Panasonic ideas for life

2D CODE READING SENSOR

PD60/65



2D Code Reading Sensor PD60/PD65 ARCT1B270E '06.7

New

Image detection capability improved by image correction using our new pre-processing functions and original decoding functions.

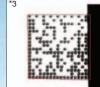
In manufacturing environments, 2D codes are used to record and store various kinds of data, using direct marking, as a method for product quality improvement and as a response to quality-related problems.

Panasonic has produced the PD60/PD65 to realize high accuracy in the highly problematic reading of the direct marking of 2D codes on metal parts.



Main Characteristics

- 1. Realization of highly accurate reading using original algorithm
- 2. Industry's first*1 oil-resistant construction (IP67G*2), ensuring maintainability
- 3. 2 types of image storage functions (write to main unit memory, export from USB port)
- 4. Simple setup of even high-level functions using powerful software tool "PDTOOL" PDTOOL can be downloaded free of charge from our Web site (www.nais-e.com/vision/).







2D CODE READING SENSOR

[Stationary Type]

Field of View	110mm: 12×10mm		
	200mm: 25×20mm		
Integrated Light	White LED		
Light Configuration	4 Control Sections		
Protection Construction	IP67G *2		
Read Method	Triggered by I/O		
Pre-processing	FPGA Pre-processing + Software Pre-processing		
-			

2D CODE READING SENSOR

[Handy Type]

Field of View	25×20mm
Integrated Light	White LED
Light Configuration	Dual Side Lighting/Diffuse Lighting
Protection Construction	IP67G * ²
Read Method	Triggered by button push
Pre-processing	FPGA Pre-processing + Software Pre-processing

^{*1} As of 25 May 2006 (as surveyed by Panasonic)

^{*2} Fulfils IP67G only when USB connector cap is fitted.

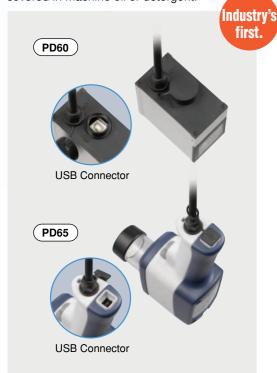
^{*3} Reads when Special Read is carried out. However, there are conditions under which reading is not possible.

PD60



Oil-resistant construction (IP67G*2) allows for peaceof-mind even in oily conditions.

Out of consideration for actual usage environments, we have created the industry's first oil-resistant construction (IP67G*2) to allow peace-of-mind when using even with gloves covered in machine oil or detergent.



200mm Long Range.

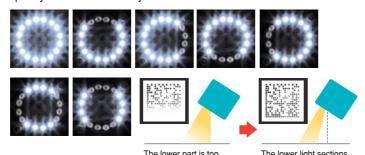
A 200mm long range lens (ANPD060-25) is fitted out of consideration for the attachment locations possible with industrial equipment.

➤ 200mm



Control of lighting sections.

Allows for stable reading regardless of variations in background, reflective properties and material quality of the marked object.



The lower part is too bright so uniformity is not possible and the image is not stable. The lower light sections are turned off, the brightness becomes uniform and a stable reading can be taken.

PD65

Control of Lighting Possible

Dual lighting

Reading under the optimum lighting conditions is made possible by the automatic light switching function, which switches between 2 lighting patterns to allow greater improvement of the accuracy of reading of direct marking.





