

Digital Readout

Type: BC-01



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Note:

Before you proceed to operate the digital readout, acquaint yourself thoroughly with this manual. Warranty claims caused by improper operation cannot be accepted.

1. Basic features and safety

The BC-01 digital readout is a multi-purpose readout which processes signals from incremental encoders providing TTL phase shifted A/B signals.

Standard functions:

- 6-digit LED display + sign
- height of the digits 14 mm
- counting direction setting
- absolute / incremental measurement
- mm / inch conversion
- radius / diameter measurement
- mirroring
- 1/2 value calculation (halving)
- resetting, presetting the initial measurement value
- encoder resolution setting
- decimal point setting
- possibility to lock any of the digital readout buttons
- reference point setting / customer reference point setting
- encoder linear correction setting
- definition of slowing-down points before a target point
- the readout can be used e.g. for cutting the endless strip

Optional functions:

- relay control outputs
- external analog/digital input
- measured values and parameters retained in memory after switching off
- possibility to reprogram functions according to customer needs

Safety

The BC-01 digital readout is powered from the mains power adapter connected to the power supply 230 V / 50 Hz. During installation and operation keep common principles valid for operation of electrical devices. The mains adapter remains connected to the mains power even after switching the power switch on the rear panel off.

2. Technical specifications

Power supply	mains adapter 9V DC (as standard) or external voltage 9...24V DC
Current	100mA
Operating temperature	+10...+40 °C
Measurement range	+/- 999.999 m for resolution 0.001 mm +/- 9999.99 m for resolution 0.01 mm +/- 16 m for resolution 0.1 mm and 1 mm
Velocity	inversely proportional to resolution; 30 m/min for resolution 0.01 mm
Encoder resolution	0.001 ... 0.999 mm
Linear correction	+/- 1 ... 999 microns per 1.048576 m

3. Digital readout setting

Connection

Connect the mains power adapter and the linear encoder to the connectors located on the rear panel of the digital readout. Turn the unit on using the power switch located on the rear panel of the digital readout.

The following tables describe individual digits on the display for setting the readout functions:

During power up press and hold a button or buttons to invoke the setting mode.

After finishing a setting confirm the set parameters by pressing the MODE button. Switch the readout off and on again. The readout starts to operate with a new setting.

If you do not want to change the setting, switch the readout off to finish the setting mode.

Meaning of the displayed digits in the setting mode:

1 – function is active

0 – function is blocked

ABS button – moves the active (blinking) position to the left

INC button – changes value of the digit on the active position (values 0 / 1)

3.1 Digital readout constants, decimal point

During power up press and hold the ABS button.

	Readout constants				Decimal point setting	
Displayed positions:	SIGN	HALF	NiE	DIA	DP2	DP1

SIGN - counting direction selection (sign)

HALF - ½ value calculation (halving)

NiE - zero pulse from the encoder (reference point)

DIA - diameter calculation (the displayed value is double of the measured value)

DP2 - 2 decimal points on the display

DP1 - 1 decimal point on the display

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When both DP2 and DP1 are active (set to 1), there are 3 decimal points on the display. Confirm the setting by pressing the MODE button.

3.2 Button locking, replacing the last digit with another decimal point, mirroring

During power up press and hold the MODE button.

	Button locking			Dec. point - last digit	Mirroring	
Displayed positions:	MODE	ABS	INC	ZOOM	MIRROR	XXX

MODE 0 = MODE button locking

ABS 0 = ABS button locking

INC 0 = INC button locking

ZOOM 1 = replacing the last digit with another decimal point. This function is intended e.g. for 25 micron resolution encoders. The digital readout shows 2 decimal places and the last non-displayed digit of 5 microns is indicated by another decimal point displayed on the right side of the displayed value.

MIRROR 0 = mirroring of the measured value (the measured value is subtracted from the maximum displayed value).

3.3 Probe, enabling the slowing-down points, cycle, displaying period setting

During power up press and hold the ABS and MODE buttons.

