

DIN-RAIL DIGITAL DRIVER FOR DIRECTIONAL AND FLOW VALVES					
<b>Industrial driver model:</b> E-BM-TEB/LEB series 20 or higher		<b>Ex-Proof driver model:</b> E-BM-TEB/LEB /A series 20 or higher			
<b>Industrial valve models:</b>		<b>Ex-Proof valve models:</b>			
Direct operated DLHZO-T    DHZO-T    QVHZO-T DLKZOR-T    DKZOR-T    QVKZOR-T		Direct operated DLHZA-T    DHZA-T    QVHZA-T DLKZA-T    DKZA-T    QVKZA-T			
Pilot operated DPZO-T    LIQZP-L		Pilot operated DPZA-T    LIQZA-L			

### IDENTIFICATION

Driver identification label

Driver label : L

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

### INSTALLATION TOOLS

Screwdriver not included	DIN-rail EN60715 not included	Connectors supplied with the driver see STEP 2
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see STEP 1

### PROGRAMMING TOOLS - not included

Software	USB connection KIT	OR	Bluetooth connection KIT
E-SW-* programming software	Cable E-C-SB-USB/BM Isolator E-A-SB-USB/OPT		Cable E-C-SB-BM/BTH Adapter E-A-SB-USB/BTH

### PROGRAMMING SOFTWARE

The software is available in different versions according to the driver's options:

E-SW-BASIC	supports NP (USB)	IL (IO-Link)	PS (Serial)	IR (Infrared)
E-SW-FIELDBUS	supports BC (CANopen)	BP (PROFIBUS DP)	EH (EtherCAT)	EP (PROFINET RT/IRT)
E-SW-/PQ	supports drivers with SP, SF, SL alternated P/Q control	EW (POWERLINK)	EI (EtherNet/IP)	

E-SW-FIELDBUS supports also drivers without fieldbus communication; E-SW-/PQ supports also drivers without P/Q control

REMARK Atos software is designed for Windows based operative systems - Windows XP SP3 or later

### DOWNLOAD AREA

Perform the registration at [www.atos.com/en-it/login](http://www.atos.com/en-it/login) by filling the form. In MyAtos area, perform login with personal username and password and then press the **Download area electronics** button

Free version of E-SW-BASIC can be downloaded and used by the "FREE Activation Code"

The software remains active for 10 days from the installation date and then it stops until the user inputs the Activation Code

### RELATED DOCUMENTATION - www.atos.com - section Catalog on-line

FS900 Operating and maintenance information - tech. table	STARTUP E-SW-BASIC Software startup guide
F*** Proportional valves with one or two LVDT - tech. table	STARTUP BLUETOOTH Bluetooth adapter startup guide
P005 Mounting surface - tech. table	E-MAN-BM-LEB TEB/LEB - driver operating manual
GS230 E-BM-TEB/LEB 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.

### PRODUCTS OVERVIEW

**STEP 1**

**STEP 2**

**STEP 3**

INSTALLATION		PROGRAMMING
<b>STEP 1</b>	<b>STEP 2</b>	<b>STEP 3</b>
<b>MECHANICAL</b>	<b>ELECTRICAL</b>	<b>SOFTWARE</b>

### STEP 1 MECHANICAL

**To lock the driver from the DIN rail:**  
1. place the attach located on the driver bottom on the DIN rail  
2. press the driver against the DIN rail until the locking slide clicks

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

**To extract the connectors:**  
1. push lever  
2. pull connector

**To insert the connectors:**  
1. push the connector in its slot

**To wire cables in the connectors:**  
1. insert the cable termination  
2. turn screw with a screwdriver

**NOTE:**  
max conductor size 2,5 mm<sup>2</sup>  
tightening torque 0,4 ÷ 0,6 Nm

**NOTE:** all connectors are supplied with a mechanical coding. This feature ensures a unique insertion of each connector in the own slot (e.g. connector A can not be inserted into connector slot of B,D,E,F)

### STEP 2 ELECTRICAL

This section considers the different drivers executions, illustrating the multiple variants of the available electrical connections. The electrical connections have to be wired according to the selected driver code

