QUICKSTART BASIC

QB020-4 - 11/24

off-board driver for proportional valves without transducer - analog reference signal

DIGITAL DRIVER IN DIN-RAIL FORMAT EN 60715

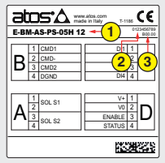
Valve model:
directional, pressure and flow valves without transducer

Driver model:
E-BM-AS

IDENTIFICATION

Driver identification label

Driver label : **L**

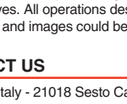
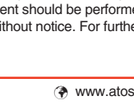


1 : driver code
2 : driver serial number
3 : factory firmware version

INSTALLATION TOOLS

Screwdriver	DIN-rian EN60715	Connectors
		
not included	not included	supplied with the driver
see STEP 1		see STEP 2.1

PROGRAMMING TOOLS - not included

PC software	Serial RS232 connection KIT	
	Cable	Adapter
		
E-SW-SETUP	**E-C-PS-DB9/RJ45**	**E-A-PS-USB/DB9**

PC SOFTWARE

E-SW-SETUP supports

NP (USB)
BC (CANopen)
EW (POWERLINK)
IL (IO-Link)
BP (PROFIBUS DP)
EI (EtherNet/IP)
PS (Serial)
EH (EtherCAT)
EP (PROFINET RT/IRT)
IR (Infrared)

supports valves with **SP**, **SF**, **SL** alternated p/Q control

REMARK Atos PC software is designed for Windows based operative systems - Windows 10 or later

PC SOFTWARE DOWNLOAD

Download area
electronics

Download PC software at **www.atos.com**
accessing to "**MyAtos** -> **Download area** electronics"

Free registration by filling the form at **www.atos.com/en-it/login**

E-SW-SETUP is free and available in Download area

RELATED DOCUMENTATION - www.atos.com

FS900	Operating and maintenance information - tech. table	**E-MAN-BM-AS**	E-BM-AS - driver operating manual
F***	Proportional valves without transducer - tech. table		
P005	Mounting surfaces - tech. table		
G030	E-BM-AS drivers - tech. table		
GS500	Programming tools - tech. table		
K800	Electric and electronic connectors - tech. table		

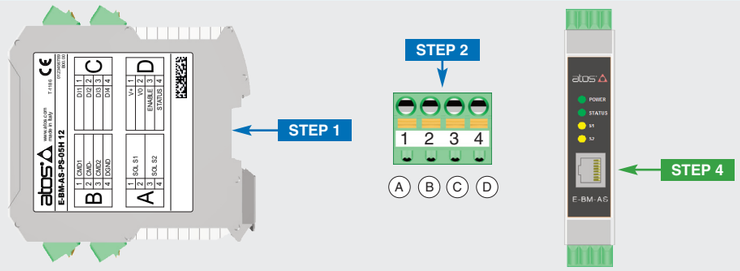
ATTENTION !

The purpose of this quickstart guide is show a logical sequence of basic operations. This guide does not cover all details or variants of Atos valves. All operations described in this document should be performed only by qualified personnel.
Operations and images could be subject to change without notice. For further information please refer to related documentation.

CONTACT US

Atos spa - Italy - 21018 Sesto Calende
www.atos.com
support@atos.com

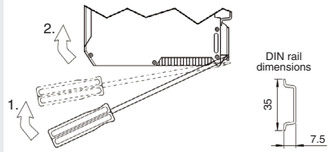
PRODUCTS OVERVIEW



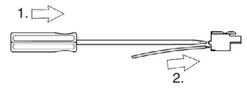
INSTALLATION		OPTIONAL	
STEP 1	**STEP 2**	**STEP 3**	**STEP 4**
INSTALLATION	ELECTRICAL	DIGITAL vs ANALOG	PC SOFTWARE

STEP 1 INSTALLATION

To unlock the driver from the DIN rail:
1. pull down the locking slide with a screwdriver
2. rotate up the driver



To wire cables in the connectors:
1. press the button with a screwdriver
2. insert the cable termination



