



# AutoID General Catalog

BARCODE READERS  
2D CODE READERS  
AUTO ID DATA CONTROLLERS



# Product Lineup / Index

## ULTRA-COMPACT 2D CODE READER

SR-600 SERIES **NEW**

04



- Reliable Moving Object Code Detection
- Advanced Reading Flexibility
- Easy Setup & Maintenance

### Reading range

SR-600HA	0.67° to 2.13°	17 mm to 54 mm
SR-600	1.06° to 3.82°	27 mm to 97 mm
SR-610	1.38° to 8.07°	35 to 205 mm

## HIGH SPEED DIGITAL TYPE

BL-1300 SERIES **NEW**

12



- Hi Scan Speed: 1300 scans/sec
- High Resolution: 0.003" 0.08 mm
- Unmatched reading ability on poor quality codes

### Reading range

BL-1300HA	1.77° to 10.63°	45 to 270 mm
BL-1300	2.56° to 19.69°	65 to 500 mm
BL-1370	6.30° to 23.62°	160 to 600 mm

## LONG-RANGE LASER TYPE

BL-700 SERIES

18



- Superior reading angle capabilities
- Longest reading range in its class: 3.9' 1.2 m
- 700 scans/s

### Reading range

BL-700	6.30° to 14.57°	160 to 370 mm
BL-740	5.91° to 29.53°	150 to 750 mm
BL-780	7.87° to 47.24°	200 to 1200 mm

## ULTRA-SMALL LASER TYPE

BL-600 SERIES

20



- Excellent reading depth and angle characteristics
- 500 scans/s

### Reading range

BL-600	2.95° to 12.99°	75 to 330 mm
BL-600HA	2.17° to 7.48°	55 to 190 mm

## ULTRA-SMALL CCD TYPE

BL-180 SERIES

22



- Ultra small size
- 500 scans/s

### Reading range

BL-180	1.30° ± 0.39°	33 ± 10 mm
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## AUTO ID DATA CONTROLLER

DV-90 SERIES

24



- Verify barcode data and output results in parallel

## COMPACT HANDHELD READER

BL-N70 SERIES

28



- Superb reading ability
- 4 connection options for various applications

## MULTI-DROP CONTROLLER

N-410K SERIES

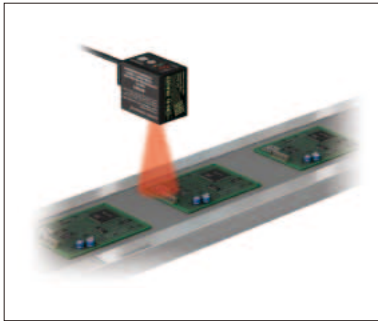
26

## PERIPHERAL DEVICES

29

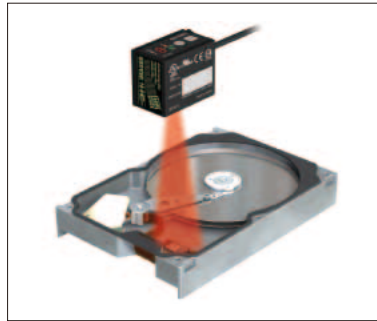
# Reliable Code Readers for A Wide Range of Applications

## SR-600 SERIES 04



### ECU: Traceability

The SR-600 easily reads different colored boards with alternate settings across 16 different memory banks.



### HDD: Traceability

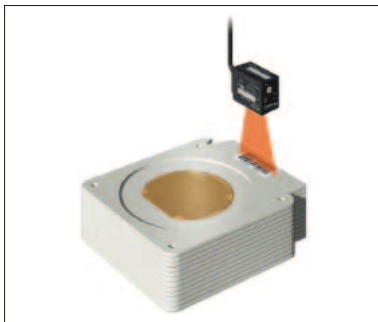
Reading the code on HDD parts to automatically control and log the manufacturing, inspection and tracability records of all items.



### RSS code check

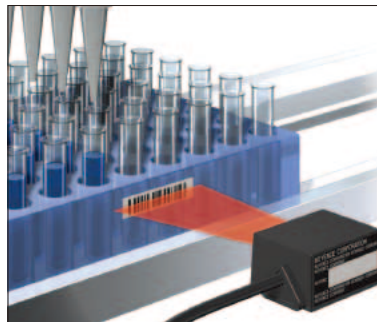
The SR-600 inspects and checks laser marked RSS codes.

## BL-1300 SERIES 12



### Wafer handler management

Stable reading for laser marked and low contrast ceramic barcodes.



### Verification of pipette tray

The world's smallest barcode reader, BL-1300, can be mounted in limited space applications.



### Verification of test tubes

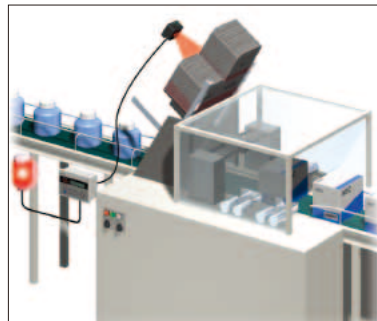
With its compact body and high speed reading capability, the BL-1300 can easily read the barcodes on medical test tubes.

## BL-700 SERIES 18 / DV-90 SERIES 24



### Seat parts: Traceability

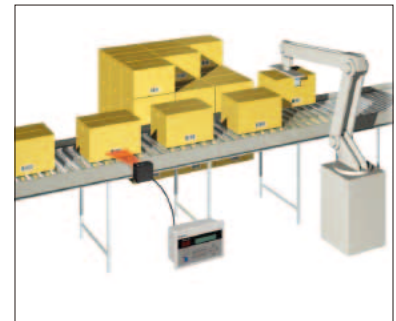
Barcodes are used for traceability management of the seat's weight, configuration, and seat belt ID.



### Cartoner: Prevent mixing

A reliable read is ensured, even for barcodes with low PCS\*, such as those on cardboard boxes.

\*Print Contrast Standard



### Product control

The preset number for the read barcode can be output enabling product sorting and control.



# The Smallest 2D Code Reader in its class

SR-600 SERIES  
ULTRA-COMPACT 2D CODE READER



## [HI-SPEED]

### Reliable Moving Object Code Detection

Fastest in its class: New optical design with high-speed, high-sensitivity imaging allows the SR-600 Series to read codes moving as fast as 160m/min.



## [HI-PERFORMANCE]

### Advanced Reading Flexibility

Simple setup with advanced reading ability. Up to 16 parameter banks allow greater flexibility when reading conditions change.



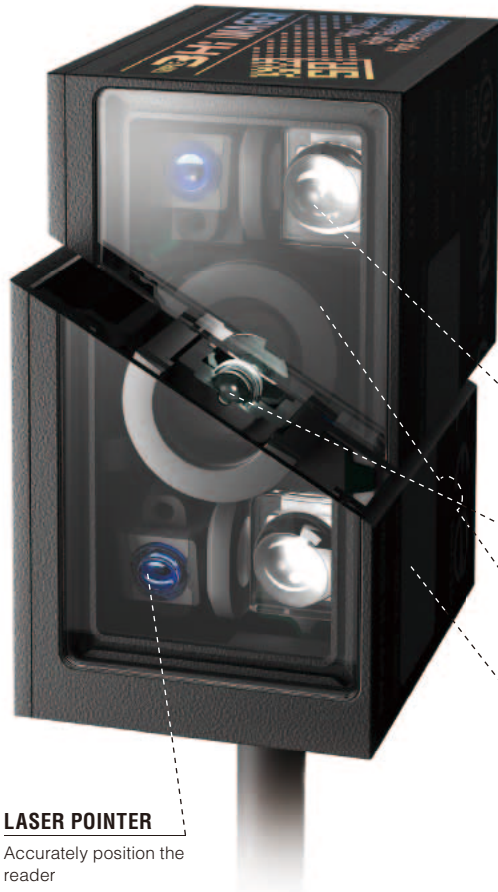
## [HI-RELIABILITY]

### Easy Setup & Maintenance

Easy calibration can be performed by simply pressing the TUNE button. Built-in USB connectivity enables [Live] monitoring, testing, and function changes via the easy-to-use AutoID Navigator software.



# New Optical Design



Reliably detects difficult-to-read and moving object codes. The new SR-600 Series optics were designed to overcome these conventional reader problems. Using KEYENCE's advanced decoding knowledge and techniques, the SR-600 Series emerges as a leader in compact 2D code readers.

**Accurately captures moving and difficult-to-read codes with its high-intensity LED lighting and high-sensitivity CMOS.**

### HIGH-INTENSITY LED

Provides a high illumination light source to improve reading capabilities on moving objects and difficult-to-read codes.

Light intensity: **2.5 times** greater than conventional readers

### REVERSE ERNSTAR LENS

Reduces aberrations to improve image clarity and reading stability

Image clarity: **2 times** greater than conventional readers

### HIGH-SPEED, HIGH-SENSITIVITY CMOS

Provides faster imaging speed and improved stability

Imaging speed: **3 times** greater than conventional readers

Sensitivity: **8 times** greater than conventional readers

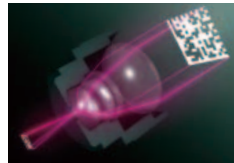
### HIGH-SPEED DSP

Enables high-speed decoding

Processing speed: **3 times** greater than conventional readers

**Approx. 3x**  
greater reading speed

**Approx. 40x**  
greater code recognition



### Reverse Ernostar lens

A reverse Ernostar lens is utilized to minimize aberration. Although small, the reverse Ernostar lens is practically free from image distortion and offers excellent reading performance. Since it is glass, the reverse Ernostar lens resists environmental changes and maintains stable reading, even under severe manufacturing conditions.

# Smallest in its Class with Outstanding Ease-of-Use

KEYENCE focused on functionality and ease-of-use, all while designing the smallest 2D code reader in its class.

### ULTRA HIGH-DENSITY DESIGN BODY

High-density body protects the optical system and circuits, etc.

### 9 SEGMENT LED DISPLAY

Displays reading stability and bank number

### TUNING BUTTON/TEST BUTTON

Initiate tuning and test modes





Fastest in its class

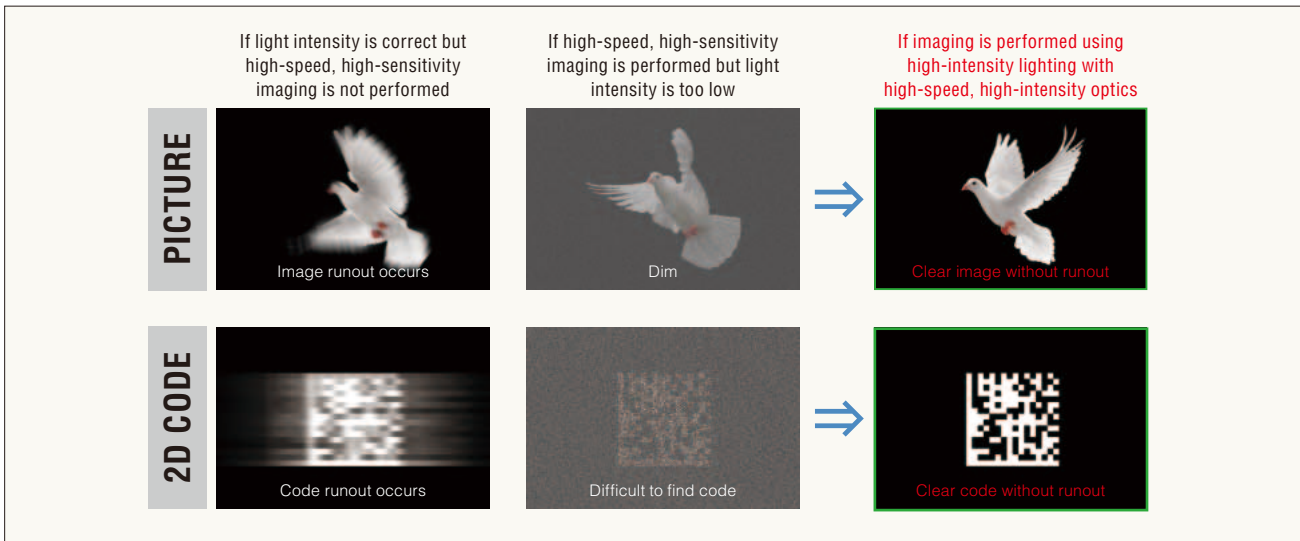
## Hi-speed imaging performance up to 160m/min\*

KEYENCE introduces its fastest in class performance technology to the SR-600 Series 2D code readers. Fusing a new optical design with advanced decoding techniques, in-line, high-speed 2D code reading is now a reality.

\* Using a test code containing the data: KEYENCE

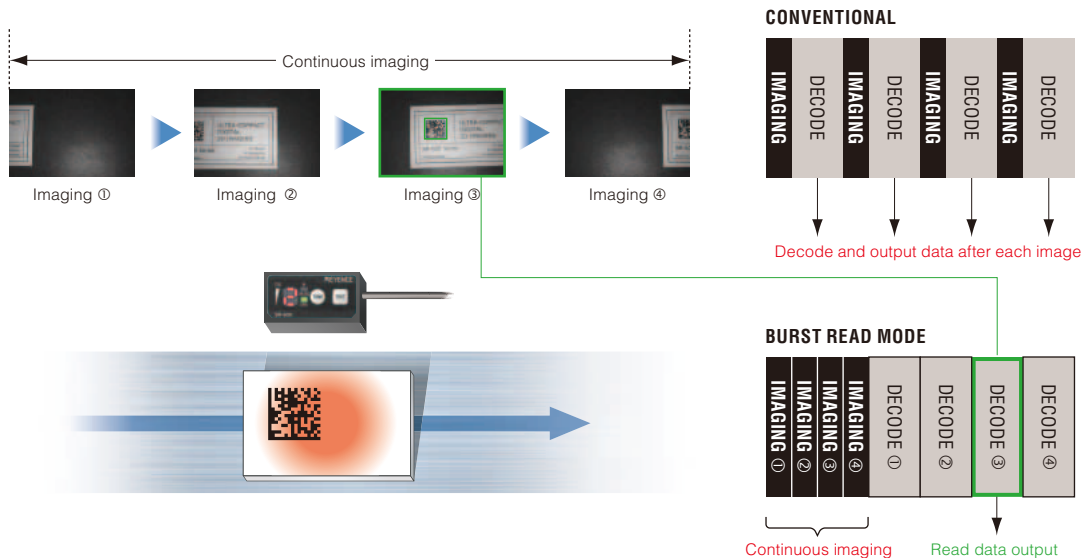
### Ultrahigh-Intensity Lighting paired with High-Sensitivity Imaging & High-Speed Processing

An ultrahigh-intensity LED was adopted to illuminate codes that move at high speeds. Paired with high-speed, high-sensitivity optics, precision 2D code detection is possible up to 160m/min. Complete high-speed decoding is possible when combined with the SR-600's high-speed digital signal processing (DSP).



### NEW Burst Read Mode

Burst Read mode acquires up to 8 consecutive images as a part quickly passes through the SR-600's field of view. The decoding process is not performed until all images have been captured. Conventional readers decode each image after it is captured, preventing additional imaging until the decode process is complete. The Burst Read mode allows for higher speed code detection as decoding is not performed until multiple images have been captured.





## Best reading ability in its class

The SR-600 Series was not just designed to be the smallest in its class. It was designed to meet the high reading performance and capability standards of KEYENCE.

### New Optical Design makes Codes Brighter & Clearer

The easiest way to improve code reading capability is to improve code clarity. The SR-600 combines the proper balance of lighting and processing to improve code clarity on all surface types.

#### Illuminates codes with sufficient light intensity



Difficult-to-read workpiece due to dark background (black resin)

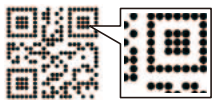
#### The Hi-DR function suppresses luster to improve code contrast



Difficult-to-read workpiece due to low contrast caused by high luster

### Built-in image filters Provide- Stable Reading

Specialized KEYENCE image filters provide stable reading by reducing poor printing and noise factors.



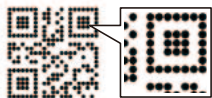
#### EXPANSION FILTER

Expands the printed portion of the code to make it more uniform for simple decoding.



