Super Compact Laser Bar Code Readers

BL-600 Series

Features

- World's smallest laser bar code reader in its class
- Twice the reading area
- Scans bars as narrow as 0.125 mm 0.005"
- Scan rate of 500 scans per second

Reading Distance

Standard – 75 to 330 mm (2.95" to 12.99")

High-resolution – 55 to 190 mm (2.17" to 7.48")

High-resolution side-scanning – 45 to 175 mm (1.77" to 6.89")

CE

Description

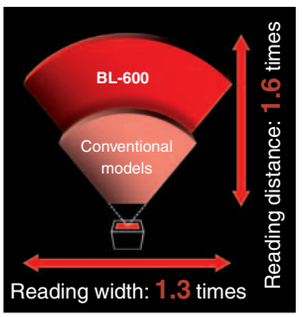
Ultra compact, half the size of standard bar code readers

With the BL-600 (31 x 40 x 21 mm 1.22" x 1.57" x 0.83") KEYENCE again breaks the world record for smallest bar code reader. Only 1/2 the size of the conventional bar code readers.

Twice the range with excellent reading performance

Built-in AGC* & SRC circuits

Using KEYENCE's original AGC circuits for advanced, high speed performance, the BL-600 offers excellent reading depth and angle characteristics. In addition, the reader includes built-in SRC circuits which greatly reduce the effects of extraneous reflected light for more reliable and stable reading.



* AGC=Auto Gain Control/SRC=Specular Reflection Cancel

The world's first built-in preventive maintenance

Built-in PMI* function (patent pending)

The BL-600 is the first bar code reader with a built-in PMI function for monitoring and reporting reading performance during operation. By referring to the PMI information, it is possible to quickly detect potential reading error problems. PMI offers a convenient tool for acquiring valuable maintenance information, and for investigating the causes of reading errors.

* Preventive Maintenance Information

Test switch for easy adjustment

Built-in test mode

The test mode allows you to confirm the optimal reading position at the point of installation by simply pressing a button. This valuable feature of the BL-600 results in faster installation and maintenance.

5-bar LED display

Indicates reading status to prevent errors

The BL-600 indicates the reading ratio* (decoding rate/100 scans) in real time using a five-bar LED display. Current reading status can be checked at a glance, helping to prevent reading errors before they occur.

5-bar LED reading status indicator

100% of max. rate | 40% of max. rate | Reading error

* Reading ratio can be output to computers.

Ultra high speed of 500 scans/sec

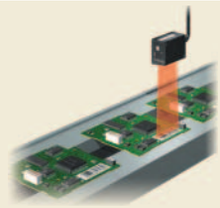
Outstanding reading accuracy, even on high-speed lines

Using advanced KEYENCE control technology the BL-600 operates at 500 scans per second, making it the fastest laser bar code reader in its class.

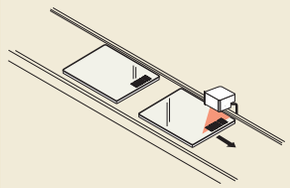
Applications

Wafer carriers
Even teflon-coated bar codes can be read reliably, thanks to the BL-600's sophisticated AGC function.

Medical
With its compact body and high speed reading capability, the BL-600 can easily read the bar codes on medical specimens.



PC media drive
The BL-600 is ideal for use in printed circuit board production lines. Even with vibrations and unevenness, the BL-600 can perform accurately and reliably.