Note: max conductor size 2,5 mm²

STEP 2 ELECTRICAL

This section considers the different valves options, illustrating the multiple variants of the available electrical connections.
The electrical connections have to be wired according to the selected valve code

2.1 CONNECTORS

Recommended LiYCY shielded cables, max length 40 m: 0,5 mm² for logic - 1,5 mm² for power supply and solenoids

Connector A	
A1	**SOL S1** (Current to solenoid S1)
A2	
A3	**SOL S2** (Current to solenoid S2)
A4	

Connector B	/P option
B1	**CMD1** (±10Vdc / 4 ÷ 20mA)	
B2	**CMD-** (ground for reference)	Reference for ±5Vdc output
B3	**CMD2** (±10Vdc / 4 ÷ 20mA)	
B4	**DGND** (optical insulated ground for on/off inputs DI1 ÷ DI4)	

Connector C	/P option	
C1	**DI1** (input 24Vdc) **(1)**	
C2	**DI2** (input 24Vdc) **(1)**	
C3	**DI3** (input 24Vdc) **(1)**	+5Vdc 10mA output supply
C4	**DI4** (input 24Vdc) **(1)**	-5Vdc 10mA output supply

Connector D	
D1	**V+** (power supply 24Vdc) **(1)**
D2	**V0** (power supply 0Vdc)
D3	**ENABLE** (input 24Vdc) **(1)**
D4	**STATUS** (output 24Vdc) **(1)**

(1) 12 Vdc for /12 option

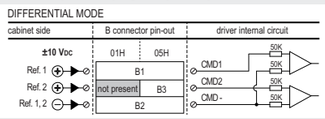
WARNING: remove power supply before any electrical or wiring operations

WARNING: a safety fuse is required in series to driver power supply - 2,5 A time lag fuse

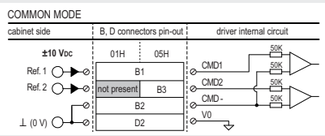
ELECTRICAL WIRING EXAMPLES

REFERENCE INPUTS - VOLTAGE

DIFFERENTIAL MODE

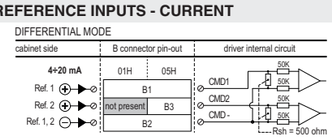


COMMON MODE

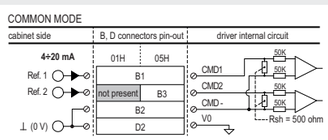


REFERENCE INPUTS - CURRENT

DIFFERENTIAL MODE

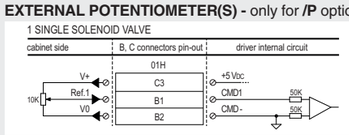


COMMON MODE

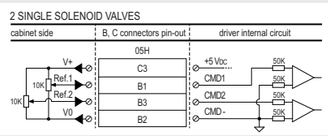


EXTERNAL POTENTIOMETER(S) - only for /P option

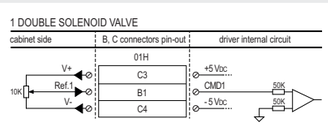
1 SINGLE SOLENOID VALVE



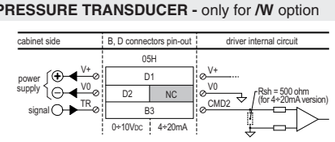
2 SINGLE SOLENOID VALVES



1 DOUBLE SOLENOID VALVE



PRESSURE TRANSDUCER - only for /W option



STEP 3 DIGITAL vs ANALOG - only for E-BM-AS series 12 or higher

E-BM-AS digital driver replaces the E-BM-AC and E-ME-AC

3.1 E-BM-AC / E-ME-AC ELECTRICAL CONNECTIONS QUICK REPLACEMENT

Disconnect the cables from E-BM-AC or E-ME-AC analog driver and connect them to the E-BM-AS digital driver connectors.

