

Panasonic

NEW

DPM

2D Code Reader

LP-ABR10 SERIES

CE
Conforming to
EMC Directive

CE
Certified

Stable Reading Performance
by Ultimate Lighting System

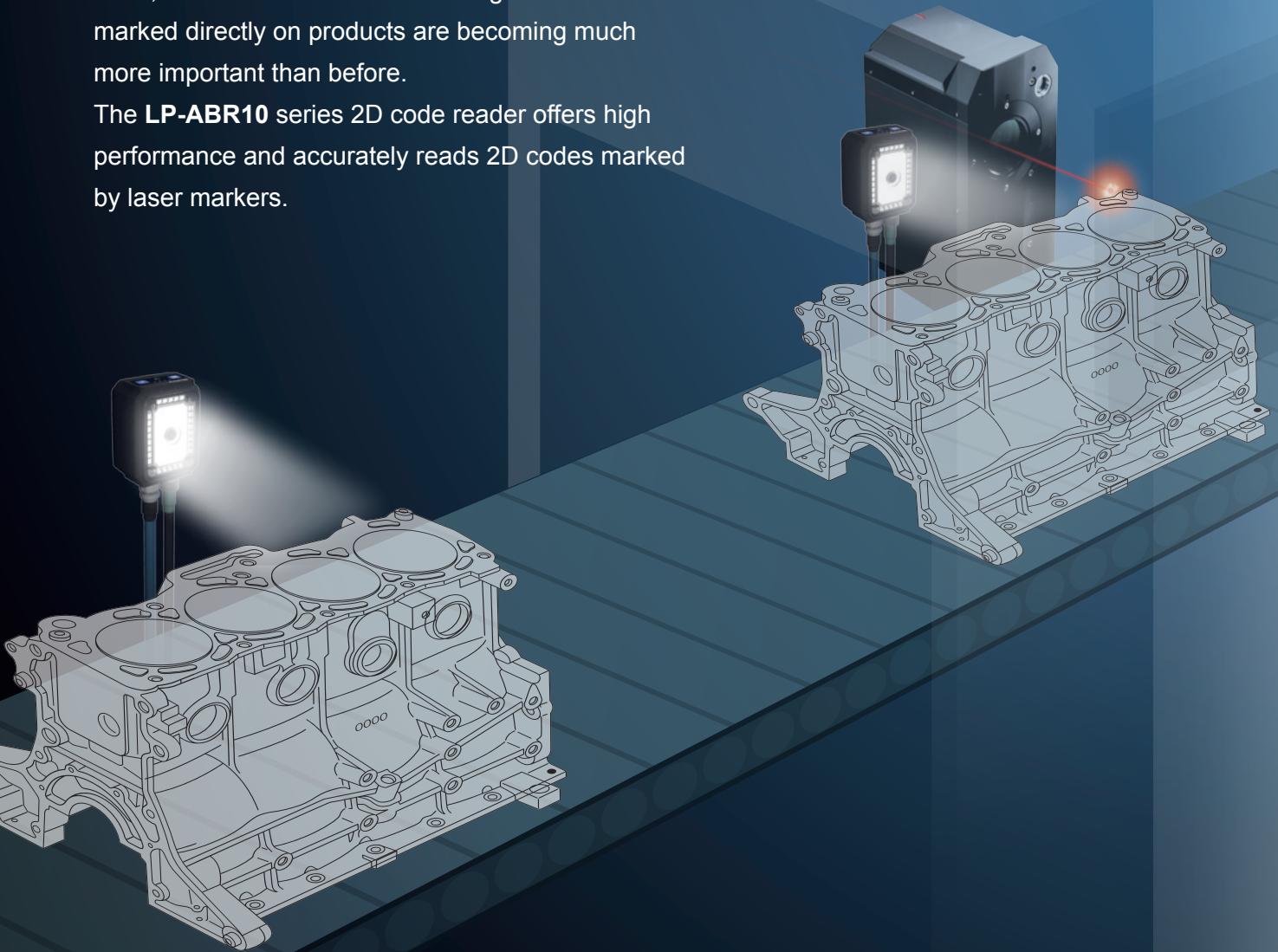


DPM

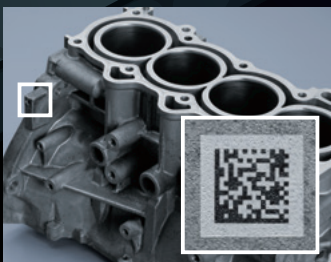
2D Code Reader

DPM (Direct Part Marking) is widely used for production management and quality control. Thus, code readers used for reading 2D codes marked directly on products are becoming much more important than before.