Bar code management for LCD boards

Specifications

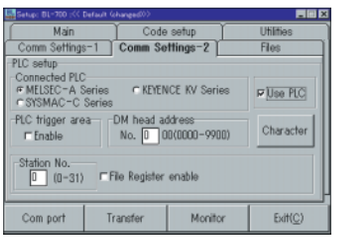
Type			Standard		High-resolution		High-resolution, side-scanning	
Model			BL-600	BL-601	BL-600HA	BL-601HA	BL-650HA	BL-651HA
Reading direction			Front				Side	
Scanning method [1.]			Single	Raster	Single	Raster	Single	Raster
Light source			Visible red semiconductor laser					
	Maximum output		1.5 mW					
	Pulse duration		FDA: 56 µs, IEC: 99 µs				FDA: 56 µs, IEC: 82 µs	
	Wavelength		650 nm					
	Class	FDA	Class II					
		IEC	Class 2					
Reading distance (Narrow bar width =)			75 to 330 mm 2.95" to 12.99" (1.0 mm 0.04")		55 to 190 mm 2.17" to 7.48" (0.5 mm 0.02")		45 to 175 mm 1.77" to 6.89" (0.5 mm 0.02")	
Readable bar width [2.]			0.19 to 1.0 mm 0.007" to 0.04" * 0.25 to 1.0 mm 0.01" to 0.04" for CODE 93 and CODE 128		0.125 to 1.0 mm 0.005" to 0.04" * 0.15 to 1.0 mm 0.006" to 0.04" for CODE 93 and CODE 128			
Largest reading label width [3.] (Reading distance =)			250 mm 9.84" (280 mm 11.02")		156 mm 6.14" (174 mm 6.85")		170 mm 6.69" (155 mm 6.10")	
PCS			0.6 or more (Reflectance of white part: 75% or higher)					
Scanning rate			500 scans/sec					
Target codes			CODE39, ITF, Industrial 2 of 5, COOP 2 of 5, Codabar, CODE128, EAN-128, CODE93, EAN/UPC(A•E)					
Reading digit [4.]			32 digits max.					
Trigger input			Non-voltage input (contact or solid-state), TTL input is also possible.					
OK/NG output	Output form		NPN					
	Rating load		24 VDC, 30 mA					
	Leakage current at OFF		0.1 mA max.					
	Residual voltage at ON		0.5 V max.					
Serial interface	Applied standard		Conforms to RS-232C					
	Synchronization		Start-stop					
	Transmission code		ASCII					
	Baud rate		600, 1,200, 2,400, 4,800, 9,600, 19,200, 31,250, 38,400 bit/s					
	Data length		7/8 bits					
	Parity check		None/Even/Odd					
	Stop bit length		1/2 bits					
Enclosure rating			IP-65					
Ambient light			Sunlight: 10,000 lux, Incandescent lamp: 6,000 lux					
Ambient temperature			0 to +45°C (32 to 113°F), No condensation					
Relative humidity			35 to 85%, No condensation					
Power supply voltage			5 VDC ±5%					
Current consumption			330 mA max.					
Weight			Approx. 115 g				Approx. 130 g	

1. BL-601 raster width: 7.1 ±1.8 mm 0.30" ±0.07" (reading distance: 120 mm 4.72")
   BL-601HA raster width: 5.5 ±1.4 mm 0.22" ±0.06" (reading distance: 90 mm 3.54")
   BL-651HA raster width: 5.5 ±1.4 mm 0.22" ±0.06" (reading distance: 65 mm 2.56")
2. The range of readable narrow bar width.
3. Largest reading label width includes the bar code margin (quiet zone).
4. When start/stop character of CODE128 is CODE-C, up to 64 digits are allowed.
   Note: The internal BL settings are written to the built-in EEPROM (erasable up to 100,000 times).

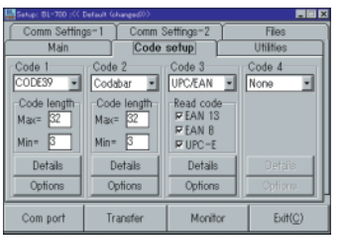
Software

A practical setup tool designed for easy operation (BL-H60WE)

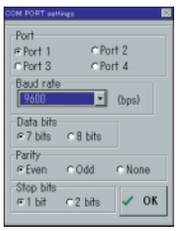
Simplify setup of your bar code reader's operating parameters with the Windows™-compatible setup program. Anyone can perform the initial setup with ease. What's more, the program allows you to easily manage data on a computer.



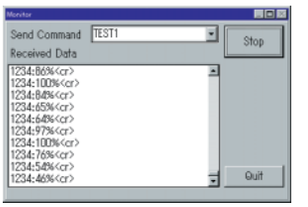
The standard Windows™-style interface makes setting up the bar code reader's operating parameters easier than ever.



Included with the software are preset values for 8 common types of bar codes. Detailed settings let you adjust the parameters to suit your application.



