

Operation Manual

DATA RECORDING SOFTWARE
DRA-730A for Windows
Ver. 1.3



Tokyo Measuring Instruments Lab.

Data Recording software

DRA—730A Instruction Manual

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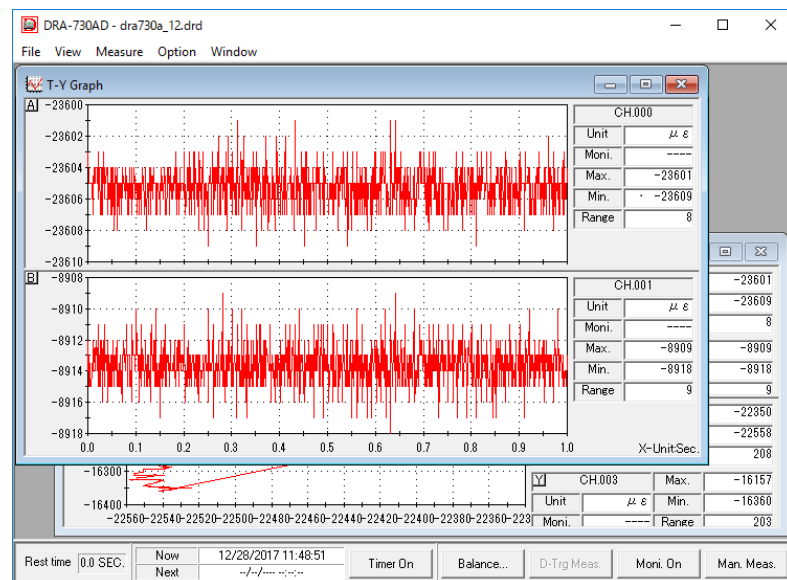
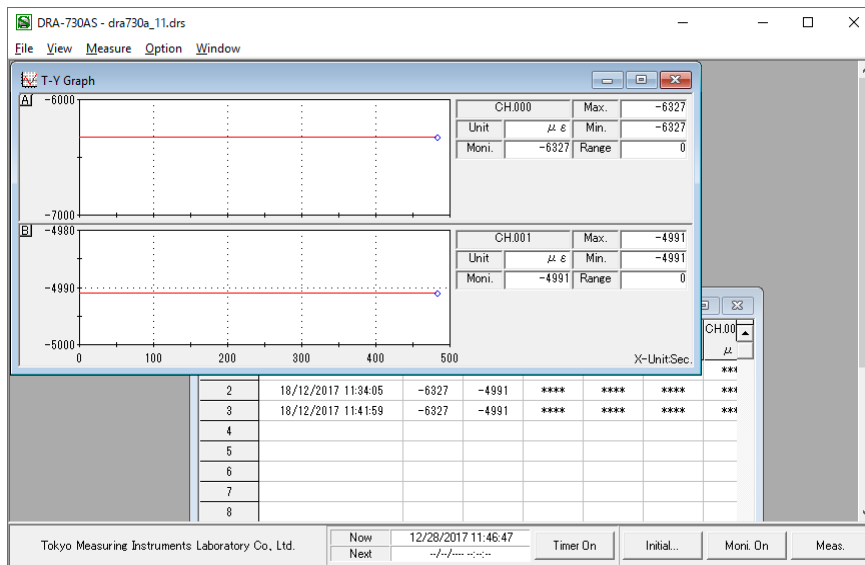
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1. Introduction

Thank you for purchasing our multi-channel digital strainmeter DRA-30A. This software is the special measurement software attached to DRA-30A (static measurement software DRA-730AS/dynamic measurement software DRA-730AD).

Please read this instruction manual well to understand the functions and operation procedure in order to utilize all the functions of this product and measure with efficiency and accuracy.



The company titles and product names described on this document are trademarks or registered trademarks of each corresponding company.

This instruction manual corresponds to software version 1.3.

1 – 1. How to Read This Instruction Document

- This instruction document uses the following notations in the main document to make it easier to understand:

| Example | Description |
|------------|---|
| Menu | : Menu is in “[].” Menus are connected with “-.” EX) [File] – [Close] |
| Button | : Buttons are in “[].” EX) [OK] button |
| Key | : Keys are in “ ”. EX) “Enter” key |
| Dialog | : Dialogs are in “ ”. EX) “Data Logger” dialog |
| Item, etc. | : Items, etc. are in “ ”. |

- As OS of the environment used, Vista(SP2), 7(SP1), 8, 8.1, 10, etc. are collectively called Windows.

1 – 2. Overview

This software is special software for multi-channel strainmeter DRA-30A, and is divided into static measurement software DRA-730AS and dynamic measurement software DRA-730AD.

With static measurement software DRA-730AS, manual measurement, initial measurement, timer measurement, monitor measurement, T-Y graph display, X-Y graph display, data list display, saving of measurement data in CSV format, etc. are possible.

With dynamic measurement software DRA-730AD, manual measurement (trigger measurement), balance, timer measurement, option measurement, monitor measurement, T-Y graph display, X-Y graph display, saving of measurement data in CSV format and DaDisp format, etc. are possible.

1 – 3. Features

1 – 3 – 1. Static Measurement Software DRA-730AS

- T-Y graph display, X-Y graph display, and data list display are possible.
- Saving of measurement data is possible in CSV format.
- Timer measurement and real time timer measurement are possible.

1 – 3 – 2. Dynamic Measurement Software DRA-730AD

- T-Y graph display and X-Y graph display are possible.
- Saving of measurement data is possible in CSV or DaDisp format.
- Timer measurement and trigger measurement are possible.

2. Operation Environment and Setup Procedure

2—1. Operation Environment

2—1—1. Connectable Measuring Instrument: Number of Measurable Channels

- | | |
|-----------|------------------------------------|
| • DRA-30A | : 3 units at maximum (90 channels) |
|-----------|------------------------------------|

* The above measuring instrument can be connected via GP-IB or USB interface.

* No other measuring instruments can be connected.

2—1—2. Personal Computers

- | | |
|------------------------|--|
| • OS environment | : Microsoft Windows, Vista(SP2), 7(SP1), 8, 8.1, 10 |
| • CPU | : Meet the operating environment of OS to use |
| • Memory | : Meet the operating environment of OS to use |
| • Hard disk | : Open space of 12Mbyte or larger |
| • CRT | : Resolution of 1024×768 dots or higher and 256 colors or more recommended |
| • Development language | : Microsoft Visual Basic 6.0(SP5) Olectra Chart Version 6.0J is used as a development tool. |

2—1—3. Interface

- GP-IB interface (manufactured by National Instruments)
PCIe-GPIB, USB-GPIB ect.
- USB

2–2. Setup Procedure for This Software

2–2–1. Setting up This Software

Static measurement software DRA-730AS/dynamic measurement software DRA-730AD is set up in the PC.

If this software of an older version is set up in the PC to be used, please refer to “**2-2-2. Version Update for This Software.**”

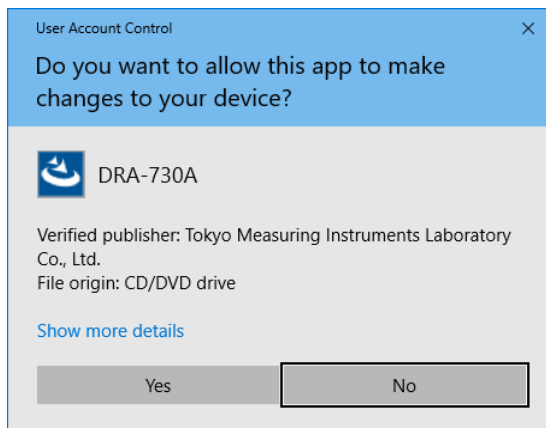
PC restart may be necessary during Setup execution.

If a restart message is displayed, restart the PC according to the message and execute Setup again.

* When setting up on Windows do so with Administrator authority.

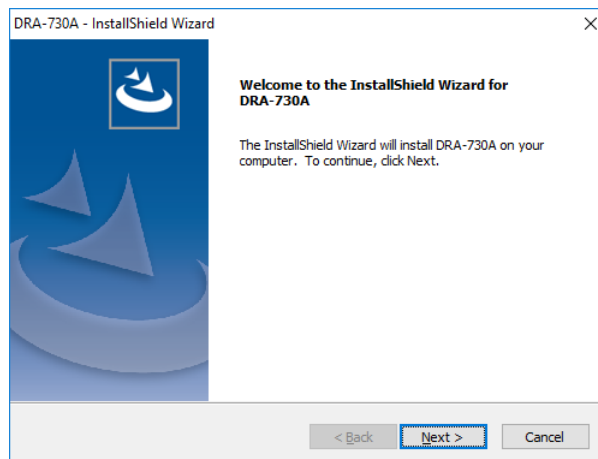
[Operation Procedure]

- 1 . Terminate all applications.
- 2 . Insert the CD-ROM for this software into the CD-ROM drive.
User Account Control window is displayed depending on OS setting.



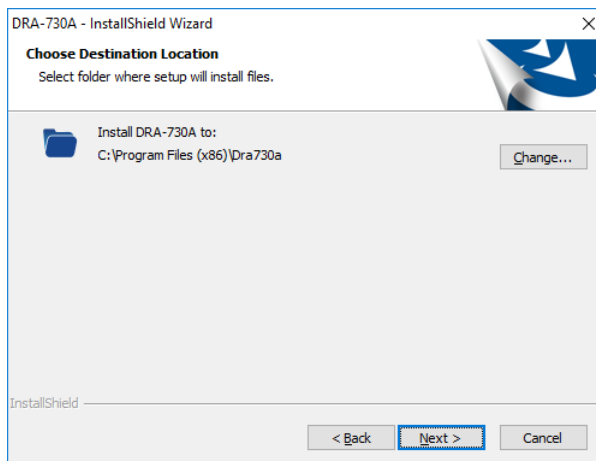
Click the [Yes] button.

- 3 . The setup program will start up.



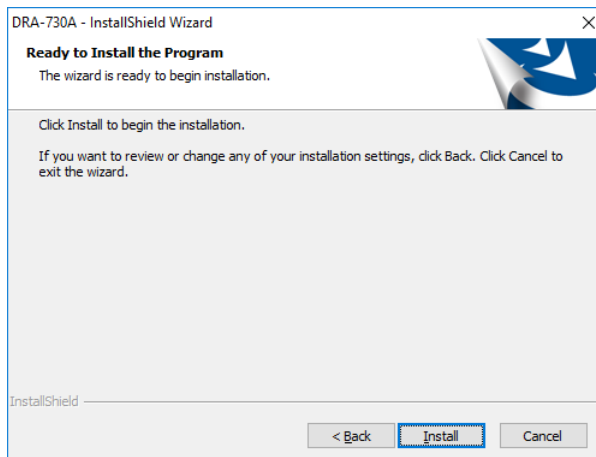
Click the [Next >] button.

4. Select where to install.



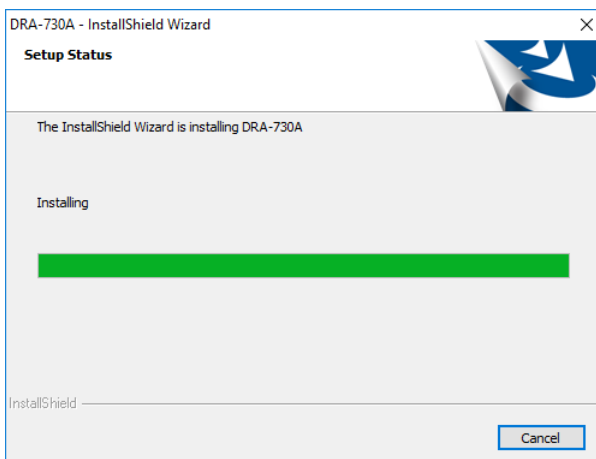
If you want to change where to install, click the [Change...] button.
Click the [Next >] button.

5. “Ready to Install the Program” is displayed.

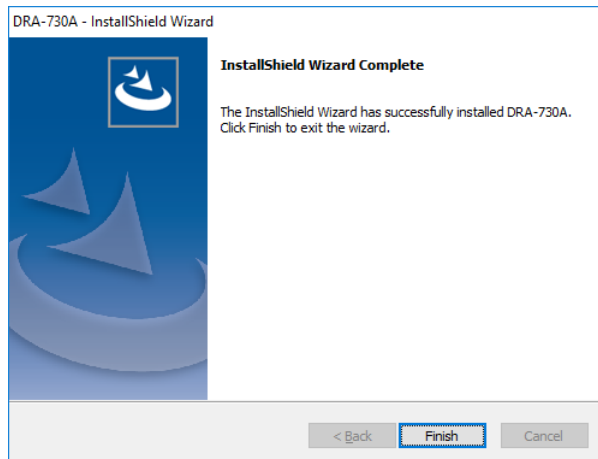


Click the [Install] button.

6. Setup is started.



7 . Setup of DRA-730A is now completed.



Click the [Finish] button to complete the setup procedure.

2 – 2 – 2. Version Update for This Software

If you use versions older than this version, please follow the procedure below:

- 1 . Execute “Add or Delete Application” on “Control Panel” to delete the old version that is already set up.
- 2 . Since the directory and files prepared by this software are not deleted and remain in the PC, be sure to install this version in the same directory.

For setup procedure, please see “**2-2-1. Setting up This Software.**”

2–3. GP-IB Setup Procedure

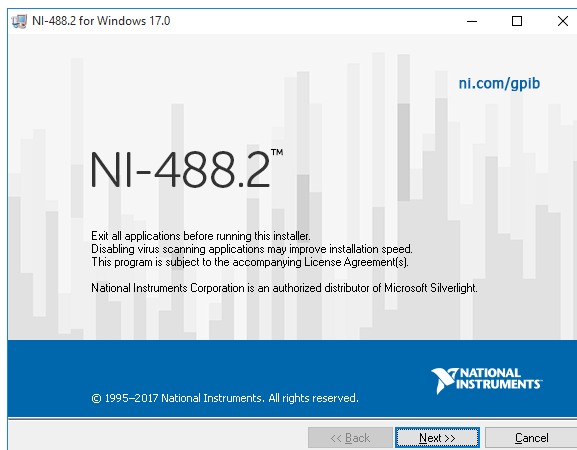
To use GP-IB as the interface for connecting the PC and measuring instrument, it is necessary that the GP-IB driver be installed in advance.

* The only GP-IB interface supported by this software is the GP-IB interface manufactured by National Instruments as described in “**2-1-3. Interface.**” No other GP-IB interface operates correctly.

* The operation screen differs depending on the GP - IB driver version.

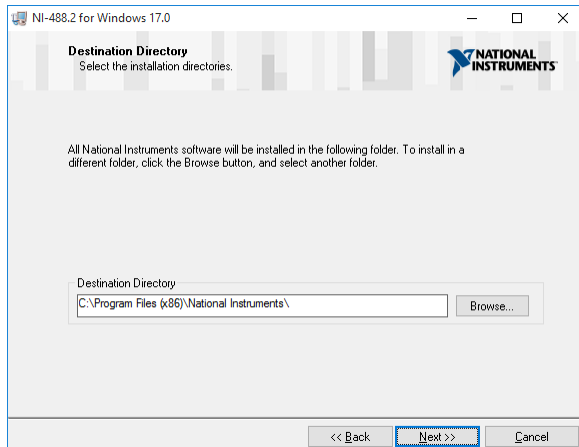
[Operation Procedure]

- 1 . Terminate all applications.
- 2 . Insert the GP-IB CD-ROM into the CD-ROM drive.
- 3 . The setup program will start up



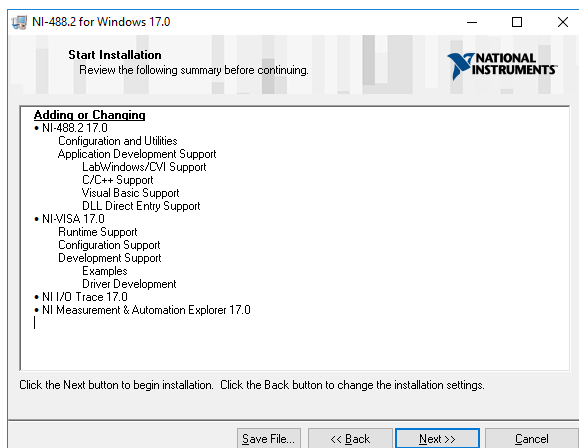
Click the [Next >>] button.

4. To change the location of installation on the selection screen for installation folder, click [Browse...] button to select the installation folder.

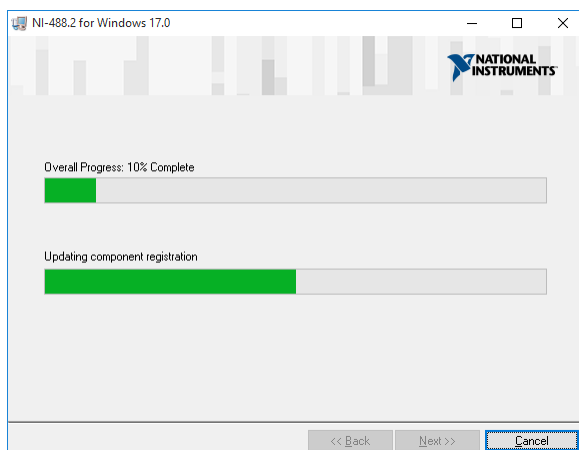


Click the [Next >>] button.

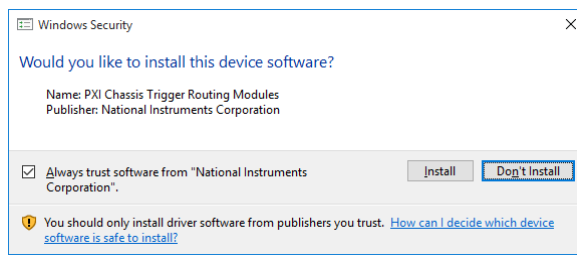
5. When preparation for installation has been made, click [Next >>] button to start installation.



6. The indicator until installation completion and the name of file being copied are displayed.

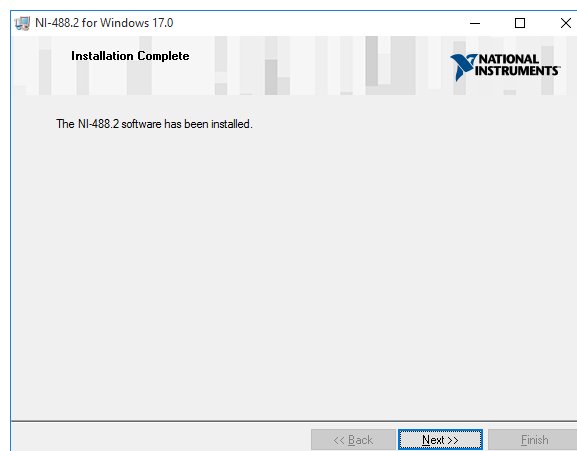


7. Windows Security window is displayed depending on OS setting.



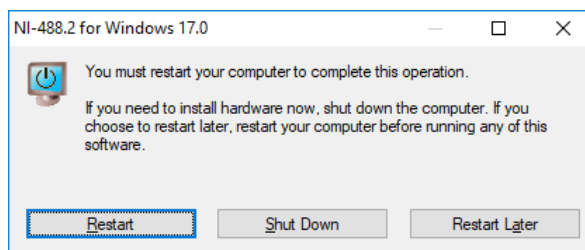
Click the [Install] button.

8. When the indicator reaches 100% and the screen below is displayed, installation is completed.



Click the [Next >>] button.

9. Restart the Windows when installation is completed.



2 – 4 . USB Setup Procedure

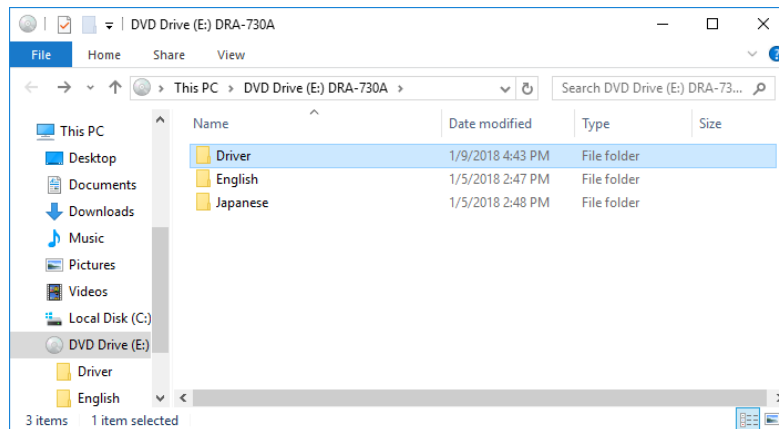
When using DRA-30A by connecting with the PC via USB interface, it is necessary that the USB driver be installed. Install the USB driver according to the following procedure before using.