The **LP-ABR10** series 2D code reader offers high performance and accurately reads 2D codes marked by laser markers.



■ Examples of DPM codes



Engine block



Camshaft



Connecting rod



Piston ring

Stable Reading Performance Backed by Advanced Features

Code readers used in production lines are required to stably read 2D codes marked on parts of diverse shapes and with various surface conditions.

The **LP-ABR10** series code reader is equipped with three advanced features that dramatically improve reading accuracy and ensure stable reading of 2D codes.



Lighting

► *Page 4*

High-brightness LED & lighting variations



High Resolution

► *Page 5*

1.2-Megapixel image sensor



Image Processing

► *Page 5*

Proprietary algorithm for DPM

DPM 2D Code Reader

LP-ABR10 SERIES

Three Advanced Features



Lighting

Lighting variations allow selection of optimal lighting condition.

DPM is a process used to directly mark parts with product information. The DPM process adds codes directly on parts made of metals, resins or other materials. Unlike codes printed on paper or labels, DPM codes can be affected by the part shape and surface condition. Thus, the ordinary lighting system of a code reader may not be able to read DPM codes properly in some cases. The **LP-ABR10** series code reader is built in with a diffused lighting block (center block) and four direct lighting blocks (top, bottom, left and right blocks). Each of these lighting blocks can be independently turned on/off, and the brightness can be adjusted in 100 steps. By setting an optimal lighting condition, the **LP-ABR10** series code reader reads DPM codes accurately.



High-brightness white color LED

All blocks ON
(Direct lighting + Diffused lighting)

Two blocks ON
(Direct lighting)

One block ON
(Direct lighting)

One block ON
(Diffused lighting)

Suitable for reading from a distance

Suitable for cylindrical workpieces

Suitable for workpieces with a step

Suitable for clear workpieces

Accurately Reads DPM Codes on Workpieces of Various Types

Problems with ordinary lighting

Insufficient light intensity (too dark)

Glare due to regular reflection

Shadow of workpiece

Reflection of light sources



High Resolution

1.2-megapixel image sensor captures clear image.

The LP-ABR10 series code reader is equipped with a high-resolution, 1.2-megapixel CMOS image sensor. It is capable of reading a small cell-size code that is difficult to be read by an ordinary 0.3-megapixel image sensor and a 2D code on a workpiece that generates a lot of noise in code reading.

The large number of pixels ensures acquisition of clear and detailed image!



Image Processing

Proprietary algorithm maintains stable reading.

Since DPM codes are directly marked on parts, they can result in the generation of a large amount of noise due to surface irregularities or insufficient contrast against the background. This makes it difficult for an ordinary code reader to read the codes accurately. Codes can also become scratched or covered with oil, and they may be exposed to harsh conditions such as washing and chemical treatment. The LP-ABR10 series code reader is provided with a proprietary code reading algorithm developed exclusively for DPM codes. This enables the LP-ABR10 series code reader to read codes that are difficult for an ordinary code reader to read and ensures stable reading. This contributes to the improvement of production management and traceability of various products.



Proprietary image processing algorithm



Stable reading

Whether the code is readable or not is indicated by the color for easy, at-a-glance confirmation.