#### SHRINK FILTER

Shrinks the printed portion of the code, making thick printed codes easier to read.



#### CLOSE PROCESSING

Combining both the expansion and shrink filters enables printed dots to be connected without changing the print thickness.

#### SAMPLE CODES

Bleeding	Primary noise	Low contrast	Scratched	Stray dots	Thick printing	Thin printing
Dot printing	Misaligned dots	Thin pattern	Narrow quiet zone	Trapezoidal distortion	Tread barrel distortion	Parallel distortion
Nylon resin	Black resin	Stainless steel	Aluminum	Brass	PCB	Ceramic

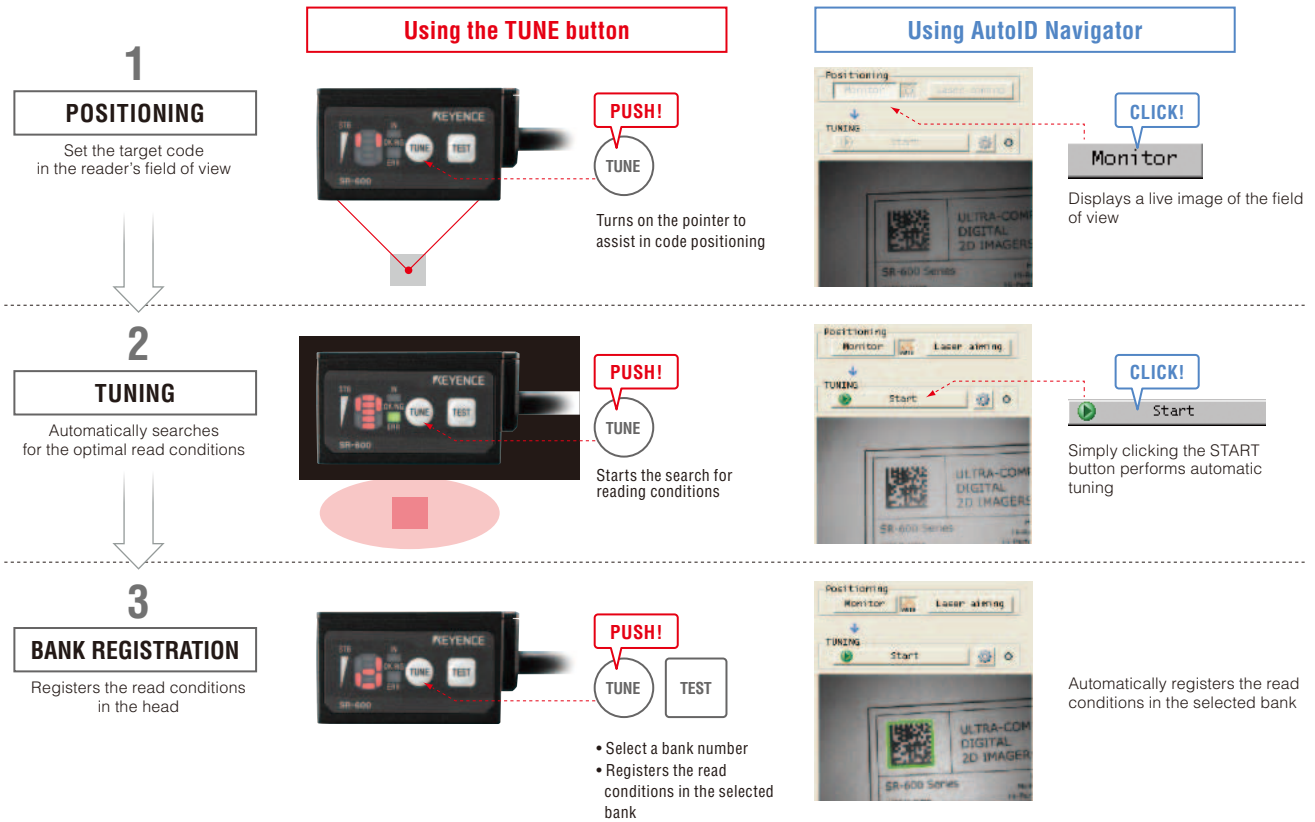


## Simple Setup

In order to be reliable, the reader must not only deliver strong performance, but also must be simple to use. KEYENCE designed the SR-600 Series with this ease-of-use in mind.

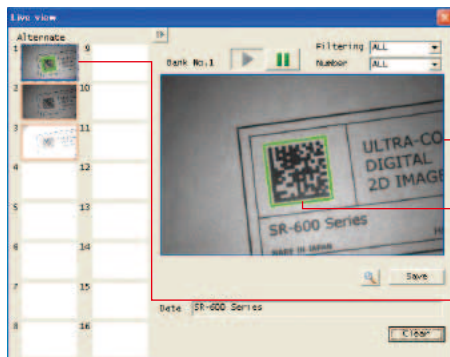
## EASY TUNING 1·2·3

Tuning can be performed by one of two simple procedures: by using the TUNE button on the reader OR via the AutoID Navigator software.



## Easy Startup from Live View

Employing the first hybrid USB interface in its class has made it possible to display, in real time, high-definition images on a PC screen. Manhours for startup and maintenance can be drastically reduced because the images can be displayed simultaneously on the PC screen and the test mode screen.



**Fastest in its class** Hybrid USB interface

Live image (20 frames/second)

When a live image is being read, the code is located and a target box   appears.

When a parameter bank is set, the bank number currently being read is displayed in a blue frame.





# ADVANCED FUNCTIONS

Convenient functions that improve reading ability in changing environments

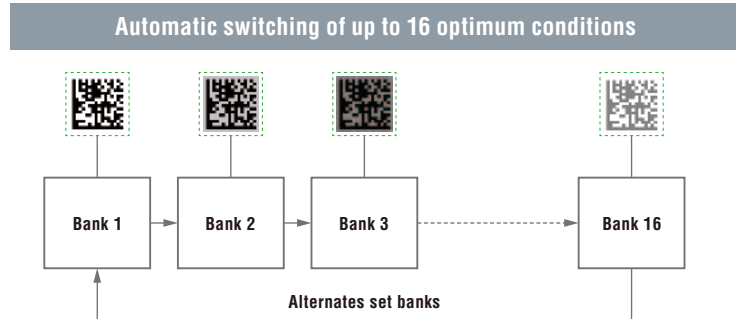


## Advanced functions that simplify operation

KEYENCE designed multiple functions into the ultra-compact 2D code reader that not only provide high performance, but also account for various condition changes that may occur during actual operation.

### PARAMETER BANK & ALTERNATE FUNCTION

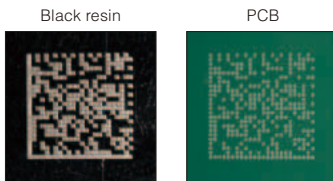
The Parameter Bank & Alternate Function allow the user to register up to 16 different reading conditions. This allows the reader to automatically compensate for changes in reading conditions, such as code contrast.



### ELIMINATE CONVENTIONAL READING PROBLEMS

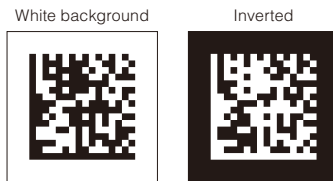
#### Unstable printing conditions

Printing quality and conditions vary with the type of printing and material used.



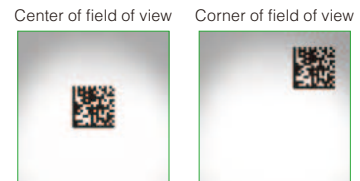
#### Setup change occurrence

Equipment setup changes sometimes involve completely different workpieces that require the labor intensive task of resetting scanning settings.



#### Variable reading positions

Reading can become unstable if the code position changes in the field of view.



### ON-BOARD TEST MODE

Pressing the TEST button enables you to start various test modes.



#### Reading rate measurement mode

Displays the reading success rate.

#### Tact measurement mode

Displays the time required for reading using a level display.

#### Code position measurement mode

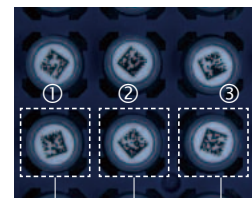
Displays the displacement from the center of the code reading area using a level display.

### ENVIRONMENTALLY-RESISTANT [IP65]

The main body has been designed from environmentally resistant magnesium die-cast, which meets IP65 specifications for use, even in harsh environments.

### READING AREA LIMITATION FUNCTION

The reading area can be split into smaller focus areas to read multiple codes in the field of view. Data can be output in any order.



Read data ①

Read data ②

Read data ③

Output of data from each area in specified order

### HIGH-RESOLUTION LINEUP

Three different reader types, tailored to accurate, high resolution decoding, are available. A minimum resolution of 0.08 mm 0.003" is possible when reading 2D codes.



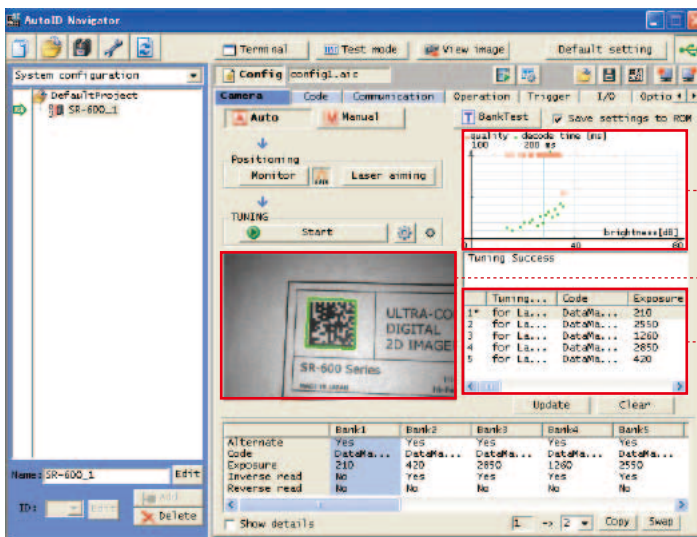
## Setup, test, and troubleshoot

The AutoID Navigator will immediately eliminate concerns such as “difficult calibration”, “long setup time”, and “troublesome maintenance”.

### SIMPLE OPERATION FROM BASIC SETTING TO MANUAL TUNING

#### AUTOMATIC TUNING

Simple, step-by-step calibration enables you to easily and automatically set the optimum reading conditions. You can perform tuning with ease while actually monitoring read images.



#### Tuning View

Enables you to view the code, in real time, throughout the tuning process.

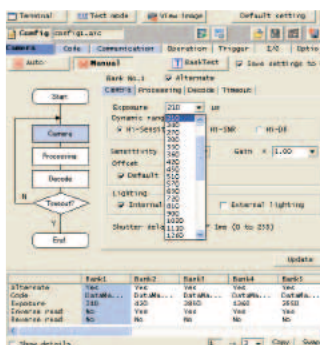
#### Real Time Plot

Graphs the relationship between the reading condition parameters and reading stability at each point of the tuning process.

#### Tuning History Function

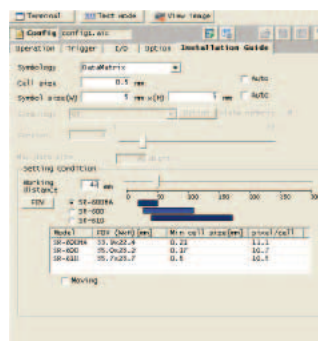
Enables you to select the optimum conditions by comparing multiple tuning results. The desired results can be set to different parameter banks, allowing the reader to account for different reading conditions, without being re-calibrated.

#### Manual Tuning Screen



Enables you to perform manual tuning. Configurable parameters are displayed on this screen to allow more detailed setting.

#### Installation Guide Screen



Entering conditions such as the data size, code type, and symbol size from this screen enables automatic calculation of the reading distance and field of view capabilities.

#### Image Capture Function

Enables you to save and review images that the SR-600 failed to successfully read.

#### Quick setup 2D Codes

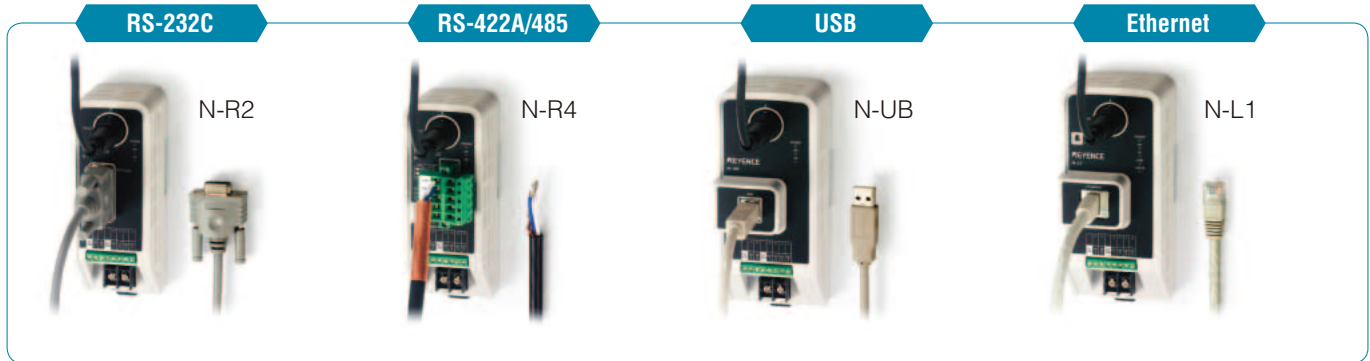
Convert the contents set on your PC to Quick setup 2D codes and print them in advance. This enables you to change the settings by simply reading codes.

## SUPPORTS USB/ETHERNET CONNECTION

# Interface lineup

The SR-600 Series supports USB and Ethernet interfaces, as well as RS-232C, RS-422A and RS-485. This wide range of supported interfaces enables versatile system configuration.

Specification: see page 17



## Specifications



Model		SR-600	SR-610	SR-600HA	
Type		Close-range type	Middle-range type	High-resolution type	
Laser pointer	Light source	Visible light semiconductor laser (wavelength: 660 nm)			
	Output	90 μW			
	Pulse duration	200 μs			
	Laser class	Class 1 (IEC60825-1, FDA CDRH Part1040.10)*			
Illumination	Light source	High-intensity red LED			
	LED class	Class 1 (IEC60825-1)			
Reading	Supported codes	Barcode	CODE39, ITF, Industrial 2-of-5, COOP 2-of-5, Codabar, CODE128, GS1-128 (EAN128), GS1 Databar (RSS), CODE93, EAN/UPC, Trioptic Code39		
		2D code	QR, MicroQR, DataMatrix, PDF417, MicroPDF, MaxiCode, GS1-Composite		
	Focal distance	60 mm 2.36"	100 mm 3.94"	38 mm 1.50"	
	Minimum resolution	Barcode	0.127 mm 0.005"	0.127 mm 0.005"	0.082 mm 0.003"
		2D code	0.127 mm 0.005"	0.25 mm 0.01"	
	Reading time (representative example)		21 ms (Focal distance, in QR CODE21 x 21)		
	Reading distance (representative example)	QR	31 mm 1.22" to 97 mm 3.82" (Cell size: 0.339 mm 0.01")	35 mm 1.38" to 188 mm 7.40" (Cell size: 0.508 mm 0.02")	17 mm 0.67" to 54 mm 2.13" (Cell size: 0.254 mm 0.01")
		DataMatrix	35 mm 1.38" to 95 mm 3.74" (Cell size: 0.339 mm 0.01")	40 mm 1.57" to 173 mm 6.81" (Cell size: 0.508 mm 0.02")	19 mm 0.75" to 51 mm 2.01" (Cell size: 0.254 mm 0.01")
		Barcode	29 mm 1.14" to 106 mm 4.17" (Narrow bar width: 0.339 mm 0.01")	44 mm 1.73" to 205 mm 8.07" (Narrow bar width: 0.508 mm 0.02")	
	Reading view range (focal distance)		42.5 mm 1.67" x 27.1 mm 1.07"	70.6 mm 2.78" x 45.0 mm 1.77"	26.6 mm 1.05" x 17.0 mm 0.67"
I/O	Input terminal		2 inputs (IN1, IN2), non-voltage input (relay contact, solid state)		
	Control output		NPN open-collector output: 4 outputs (OUT1 to OUT4) 30 mA max. (24 V max.) Residual voltage 0.8 V max., leakage current 0.1 mA max.		
	RS-232C	Communication method	Conforms to RS-232C		
		Communication speed	9600/19200/38400/57600/115200 bps		
		Synchronous method	Start-stop synchronization		
		Data length	7/8 bits		
		Stop bit length	1/2 bits		
	Parity check	None/Even/Odd			
USB		Conforms to USB 2.0 Full Speed			
Environmental resistance	Enclosure rating		IP65		
	Operating ambient temperature		0 to 45 °C 32 to 113 °F		
	Storage ambient temperature		-10 to +50 °C 14 to 122 °F, No condensation		
	Operating ambient humidity		35 to 95% RH, No condensation		
	Ambient operating illuminance		Sunlight: 10000 lux, Incandescent lamp: 6000 lux, Fluorescent lamp: 2000 lux		
	Operating atmosphere		No dust or corrosive gas present		
	Vibration resistance		10 to 55 Hz, 1.5 mm 0.06" double amplitude in X, Y, and Z directions, 3 hours respectively		
Rating	Power voltage		5 VDC +5%, -10%		
	Consumption current		630 mA max.		
Weight		Approx. 160 g (including the cable)/Weight without cable: Approx. 27 g			

\* The laser classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.