POWER SUPPLY AND ENABLE

E-BM-AC		E-BM-AS	E-ME-AC	
E-K-11B socket pin-out		D connector pin-out	E-K-32M socket pin-out	
11	Power supply V+	D1	Power supply V+	AC2
1	Power GND	D2	Power GND	AC4
		D3	Enable	A18

COILS

E-BM-AC		E-BM-AS	E-ME-AC	
E-K-11B socket pin-out		A connector pin-out	E-K-32M socket pin-out	
9	Coil S1	A1	Coil S1	AC28
10	Coil S1	A2	Coil S1	AC26
5	Coil S2 **(1)**	A3	**(2)** Coil S2	AC32
4	Coil S2 **(1)**	A4	**(2)** Coil S2	AC30

(1) Only for 05F and 011F **(2)** Only for 05F

EXTERNAL POTENTIOMETERS - only for /P option

E-BM-AC-01F		E-BM-AS-01H/P		E-ME-AC-01F	
E-K-11B socket pin-out		B connector pin-out		E-K-32M socket pin-out	
3	R1 input signal +	B1	Ext. reference signal	C12	
2	R1 input signal -	B2	Signal GND	A8	
1	Power GND -	C connector pin-out		A14	
6	+5V Ext. power supply	C3	+5V Ext. power supply	C10	

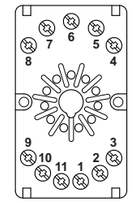
E-BM-AC-05F		E-BM-AS-05H/P		E-ME-AC-05F	
E-K-11B socket pin-out		B connector pin-out		E-K-32M socket pin-out	
3	R1 input signal +	B1	Ext. reference signal	C12	
6	+5V Ext. power supply	B2	Signal GND	A8	
7	-5V Ext. power supply	C connector pin-out		A14	
		C3	+5V Ext. power supply	C10	
		C4	-5V Ext. power supply	C14	

EXTERNAL REFERENCE

E-BM-AC-0*F		E-BM-AS-0*H		E-ME-AC-0*F	
E-K-11B socket pin-out		B connector pin-out		E-K-32M socket pin-out	
3	R1 input signal +	B1	Ext. reference signal	C12	
2	R1 input signal -	B2	Signal GND	A8	
				A14	

E-BM-AC-011F		E-BM-AS-05H	
E-K-11B socket pin-out		B connector pin-out	
3	R1 input signal +	B1	
2	R1 input signal -	B2	
8	R2 input signal +	B3	
7	R2 input signal -		

E-BM-AC
Socket type: E-K-11B
Undecal



PIN	SIGNALS
1	Power GND
2	R1 Input Signal -
3	R1 Input Signal +
4	Coil S2
5	Coil S2
6	+5V Ext. power supply
7	-5V Ext. power supply R2 Input Signal -
8	R2 Input Signal +
9	Coil S1
10	Coil S1
11	Power supply V+

E-ME-AC
Socket type: E-K-32M
Eurocard DIN 41612

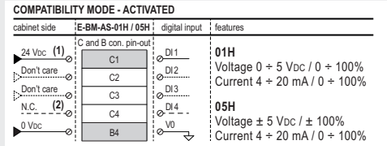
PIN	SIGNALS	
	A	C
2	Power supply V+	
4	Power GND	
6	Ramp SW off	
8	Signal GND	+15V
10	/	+5V Ext. p.s.
12	-15V	Ext. Ref. Sign.
14	Signal GND	-5V Ext. p.s.
16	/	
18	Enable	Ref. Invers.
20	Ref. Com.	
22	Ref. 4	Ref. 1
24	Ref. 3	Ref. 2
26	Coil S1	
28	Coil S1	
30	Coil S2	
32	Coil S2	

3.2 E-BM-AS COMPATIBILITY FUNCTIONALITIES ACTIVATION

E-BM-AS digital inputs (DI1..DI4) activate compatibility functionalities with E-BM-AC and E-ME-AC analog drivers.

