

Operating instructions
3-segment signal light

GB

DV13x0
DV23x0



Contents

1	Preliminary note	3
1.1	Symbols used	3
2	Safety instructions	4
3	Intended use	5
4	Function	6
4.1	IO-Link	6
5	Installation	7
6	Electrical connection	8
6.1	Pin assignment	8
6.1.1	IO-Link device (DV23x0)	8
6.1.2	Standard device (DV13x0)	8
7	Operating and display elements	9
8	Operation	10
8.1	Operation of the IO-Link version	10
8.1.1	General	10
8.1.2	On/Off mode	10
8.1.3	RGB mode	10
8.2	Operation of the standard version	11
8.3	Demo mode	11
9	Parameter setting	12
9.1	IO-Link version	12
9.2	Standard version	12
9.2.1	Parameter structure	12
10	Maintenance, repair and disposal	14

1 Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at www.ifm.com.

1.1 Symbols used

- ✓ Requirement
- ▶ Instructions
- ▷ Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

2 Safety instructions

- The unit described is a subcomponent for integration into a system.
 - The system architect is responsible for the safety of the system.
 - The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Intended use).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, programming, configuration, operation and maintenance of the product must be carried out by personnel qualified and authorised for the respective activity.
- Protect units and cables against damage.
- Replace damaged units, otherwise the technical data and safety will be impaired.

3 Intended use

The unit is used for the visual display of machine conditions. The versions DVx310 and DVx330 additionally have a buzzer for acoustic signalling.

The LED segments and the audible warning device can be switched on and off individually.



The unit is not suited for environments with particular requirements on mechanical stability (e.g. shock/vibration).

The unit is intended for indoor use only.

► Observe the operating conditions (→ Technical data at www.ifm.com).



The unit is not approved for safety-related tasks in the field of operator protection.

4 Function

The standard units are DV13xx. The DV23xx units are IO-Link devices.

The IO-Link version can be triggered and configured via the standard IO-Link interface. With the standard version the individual LED segments can be switched individually via digital inputs. Parameters are set via a parameter setting button or via an additional IO-Link interface.

4.1 IO-Link

This unit has an IO-Link communication interface which enables direct access to process and diagnostic data. In addition it is possible to set the parameters of the unit while it is in operation. Operation of the unit via the IO-Link interface requires an IO-Link master.

With a PC, suitable IO-Link software and an IO-Link adapter cable, communication is possible while the system is not in operation.

The IODDs necessary for the configuration of the unit, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required IO-Link hardware and software can be found at www.ifm.com.

5 Installation



- ▶ Disconnect the power of the machine before installation.



- ▶ For installation choose a flat mounting surface.

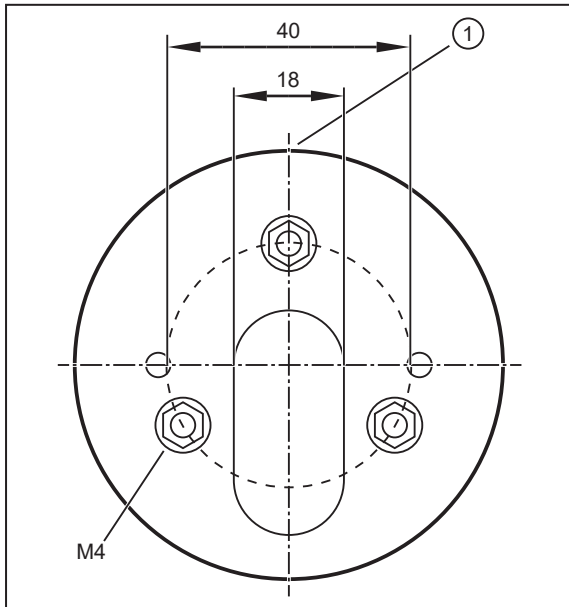


Fig. 1: Fixture (view from bottom)

