

# Chapter

# 4

## E-CON

- 4-1 E-CON Overview**
- 4-2 EA-100 Setup**
- 4-3 Setup Memory**
- 4-4 Program Converter**
- 4-5 Starting a Sampling Operation**

## 4

All of the explanations provided here assume that you are already familiar with the operating precautions, terminology, and operational procedures of the calculator and the EA-100.

## 4-1 E-CON Overview

- From the Main Menu, select E-CON to enter the E-CON Mode.



- The E-CON provides the functions listed below for simple and more efficient data sampling using the CASIO EA-100.
  - **[F1] (SETUP)** ... Displays a screen for setting up the EA-100.
  - **[F2] (MEM)** ..... Displays a screen for saving EA-100 setup data under a file name.
  - **[F3] (PRGM)** ..... Performs program conversion.
    - This function converts EA-100 setup data created by E-CON to a program.
    - It can also be used to convert data to a program that can be run on a CFX-9850 Series/fx-7400 Series calculator, and to transfer the data to the calculator.
  - **[F4] (START)** .... Starts data collection.
  - **[F6] (HELP)** ..... Displays E-CON help.
- Pressing the **[OPTN]** key (Setup Preview) or a cursor key while the E-CON main menu is on the screen displays a preview dialog box that shows the contents of the setup in the current setup memory area.



To close the preview dialog box, press **[ESC]**.

## About online help

Pressing the **[F6]** (HELP) key displays online help about the E-CON Mode.

## 4-2 EA-100 Setup

You can use the E-CON Mode to set up the EA-100 for sampling and then start sampling immediately or save the setup in calculator memory. You can use either of the following two methods to set up the EA-100.

**Setup Wizard:** With this method, you set up the EA-100 simply by replying to questions as they appear.

**Advanced Setup:** Advanced setup gives you control over a variety of sampling parameters, which means you can set up the EA-100 for exactly the type of sampling you want.

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### ■ Using Setup Wizard to Create an EA-100 Setup

With Setup Wizard, you set up the EA-100 simply by replying to questions as they appear.

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#### • Setup Wizard parameters

Setup Wizard lets you make changes to the following three EA-100 basic sampling parameters using an interactive wizard format.

- **Sensor (Select Sensor)**  
Specify a CASIO or VERNIER\*<sup>1</sup> sensor from a menu of choices.
- **Sampling Interval (Sampling Time)**  
When you have Photogate specified as the sensor type, you can specify the sampling timing (Gate Status) and sampling time recording method (Record Time) with this parameter.
- **Number of Samples (Number of Samples)**  
You can specify a value from 1 to 255.

Note the following limitations that apply to a setup made using Setup Wizard.

- You can use Setup Wizard only when the EA-100 sampling channel is CH1 or SONIC.
- The trigger for a Setup Wizard setup is always the **EXE** key.
- Sampling results are always stored in List 1 (for the sampling time) and List 2 (for sample values).



\*<sup>1</sup> Vernier Software & Technology

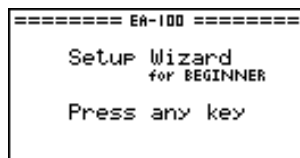


## • To create an EA-100 setup using Setup Wizard

### ***Before getting started...***

- Before starting the procedure below, make sure you first decide if you want to start sampling immediately using the setup you create with Setup Wizard, or if you want to store the setup for later sampling.
- See sections 4-3, 4-4, and 4-5 of this manual for information about procedures required to start sampling and to store a setup. We recommend that you read through the entire procedure first, referencing the other sections and pages as noted, before actually trying to perform it.
- To terminate Setup Wizard part way through and cancel the setup, press **[SHIFT]** **[ESC]** (QUIT).

1. Display the E-CON main menu.
2. Press **[F1]** (SETUP). This displays the “Setup EA-100” sub-menu.
3. Press **[1]** (Wizard). This displays the Setup Wizard initial screen.