\* Use the Limited Power Source defined in UL/IEC60950-1 to comply with UL/IEC60950-1.

# The Future Belongs to Digital Barcode Readers

## BL-1300 SERIES

ULTRA-COMPACT DIGITAL BARCODE READERS

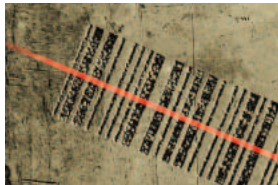


KEYENCE's new BL-1300 Series (3Hi-Digital) models. The first models in this class to use parallel digital processing technology. Noise reduction and compensation functions only possible with digital processing overcome the reading performance difficulties of conventional analog circuits.

### [HI-PERFORMANCE]

#### New Digital Processing Reads Very Low Quality Codes

A new edge detection process accurately extracts the points of alternation between bars and spaces in even the most difficult-to-read barcodes, while digital compensation makes it possible to read varying narrow/wide ratios.



### [HI-SPEED]

#### 100% Decode Rate at 1300 scans/sec is Unmatched by Conventional Barcode Readers

New high-speed motor (2.6 times faster than previous model) and high-speed processing engine (HPPE\*).

\* HPPE = Hi-Speed Parallel Processing Engine



### [HI-RESOLUTION]

#### Minimum Readable Narrow Bar Width : 0.08 mm 0.003"

Digital processing guarantees stable decoding of barcodes with incredibly small margins. This allows codes to be printed smaller without the worry of noise affecting the reader.



CODE39:16 digits

## Same Basic Functions as Previous Models



### Test modes available from the test button

BL-1300 Series models have a test button that lets you initiate test modes from the barcode reader body.

#### Test button

- TEST MODE
- Read ratio measurement mode
- Cycle time measurement mode
- Barcode position measurement mode NEW

### 5-Bar LED

Displays the result of the executed test mode. Shows the result at a glance, significantly reducing the man-hours needed for adjustment work.

#### Read ratio measurement mode



100% read ratio



40% read ratio



Read error

## Specifications

Model	BL-1300	BL-1301	BL-1300HA	BL-1301HA
Type	Standard type		High-resolution	
Read direction			Front	
Light source	Visible-light semiconductor laser (660 nm wavelength)			
Output	1.0 mW			
Pulse duration	112 µs			
Laser class	Class 2 (IEC60825-1, FDA CDRH Part1040.10) <sup>1</sup>			
Scanning method	Single	Raster	Single	Raster
Focal distance	120 mm 4.72"		90 mm 3.54"	
Reading distance	65 to 500 mm 2.56" to 19.69" <sup>2</sup> (1.0 mm 0.04" narrow bar width)		45 to 270 mm 1.77" to 10.63" <sup>2</sup> (0.5 mm 0.02" narrow bar width)	
Readable bar width	0.125 mm 0.005"		0.08 mm 0.003"	
Largest readable label width	339 mm 13.35" <sup>2</sup> (350 mm 13.78" distance, 1.0 mm 0.04" narrow bar width)		189 mm 7.44" <sup>2</sup> (189 mm 7.44" distance, 0.5 mm 0.02" narrow bar width)	
PCS	0.4 or more			
Scanning rate	500 to 1300 scans/second			
Supported barcodes	CODE39, ITF, Industrial 2-of-5, Standard 2-of-5, COOP 2-of-5, Codabar, CODE128, GS1-128 (EAN-128), CODE93, UPC/EAN, GS1 DataBar (RSS)			
Number of readable digits	74 digits (148 digits with CODE128 start character C)			
Environmental resistance	Enclosure rating	IP65		
	Operating ambient illumination	Sunlight: 10000 lux, Incandescent lamp: 6000 lux		
	Operating ambient temperature	0 to 45°C 32 to 113 °F		
	Storage ambient temperature	-20 to +60°C -4 to +140 °F		
	Operating ambient humidity	35 to 85% RH, No condensation		
	Operating environment	No dust or corrosive gas		
Rated values	Power supply	5 VCD ±5%		
	Current consumption	400 mA max.		
Weight	Approx. 115 g			

Model	BL-1350HA	BL-1351HA	BL-1370	BL-1371
Type	High-resolution side type		Long-distance type	
Read direction	Side		Front	
Light source	Visible-light semiconductor laser (660 nm wavelength)			
Output	1.0 mW			
Pulse duration	112 µs			
Laser class	Class 2 (IEC60825-1, FDA CDRH Part1040.10) <sup>1</sup>			
Scanning method	Single	Raster	Single	Raster
Focal distance	65 mm 2.56"		230 mm 9.06"	
Reading distance	40 to 250 mm 1.57" to 9.84" <sup>2</sup> (0.5 mm 0.02" narrow bar width)		160 to 600 mm 6.30" to 23.62" <sup>2</sup> (1.0 mm 0.04" narrow bar width)	
Readable bar width	From 0.08 mm 0.003"		From 0.15 mm 0.006"	
Largest readable label width	201 mm 7.91" <sup>2</sup> (175 mm 6.89" distance, 0.5 mm 0.02" narrow bar width)		404 mm 15.91" <sup>2</sup> (420 mm 16.54" distance, 1.0 mm 0.04" narrow bar width)	
PCS	0.4 or more			
Scanning rate	500 to 1300 scans/second			
Supported barcodes	CODE39, ITF, Industrial 2-of-5, Standard 2-of-5, COOP 2-of-5, Codabar, CODE128, GS1-128 (EAN-128), CODE93, UPC/EAN, GS1 DataBar (RSS)			
Number of readable digits	74 digits (148 digits with CODE128 start character C)			
Environmental resistance	Enclosure rating	IP65		
	Operating ambient illumination	Sunlight: 10000 lux, Incandescent lamp: 6000 lux		
	Operating ambient temperature	0 to 45°C 32 to 113 °F		
	Storage ambient temperature	-20 to +60°C -4 to +140 °F		
	Operating ambient humidity	35 to 85% RH, No condensation		
	Operating environment	No dust or corrosive gas		
Rated values	Power supply	5 VCD ±5%		
	Current consumption	400 mA max.		
Weight	Approx. 130 g		Approx. 115 g	

<sup>1</sup> The laser classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.

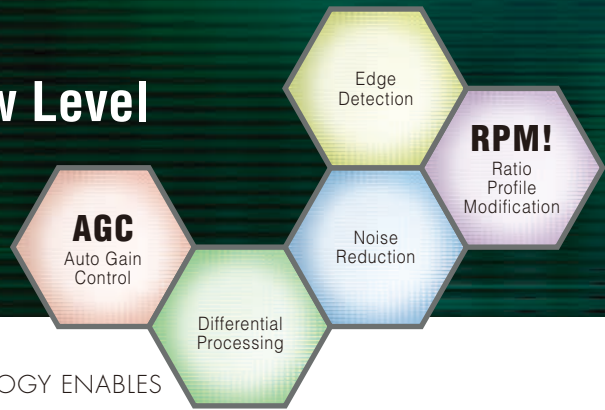
<sup>2</sup> Specifications for 500-scan/second operation

- Use the Limited Power Source defined in UL/IEC60950-1 to comply with UL/IEC60950-1.
- Internal body settings are written in the internal memory area (can be rewritten 100,000 times).

## I/O specifications

Input terminals	2 inputs (IN1, IN2), non-voltage input (contact or solid-state)	
Output terminals	Output format	4 (OUT1 through OUT4), NPN open collector
	Rated load	24 VDC, 30 mA
	OFF leak current	0.1 mA max.
	ON residual voltage	0.5 V max.
Serial interface	Communication standard	Conforms to EIA, RS-232C
	Baud rates	600/1200/2400/4800/9600/19200/31250/38400/57600/115200 bps
	Synchronization method	Start/stop synchronization
	Data bit length	7/8 bits
	Stop bit length	1/2 bits
	Parity check	None/Even/Odd

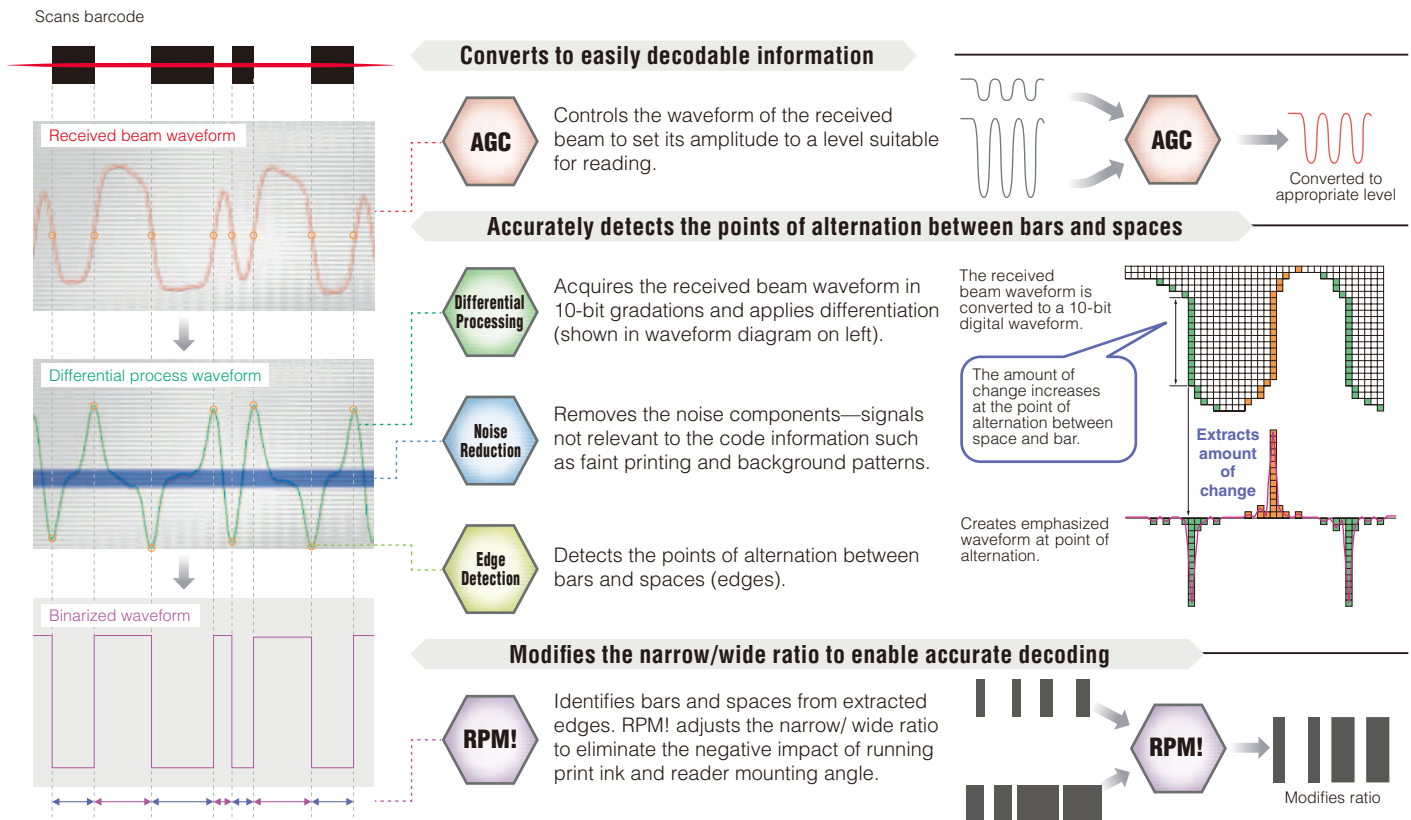
# 3Hi-DIGITAL Models Provide A New Level of Reading Performance



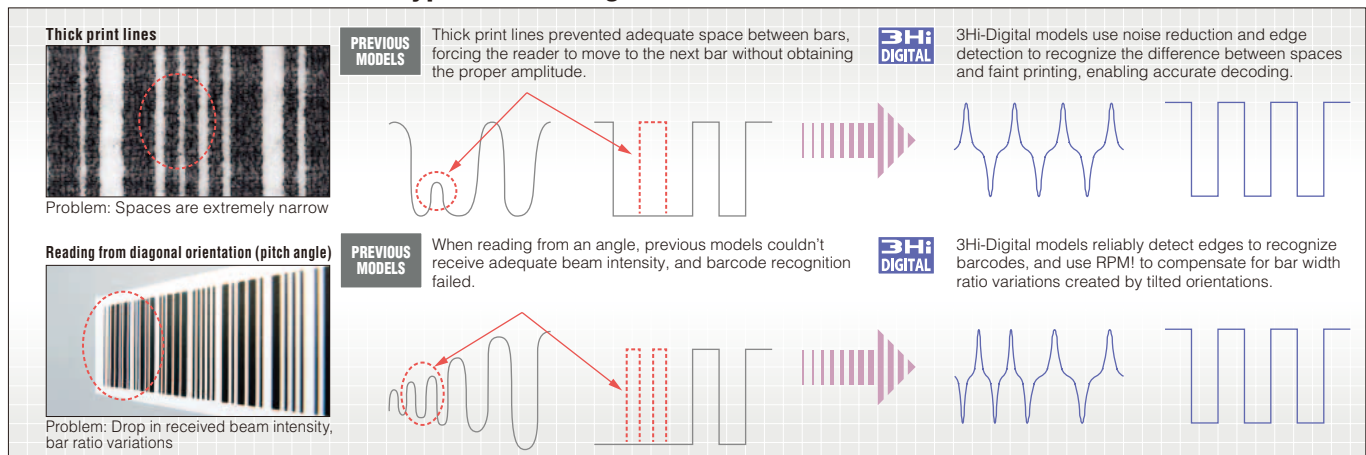
[INDUSTRY-BEST] ORIGINAL DIGITAL PROCESSING TECHNOLOGY ENABLES

## Superior Reading Performance 3Hi-DIGITAL

New Decoding Process Provides Unrivaled Reading Performance



## 3Hi-DIGITAL Models Solve Typical Reading Problems



# 1300 scans per second/ 1300 decodes per second

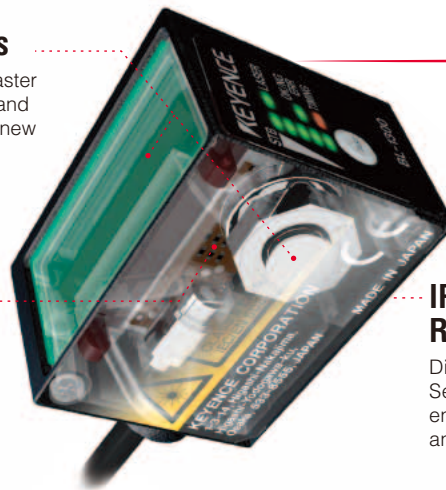


[UNMATCHED DECODE SPEED]

## High-Speed Engine Maximizes Performance **HPPE**

### New High-Speed Motor and Receiver Lens

BL-1300 Series models have a high-speed motor 2.6 times faster than previous models, enabling performance of 1300 scans and 1300 decodes per second. KEYENCE has also developed a new aspherical lens that has doubled the intensity of the received beam (the read source), reducing noise and increasing the effective label reading distance.



