

Thank you very much for purchasing this Panasonic product. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

**1 About PVWIN-T30 / PV-T30**

- **PVWIN-T30** is simulation software only for **PV-T30**. It adopts a simple menu structure, allowing you to perform simple inspection via image processing.
- **PV-T30** is a **PV200 MC**-based 1-camera type machine vision system only for **PVWIN-T30**, supporting simple inspection and simple settings.
- Live image of the **PV-T30** can be displayed in real time in PC (**PVWIN-T30**). (Live mode)
- Camera settings from **PVWIN-T30** to **PV-T30**, e.g., for adjustments of camera gain value and white balance, etc., can directly be made.

**2 Installation of PVWIN-T30**

- Click "pvwinT30\_v1xx.exe" to perform installation according to the screen display. (Digit xx of installer v1 or later varies depending on the version of **PVWIN-T30** provided.) Note that a serial No. is required for installation. You can obtain and use the serial No. of PVWIN200, a standard product, from our Web site. In addition to the registration of customer information, obtaining a serial No. requires the MAC address of **PV-T30** and MAC address of your personal computer. <http://panasonic.net/id/pidsx/>

- If the **PVWIN-T30** is installed, PVImageConverter\* is installed at the same time. (\* Tool software that converts a Bayer image to a bit map image)

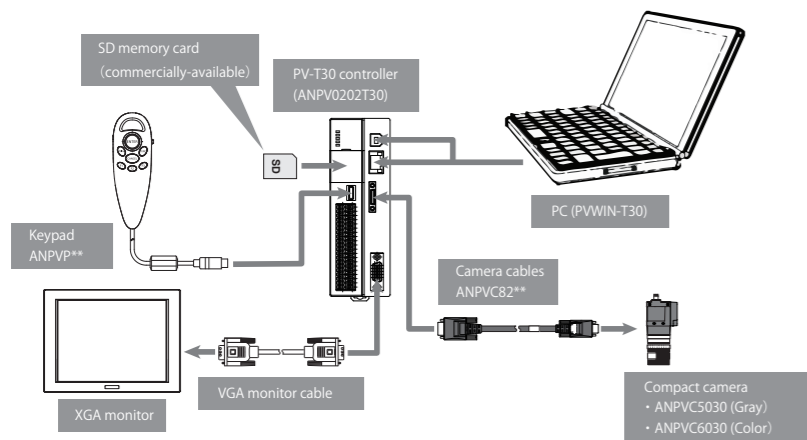
**3 Hardware Requirements of PVWIN-T30**

|                      |  |
|----------------------|--|
| PC                   | Compatible computer for IBM PC/AT  |
| OS <sup>*1</sup>     | Windows <sup>®</sup> 8 <sup>™</sup> , Windows <sup>®</sup> 7 <sup>™</sup> , Windows Vista <sup>®</sup> , Windows <sup>®</sup> XP |
| CPU                  | Pentium III 700MHz or more   |
| Memory Amount        | 512 MB or more   |
| Display resolution   | 1024 × 768 or more   |
| Display color        | High Color (32-bit) or more  |
| Communication format | USB2.0, TCP/IP Ethernet (1 Gbps supported)   |
| Target model         | <b>PV-T30</b>  |

\*1) As for operation systems other than Windows 7 and Windows 8, only 32-bit edition is applicable.  
 \*2) If your operating system is Windows 7, 8, or 8.1, refer to how to install USB driver of **PVWIN200** on our website.

**4 Hardware Requirements of PVWIN-T30**

System Configurations



- Only one camera can be connected. (CAMERA port: 0)
- Only a compact camera is available.

Connection Method

- Connect **PVWIN-T30** and the **PVWIN-T30**-installed PC with a USB cable or an Ethernet cable.

Communicable Conditions

|                                     | RUN menu |      | SETUP menu                  |                |
|-------------------------------------|----------|------|-----------------------------|----------------|
|                                     | RUN      | STOP | Tool - PV-T30 communication | Other statuses |
| Upload and Download of Setting Data | A        | A    | A                           | N/A            |
| Reading of image data               | A        | A    | A                           | N/A            |
| Upload of saved images              | N/A      | A    | A                           | N/A            |
| Download of test images             | N/A      | N/A  | A                           | N/A            |

A: Available. It is also OK not to use. N/A: Not available

**5 Before using PVWIN-T30**

- Before the use of **PVWIN-T30**, the following settings are required in the **PV-T30**.