4. Press any key to start Setup Wizard and display the sensor specification screen.
  - Press **[F1]** to specify a CASIO sensor, or **[F2]** to specify a VERNIER sensor. From the menu of supported sensors that appears, select the one you want.
5. The screen that appears after you select a sensor in step 4 depends on whether or not you specified “Photogate” as the sensor.
  - If you did not specify “Photogate,” a screen for setting the sampling interval appears after step 4.
    1. Use the number keys to input the sampling interval.
      - Inputting a value in the range of 0.52 to 300 enables real-time sampling. Inputting a value outside this range enables non-real-time sampling.
    2. Press **[EXE]**.
  - If you specified “Photogate” as the sensor, a screen for setting the sampling timing appears after step 4.
    1. Press either **[F1]** (Open) or **[F2]** (Close) to specify the sampling timing. Pressing either key advances to a screen for setting the time recording method.
      - See online help (GATE TRIGGER STATUS HELP) for details about the Open and Close settings.
    2. Press **[F1]** (Abs) or **[F2]** (Rel) to specify the sampling time recording method.

6. After you complete step 5, a screen for setting the number of samples appears on the display.
  - Use the number keys to input the number of samples, and then press **[EXE]**.
7. After you complete step 6, a screen like the one shown below appears on the display.

```

===== EA-100 =====
      Total time:5sec
      Start Collection
                        of Data?
=====
YES NO SAVE PRGM  HELP
  
```

- Press one of the function keys described below to specify what you want to do with the setup you have created with the above steps.
  - **[F1]** (YES) ..... Starts sampling using the setup (page 4-5-1).
  - **[F2]** (NO) ..... Returns to the E-CON main menu (page 4-1-1).
  - **[F3]** (SAVE) ..... Saves the setup (page 4-3-1).
  - **[F4]** (PRGM) ..... Converts the setup to a program (page 4-4-1).
- Pressing **[F2]** (NO) in step 7 returns to the E-CON main menu and stores the setup in the E-CON Mode's current setup memory area. You can use the following function key operations from the E-CON main menu to manipulate the contents of the current setup memory area.
  - **[F2]** (MEM), then **[F2]** (SAVE)
    - ..... Saves the current setup memory area setup (page 4-3-1).
  - **[F3]** (PRGM) ..... Converts the setup in the current setup memory area to a program (page 4-4-1).
  - **[F4]** (START) .... Starts sampling using the setup in the current setup memory area (page 4-5-1).
- Pressing **[F1]** (SETUP) and then **[2]** (Advan) displays an Advanced Setup screen for more detailed control over the parameters that make up the setup in the current setup memory area. See "Creating an EA-100 Setup Using Advanced Setup" for more information about changing advanced setup parameters.



## ■ Creating an EA-100 Setup Using Advanced Setup

Advanced Setup provides you with total control over a number of parameters that you can adjust to create the EA-100 setup that suits your particular needs.

### ● To create an EA-100 setup using Advanced Setup

The following procedure describes the general steps for using Advanced Setup. Refer to the pages as noted for more information.

1. Display the E-CON main menu.
2. Press **[F1]** (SETUP). This displays the “Setup EA-100” sub-menu.
3. Press **[2]** (Advan). This displays the Advanced Setup menu.



4. If you want to configure a custom probe at this point, press **[5]** (Custom Probe). Next, follow the steps under “To configure a custom probe starting from the Advanced Setup menu” on page 4-2-12.
  - You can also configure a custom probe during the procedure under “To change Channel parameter settings” on page 4-2-6.
  - Custom probe configurations you have stored in memory can be selected using Channel in step 5, below.
5. Use the Advanced Setup function keys described below to set other parameters.
  - **[1]** (Channel) ..... Displays a screen for setting the following parameters: sampling channel, sensor, sensor configuration, and storage location for sample data (page 4-2-5).
  - **[2]** (Sample) ..... Displays a screen for setting the following parameters: real-time settings, sampling interval, number of samples, measurement time recording method, and storage location for measurement time records (page 4-2-7).
  - **[3]** (Trigger) ..... Displays a screen for setting sampling start (trigger) conditions (page 4-2-8).
  - **[4]** (Option) ..... Displays a screen for making View Window settings, real-time settings (channel for real-time sampling), and filter settings (page 4-2-10).