### High-Speed Processing Circuit

The new HPPE\* in BL-1300 Series models provides about 100 times the information processing capacity of previous models, providing reading performance that combines high speed and high precision.

\* HPPE: Hi-Speed Parallel Processing Engine

### IP65 Environmental Resistance

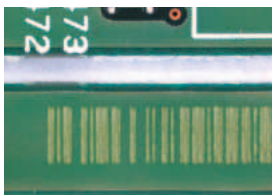
Die-cast magnesium bodies make BL-1300 Series models highly resistant to adverse environments and dirt, allowing mounting anywhere and use with any equipment.

### Extensive Product Lineup

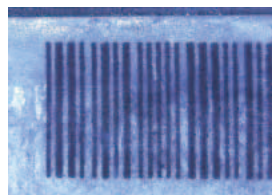
Standard type	Reading distance	65 to 500 mm 2.56" to 19.69" (1.0 mm 0.04" narrow bar width)	Single: BL-1300 Raster: BL-1301
High-resolution type	Reading distance	45 to 270 mm 1.77" to 10.63" (0.5 mm 0.02" narrow bar width)	Single: BL-1300HA Raster: BL-1301HA
Long-distance type	Reading distance	160 to 600 mm 6.30" to 23.62" (1.0 mm 0.04" narrow bar width)	Single: BL-1370 Raster: BL-1371
High-resolution Side type	Reading distance	40 to 250 mm 1.57" to 9.84" (0.5 mm 0.02" narrow bar width)	Single: BL-1350HA Raster: BL-1351HA



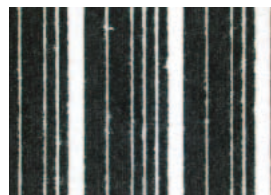
### Sample Barcodes



Misaligned marking (PCB)



Shiny background (aluminum)



Thick print lines (coated paper)



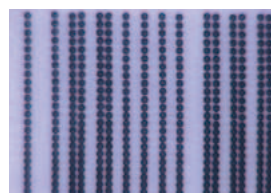
Faint printing (thermal paper)



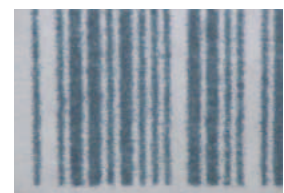
Uneven background (cardboard)



Curved part (sticker)



Dot printing (plastic)



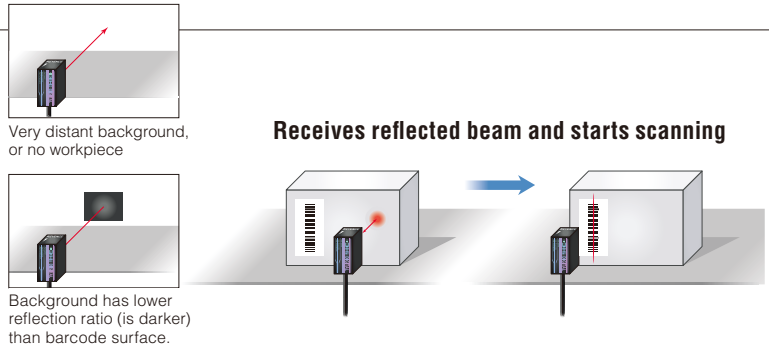
Running ink (copy of slip)

# Advanced Functions Designed for Ease-of-Use



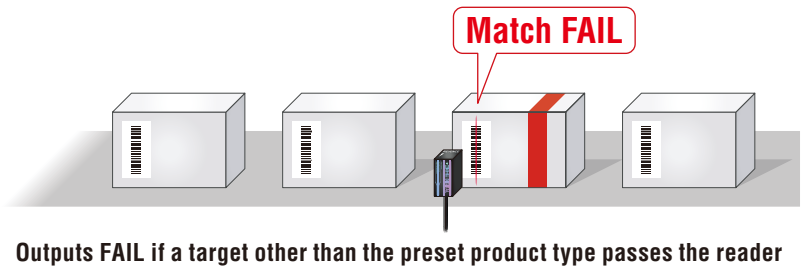
## **NEW** Auto-Trigger Mode

Monitors the received light intensity of an internal laser sensor to determine if the product is present or absent. Automatically detects and reads the target workpiece when it is placed in the scan area, with no need to install timing sensors or use serial commands.



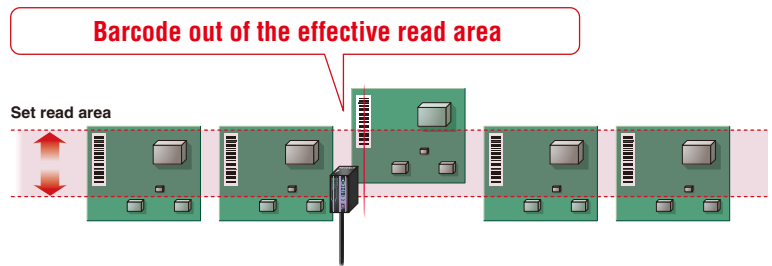
## **NEW** Preset/Comparison Function

Compares the read barcode data with barcode data stored internally on the BL (preset data), and outputs a match PASS or FAIL. In environments supporting multi-I/O functions, you can quickly register a new preset code by sending an input signal to the reader.



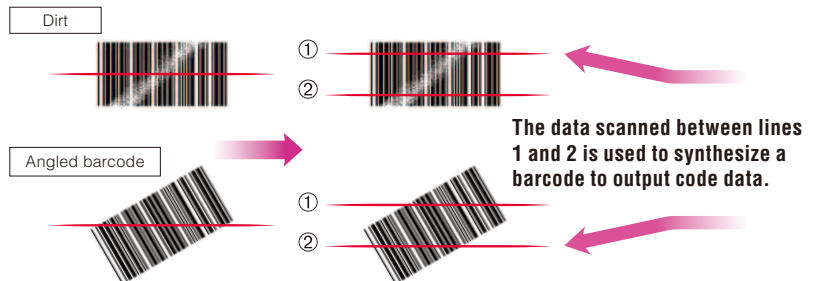
## **NEW** Barcode Position Detection Function

Checks the left/right edge positions of the read barcode labels, and appends edge position data when outputting the code information. An output terminal can be set to turn ON when read data is out of the set edge range, providing status information before reading fails completely.



## **NEW** Synthesized Barcode Reading Function

When a barcode is damaged by scratches or dirt, or enters the read area at an angle, this function reads the barcode data by synthesizing a barcode from a combination of laser scans



## **NEW** Supports GS1 Databar (RSS) Barcodes

The BL-1300 Series can read GS1 DataBar (RSS) barcodes, which can express the same quantity of data in a smaller space.





# Wide Range of Interfaces



## SUPPORTS USB/ETHERNET CONNECTION

### Interface lineup

The BL-1300 Series supports USB and Ethernet interfaces, as well as RS-232C, RS-422A and RS-485. This wide range of supported interfaces enables versatile system configuration.



### Multi-I/O Function

Lets you assign various operation conditions to individual I/O terminals. Supports two inputs and four outputs, which can be freely configured to match application conditions.

#### Example configuration when reading serial Nos.

- IN 1: Timing input
- IN 2: Test mode START





- OUT 1: OK (Read OK)
- OUT 2: ERROR (Read error output)
- OUT 3: POSITION (Read position is outside set area.)

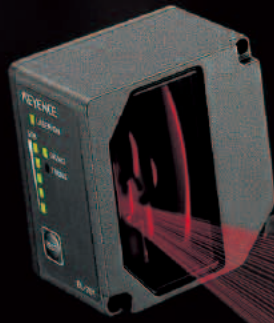
#### Example configuration when checking for presence of different products

- IN 1: Timing input
- IN 2: Preset registration
- OUT 1: OK (Read OK/comparison OK)
- OUT 2: FAIL (Comparison FAIL output: Mismatch with preset data)
- OUT 3: ERROR (Read error output: Barcode read failure)
- OUT 4: PRESET: Output when preset data registration has finished.

### Specifications



Type	 RS-232C	 RS-422A/485	 USB	 Ethernet
Model	N-R2	N-R4	N-UB	N-L1
<b>Power supply for the code reader</b>				
Environment resistance	5 VCD ± 5% (650 mA)			
	Operating surrounding air temperature 0 to 50°C 32 to 122°F			
	Storage ambient temperature -20 to +60°C -4 to +140°F			
	Operating ambient humidity 35 to 85% RH, No condensation			
	Operating atmosphere No dust or corrosive gases present			
Rating	Vibration resistance 10 to 55 Hz, complex amplitude 1.5 mm 0.06", 2 hours in each of X, Y, and Z directions			
	Power voltage 24 VCD (+10%, -20%)			
Mass	Consumption current 380 mA or less			
	Approx. 135 g		Approx. 155 g	
Terminal block	Input	Number of pins 2 (IN1 and IN2)		
		Input format Bidirectional voltage input		
		Input maximum rating 26.4 VCD		
		Minimum ON voltage 15 VCD		
		Maximum OFF current 1 mA		
	Output	Number of pins 4 (OUT1 to 4)		
		Output format Photo MOS relay output		
		Output rating load 30 VCD, 100 mA		
		OFF time leak current 0.1 mA or less		
		ON time residual voltage 1 V or less		
<b>Host interface</b>				
15 m 49.21' or less (including the head cable)		1.2 km 0.75 mile or less		5 m 16.40' or less
100 m 328.08' or less				



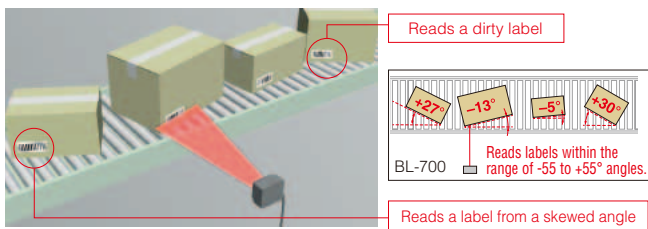
## Long Range Reading Capabilities

### BL-700 SERIES

LASER BARCODE READER

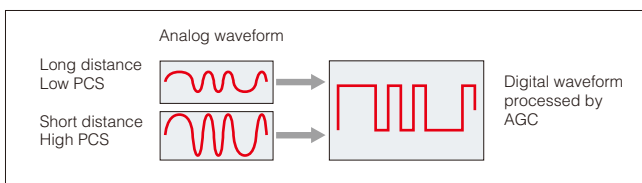


KEYENCE's original AGC (Auto Gain Control) provides superior angle reading capabilities. This revolutionary reading capability is outstanding compared to other models. The BL-700 Series provides reliable reading regardless of the orientation or size of the labels.



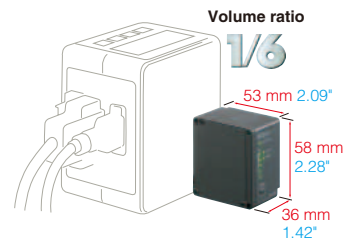
### Auto Gain Control

The Auto Gain Control (AGC) function automatically adjusts the intensity of the received light according to the change in the reading distance and PCS. With the AGC function, the BL-700 Series achieves an excellent reading range despite its ultra-small body. A reliable read is ensured for barcodes with low PCS, such as those on cardboard boxes. During the AGC operation, the Specular Reflection Cancel (SRC) circuit minimizing the influence of strong reflective beams from parts other than barcodes.



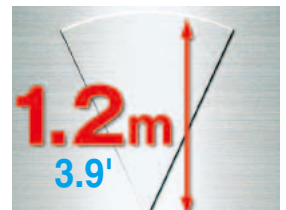
### Compact Design

The BL-700 Series, a standard model for the warehousing industry, is surprisingly small with a depth of only 36 mm 1.42". The cable, which exits from a slanted corner of the housing, greatly reduces the extra space needed for a cable or connector. Mounting can be done without any restrictions on the size of the space.



### Longest Reading Range in Its Class : 1.2m 3.9'

With KEYENCE's laser technology, the BL-700 Series allows an ultra-long distance read. Even if the target size varies, the AGC function ensures a reliable reading through an unparalleled reading depth.



### High Speed : 700 Scans/s

With a 32-bit RISC CPU chip and KEYENCE's control technology, the BL-700 Series achieves 700 scans (700 decodes) per second. An ultra high-speed response that reliably reads barcodes moving at high speed on production lines.



## Space-Saving, Slanted-Corner Design

The slanted corner of the housing allows the cable to be routed in any direction. Since the BL-700 Series requires no space for a connector, it can be neatly mounted anywhere, such as the side of a conveyor, in a space just as large as its body size.



Vertical mounting

Horizontal mounting

Direct wall mounting

## Built-in Test Button

The BL-700 Series features a test mode that indicates the optimal reading position by a press of a button. This saves a large amount of installation and maintenance labor.



## First-in-class, 5-level LED Indicating the Reading Performance

By pressing the test button, the 5-level LED indicator shows, in real time, the decoding ratio per 100 scans as a percentage.



Stable reading indicator using bar LEDs

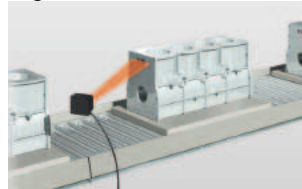
At 100 scans and 100 decodes

At 100 scans and 40 decodes

Reading error status

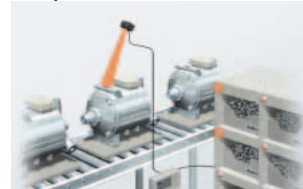
## Applications

### Engine block



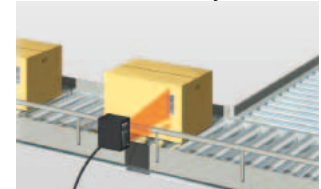
The AGC function guarantees a reliable read even if the barcode labels are dirty or dusty.

### Compressor



Giving directions to pick the necessary parts for compressor assembly.

### Cardboard box conveyors



The BL-700 Series can be mounted in small spaces and is less affected by the conveyor guide.

## Specifications

Model	BL-700	BL-701	BL-740	BL-741	BL-780	BL-781
Type	High-resolution		Middle-range		Long-range	
Scanning method <sup>*1</sup>	Single	Raster	Single	Raster	Single	Raster
Light source	Visible semiconductor laser (Wavelength: 650 nm)					
Output	1.4 mW		1.8 mW		2.0 mW	
Pulse duration	FDA: 50 μs, IEC: 43 μs		FDA: 50 μs, IEC: 29 μs		FDA: 50 μs, IEC: 23 μs	
Laser class	Class II (FDA CDRH Part1040.10), Class 2 (IEC6085-1)					
Reading distance	160 to 370 mm 6.30° to 14.57° (When narrow bar width is 0.5 mm 0.02°)		150 to 750 mm 5.91° to 29.53° (When narrow bar width is 1.0 mm 0.04°)		200 to 1200 mm 7.87° to 47.24° (When narrow bar width is 2.0 mm 0.08°)	
Reading bar width <sup>*2</sup>	0.15 to 1.0 mm 0.006° to 0.04°		0.25 to 2.0 mm 0.01° to 0.08°		0.32 to 2.0 mm 0.01° to 0.08°	
Largest readable label width <sup>*3</sup>	310 mm 12.20° (When reading distance is 335 mm 13.19°)		600 mm 23.62° (When reading distance is 680 mm 26.77°)		1010 mm 39.76° (When reading distance is 1080 mm 42.52°)	
PCS	0.6 or more (Reflectance of white part: 75% or more)					
Scanning rate	700 scans/sec					
Target code	CODE39, ITF, Industrial 2-of-5, COOP 2-of-5, Codabar, CODE128, CODE93, EAN/UPC (A-E)					
Number of readable digits	32 digits max. <sup>*4</sup>					
Trigger input	Non-voltage input (contact, solid-state), TTL input is also possible.					
Serial interface	Applied standard	RS-232C				
	Synchronization	Start-stop				
	Transmission code	ASCII				
	Baud rate	600/1200/2400/4800/9600/19200/31250/38400 bps				
	Data length	7/8 bits				
	Parity check	None/Even/Odd				
OK/NG output	Stop bit length	1 bit/2 bits				
	Output form	NPN				
	Rated load	24 VCD, 30 mA				
	Leakage current (at OFF)	0.1 mA max.				
	Residual voltage (at ON)	0.5 V max.				
Environmental resistance	Enclosure rating	IP65				
	Ambient light	Sunlight: 10000 lux, Incandescent lamp: 6000 lux	Sunlight: 10000 lux, Incandescent lamp: 4000 lux		Sunlight: 8000 lux, Incandescent lamp: 3000 lux	
	Ambient temperature	0 to 40°C 32 to 104°F, No condensation				
	Relative humidity	35 to 85%, No condensation				
	Operating atmosphere	No dust or corrosive gas present				
Power rating	Vibration	10 to 55 Hz, 1.5 mm 0.06° double amplitude in X, Y, and Z directions, 2 hours respectively				
	Power supply voltage	5 VCD ±5%				
	Current consumption	510 mA max.				
Weight	Approx. 300 g (including cable)					

\*1 BL-701 raster width: 10 ±1 mm 0.39° ±0.04° (reading distance: 200 mm 7.87°) BL-741 raster width: 20 ±2 mm 0.79° ±0.08° (reading distance: 300 mm 11.81°)

BL-781 raster width: 30 ±3 mm 1.18° ±0.12° (reading distance: 450 mm 17.72°)

\*2 When the barcode type is CODE39.