Caution

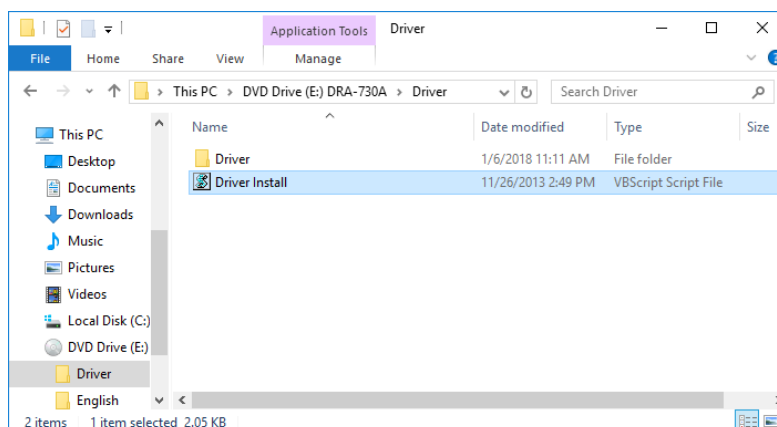
Log in as a user with Administrator authority.
Exit all active applications, if any.

[Operation Procedure]

- 1 . Start up your PC.
- 2 . Insert the Setup CD into the CD-ROM drive.
- 3 . Open the Setup CD.

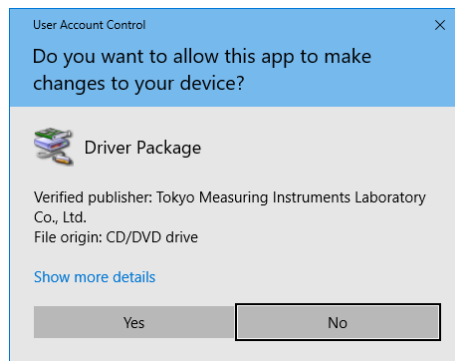


- 4 . Open a folder with the name of a measuring instrument you use in the Driver folder.



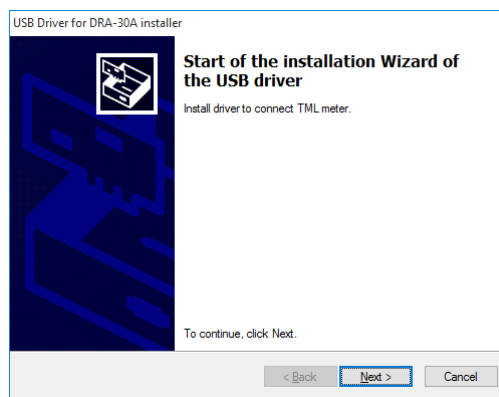
- 5 . Double-click Driver Install.

6 . When [User Account Control] appears, click [Yes] button.



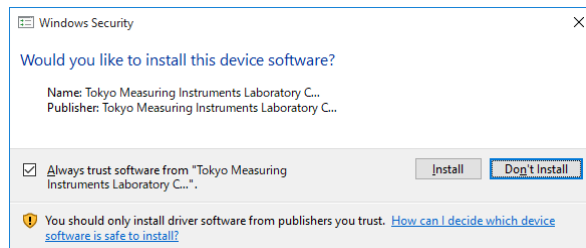
The driver installation process starts.

[Start of the Installation Wizard of the USB driver] appears.

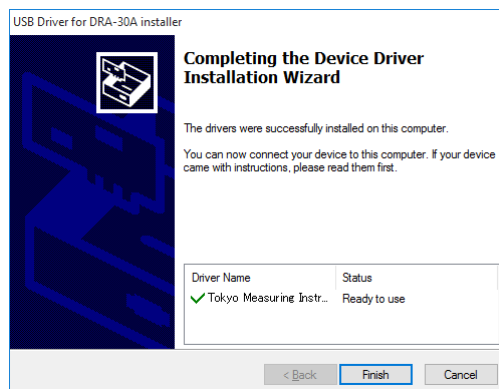


Click [Next>] button.

When [Windows Security] appears, click [Install] button.



[Completing the Device Driver Installation Wizard] appears.



Click [Finish] to finish the USB driver installation process.

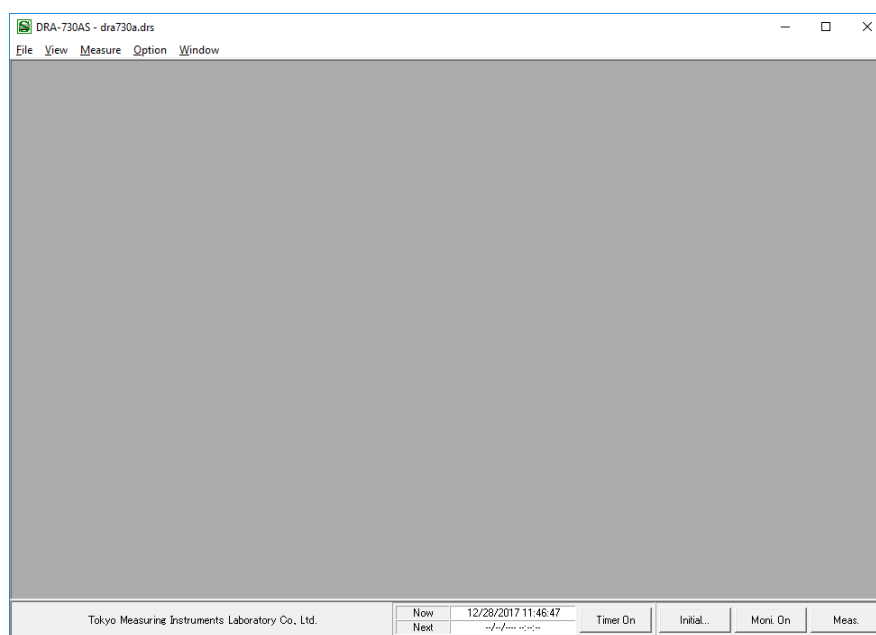
3. Startup and Exit

3—1. Starting up Static Measurement Software (DRA-730AS)

Static measurement software (DRA-730AS) is started.

[Operation Procedure]

1. Click [Start] - [All Programs (P)] - [Data Recording Software DRA-730A] - [Static Measurement Software DRA-730AS].
2. Static measurement software DRA-730AS will start.

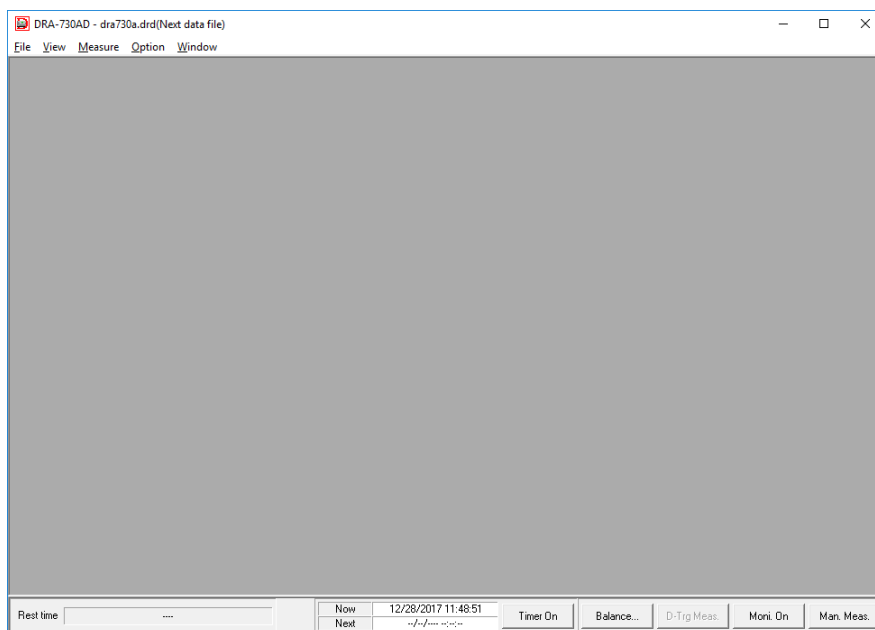


3—2. Starting up Dynamic Measurement Software (DRA-730AD)

Dynamic measurement software (DRA-730AD) is started.

[Operation Procedure]

1. Click [Start] - [All Programs (P)] - [Data Recording Software DRA-730A] - [Dynamic Measurement Software DRA-730AD].
2. Dynamic measurement software DRA-730AD will start.



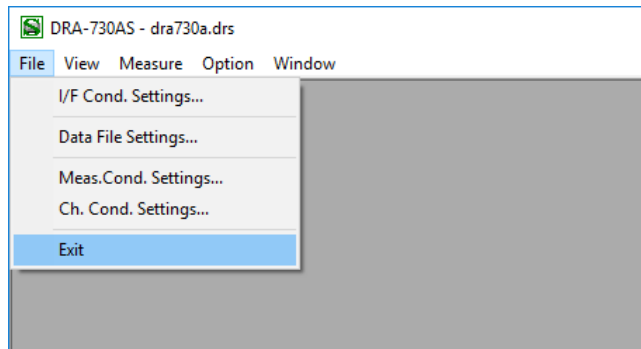
3—3. Exit Procedure

3—3—1. Procedure to Exit Static Measurement Software (DRA-730AS)

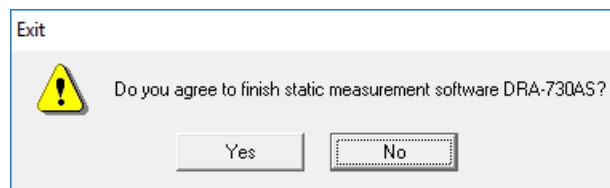
Static measurement software (DRA-730AS) is exited.

[Operation Procedure]

- 1 . Click [File]—[Exit].



- 2 . A confirmation message will be displayed.



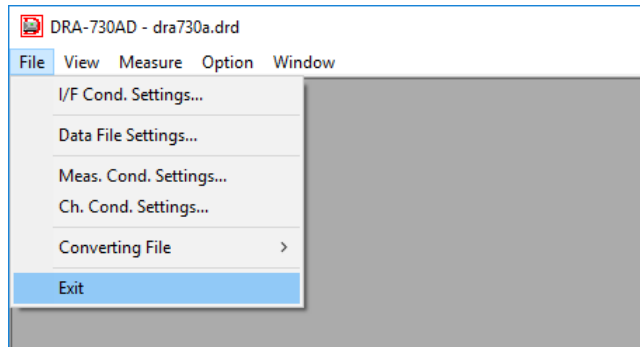
- 3 . Click the [Yes] button to exit from this software.

3—3—2. Procedure to Exit Dynamic Measurement Software (DRA-730AD)

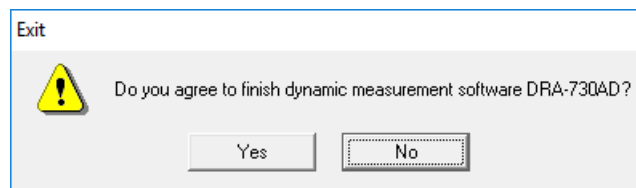
Dynamic measurement software (DRA-730AD) is exited.

[Operation Procedure]

- 1 . Click [File] - [Exit].



- 2 . A confirmation message will be displayed.



- 3 . Click the [Yes] button to exit from this software.

4. Static Measurement Software (DRA-730AS)

4-1. Setting Up

I/F conditions, the names of the folder to save the measurement data and measurement data file, measurement conditions and channel conditions are set up.

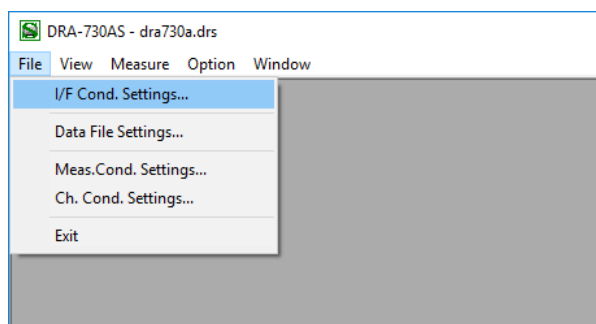
Settings cannot be changed during manual measurement or timer measurement.

4-1-1. Setting up the I/F Conditions

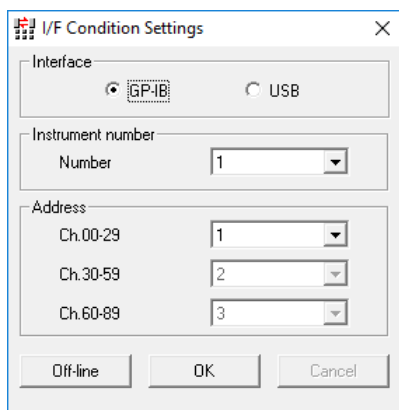
“GP-IB” or “USB” and the number of DRA-30A units to be connected are set up.

[Operation Procedure]

1. Click [File] - [I/F Cond. Settings...].

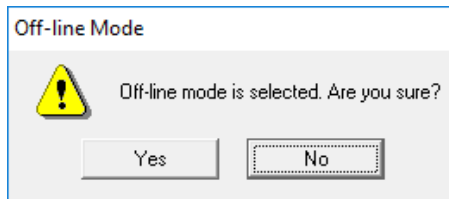


2. “I/F Condition Settings” dialog will be displayed.



| Setting Item | Description |
|-------------------|--|
| Interface | Selects the interface to be used from GP-IB/USB. |
| Instrument number | Selects the number of DRA-30A units to be connected. It is possible to connect up to 3 units. |
| Address | Sets up the address of DRA-30A. Match with the address number for the rotary switch on the front surface of DRA-30A. When connecting several units, set up so that the addresses do not overlap. |

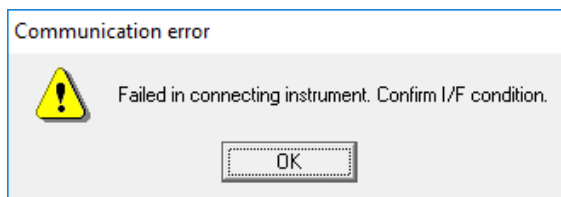
3. To execute off-line process such as checking the saved measurement data without connecting DRA-30A, click [Off line] button. A confirmation message will be displayed.



4. When [Yes] button is clicked, the software starts operating in off-line process mode. To connect DRA-30A and take measurements from off-line process mode, execute "I/F Condition Settings" again.
5. When [OK] button is clicked, the following message is displayed and whether DRA-30A is connected properly is checked.



6. If DRA-30A is not connected properly, "Communication error" message will be displayed.

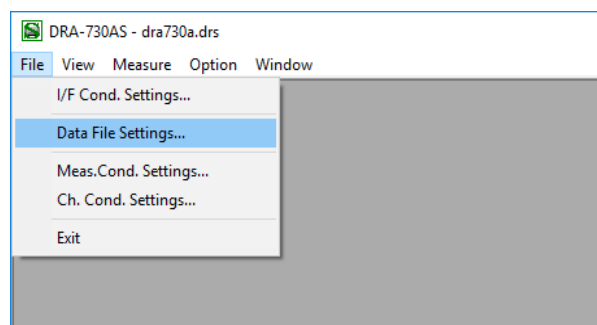


4 — 1 — 2. Setting up the Data File

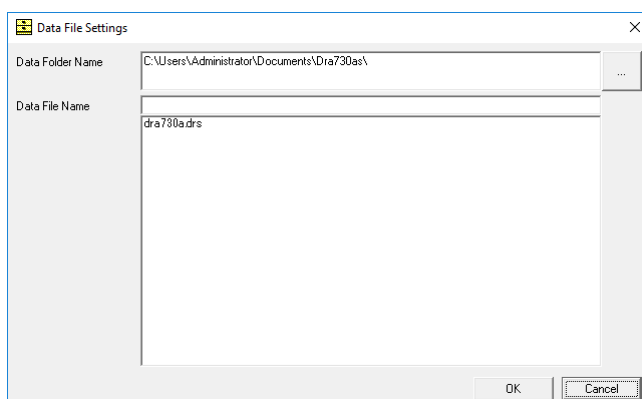
The name of the folder to save the measurement data and file name are set up.

[Operation Procedure]

- 1 . Click [File] - [Data File Settings...].



- 2 . “Data File Settings” dialog will be displayed.



| Item | Setting Description |
|------------------|--|
| Data Folder Name | Sets up the name of the folder to save the measurement data. |
| Data File Name | Sets up the file name to save the measurement data (extension is fixed to “.drs”). |

This software creates a data folder named “DRA730AS” in “My Documents” folder and a file named “Dra730a.drs” is created in it to enable measurement at startup immediately after installation.

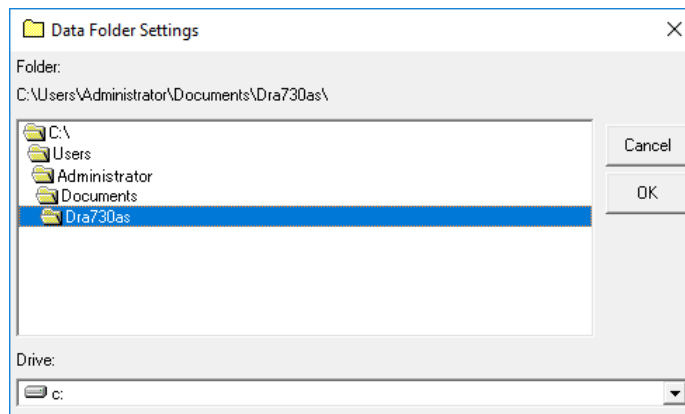
If previous data file exists, it is read to enable measurement.

When starting this software for the first time, or when no previous data file exists, “Dra730a.drs” file is automatically created to enable measurement.

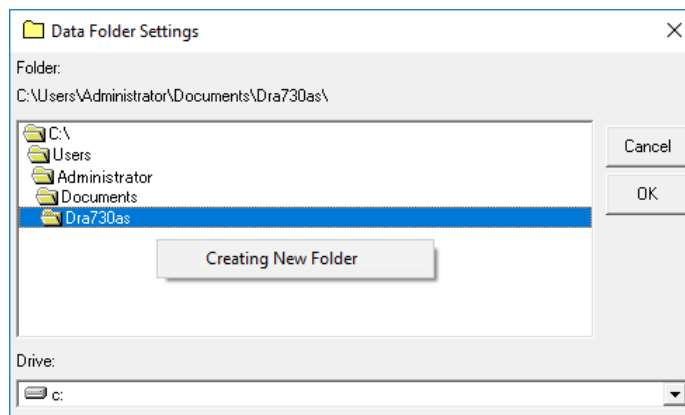
Set data file to start measurement (“Test1.drs” for example).

- If a condition that no data file exists occurs again, a suffix is appended like as “DRA730a_1.drs”.
- You cannot set “Dra730a.drs” or “DRA730a_1.drs”.

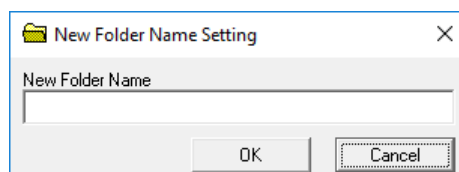
3. Click [...] button to display the “Data Folder Settings” dialog.



4. To create a new folder, bring the mouse pointer to the “Folder” list box and right-click and display the “Create a New Folder” submenu.

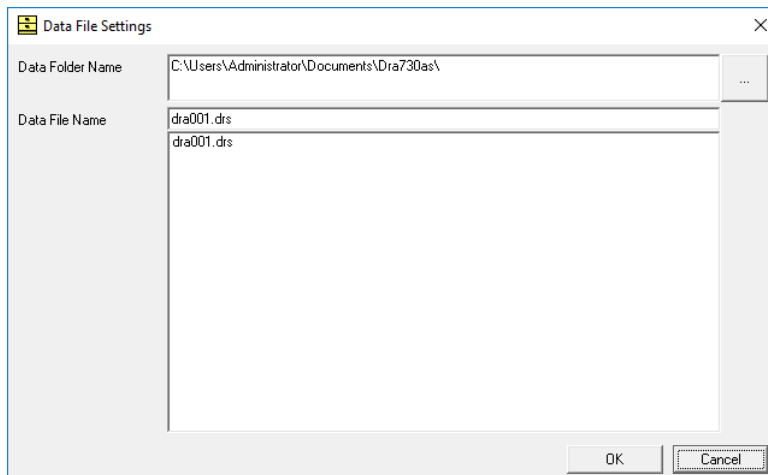


5. Click the “Create a New Folder” submenu to display the “Setup New Folder Name” dialog.



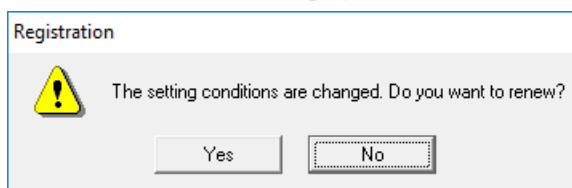
6. Input the folder name and click the [OK] button to create a new folder.

- 7 . Select the folder to save the measurement data and click [OK] button.
- 8 . The list of measurement data files in the folder specified in “Data Folder Name” will be displayed in the list box.



- 9 . Input the measurement data file name in the “Data File Name” text box or select the measurement data file name from the list box. When a measurement data file that is already saved is selected, measurement is taken by adding to the selected measurement data file.

- 1 0 . Click [OK] button to display the confirmation message.



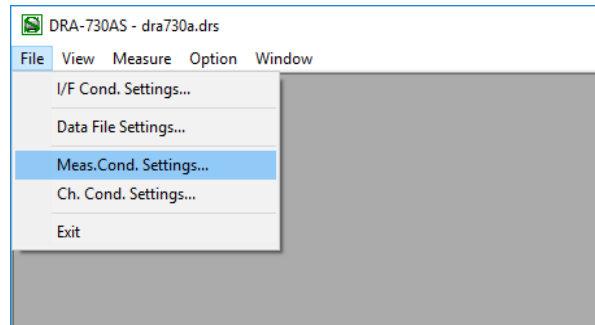
- 1 1 .Click [Yes] button to update the names of the folder to save measurement data and measurement data file.
- 1 2 .When measurement data file name is updated, a text data file (CSV format) in the same file name is created at the same time to store the measurement data in both data files and formats in each measurement.