The software's versatility lets you fine-tune communications settings for compatibility with a wide range of equipment.



When in test mode, the BL Series performance rate (% of maximum) and reading frequency (scans per second) are clearly displayed, using built-in monitor screen.

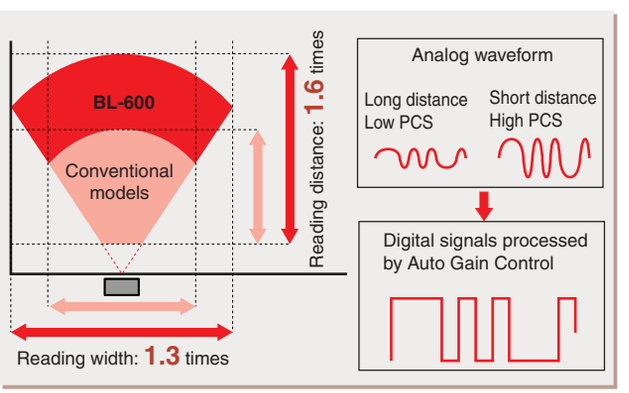
Functions

Best in its class, with amazing reading performance

AGC* & SRC circuits

Auto Gain Control automatically controls the amount of light received by the bar code reader by adjusting gain to the optimal level according to reading distance and PCS changes. Through this AGC function, the BL 600 can operate over long and wide reading distances and angles, despite its ultra compact size. Since the AGC circuits can amplify the signals received by the reader, even bar codes with low PCS can be read accurately. In addition to automatic gain control, the BL-600 features built-in SRC circuits that cancel out the influence of light reflected from sources other than the bar codes. For example, under conditions where laser light bounces off polished metal or mirror surfaces, the BL-600 delivers much more stable reading performance than current models.

* AGC=Auto Gain Control/ SRC=Specular Reflection Cancel

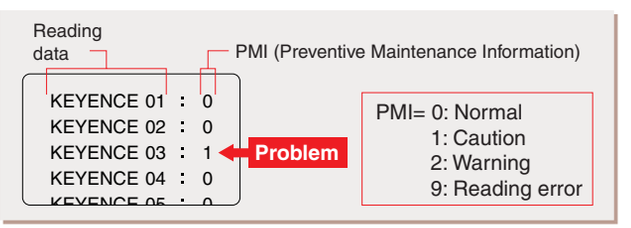


Preventive Maintenance Information (PMI) prevents reading errors before they occur

The world's first PMI function (patent pending)

This function adds preventive maintenance information (PMI), relating to the reliability and stability of bar code reading performance, to the bar code data that is output by the reader. The PMI function allows performance to be monitored so that possible causes of reading errors, such as deterioration in bar code printing quality or the presence of dirt on the lens of the bar code reader, can be detected at an early stage. These kinds of errors are often difficult to identify with conventional bar code readers. This function is especially convenient when using several bar code readers together.

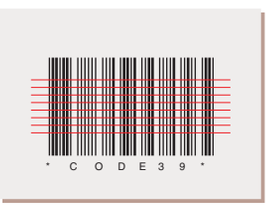
* Reading stability tolerance settings are freely adjustable.



Enhanced stability reading with 8 scan lines

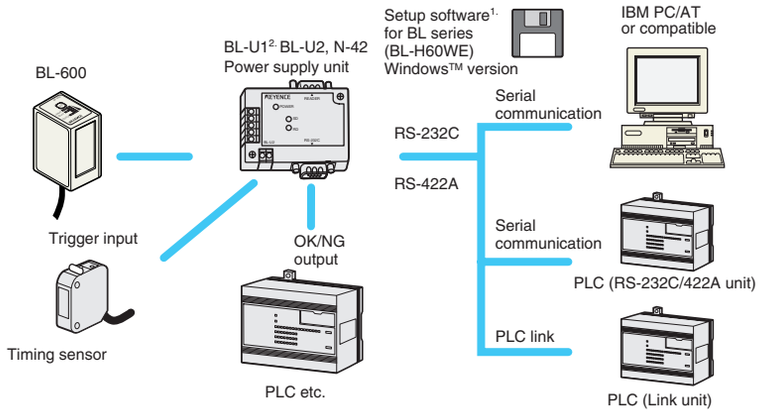
Raster scan type

The BL-600 is available in a raster scan unit that reads bar codes using eight scan lines. Raster scan offers reliable, accurate bar code reading even with bar codes containing flaws such as chips, voids, or stains.