\*3 Largest reading label width includes the barcode 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).



# Ultra-small Barcode Reader BL-600 SERIES

LASER BARCODE READER



The BL-600 is one of the world's smallest barcode readers. (31 x 40 x 21 mm 1.22" x 1.57" x 0.83")

\*The BL-600 is roughly than 1/2 the size of conventional barcode readers but delivers ultra high performance

Microscopic Polygon Mirror and Motor

The BL-600 features an ultra compact polygon mirror. The compact size is achieved by using optical technology developed for high precision measurement.



## Preventive Maintenance Information (PMI)

The BL-600 Series is the first barcode reader to feature a PMI function, which prevents reading errors before they occur. This function outputs diagnostic information while the reader is reading barcodes. By examining the information, it is possible to detect problems that may cause reading errors. This unique function is an invaluable tool for acquiring maintenance information or for analyzing and finding the cause of reading errors.

Reading data      PMI (Preventive Maintenance Information)

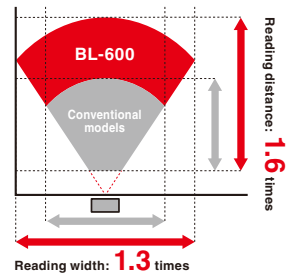
KEYENCE 01 :	0
KEYENCE 02 :	0
KEYENCE 03 :	1
KEYENCE 04 :	0
KEYENCE 05 :	0
KEYENCE 06 :	0

**Problem**

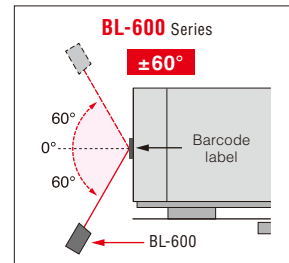
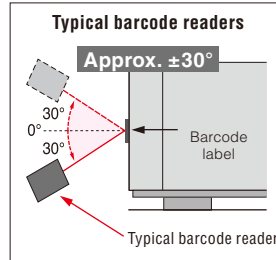
PMI = 0 : Normal  
1 : Caution  
2 : Warning  
9 : Reading error

## Superior Reading Performance

Using KEYENCE's exclusive AGC, circuits for advanced high-speed performance, the BL-600 offers excellent reading depth and angle characteristics. The reader also includes built-in SRC circuits that greatly reduce the effects of extraneous reflected light and allows a more reliable and stable reading.



### [STABLE READING RANGE]



The BL-600 Series offers greater mounting flexibility.

### FRONT-VIEW TYPE

- STANDARD
- BL-600 (Single-scan)
- BL-601 (Raster-scan)
- HIGH-RESOLUTION
- BL-600HA (Single-scan)
- BL-601HA (Raster-scan)

### SIDE-VIEW TYPE

- HIGH-RESOLUTION
- BL-650HA (Single-scan)
- BL-651HA (Raster-scan)



## Test Button for Easy Adjustment

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 quick maintenance.



## 5-Bar LED Display

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

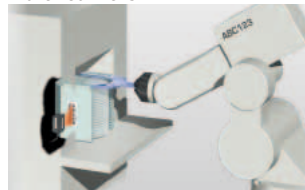
\* The reading ratio can be output to a PC.



## Reading Status Indicator

## Applications

### Wafer carriers



Thanks to the AGC function, the BL-600 can reliably read PFA-coated barcode labels even at extreme angles.

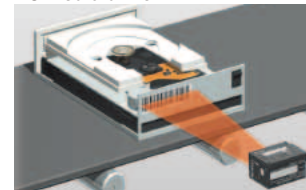
\* A special model for a 300 mm 11.81" wafer load ports (SEMI E15.1 fully supported) is also available.

### Medical



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

### PC media drive



Even with vibrations and unevenness, the BL-600 performs accurately and reliably.

## Heavy duty construction in an ultra-light package

Thanks to its die-cast magnesium casing, the BL-600 is not only ultra light and compact, but also durable.

## Exceptional resistance in severe environments

The highly resistant construction of the BL-600 passes the demanding IP65 environmental specifications for sensors. The BL-600 offers excellent protection in harsh or dirty environments and can be installed in almost any location.

## Easy maintenance

The flat reading surface of the BL-600 Series greatly reduces the tedious maintenance often involved with barcode readers.

## Specifications

Model	BL-600	BL-601	BL-600HA	BL-601HA	BL-650HA	BL-651HA
Type	Standard		High-resolution		High resolution, side type	
Reading direction	Front					
Scanning method <sup>1</sup>	Single	Raster	Single	Raster	Single	Raster
Light source	Visible semiconductor laser (Wavelength: 650 nm)					
Output	1.5 mW					
Pulse duration	FDA: 56 µs, IEC: 65 µs					
Laser class	Class II (FDA CDRH Part1040.10), Class 2 (IEC60825-1)					
Reading distance	75 to 330 mm 2.95" to 12.99" (When narrow bar width is 1.0 mm 0.04")		55 to 190 mm 2.17" to 7.48" (When narrow bar width is 0.5 mm 0.02")		45 to 175 mm 1.77" to 6.89" (When narrow bar width is 0.5 mm 0.02")	
Readable bar width <sup>2</sup>	0.19 to 1.0 mm 0.008" 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 readable label width <sup>3</sup>	250 mm 9.84" (When reading distance is 280 mm 11.02")	156 mm 6.14" (When reading distance is 174 mm 6.85")	170 mm 6.69" (When reading distance is 155 mm 6.10")			
PCS	0.6 or more (Reflectance of white part: 75% or more)					
Scanning rate	500 scans/sec					
Target code	CODE39, ITF, Industrial 2-of-5, COOP 2-of-5, Codabar, CODE128, GS1-128(EAN-128), CODE93, EAN/UPC (A-E)					
Number of readable digits	32 digits max. <sup>4</sup>					
Trigger input	Non-voltage input (contact, solid-state), TTL input is also possible.					
Serial interface	RS-232C (Refer to the data of BL-700 Serial Interface in page 19 for details.)					
OK/NG output	Output form	NPN				
	Rated load	24 VCD, 30 mA				
	Leakage current (at OFF)	0.1 mA max.				
	Residual voltage (at ON)	0.5 V max.				
Environmental resistance	Enclosure rating	IP65				
	Ambient light	Sunlight: 10000 lux, Incandescent lamp: 6000 lux				
	Ambient temperature	0 to 45°C 32 to 113°F, No condensation				
	Relative humidity	35 to 85%, No condensation				
	Operating atmosphere	No dust or corrosive gas present				
Power rating	Vibration	10 to 55 Hz, 1.5 mm 0.06" double amplitude in X, Y, and Z directions, 2 hours respectively				
	Power supply voltage	5 VCD ±5%				
Weight	Power consumption	330 mA max.				
		Approx. 115 g			Approx. 130 g	

<sup>1</sup> Raster width: BL-601: 7.1 ±1.8 mm 0.28" ±0.07" (When reading distance is 120 mm 4.72"), BL-601HA: 5.5 ±1.4 mm 0.22" ±0.06" (When reading distance is 90 mm 3.54"), BL-651HA: 5.5 ±1.4 mm 0.22" ±0.06" (When reading distance is 65 mm 2.56")

<sup>2</sup> Reading bar width indicates the range of readable narrow bar width when the barcode type is CODE39.

<sup>3</sup> Maximum reading label width includes the barcode margin (quiet zone).

<sup>4</sup> 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).



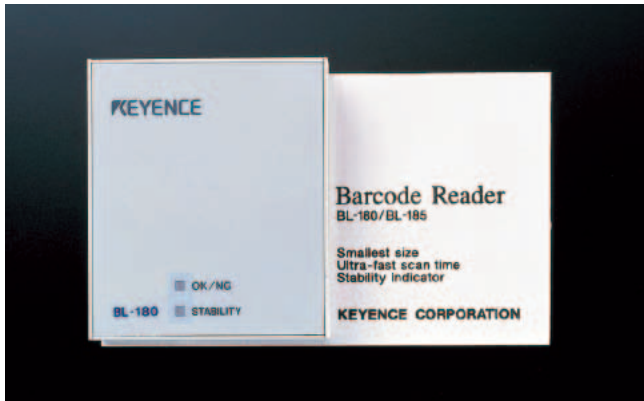
## Ultra Small Size... Half the Size of a Business Card

### BL-180 SERIES

CCD BARCODE READER

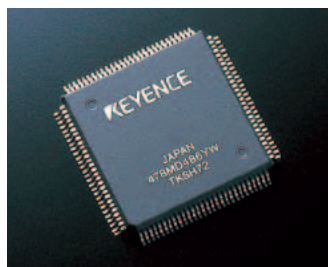


The BL-180 Series ultra-small CCD barcode reader is easily mounted in any device, allowing the complete system to be downsized. Despite the small size, it features a built-in decoder and reads labels as wide as 80 mm  $3.15''$ .



### 500 Scans Per Second

The BL-180 Series is the first CCD barcode reader that achieves a laser-type-level, 500 scans per second. The reliability is dramatically improved with the high-speed processing circuit developed by KEYENCE.



### Stability LED for Easy Mounting

The BL-180 Series features a highly visible STABILITY LED indicator. The optimal mounting position can be determined quickly and easily. Moreover, reading errors can be prevented by checking the reading performance rate or the decode count output.



The LED shows the performance rate with three colors: green, orange, and red.



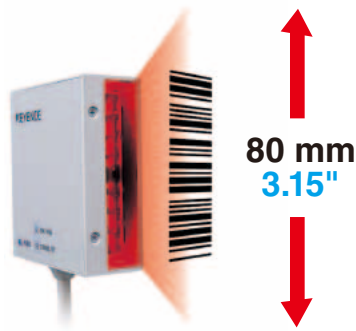
Front type  
BL-180



Side type  
BL-185

## Ultra-small Body Reads Labels as Wide as 80 mm 3.15"

The BL-180 Series is small in size but reads wide. KEYENCE's original optical technology achieves 80 mm 3.15" of readable label width.



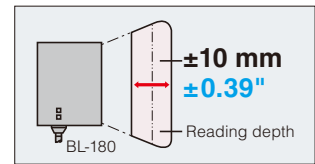
## Reads Bars as Narrow as 0.125 mm 0.005"

The BL-180 Series offers the best reading capability of all other CCD barcode readers in the world. It can read bars as narrow as 0.125 mm 0.005", making it ideal for today's increasingly miniaturized barcodes.



## Reading Depth of ±10 mm ±0.39"

Reading is reliable regardless of vibration or position of the targets. The original optical technology and the high-intensity LED achieve a reading depth of ±10 mm ±0.39", resulting in a stable reading performance.



## Applications

### Medical applications



The BL-180 Series excels at reading barcodes on specimen containers with its reading width of 80 mm 3.15".

### PC board mounting process



The compact body and high-speed reading capability of the BL-180 Series makes it ideal for reading barcodes on PC boards or wafer carriers.

### Shelf management



The compact body can be mounted easily anywhere in the shelf.

## Specifications

Model	BL-180	BL-185
Model (with connector)	BL-180SO (7030)	BL-185SO (7031)
Reading direction	Front	Side
Light source/Light receiving element	LED/CCD image sensor	
Scanning distance	33 ±10 mm 1.30" ±0.39"*1 (Using narrow bars of at least 0.19 mm 0.008" in width)	
Readable bar width*2	0.125 to 1.0 mm 0.005" to 0.04"	
Largest readable label width	80 mm 3.15"*3 (Using narrow bars of at least 0.19 mm 0.008" in width)	
PCS	0.45 or more (Reflectance of white part: 75% or more)	
Scanning rate	500 scans/sec	
Target code	CODE39, ITF, Industrial 2-of-5, COOP 2-of-5, Codabar, CODE128, EAN/UPC (A-E)	
Number of readable digits	32 digits	
Trigger input	Non-voltage input (contact or solid-state), TTL input is also possible.	
Serial interface	Applied standard	RS-232C
	Synchronization	Start-stop
	Transmission code	ASCII
	Baud rate	600/1200/2400/4800/9600/19200/31250/38400 bps
	Data length	7/8 bits
	Parity check	None/Even/Odd
OK/NG output	Stop bit length	1 bit/2 bits
	Output form	NPN
	Rated load	24 VDC, 100 mA
	Leakage current (at OFF)	0.1 mA max.
Environmental resistance	Residual voltage (at ON)	0.5 V max.
	Ambient light	Sunlight, Incandescent lamp: 10000 lux, Fluorescent lamp: 3000 lux.
	Ambient temperature	0 to 40°C 32 to 104°F, No condensation
	Relative humidity	35 to 85%, No condensation
	Operating atmosphere	No dust or corrosive gas present
Power rating	Vibration	10 to 55 Hz, 1.5 mm 0.06" double amplitude in X, Y, and Z directions, 2 hours respectively
	Power supply voltage	5 VDC ±5%*4
Weight	Current consumption	300 mA max.
		Approx. 165 g

\*1 33 ±5 mm 1.30" ±0.20" when the narrowest bar is less than 0.19 mm 0.008".

\*2 Readable bar width indicates the range of the narrowest readable bar.

\*3 60 mm 2.36" when the narrowest bar is less than 0.19 mm 0.008".

\*4 Use a stable power supply of 5 VDC ±5%. The BL-U1 special power unit is available as an option.

Note: The internal BL settings are written to the built-in EEPROM (erasable up to 100,000 times).



# Automatic Data Verification and Evaluation

## DV-90 SERIES

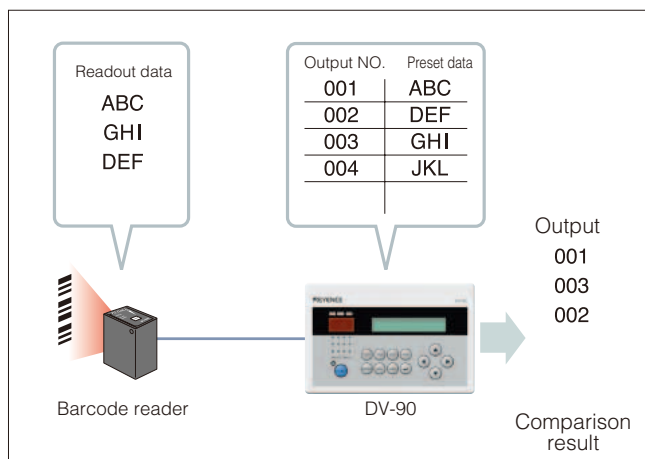
AUTO ID DATA CONTROLLER



### Immediate Verification/ Evaluation of Code Data

The DV-90 compares the data read with a code reader to the data registered in advance (preset data) for verification. The evaluation result is output in parallel \*. Setting is easy without any need for difficult PLC programming.

\*The output can be selected from bit, binary, and BCD. Up to 900 pieces of master data can be registered.



### Easy Preset Registration

The preset barcode data can be registered by simply scanning the barcodes applied on products or instruction sheets. Additions or product changeovers can be registered without the need for complicated PLC programming.

