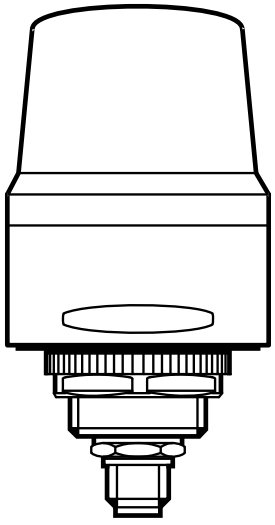
Operating instructions
1-segment signal lamp

DV2120
DV2121
DV2130
DV2131

UK



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Contents

1 Preliminary note

Technical data, approvals, accessories and further information at www.ifm.com.

1.1 Symbols used

UK

▶ Instruction

> Reaction, result

[…] Designation of keys, buttons or indications

→ Cross-reference

Important note
Non-compliance may result in malfunction or interference.

Information
Supplementary note.

1.2 Warnings used

WARNING!

Warning of serious personal injury.
Death or serious irreversible injuries may result.

CAUTION!

Warning of personal injury.
Slight reversible injuries may result.

NOTE!

Warning of damage to property

2 Safety instructions

- The device described is a subcomponent for integration into a system. The manufacturer is responsible for the safety of the system. The system manufacturer undertakes to perform a risk assessment and to create a 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 manufacturer 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 (→ 3 Functions and features).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- In case of malfunctions of the unit, please contact the manufacturer. Tampering with the unit is not allowed.
- 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.
- If the device is used in a way that is not allowed by the manufacturer the protection provided by the device may be affected.

3 Functions and features

The unit is used for the visual display of machine conditions. The versions DV2130 and DV2131 additionally have a buzzer for acoustic signalling. The versions DV2121 and DV2131 additionally have a feedback button.

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

- ▶ The device is intended for indoor use only.
  Observe the operating conditions (→ 10 Technical data).
- ▶ The unit must not be used for safety-related applications such as access control.

The units can be controlled and configured via the standardised IO-Link interface.

3.1 IO-Link

3.1.1 General information

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 an IO-Link interface requires an IO-Link capable module (IO-Link master).

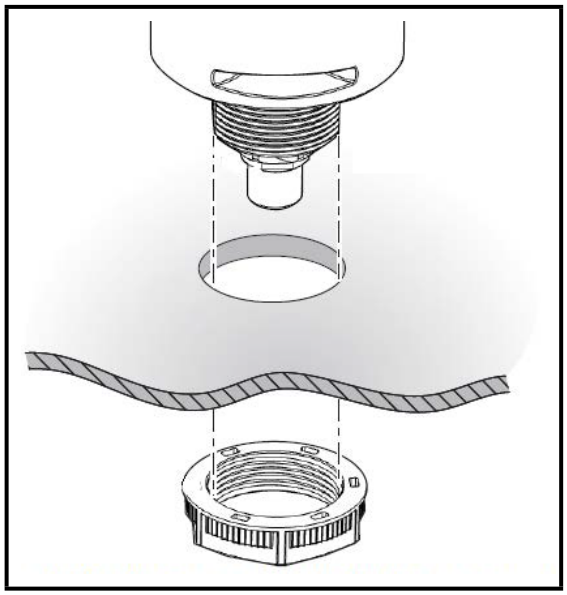
3.1.2 Device-specific information

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.

4 Installation

▶ Disconnect power before installation.

▶ For installation choose a flat mounting surface.
Maximum thickness of the mounting surface: 10 mm



Installation example:

▶ Create a mounting section Ø 31 mm

▶ Only mount the unit in upright position using the supplied M30 nut.
Tightening torque 4.5 Nm.

Special accessories are available to allow mounting the unit using a mounting tube or pole.

Integrated seals at the bottom of the unit and an O-ring on the cover prevent penetration of humidity.

More information about available accessories at www.ifm.com

5 Electrical connection

The device must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply according to SELV, PELV

For use in USA and Canada: voltage supply to class 2

▶ 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.

5.1 IO-Link connection

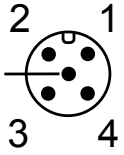
The IO-Link port must be connected according to the IO-Link specification.