4 – 1 – 3. Setting up the Measurement Conditions

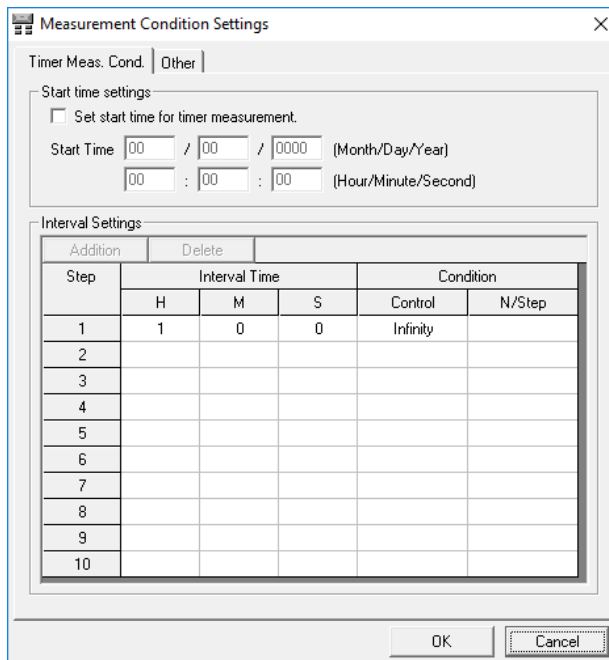
Timer measurement conditions and power supply frequency are set up.

[Operation Procedure]

- 1 . Click [File] - [Meas. Cond. Settings...].



- 2 . “Measurement Condition Settings” dialog will be displayed.



| Tab | Description |
|-------------------|---|
| Timer Meas. Cond. | The date and time of timer measurement startup and interval time are set up. It is possible to set up the interval with up to 10 steps. |
| Others | Power supply frequency is set up. |

3. Click the “Timer Meas. Cond.” tab to set up the timer measurement conditions.

Measurement Condition Settings

Timer Meas. Cond. | Other

Start time settings

☐ Set start time for timer measurement.

Start Time / / (Month/Day/Year)

: : (Hour/Minute/Second)

Interval Settings

| Step | Interval Time | | | Condition | |
|------|---------------|---|---|-----------|--------|
| | H | M | S | Control | N/Step |
| 1 | 1 | 0 | 0 | Infinity | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

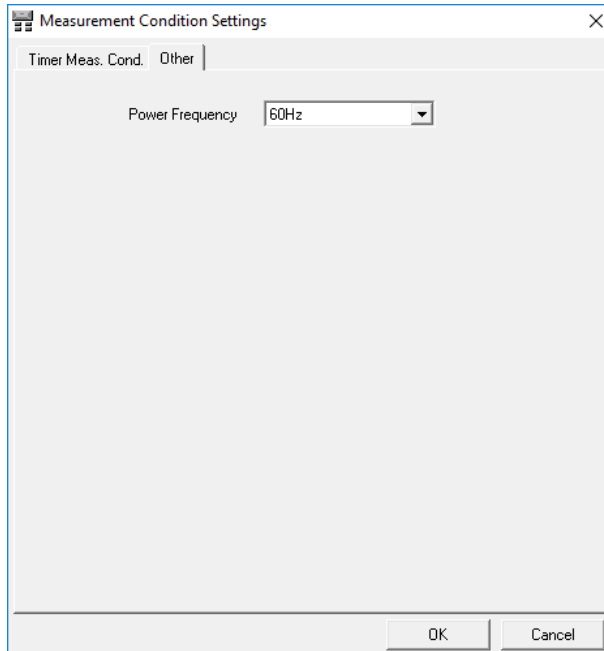
OK Cancel

| Button | Description |
|----------|---|
| Addition | Click [Add] button to add a new step. However, a new step cannot be added if the control on the final step is set to unlimited. |
| Delete | Click [Delete] button to delete the final step. |

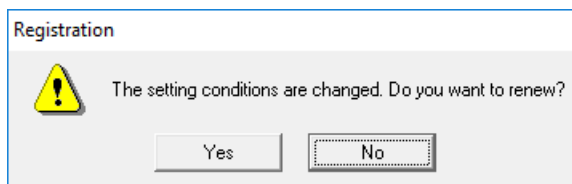
| Setting Item | | | Description |
|-----------------------------------|---------------|---------|---|
| Setting of date and time to start | | | To set up the date and time to start, check the “Set start time for timer measurement” checkbox and set up the startup date and time. |
| Interval setting | Interval Time | H | Sets up the “hour” of interval. |
| | | M | Sets up the “minute” of interval. |
| | | S | Sets up the “second” of interval. |
| | Condition | Control | Select the control from Infinity/Repeat/GOTO step. |
| | | N/Step | Sets up the number of repetition when control is set to repeat. Sets up the number of steps when control is set to GOTO step. |

Caution: The range of interval that can be set up is from 00:00:00 to 99:59:59. Continuous measurement is taken when it is set to “00:00:00.”

4. Click the “Other” tab to set up the power supply frequency. Set up the power supply frequency for the location of use in power supply frequency setting. If it is not identical to the power supply frequency at the location of use, fluctuation, etc. may occur in measurement data and proper measurement may not be taken.



5. Select the power supply frequency from 50Hz/60Hz in “Power Frequency” combo-box.
6. Click [OK] button to display the confirmation message.



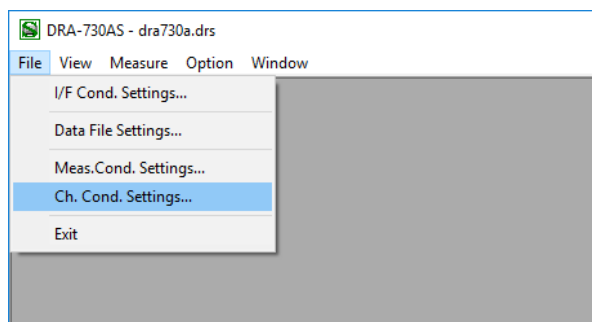
7. Click [Yes] button to update the timer condition settings and power supply frequency setting.

4 – 1 – 4. Setting up the Channel Conditions

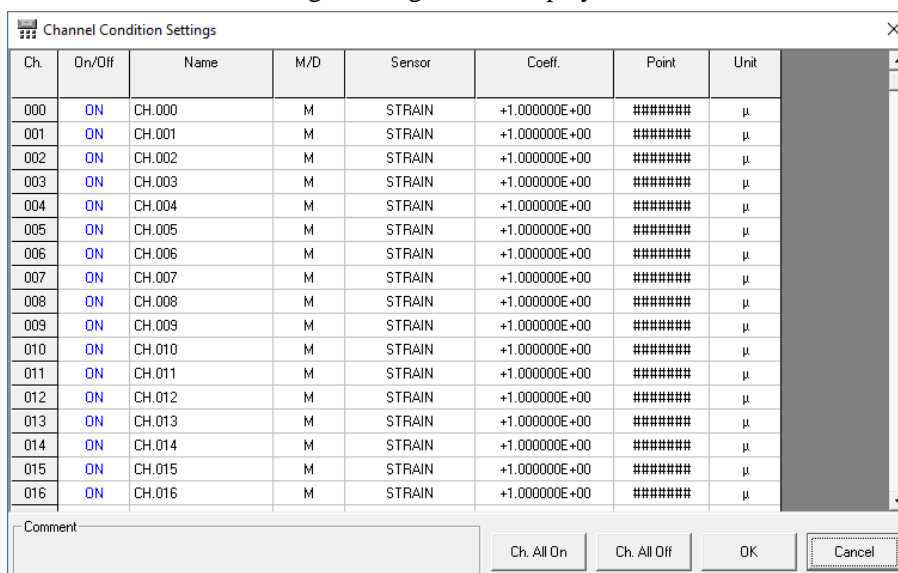
Whether each channel number is used, channel name, measurement mode (measure/direct), coefficient, point, and unit are set up.

[Operation Procedure]

- 1 . Click [File] - [Ch. Cond. Settings...].



- 2 . “Channel Condition Settings” dialog will be displayed.

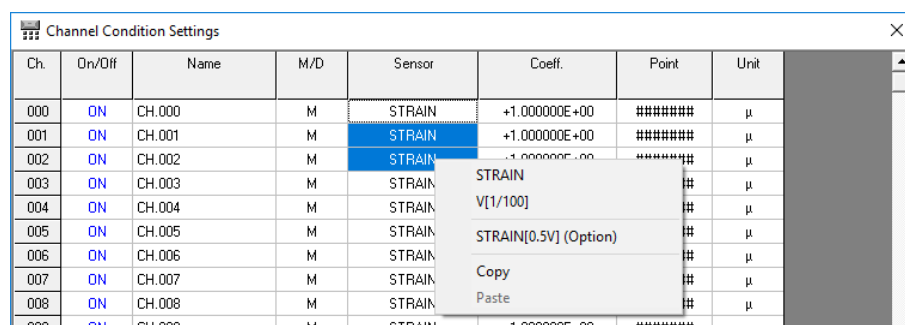


| Button | Description |
|-------------|---|
| Ch. All On | All channels are set to “On” (used). |
| Ch. All Off | All channels are set to “Off” (not used). |

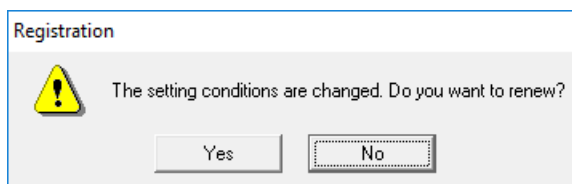
| Setting Item | Description |
|--------------|---|
| On/Off | Sets up On (used)/Off (not used) for each channel. On/Off is reversed when the cell is double-clicked. |
| Name | Sets up the name of each channel. |
| M/D | Sets up M (measure mode)/D (direct mode) for each channel. M/D is reversed when the cell is double-clicked. |
| Sensor | Sets up the sensor mode for each channel. Select the sensor mode from STRAIN/ V[1/100]/ STRAIN[0.5V]. Caution: Set up so that it is identical to the setting of mode switch on measuring instrument DRA-30A. Caution: STRAIN[0.5V] is an optional function. |
| Coeff. | Sets up the coefficient for each channel. |
| Point | Sets up the point for each channel. |
| Unit | Sets up the unit for each channel. |

For setting items of On/Off, M/D, Sensor and Point, the setting is switched when the cell is double-clicked. A submenu is selected when the cell is right-clicked, and it is also possible to select from this submenu.

- To set up several channels simultaneously, select and right-click the cell to be set up and then select from the submenu.



- Click [OK] button to display the confirmation message.



- Click [Yes] button to update the channel condition setting.

4–2. Display

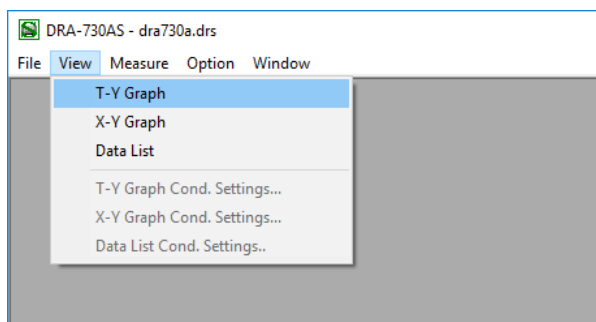
T-Y graph, X-Y graph and data list are displayed and set up.

4–2–1. T-Y Graph Display

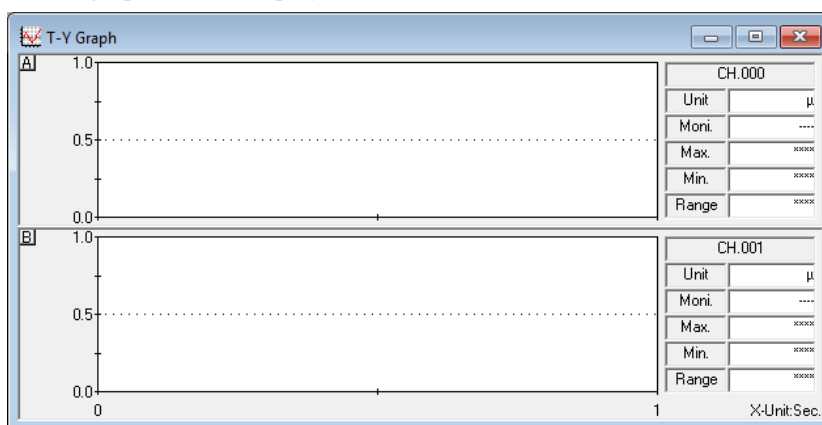
T-Y graph is displayed. Graph is plotted by setting up the measurement data as the vertical axis, and time elapsed for measurement as the horizontal axis.

[Operation Procedure]

1. Click [View] - [T-Y Graph].



2. T-Y graph will be displayed.



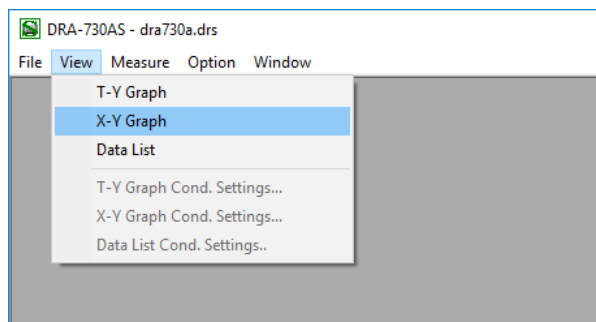
| | Description |
|-------|--|
| Unit | The unit for the channel is displayed. |
| Moni. | Monitor measurement value is displayed in value. |
| Max. | The maximum value of the measurement data from measurement startup is displayed. |
| Min. | The minimum value of the measurement data from measurement startup is displayed. |
| Range | Difference between the maximum and minimum values of the measurement data from measurement startup is displayed. |

4 – 2 – 2. X-Y Graph Display

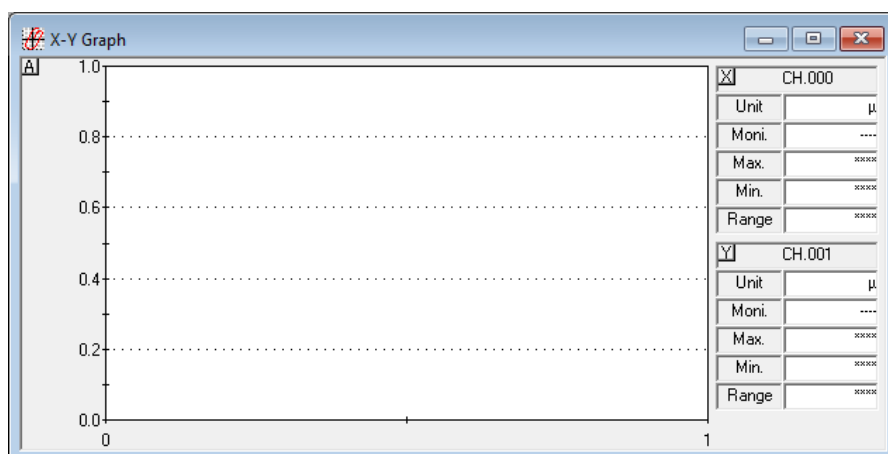
X-Y graph is displayed. Graph is plotted by setting up the measurement data on horizontal and vertical axes.

[Operation Procedure]

1. Click [View] - [X-Y Graph].



2. X-Y graph will be displayed.



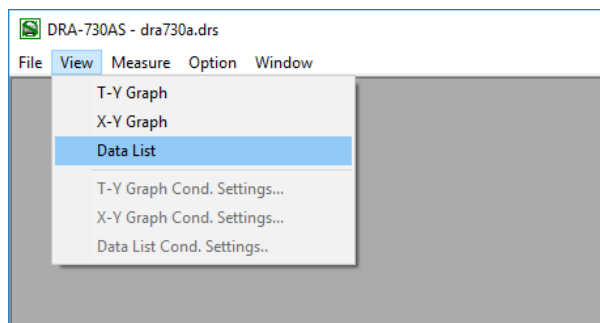
| | Description |
|-------|--|
| Unit | The unit for the channel is displayed. |
| Moni. | Monitor measurement value is displayed in value. |
| Max. | The maximum value of the measurement data from measurement startup is displayed. |
| Min. | The minimum value of the measurement data from measurement startup is displayed. |
| Range | Difference between the maximum and minimum values of the measurement data from measurement startup is displayed. |

4 – 2 – 3. Data List Display

Data list is displayed.

[Operation Procedure]

1. Click [View] - [Data List].



2. Data list will be displayed.

The screenshot shows the 'Data List' window, which contains a table with 15 rows (Steps 1 to 15) and 8 columns (Measured Time, CH.000, CH.001, CH.002, CH.003, CH.004, CH.005, CH.006). The table is currently empty, with only the headers visible. The 'Measured Time' column has a unit of μ (microseconds) below the header. The channels CH.000 through CH.006 also have a unit of μ below their respective headers. The window has a standard Windows-style title bar and a scroll bar on the right side.

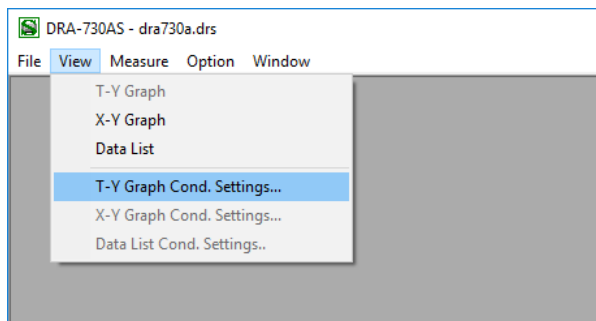
| Step | Measured Time | CH.000 | CH.001 | CH.002 | CH.003 | CH.004 | CH.005 | CH.006 |
|------|---------------|--------|--------|--------|--------|--------|--------|--------|
| 1 | | μ | μ | μ | μ | μ | μ | μ |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |

4 – 2 – 4. Setting up the T-Y Graph

T-Y graph is set up.

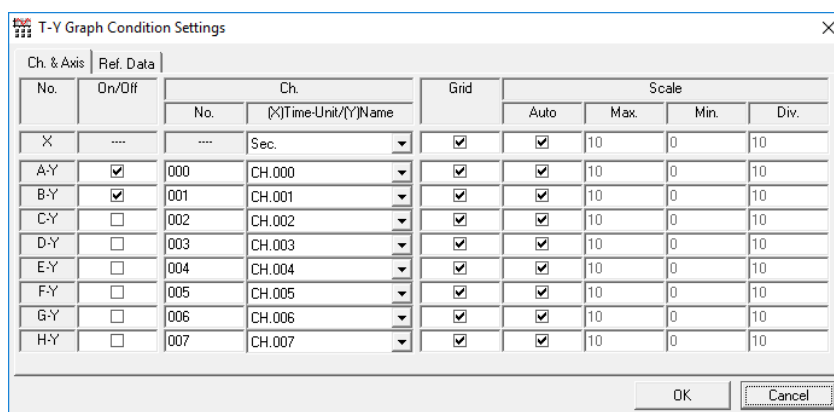
[Operation Procedure]

1. Click [View] - [T-Y Graph Cond. Settings...].



Or double-click the “T-Y Graph” screen.

2. “T-Y Graph Condition Settings” dialog will be displayed.



| Tab | Description |
|------------|--|
| Ch. & Axis | The channel number, whether grid is used on graph, whether the automatic scale is used, and maximum and minimum scales and number of divisions when automatic scale is not used for the waveform to render are set up. |
| Ref. Data | Specifies the measurement data file to be referred when rendering a stored measurement data again during offline process. However, the data file to be referred is limited to data files stored in the hard disk. |

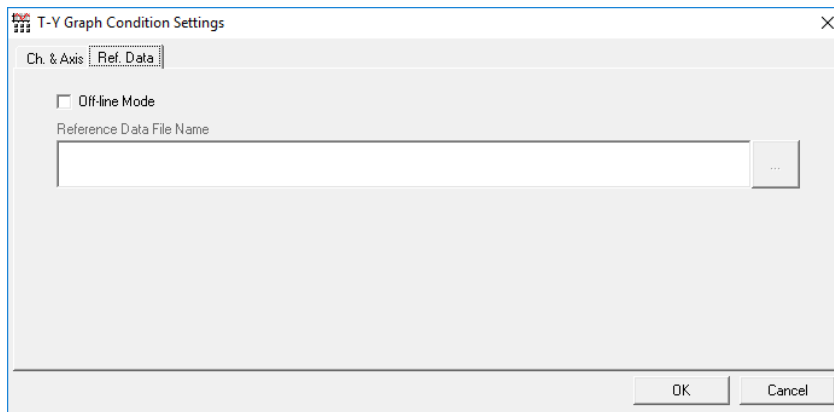
3. Click the “Ch. & Axis” tab to set up the channel number, use of grid on graph, use of automatic scale, etc. for the waveform to be rendered.

| Ch. & Axis | | Ref. Data | | Ch. | | Grid | Scale | | | |
|------------|-------------------------------------|-----------|----------------------|-----|--|-------------------------------------|-------------------------------------|------|------|----|
| No. | On/Off | No. | [X]Time-Unit/[Y]Name | | | Auto | Max. | Min. | Div. | |
| X | ---- | ---- | Sec. | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| A-Y | <input checked="" type="checkbox"/> | 000 | CH.000 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| B-Y | <input checked="" type="checkbox"/> | 001 | CH.001 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| C-Y | <input type="checkbox"/> | 002 | CH.002 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| D-Y | <input type="checkbox"/> | 003 | CH.003 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| E-Y | <input type="checkbox"/> | 004 | CH.004 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| F-Y | <input type="checkbox"/> | 005 | CH.005 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| G-Y | <input type="checkbox"/> | 006 | CH.006 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| H-Y | <input type="checkbox"/> | 007 | CH.007 | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |

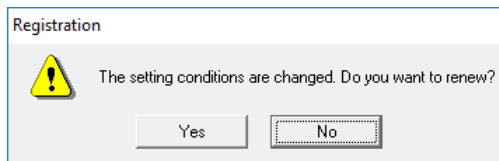
OK Cancel

| Setting Item | | Description |
|--------------|---------|--|
| On/Off | | Which of the graphs A to D is displayed is selected. |
| Ch. | X | The time unit for X axis is selected from Sec/Min/Hour/step. |
| | (A~H)-Y | The channel number for Y axis is set up. |
| Grid | | Whether grid is used or not is selected. |
| Scale | Auto | Whether automatic scale is used or not is selected. |
| | Max. | When automatic scale is not used, the maximum value for the scale is set up. |
| | Min. | When automatic scale is not used, the minimum value for the scale is set up. |
| | Div. | When automatic scale is not used, the number of divisions for the scale is set up. |

- Click the “Ref. Data” tab to set up the reference data.



