

# Panasonic

ideas for life

2D CODE READING SENSOR

# PD60/65



**Robust Reading of 2D Codes.**  
For Direct Marking on Metal Parts.



2D Code Reading Sensor PD60/PD65  
ARCT1B270E '06.7

**New**

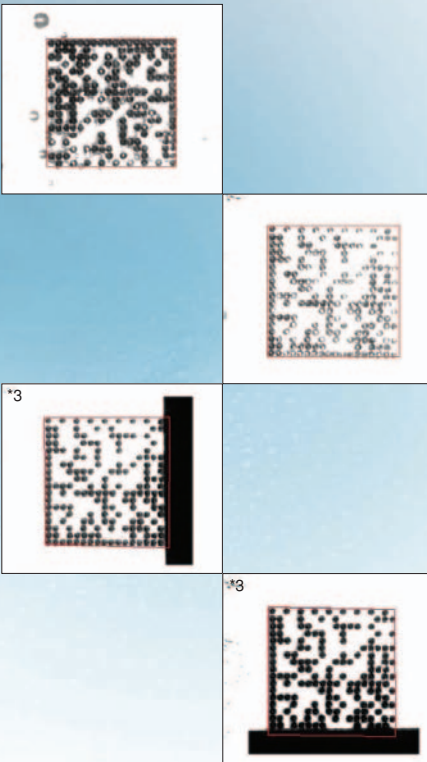
# Image detection capability improved by image correction using our new pre-processing functions and original decoding functions.

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/](http://www.nais-e.com/vision/)).



2D CODE READING SENSOR

# PD60

[Stationary Type]

|                         |                                                  |
|-------------------------|--------------------------------------------------|
| Field of View           | 110mm: 12×10mm<br>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 +<br>Software Pre-processing |



2D CODE READING SENSOR

# PD65

[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 +<br>Software Pre-processing |

\*1 As of 25 May 2006 (as surveyed by Panasonic)  
\*2 Fulfills 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.

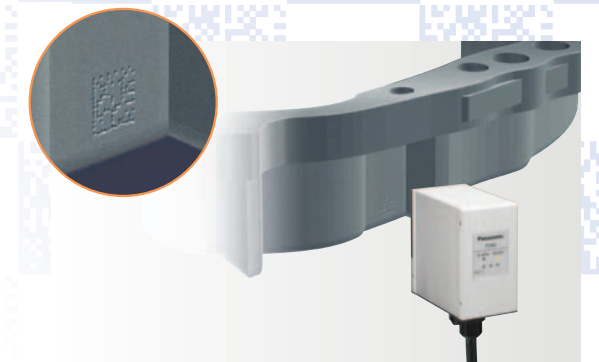
# PD60



## 200mm Long Range.

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

200mm



## Oil-resistant construction (IP67G\*2) allows for peace-of-mind even in oily conditions.

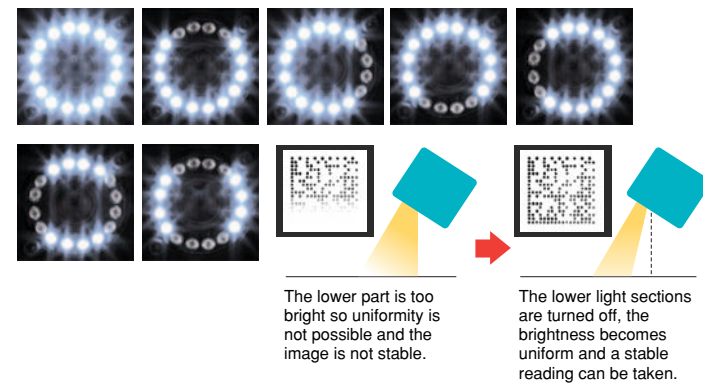
Out of consideration for actual usage environments, we have created the industry's first oil-resistant construction (IP67G\*2) to allow peace-of-mind when using even with gloves covered in machine oil or detergent.

Industry's first.\*1

## Control of Lighting Possible

### Control of lighting sections.

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



Equipped with handy hook hole for hanging.