**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

Recommended LIYCY shielded cables: 0,5 mm<sup>2</sup> max 50 m - for logic - 1,5 mm<sup>2</sup> max 50 m - for power supply and solenoids

Power supply	
A	1 V+ (power supply 24Voc)
	2 V0 (power supply 0Voc)
	3 ENABLE (input 24Voc)
	4 FAULT (output 24Voc)

Enable and fault signals	
B	1 SOL_S1- (negative current to solenoid S1)
	2 SOL_S1+ (positive current to solenoid S1)
	3 SOL_S2- (negative current to solenoid S2)
	4 SOL_S2+ (positive current to solenoid S2)

Pressure transducer	
D	1 Q_INPUT+ (±10Voc / 4 ÷ 20mA)
	2 INPUT- (negative reference for INPUT+)
	3 Q_MONITOR (±10Voc / 4 ÷ 20mA)
	4 AGND (ground for monitor)

LVDT position transducer - direct valve or pilot valve	
E	1 LVDT_T (direct or pilot valve - transducer input signal)
	2 -15V (power supply -15Voc)
	3 +15V (power supply +15Voc)
	4 AGND (ground for transducer power)

LVDT position transducer - main stage valve	
F	1 LVDT_L (main stage valve - transducer input signal)
	2 -15V (power supply -15Voc)
	3 +15V (power supply +15Voc)
	4 AGND (ground for transducer power)

(1) F connector is available only for LEB

### ELECTRICAL WIRING EXAMPLES FOR INDUSTRIAL VALVES - for Ex-Proof valves please refer to relevant tech. tables

#### REFERENCE INPUT - VOLTAGE

**DIFFERENTIAL MODE**

cabinet side    D connector pin-out    driver internal circuit

±10 Voc

Ref. ⊕    Ref. ⊖

**COMMON MODE**

cabinet side    D connector pin-out    driver internal circuit

±10 Voc

Ref. ⊕

⊥ (0 V)

#### REFERENCE INPUT - CURRENT

**DIFFERENTIAL MODE**

cabinet side    D connector pin-out    driver internal circuit

4÷20 mA

Ref. ⊕    Ref. ⊖

**COMMON MODE**

cabinet side    D connector pin-out    driver internal circuit

4÷20 mA

Ref. ⊕

⊥ (0 V)

#### MONITOR OUTPUT - VOLTAGE

**MONITOR OUTPUT**

cabinet side    D connector pin-out    driver internal circuit

±10 Voc

Mon. ⊕

⊥ (0 V)

#### MONITOR OUTPUT - CURRENT

**MONITOR OUTPUT**

cabinet side    D connector pin-out    driver internal circuit

4÷20 mA

Mon. ⊕

⊥ (0 V)

Rmax = 500 ohm

#### SOLENOIDS

**01H SINGLE SOLENOID**

valve solenoid side    B connector pin-out    driver signals

connector code 666

2 COIL

1 EARTH

3

B1 SOL\_S1-

B2 SOL\_S1+

**05H DOUBLE SOLENOID**

valve solenoids side    B connector pin-out    driver signals

connector code 666

2 COIL

1 EARTH

3 COIL

B1 SOL\_S1-

B2 SOL\_S1+

B3 SOL\_S2-

B4 SOL\_S2+

**LVDT TRANSDUCERS**

**DIRECT OPERATED VALVES AND PILOT VALVES**

4-ETH transducer side    E connector pin-out    driver signals

connector code 345

1 TR

2 VT-

3 VT+

4 GND

E1 LVDT\_T

E2 -15V

E3 +15V

E4 AGND

**MAIN STAGE OF PILOT OPERATED VALVES WITH 2 TRANSDUCERS (EXCEPT LIQZP-125)**

E-THT-8M12 and E-THT-15 transducers side    F connector pin-out    driver signals