- You can return the settings on the above setup screens (**[1]** through **[4]**) using the procedure described under “To return setup parameters to their initial defaults”.
6. After you create a setup, you can use the function key operations described below to start sampling or perform other operations.
- **[F1]** (START) .... Starts sampling using the setup (page 4-5-1).
  - **[F2]** (MULT) ..... Starts MULTIMETER Mode sampling using the setup (page 4-2-14).
  - **[F3]** (MEM) ..... Saves the setup (page 4-3-1).
  - **[F4]** (PRGM) ..... Converts the setup to a program (page 4-4-1).

### • To return setup parameters to their initial defaults

Perform the following procedure when you want to return the parameters of the setup in the current setup memory area to their initial defaults.

1. While the Advanced Setup menu is on the display, press **[6]** (Initialize).



2. In response to the confirmation message that appears, press **[EXE]** to initialize the setup.
  - To clear the confirmation message without initializing the setup, press **[ESC]**.

### • Advanced setup parameters

This section provides detailed information about the parameters you can change in step 5 of the procedure under “To create an EA-100 setup using Advanced Setup” on page 4-2-4.

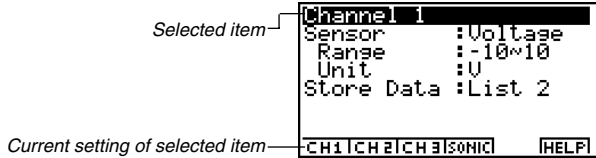
#### Channel

Selecting this parameter displays a screen where you can specify the EA-100 channel to be used for sampling, the type of sensor used for each channel, and the storage location for saving sample data.

• **To change Channel parameter settings**

1. While the Advanced Setup menu is on the display, press **[1]** (Channel).

- This displays the Channel parameter setting screen.



2. Use the function key operations described below to change Channel parameter settings.

(1) Selected Channel

- **[F1]** (CH1) ..... Channel 1
- **[F2]** (CH2) ..... Channel 2
- **[F3]** (CH3) ..... Channel 3
- **[F4]** (SONIC) .... Sonic channel

(2) Selected Sensor (Sensor)

- **[F1]** (CASIO) .... CASIO sensor
- **[F2]** (VERN) .... VERNIER sensor
- **[F3]** (CSTM) ..... Custom probe
- **[F4]** (None) ..... No sensor

(3) Sample Data Storage Location (Store Data)

- **[F1]** (LIST) ..... Displays a dialog box for specifying the list for storage of measurement data. Specify a list number from 1 to 20.

- To change the setting of an item, first use the **▲** and **▼** cursor keys to move the highlighting to the item. Next, use the function keys to select the setting you want. Note that the Channel parameter settings you make affect the Selected Channel only. You need to make separate settings for each channel you plan to use for sampling.

- Specifying a sensor causes its sampling range (Range) and measurement unit (Unit) to appear on the display.

3. After all the settings are the way you want, press **[EXE]** to return to the Advanced Setup menu.



# If the list you specify for the Sample Data Storage Location (Store Data) in step 2 is already being used, data is overwritten according to the priority sequence shown below.

- |                    |                         |
|--------------------|-------------------------|
| 1. (Highest) SONIC | 4. CH1                  |
| 2. CH3             | 5. (Lowest) Record Time |
| 3. CH2             |                         |

Example: Specifying the same list number for CH3 sample data and SONIC sample data causes the CH3 data to be overwritten by the SONIC data.



## Sample

Selecting this parameter displays a screen for making real-time settings, and for specifying the sampling interval, number of samples, measurement time recording method, and storage location for measurement time records.