	Input	Display period			Output	
Pozice na indikaci zleva	(PROBE)	0	0	0	CUT	SLOW
		↓	↓	↓	Displaying period parameters setting	
		0	0	0	10 ms	
		0	0	1	200 ms	
		0	1	0	400 ms	
		0	1	1	600 ms	
		1	0	0	800 ms	
		1	0	1	1000 ms	
		1	1	0	1200 ms	
		1	1	1	1400 ms	

The following functions can be set by numerical values on the display:

ABS button – moves the active (blinking) position to the left

INC button – increasing value of the digit on the active position (values 0 up to 9)

PROBE - touch probe (not included into the standard digital readout accessories)

CUT - after reaching the target value, the pre-defined value is set again (repeating the cycle)

SLOW - enabling the slowing-down points

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Displaying period setting

The digital readout BC-01 allows to set the value displaying period setting (the standard speed is 10 ms). This function is very convenient, when the machine has vibrations for example.

3.4 Reference point setting

During power up press and hold the INC button.

	Primary reference point					
Value:	0-9	0-9	0-9	0-9	0-9	0-9

3.5 Slowing-down points setting

During power up press and hold the INC and MODE buttons.

			1st s-d p.	2nd s-d p.	3th s-d p.	Target
Value:	0	0	0-9	0-9	0-9	0-9

The values stand for distances before the target according to the set decimal places
1st s-d p. - 1st slowing-down point (tens of mm for 2 decimal places display)
2nd s-d p. - 2nd slowing-down point (mm for 2 decimal places display)
3th s-d p. - 3th slowing-down point (tenths of mm for 2 decimal places display)
Target - coincidence (hundredths of mm for 2 decimal places display)

3.6 Digital readout resolution setting according to the connected encoder

During power up press and hold the ABS and INC buttons.

	Digital readout resolution according to the connected encoder					
Value:	0	0	0	0-9	0-9	0-9

Acceptable setting range: 0.001 – 0.999 mm.

3.7 Linear correction setting

During power up press and hold the MODE, ABS and INC buttons.

	Linear correction setting					
Value:	0	0	0	0-9	0-9	0-9

Acceptable linear correction setting range: 0 ... +/- 999 microns per 1.048576 m

Linear correction factor per 1 m calculation:

Correction factor = (measured value in microns per 1 m / 1.048576) x 1000

4. Digital readout operation

4.1 MODE button

- Press this button shortly to select mm / inch.
(inches are indicated by the luminous LED over the MODE button)

4.2 ABS button

- Press this button shortly to select absolute scale of measurement
(it is indicated by the luminous LED over the ABS button)
- Press this button long to switch the readout to the mode of presetting value of the absolute scale (the value is retained after switching the readout off)
 - ABS button – moves the active (blinking) position to the left
 - INC button – increases value of the digit on the active position (values 0 up to 9)
 - MODE button – confirms the set value and returns to the measurement mode

4.3 INC button

- Press the button to clear the display and to select incremental scale of measurement
(it is indicated by the luminous LED over the INC button)
- Press this button long when the function HALF active to halve the displayed value.

5. Troubleshooting

5.1 Not able to switch the digital readout on

Check power inlet and the mains adapter.

5.2 Measured values are not correct

- 1) Check correct connection between the readout and the encoder.
- 2) Check if velocity of the movement is not too high.
- 3) Check correct installation of the encoder.
- 4) Check correct setting of the readout resolution.
- 5) Check correct setting of the linear correction factor.

6. Maintenance, repair, disposal

Cleaning and maintenance

The casing of the readout may be cleaned with a soft cloth. Do not use any solvents.

The electronic system of the readout does not require any maintenance.

Repairs

Let the faulty readout repair at the supplier or in an authorized service point only. Unauthorized repairs lead to cancellation of warranty.

Disposal

Worn-out electronic device should be sent to a collection point in accordance with regulations valid for worn-out electric and electronic equipments.