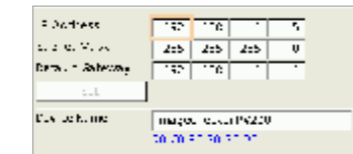
Focus Adjustment

1. Start up **PV-T30** and display the SETUP menu.
2. Adjust the position of the camera to display the inspection object on the monitor screen.
3. From "TOOL" in the menu on Page 3, select "Setting Help" (or "Aperture Adjustment").
4. Select "Area Setting" and set an area at a position where feature of the object exists.
5. Adjust the focus according to the message displayed. Make adjustments so that "Result" is "OK".
6. When the result is "OK", the adjustments are completed by pressing the ENTER key.



Network

1. From "TOOL" in the menu on Page 3, select "Network".
2. Change the IP address, subnet mask and default gateway as necessary.



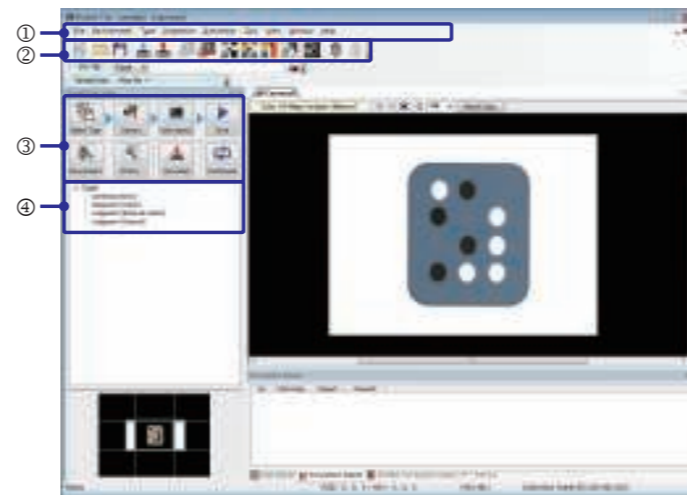
Calendar

1. From "TOOL" in the menu on Page 3, select "Calendar".
2. Select "Date Format".
3. Adjust year, month, day, hour, and minute.
4. After setting is completed, press "Set" button.
5. After setting is completed, press the CANCEL key.



**6 Reading the PVWIN-T30 screen**

Home screen



|   |                 |  |
|---|-----------------|--|
| ① | Menu bar        | Item that is used to set <b>PVWIN-T30</b> .  |
| ② | Menu icons      | Icons displaying functions that are used in <b>PVWIN-T30</b> in particular.  |
| ③ | Navigation view | Displays a series of flow of an inspection. Icons of inspection items can be selected according to the flow of items to proceed with settings smoothly.  |
| ④ | Tree display    | <p>A tree is used to display inspection items or the contents of settings. Inspection items that are set are numbered as shown below to display comments of the settings.</p> <ul style="list-style-type: none"> <li>• When setting data R/W or output of judgment, make a setting for reference according to "Checker No." assigned to each inspection item.</li> </ul> |

**7 List of Processing Icons**

Menu bar

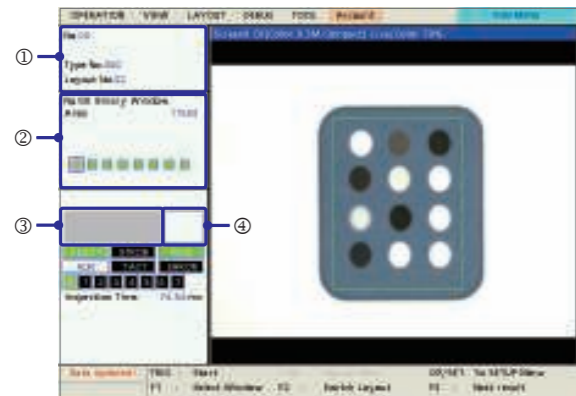
| Icon | Function                 | Description  |
|------|--------------------------|--|
|      | Creation of a new file   | Creates a new setting file.  |
|      | Open a file              | Opens an existing setting file.  |
|      | Save a file              | Saves the setting file.  |
|      | Upload                   | Uploads a setting file from the <b>PV-T30</b> to <b>PVWIN-T30</b> .  |
|      | Download                 | Downloads a setting file from <b>PVWIN-T30</b> to <b>PV-T30</b> .  |
|      | Read a base image        | Reads a base image.  |
|      | Save a base image        | Registers an original image displayed in the camera window as a base image.  |
|      | Binary level setting     | Sets a binary level group.   |
|      | Grayscale conversion     | Sets grayscale conversion levels for color images.   |
|      | Color extraction         | Sets color extraction conditions for color images.   |
|      | Gray preprocess setting  | Sets a gray preprocess setting group.  |
|      | Edit position adjustment | Replaces the follow-up order of position adjustments. It is re-registered based on an original image displayed in the camera window. |
|      | Start live mode          | Starts the live mode.  |
|      | Exit live mode           | Exits the live mode.   |