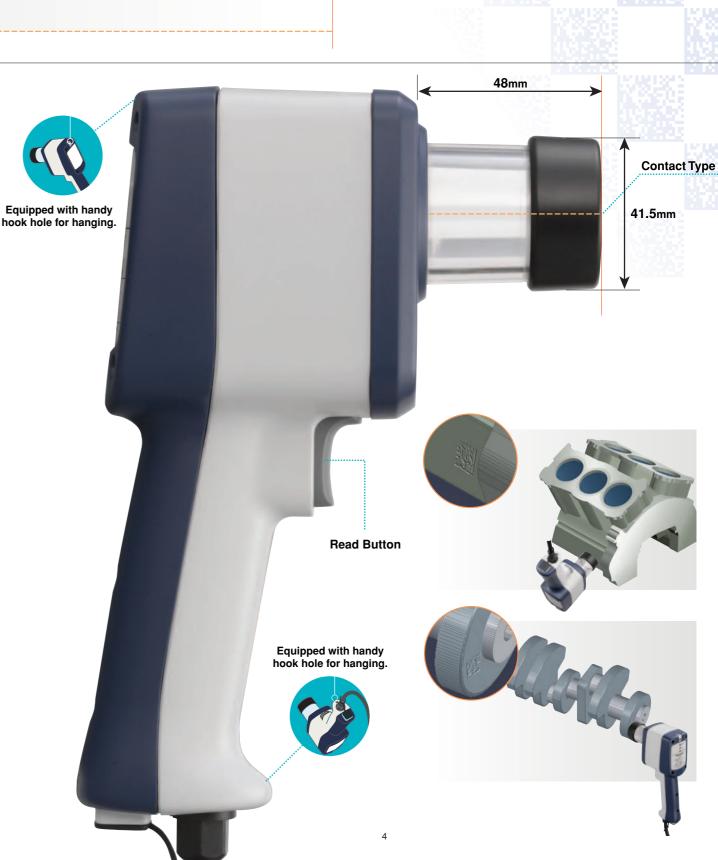
Diffused Lighting

Double Signal Notification

Whether reading is possible or not can be confirmed visually during operation. **Ready to Read** Green Light + Buzzer

Read Not Possible
Orange Light



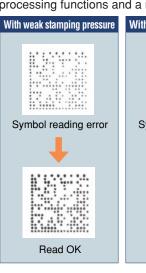


Panasonic PD60 ALARM READY OUT 1

Improved Reading Accuracy

Development of original algorithm with image processing technology cultivated over 20 years by MEW.

We have greatly improved the accuracy of reading direct marking on metal, which is highly problematic for automatic reading, and greatly improved the image detection abilities with image correction using our new preprocessing functions and a new library.



With a coating of detergent Symbol reading error Read OK

Real-time Image Storage.

Realization of traceability. Images with read errors (or all images) can be stored in the main unit.

In addition, using the free utility tool PDTOOL, images can be transferred to a PC and stored in specified folders in real time.

Construction with Emphasis on Maintenance

Just in case some problem occurs with the product, the controller part and cable part are connected with an oil-resistant connector, allowing the controller part to be replaced immediately. This practical construction eliminates the need for troublesome cable tracing and re-laying and allows priority to be given to restoring the work environment.

Advanced Oil-Resistant Construction (IP67G*2)

With its oil-resistant capabilities, an industry first for a 2D code reader, the unit can be used with peace-of-mind even in automobile parts manufacturing environments (with engines, transmissions, etc.) in which machine oil and detergents are used.

Dedicated Software Tool "PDTOOL" for Easy Setup

The software tool "PDTOOL" has been enhanced to allow settings to be made easily even with the more advanced functions. PDTOOL can be downloaded free-of-charge from our Web site



Further Improvement of Decoding Capabilities with Pre-Processing Functions

In pre-processing, various original algorithms are applied to images of difficult-to-read 2D codes to improve their readability.

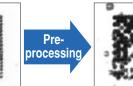
Detergent is caught in the

Read OK

code, making donuts shapes.

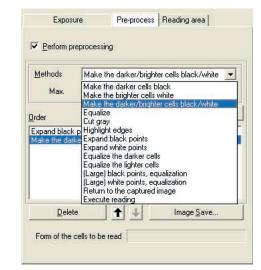
In the past, read accuracy was improved for stamp errors (stained, chipped, tilted, flipped or black/white reversed codes) on hard-to-read metal surfaces.



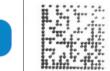




The stamp is restored by correcting the image.



14 types of pre-processing are available. Settings are made by simply selecting from a pull-down menu.



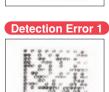
Improvement of

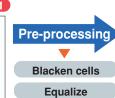
Read Accuracy due

No detergent

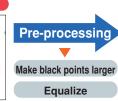
With detergent

to Pre-processing.