System Configuration

When using an RS-232C or RS-422A connection

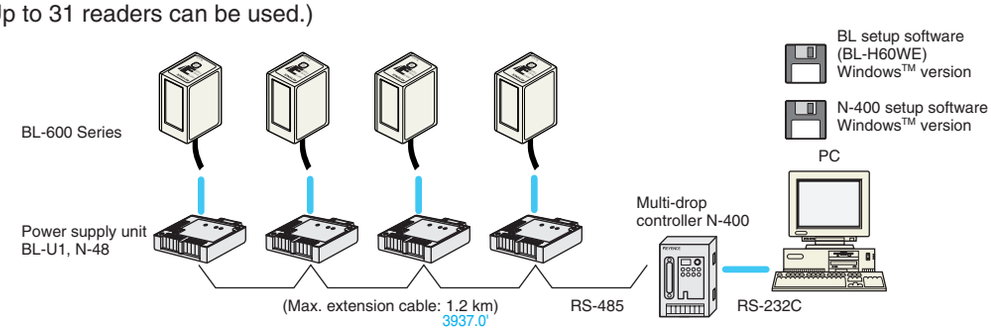


1. The BL-H60WE setup software is not included in the product and should be ordered separately (free of charge).
2. This product does not comply with EMC directives.

Note: "MS-windows" and "Windows" are registered trademarks of Microsoft. Any other company name is a registered trademark of that company.

When using an RS-485 multidrop link connection

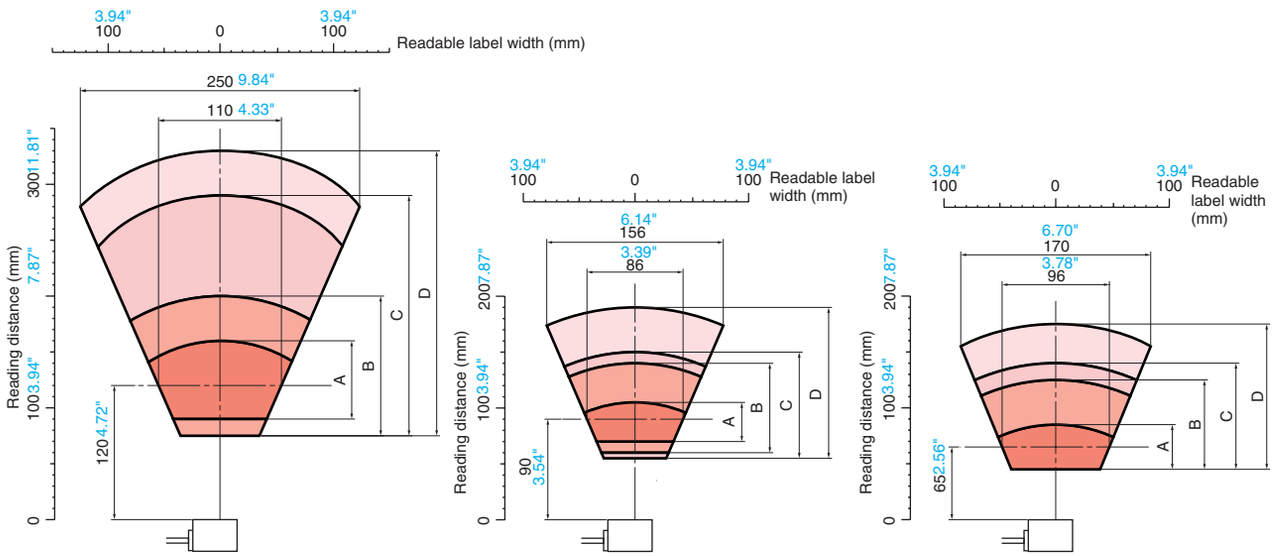
(Up to 31 readers can be used.)