Navigation view

| Icon | Function             | Description   |
|------|----------------------|---|
|      | Select type          | Selects a type.   |
|      | Camera               | Sets the conditions of the camera, e.g., white balance, gain value, etc., to capture images.  |
|      | Add inspection       | Adds various checkers that are used as inspection items.  |
|      | Execute once         | Executes the contents of current setting (program) once in response to an image read in the camera window.  |
|      | Environment          | Sets the <b>PV-T30</b> environment, e.g., system settings, input / output, etc.   |
|      | PC environment       | Make language and communication settings for <b>PVWIN-T30</b> .   |
|      | Download             | Downloads a setting file from <b>PV-WINT30</b> to <b>PV-T30</b> .   |
|      | Continuous execution | Continuously executes the inspection of multiple images saved in the PC or images received from <b>PV-T30</b> at a certain interval. For many images, the contents of settings can be confirmed and adjusted. |

## 8 Reading the PV-T30 screen

### RUN menu



|   |  |   |
|---|--|---|
| ① | Information display area                   | Displays the area No., type No., etc.   |
| ② | Individual examination result display area | Displays detailed results of checkers at the upper stage when the F3 key is pressed. At the lower stage, symbols are used to display checker OK / NG result in color. Of the checkers registered in "Inspection content" of PV-T30, Nos. 0 to 15 are to be displayed. Colors of the symbols ... OK: Yellowish green, NG: Red) |
| ③ | Total judgment                             | Displays the result of a judgment expression registered in the total judgment expression.   |
| ④ | Error display area                         | Displays the error No.  |

### SETUP menu



|   |                     |   |
|---|---------------------|---|
| ① | Select menu (fixed) | Displays the menu to be used to set PV-T30. The select menu cannot be edited. |
|---|---------------------|---|

## 9 Setting simple inspection

### Setting procedure

1. In the list of menu icons of PVWIN-T30, click the icon of "Live mode" to change the mode to the live mode.



2. In response to the message "Are you sure you want to change the mode of the main unit to camera live mode?", select "Yes".



The mode of the camera window of PVWIN-T30 then changes to the live mode.

• During the PVWIN-T30 live mode, pressing the F3 key for 5 seconds or more can forcibly exit the live mode linkage of PV-T30. This should be used when a problem such as communication cable cutoff occurs during PVWIN-T30 live mode.

3. Press the "Select type" button in the navigation view to select the type.



4. Press the "Camera" button to set the camera to be used.

While confirming the live image on the screen, adjust camera setting items.

• To perform auto adjustment of white balance in camera setting, capture images in such a manner that the whole screen turns white.

5. Press "Add inspection" to select the inspection content.

6. Click the inspection item and then click the "Add" button.



7. Set details of the inspection content.

8. Click "Once" to simulate the set inspection item. Adjust the set inspection items based on the execution result.



9. When the adjustment above is completed, click "Download" and save the set data in PV-T30.



• While Image Receiver for PV is being started, download cannot be executed. Exit Image Receiver for PV and then execute the download again.

10. A message asking to confirm selecting to save data in the PV main unit appears.

To save data in the main unit, select "Save" and click "Execute". If you do not select to save data, PV-T30 uses execution memory to execute the inspection.



## 10 Setting a base image

• An image used for setting an inspection item such as position adjustment can be saved as "Base image". When an inspection item is adjusted, the base image can be read out for resetting while the same image as that for registration is looked at.

• To make readjustments for a position adjustment, be sure to use the same base image as that for initial setting.