5.2 Pin connection

5.2.1 IO-Link mode

M12 connector, 5 poles, A-coded
(4 x 0.34 mm² / AWG 22)

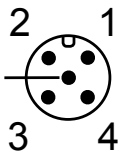
1: V+
2: not connected
3: 0V
4: IO-Link
5: not connected



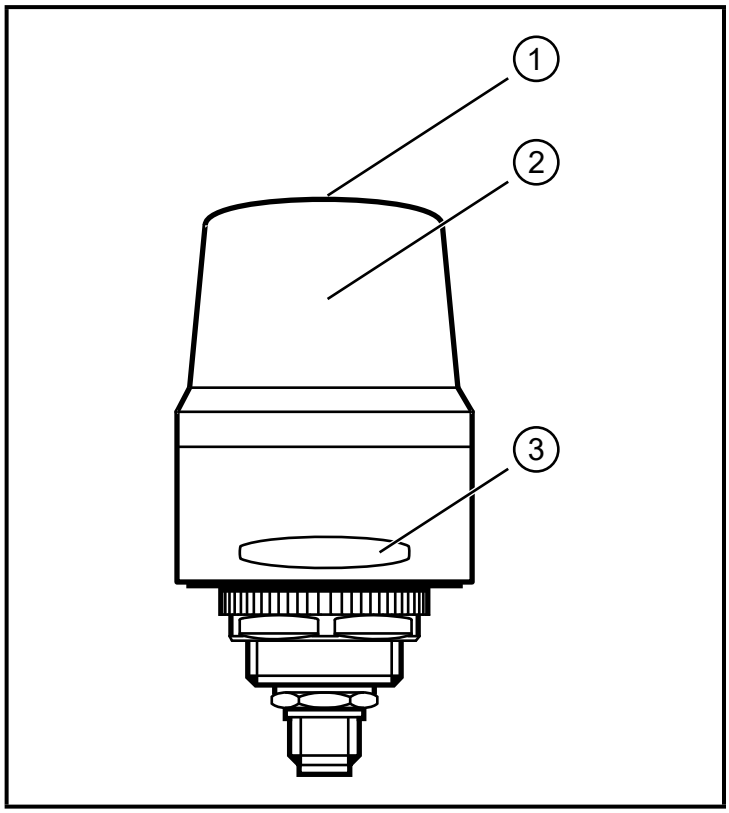
5.2.2 Standard mode

M12 connector, 5 poles, A-coded
(4 x 0.34 mm² / AWG 22)

1: LED-a (RGB red)
2: LED-b (RGB green)
3: GND
4: Feedback button (only DV21x1) /
Buzzer (only DV213x)
5: LED-c (RGB blue)



6 Operating and display elements



1: Feedback button (only DV21x1)
2: LED segment 1 with 3 RGB LEDs
3: Buzzer (only DV213x)

7 Operation

7.1 IO-Link

7.1.1 General

Connect the unit to an IO-Link master (A port) using a 5-pole connection cable. The controller switches the LED segment 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

Versions with feedback button: The status of the feedback button can be read (both in on/off mode and in RGB mode).

7	6	5	4	3	2	1	0	PDin
Device fault information								Byte 0
							Feedback button	Byte 1

7.1.2 On/off mode

While the unit is operating, the controller switches the LED segment and the buzzer (DV213x) on and off (PDout, cyclical data communication). The signalling corresponds to the parameters previously defined for the LED segment and the buzzer.

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

- Colour (red, green, orange, blue, violet, turquoise, white, yellow, off)
- Frequency (permanently on, low flash rate slow/medium/fast, high flash rate slow/medium/fast)
- Brightness (0...100 %)

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
					LED-c	LED-b	LED-a	Byte 0
							Buzzer	Byte 1

7.1.3 RGB mode

While the unit is operating, the controller switches the LED segment and the buzzer (only DV213x) 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
	LED properties			Seg. 1 = yellow	Seg. 1 = red	Seg. 1 = green	Seg. 1 blue	Byte 0
	Buzzer sound (buzzer style 1...8)						Buzzer	Byte 1