Reading Range Characteristics

Typical

Unit: mm Inch



BL-600/601

	Name	Narrow bar width	Readable label width
A	CODE39	0.19 0.007"	90 to 160 3.54" to 6.30"
B	CODE39	0.25 0.010"	75 to 200 2.95" to 7.87"
C	CODE39	0.5 0.02"	75 to 290 2.95" to 11.42"
D	CODE39	1.0 0.04"	75 to 330 2.95" to 12.99"

(Measuring conditions)
Using KEYENCE standard bar code.
Ratio of thin bar to thick bar = 1:2.5
Skew: 15°
Pitch: 0°
Tilt: 0°

BL-600HA/601HA

	Name	Narrow bar width	Readable label width
A	CODE39	0.125 0.049"	70 to 105 2.76" to 4.13"
B	CODE39	0.19 0.007"	60 to 140 2.36" to 5.51"
C	CODE39	0.25 0.010"	55 to 150 2.17" to 5.91"
D	CODE39	0.5 0.02"	55 to 190 2.17" to 7.48"

(Measuring conditions)
Using KEYENCE standard bar code.
Ratio of thin bar to thick bar = 1:2.5
Skew: 15°
Pitch: 0°
Tilt: 0°

BL-650HA/651HA

	Name	Narrow bar width	Readable label width
A	CODE39	0.125 0.0049"	45 to 85 1.77" to 3.35"
B	CODE39	0.19 0.007"	45 to 125 1.77" to 3.35"
C	CODE39	0.25 0.010"	45 to 140 1.77" to 5.51"
D	CODE39	0.5 0.02"	45 to 175 1.77" to 6.89"

(Measuring conditions)
Using KEYENCE standard bar code.
Ratio of thin bar to thick bar = 1:2.5
Skew: 15°
Pitch: 0°
Tilt: 0°

Connections

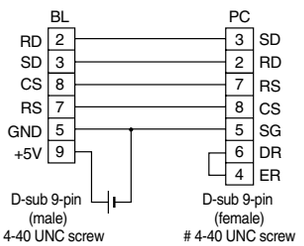
Connector pin assignments

Pin No.	Cable color	Symbol	Description	Signal direction
Connector case	Shield	FG	Frame ground	—
1	Yellow	TIM	Trigger input	Input
2	Brown	RD (RXD)	Receives RS-232C data	Input
3	Purple	SD (TXD)	Sends RS-232C data	Output
4	White	OK	OK output	Output
5	Black	GND (SG)	Ground 9 (common ground for respective signals)	—
6	Gray	NG	NG output	Output
7	Pink	RS (RTS)	Request to send RS-232C data (always ON)	Output
8	Blue	CS (CTS)	Enable to send data through RS-232C	Input
9	Red	+5 V	+5 V DC power supply	Input

RS-232C connections

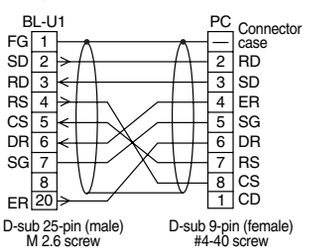
[When using a D-sub 9-pin connector]

Use a metallic connector housing for the D-sub 9-pin connector. Connect the shielded cable with the connector housing.

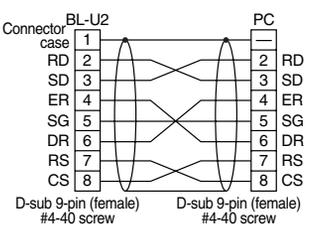


[When using the BL-U1/U2]

BL-U1

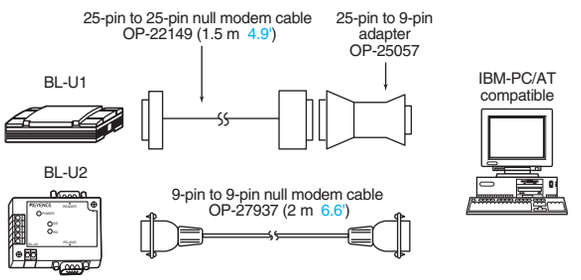


BL-U2



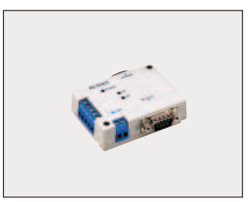
Options

The optional null modem cable is available from KEYENCE.