- Check the “Off-line Mode” checkbox and click the [...] button to display the “Open” dialog.
- Select the measurement data file (*.drs) to be rendered and click [OK] button.
- When the [OK] button is clicked, a confirmation message will be displayed.



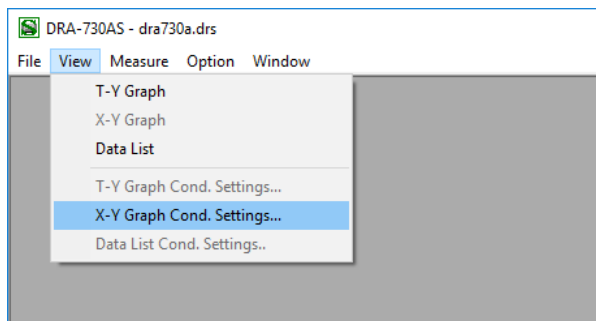
- Click [Yes] button to update the T-Y graph condition settings.

4 – 2 – 5. Setting up the X-Y Graph

X-Y graph is set up.

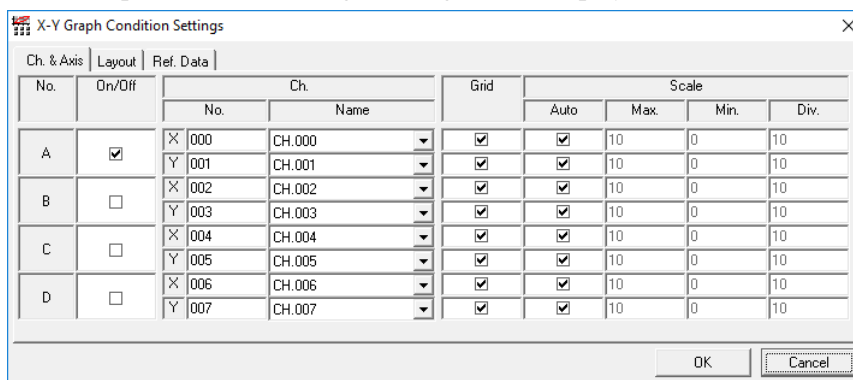
[Operation Procedure]

1. Click [View] - [X-Y Graph Cond. Settings...].



Or double-click the “X-Y Graph” screen.

2. “X-Y Graph Condition Settings” dialog will be displayed.



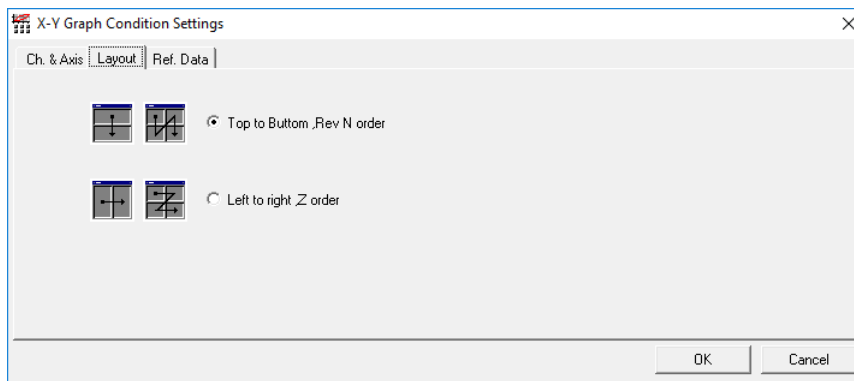
| Tab | Description |
|------------|--|
| Ch. & Axis | The channel number, whether grid is used on graph, whether the automatic scale is used, and maximum and minimum scales and number of divisions when automatic scale is not used for the waveform to render are set up. |
| Layout | Arrangement of graphs A, B, C, and D is set up. |
| Ref. Data | Specifies the measurement data file to be referred when rendering a stored measurement data again during offline process. However, the data file to be referred is limited to data files stored in the hard disk. |

3. Click the “Ch. & Axis” tab to set up the channel number, use of grid on graph, use of automatic scale, etc. for the waveform to be rendered.

| X-Y Graph Condition Settings | | | | | | | | | |
|------------------------------|-------------------------------------|-----|------------|-------------------------------------|-------------------------------------|-----------|------|------|--|
| Ch. & Axis | | | | Layout | | Ref. Data | | | |
| No. | On/Off | Ch. | | Grid | Scale | | | | |
| | | No. | Name | | Auto | Max. | Min. | Div. | |
| A | <input checked="" type="checkbox"/> | X | 000 CH.000 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 001 CH.001 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| B | <input type="checkbox"/> | X | 002 CH.002 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 003 CH.003 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| C | <input type="checkbox"/> | X | 004 CH.004 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 005 CH.005 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| D | <input type="checkbox"/> | X | 006 CH.006 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 007 CH.007 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |

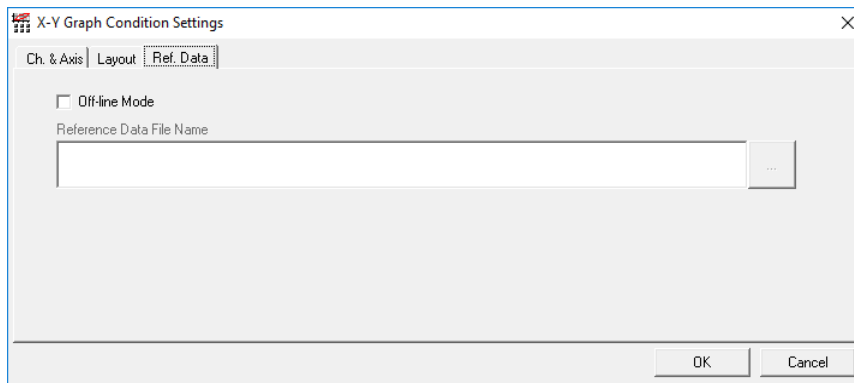
| Setting Item | | Description |
|--------------|------|--|
| ON/OFF | | Which of the graphs A to D is displayed is selected. |
| Ch. | X | Sets up the channel number for X axis. |
| | Y | Sets up the channel number for Y axis. |
| Grid | | Whether grid is used or not is selected. |
| Scale | Auto | Whether automatic scale is used or not is selected. |
| | Max. | When automatic scale is not used, the maximum value for the scale is set up. |
| | Min. | When automatic scale is not used, the minimum value for the scale is set up. |
| | Div. | When automatic scale is not used, the number of divisions for the scale is set up. |

4. Click the “Layout” tab to set up the graph arrangement method.



5. Select the graph arrangement method from “Top to Bottom, Rev N order” and “Left to right, Z order”

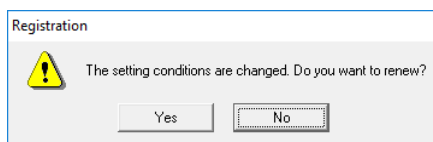
6. Click the “Ref. Data” tab to set up the reference data.



7. Check the checkbox for “Off-line Mode” and click [...] button to display the “Open” dialog.

8. Select the measurement data file to be rendered again and click the [OK] button.

9. When the [OK] button is clicked, a confirmation message will be displayed.



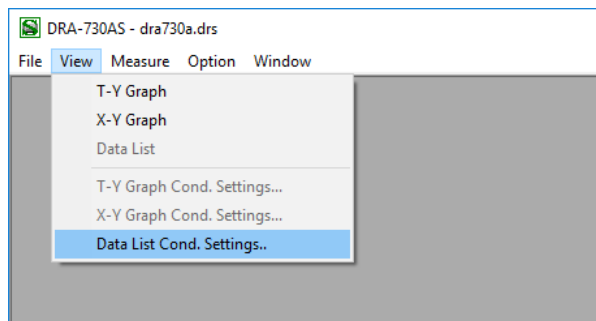
10. Click [Yes] button to update the X-Y graph condition settings.

4 – 2 – 6. Setting up the Data List

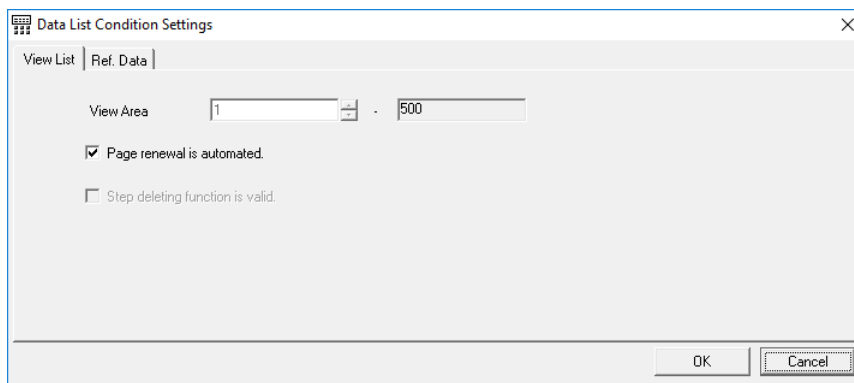
Data list is set up.

[Operation Procedure]

1. Click [View] - [Data List Cond. Settings...].

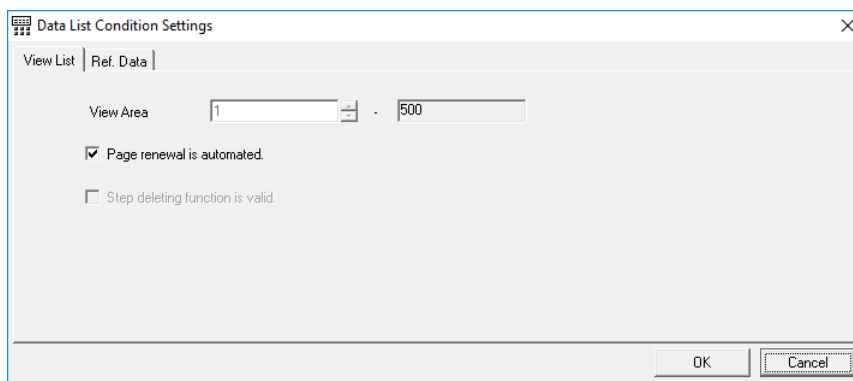


2. “Data List Condition Settings” dialog will be displayed.



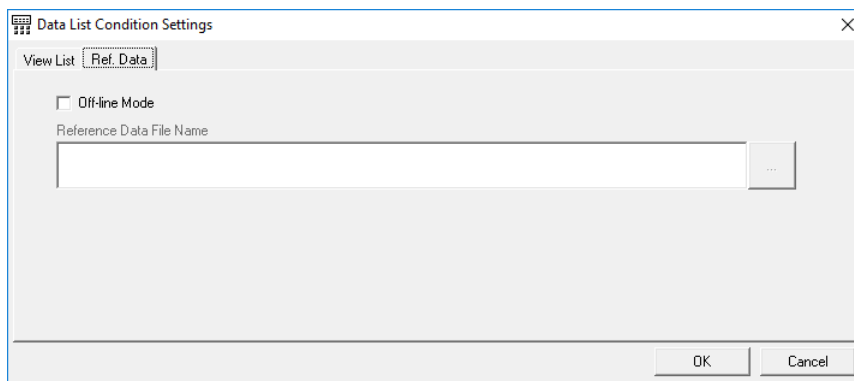
| Tab | Description |
|-----------|---|
| View List | Sets up the display range and page update to be automatic/non-automatic. |
| Ref. Data | Specifies the measurement data file to be referred when displaying the data list for stored measurement data in off-line process. |

3. Click the “View List” tab to set up the display range and whether page update is to be automatic or not.

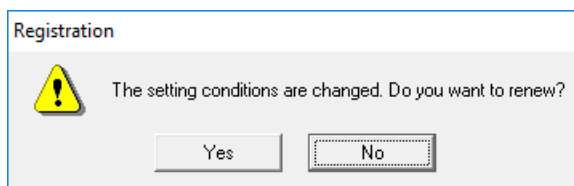


4. Set up the “View Area” in value from 1 to 500.
5. Select whether page update is to be automatic or not on “Page renewal is automated.”

6. Click the “Ref. Data” tab to set up the reference data.



7. Check the checkbox for “Off-line Mode” and click [...] button to display the “Open” dialog.
8. Select the measurement data file to be rendered again and click the [OK] button.
9. When the [OK] button is clicked, a confirmation message will be displayed.



10. Click [Yes] button to update the data list settings.

4 – 3 . Measurement

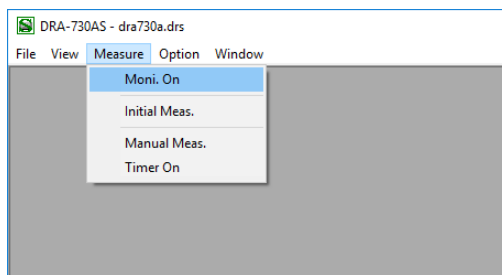
Monitor measurement, initial measurement, manual measurement or timer measurement is executed.

4 – 3 – 1 . Monitor Measurement

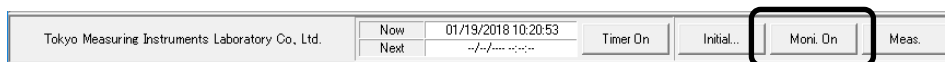
Monitor measurement is started or stopped.

[Monitor Measurement Startup Procedure]

- 1 . Click [Measure] - [Moni. On].



Or click the [Moni. On] button at the bottom of the screen.

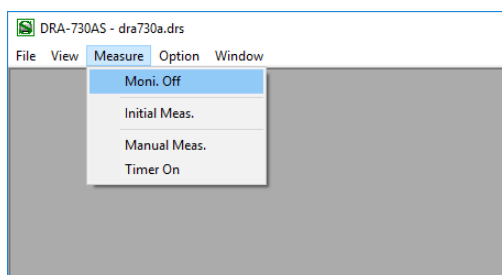


[Monitor] button display will change to [Moni. Off].

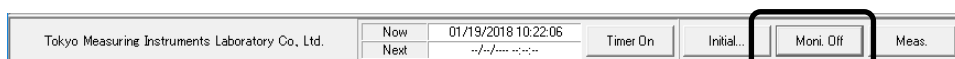
- 2 . Monitor measurement will be started.

[Monitor Measurement Stopping Procedure]

- 1 . Click [Measure] - [Moni. Off].



Or click the [Moni. Off] button at the bottom on the screen.



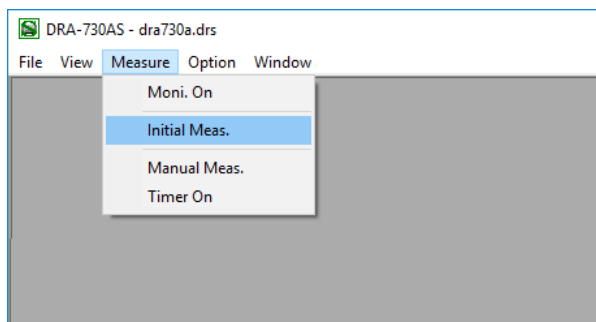
- 2 . Monitor measurement will be stopped.

4 – 3 – 2. Initial Measurement

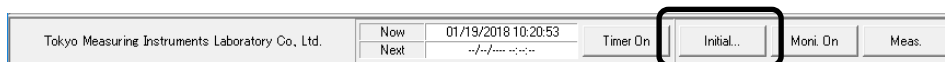
Initial value for each channel is measured. For channels set up for measure mode, the value subtracted with the initial value will be considered the measurement value in later measurements.

[Operation Procedure]

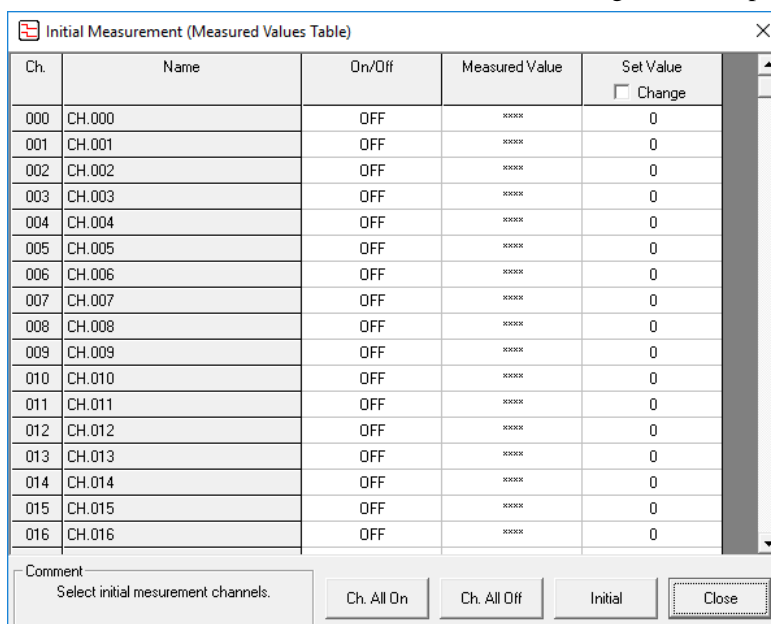
- 1 . Click [Measure] - [Initial Meas.].



Or click the [Initial...] button at the bottom of the screen.



- 2 . “Initial Measurement (Measured Values Table)” dialog will be displayed.



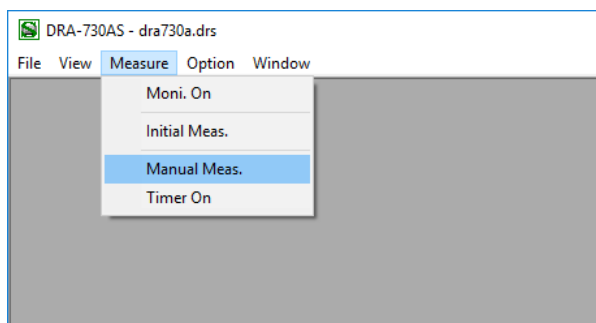
| Button | Description |
|-------------|--|
| Ch. All On | All channels are set to On. |
| Ch. All Off | All channels are set to Off. |
| Initial | Initial measurement is taken. |
| Close | “Initial Measurement (List of Measurement Values)” dialog is closed. |

4 – 3 – 3. Manual Measurement

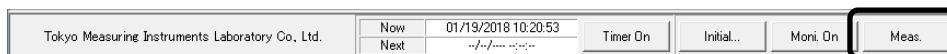
Manual measurement is executed.

[Operation Procedure]

- 1 . Click [Measure] - [Manual Meas.].



Or click the [Meas.] button at the bottom of the screen.



- 2 . Manual measurement will be executed. Measurement data will be stored in the data file set up in “Data File Setup.”

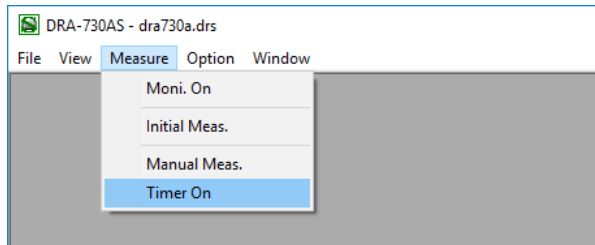
Check measurement data from T-Y graph display, X-Y graph display or data list display.

4 – 3 – 4. Timer Measurement

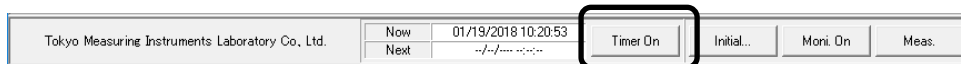
Timer measurement is executed.

[Operation Procedure]

- 1 . Click [Measure] - [Timer On].

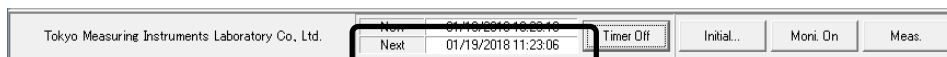


Or click the [Timer On] button at the bottom of the screen.