### • To change Sample Setup settings

1. While the Advanced Setup menu is on the display, press **[2]** (Sample).
  - This displays the Sample Setup screen.



2. Use the function key operations described below to change Sample Setup settings.

- To change the setting of an item, first use the **[▲]** and **[▼]** cursor keys to move the highlighting to the item. Next, use the function keys to select the setting you want.

#### (1) Real-time Settings (Real-Time)

- **[F1]** (NO) ..... Disables real-time sampling.
- **[F2]** (YES) ..... Enables real-time sampling.

#### (2) Sampling Interval (Interval)

- **[F1]** (TIMER) .... Displays a dialog box for specifying a timer value, and enables fixed-interval sampling.
- **[F2]** (KEY) ..... Starts sampling operation that uses the EA-100 [TRIGGER] key. The [TRIGGER] key must be pressed the number of times specified for the number of samples.
- **[F3]** (GATE) ..... Starts sampling in accordance with the Photogate Gate Status trigger timing. Press **[F1]**, **[F2]**, or **[F3]** to specify the channel of the Photogate sensor. Photogate is assigned to the sensor of the specified channel.

#### (3) Number of Samples (Number)

- **[F1]** (NUM) ..... Displays a dialog box for specifying the number of samples by inputting a value from 1 to 255.



(4) Measurement Time Recording Method (Rec Time)

- **[F1]** (None) ..... No time recorded.
- **[F2]** (Abs) ..... Absolute time in seconds from start of sampling
- **[F3]** (Rel) ..... Relative time (interval between samples) in seconds
- **[F4]** (Int A) ..... Absolute time calculated from sampling interval and number of samples
- **[F5]** (Int R) ..... Relative time calculated from sampling interval and number of samples

(5) Sample Data Storage Location (Store Data)

- **[F1]** (LIST) ..... Displays a dialog box for specifying the list (1 to 20) for storing sample data.

3. After all the settings are the way you want, press **[EXE]** to return to the Advanced Setup menu.

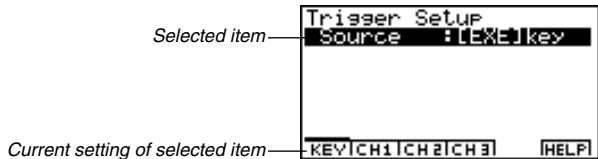
## Trigger

Use the Trigger Setup screen to specify the following measurement start (trigger) conditions: trigger source, trigger threshold, trigger edge.



### • To change Trigger Setup settings

1. While the Advanced Setup menu is on the display, press **[3]** (Trigger).

- This displays the Trigger Setup screen.



2. Use the function key operations described below to change Trigger Setup settings.

- To change the setting of an item, first use the  and  cursor keys to move the highlighting to the item. Next, use the function keys to select the setting you want.

(1) Trigger Source (Source)

- **[F1]** (KEY)

**[1]** ([EXE]) ..... Calculator **[EXE]** key press starts sampling.

**[2]** (TRIGER) ..... EA-100 [TRIGGER] key press starts sampling.

- **[F2]** (CH1) ..... Channel 1

- **[F3]** (CH2) ..... Channel 2

- **[F4]** (CH3) ..... Channel 3

- Specifying CH1, CH2, or CH3 as the trigger source displays the specified channel's sensor name, trigger threshold initial value, measurement unit, and trigger edge initial value.

(2) Trigger Threshold (Threshold)

- **[F1]** (EDIT) ..... Displays a dialog box for inputting the trigger threshold. This option is available only when CH1, CH2, or CH3 is specified as the trigger source.

(3) Trigger Edge (Edge)

- **[F1]** (Rise) ..... Rising edge triggers sampling

- **[F2]** (Fall) ..... Falling edge triggers sampling

3. After all the settings are the way you want, press **[EXE]** to return to the Advanced Setup menu.



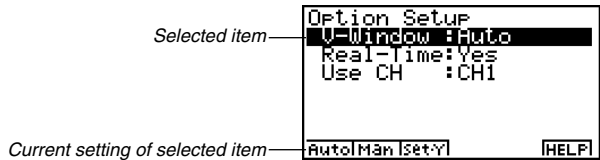
## Option

Use the Option Setup screen to make View Window settings, to specify the channel for real-time sampling, and to make filter settings.