Versatile Functions Useful on the Production Floor

2D Code Marking Quality Verification Function

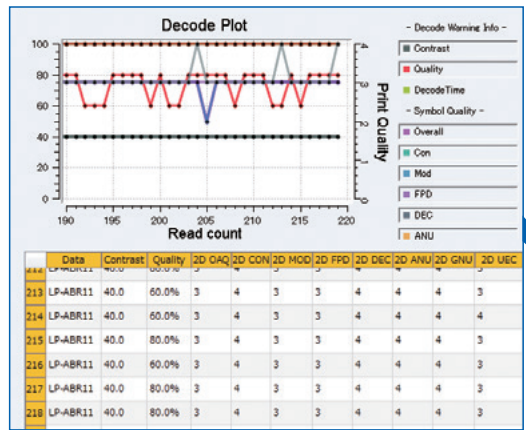
The **LP-ABR10** series code reader supports 2D code marking quality verification in compliance with ISO/IEC 15415 and AIM DPM-1-2006. This enables management of 2D code marking quality using quality items in compliance with the international standards. Management of changes in the 2D code marking quality is useful for preventive maintenance of production lines.

Overall score: 4.0

■ Verification items

4: CON (Contrast)	4: ANU (Axial Non-Uniformity)
4: MOD (Modulation)	4: GNU (Grid Non-Uniformity)
4: FPD (Fixed Pattern Damage)	4: UEC (Unused Error Correction)
4: DEC (Decode)	

* The overall score can be added to the reading result data. It is also possible to select only necessary items from seven verification items and output the overall score.

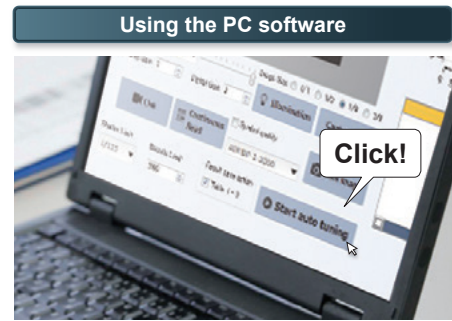


Verification results include a graph and numerical data for easy understanding.



Auto Teaching Function

The auto teaching function automatically sets the most suitable 2D code reading condition. This function allows easy and convenient setting of optimal reading condition for various types of parts.



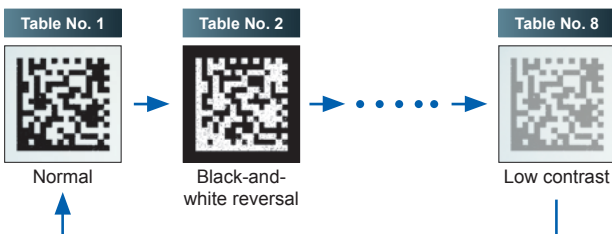
Auto teaching function for easy setting of reading condition for various types of parts

Aluminum	Copper	Cast metal	Substrate	Resin	Glass	Ceramic	Rubber

Table Function

The code reader unit can be registered with up to eight sets of conditions. Even when 2D codes with different marking quality levels must be read, the setting automatically changes to an appropriate registered setting. This helps reduce the production line from stopping due to a read error.

When the code cannot be read, the code reader automatically changes the Table No. in use.



Data Check Function (Preset Mode)

With this function enabled, the code reader compares the 2D code to read with preregistered data and reads it only when the 2D code matches the preset condition. The function has two types of setting, "Perfect match" and "Partial match." This function helps prevent defect products from mixing with good products.

When set to "Perfect match"	ABC123	ABCD	BBC189
ABC123	Match	Unmatch	Unmatch
Registered data	ABC123	ABCD	BBC189
When set to "Partial match" (Comparison of 2 to 4 characters)	ABC123	ABCD	BBC189
ABC123	Match	Unmatch	Match

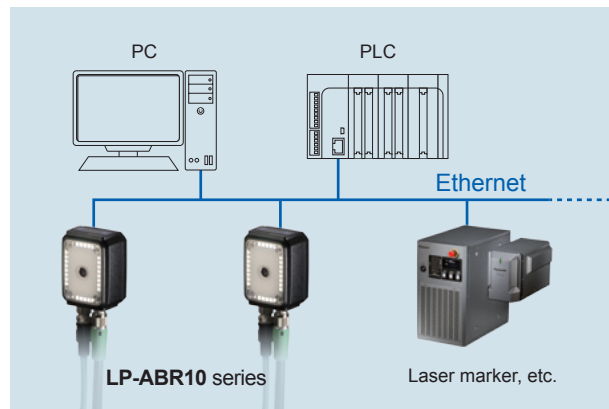
IP65 Rating

The code reader boasts an IP65 rating (IEC), and prevents entry of dust particles and resists the effect of water droplets.