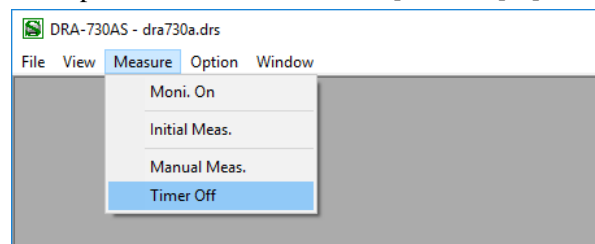


[Timer Measurement] button display will change to [Timer Off].

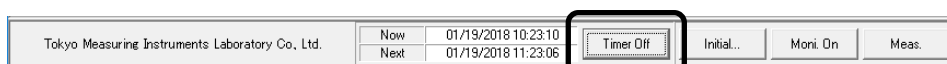
- 2 . Timer measurement will be started. From this point, continuous measurement is taken automatically according to the timer measurement condition settings.
“Time for Next Measurement” is displayed at the bottom of the screen.



- 3 . To stop timer measurement, click [Measure] - [Timer Off].



Or click the [Timer Off] button at the bottom of the screen.



- 4 . Timer measurement will be stopped.
- 5 . When measurement is executed until it reaches the step at which repeat count is set to 0 or when execution of step 10 is completed, timer measurement is completed automatically.

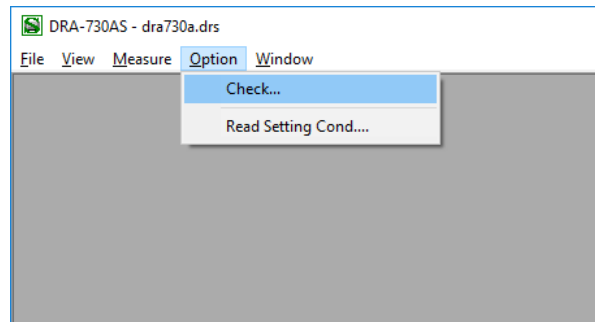
4 – 4. Options

4 – 4 – 1. Check

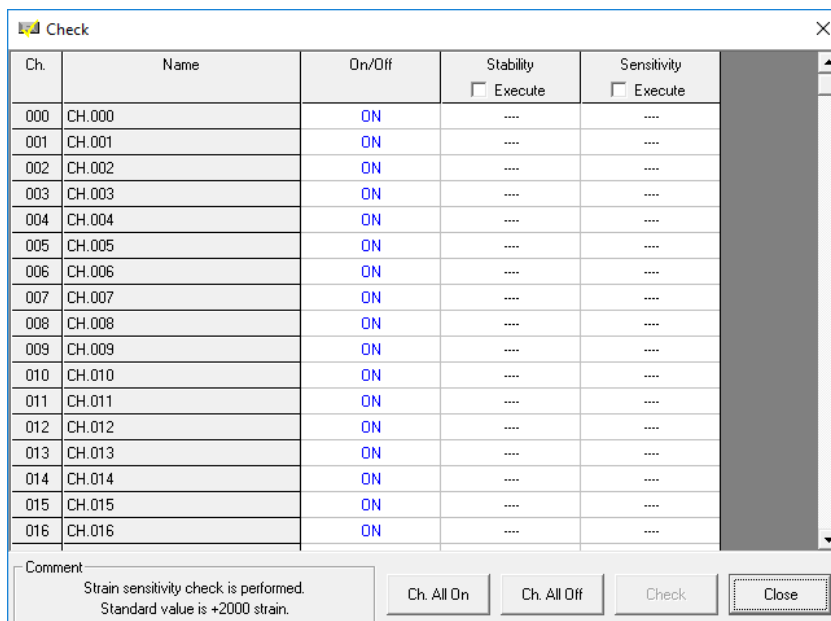
DRA-30A stability and sensitivity are checked.

[Operation Procedure]

- 1 . Click [Option] - [Check...].



- 2 . “Check” dialog will be displayed.



| Button | Description |
|-------------|---|
| Ch. All On | All channels are set to On. |
| Ch. All Off | All channels are set to Off. |
| Check | Stability and strain sensitivity are checked. |
| Close | “Check” dialog is closed. |

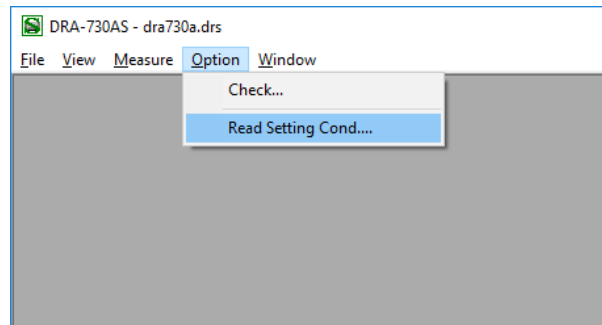
4 – 4 – 2. Read Setting Condition

Read the setting condition from data file.

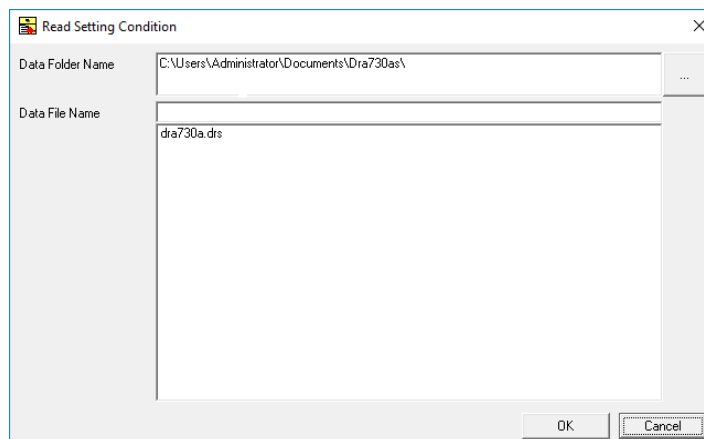
Only for files with extension ".drs" (file format peculiar to this software).

[Operation Procedure]

1. Click [Option] - [Read Setting Cond. ...].

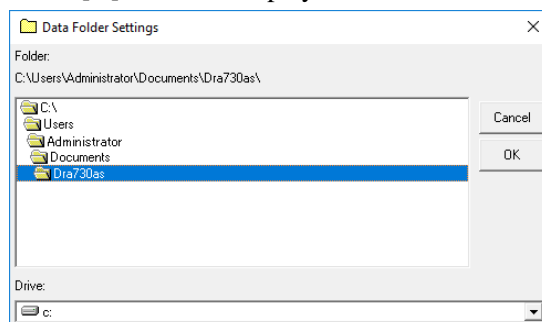


2. "Read Setting Condition" dialog will be displayed.



| Item | Setting Description |
|------------------|--|
| Data Folder Name | Sets up the folder name of the measurement data to read setting condition. |
| Data File Name | Sets up the file name of the measurement data to read setting condition. (extension is fixed to ".drs"). |

3. Click [...] button to display the "Data Folder Settings" dialog.

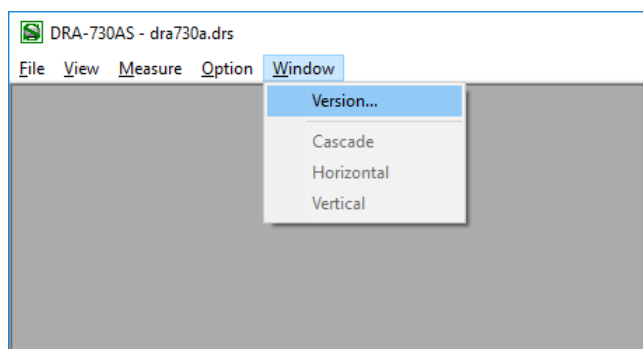


4 – 5. Version Display

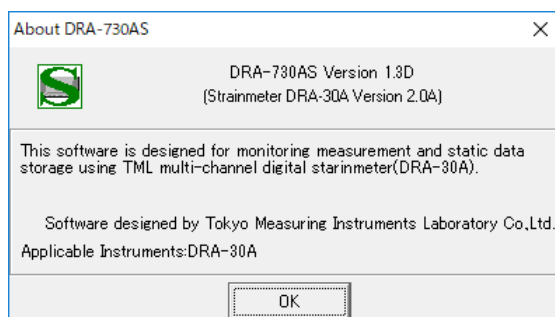
The version of this software is displayed.

[Operation Procedure]

- 1 . Click [Window] - [Version...].



- 2 . The version data for this software will be displayed.



5. Dynamic Measurement Software (DRA-730AD)

5-1. Setting up

I/F conditions, the names of the folder to save the measurement data and measurement data file, measurement conditions and channel conditions are set up.

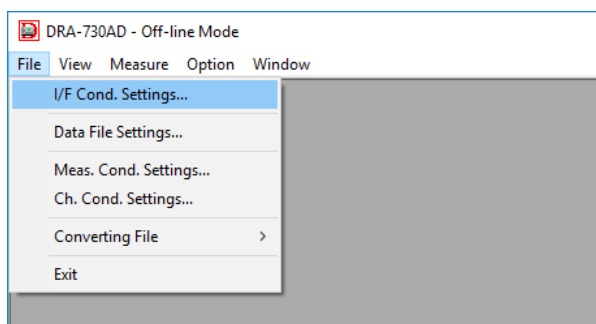
Settings cannot be changed during measurement.

5-1-1. I/F Condition Setting

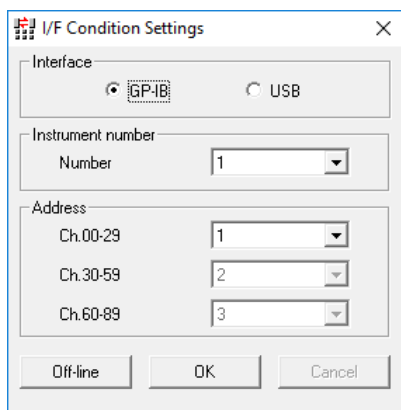
“GP-IB” or “USB” and the number of DRA-30A units to be connected are set up.

[Operation Procedure]

1. Click [File] - [I/F Cond. Settings...].

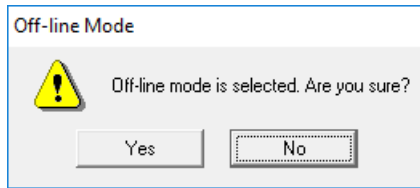


2. “I/F Condition Settings” dialog will be displayed.

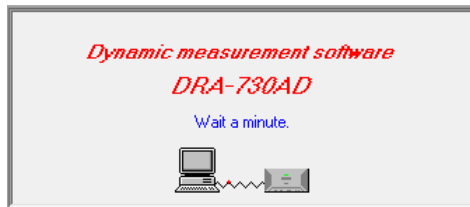


| Setting Item | Description |
|-------------------|--|
| Interface | Selects the interface to be used from GP-IB/USB. |
| Instrument number | Selects the number of DRA-30A units to be connected. It is possible to connect up to 3 units. |
| Address | Sets up the address of DRA-30A. Match with the address number for the rotary switch on the front surface of DRA-30A. When connecting several units, set up so that the addresses do not overlap. |

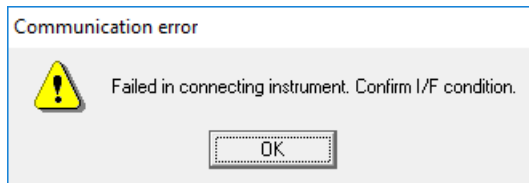
- 3 . To execute offline process such as checking the saved measurement data without connecting DRA-30A, click [Off-line] button. A confirmation message will be displayed.



- 4 . When [Yes] button is clicked, the software starts operating in off-line process mode. To connect DRA-30A and take measurements from off-line process mode, execute "I/F Condition Settings" again.
- 5 . When [OK] button is clicked, the following message is displayed and whether DRA-30A is connected properly is checked.



- 6 . If DRA-30A is not connected properly, "Communication Error" message will be displayed.

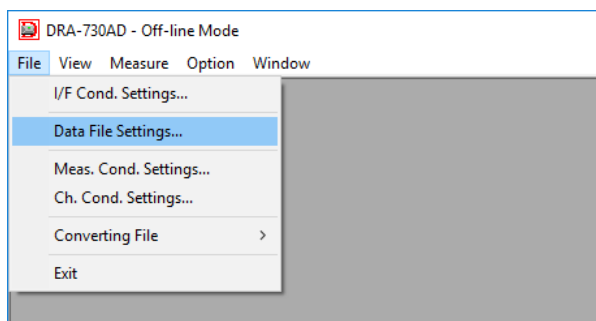


5 – 1 – 2. Setting up the Data File

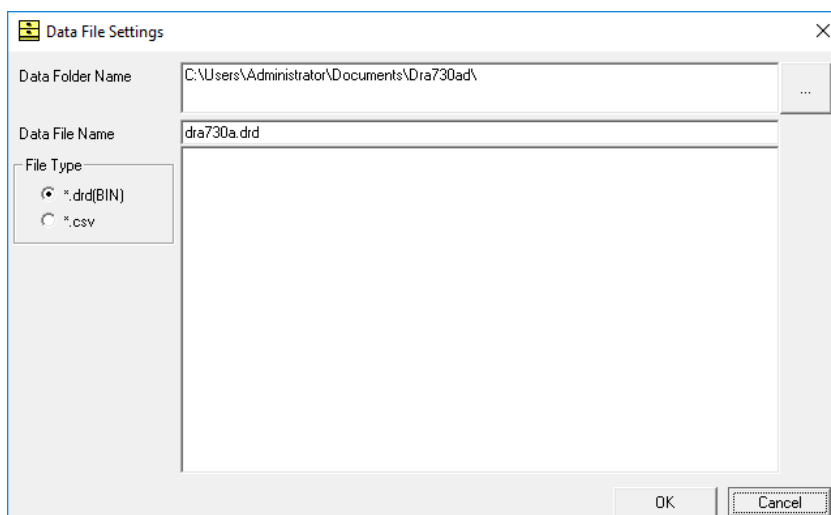
The name of the folder to save the measurement data and file name are set up.

[Operation Procedure]

- 1 . Click [File] - [Data File Settings...].



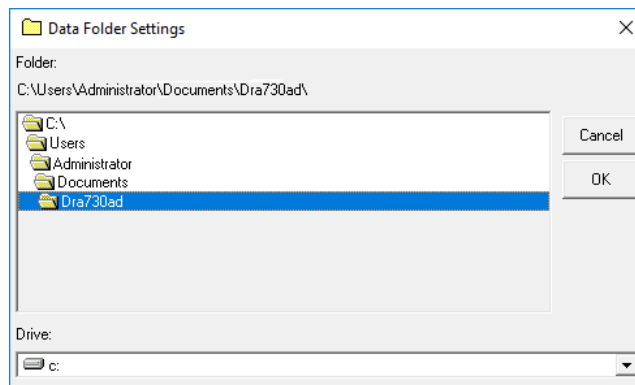
- 2 . “Data File Settings” dialog will be displayed.



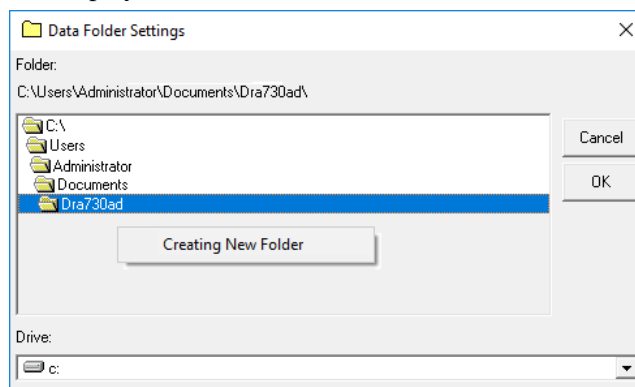
| Item | Setting Description | |
|------------------|---|---|
| Data folder name | Sets up the name of the folder to save the measurement data. | |
| Data file name | Sets up the file name to save the measurement data. | |
| File type | The file type for measurement data is selected from the following (if re-rendering of data is required in off-line process, specify *.drd (BIN)). | |
| | *.drd(BIN) | Binary format (file format specific to this software) |
| | *.csv | CSV text format |

This software creates a folder named “DRA730AD” in “My Documents” folder at startup immediately after installation.

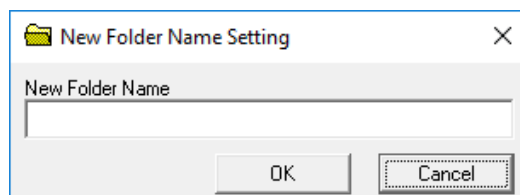
- 3 . Click [...] button to display the “Data Folder Settings” dialog.



- 4 . To create a new folder, bring the mouse pointer to the “Folder” list box and right-click and display the “Create a New Folder” submenu.

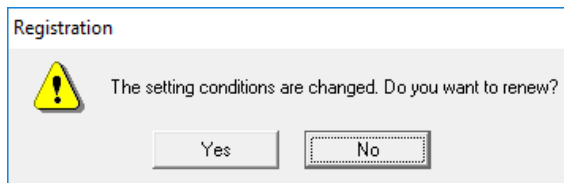


- 5 . Click the “Create a New Folder” submenu to display the “Setup New Folder Name” dialog.

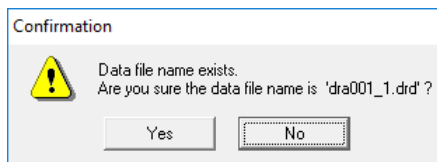


- 6 . Input the folder name and click the [OK] button to create a new folder.

- 7 . Select the folder to save the measurement data and click [OK] button.
- 8 . The list of measurement data files in the folder specified in “Data Folder Name” will be displayed in the list box.
- 9 . To make additional measurement, select the measurement data file to implement additional measurement in the list box.
- 1 0 . Click [OK] button to display the confirmation message.



- 1 1 . Click [Yes] button to display the following confirmation message when an existing data file is selected.



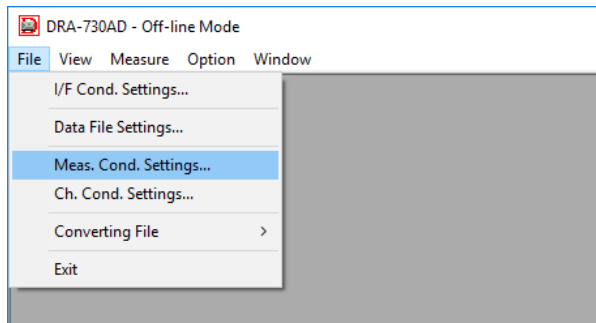
- 1 2 . Click [Yes] button to update the names of the folder to save measurement data and measurement data file.

5 – 1 – 3. Setting up the Measurement Conditions

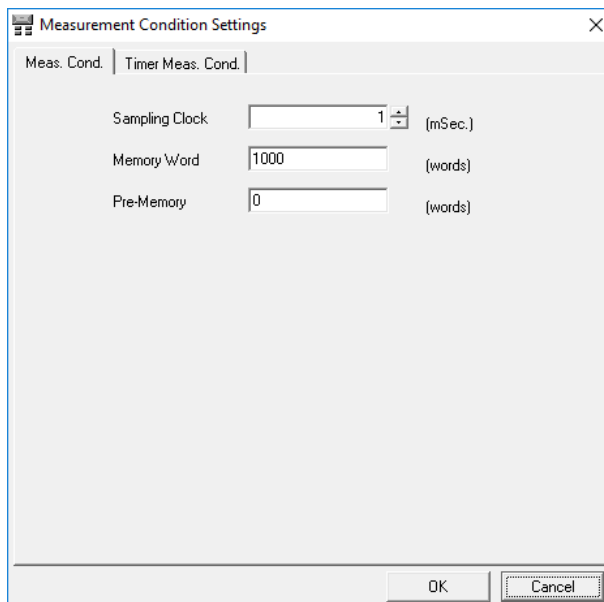
Measurement conditions and timer measurement conditions are set up.

[Operation Procedure]

- 1 . Click [File] - [Meas. Cond. Settings...].

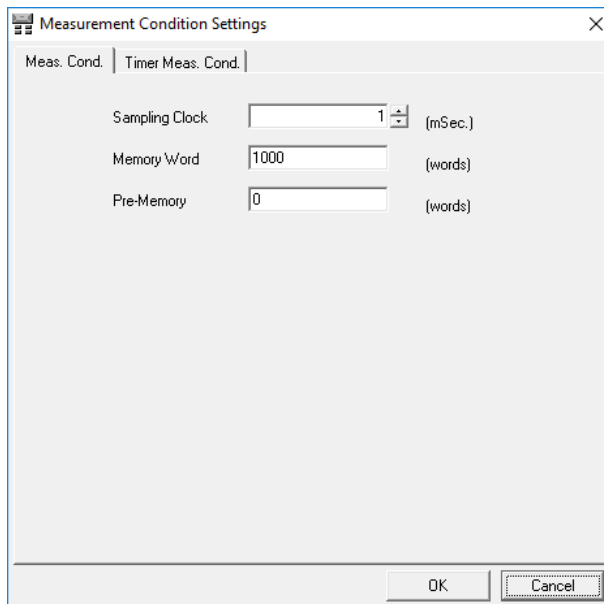


- 2 . “Measurement Condition Settings” dialog will be displayed.



| Item | Description |
|-------------------|---|
| Meas. Cond. | Sampling clock, number of recording data, and number of pre-area data are set up. |
| Timer Meas. Cond. | The interval for timer measurement is set up. It is possible to set up intervals in up to 10 steps. |

- 3 . Click the “Meas. Cond.” tab to set up the measurement conditions.



| Setting Item | Description |
|----------------|---|
| Sampling clock | Sampling clock is set up in the range of 0.1 - 32767 msec. |
| Memory word | The number of recording data is set up in the range of 1 – 114688 (word). However, the number of recording data that can be set is up to 65000 (word) when the file type is set to CSV format in “Data File Setup.” |
| Pre-memory | The number of pre-area data is set in the range of 1 – 114688 (word). However, the number of recording data that can be set is up to 65000 (word) when the file type is set to CSV format in “Data File Setup.” |

- 4 . Click the “Timer Meas. Cond.” tab to set up the timer measurement conditions.