1: Front side

- ▶ Attach the fixture for the unit to the mounting surface using the supplied M4 nuts. Tightening torque 1.8 Nm.
- ▶ Only with the models DVx300 and DVx310:
For mounting on a horizontal surface attach the base to the fixture (overlapping marks on base and fixture) and turn clockwise by approx. 10 ° to fix it. For mounting on a vertical surface loosen the screw in the base, turn the upper part of the base by 180 ° and tighten the screw again. Attach the base to the fixture (overlapping marks on base and fixture) and turn clockwise by approx. 10 ° to fix it.
- ▶ Insert the cable through the fixture and, if necessary, the base and connect the socket with the M12 connector in the signal lamp. Tightening torque max. 1 Nm. (Observe the maximum tightening torque of the connection cable.)
- ▶ Attach the signal lamp to the fixture or the base (overlapping marks) and turn clockwise by approx. 10 ° to fix it.



Integrated seals at the bottom of the fixture and in the base as well as O-rings at the fixture and base prevent ingress of moisture.



Information about available accessories at www.ifm.com

6 Electrical connection



The device must be connected by a qualified electrician.

Observe the national and international regulations for the installation of electrical equipment.

Voltage supply according to EN 50178, SELV, PELV.



The IO-Link port must be connected according to the IO-Link specification.

- ▶ Disconnect power.
- ▶ Connect the cable with the M12 connector of the unit.
Tightening torque max. 0.4 Nm.



Observe the maximum tightening torque of the connection cable.

6.1 Pin assignment

6.1.1 IO-Link device (DV23x0)

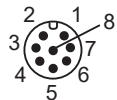
M12 plug IO-Link, 4-pole (4 x 0.34 mm² / AWG 22)



- 1: L+
- 2: not used
- 3: L-
- 4: IO-Link

6.1.2 Standard device (DV13x0)

M12 plug, 8-pole (8 x 0.25 mm² / AWG 24)



- 1: not used
- 2: Buzzer (DV1310 and DV1330)
- 3: LED segment 3
- 4: LED segment 2
- 5: Voltage supply
- 6: LED segment 1
- 7: not used
- 8: IO-Link



The input polarity is selectable.

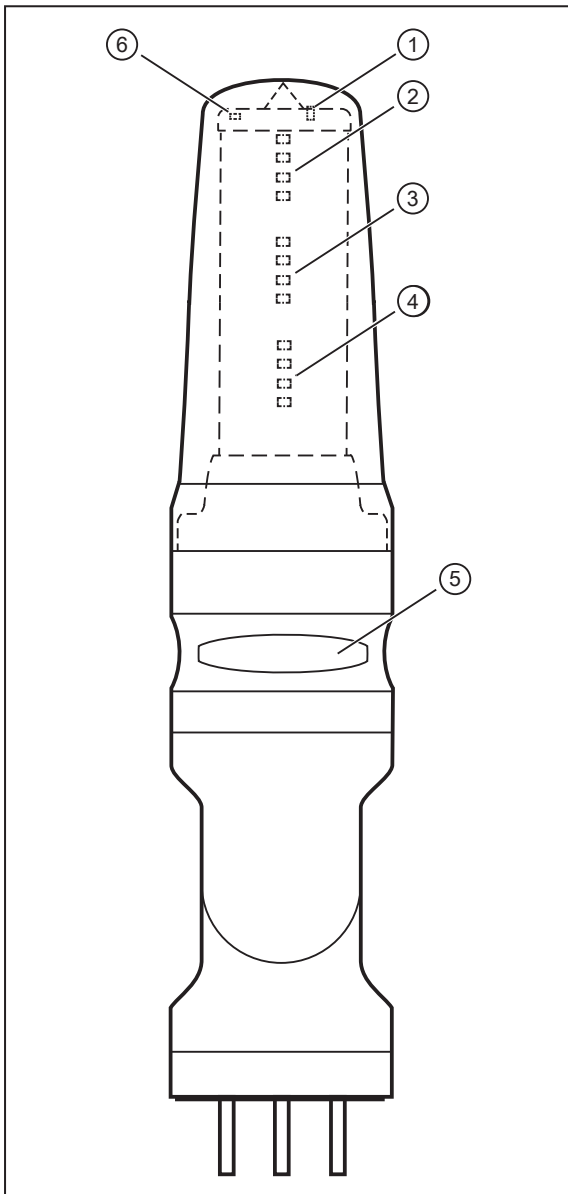
- ▶ Connect pin 5 to +24 V DC to trigger the inputs with a NPN transistor.
- ▶ Connect pin 5 to GND to trigger the inputs with a PNP transistor.