Ethernet Compatibility

The Ethernet compatibility enables the transmission of not only the read data but also images and quality verification data. The LP-ABR10 series code reader is also equipped with a PLC link function for easy configuration of a network.



SPECIFICATIONS

Specifications of 2D code reader unit

Type		Standard type	Long-distance type
Item	Model No.	LP-ABR11	LP-ABR12
Image sensor		1/3 inches CMOS monochrome	
Effective pixels		1,280 × 960 (1.2 million pixels approx.)	
Internal illumination source		White LED	
Reading angle		PITCH: ±35°, SKEW: ±35°, TILT: 360°	
Supply voltage		24 V DC ±10 %	
Power consumption		Command (SYNC) standby: 140 mA approx., During reading operation: 400 mA approx.	
Interface	Ethernet	10Base-T, 100Base-T, 1000Base-T	
	RS-232C	1200 bps to 115.2 kbps	
Digital input		Photo-coupler isolation × 1 (Input resistance: 1 kΩ, OFF voltage: 0 to 0.8 V, ON voltage: 6 to 28 V)	
Digital output		Photo-coupler isolation × 4 (Maximum rating: 30 V DC, 50 mA)	
Environmental resistance	Protection	IP65 (IEC)	
	Ambient temperature	0 to +40 °C +32 to +104 °F , Storage: -20 to +65 °C -4 to +149 °F	
	Ambient humidity	35 to 85 % RH (No dew condensation allowed), Storage: 35 to 85 % RH (No dew condensation allowed)	
Vibration resistance		10 to 55 Hz amplitude 1.5 mm 0.059 in (total width) in X, Y, Z directions for two hours each	
Weight		Net weight: 200 g approx.	

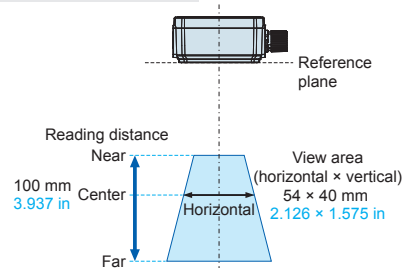
Specifications of read function

Type		Standard type	Long-distance type
Item	Model No.	LP-ABR11	LP-ABR12
Supported symbols (2D)		Data Matrix (ECC200), QR Code	
Minimum resolution		0.167 mm 0.007 in	
Read center distance		100 mm 3.937 in	200 mm 7.874 in
View area (horizontal × vertical)		54 × 40 mm 2.126 × 1.575 in (at read center distance)	44 × 33 mm 1.732 × 1.299 in (at read center distance)
Reading distance (typical)		<Data Matrix (ECC200)> • For cell size of 0.167 mm 0.007 in : 85 to 125 mm 3.346 to 4.921 in • For cell size of 0.25 mm 0.010 in : 70 to 150 mm 2.756 to 5.906 in <QR Code> • For cell size of 0.167 mm 0.007 in : 190 to 215 mm 7.48 to 8.465 in • For cell size of 0.25 mm 0.010 in : 180 to 225 mm 7.087 to 8.858 in	

* Cell size of 0.25 mm **0.010 in** or larger is recommended (horizontal direction) when the 2D code print quality verification function is used.

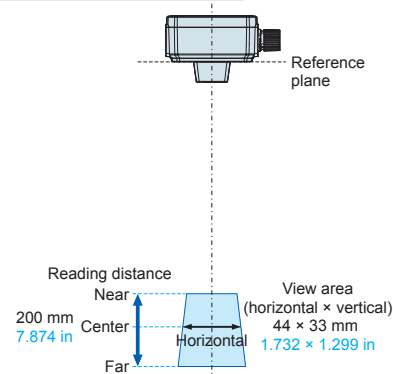
Reading distance – View area (typical)