Measurement Condition Settings

Meas. Cond. **Timer Meas. Cond.**

Interval Settings

| Step | Interval Time | | | Condition | |
|------|---------------|---|---|-----------|--------|
| | H | M | S | Control | N/Step |
| 1 | 1 | 0 | 0 | Infinity | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

Comment
Timer measurement is not data trigger measurement.

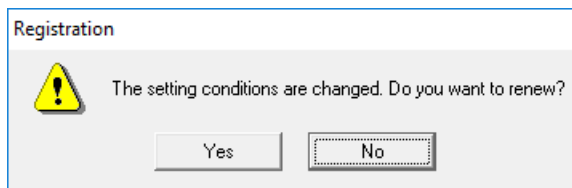
OK Cancel

| Button | Description |
|----------|--|
| Addition | Click [Add] button to add a new step. However, a new step cannot be added if the control on the final step is set to Infinity. |
| Delete | Click [Delete] button to delete the final step. |

| Setting Item | | | Description |
|------------------|---------------|---------|--|
| Interval setting | Interval Time | H | Sets up the “hour” of interval. |
| | | M | Sets up the “minute” of interval. |
| | | S | Sets up the “second” of interval. |
| | Condition | Control | Select the control from unlimited/repeat/GOTO step. |
| | | N/Step | Sets up the number of repetition when control is set to repeat. Sets up the number of steps when control is set to GOTO step. |

Caution: The range of interval that can be set up is from 00:00:00 to 99:59:59. Continuous measurement is taken when it is set to “00:00:00.”

- 5 . Click the [OK] button to display the confirmation message.



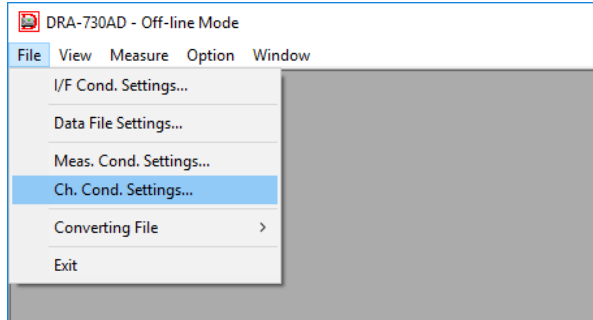
- 6 . Click [Yes] button to update the measurement condition settings and timer measurement condition settings.

5 – 1 – 4. Setting up the Channel Conditions

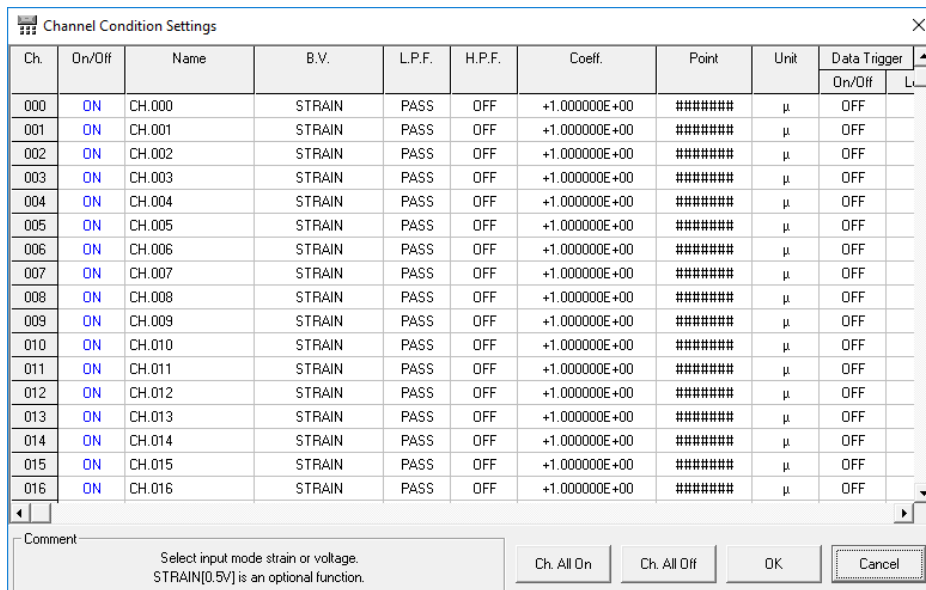
Use and name of each channel number, input mode (B.V.), low-pass filter (L.P.F), high-pass filter (H.P.F), coefficient, point, unit, data trigger, and offset are set up.

[Operation Procedure]

- 1 . Click [File] - [Ch. Cond. Settings...].



- 2 . “Channel Condition Settings” dialog will be displayed.

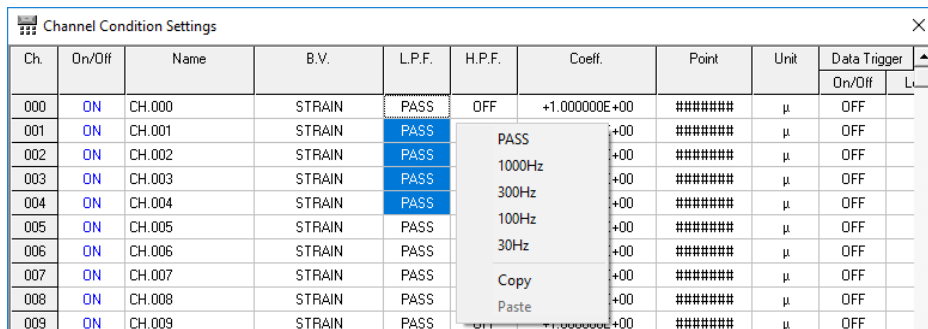


| Button | Description |
|-------------|---|
| Ch. All On | All channels are set to “On” (used). |
| Ch. All Off | All channels are set to “Off” (not used). |

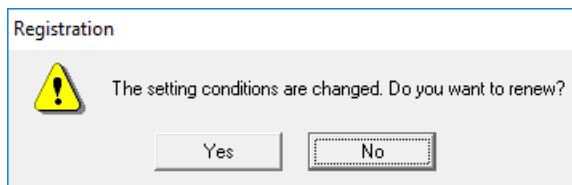
| Setting Item | | Description |
|--------------|--------|--|
| On/Off | | Sets up On (used)/Off (not used) for each channel. |
| Name | | Sets up the name of each channel. |
| B.V. | | Selects the input mode from STRAIN (strain input, bridge voltage 2V)/ VOLT (voltage input)/ STRAIN [0.5V] (strain input, bridge voltage 0.5V). Caution: STRAIN[0.5V] is an optional function. |
| L.P.F. | | Selects the low-pass filter from PASS/1000Hz/300Hz/100Hz/30Hz. |
| H.P.F. | | Selects the high-pass filter from ON/OFF. |
| Coeff. | | Sets up the coefficient for each channel. |
| Point | | Sets up the point for each channel. |
| Unit | | Sets up the unit for each channel. |
| Data trigger | On/Off | Sets up the data trigger to be ON/OFF. |
| | Level | Sets up the trigger level of the data trigger. |
| | [DRA] | This is a trigger data to be set in strainmeter. Can not be changed. |
| Offset | | Sets up the offset. |

For setting items of On/Off, B.V., L.P.F., H.P.F., Point and data trigger On/Off, the setting is switched when the cell is double-clicked. A submenu is selected when the cell is right-clicked, and it is also possible to select from this submenu.

- To set up several channels simultaneously, select and right-click the cell to be set up and then select from the submenu.



- Click [OK] button to display the confirmation message.



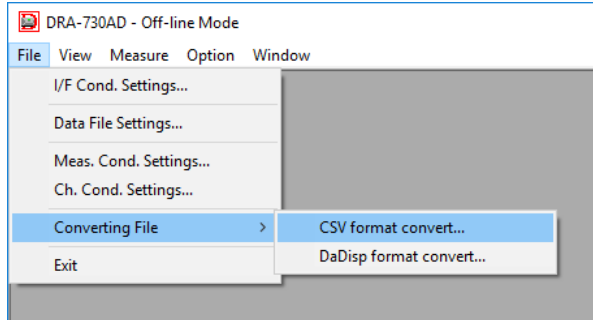
- Click [Yes] button to update the channel condition setting.

5–2. File Conversion

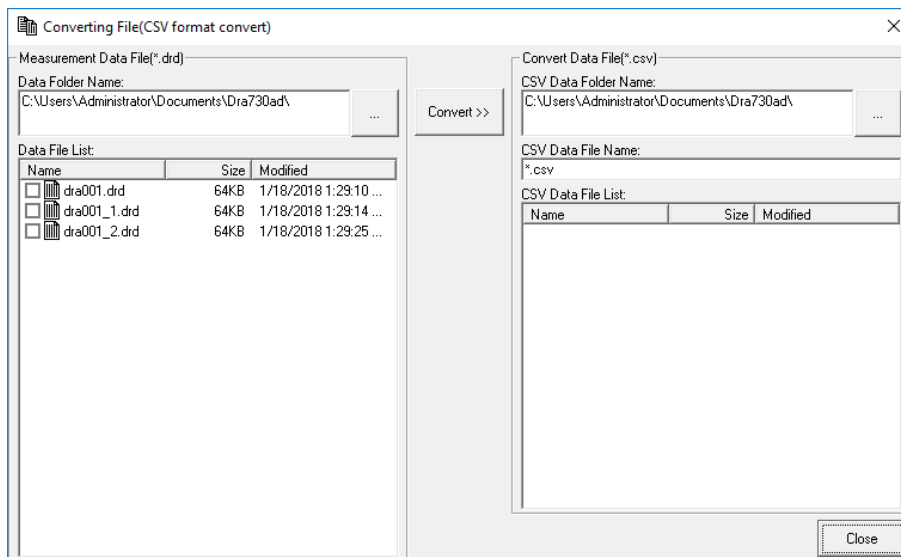
Measurement data is converted and saved in a CSV format or DaDisp format file.

[CSV File Conversion Operation Procedure]

- 1 . To save in CSV format, click [File] - [Converting File] - [CSV format convert...].

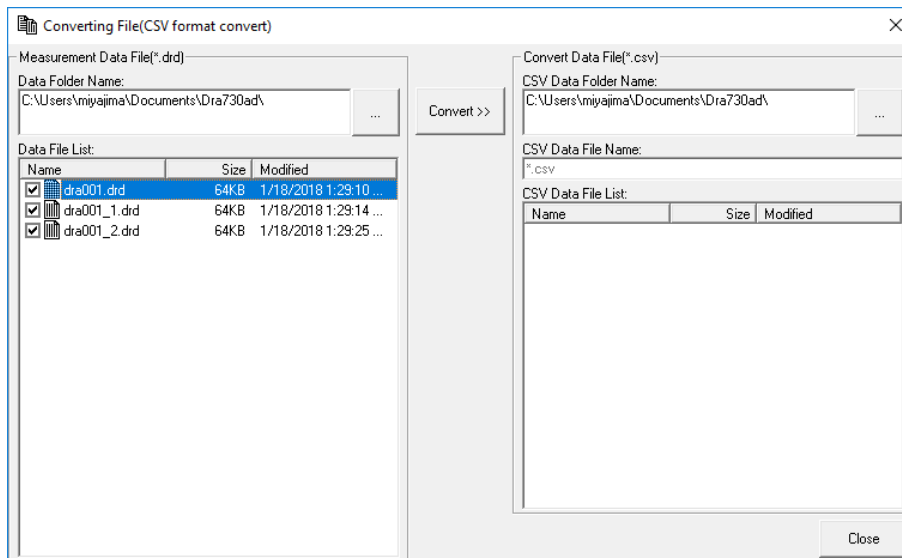


- 2 . “Converting File (CSV format convert)” dialog will be displayed.



| Button | Description |
|-----------|--|
| ... | Selects the folder in which the measurement data file is saved and the folder in which the file converted to CSV format will be saved. |
| Convert>> | Converts the measurement data file into CSV format and saves it in the specified folder under the specified file name. |
| Close | Terminates file conversion. |

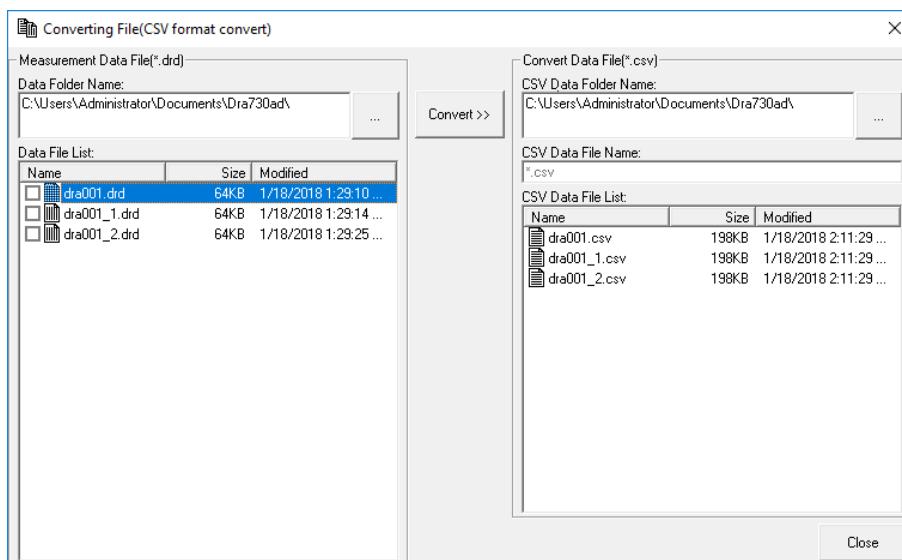
- 3 . The measurement data file to be converted is checked.



- 4 . Click [Convert>>] button to start file conversion.



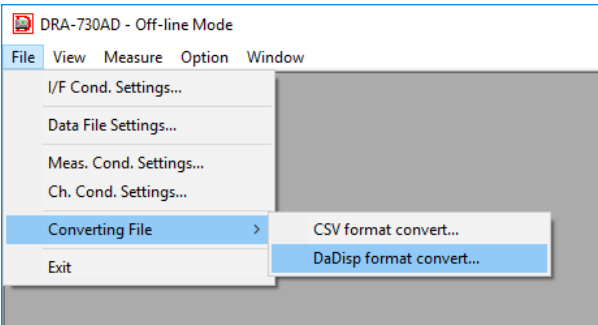
- 5 . When conversion is completed, a list of data files in CSV format is displayed.



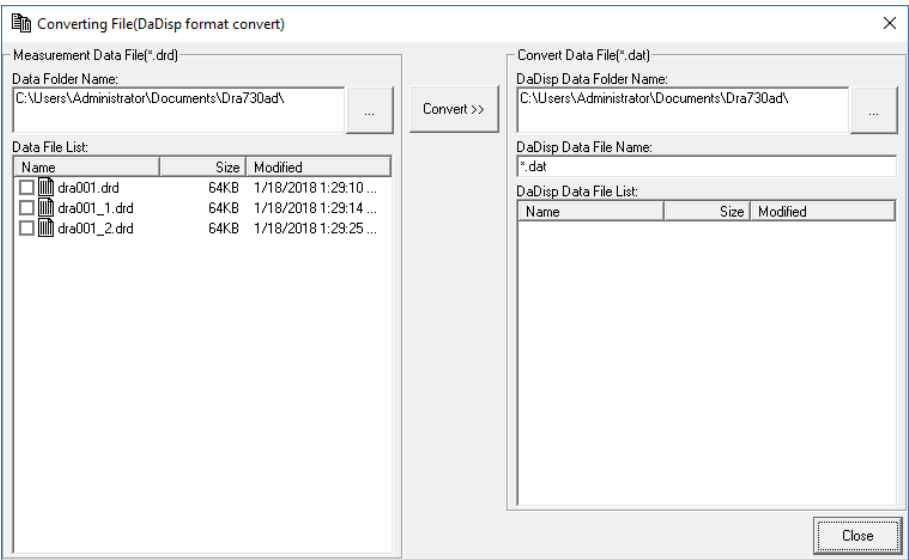
Though the file name for the converted data file is not changed from the name of the measurement data file except for the extension which is changed to ".CSV," it is possible to change the file name from "CSV Data File Name" when a single measurement data file is converted.

[DaDisp File Conversion Operation Procedure]

- 1 . To save in DaDisp format, click [File] - [Converting File] - [DaDisp format convert].

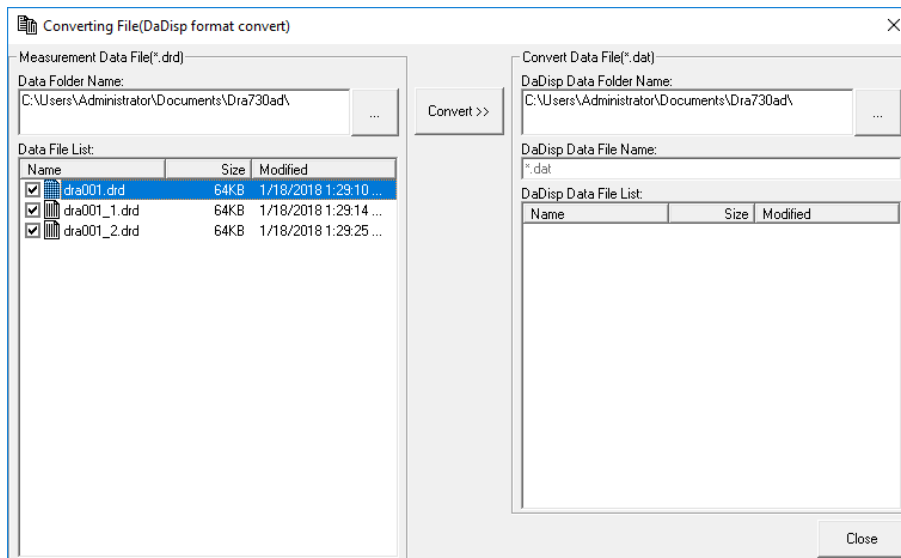


- 2 . “Converting File (DaDisp format convert)” dialog will be displayed.



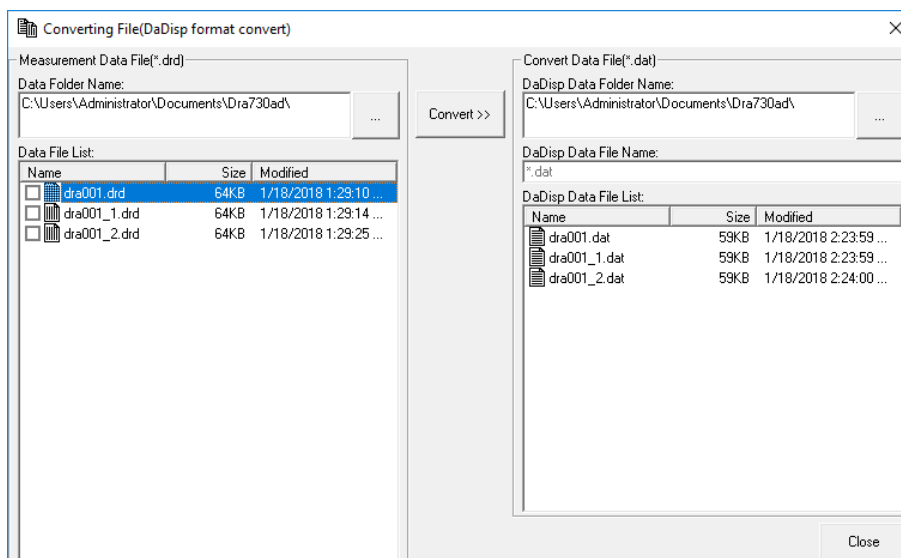
| Button | Description |
|-----------|---|
| ... | Selects the folder in which the measurement data file is saved and the folder in which the file converted to DaDisp format will be saved. |
| Convert>> | Converts the measurement data file into DaDisp format and saves it in the specified folder under the specified file name. |
| Close | Terminates file conversion. |

- 3 . The measurement data file to be converted is checked.



- 4 . Click [Convert>>] button to start file conversion.

- 5 . When conversion is completed, a list of data files in DaDisp format is displayed.



Though the file name for the converted data file is not changed from the name of the measurement data file except for the extension which is changed to ".dat," it is possible to change the file name from “DaDisp Data File Name” when a single measurement data file is converted.