connector code ZBE-08

4 TR

5 VT-

2 VT+

3 AGND

F1 LVDT\_L

F2 -15V

F3 +15V

F4 AGND

F connector is available only for LEB

**MAIN STAGE OF LIQZP-125**

E-THT-50-MTS transducer side    F connector pin-out    driver signals

connector code STCO9131-6-PG9

1 TR

6 VT-

5 VT+

2 AGND

F1 LVDT\_L

F2 -15V

F3 +15V

F4 AGND

F connector is available only for LEB

**MAIN STAGE OF PILOT OPERATED VALVES WITH 1 TRANSDUCER**

E-THT-8M12 transducer side    E connector pin-out    driver signals

connector code ZBE-08

4 TR

5 VT-

2 VT+

3 AGND

E1 LVDT\_T

E2 -15V

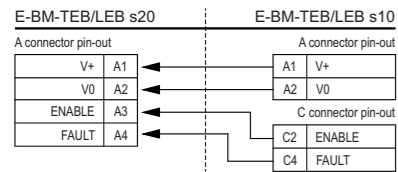
E3 +15V

E4 AGND

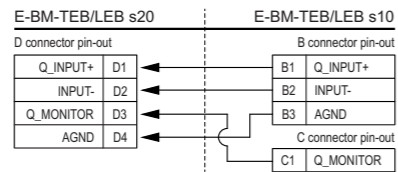
**WARNING:** for double solenoid valve pay attention to do not invert the connectors (1) and (2). If they are not inserted as shown in the example, the valve will not work properly and could cause eventual damages to the system.

**ELECTRICAL CONNECTIONS QUICK REPLACEMENT OF SERIES 20 OR HIGHER VS SERIES 10**

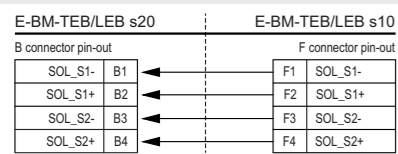
**POWER SUPPLY, ENABLE, FAULT**



**FLOW REFERENCE, FLOW MONITOR, AGND**

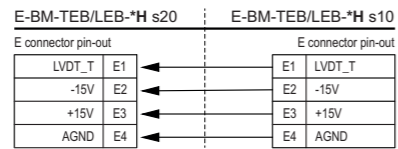


**COILS**



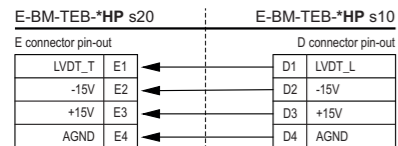
**LVDT TRANSDUCER**

DIRECT VALVES AND PILOT STAGE OF PILOTED VALVES WITH 2 TRANSDUCERS



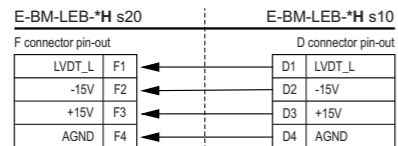
**LVDT TRANSDUCER**

MAIN STAGE OF PILOT OPERATED VALVES WITH 1 TRANSDUCER



**LVDT TRANSDUCER**

MAIN STAGE OF PILOT OPERATED VALVES WITH 2 TRANSDUCERS



NOTE: R\_ENABLE (pin C3) and EARTH (pin B4) of E-BM-TEB/LEB series 10 are not supported by series 20

**STEP 3 SOFTWARE**

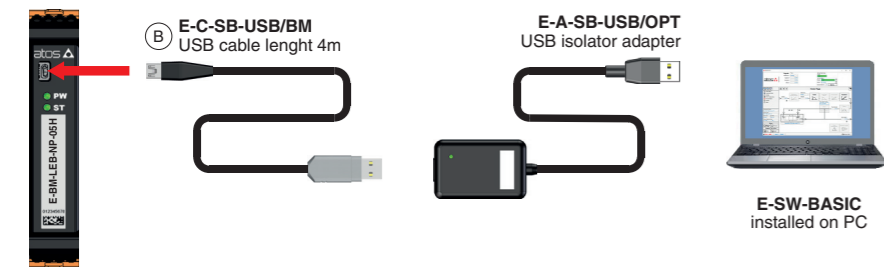
REMARK off-board drivers are factory preset with default parameters and ready to use after piping and electrical connections. **Play with parameters is optional, not mandatory!**

PROGRAMMING			PC
3.1	3.2	3.3	3.4
CONNECTION	CONFIGURATION	STORE	BACK UP

**3.1 CONNECTION**

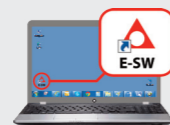
- In order to access valve parameterization:
  - Install E-SW software on PC
  - Complete the electrical installation and power on the driver with 24Vdc