Standard type LP-ABR11



Supported symbols (2D)		Data Matrix (ECC200), QR Code	
Cell size		0.167 0.007	0.25 0.010
Near	Reading distance	85 3.346	70 2.756
	View area (horizontal × vertical)	46 × 34 1.811 × 1.339	38 × 29 1.496 × 1.142
Center	Reading distance	100 3.937	
	View area (horizontal × vertical)	54 × 40 2.126 × 1.575	
Far	Reading distance	125 4.921	150 5.906
	View area (horizontal × vertical)	66 × 50 2.598 × 1.969	79 × 60 3.11 × 2.362

Long-distance type LP-ABR12



Supported symbols (2D)		Data Matrix (ECC200)		QR Code	
Cell size		0.167 0.007	0.25 0.010	0.167 0.007	0.25 0.010
Near	Reading distance	185 7.283	175 6.890	190 7.480	180 7.087
	View area (horizontal × vertical)	40 × 30 1.575 × 1.181	38 × 28 1.496 × 1.102	42 × 31 1.654 × 1.220	39 × 29 1.535 × 1.142
Center	Reading distance	200 7.874		200 7.874	
	View area (horizontal × vertical)	44 × 33 1.732 × 1.299		44 × 33 1.732 × 1.299	
Far	Reading distance	220 8.661	230 9.055	215 8.465	225 8.858
	View area (horizontal × vertical)	49 × 37 1.929 × 1.457	51 × 38 2.008 × 1.496	48 × 36 1.890 × 1.417	50 × 37 1.969 × 1.457

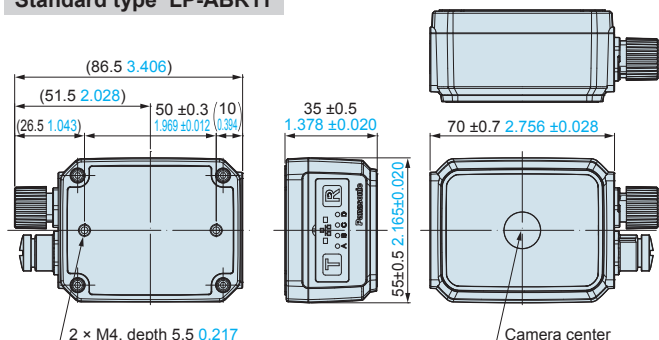
LP-ABR10

DIMENSIONS (Unit: mm in)

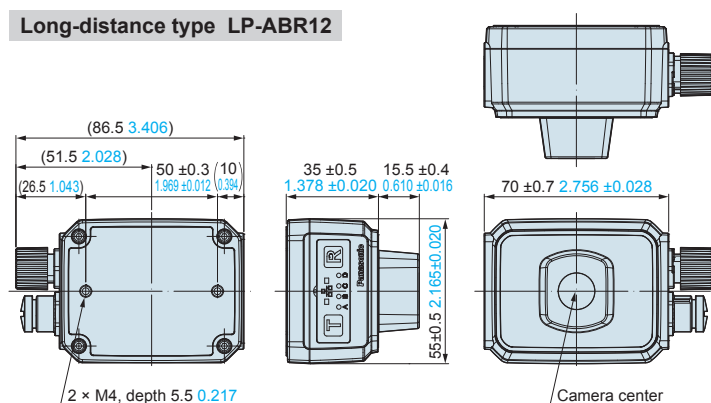
The CAD data can be downloaded from our website.

2D code reader

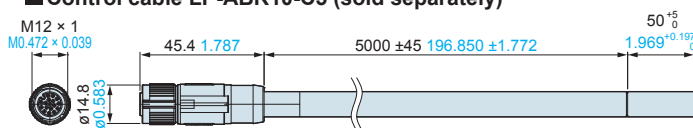
Standard type LP-ABR11



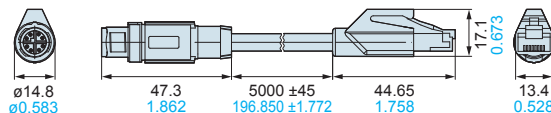
Long-distance type LP-ABR12



Control cable LP-ABR10-C5 (sold separately)



LAN cable LP-ABR10-L5 (sold separately)



Disclaimer

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