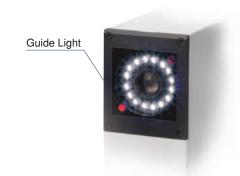






Guide light red LED enables easy fitting and installation

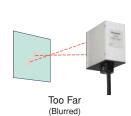
Two red-LED guide lights allow quick installation of the unit in the optimum position.







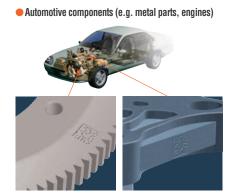
Too Close



Suitable Distance and Position

Application

Supports 2D codes indicated on a great variety of applications













(Printing type (Direct printing))

Laser marking Glass boards, wafers, printed circuit boards, etc. Stamping

Metal parts, engines, etc.

Ink jet printing

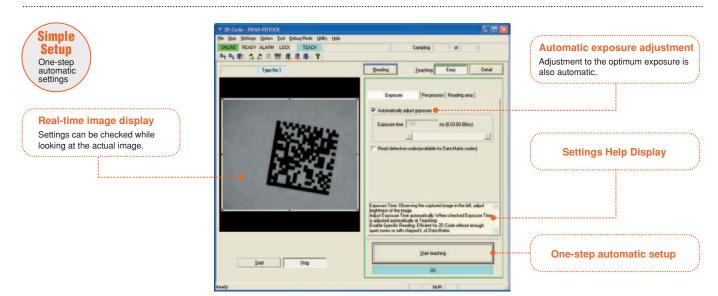
Automotive components, packages, paper, cardboards, printed circuit boards, etc.

Simple setup using the free software "PDTOOL".

PDTOOL provides the customer with 4 convenient functions

The latest version of PDTOOL, the setup software tool which aims at ease of use with multiple functions, is available for download from the Web.

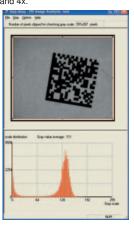




Screen Resolution Brightness distribution graph display

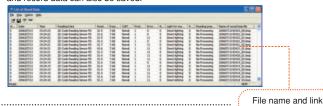
Free selection of part of image to be analyzed.

Image display can be zoomed to 2x and 4x.





Record data is displayed as reading is carried out and read-in images and record data can also be saved.



Settings Support

Examine mode

Images undergoing read retry processing and read results can be saved on a PC.

Debug Mode

Image data saved in PDTOOL can be downloaded to the PD60 and settings made or read executed on the downloaded image, without having to acquire an image of a 2D code.



to saved images.

PDTOOL can be downloaded free of charge from our Web site

www.nais-e.com/vision/

Interface

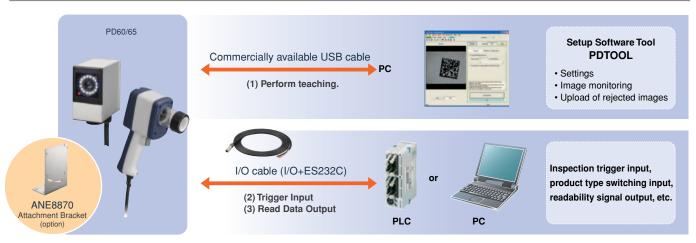


Table of Order Numbers

Name		Part No.	Content	
2D code reading		ANPD060-12	Field of view: 12×10mm Installation distance: 110±5.5mm	
sensor	PD60	ANPD060-25	Field of view: 25×20mm Installation distance: 200±10mm	
		ANPD060S25	Field of view: 25×20mm Installation distance: 105±5mm	
PD65		ANPD065-25	Field of view: 25×20mm (In 24.5 mm diameter guide pipe.)	
Attachment B	Attachment Bracket		For mounting PD60	
PDT00L	PDT00L		Setup Software Tool Note: free download from our Web site	
Extension Cable		ANPD068-03	3m	
		ANPD068-05	5m	
		ANPD068-10	10m	
Options (repair parts)		ANPD068-P1	Set with PD60 front panel, packing, and stop screws.	
		ANPD068-G1	Set with PD65 guide pipe, packing, and stop screws.	
		ANPD068-K1	2700 mm power supply I/O cable for PD 60.	