The properties of the LED segment 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	0	0	1	red
0	0	1	0	green
0	0	1	1	orange
0	1	0	0	blue
0	1	0	1	violet
0	1	1	0	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

The buzzer sound can be set as follows:

Buzzer style	Byte 1 Bit 6	Byte 1 Bit 5	Byte 1 Bit 4	Description
1	0	0	0	off
2	0	0	1	pulsating fast 2450 Hz
3	0	1	0	alternating fast 2450 Hz and 3080 Hz
4	0	1	1	rising from 1000 Hz to 4000 Hz, falling to 1000 Hz
5	1	0	0	continuous note 2450 Hz interrupted every 500 ms
6	1	0	1	pulsating fast 2450 Hz interrupted every 500 ms
7	1	1	0	alternating fast 2450 Hz and 3080 Hz interrupted every 500 ms
8	1	1	1	rising from 1000 Hz to 4000 Hz, falling to 1000 Hz interrupted every 500 ms

7.2 Operation with digital IOs

7.2.1 General

In addition to the IO-Link port (pin 4), the signal lamp has three digital inputs. The digital inputs can be used to set the colour of the signal lamp individually without using IO-Link communication.

To do so, put the signal lamp into SIO mode.

How these digital inputs are used can be defined via the parameter mode.

7.2.2 SIO mode in on/off mode

Acyclic IO-Link parameter setting can be used to assign the colour, the flashing frequency and the luminous intensity to each digital input. Depending on which input is addressed, the signal lamp glows with the corresponding colour and flashing frequency:

Example:
Input 1: red, flashing fast, 100%
Input 2: yellow, permanently on, 100%
Input 3: green, permanently on, 100%

This is how this single-segment signal lamp can replace a 3-segment signal lamp without the software of the installation requiring any adjustment.

If two inputs are addressed simultaneously, the appearance of input 1 will have a higher priority than input 2. Input 2 has a higher priority than input 3.

Depending on the product version, the IO-Link port is used as an input for the buzzer or as an output for the feedback button. For the version with buzzer and feedback button, the IO-Link parameter OUT1 (Index 580) can be used to set whether the IO-Link port is used as input or as output.

7.2.3 SIO mode in RGB mode

In this mode, fixed properties are assigned to the three digital inputs.

- Input 1 - red
- Input 2 - green
- Input 3 - blue

By triggering the three inputs correspondingly, the user can determine the colour of the signal lamp.

Example:
Input 1 triggered: The signal lamp glows red.
Input 3 triggered: The signal lamp glows blue.
Inputs 1 and 3 triggered: The signal lamp glows purple.

Depending on the product version, the IO-Link port is used as an input for the buzzer of as an output for the feedback button. For the version with buzzer and feedback button, the IO-Link parameter OUT1 (Index 580) can be used to set whether the IO-Link port is used as input or as output.