### • To change Option Setup settings

1. While the Advanced Setup menu is on the display, press **[4]** (Option).

- This displays the Option Setup screen.



2. Use the function key operations described below to change Option Setup settings.

- To change the setting of an item, first use the **▲** and **▼** cursor keys to move the highlighting to the item. Next, use the function keys to select the setting you want.

(1) View Window Settings (V-Window)

- **[F1]** (Auto) ..... Makes View Window settings automatically.
- **[F2]** (Man) ..... Enables manual View Window settings.
- **[F3]** (Set•Y) ..... Displays screens for specifying the Y-axis (sample data) minimum value (Ymin) and maximum value (Ymax).

(2) Real-time Settings (Real-Time)

- **[F1]** (NO) ..... Disables real-time sampling.
- **[F2]** (YES) ..... Enables real-time sampling.
- Note that this item is linked with the Real-Time item of the Sample Setup on page 4-2-7.



(3) Real-time Sampling Channel (Use CH)

- **F1** (CH1) ..... Channel 1
- **F2** (CH2) ..... Channel 2
- **F3** (CH3) ..... Channel 3
- **F4** (SONIC) .... Sonic channel

• Note that the above options appear only when real-time sampling is turned on (by pressing **F1** (YES) for the Real-Time item).

(4) Filter Settings (Filter)

- **F1** (None) ..... No setting
- **F2** (S-G) ..... S-G Smoothing
  - 1** (5-p): 5-point      **2** (9-p): 9-point
  - 3** (17-p): 17-point      **4** (25-p): 25-point
- **F3** (MED) ..... Median Filter
  - 1** (3-p): 3-point      **2** (5-p): 5-point

• Note that the above options appear only when real-time sampling is turned off (by pressing **F2** (NO) for the Real-Time item).

3. After all the settings are the way you want, press **EXE** to return to the Advanced Setup menu.

## • To configure a custom probe

You can use the procedures in this section to configure a custom probe\*<sup>1</sup> for use with the EA-100.

### Creating a New Custom Probe Configuration

To configure a custom probe, you must input values for the constants of the fixed linear transformation formula ( $ax + b$ ). The required constants are slope ( $a$ ) and intercept ( $b$ ).  $x$  in the above expression ( $ax + b$ ) is the sampled voltage value (sampling range: 0 to 5 volts).

You can use either of the two following procedures to create a new custom probe configuration while creating an EA-100 setup using Advanced Setup.



\*<sup>1</sup>The term "custom probe" means any sensor other than the CASIO or VERNIER sensors specified as standard for the E-CON Mode.

• **To configure a custom probe starting from the Advanced Setup menu**

1. From the E-CON main menu, press **[F1]** (SETUP) and then **[2]** (Advan) to display the Advanced Setup menu.
  - See “Creating an EA-100 Setup Using Advanced Setup” on page 4-2-4 for more information.
2. On the Advanced Setup menu, press **[5]** (Custom Probe) to display the Custom Probe List.

```

Custom Probe List
1:BAROMETER MM.HG
2:BAROMETER MBAR
3:EKG

[SET] [NEW] [EDIT] [DEL] [HELP]
  
```

- The message “No Custom Probe” appears if the Custom Probe List is empty.
3. Press **[F2]** (NEW).
    - This displays the screen for inputting the name of the new custom probe.
  4. Input up to 18 characters for the custom probe name, and then press **[EXE]**.
    - This displays the screen for configuring a new custom probe.

```

Edit Slope
[BAROMETER MM.HG ]

== Specifications ==
Slope :1
Intercept:0
Unit Name:None

[EDIT] [HELP]
  
```

5. Use the function key operations described below to make custom probe configuration settings.
  - To change the setting of an item, first use the **▲** and **▼** cursor keys to move the highlighting to the item. Next, use the function keys to select the setting you want.
- (1) Slope
  - Press **[F1]** (EDIT) to display a dialog box for inputting the slope for the linear transformation formula.
- (2) Intercept
  - Press **[F1]** (EDIT) to display a dialog box for inputting the intercept for the linear transformation formula.
- (3) Unit Name
  - Press **[F1]** (EDIT) to display a dialog box for inputting up to eight characters for the unit name.
6. Press **[EXE]** and then input a memory number (1 to 99).
  - This saves the custom probe configuration and returns to the Custom Probe List, which should now contain the new custom probe you configured.