### Two Serial Ports & USB Interface are Standard

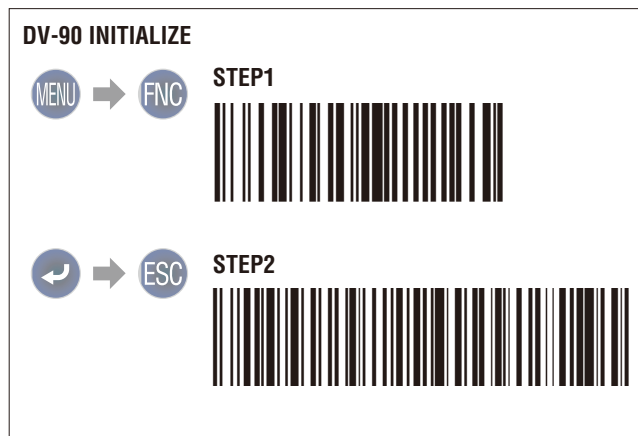
Both serial ports can be used to connect BL/SR Series units (code readers). It is also possible to select from PORT 1 or 2 to verify data for each preset number. In addition, a USB interface is featured as standard. Consequently, two BL/SR Series units and a PC can be connected simultaneously.

### PNP Output Type Available

A PNP open-collector output model is also available (DV-90PE)

### DV Quick Setup Code

The included software allows users to set up the DV-90 by simply scanning barcodes that are printed out from the software.





# DV-90 Series Verification Functions

## Normal Verification

Compares scanned data to all preset data and outputs the result with a corresponding output number.

## Step Verification

Compares two consecutive data readings and outputs whether the two data strings match or do not match.

## Active Verification

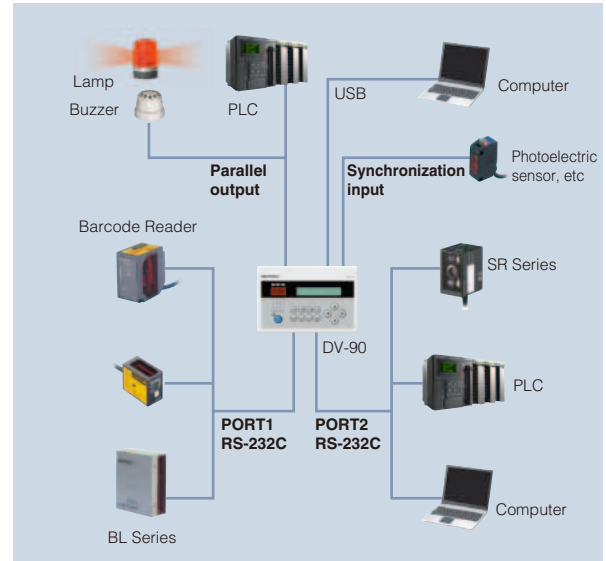
Compares scanned data to a specific preset data and outputs whether they match or do not match.

## 3-Point A Verification

Compares the combinations of three pieces of data and outputs whether the combinations match or do not match.

## 3-Point B Verification

Compares three barcodes in turn and determines that they are picked in the correct order.



## Applications

### Prevent Mixing



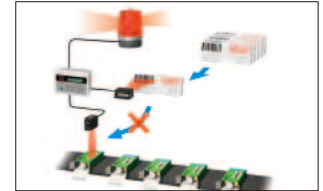
Wrong products can be effectively prevented from entering the line.

### Changeover



The DV-90 will handle product differentiation and provide accurate instructions to the upper (control) devices.

### POKA-YOKE



Make sure that the correct instruction sheet is included with the product.

## Specifications

Model		DV-90NE (NPN output type), DV-90PE (PNP output type)	
Applicable barcode reader		SR Series, BL-1300/700/600/500/180/N70RKE	
Registered preset data number		900 max.	
Memory backup		Flash ROM (Rewritable: 100,000 times)	
I/O terminal	Input (4 points) • Trigger input (2 points) • Unlock input • Remote input	Rated input voltage	10 to 26 VDC, 10 mA, Class 2
		Maximum OFF current	1.0 mA
	Output (16 points) • Out 1 through 12 • OK output • NG output • Read error output • Quality error output	Output form	DV-90NE: NPN Open-collector DV-90PE: PNP Open-collector
		Rated load	30 VDC, 100 mA
		Leakage current at OFF	0.1 mA max.
		Residual voltage at ON	Less than 1 V
Serial interface	PORT1 (For connecting code reader)	Applied standards	RS-232C
		Synchronization	Asynchronous
	PORT2 (For connecting PC, PLC, or code reader)	Baud rate	600/1200/2400/4800/9600/19200/31250/38400/57600/115200 bps
		Data length	7/8 bits
		Parity check	None/Even/Odd
USB (Special for connecting PC)		USB 2.0 (B type) (Communication speed fixed to 115200 bps)	
Power output	Power for barcode reader	5 VDC $\pm 5\%$ , 1100 mA max. (at the ambient temperature of 0 to 40°C 32 to 104°F) 850 mA max. (at the ambient temperature of 40 to 50°C 104 to 122°F)	
	Power for sensor	24 VDC $\pm 10\%$ , 250 mA max.	
Environmental resistance	Enclosure rating	IP65 (only the front panel when panel-mounted)	
	Ambient temperature	0 to 50°C 32 to 122°F, No condensation	
	Relative humidity	35 to 85%, No condensation	
	Operating atmosphere	No dust or no corrosive gas present	
Power rating	Power supply voltage	24 VDC $\pm 10\%$ , Class 2	
	Current consumption	850 mA max.	
Weight		Approx. 360 g	



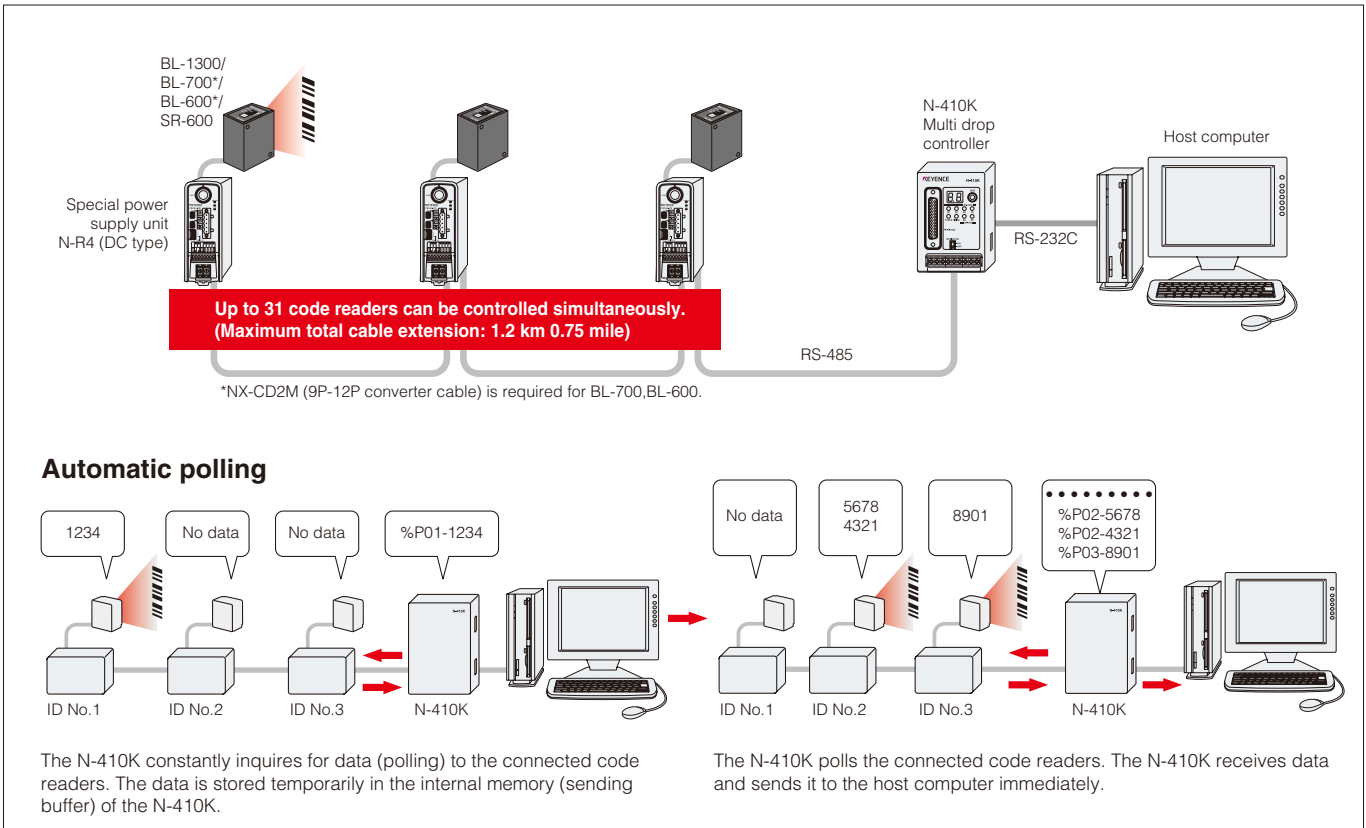
# Multi-Drop Link for BL/SR Networking

## N-410K SERIES

### MULTI-DROP CONTROLLER



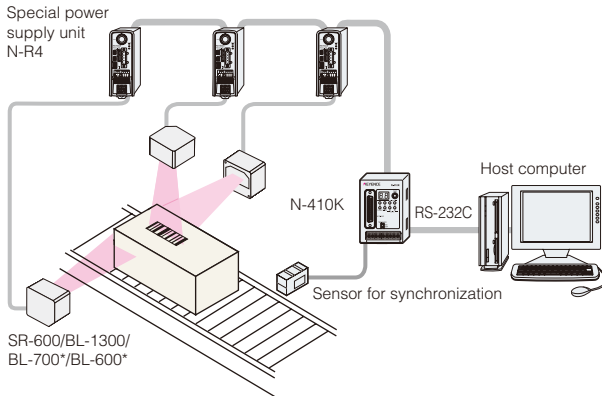
Up to 31 code readers can be controlled with a single host computer. The N-410K controls the communication between the code readers, partially eliminating the need for programming the host computer.



# Multiple Scanning Heads

## Multi-Head Mode

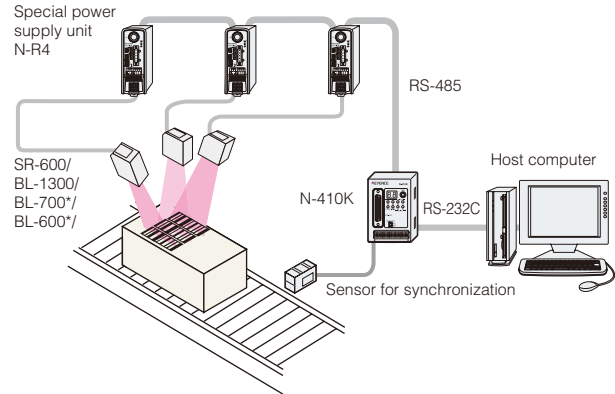
The N-410K controls several code readers as if they were a single unit, without using a host computer. This mode is useful when the position of labels varies between work pieces.



\*NX-CD2M (9P-12P converter cable) is required for BL-700, BL-600.

## Mutual Interference Prevention Function

The N-410K controls several code readers so that they scan alternately, eliminating mutual interference. This function is useful when several code readers must be installed close to each other to read a label with multiple codes.



\*NX-CD2M (9P-12P converter cable) is required for BL-700, BL-600.

# Features of the N-410K

## Greatly Reduced Programming for the Host Computer

Up to 31 code readers can be controlled with a single host computer.

## 100 KB Memory (Sending Buffer) Featured as Standard

The internal buffer can store up to 3000 pieces of data. In the event of an accident, the data is retained, even when the host computer is turned off.

## Built-in Test Mode for Connection Check

The N-410K features a test mode to enable an easy verification of the connection with the code readers. No special programming or PC is required.

## Setting Change of Code Readers

You can change various settings of code readers using the N-410K, such as adding code types or changing the maximum code length to be read.

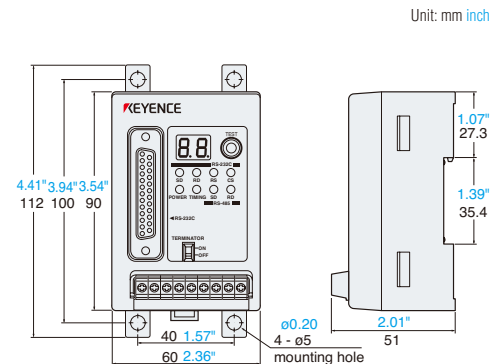
## Reading Test of Each Code Reader

You can use the functions of the BL/SR Series, as well as the test mode, through the N-410K. This allows remote access to the code readers to check settings and ensure correct operation.

## Specifications

Model	N-410K	
Connectable code reader	SR Series, BL-1300/700/600 Series	
Trigger input	Rated input	15 to 26.4 VDC, 10 mA max.
	Max. OFF current	1.0 mA
RS-232C	Applied standards	RS-232C
	Synchronization	Start-stop (Full-duplex)
	Transmission code	ASCII
	Baud rate	9600/19200/38400/57600/115200 bps
	Data length	7/8 bits
	Parity check	Even/Odd/None
	Stop bit length	1 bit/2 bits
RS-485	Applied standards	RS-485
	Synchronization	Start-stop (Full-duplex)
	Transmission code	ASCII
	Baud rate	600 to 115200 bps
	Data length	7/8 bits
	Parity check	Even/Odd/None
	Stop bit length	1 bit/2 bits
	Max. number of connectable units	31
Max. total extension distance	1.2 km 0.75 mile	
Environmental resistance	Ambient temperature	0 to 55°C 32 to 131°F, No condensation
	Relative humidity	35 to 85%, No condensation
Power rating	Power supply voltage	24 VDC (+10%, -20%)
	Current consumption	80 mA max.
Weight	Approx. 180 g	

## Dimensions



Unit: mm inch



## BL-N70 SERIES

COMPACT HANDHELD BARCODE READER



### Superb Reading Ability

Wide depth-of-field capability from contact to non-contact reading.

### Compact & Light Weight Body That is Easy to Handle & Operate

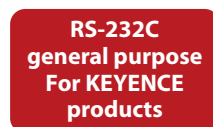
Significantly improved ergonomics thanks to the approx. 100 g compact body.

### Read Any Code System

Reads EAN-128, magazine code (UPC Supplemental), RSS code and more.

### 3 WAYS TO CONNECT

Transmitting barcode data is as easy as connecting the reader to a PC. There is no need for special power supply or software



KEYBOARD I/F

RS-232C

### Specifications

Model	BL-N70VE	BL-N70UBE	BL-N70RE <sup>*1</sup>	BL-N70RKE
Interface	PS2	USB	RS-232C	RS-232C *For KEYENCE products
Connector type	Mini-DIN 6-pin	USB (Type A)	D-sub 9-pin (female)	
Light source	Visible red semiconductor laser (Wavelength 650 nm)			
Output	40 μW			
Pulse duration	1.5 ms			
Laser class	Class 1 (IEC 60825-1, FDA CDRH Part1040.10) <sup>*2</sup>			
Reading distance	0 to 177 mm 0" to 6.97" (When the narrow bar width is 0.66 mm 0.03")			
Resolution	0.125 mm 0.005" min.			
PCS	0.35 min.			
Scanning rate	72 scans per second			
Target codes	EAN/UPC(A-E), CODE39, CODE128/GS1-128 (EAN128), Codabar, CODE93, ITF, 2-of-5, GS1 Data bar (RSS)			
Readable bar width	Maximum 40 digits (80 digits with CODE128 CODE-C)			
Ambient light	4800 lux			
Ambient temperature	0 to 40°C 32 to 104°F			
Relative humidity	35 to 85% RH, No condensation			
Operating atmosphere	No dust or corrosive gas			
Power supply	5 VDC ±5%			
Current consumption	200 mA max.			
EMI	Class B			
Weight	Approx.100 g			

\*1 Available in U.S only.

\*2 The laser classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.