- Connect driver to the PC as shown below

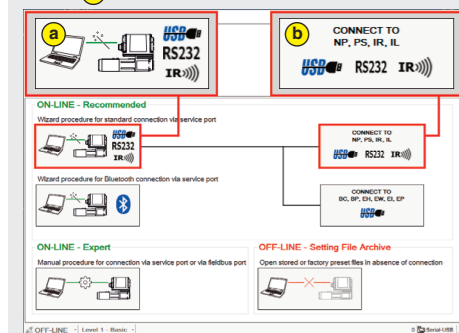


**WARNING: drivers USB port is not isolated!**  
The use of USB isolator adapter is highly recommended for PC protection (see GS500)

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

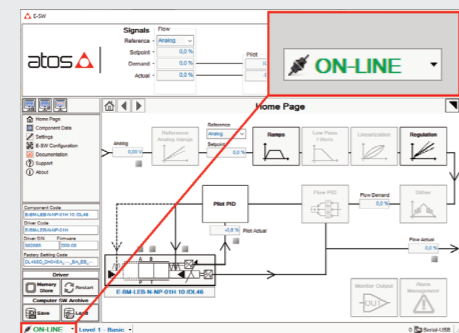


- Press buttons according the below sequence:
  - a** : ON-LINE - Recommended Wizard procedure for standard connection
  - b** : CONNECT TO NP, PS, IR, IL



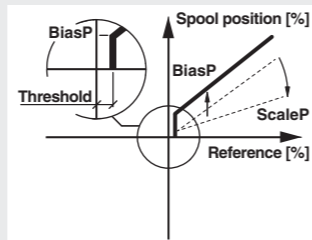
NOTE: Bluetooth adapter available!  
For more info please refer to STARTUP BLUETOOTH guide

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



**3.2 CONFIGURATION**

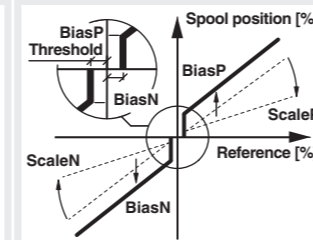
Single solenoid directional control valve, 2 positions with positive overlapping, flow control valve and cartridges 2 way



BiasP positive bias  
ScaleP positive scale

Threshold = 2%  
(200mV or 0,32mA for I option)

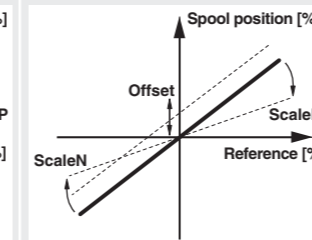
Double solenoid directional control valve, 3 positions with positive overlapping



BiasP positive bias  
ScaleP positive scale  
BiasN negative bias  
ScaleN negative scale

Threshold = 2%  
(±200mV or ±0,16mA for I option)

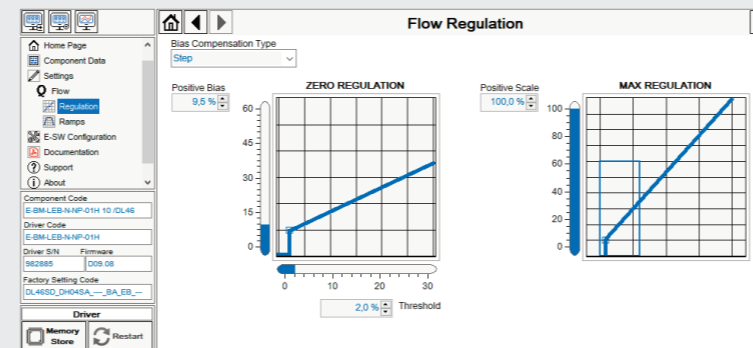
Single or double solenoid directional control valve, 3 positions with zero overlapping and cartridges 3 way