### Saving a base image

1. Display an image to be set as a base image on the camera window and set inspection items such as position adjustment.



2. Click the icon "Save a base image" in the menu bar.



3. When the response asking to confirm registering the image as a base image, click "Yes". The base image is saved in a predetermined folder\*.



\* The saved base image is stored in the following folder \Documents\PVWIN-T30\BaseImage\Temp  
 • The base images of the set file appearing in PVWIN-T30 are always stored in the Temp folder.  
 • Saving a set file creates a folder of the same name in the same hierarchy as that of the Temp folder.  
 • Only one kind of base images can be saved per type.  
 • The file name of a base image is as shown in the right figure.

Camera type No.\*  
 C0T12\_TYPE00.bmp  
 Camera No. Type No.  
 \* Camera type No.: T11 = Gray camera, T12 = Color camera

### Reading a base image

1. Click the icon "Read a base image" in the menu bar. The read base image appears on the camera window.



• No other operation except for reading a base is allowed in the live mode. Exit the live mode to read data.  
 • To make readjustments for a position adjustment, be sure to use the same base image as that for initial setting.

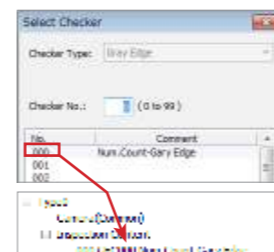
## 11 Setting Judgment

• This function totally judges the results of checkers and numerical calculation. A maximum of 100 expressions of judgment can be set per type.

• In PVWIN-T30 (PV-T30), the logical product of the checker of an inspection item that has been set is automatically referred to JDC000 and output as the total judgment result. In addition, the reversed value of judgment of JDC001 is automatically referred to JDC001.

### Items that can be referred

|               |  |                                       |
|---------------|--|---------------------------------------|
| Checker       | Selected to enter various judgment results of checkers.  |                                       |
|               | Inspection item  | Name of a checker for judgment output |
|               | Position adjustment  | → PAC: Position adjustment            |
|               | Black and white areas, specified destination of color surface  | → BWC: Binary window                  |
|               | Presence / absence - gray average  | → GWC: Gray window                    |
|               | Counting - edge (binary)   | → BEC: Binary edge                    |
|               | Counting - edge (gray)   | → GEC: Gray edge                      |
|               | Counting - block (color / gray)  | → FEC: Feature extraction             |
|               | Presence / absence of position, counting - gray pattern  | → SMC: Smart matching                 |
|               | Presence / absence - color elements  | → CWC: Color window                   |
| Judgment JRC: | Selected to enter the judgment result of JRC (internal). (When Judgment JRC is set, only JRC whose number is less than the number currently being set is selectable.)                          |                                       |
| Judgment JDC: | Selected to enter the judgment result of the JDC (external output) whose number is less than the Judgment No. currently being set. (Note that JDC is not selectable when Judgment JRC is set.) |                                       |
| Operator:     | Selected to enter operators, such as AND and OR, that are used to totally judge each judgment result.  |                                       |
|               | + : Logical sum, * : Logical product, # : Exclusive OR, / : Negation, ( : Left parenthesis, ) : Right parenthesis  |                                       |



• To refer the inspection result of checker to Judgment or data R/W, select the checker corresponding to the checker No. in the tree display on the checker selecting window.