5—3. Display

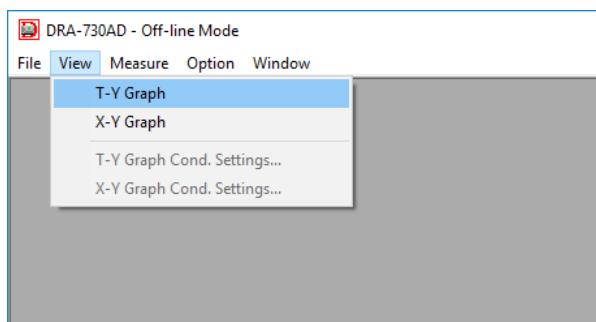
T-Y graph and X-Y graph are displayed and set up.

5—3—1. T-Y Graph Display

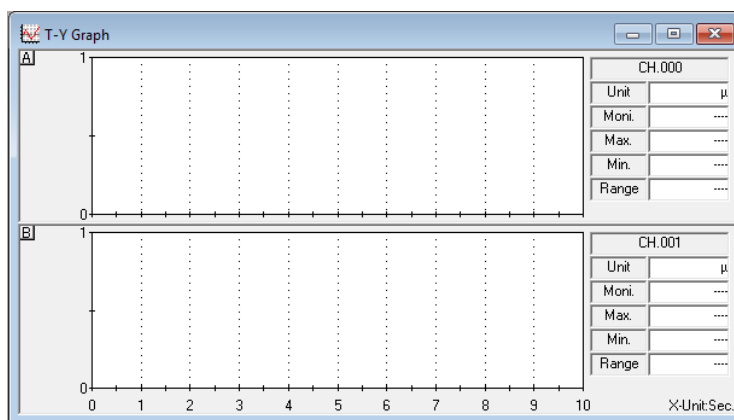
T-Y graph is displayed. Graph is plotted by setting up the measurement data as the vertical axis, and time elapsed for measurement as the horizontal axis.

[Operation Procedure]

1. Click [View] - [T-Y Graph].



2. T-Y graph will be displayed.



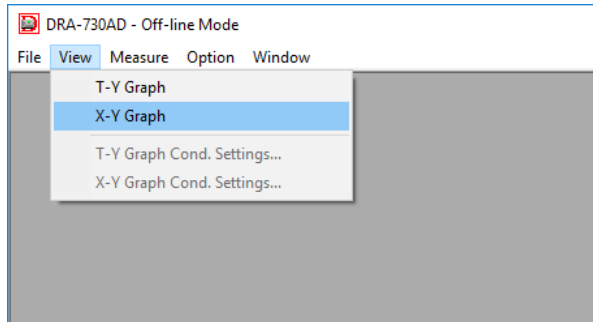
| | Description |
|-------|--|
| Unit | The unit for the channel is displayed. |
| Moni. | Monitor measurement value is displayed in value. |
| Max. | The maximum value of the measurement data from measurement startup is displayed. |
| Min. | The minimum value of the measurement data from measurement startup is displayed. |
| Range | Difference between the maximum and minimum values of the measurement data from measurement startup is displayed. |

5—3—2. X-Y Graph Display

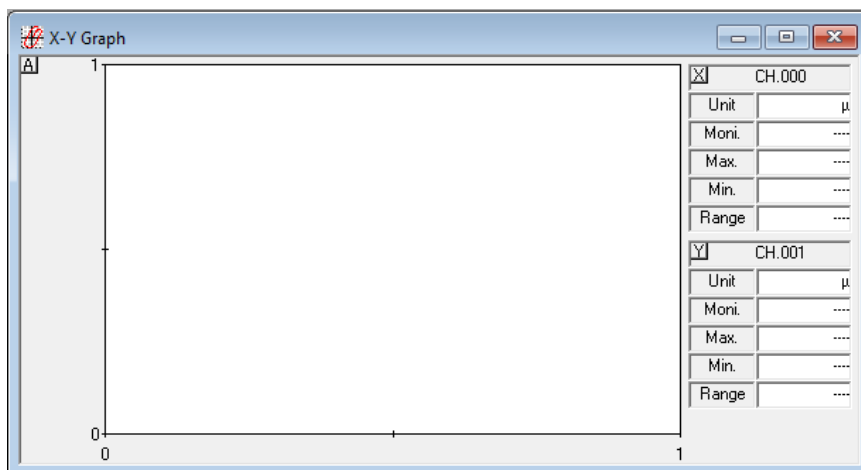
X-Y graph is displayed. Graph is plotted by setting up the measurement data on horizontal and vertical axes.

[Operation Procedure]

1. Click [View] - [X-Y Graph].



2. X-Y graph will be displayed.



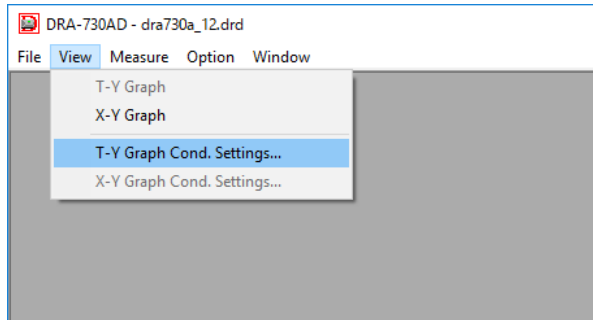
| | Description |
|-------|--|
| Unit | The unit for the channel is displayed. |
| Moni. | Monitor measurement value is displayed in value. |
| Max. | The maximum value of the measurement data from measurement startup is displayed. |
| Min. | The minimum value of the measurement data from measurement startup is displayed. |
| Range | Difference between the maximum and minimum values of the measurement data from measurement startup is displayed. |

5—3—3. Setting up the T-Y Graph

T-Y graph is set up.

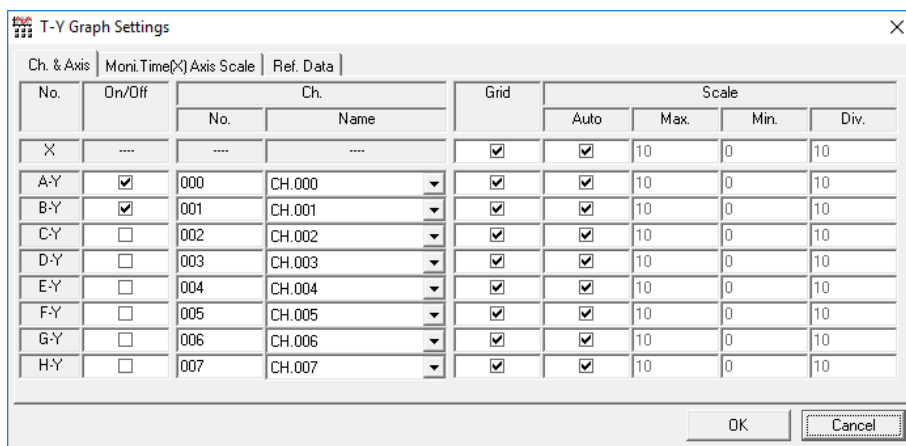
[Operation Procedure]

1. Click [View] - [T-Y Graph Cond. Settings...].



Or double-click the “T-Y Graph” screen.

2. “T-Y Graph Settings” dialog will be displayed.



| Tab | Description |
|------------------------------|--|
| Ch. & Axis | The channel number, whether grid is used on graph, whether the automatic scale is used, and maximum and minimum scales and number of divisions when automatic scale is not used for the waveform to render are set up. |
| Moni. Time (X) Axis Scale | The span, scroll pitch, number of divisions, and use of grid display for monitor time (X) axis are set up. |
| Ref. Data | Specifies the measurement data file to be referred when rendering a stored measurement data again during off-line process. However, the data file to be referred is limited to data files stored in the hard disk. |

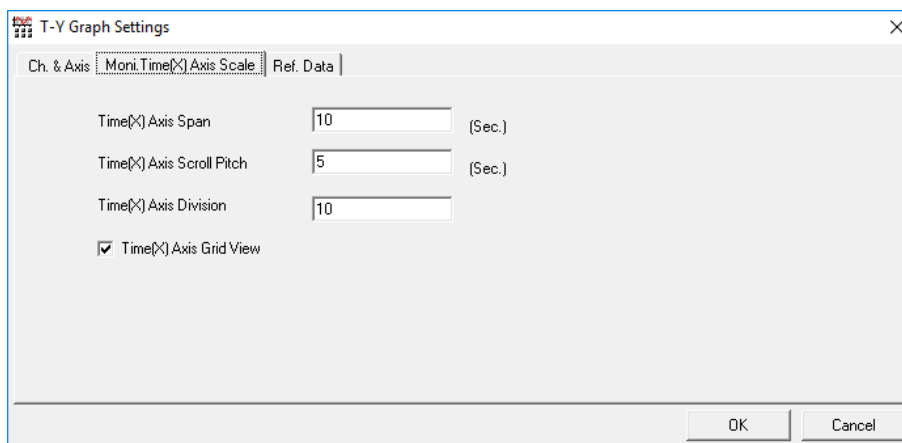
3. Click the “Ch. & Axis” tab to set up the channel number, use of grid on graph, use of automatic scale, etc. for the waveform to be rendered.

| Ch. & Axis | | Moni.Time[%] | Axis Scale | Ref. Data | | | | |
|------------|-------------------------------------|--------------|------------|-------------------------------------|-------------------------------------|------|------|------|
| No. | On/Off | No. | Ch. Name | Grid | Scale | | | |
| | | | | | Auto | Max. | Min. | Div. |
| X | ---- | ---- | ---- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| A-Y | <input checked="" type="checkbox"/> | 000 | CH.000 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| B-Y | <input checked="" type="checkbox"/> | 001 | CH.001 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| C-Y | <input type="checkbox"/> | 002 | CH.002 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| D-Y | <input type="checkbox"/> | 003 | CH.003 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| E-Y | <input type="checkbox"/> | 004 | CH.004 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| F-Y | <input type="checkbox"/> | 005 | CH.005 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| G-Y | <input type="checkbox"/> | 006 | CH.006 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |
| H-Y | <input type="checkbox"/> | 007 | CH.007 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 |

OK Cancel

| Setting Item | | Description |
|--------------|------|--|
| On/Off | | Which of the graphs A to H is displayed is selected. |
| Name | | The channel number for Y axis is set up. |
| Grid | | Whether grid is used or not is selected. |
| Scale | Auto | Whether automatic scale is used or not is selected. |
| | Max. | When automatic scale is not used, the maximum value for the scale is set up. |
| | Min. | When automatic scale is not used, the minimum value for the scale is set up. |
| | Div. | When automatic scale is not used, the number of divisions for the scale is set up. |

4. Click “Moni. Time (X) Axis Scale” tab to set up the span, scroll pitch, number of divisions, and use of grid display for monitor time (X) axis.

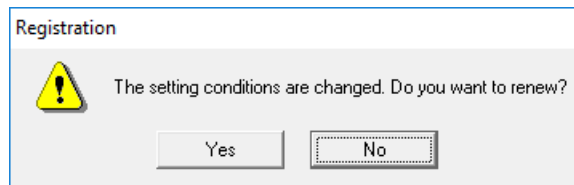


| Setting Item | Description |
|----------------------------|--|
| Time (X) Axis Span | Sets up the maximum value for time axis in seconds. |
| Time (X) Axis Scroll Pitch | Sets up the scroll interval for time axis in seconds. |
| Time (X) Axis Division | Sets up the number of divisions for the time (X) axis. |
| Time (X) Axis Grid View | Sets up the use of grid display on time (X) axis. |

5. Click the “Ref. Data” tab to set up the reference data.



6. Check the “Off-line Mode” checkbox and click the [...] button to display the “Open” dialog.
7. Select the measurement data file (*.dtd) to be rendered and click [OK] button.
8. When the [OK] button is clicked, a confirmation message will be displayed.



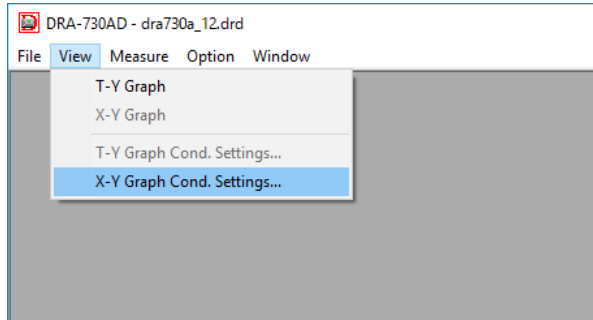
9. Click [Yes] button to update the T-Y graph condition settings.

5—3—4. Setting up the X-Y Graph

X-Y graph is set up.

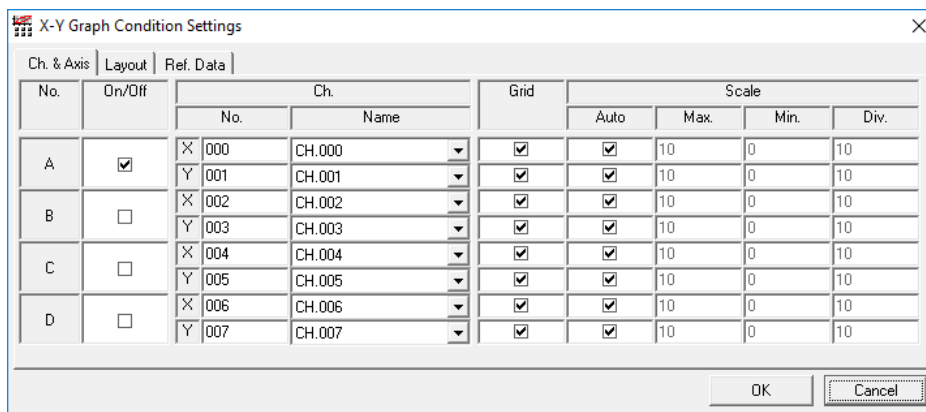
[Operation Procedure]

1. Click [View] - [X-Y Graph Cond. Settings].



Or double-click the “X-Y Graph” screen.

2. “X-Y Graph Condition Settings” dialog will be displayed.



| Tab | Description |
|------------|--|
| Ch. & Axis | The channel number, whether grid is used on graph, whether the automatic scale is used, and maximum and minimum scales and number of divisions when automatic scale is not used for the waveform to render are set up. |
| Layout | Arrangement of graphs A, B, C, and D is set up. |
| Ref. Data | Specifies the measurement data file to be referred when rendering a stored measurement data again during off-line process. However, the data file to be referred is limited to data files stored in the hard disk. |

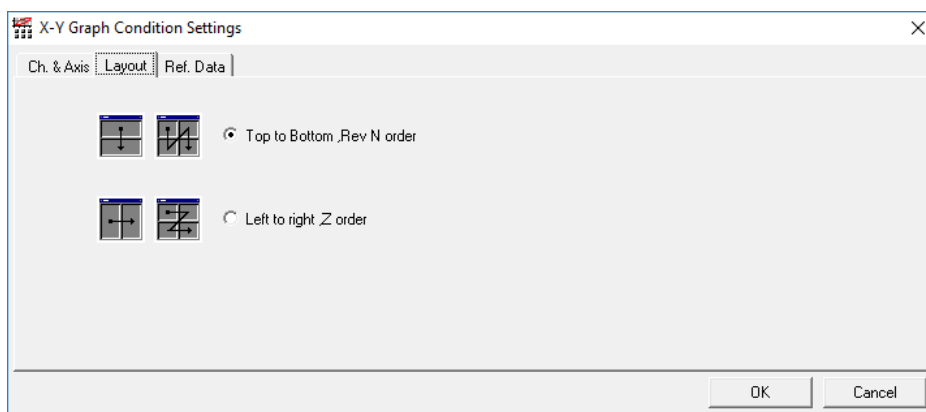
3. Click the “Ch. & Axis” tab to set up the channel number, use of grid on graph, use of automatic scale, etc. for the waveform to be rendered.

| X-Y Graph Condition Settings | | | | | | | | | |
|------------------------------|-------------------------------------|-----|------------|-------------------------------------|-------------------------------------|-----------|------|------|--|
| Ch. & Axis | | | | Layout | | Ref. Data | | | |
| No. | On/Off | Ch. | | Grid | Scale | | | | |
| | | No. | Name | | Auto | Max. | Min. | Div. | |
| A | <input checked="" type="checkbox"/> | X | 000 CH.000 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 001 CH.001 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| B | <input type="checkbox"/> | X | 002 CH.002 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 003 CH.003 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| C | <input type="checkbox"/> | X | 004 CH.004 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 005 CH.005 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| D | <input type="checkbox"/> | X | 006 CH.006 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |
| | | Y | 007 CH.007 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 10 | 0 | 10 | |

OK Cancel

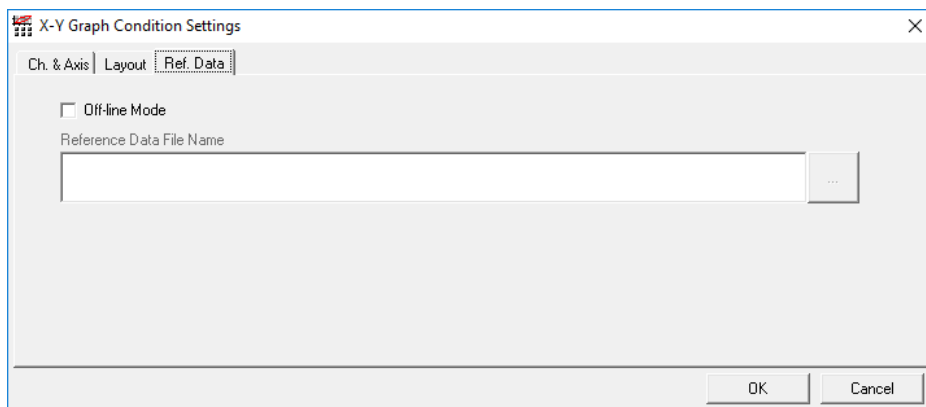
| Setting Item | | Description |
|--------------|------|--|
| On/Off | | Which of the graphs A to D is displayed is selected. |
| Ch. | X | Sets up the channel number for X axis. |
| | Y | Sets up the channel number for Y axis. |
| Grid | | Whether grid is used or not is selected. |
| Scale | Auto | Whether automatic scale is used or not is selected. |
| | Max. | When automatic scale is not used, the maximum value for the scale is set up. |
| | Min. | When automatic scale is not used, the minimum value for the scale is set up. |
| | Div. | When automatic scale is not used, the number of divisions for the scale is set up. |

4. Click the “Layout” tab to set up the graph arrangement method.

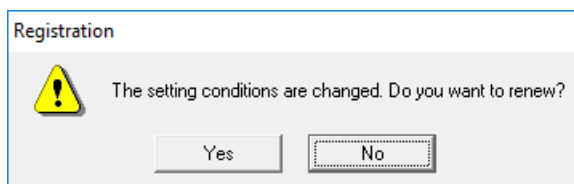


5. Select the graph arrangement method from “Top to Bottom, Z order” and “Left to right, Rev N order.”

6. Click the “Ref. Data” tab to set up the reference data.



7. Check the checkbox for “Off-line Mode” and click [...] button to display the “Open” dialog.
8. Select the measurement data file (*.dtd) to be rendered again and click the [OK] button.
9. When the [OK] button is clicked, a confirmation message will be displayed.



10. Click [Yes] button to update the X-Y graph condition settings.

5 – 4. Measurement

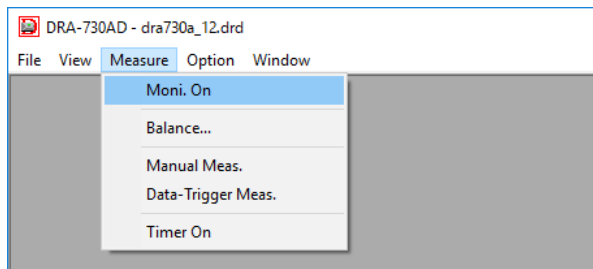
Monitor measurement, balancing, manual measurement, data trigger measurement or timer measurement is executed.

5 – 4 – 1. Monitor Measurement

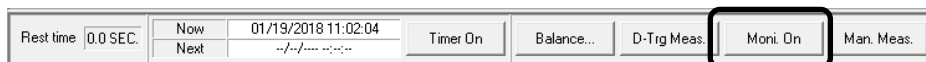
Monitor measurement is started or stopped.

[Monitor Measurement Startup Procedure]

- 1 . Click [Measure] - [Moni. On].



Or click the [Moni. On] button at the bottom of the screen.

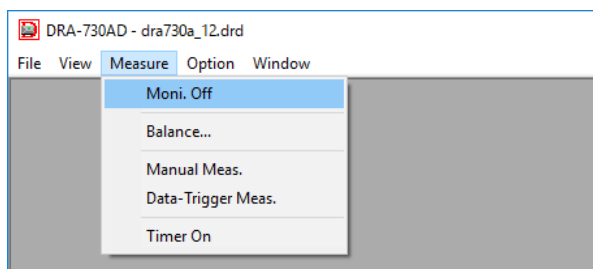


[Monitor] button display will change to [Moni. Off].

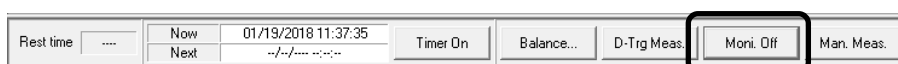
- 2 . Monitor measurement will be started.

[Monitor Measurement Stopping Procedure]

- 1 . Click [Measure] - [Moni. Off].



Or click the [Moni. Off] button at the bottom on the screen.