ScaleP positive scale  
ScaleN negative scale  
Offset

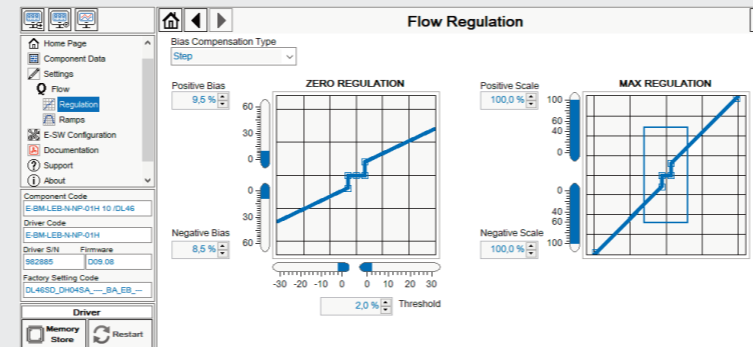
**BIAS AND SCALE - 2 POSITION VALVES, FLOW CONTROL VALVES and CARTRIDGES 2 WAY**

**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



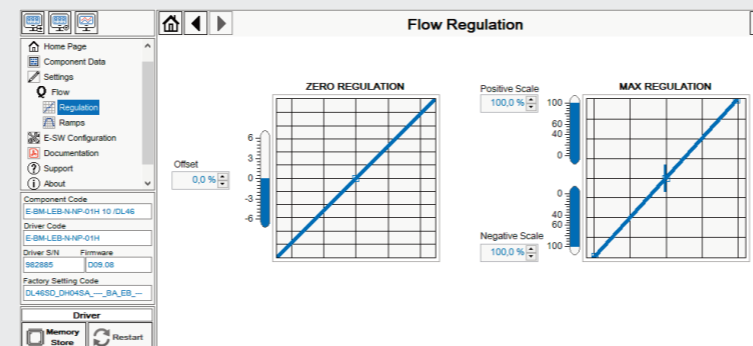
**BIAS AND SCALE - 3 POSITION VALVES**

Follow the same indications reported for 2 position valves for both valve's solenoids



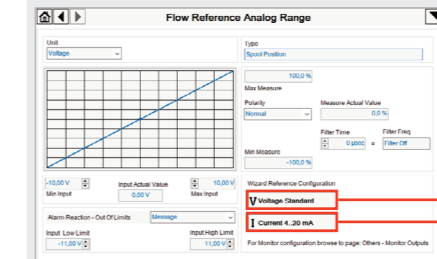
**OFFSET AND SCALE – 3 POSITION VALVES, ZERO OVERLAP and CARTRIDGES 3 WAY**

**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



**WIZARD REFERENCE - E-SW level 2 functionality**

Reference input signal is factory preset according to selected valve code, defaults are ±10 Vdc for standard and 4 ÷ ±20 mA for I option. Input signal can be reconfigured via software selecting between voltage and current, browsing to **Reference Analog Range** page:



press **Voltage Standard** button to automatically set the analog input signal to voltage

press **Current 4..20 mA** button to automatically set the analog input signal to current

REMARK: **Voltage Standard** or **Current 4..20 mA** buttons do not act on Monitor output signal configuration!  
For Monitor output signal configuration browse to page **Others - Monitor Outputs**

**3.3 STORE**

Parameters modifications will be stored into driver permanent memory:

- press **Memory Store** button to access **Driver - Memory Store** window
- press **Store User** buttons to store **Valve Parameters**

**WARNING:** During valve or fieldbus 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.

**3.4 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 air bleeding procedure – see tech. table of the connected valve

**The valve does not follow the reference signal**  
 • driver is powered off, verify presence of 24 Vdc power supply  
 • driver is disabled, verify presence of 24 Vdc 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  
 • spool sticking, contact Atos service center  
 • missing piloting pressure, verify that hydraulic pressure in X (for DPZO/E and LIQZP) or P line (DPZO) is compliant with the required value  
 • wrong pilot/drain configuration - check if the pilot/drain configuration of the valve corresponds to the effective system layout (only DPZO)

**Software parameters modifications are lost when valve is switched off**  
 • parameter store operation was not performed, check store procedure – see STEP 3, section 3.3

**Software parameters modifications have no effect on the valve**  
 • valve is OFF LINE, check connection procedure – see STEP 3, section 3.1

**After the modifications of software parameters the valve does not work properly**  
 • restore valve factory parameters using 'Restore Factory' button, located in 'Driver - Memory Store' 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!