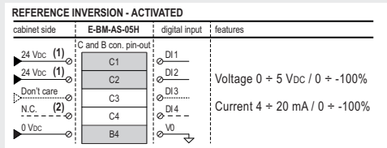
COMPATIBILITY MODE - for E-BM-AC 01F/05F or E-ME-AC 01F/05F

COMPATIBILITY MODE - ACTIVATED

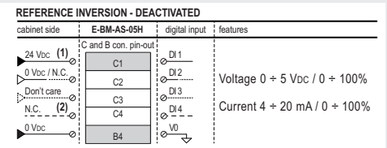


REMARK:
- To activated compatibility mode connect 24 Vdc **(1)** to DI1 (pin C1) before driver power on
- Reference Inversion and Ramp Off functionality are available only if this compatibility mode is activated

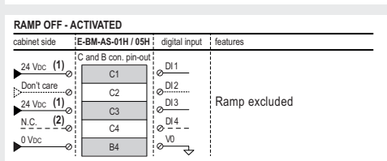
REFERENCE INVERSION - ACTIVATED



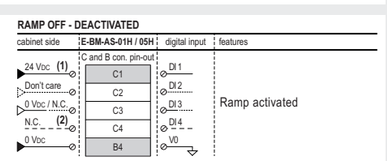
REFERENCE INVERSION - DEACTIVATED



RAMP OFF - ACTIVATED



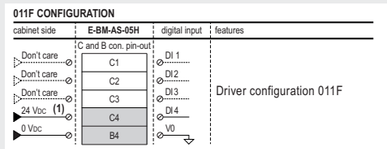
RAMP OFF - DEACTIVATED



(1) 12 Vdc for /12 option - not available for E-ME-AC **(2)** Do not connect

COMPATIBILITY MODE - for E-BM-AC 011F (not available for /P option)

011F CONFIGURATION



REMARK:
- To activated compatibility mode connect 24 Vdc **(1)** to DI4 (pin C4) before driver power on

(1) 12 Vdc for /12 option

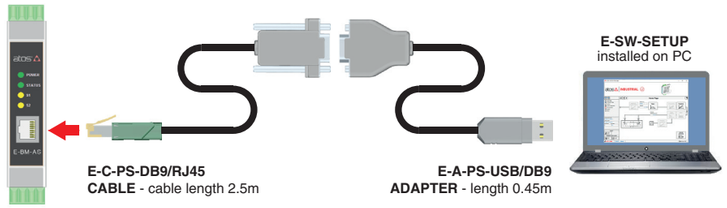
STEP 4 PC SOFTWARE

REMARK off-board drivers are factory preset with default parameters and ready to use after piping and electrical connections.
Play with parameters is optional, not mandatory!

4.1 CONNECTION

1 **In order to access valve parameterization:**
- Install E-SW-SETUP software on PC
- Complete the electrical installation and power on the driver with **24Vdc** (standard) or **12Vdc** (/12 option)

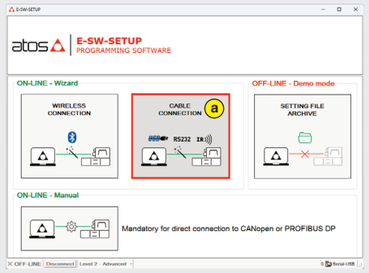
2 Connect driver to the PC as shown below



WARNING: drivers RS232 port is not isolated!

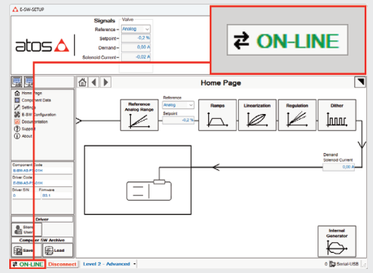
3 Launch the PC software using E-SW-SETUP icon:
- **PC software does NOT detect valid connection**
  communication is not established, please follow wizard procedure **4**
- **PC software detects valid connection**
  communication automatically established - valve is **ON-LINE** see **5**