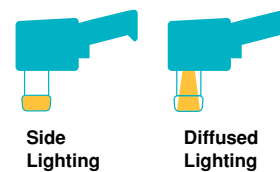


# PD65

## 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.



## 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

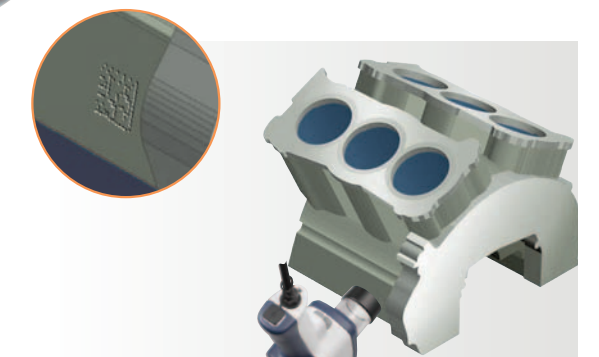


OK

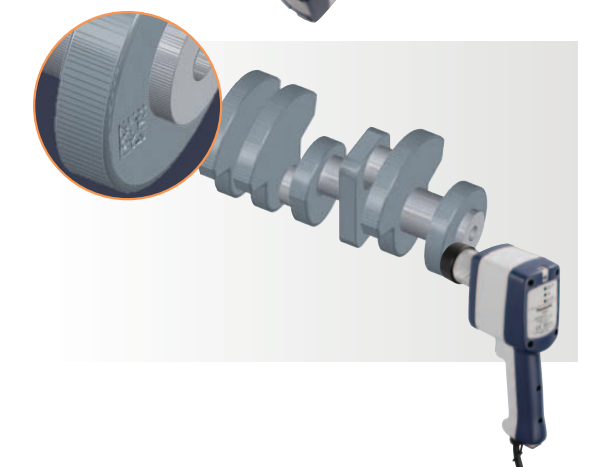
NG



Read Button



Equipped with handy hook hole for hanging.



PD60



USB Connector

PD65



USB Connector

## 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.

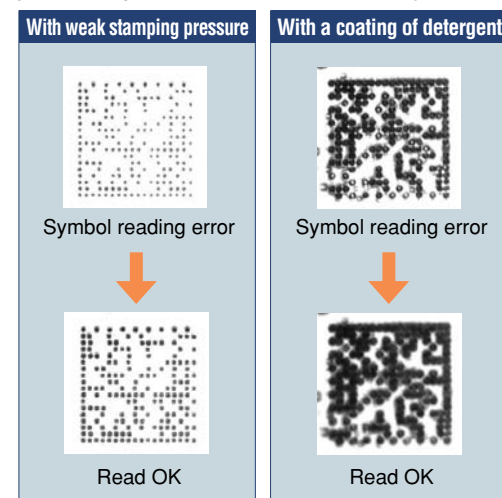
## Dedicated Software Tool "PDTOOL" for Easy Setup

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.