# PERIPHERAL DEVICES

## Power Supply Units

BL-U1SO (7176)<sup>\*1</sup>



N-42



N-48



BL-U2



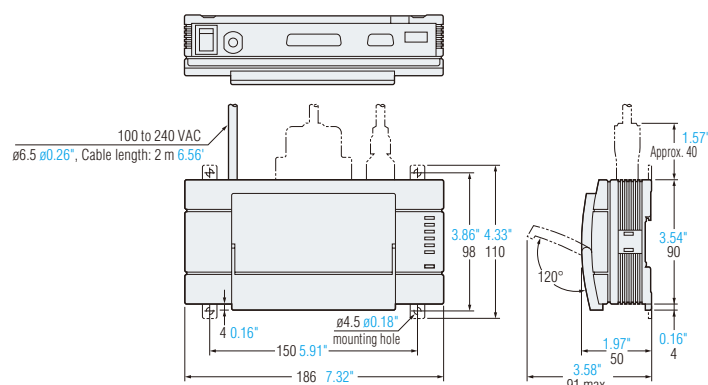
### Specifications

Model		BL-U1SO (7176) <sup>*1</sup>	BL-U2
Connectable barcode reader		BL-700/600/180 Series	
Power supply for barcode reader		5 VDC ±5% (1.5 A)	5 VDC ±5% (630 mA)
Power supply for sensor		12 V ±10% (300 mA)	
Trigger input	Input rating	8.5 to 30 VDC, 10 mA max.	8.5 to 26 VDC, 10 mA max.
	Max. OFF current	0.5 mA	1.0 mA
Interface		RS-232C, RS-422A, RS-485 multi-drop (Max. number of connectable units: 31) (Max. total extension distance: 1.2 km 0.75 mile)	Conforms to RS-232C approved by EIA
Power rating	Power supply voltage	100 to 240 VAC (50/60 Hz)	24 VDC (+10%, -20%)
	Power consumption	40 VA (100 VAC), 50 VA (240 VAC)	
	Current consumption		250 mA max.
Weight		Approx. 615 g (including cable)	Approx. 80 g

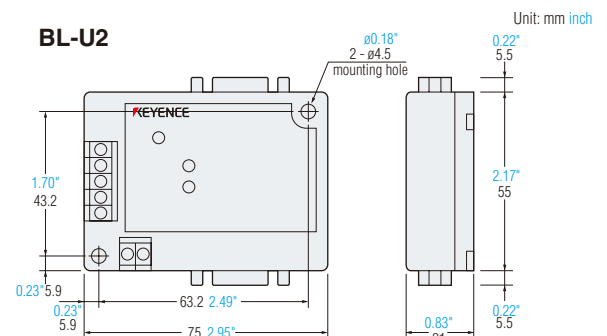
Model		N-42	N-48
Conversion interface		RS-232C ↔ RS-422A (Level conversion)	RS-232C ↔ RS-485 (Level conversion)
Connectable barcode reader		BL-700/600/180 Series	
Power supply for barcode reader		5 VDC ±5% (630 mA)	
Trigger input	Input rating	15 to 26 VDC, 10 mA max.	
	Max. OFF current	1.0 mA	
Interface		RS-422A (Max. total extension distance: 1.2 km 0.75 mile)	RS-485 (Max. number of connectable units: 31) (Max. total extension distance: 1.2 km 0.75 mile)
Power rating	Power supply voltage	24 VDC, +10%, -20%	
	Current consumption	260 mA max.	
Weight		Approx. 100 g	

### Dimensions

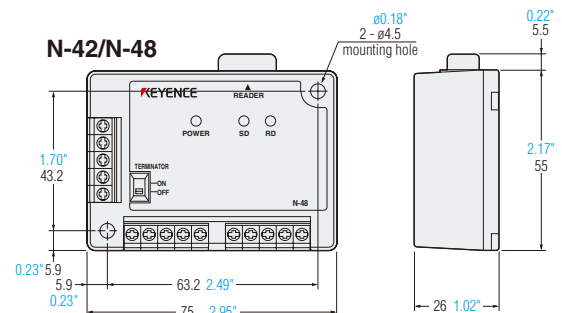
BL-U1SO (7176)<sup>\*1</sup>



BL-U2



N-42/N-48



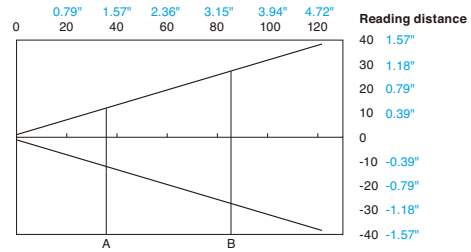
\*1 Available in U.S. only.

# Reading Range Characteristics & Dimensions

Unit: mm inch

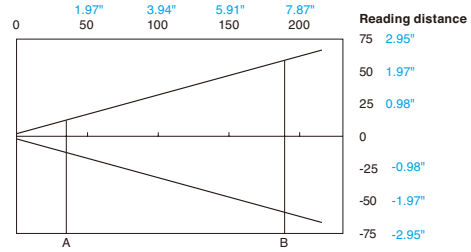
## SR-600

Code type		Cell size*	A	B
2D code	QR	0.127 0.005"	48 1.89"	74 2.91"
	QR	0.25 0.01"	36 1.42"	85 3.35"
	DataMatrix	0.127 0.005"	48 1.89"	71 2.80"
	DataMatrix	0.25 0.01"	38 1.50"	84 3.31"
Composition symbol		CC-A	31 1.22"	89 3.50"
Barcode	CODE39	0.127 0.005"	42 1.65"	76 2.99"
	CODE39	0.25 0.01"	30 1.18"	95 3.74"
	CODE128	0.25 0.01"	27 1.06"	96 3.78"
	GS1 DataBar	0.25 0.01"	37 1.46"	97 3.82"



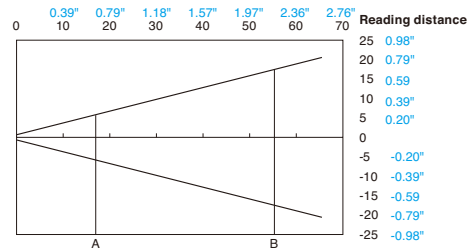
## SR-610

Code type		Cell size*	A	B
2D code	QR	0.25 0.01"	58 2.28"	135 5.32"
	QR	0.5 0.02"	35 1.38"	188 7.40"
	DataMatrix	0.25 0.01"	62 2.44"	135 5.32"
	DataMatrix	0.5 0.02"	40 1.57"	173 6.81"
Composition symbol		CC-A	51 2.00"	142 5.59"
Barcode	CODE39	0.25 0.01"	45 1.77"	158 6.22"
	CODE39	0.5 0.02"	44 1.73"	205 8.07"
	CODE128	0.25 0.01"	41 1.61"	154 6.06"
	GS1 DataBar	0.25 0.01"	48 1.89"	160 6.30"



## SR-600HA

Code type		Cell size*	A	B
2D code	QR	0.08 0.003"	28 1.10"	40 1.57"
	QR	0.127 0.005"	24 0.94"	45 1.77"
	QR	0.25 0.01"	17 0.67"	54 2.13"
	DataMatrix	0.08 0.003"	28 1.10"	39 1.54"
	DataMatrix	0.127 0.005"	24 0.94"	45 1.77"
	DataMatrix	0.25 0.01"	19 0.75"	51 2.01"



\* For barcode, narrow bar width.

## SR-600 (Close Range Type)

Reading Distance	27	38	60	84	97
View Size	Width 20.6 0.81"	27.9 1.10"	42.5 1.67"	58.4 2.30"	67.0 2.64"
	Height 13.1 0.52"	17.8 0.70"	27.1 1.07"	37.3 1.47"	42.8 1.69"

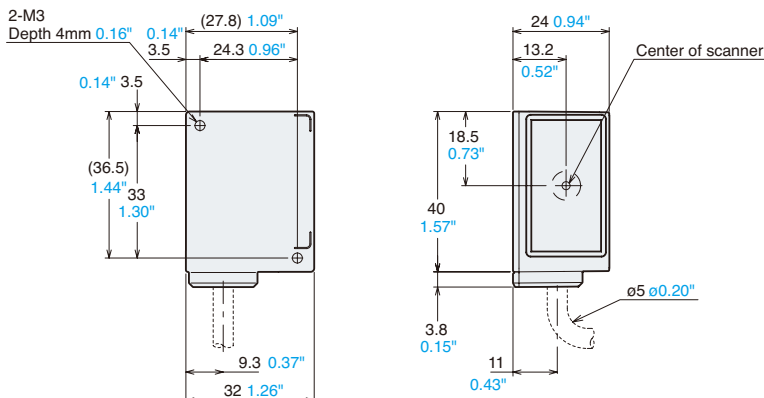
## SR-610 (Middle Range Type)

Reading Distance	35	62	100	154	205
View Size	Width 26.6 1.05"	44.8 1.76"	70.6 2.78"	107.1 4.22"	141.6 5.57"
	Height 17.0 0.67"	28.6 1.13"	45.0 1.77"	68.4 2.69"	90.4 3.56"

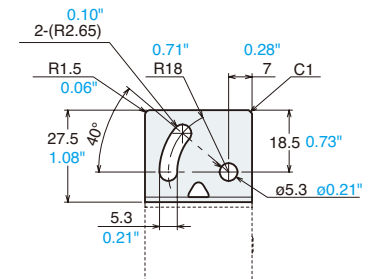
## SR-600HA (High Resolution Type)

Reading Distance	17	28	38	45	54
View Size	Width 13.2 0.52"	20.2 0.80"	26.6 1.05"	31.1 1.22"	36.9 1.45"
	Height 8.4 0.33"	12.9 0.51"	17.0 0.67"	19.8 0.78"	23.5 0.93"

## Main body SR-600/610/600HA



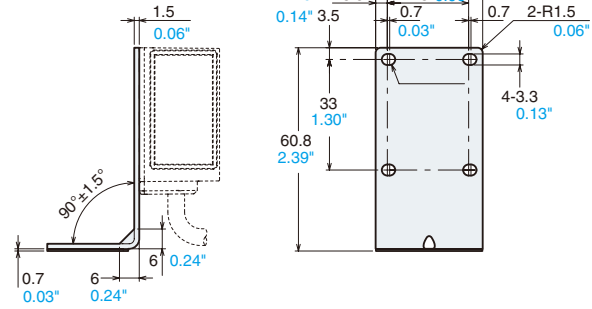
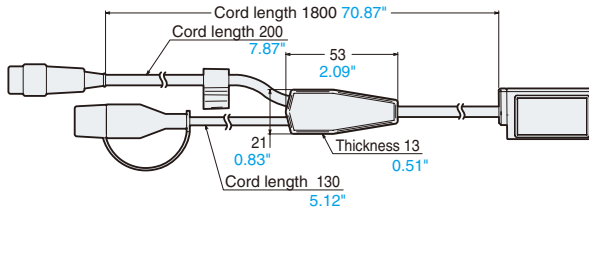
## Mounting bracket



# Dimensions

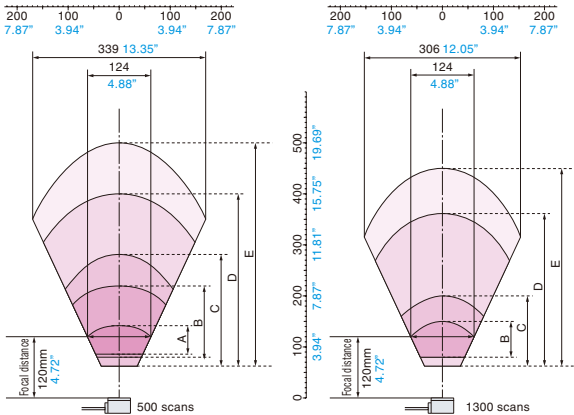
Unit: mm inch

## Head cable



## Reading Range Characteristics

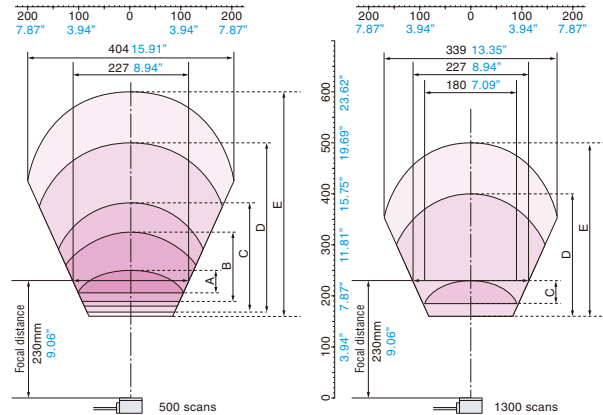
### BL-1300/1301 (standard type)



	Barcode type	Narrow bar width	Read distance (500 scans)	Read distance (1300 scans)
A	CODE39	0.125 0.005"	85 to 140 3.35" to 5.51"	—
B	CODE39	0.19 0.008"	80 to 220 3.15" to 8.66"	80 to 150 3.15" to 5.91"
C	CODE39	0.25 0.01"	65 to 280 2.56" to 11.02"	60 to 200 2.36" to 7.87"
D	CODE39	0.5 0.02"	65 to 400 2.56" to 15.75"	60 to 360 2.36" to 14.17"
E	CODE39	1.0 0.04"	65 to 500 2.56" to 19.69"	60 to 450 2.36" to 17.72"

Measurement conditions: Standard KEYENCE barcode (narrow/wide bar ratio of 1:2.5);  
Mounting conditions: 15° skew, 0° pitch, 0° tilt

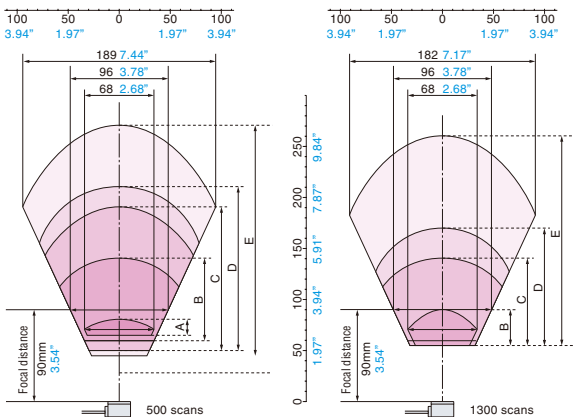
### BL-1370/1371 (long-distance type)



	Barcode type	Narrow bar width	Read distance (500 scans)	Read distance (1300 scans)
A	CODE39	0.15 0.006"	205 to 250 8.07" to 9.84"	—
B	CODE39	0.19 0.008"	190 to 330 7.48" to 12.99"	—
C	CODE39	0.25 0.01"	180 to 380 7.09" to 14.96"	180 to 230 7.48" to 9.06"
D	CODE39	0.5 0.02"	170 to 500 6.69" to 19.69"	160 to 400 6.30" to 15.75"
E	CODE39	1.0 0.04"	160 to 600 6.30" to 23.62"	160 to 500 6.30" to 19.69"

Measurement conditions: Standard KEYENCE barcode (narrow/wide bar ratio of 1:2.5);  
Mounting conditions: 15° skew, 0° pitch, 0° tilt

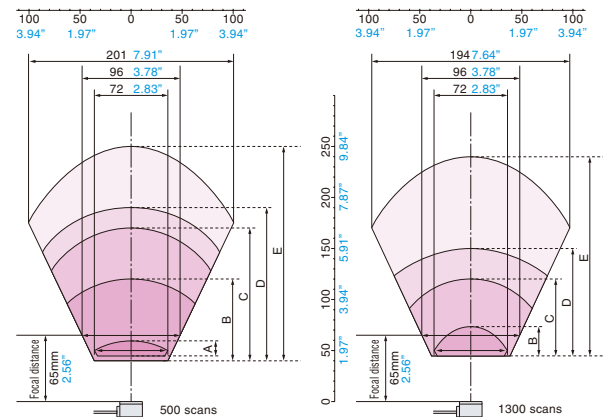
### BL-1300HA/1301HA (high-resolution front type)