When triggered via IO-Link (pin 8) without E12572 connection cable:

- ▶ Connect pin 5 to +24 V DC.
- ▶ Connect pin 3 to GND.

7 Operating and display elements



- 1: Parameter setting button (only DV13x0)
- 2: LED segment 1 with 4 RGB LEDs
- 3: LED segment 2 with 4 RGB LEDs
- 4: LED segment 3 with 4 RGB LEDs
- 5: Buzzer (only DVx310 and DVx330)
- 6: Feedback LED (only DV13x0)

8 Operation

8.1 Operation of the IO-Link version

8.1.1 General

Connect the unit to an IO-Link master (A port) using a 4-pole connection cable. The controller switches the individual LED segments on and off in the configured colours according to the set parameters.

Via the parameter [Operating mode] the following modes can be set:

- On/Off mode
- RGB mode

8.1.2 On/Off mode

While the unit is operating, the controller switches the LED segment and the buzzer (if present) on and off (PDout, cyclical data communication). Signalling corresponds to the pre-defined parameters for the individual LED segments and the buzzer.

Via the acyclic parameter setting the following properties can be set for every LED segment:

- Colour (red, green, orange, blue, purple, turquoise, white, yellow, off)
- Frequency (permanently on, low flash rate slow/medium/fast, high flash rate slow/medium/fast)
- Brightness (100 %, 75 %, 50 %, 25 %)

For the models with an acoustic signal device the audibility of the buzzer can be set.

7	6	5	4	3	2	1	0	PDout
					Seg. 3	Seg. 2	Seg. 1	Byte 0
								Byte 1
								Byte 2
								Byte 3
								Byte 4
	Buzzer sound (buzzer style 1...8)						Buzzer	Byte 5

8.1.3 RGB mode

While the unit is operating, the controller switches the LED segment and the buzzer (if present) on and off and determines the corresponding properties (PDout, cyclical data communication).

In this operating mode 8 different acoustic signals are available for the buzzer.

7	6	5	4	3	2	1	0	PDout
	Segment 1 LED properties			Seg. 1 yellow	Seg. 1 red	Seg. 1 green	Seg. 1 blue	Byte 0
	Segment 2 LED properties			Seg. 2 yellow	Seg. 2 red	Seg. 2 green	Seg. 2 blue	Byte 1
	Segment 3 LED properties			Seg. 3 yellow	Seg. 3 red	Seg. 3 green	Seg. 3 blue	Byte 2
	Buzzer sound (buzzer style 1...8)						Buzzer	Byte 3

The properties of the LED segments are defined as follows:

Byte 0 Bit 3	Byte 0 Bit 2	Byte 0 Bit 1	Byte 0 Bit 0	Colour
0	0	0	0	off
0	1	0	0	red
0	0	1	0	green
0	1	1	0	orange
0	0	0	1	blue
0	1	0	1	purple
0	0	1	1	turquoise
0	1	1	1	white
1	0	0	0	yellow

Byte 0 Bit 6	Byte 0 Bit 5	Byte 0 Bit 4	Frequency
0	0	0	permanently on
0	0	1	low flash rate slow
0	1	0	low flash rate medium
0	1	1	low flash rate fast
1	0	0	high flash rate slow
1	0	1	high flash rate medium
1	1	0	high flash rate fast

8.2 Operation of the standard version

The unit is connected to the digital outputs of the controller via an 8-pole cable (see accessories at www.ifm.com). The HTTL inputs of the signal lamp are triggered with 24 V DC. According to the set parameters the LED segments are on and the buzzer sounds (if present).