## 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 pre-processing functions and a new library.



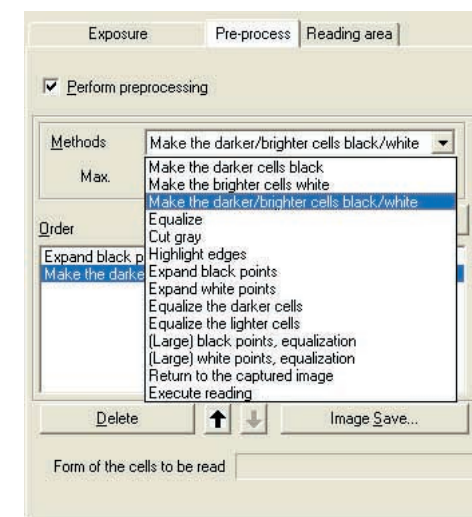
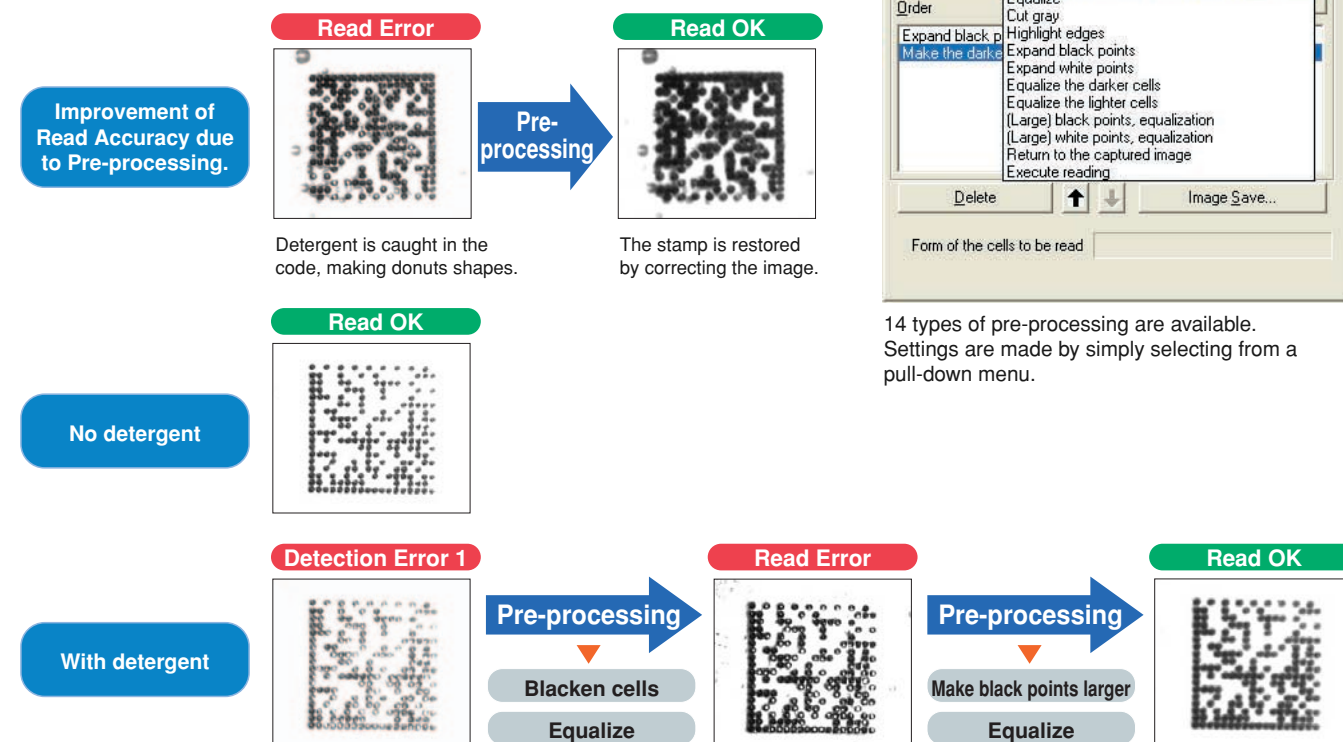
## Real-time Image Storage.

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.

## Further Improvement of Decoding Capabilities with Pre-Processing Functions

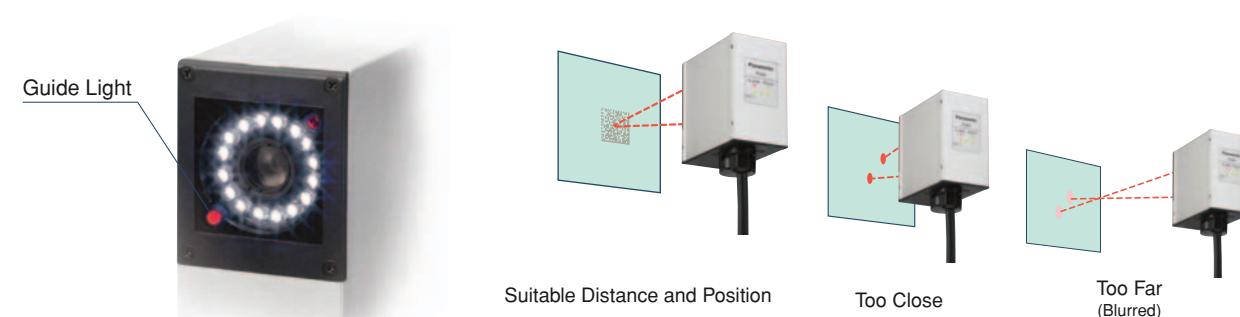
In pre-processing, various original algorithms are applied to images of difficult-to-read 2D codes to improve their readability. In the past, read accuracy was improved for stamp errors (stained, chipped, tilted, flipped or black/white reversed codes) on hard-to-read metal surfaces.