4 In **ON-LINE - Wizard** press button:
(a) : CABLE CONNECTION
Wizard procedure for connection via USB cable

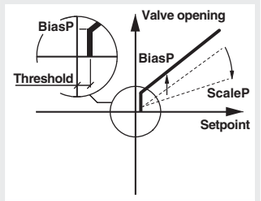
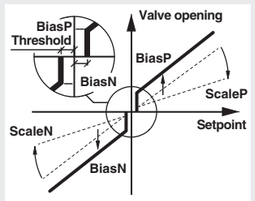
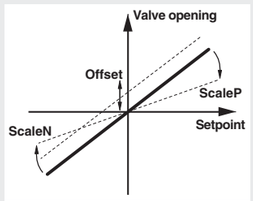


NOTE: Bluetooth not available for E-BM-AS

5 Communication established, valve is **ON-LINE** and it is possible change parameters



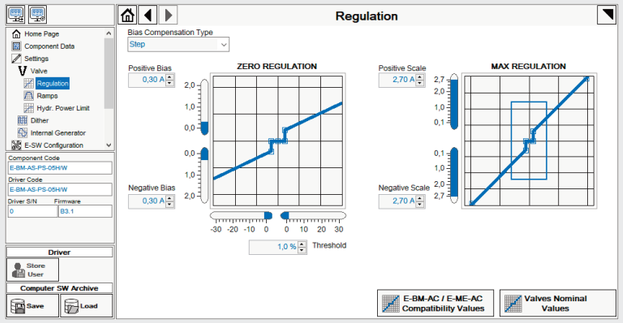
4.2 CONFIGURATION

Single solenoid directional control valve, 2 positions with positive overlapping	Double solenoid directional control valve, 3 positions with positive overlapping	Single or double solenoid directional control valve, 3 positions with zero overlapping
		
BiasP positive bias **ScaleP** positive scale	**BiasP** positive bias **ScaleP** positive scale **BiasN** negative bias **ScaleN** negative scale	**ScaleP** positive scale **ScaleN** negative scale **Offset**
Threshold = 2% (200mV or 0,32mA for **/I** option)	**Threshold** = 2% (±200mV or ±0,16mA for **/I** option)	

BIAS AND SCALE - 2 and 3 POSITION VALVES

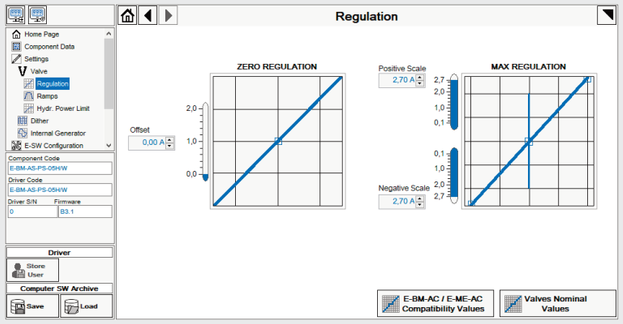
Bias setting: supply input signal just over the Threshold value; increase the Bias until the actuator is start moving, then lightly reduce the Bias just to stop the actuator
Scale setting: supply the max input signal; adjust the Scale to obtain the max actuator speed

NOTE: bias and scale negative parameter are available only for 3 position valves



OFFSET AND SCALE – 3 POSITION VALVES, ZERO OVERLAP

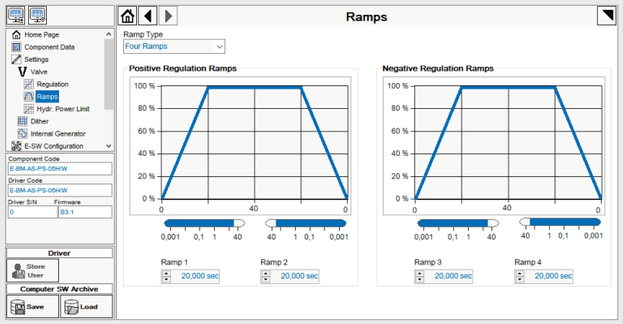
Offset setting: supply the input signal equal to 0%; adjust the Offset until the actuator is stopped
Scale setting: supply the max input signal (positive/negative); adjust the Scale to obtain the max actuator speed in both directions



RAMPS

Ramps setting: select required ramp configuration and adjust ramp time to optimize the actuator's acceleration and deceleration