The signal inputs can be triggered either in PNP or in NPN technology (→ Electrical connection > Pin configuration > Standard unit).

With the parameter setting button the following properties can be set for every LED segment:

- Colour (red, green, orange, blue, purple, turquoise, white, yellow, off)
- Frequency (permanently on, low flash rate slow/medium/fast, high flash rate slow/medium/fast)
- Brightness (100 %, 75 %, 50 %, 25 %)

Parameter setting via the IO-Link interface (pin 8 of the M12 connector) is also possible.

After parameter setting the unit goes to the Run mode.

8.3 Demo mode

In demo mode, the unit demonstrates the different

- Colours
- Buzzer sounds (buzzer styles, provided the unit features a buzzer)

Set the parameter [Demo mode] in the IO-Link parameter setting tool. For SIO and IO-Link mode, the demo is available in 3 different speeds, respectively.

9 Parameter setting

9.1 IO-Link version

The parameters of the device can be set using an IO-Link parameter setting tool IO-Link (→ □ 6).



IO Device Description (IODD) with all parameters and process data of the unit can be found at documentation.ifm.com.

9.2 Standard version

- ▶ Turn the transparent protective cover anticlockwise by approx. 10 ° and remove it.
- ▶ Briefly press the parameter setting button at the head of the unit (< 5 s).
 - ▷ The feedback LED is green on.
The unit is in the parameter setting mode.
- ▶ Briefly press the parameter setting button (< 5 s) to go to the next parameter.
- ▶ Press the parameter setting button for a longer time (> 5 s) to set the selected parameter.
 - ▷ The feedback LED flashes green.
The unit indicates the current settings of the LED segment to be configured.
- ▶ Briefly press the parameter setting button (< 5 s) to change the value for the selected parameter.
Repeat this step until the requested setting is selected.
 - ▷ The unit indicates the current settings of the LED segment to be configured.
- ▶ Press the parameter setting button for a longer time (> 5 s) to save the selected value for this parameter.
 - ▷ The feedback LED flashes green.
The unit saves the value and goes to the next parameter.
 - ▷ After configuration of all LED segments the unit displays the current settings of all LED segments.
- ▶ Briefly press the parameter setting button (< 5 s) to finish the parameter setting mode.
 - ▷ The feedback LED goes out. The unit is in the Run mode.



If the parameter setting button is not pressed for longer than 30 seconds, the unit saves the last changes and goes to the Run mode.

9.2.1 Parameter structure

LED seg.	Parameter	Value								
1	Colour	red	green	orange	blue	purple	tur-quoise	white	yellow	off
	Frequency	on	low flash rate slow	low flash rate medium	low flash rate fast	high flash rate slow	high flash rate medium	high flash rate fast		
	Brightness	100 %	75 %	50 %	25 %					
2	Colour	red	green	orange	blue	purple	tur-quoise	white	yellow	off
	Frequency	on	low flash rate slow	low flash rate medium	low flash rate fast	high flash rate slow	high flash rate medium	high flash rate fast		

LED seg.	Parameter	Value								
2	Brightness	100 %	75 %	50 %	25 %					
3	Colour	red	green	orange	blue	purple	tur- quoise	white	yellow	off
	Frequency	on	low flash rate slow	low flash rate medium	low flash rate fast	high flash rate slow	high flash rate medium	high flash rate fast		
	Brightness	100 %	75 %	50 %	25 %					

10 Maintenance, repair and disposal

Cleaning the unit:

- ▶ Disconnect the unit from the voltage supply.
- ▶ Clean the unit from dirt using a soft, chemically untreated and dry micro-fibre cloth.

The operation of the unit is maintenance-free.

Only the manufacturer is allowed to repair the unit.

- ▶ After use dispose of the device in an environmentally friendly way in accordance with the applicable national regulations.