• **To configure a custom probe starting from the Channel parameter setting screen**

1. From the E-CON main menu, press **[F1]** (SETUP) and then **[2]** (Advan) to display the Advanced Setup menu.
  - See “Creating an EA-100 Setup Using Advanced Setup” on page 4-2-4 for more information.
2. On the Advanced Setup menu, press **[1]** (Channel).
3. On the Channel parameter setting screen, press the function key (**[F1]**, **[F2]**, or **[F3]**) for the channel whose parameter settings you want to change.
4. Next press **[F3]** (CSTM) to display the Custom Probe List.
5. Perform steps 3 through 6 under “To configure a custom probe starting from the Advanced Setup menu” on page 4-2-12.

### Editing an Existing Custom Probe Configuration

Use the following procedure when you want to edit the configuration of an existing custom probe.

1. Display the Custom Probe List.
2. Select the custom probe whose configuration you want to edit.
  - Use the **[▲]** and **[▼]** cursor keys to highlight the name of the custom probe you want.
3. Press **[F3]** (EDIT).
  - This displays the screen for configuring a custom probe.
  - To edit the custom probe settings, perform the procedure starting from step 5 under “To configure a custom probe starting from the Advanced Setup menu” on page 4-2-12.

### Deleting a Custom Probe Configuration

Use the following procedure when you want to delete the configuration of a custom probe.

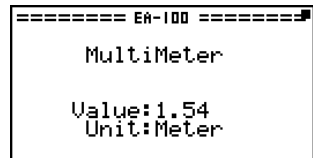
1. Display the Custom Probe List.
2. Select the custom probe whose configuration you want to delete.
  - Use the **[▲]** and **[▼]** cursor keys to highlight the name of the custom probe you want.
3. Press **[F4]** (DEL).
4. In response to the confirmation message that appears, press **[EXE]** to delete the custom probe configuration.
  - To clear the confirmation message without deleting anything, press **[ESC]**.



### • To use the MULTIMETER Mode

You can use the Channel parameter settings of Advanced Setup to configure a channel so that EA-100 MULTIMETER Mode sampling is triggered by a calculator operation.

1. Use the Channel parameter setting Sensor item to configure a sensor.
  - See “To create an EA-100 setup using Advanced Setup” on page 4-2-4 for more information.
2. After making the required settings, press **[EXE]** to display the Advanced Setup menu and then press **[F2]** (MULT).
  - This displays the channel selection screen for MULTIMETER Mode sampling.
3. Specify a channel for sampling.
  - Pressing a function key to specify a channel causes the EA-100 to enter the MULTIMETER Mode and start sampling over the specified channel.



4. To stop MULTIMETER Mode sampling, first press the **[AC]** key. After the Break screen appears, press **[ESC]**.
  - Sample data is updated at intervals of 0.52 second.
  - Do not have sensors connected to channels other than the one you specify in step 3. However, it is not necessary to specify “None” for the Channel parameter Sensor item for the unused channels.
  - Sample data is not stored in memory.





## 4-3 Setup Memory

You can use setup memory to save EA-100 setups you create using Setup Wizard or Advanced Setup in calculator memory for later recall when you need them.

### ■ Saving a Setup

A setup can be saved when any one of the following conditions exist.

- After creating a new setup with Setup Wizard  
See step 7 under “To create an EA-100 setup using Setup Wizard” on page 4-2-2.
- After creating a new setup with Advanced Setup  
See step 6 under “To create an EA-100 setup using Advanced Setup” on page 4-2-4 for more information.
- While the E-CON main menu is on the display  
Performing the setup save operation while the E-CON main menu is on the display saves the contents of the current setup memory area (which were created using Setup Wizard or Advanced Setup).