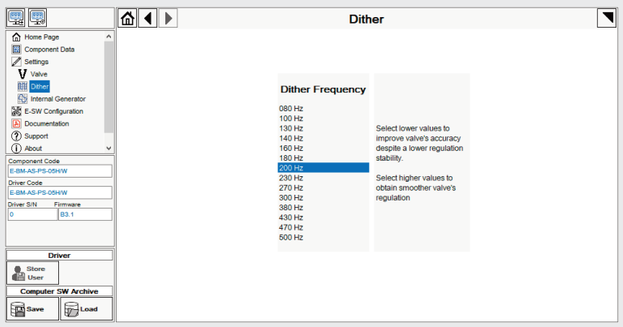
No Ramp : no ramps selected
Single Ramp : setup **Ramp 1**
Double Ramp : setup **Ramp 1** and **2**
Four Ramps : setup **Ramp 1**, **2**, **3** and **4** (only 3 position)



DITHER

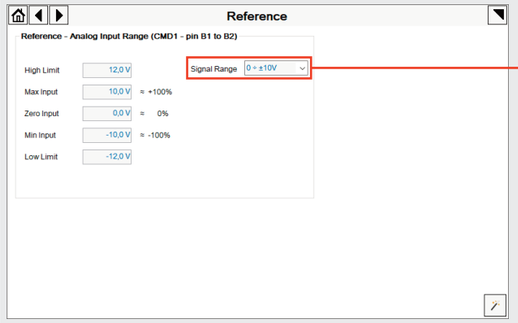
Dither setting: factory default 200 Hz

- lower frequencies reduce the hysteresis of the valve, too low values can affect the valve stability
- higher frequencies increase regulation stability, but increase also the hysteresis of the valve

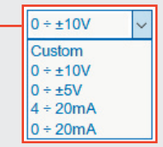


REFERENCE ANALOG INPUT RANGE - E-SW-SETUP

Reference input signal can be selected between different options.
Defaults: 0 ÷ ±10 V for standard and 4 ÷ 20 mA for /I option.
Input signal is configurable via software selecting between voltage and current, browsing to **Reference** page:



select **Signal Range** control to set the analog input signal



NOTE:
if different settings are required use **Custom** option

4.3 STORE

Parameters modifications will be stored into driver permanent memory:

- press Store User button to store **Valve Parameters**

WARNING: during valve parameters storing operations, the driver automatically shuts down the solenoid power supply for a short time. Do not perform any storing commands while the system is working.

4.4 BACK UP

Parameter modifications will be saved into PC memory:

- press Save button to access **Computer SW Archive - Setting Files** page, **Setting File Name** pop-up appears
- input a valid name into **Description** field and press **Ok** button

TROUBLESHOOTING

Valve vibration or noise
- presence of air in the solenoid; perform valve air bleeding procedure – see tech. table of the connected valve
- dither frequency too low; increase value of the frequency – see STEP 4, section 4.2

The valve does not follow the reference signal
- driver is powered off, verify presence of 24 Vdc (standard) or 12 Vdc (/12 option) power supply and the coil(s) connection
- driver is disabled, verify presence of 24 Vdc (standard) or 12 Vdc (/12 option) on enable pin
- flow/pressure values exceeding the valve's performance limits, verify that hydraulic operating conditions are in compliance with the valve's characteristics
- big hysteresis or spool stick-slip, reduce the dither frequency
- spool sticking, contact Atos service center

PC software parameters modifications are lost when valve is switched off
- parameter store operation was not performed, check store procedure – see STEP 4, section 4.3

PC software parameters modifications have no effect on the valve
- driver is OFF LINE, check connection procedure – see STEP 4, section 4.1

After the modifications of PC software parameters the valve/driver does not work properly
- restore driver factory parameters using 'Restore Factory' button, located in 'Signals - Extended Page' window:
  - during restore, the current to the solenoid(s) will be temporarily switched to off!
  - factory parameters will be applied at next driver restart or after power off-on sequence!
  - perform the bias and scale configurations again!