	Barcode type	Narrow bar width	Read distance (500 scans)	Read distance (1300 scans)
A	CODE39	0.08 0.003"	65 to 80 2.56" to 3.15"	—
B	CODE39	0.125 0.005"	60 to 140 2.36" to 5.51"	55 to 90 2.17" to 3.54"
C	CODE39	0.19 0.008"	50 to 190 1.97" to 7.48"	55 to 140 2.17" to 5.51"
D	CODE39	0.25 0.01"	45 to 210 1.77" to 8.27"	55 to 170 2.17" to 6.69"
E	CODE39	0.5 0.02"	45 to 270 1.77" to 10.63"	55 to 260 2.17" to 10.24"

Measurement conditions: Standard KEYENCE barcode (narrow/wide bar ratio of 1:2.5);  
Mounting conditions: 15° skew, 0° pitch, 0° tilt

### BL-1350HA/1351HA (high-resolution side type)



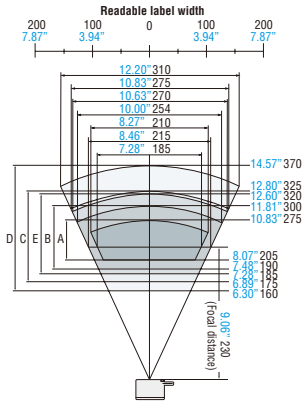
	Barcode type	Narrow bar width	Read distance (500 scans)	Read distance (1300 scans)
A	CODE39	0.08 0.003"	45 to 60 1.77" to 2.36"	—
B	CODE39	0.125 0.005"	40 to 120 1.57" to 4.72"	45 to 75 1.77" to 2.95"
C	CODE39	0.19 0.008"	40 to 170 1.57" to 6.69"	45 to 120 1.77" to 4.72"
D	CODE39	0.25 0.01"	40 to 190 1.57" to 7.48"	45 to 150 1.77" to 5.91"
E	CODE39	0.5 0.02"	40 to 250 1.57" to 9.84"	45 to 240 1.77" to 9.45"

Measurement conditions: Standard KEYENCE barcode (narrow/wide bar ratio of 1:2.5);  
Mounting conditions: 15° skew, 0° pitch, 0° tilt

# Reading Range Characteristics

Unit: mm inch

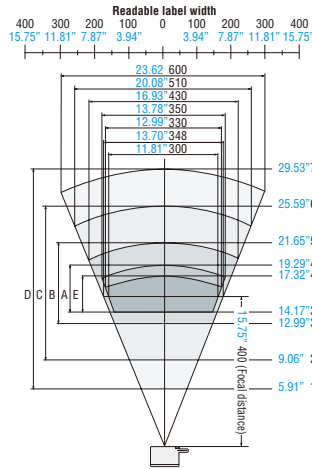
**BL-700/701**



Narrow bar width	
A	0.006" 0.15 mm
B	0.008" 0.19 mm
C	0.01" 0.25 mm
D	0.02" 0.5 mm
E	1 (EAN)

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 0°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

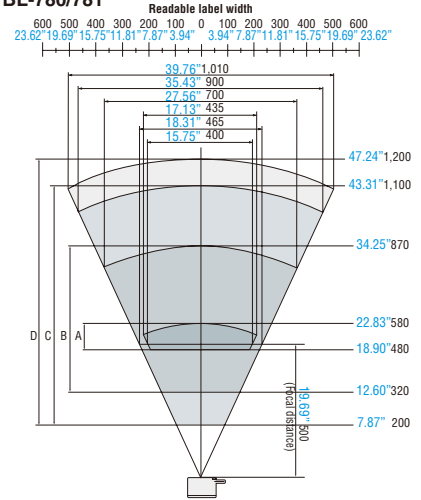
**BL-740/741**



Narrow bar width	
A	0.01" 0.25 mm
B	0.013" 0.32 mm
C	0.02" 0.5 mm
D	0.04" 1 mm
E	1 (EAN)

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 0°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

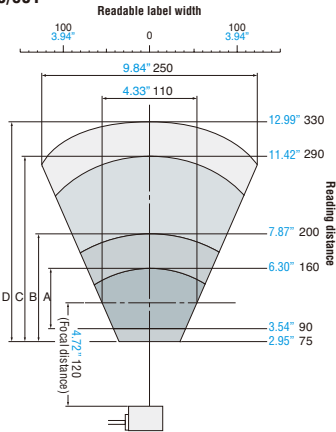
**BL-780/781**



Narrow bar width	
A	0.013" 0.32 mm
B	0.02" 0.5 mm
C	0.04" 1.0 mm
D	0.08" 2.0 mm

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 0°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

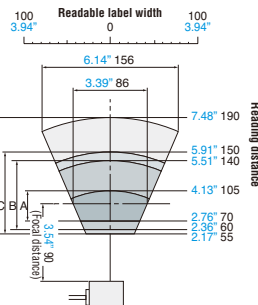
**BL-600/601**



Narrow bar width	
A	0.008" 0.19 mm
B	0.01" 0.25 mm
C	0.02" 0.5 mm
D	0.04" 1.0 mm

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 15°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

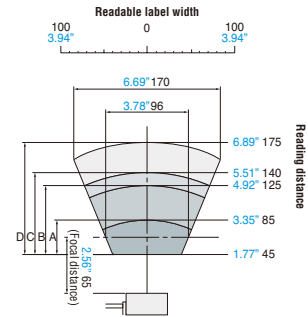
**BL-600HA/601HA**



Narrow bar width	
A	0.005" 0.125 mm
B	0.008" 0.19 mm
C	0.01" 0.25 mm
D	0.02" 0.5 mm

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 15°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

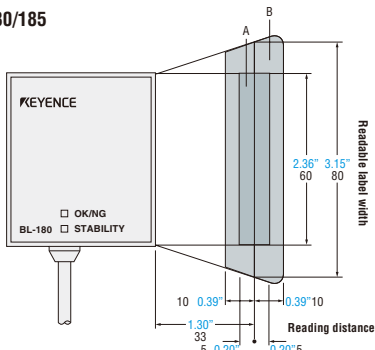
**BL-650HA/651HA**



Narrow bar width	
A	0.005" 0.125 mm
B	0.008" 0.19 mm
C	0.01" 0.25 mm
D	0.02" 0.5 mm

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: 0°
  - Pitch: 0°
  - Tilt: 0°
  - Ratio 1:2.5
  - Including the margins

**BL-180/185**



Narrow bar width	
A	Less than 0.008" 0.19
B	0.008" 0.19 Min.

- (Measuring conditions)
- The KEYENCE standard barcode is used.
  - Skew: -10°
  - Pitch: 0°
  - Tilt: 0°

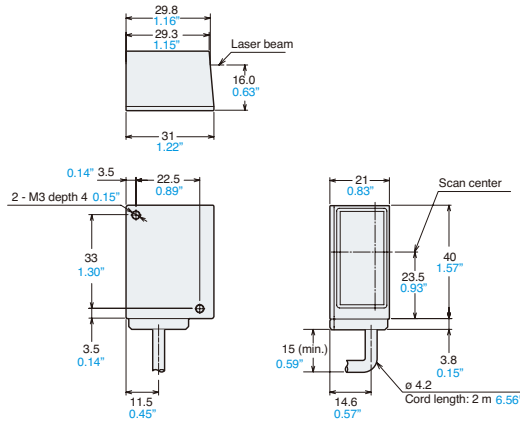


# Dimensions

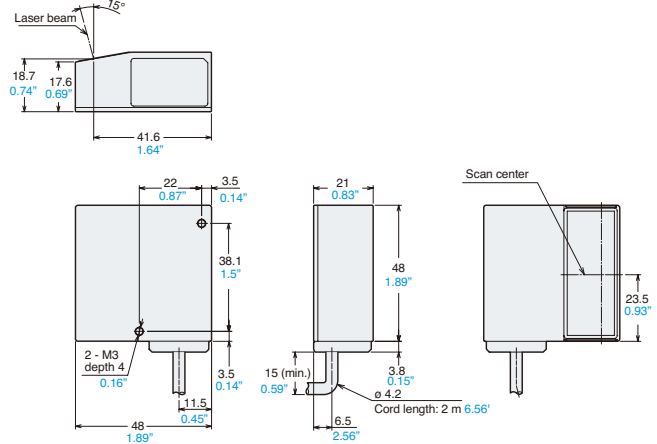
Unit: mm inch

## Body

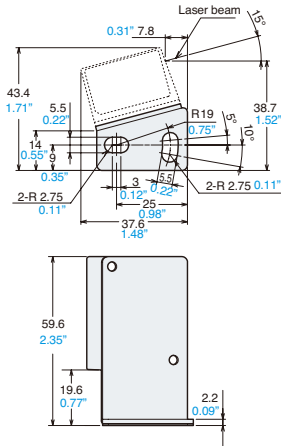
BL-1300/1301/1300HA/1301HA/1370/1371 (front type)



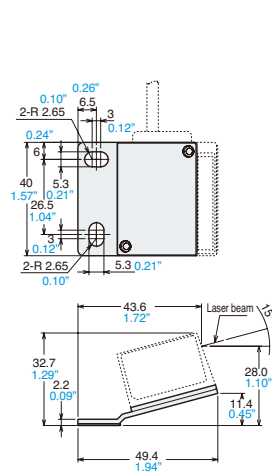
BL-1350HA/1351HA (side type)



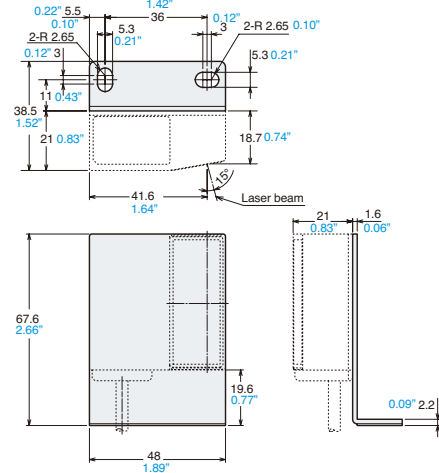
Mounting A (front type)



Mounting B (front type)

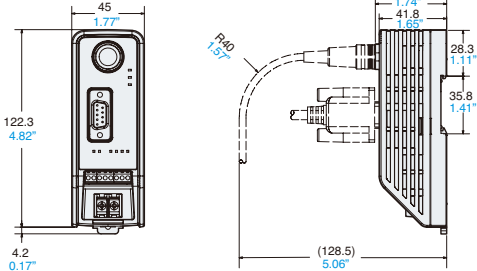


Mounting (side type)

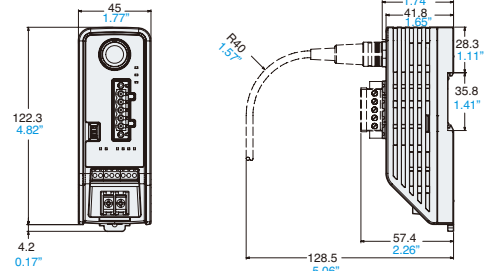


## Power unit

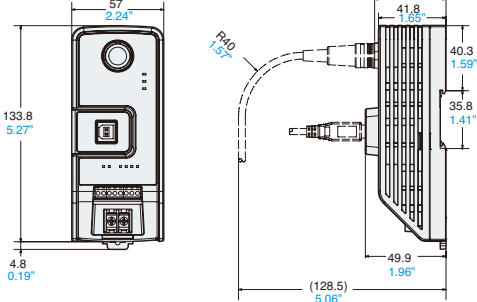
N-R2



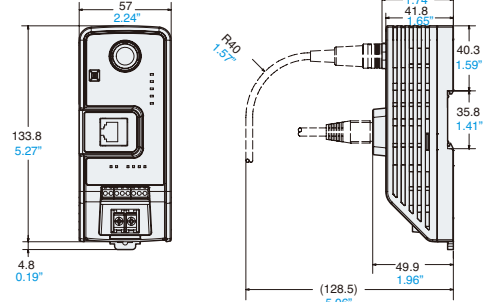
N-R4



N-UB



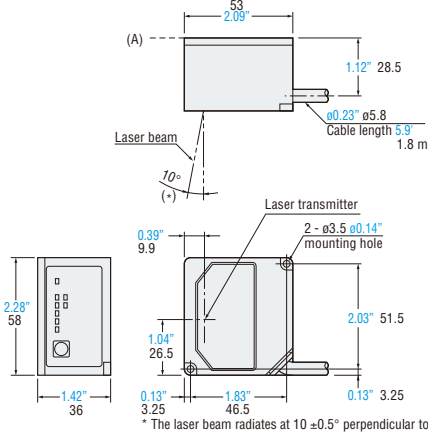
N-L1



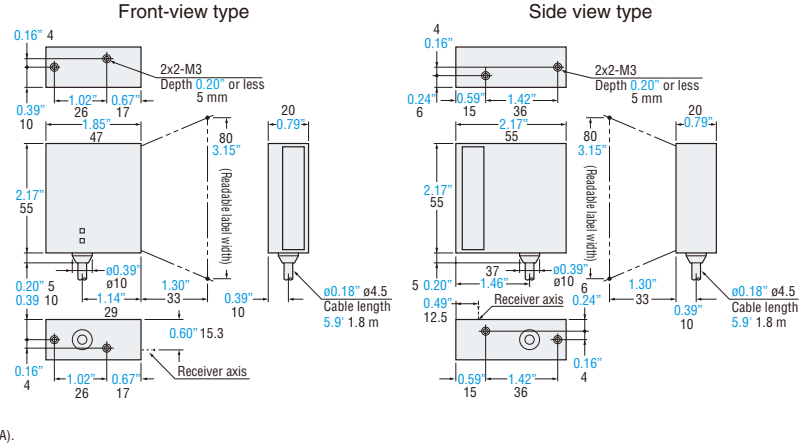
# Dimensions

Unit: mm inch

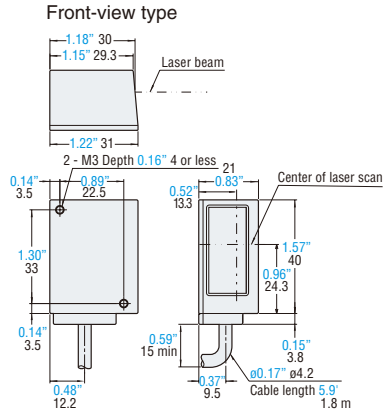
## BL-700 Series



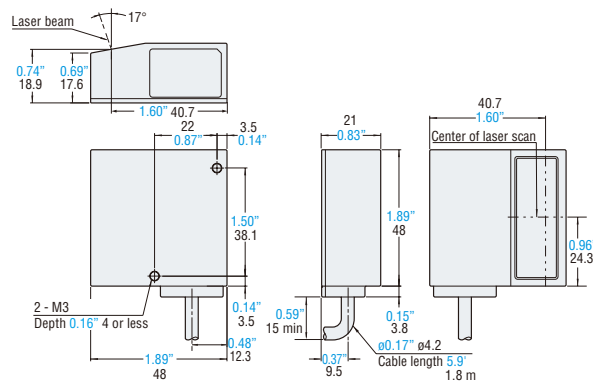
## BL-180 Series



## BL-600 Series



## Side view type



## Laser labels

### BL-1300 Series

BL-1300 Series complies with FDA performance standards for laser products except for deviations pursuant to laser Notice No.50.

### Warning label

#### BL-1300 Series



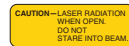
### BL-600 Series

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

### Protective housing label

#### FDA

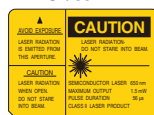


### Warning labels

#### BL-600/601/

600HA/  
601HA

#### FDA Class II



#### IEC Class 2



BL-650HA/  
651HA

#### FDA Class II



#### IEC Class 2



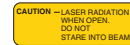
### BL-700 Series

The BL-700 Series conforms to FDA and IEC standards as follows:

Model	BL-700/701/740/741/780/781
FDA	Class II
IEC	Class 2

### Protective housing label

#### FDA



### Warning labels

#### BL-700/701

#### FDA Class II



#### IEC Class 2



#### BL-740/741

#### FDA Class II



#### IEC Class 2



#### BL-780/781

#### FDA Class II



#### IEC Class 2



# Barcode Samples

NB= Narrow bar width  
WB= Wide bar width  
\* The barcodes given below do not show the barcode reader performance criteria.

## CODE39



## UPC/EAN



## CODE128



## ITF



## 2D CODE





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**SAFETY INFORMATION**

Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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