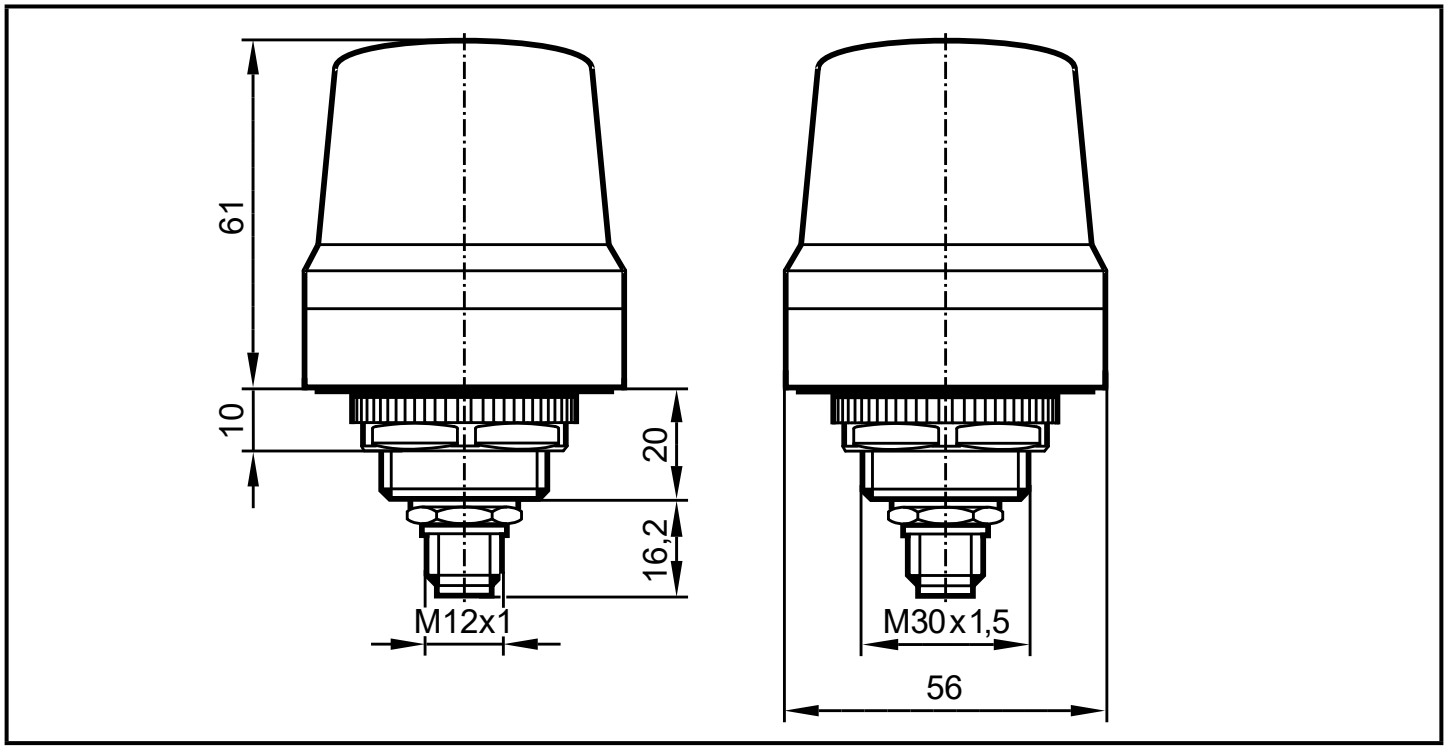
8 Parameter setting

The unit can be configured using an IO-Link parameter setting tool (e.g. LR DEVICE) (→ 3.1 IO-Link).

More information is given in the IODD at www.ifm.com.