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

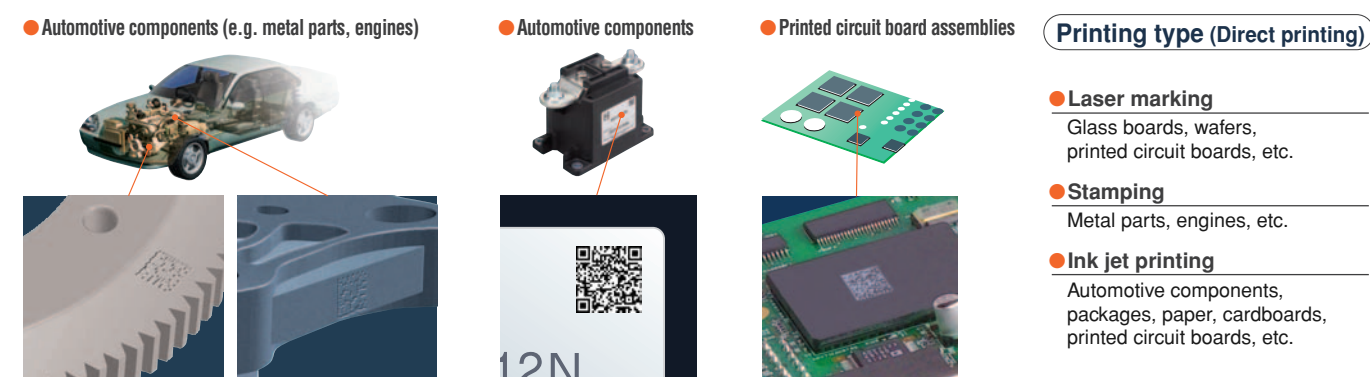
## Guide light red LED enables easy fitting and installation

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



## Application

Supports 2D codes indicated on a great variety of applications



# 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.

**Simple Setup**  
One-step automatic settings

**Automatic exposure adjustment**  
Adjustment to the optimum exposure is also automatic.

**Real-time image display**  
Settings can be checked while looking at the actual image.

**Settings Help Display**

**One-step automatic setup**

**Screen Resolution**  
Brightness distribution graph display

**Traceability**  
Record displayed of read results.

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

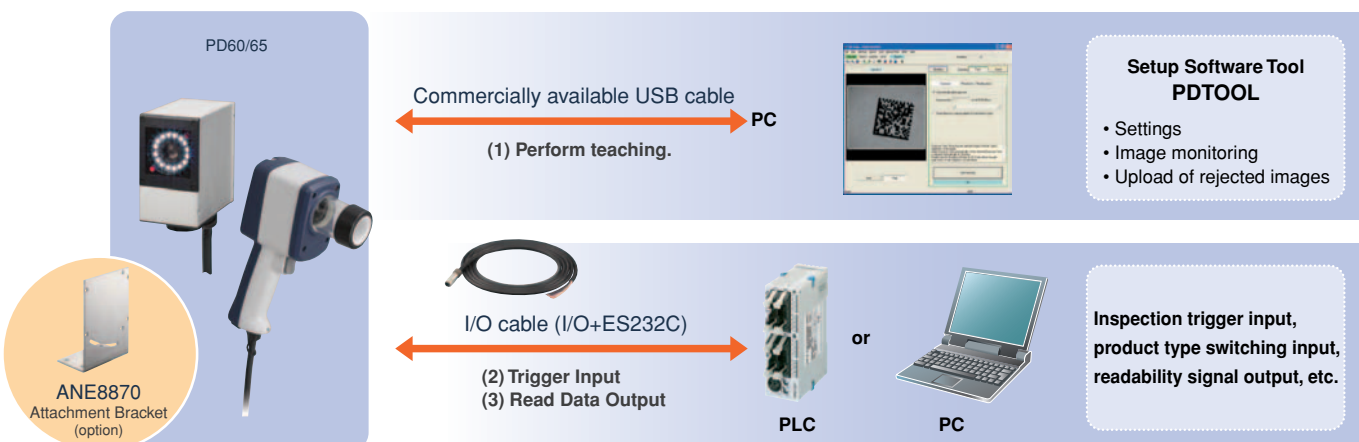
**Settings Support**

**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.

**File name and link to saved images.**

PDTOOL can be downloaded free of charge from our Web site [www.nais-e.com/vision/](http://www.nais-e.com/vision/)