General Specifications

General Specifications

Item	Specification		
	PD60	PD65	
Rated operating voltage	24 V DC		
Operating voltage range	21.6 to 26.4 V DC	(including ripples)	
Rated current consumption	0.5 A	max.	
Ambient temperature in use	0 to +	-40°C	
Storage ambient temperature	−20 to +60°C (no free	zing or condensation)	
Ambient humidity in use	35 to 85%RH (at 25°C no	freezing or condensation)	
Storage ambient humidity	35 to 85%RH (at 25°C no freezing or condensation)		
Noise immunity	1000 V pulse width 50 ns/1 μs (using noise simulator method)		
Vibration resistance	10 to 55 Hz, 1 sweep/min. Double amplitude of 1.5 mm. 30 min. each in X, Y and Z directions		
Shock resistance	196 m/s ² , 5 times each in X, Y and Z directions		
Insulation resistance (initial)	Min. 100MΩ (with a 500 VDC isolation resistance tester) Note 1: Parallel input/parallel output, parallel input/power, parallel input/functional earth, parallel output/power, parallel output/functional earth, power/functional earth.		
Breakdown voltage (initial)	500V AC/1 minute (600V AC/1 second) Cut-off current 10mA Note 1: Parallel input/parallel output, parallel input/power, parallel input/functional earth, parallel output/power, parallel output/functional earth, power/functional earth.		
Protective Construction	IP67G Note 2:		
Mass Note 3:	Approx: 500 g		

- Note *1 Evaluation was carried out with the primary side power supply varistor and capacitor removed from the internal circuit of the device.

 Note *2 Evaluation was carried out with the USB cable not connected and the waterproof cap
- in place. Note $^{\star}3$ Weight includes power supply I/O cable.



Function Specifications

Main Unit

Item		Specification		
		PD60	PD65	
Туре		Stationary Type	Handy Type	
Light Configuration		4 Control Sections Dual Side/Diffused Lighting		
Read Method		External Start, Auto start Trigger button		
lmage c	apture element	Black/white C-MOS		
Valid pi	xels	352 horizontal × 288 verti	cal pixels (100,000 pixels)	
lmage c	apture light source	ce White LED		
Expected life		Expected Life: Min. 30000 hours (until light intensity falls to 50%) (at 25°C, internal trigger: ON, read time: 60ms, exposure time: 3ms)		
	Exposure time	Shutter timing and interlock (0.03 to 50 ms)		
Visual Pilot Beam		Red LED		
Input/ Output	Parallel	Power I.	/O Cable	
Output	Input	2 Photo-coupler Inputs (trigg	er: 1 bit, model switch: 1 bit)	
	Output	3 PhotoMOS outputs (ready: 1 bit, alarm: 1 bit, OK/NG: 1 bit)		
	Serial	Power I/O cable (RS232C communication: Max. 57600 bit/s)		
USB		USB Cable (AB Type) Sold separately		
	PC I/P	USB1.1		
	Supported OS	Windows® XP, 2000, Me, 98SE		

Application Software

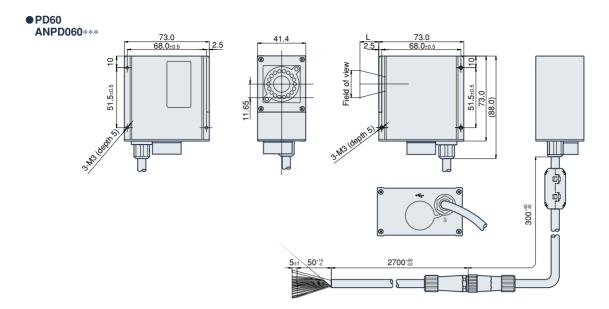
	Item	Specification			
nom		PD60			
Detection	Capability	5 or more pixels per cell			
Total proce	essing time	30 ms to 200 ms			
No. of Reg	jistered Items	7 types			
Type Regi	stration Method	Teaching [settings related to codes to be decoded]			
Serial					
		I/O Command	Trigger input, type switching (types 1 to 7)		
	Input	Teaching Command	Exposu	re time setting, and code setting (QR codes, data matrix)	
	Output	Readability, readouts, error correction rate, and error output			
Parallel					
	Input	Trigger input, type switching (types 1 to 7) mode switching (teaching/RUN)			
	Output	Evaluation result (OK/NG), READY, Alarm			

