED-BLUE	**T1.out**	RED-BLUE	**P2**	GREY	**P2**	GREY
		T2.out	PINK-GREY	**T.out**	RED-BLUE	**T1.out**	RED-BLUE
						T2.out	PINK-GREY

JD1	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
J.up	PINK
J.down	PINK-BROWN
J.right	RED-BLUE
J.left	GREY-PINK

JD2	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
P.Comm	BLUE
P1	WHITE
J.up	PINK
J.down	PINK-BROWN
J.right	RED-BLUE
J.left	GREY-PINK

JD3	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
P.Comm	BLUE
P1	WHITE
P2	GREY
J.up	PINK
J.down	PINK-BROWN
J.right	RED-BLUE
J.left	GREY-PINK

JE1	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
T.out	RED-BLUE

JE2	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
R.Comm	BLACK-WHITE
R.up	GREEN-WHITE
R.down	YELLOW-WHITE
T.out	RED-BLUE

JE3	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
R.Comm	BLACK-WHITE
R.up	GREEN-WHITE
R.down	YELLOW-WHITE
T.out	RED-BLUE
P.Comm	BLUE
P1	WHITE

JE4	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
R.Comm	BLACK-WHITE
R.up	GREEN-WHITE
R.down	YELLOW-WHITE
T.out	RED-BLUE
P.Comm	BLUE
P1	WHITE
P2	GREY

JF1	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
R.Comm	BLACK-WHITE
R.up	GREEN-WHITE
R.down	YELLOW-WHITE

JF2	
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
R.Comm	BLACK-WHITE
R.up	GREEN-WHITE
R.down	YELLOW-WHITE
J.up	PINK
J.down	PINK-BROWN
J.right	RED-BLUE
J.left	GREY-PINK

E274-AXIS SWITCH	
SWITCH X+	RED-BLUE
SWITCH X-	PINK-GREY
SWITCH Y+	GREEN-BROWN
SWITCH Y-	YELLOW-BROWN
SWITCH Comm	GREY
DEADMAN	WHITE
DEADMAN Comm	BLUE
P1	RED
P2	YELLOW
P3	GREEN
P4	PINK
P.Comm	BLACK

RELAY + ANALOG	
+V	RED
GND	BLACK
AX	YELLOW
AY	GREEN
+XCom	BLUE
+XNC	RED-BLUE
+XNO	PINK-GREY
-XCOM	GREY
-XNC	GREEN-WHITE
-XNO	YELLOW-WHITE
+YCOM	WHITE
+YNC	GREEN-BROWN
+YNO	YELLOW-BROWN
-YCOM	PURPLE
-YNC	BLACK-WHITE
-YNO	GREY-BROWN
P.COM	PINK
P1	BROWN

* When the Relay + Analog version is selected, only the **JA1** front panel variation can be chosen.

CANopen

CAN CONNECTION

Signal	Cable
CAN_SHIELD	SHIELD
V+ (8...30VDC)	RED
GND (0V)	BLACK
CAN_H	YELLOW
CAN_L	GREEN

CAN + EXTERNAL BUTTON CONNECTION

Signal	Cable
CAN_SHIELD	SHIELD
V+ (8...30VDC)	RED
GND (0V)	BLACK
CAN_H	YELLOW
CAN_L	GREEN
Comm.	BLUE
Buton1	WHITE
Buton2	GREY

ORDER CODING

BASE SELECTION

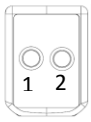
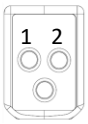
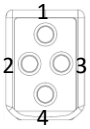
Model	Axis	Output Signal	Relay	Cable Length
AJS 600 (Hall effect)	**Diagonal** **X**: 1 axis/X axis **Y**: 1 axis/Y axis **XY**: 2 axis **Linear** **XL**: 1 axis /X axis **YL**: 1 axis /Y axis **XYL**: 2 axis *See page 3 for axis	**C**: CANopen **V**: 0-10V **V1**: 0-5V **V3**: 0.5-4.5V **A**: 4-20mA **A0**: 0-20mA	**0:** Without Relay **1:** With Relay	**1M**:1m cable (std) *Optional others

GRIP AND BUTTON SELECTION

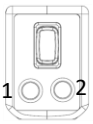
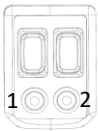
Rear Panel Button Variations	Front Panel Button Variations	Push Button Color and LED Selection	Thumbwheel Button Output Signal	Rocker- Thumbwheel Button Placement Angle
0: No deadman switch 1: Button deadman 2: capacitive deadman 3: capacitive+button deadman	0: No button JA1, JA2, JA3, JA4 JB1, JB2, JB3, JB4 JC1, JC2, JC3, JC4 JD1, JD2, JD3 JE1, JE2, JE3, JE4 **See button configurations**	G: Green R: Red B :Blue S : Black **The number of each button is written next to it, when choosing a color, the number of the relevant button should also be added. If LED is desired on the button, "L" code should be added after color selection. (like 1SL, 2B…)**	V8 : 0.5…4.5V V9 : 0…5V	V : Vertical (std) H : Horizontal

BUTTON CONFIGURATIONS

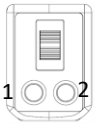
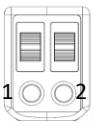
JA: Push button(P)

JA1 P1	
JA2 P2	
JA3 P3	
JA4 P4	

JB: Push button(P) + Rocker button(R)

JB1 P1+ R1	
JB2 P1+ R2	
JB3 P2+R1	
JB4 P2+ R2	

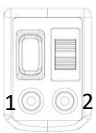
JC: Push button(P) + Thumbwheel button(T)

JC1 P1+T1	
JC2 P1+T2	
JC3 P2+T1	
JC4 P2+T2	

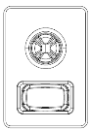
JD: Push button(P) + Micro joystick(J)

JD1 J1	
JD2 P1+J1	
JD3 P2+J1	

JE: Rocker button(R)+ thumbwheel button(T) + push button(P)

JE1 T1	
JE2 R1+T1	
JE3 R1+T1+P1	
JE4 R1+T1+P2	

JF: Rocker buton (R) + Micro joystick (J)

JF1 R1	
JF2 R1+J1	

SAMPLE ORDER CODE:

BASE SELECTION					GRIP SELECTION				
Model	**Axis**	**Output Signal**	**Cable Length**	**Relay**	**Rear panel button**	**Front panel button**	**Push Button Color Selection**	**Thumbwheel Output Signal**	**Rocker-Thumbwheel button angle**
AJS 600	XY	V	1M	0	1	JB3	1SL-2B	V8	V
	2 axis	0-10V	1 meters	Without Relay	Button deadman	P2+R1	Buton1: Black with led Buton2: Blue without	0.5…4.5V	Vertical