## Interface



## Table of Order Numbers

| Name                   | Part No.   | Content                                                                                                 |
|------------------------|------------|---------------------------------------------------------------------------------------------------------|
| 2D code reading sensor | PD60       | ANPD060-12 Field of view: 12×10mm Installation distance: 110±5.5mm                                      |
|                        |            | ANPD060-25 Field of view: 25×20mm Installation distance: 200±10mm                                       |
|                        | PD65       | ANPD060S25 Field of view: 25×20mm Installation distance: 105±5mm                                        |
|                        | PD60       | ANPD065-25 Field of view: 25×20mm Installation distance: Contact type (In 24.5 mm diameter guide pipe.) |
|                        |            |                                                                                                         |
|                        |            |                                                                                                         |
| Attachment Bracket     | ANE8870    | For mounting PD60                                                                                       |
| 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                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <b>PD60</b> <b>PD65</b>                                                                                                                                                                                                                  |
| 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 freezing 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 <sup>2</sup> , 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 Approx: 700 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 \*3 Weight includes power supply I/O cable.

### Options (repair parts)



ANPD068-P1



ANPD068-G1



ANPD068-K1

## Function Specifications

### Main Unit

| Item                       | Specification                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                            | <b>PD60</b> <b>PD65</b>                                                                                                                   |
| Type                       | Stationary Type Handy Type                                                                                                                |
| Light Configuration        | 4 Control Sections Dual Side/Diffused Lighting                                                                                            |
| Read Method                | External Start, Auto start Trigger button                                                                                                 |
| Image capture element      | Black/white C-MOS                                                                                                                         |
| Valid pixels               | 352 horizontal × 288 vertical pixels (100,000 pixels)                                                                                     |
| Image capture light source | 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                                                                                                                  |
| Input                      | 2 Photo-coupler Inputs (trigger: 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                                                              |
|--------------------------|----------------------------------------------------------------------------|
|                          | <b>PD60</b> <b>PD65</b>                                                    |
| Detection Capability     | 5 or more pixels per cell                                                  |
| Total processing time    | 30 ms to 200 ms                                                            |
| No. of Registered Items  | 7 types                                                                    |
| Type Registration Method | Teaching [settings related to codes to be decoded]                         |
| Serial                   |                                                                            |
| Input                    | I/O Command Trigger input, type switching (types 1 to 7)                   |
| Teaching Command         | Exposure 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                                    |

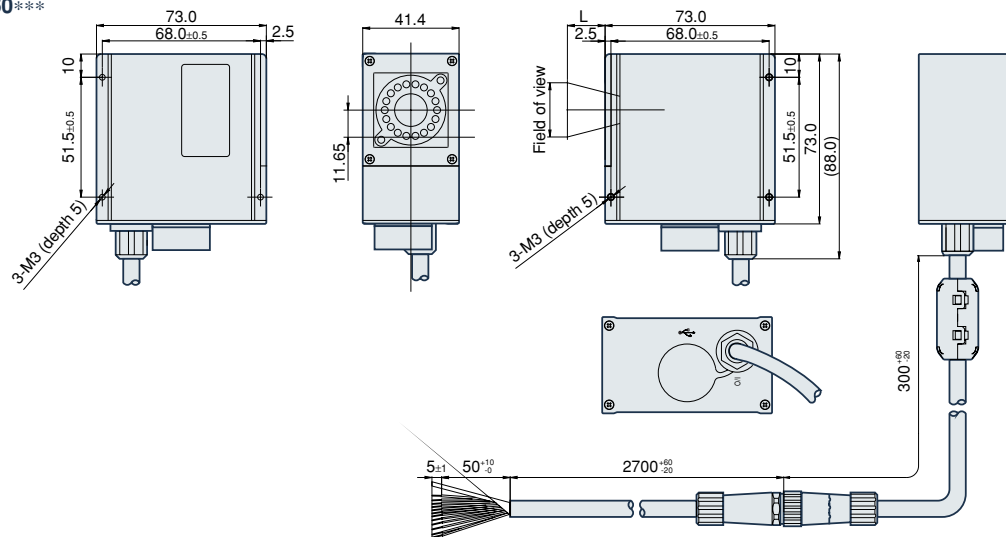
\* The total processing time from receiving the trigger input to output varies with the exposure time and matrix size.