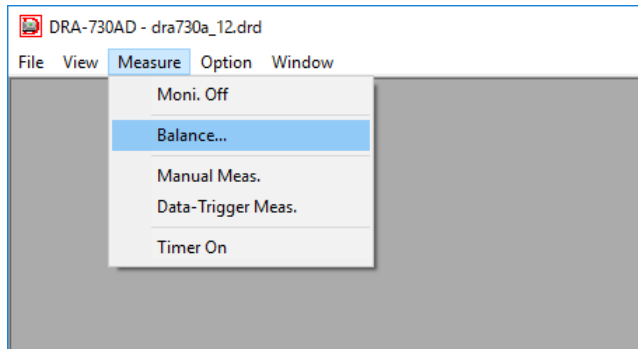
- 2 . Monitor measurement will be stopped.

5—4—2. Balancing

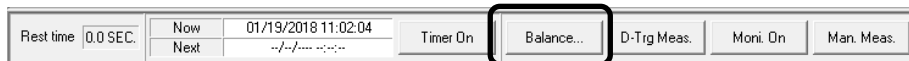
The initial value for each channel is measured. The value subtracted with the initial value will be considered the measurement value in later measurements.

[Operation Procedure]

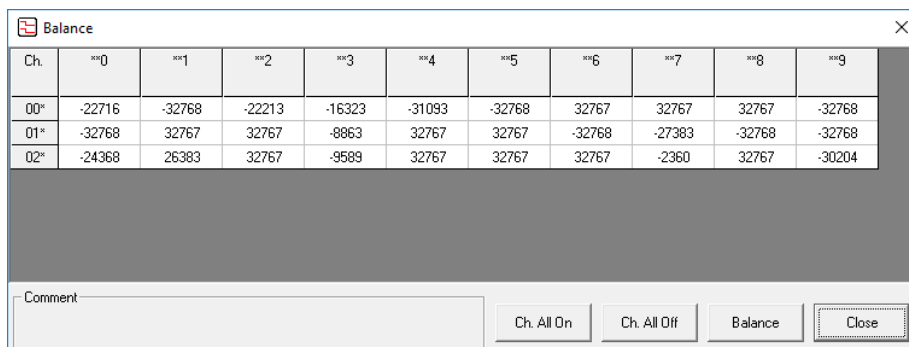
- 1 . Click [Measure] - [Balance...].



Or click the [Balance...] button at the bottom of the screen.

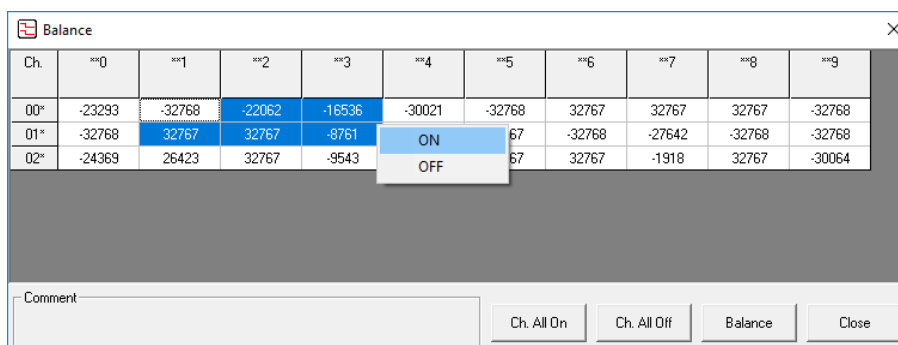


- 2 . “Balance” dialog will be displayed.

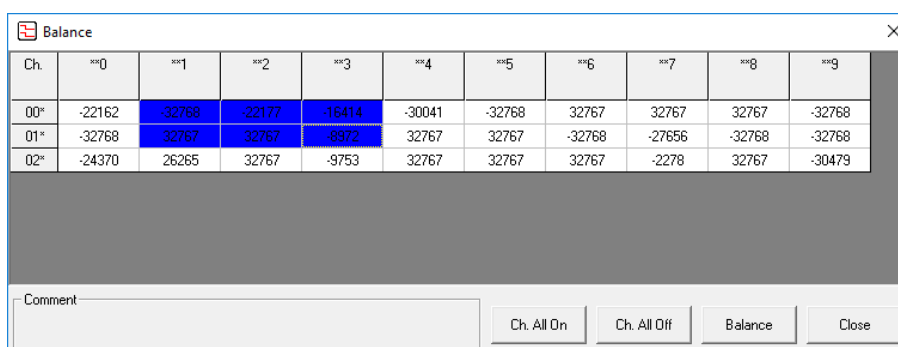


| Button | Description |
|-------------|---|
| Ch. All On | Balancing is enabled for all channels. |
| Ch. All Off | Balancing is disabled for all channels. |
| Balance | Balancing is executed. |
| Close | Closes the “Balance” dialog. |

3. Select and right-click the cell for the channel number to be balanced to display the submenu. Select “ON” from the submenu.



4. The cell for the selected channel number will be highlighted. Click [Balance] button to execute balancing.



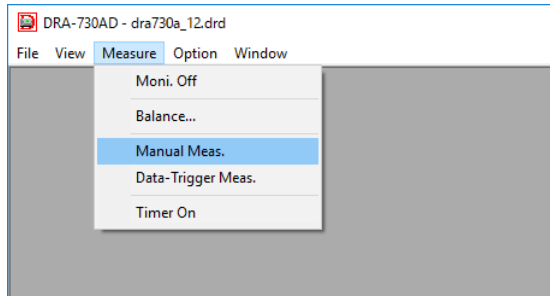
5. Click the [Close] button to terminate balancing.

5—4—3. Manual Measurement

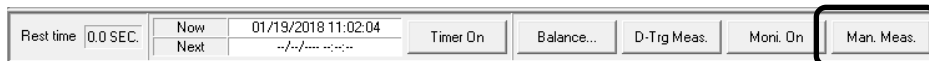
Manual measurement is executed.

[Operation Procedure]

- 1 . Click [Measure] - [Manual Meas.].

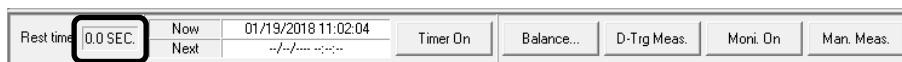


Or click the [Man. Meas.] button at the bottom of the screen.

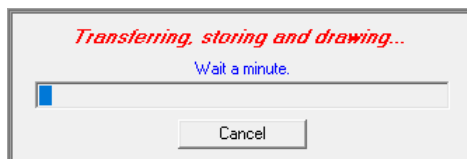


[Man. Meas.] button display will change to [Man. Stop].

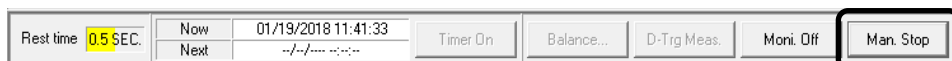
- 2 . Manual measurement will be executed. The period until manual measurement completion will be displayed at the bottom of the screen. Monitor measurement is also started at the same time.



- 3 . When manual measurement is completed, the following message will be displayed to intake the data from the measuring instrument DRA-30A to save in data file and display the data in each of T-Y and X-Y graphs.



- 4 . To cancel manual measurement before completion, click the [Man. Stop] button.



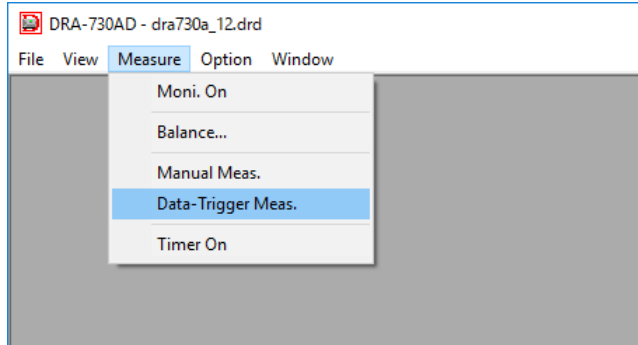
- 5 . Manual measurement will be cancelled.

5—4—4. Data Trigger Measurement

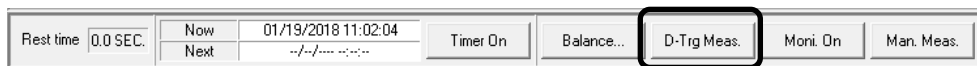
Data trigger measurement is executed.

[Operation Procedure]

- 1 . Click [Measure] - [Data-Trigger Meas.].

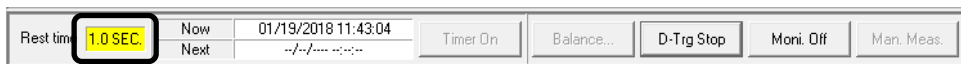


Or click the [D-Trig Meas.] button.



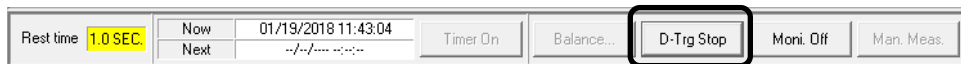
The [D-Trig Meas.] button display will change to [D-Trig Stop].

- 2 . Recording time is displayed at the bottom of the screen, and the system stands by for data trigger. Monitor measurement is started at the same time.



- 3 . When data trigger condition is met, measurement is started. When measurement is completed, the data is taken from the measuring instrument DRA-30A to save in data file and is displayed in each of T-Y and X-Y graphs.

- 4 . To cancel data trigger measurement before completion, click the [D-Trig Stop] button.



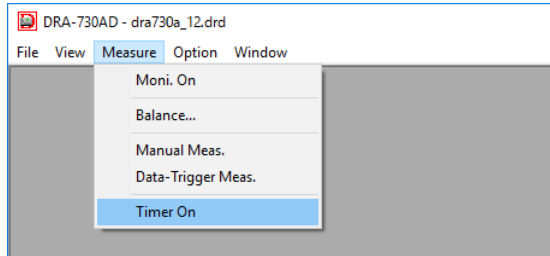
- 5 . Data trigger measurement will be cancelled.

5 – 4 – 5. Timer Measurement

Timer measurement is executed.

[Operation Procedure]

- 1 . Click [Measure] - [Timer On].



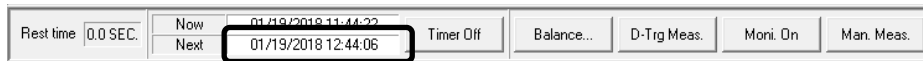
Or click the [Timer On] button at the bottom of the screen.



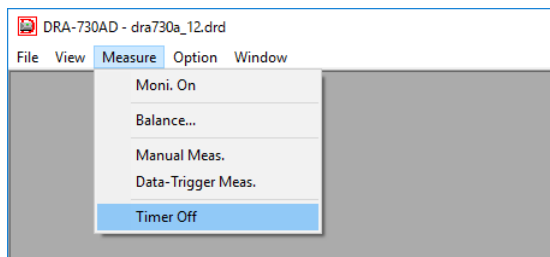
[Timer On] button display will change to [Timer Off].

- 2 . Timer measurement will be started. From this point, continuous measurement is taken automatically according to the timer measurement condition settings.

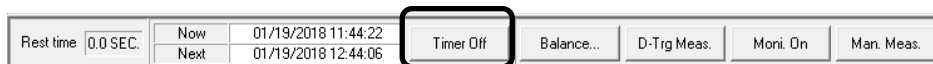
“Time for Next Measurement” is displayed at the bottom of the screen.



- 3 . To stop timer measurement, click [Measure] - [Timer Off].



Or click the [Timer Off] button at the bottom of the screen.



- 4 . Timer measurement will be stopped.
- 5 . When measurement is executed until it reaches the step at which repeat number is set to 0 or when execution of step 10 is completed, timer measurement is completed automatically.

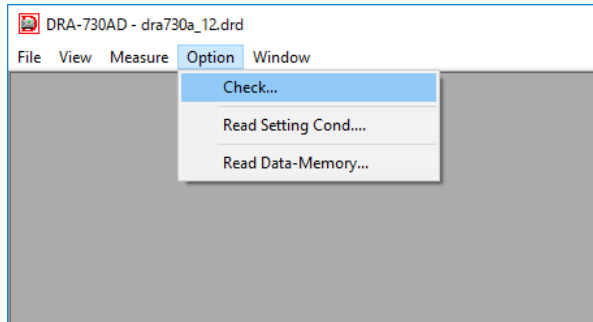
5–5. Options

5–5–1. Check

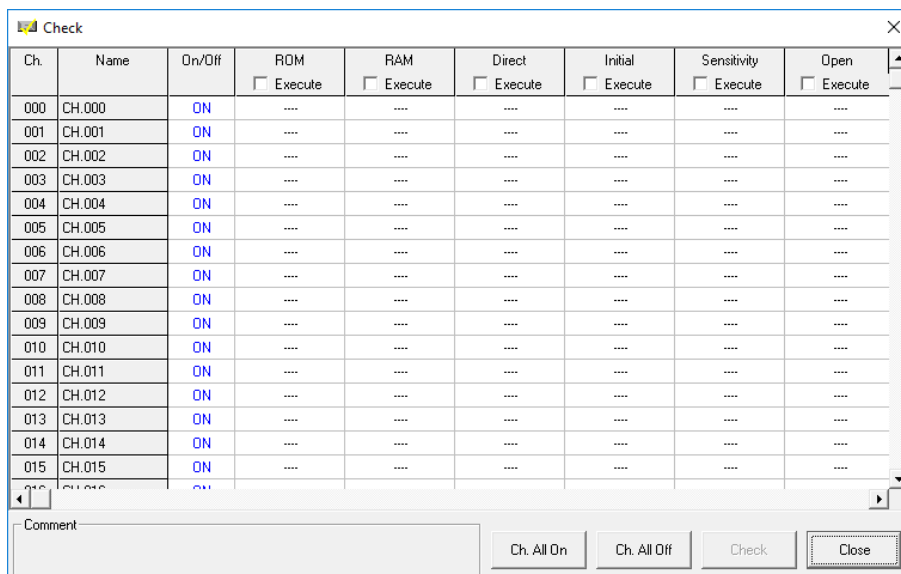
Check is executed on DRA-30A's ROM, RAM, direct value, initial value, strain sensitivity, and open.

[Operation Procedure]

1. Click [Option] - [Check...].



2. "Check" dialog will be displayed.



| Button | Description |
|-------------|---|
| Ch. All On | All channels are set to On. |
| Ch. All Off | All channels are set to Off. |
| Check | Check is executed on ROM, RAM, direct value, initial value, strain sensitivity, and open. |
| Close | "Check" dialog is closed. |

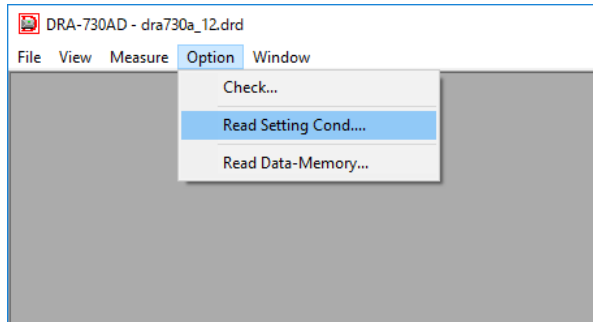
5—5—2. Read Setting Condition

Read the setting condition from data file.

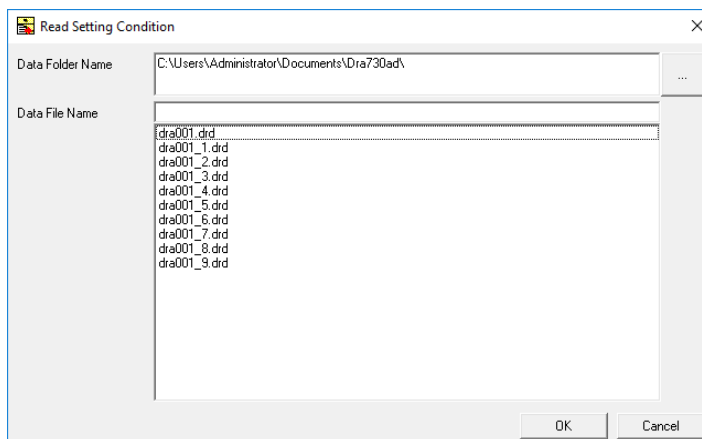
Only for files with extension ".drd" (file format peculiar to this software).

[Operation Procedure]

1. Click [Option] - [Read Setting Cond....].

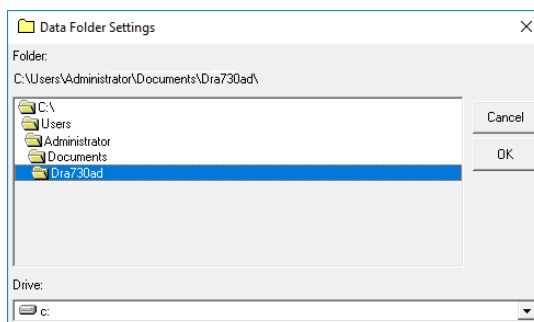


2. "Read Setting Condition" dialog will be displayed.



| Item | Setting Description |
|------------------|--|
| Data folder name | Sets up the folder name of the measurement data to read setting condition. |
| Data file name | Sets up the file name of the measurement data to read setting condition. (extension is fixed to ".drd"). |

3. Click [...] button to display the "Data Folder Settings" dialog.

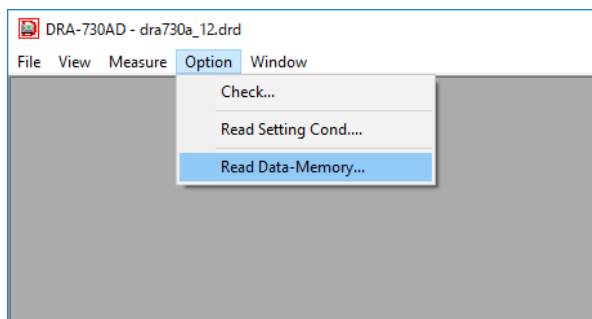


5 – 5 – 3. Read Data-Memory

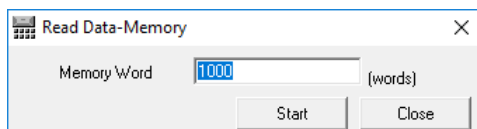
Read the data-memory from the measuring instrument DRA-30A.

[Operation Procedure]

1. Click [Option] - [Read Data-Memory...].



2. “Read Data-Memory” dialog will be displayed.



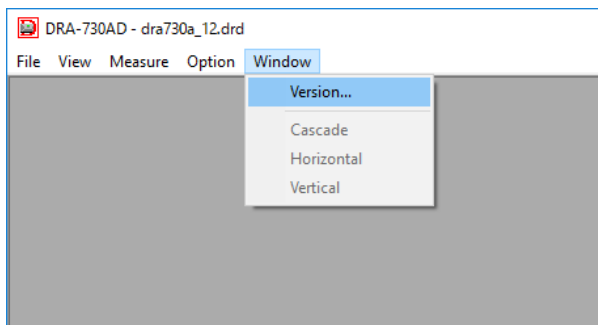
| Item | Setting Description |
|-------------|---|
| Memory Word | The number of data memory words to read is set up. *After the dialog display, measurement condition setting data memory word is set. |
| Start | Reading is started. *After reading, data storage and graph drawing are performed in the same manner as the measurement process. |

5–6. Version Display

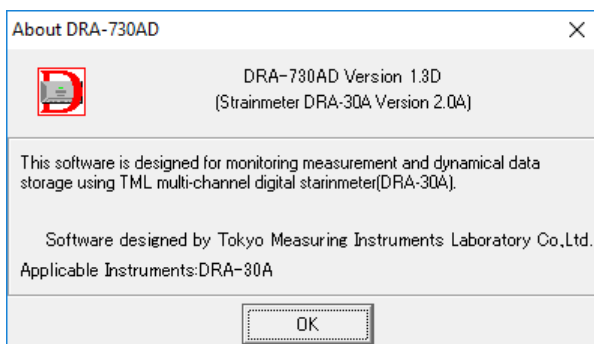
The version of this software is displayed.

[Operation Procedure]

- 1 . Click [Window] - [Version...].



- 2 . The version data for this software will be displayed.



Before Requesting for Maintenance and Service (repair)

If there should be any failure or malfunction of DRA-730A, please contact your local representative or Tokyo Measuring Instruments Laboratory Co.,Ltd.

■When you send us the device for repair and maintenance service:

- For quick and precise repair and delivery service, please let us know the conditions of trouble or likely cause of such trouble.
- When packing the device to return it to us, use the packing material employed upon delivery of the device from us or the equivalent.
- If the device must be adjusted with accessory parts or element attached, make sure to deliver them to us at the same time.

■Guarantee

This product has been carefully examined by our in-house inspection division before delivery. If it malfunctions due to a manufacturing fault or an accident during shipment, please report on the condition to your nearest dealer or directly to Tokyo Measuring Instruments Laboratory Co.,Ltd.

The guarantee period of this product is twelve months from the date of delivery. If the product goes out of order or is broken during this period, we will repair it free of charge. However, this free guarantee repair service will not apply in the case of trouble or damage caused by improper handling of the product, remodeling or modification by the user, or an act of God.

Tokyo Measuring Instruments Laboratory Co.,Ltd. shall not take any responsibility for claims and guarantee of loss and/or damage arising from the operation of this product regardless of any misdescription, inaccuracy or missing items in the contents of this manual.

Data Recording Software for Windows **DRA-730A** Ver1.3
9th edition, February 2021

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URL <http://www.tml.jp/e>

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