Options

BL-U1 AC power supply unit (with RS-232C, 422A, 485 interface)



BL-U2 DC power supply unit (with RS-232C interface)

N-42 DC power supply unit (with RS-422A interface)

N-48 DC power supply unit (with RS-485 interface)

N-400 Multidrop link controller

Power supply units

Model		BL-U1	BL-U2	N-42	N-48
Power supply for bar code reader		5 V ±5% (1.5 A)	5 V ±5% (630 mA)		
Power supply for sensor		12 V ±10% (300 mA)	—		
Interface		RS-232C, RS-422A, RS-485 (Up to 31 units can be connected. Max. cable extension: 1.2 km 3,937')	RS-232C	RS-422A (Max. cable extension: 1.2 km 3,937')	RS-485 (Up to 31 units can be connected. Max. cable extension: 1.2 km 3,937')
Trigger input	Input rating	15 to 26 VDC, 10 mA max.			
	Max. OFF current	1.0 mA			
OK/NG output	Output type	NPN			
	Rated load	30 VDC, 100 mA			
	Leakage current	0.1 mA max.			
	Residual voltage	1 V max.			
Ambient temperature		0 to +50°C (32 to 122°F), No condensation			
Relative humidity		35 to 85%, No condensation			
Power supply voltage		100 to 240 VAC (50/60 Hz)	24 VDC +10%/-20%		
Current consumption		40 VA (100 VAC), 50 VA (240 VAC)	250 mA	260 mA	
Weight (including cable)		Approx. 615 g [1.]	Approx. 80 g	Approx. 100 g	

1. including cable

Multi-drop link controller

Model		N-400
Trigger input	Input rating	15 to 26 VDC, 10 mA max.
	Maximum OFF current	1.0 mA
RS-232C	Standard	Conforms to RS-232C
	Synchronization	Start-Stop (full duplex)
	Transmission code	ASCII
	Baud rate	600, 1,200, 2,400, 4,800, 9,600, 19,200, 31,250, 38,400 bps
	Data length	7 bits/8 bits
	Parity check	None/Even/Odd
	Stop bit length	1 bit/2 bits
RS-485	Standard: conform to RS-485	RS-485
	Synchronization	Start-Stop (full duplex)
	Transmission code	ASCII
	Baud rate	600, 1,200, 2,400, 4,800, 9,600, 19,200, 31,250, 38,400 bps
	Data length	7 bits/8 bits
	Parity check	None/Even/Odd
	Stop bit length	7 bits/8 bits
	Maximum connectable units	31 units
	Maximum extension length	1.2 km 3,937'
Ambient temperature		0 to +50°C (32 to 122°F), No condensation
Relative humidity		35 to 85%, No condensation
Power supply voltage		24 VDC +10%/-20%
Current consumption		140 mA max.
Weight		Approx. 180 g

Warning

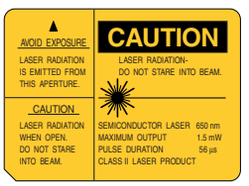
The BL-600 Series conforms to FDA and IEC standards as follows:

Model	BL-600/601/600HA/601HA/650HA/651HA
FDA	Class II
IEC	Class 2

Warning labels

BL-600/601/600HA/601HA

FDA Class II

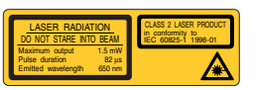


IEC Class 2

BL-650HA/651HA

FDA Class II

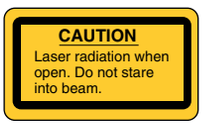
IEC Class 2



Protective housing labels

FDA

IEC



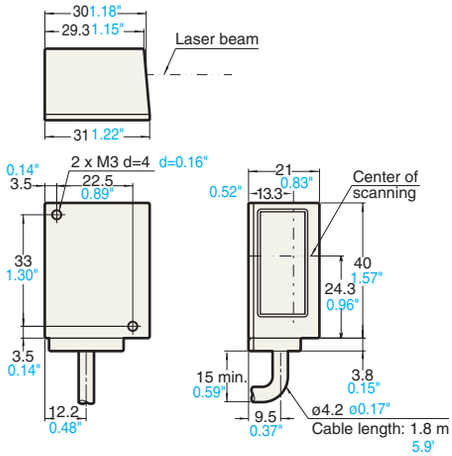
Dimensions

▶ For CAD Data Download >>> http://world.keyence.com/cadg

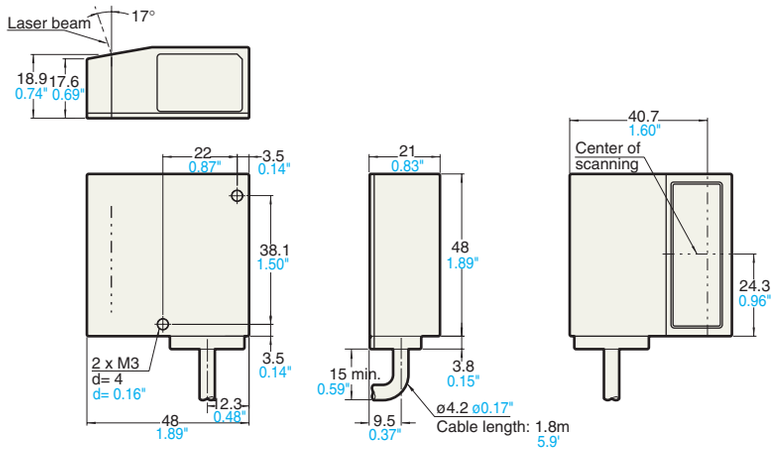
Unit: mm Inch

Bar code readers

BL-600/601/600HA/601HA

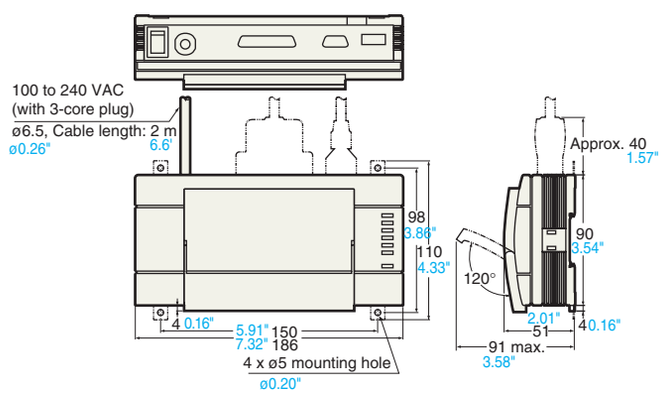


BL-650HA/651HA

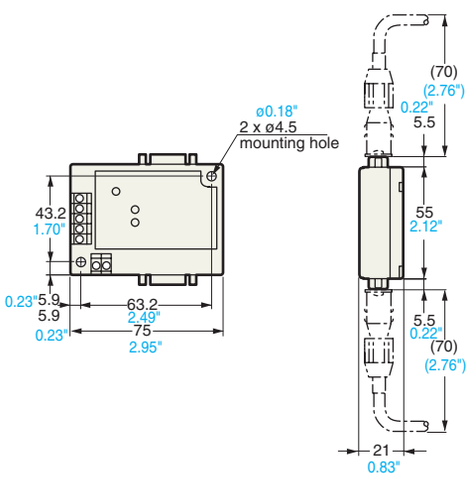


Power supply units

BL-U1

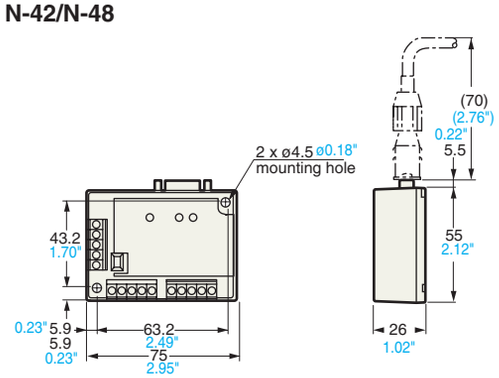


BL-U2



Multi-drop link controller

N-42/N-48



N-400