### 2D Code Reading

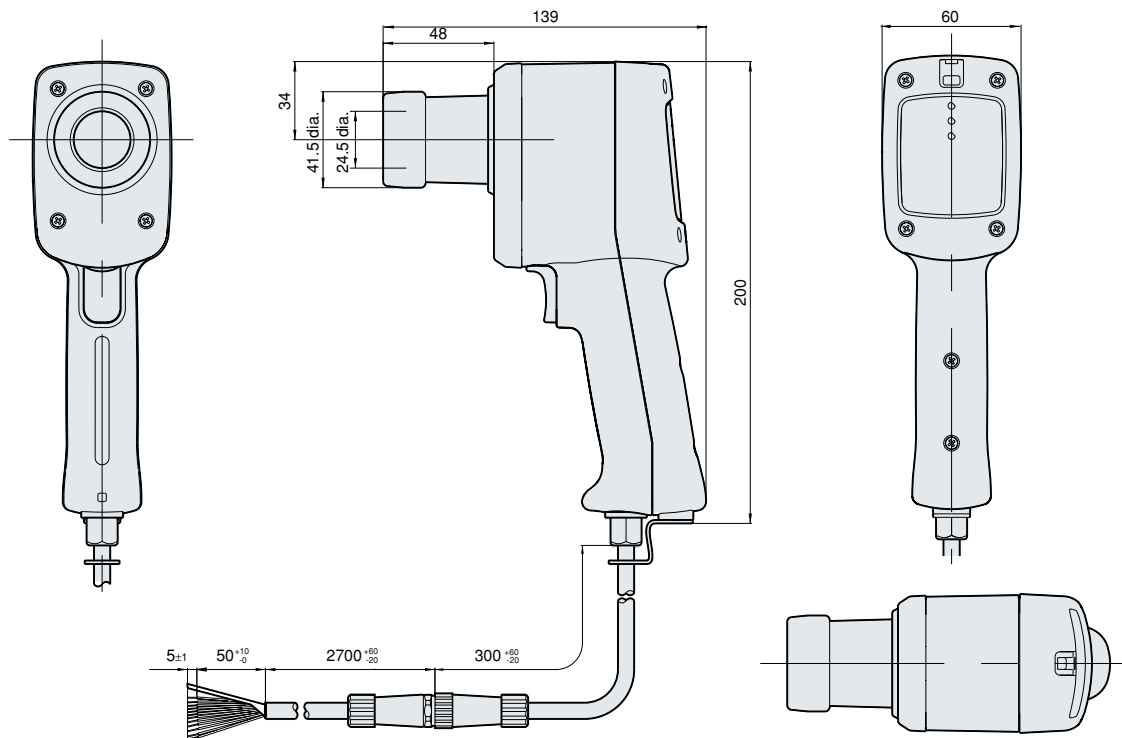
| Item                   | Specification                                                                          |
|------------------------|----------------------------------------------------------------------------------------|
|                        | <b>PD60</b> <b>PD65</b>                  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

## Dimensions (Unit: mm)

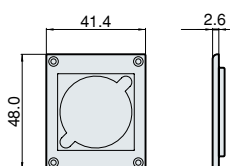
### ● PD60 ANPD060\*\*\*



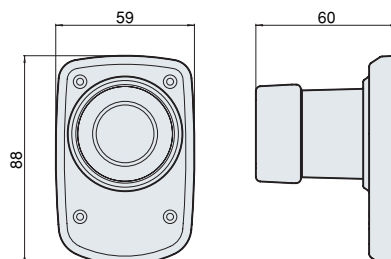
### ● PD65 ANPD065-25



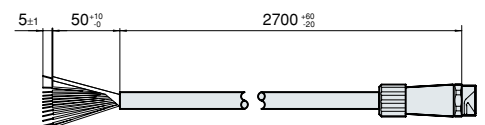
### ● PD60 front panel (option) ANPD068-P1



### ● 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



## MICRO-IMAGECHECKER **A230**

Character recognition & character checker type



## MICRO-IMAGECHECKER **A110**

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



## 2D Code Reading Sensor **PD50**

High accuracy, easy operation  
For 2D code reading



## MICRO-IMAGECHECKER **AX40**

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



## MICRO-IMAGECHECKER **A210**

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



## LightPix **AE20**

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**

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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# Panasonic®

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