## 12 Specifications

### PV-T30 main unit

|                             |  |   |
|-----------------------------|--|---|
| Item                        | Description  |   |
| CPU                         | 32-bit RISC CPU&DSP  |   |
| Input / output              | Camera   | 0.3M Compact Gray (640 × 480), 0.3M Compact Color (640 × 478) 1 Camera Connectable  |
|                             | Monitor output   | VGA output (640 × 480)  |
|                             | Memory card  | SD / SDHC memory card   |
|                             | Serial   | RS232C (3 lines) × 1  |
|                             | Parallel   | Input 14 points / Output 4 points   |
|                             | Keypad input   | Connector 1 channel for dedicated keypad (ANPVP**)  |
| Menu display                | 4 languages (5 fonts) switching (Japanese, English, Korean, Traditional Chinese, Simplified Chinese)   |   |
| Monitor display (VGA)       | Split screen of 1-camera image available, zooming (2 to 400%) display available<br>Displayed image: Live / Memory / NG image<br>Display effect: Gray / Binary group / Preprocessing group / Color / Extraction binary / Grayscale conversion image<br>Display area (640 × 480)   |   |
| Processing method           | Gray scale processing / Extraction binary / RGB adjustment / Color   |   |
| Processing resolution       | 0.3-Mega Compact Camera (Gray): 640 pixels (Hor.) × 480 pixels (Ver.)<br>0.3-Mega Compact camera (Color): 640 pixels (Hor.) × 478 pixels (Ver.)  |   |
| Trigger input               | Selection of all cameras or detection trigger  |   |
| Number of cameras connected | 1 camera maximum   |   |
| Cameras connection          | Connection via PoCL-Lite (Power Over Camera Link Lite)   |   |
| Image capturing method      | Frame imaging only<br>Partial imaging is available (one area), and imaging range of at least one line can be specified.  |   |
| Shutter speed               | 100μs to 500ms (set in units of 10μs)  |   |
| Software gain               | 1.00 to 15.00  |   |
| Offset range                | 0 to 1000  |   |
| Number of types             | 16 types fixed   |   |
| Inspection content          | Maximum of 100 pieces per type (Based on the set data)<br>6 types of position adjustments (including position / rotation adjustments and rotation adjustments)<br>Pattern position, Edge position (binary), and Edge position (gray)<br>Center of gravity of block, Corner position, and Circle / feature rotation<br>3 items and 10 kinds of inspection (Presence / absence)<br>Black and white areas, specified color areas, gray average, color elements (Presence / absence of position)<br>Presence / absence of position (Counting)<br>Block (color), block (gray), gray pattern, edge (gray), and edge (binary) |   |
| Inspection operation mode   | Serial processing:   | Images can be captured for next inspection after the completion of result output  |
|                             | Parallel processing:   | After the completion of image capturing and the completion of the synchronous output of the previous inspection, image capturing for the next inspection can be done. Image capturing and inspection output processing are then performed simultaneously and in parallel. |
| Trapezoid Adjustment        | High speed (Bilinear method), High Accuracy (Bicubic method) 1 piece per type  |   |
| Binary level group          | 16 groups, 256 intensities (0 to 255)  |   |
| Image preprocess            | 16 groups per type, up to 10 intensities<br>21 kinds of filter (Dilation, Erosion, Erosion -> Dilation, Dilation -> Erosion, Auto Correction, Gray Cut, Area Averaging, Correction Setting, Median, Smoothing, Sobel, Prewitt, Laplacian, Edge Extract X, Edge Extract Y, Sharpen, Tophat, Dynamic, Frequency Extraction, Rotation, Reflect)   |   |
| Judgment                    | Maximum of 100 expressions per type (based on the set data) Judgment result of each inspection item is referred for logical operation  |   |
|                             | Operator   | NOT / AND / OR / XOR / Parenthesis  |
|                             | Number of items referring operation expressions  | Maximum of 16 items per expression  |
|                             | Others   | Setting of a condition for total judgment, Setting of a condition to save images, and Image output condition<br>Parallel output setting (8 outputs (OUT0 to OUT7))  |
| Data R/W                    | During RUN mode, a maximum of 80 (5 × 16) cells per type in tabular format can be displayed in one window.<br>The following can be referred: Enter Title, Various conditions / results of inspection items, Judgment results, and Statistics / Result  |   |
| Calibration                 | Coordinates, coordinate origin, horizontal and vertical coefficients can be set to obtain actual dimensions for each product type.   |   |
|                             | Processing method  | Unit conversion / 1 point coordinate conversion / 2 point coordinate conversion / 3 points coordinate conversion  |
|                             | Operation method   | Static / Dynamic  |
| Register Base               | Desired Position / Smart Matching / Contour Matching / Intersection / Circle Center / Feature Extraction   |   |
| Execution mode              | Normal execution   | Execution of all checkers   |
| Debug function              | Target Image   | Image memory, Test Image in SD, Image Memory in SD / Output Image in SD, Select Folder  |
|                             | Execution mode   | Continuous execution (at the time of NG, stop mode available), Step execution   |
|                             | Image targeted for debugging   | ALL Image / OK Image / NG Image   |
|                             | Automatic switching of setting   | Type No.  |
|                             | Interval   | Fastest, 1 to 5 seconds   |
|                             | Adjustment function  | Selectable between detail result display (RUN menu) and setting window  |

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