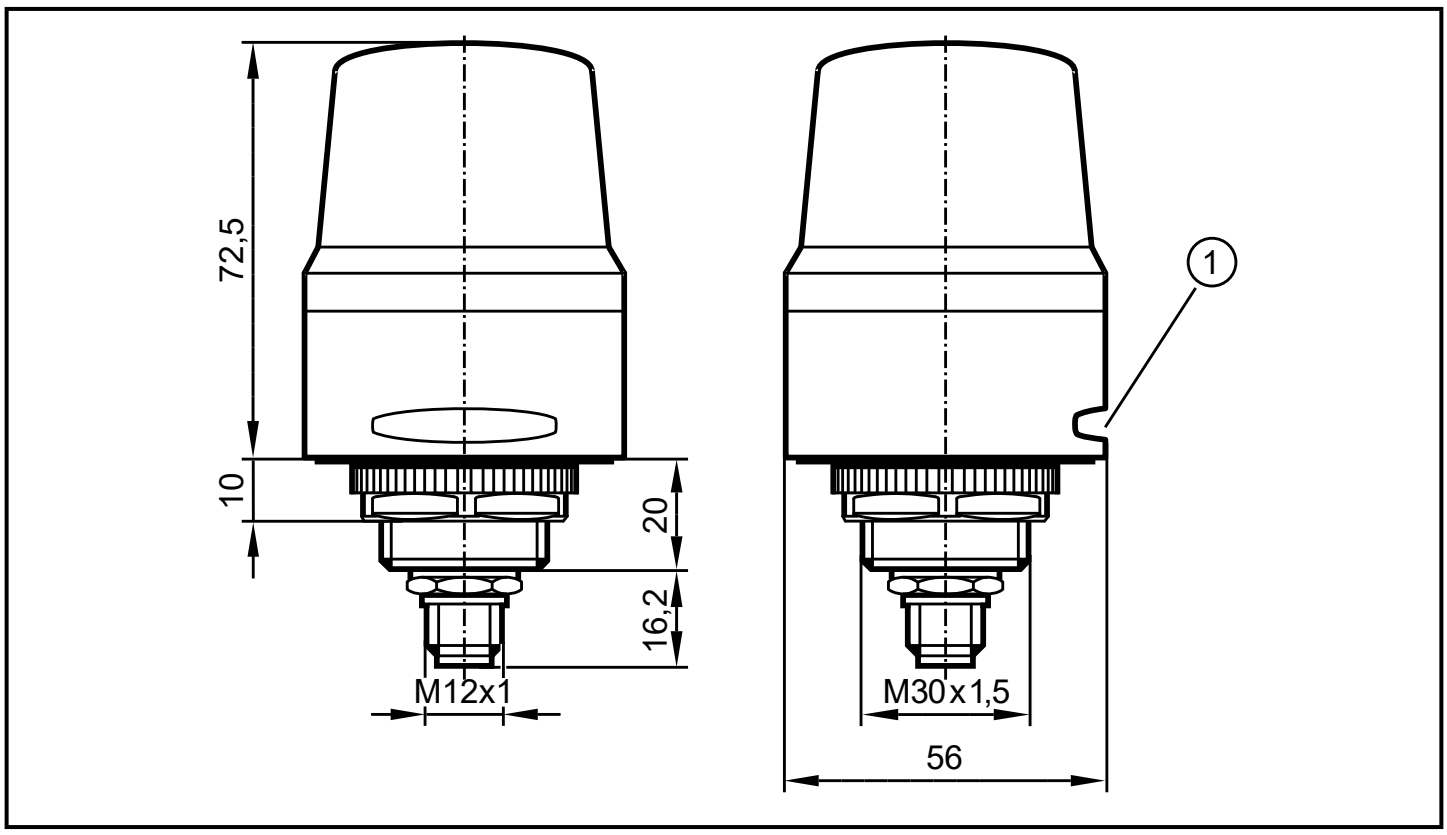
9 Scale drawing

9.1 DV212x



Dimensions [mm]

9.2 DV213x



1: Buzzer

Dimensions [mm]

10 Technical data

		DV2120	DV2121	DV2130	DV2131
Operating voltage DC	[V]	18...30			
Nominal voltage DC	[V]	24			
Current consumption	[mA]	≤ 90 RMS (400 mA for 50 ms)			
Input current on the IO-Link pin	[mA]	type. 6.6 (24 V DC, high signal)			
Max. buzzer volume	[dB]	-		90	
Feedback button		-	●	-	●
Protection rating		IP 67		IP 65	
Degree of soiling		2			
Ambient temperature	[°C]	-25…50			
Storage temperature	[°C]	-40…75			
Max. permissible relative air humidity	[%]	90			
Maximum operating altitude	[m]	4000 above sea level			
IO-Link		●	●	●	●
Connectors		M12 connector, 5 poles			
Weight		85		100	

10.1 IO-Link device

Transmission type		COM2 /38.4 kBaud)
IO-Link revision		1.1
SDCI standard		IEC 61131-9
IO-Link device ID		
DV2120, DV2121		1054 d / 00 04 1E h
DV2130		1085 d / 00 04 3D h
DV2131		1176 d / 00 04 98 h
SIO mode		yes
Input load current at input C/Q to V0 (ILL)	[mA]	< 250
Required master port type		A
Min. process cycle time	[ms]	2.3

11 Maintenance, repair and disposal

The unit is maintenance-free.

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

11.1 Cleaning the housing surface

- ▶ Disconnect the device.
- ▶ Clean the device from dirt using a soft, chemically untreated and dry cloth.
- ▶ In case of heavy dirt, use a damp cloth.

Micro-fibre cloths without chemical additives are recommended.

12 Approvals/standards

EC declarations of conformity, approvals, etc. at www.ifm.com