^{*} The total processing time from receiving the trigger input to output varies with the exposure time and matrix size.

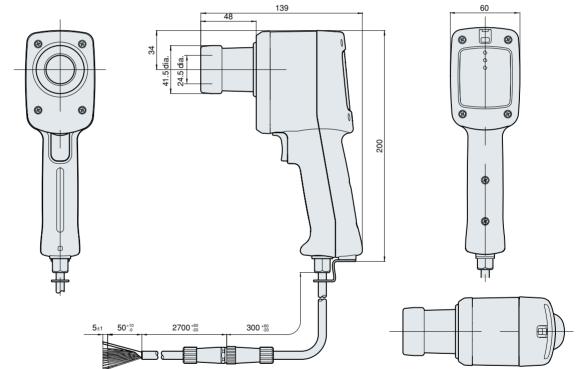
●2D Code Reading

li	tem		Specification	
			PD60 PD65	
Readable	QR code	Model	Model 1 and Model 2	
code type		Matrix	Model 1: 21 x 21 cells to 49 x 49 cells (Ver. 1 to 8)	
		size	Model 2: 21 x 21 cells to 49 x 49 cells (Ver. 1 to 8)	
		Error correction level	L (7%), M (15%), Q (25%), H (30%)	
		Supports b	lack/white reversed codes, horiz	ontally-flipped codes, and dots.
		The model,	matrix size, and the error correction	n level are automatically identified.
Data matrix		Matrix size	Square symbol: 10 x 10 cells to 44 x 44 cells matrix	
(E	(ECC200)		Rectangular symbol: 8 x 18 cells, 8 x 32 cells, 12 x 26 cells, 12 x 36 cells, 16 x 36 cells, 16 x 48 cells	
		Supports black/white reversed codes, horizontally-flipped codes, and dots.		
		The matrix size is automatically identified.		

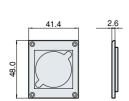
Dimensions (Unit: mm)



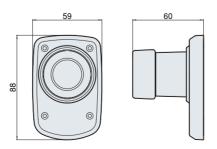
●PD65 ANPD065-25



●PD60 front panel (option) ANPD068-P1



● PD65 Guide pipe (option) ANPD068-G1



● PD60 Series power supply I/O cable (option) ANPD068-K1

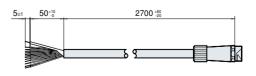


Image Processing Device Lineup

MICRO-IMAGECHECKER PV310



Ultra high-speed, gray scale image processing Full set of interfaces with CompactFlash card and Ethernet

Color and gray scale image processing Full set of interfaces with CF card and Ethernet

MICRO-IMAGECHECKER AX40

MICRO-IMAGECHECKER A210

Compact-size, gray scale image processing



MICRO-IMAGECHECKER A230

Character recognition & character checker type



MICRO-IMAGECHECKER A110



Multi-checker V2 series Compact-size, gray scale image processing (1-camera type)

LightPix AE20

Multi-checker V2 series

(2-camera type)



Visual sensor with lights, camera and CPU integrated into one unit Color area/color discrimination/color and pattern matching/edge detection/apex detection/size measurement

(Stationary Type) (Handy Type)

2D Code Reading Sensor PD60/PD65



High accuracy, easy operation For 2D code reading

2D Code Reading Sensor PD50

Highly accurate, simple operation, IP67G For reading stamped direct marking 2D codes.

These materials are printed on ECF pulp.
These materials are printed with earth-friendly vegetable-based (soybean oil) ink



Please contact

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