Details on saving a setup are listed below.

#### • To save a setup

1. Start the save operation by performing one of the function key operations described below.
  - If the final Setup Wizard screen is on the display, press **[F3]** (SAVE).
  - If the Advanced Setup menu screen is on the display, press **[F3]** (MEM).
  - If the E-CON main menu screen is on the display, press **[F2]** (MEM).
- Performing any one of the above operations causes the setup memory list to appear.



- The message “No Setup-MEM” appears if setup memory is empty.

2. Press **[F2]** (SAVE).

- This displays the screen for inputting the setup name.



3. Press **[EXE]** and then input a memory number (1 to 99).

- If you start from the final setup screen, this saves the setup and the message "Complete!" appears. Press **[EXE]** to return to the final setup screen.
- If you start from the Advanced Setup menu or the E-CON main menu, this saves the setup and returns to the setup memory list which includes the name you assigned it.

## ■ Using and Managing Setups in Setup Memory

All of the setups you save are shown in the setup memory list. After selecting a setup in the list, you can use it to sample data or you can edit it.

### • To preview saved setup data

You can use the following procedure to check the contents of a setup before you use it for sampling.

1. On the E-CON main menu, press **[F2]** (MEM) to display the setup memory list.
2. Use the **[▲]** and **[▼]** cursor keys to highlight the name of the setup you want.
3. Press **[OPTN]** (Setup Preview).
  - This displays the preview dialog box.



4. To close the preview dialog box, press **[ESC]**.

---

### • To recall a setup and use it for sampling

Be sure to perform the following steps before starting sampling with the EA-100.

1. Connect the calculator to the EA-100.
2. Turn on EA-100 power.
3. In accordance with the setup you plan to use, connect the proper sensor to the appropriate EA-100 channel.
4. Prepare the item whose data is to be sampled.

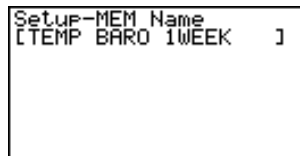
### • To recall a setup and use it for sampling

1. On the E-CON main menu, press **[F2]** (MEM) to display the setup memory list.
2. Use the **[▲]** and **[▼]** cursor keys to highlight the name of the setup you want.
3. Press **[F1]** (START).
4. In response to the confirmation message that appears, press **[EXE]**.
  - Pressing **[EXE]** sets up the EA-100 and then starts sampling.
  - To clear the confirmation message without sampling, press **[ESC]**.

---

### • To change the name of setup data

1. On the E-CON main menu, press **[F2]** (MEM) to display the setup memory list.
2. Use the **[▲]** and **[▼]** cursor keys to highlight the name of the setup you want.
3. Press **[F3]** (REN).
  - This displays the screen for inputting the setup name.



Setup-MEM Name  
[TEMP BARO 1WEEK ]

4. Input up to 18 characters for the setup name, and then press **[EXE]**.
  - This changes the setup name and returns to the setup memory list.



# See "Operations during a sampling operation" on page 4-5-2 for information about

operations you can perform while a sampling operation is in progress.

---

• **To delete setup data**

1. On the E-CON main menu, press **[F2]** (MEM) to display the setup memory list.
2. Use the **▲** and **▼** cursor keys to highlight the name of the setup you want.
3. Press **[F4]** (DEL).
4. In response to the confirmation message that appears, press **[EXE]** to delete the setup.
  - To clear the confirmation message without deleting anything, press **[ESC]**.

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• **To recall setup data**

Recalling setup data stores it in the current setup memory area. You can then use Advanced Setup to edit the setup. This capability comes in handy when you need to perform a setup that is slightly different from one you have stored in memory.

1. On the E-CON main menu, press **[F2]** (MEM) to display the setup memory list.
2. Use the **▲** and **▼** cursor keys to highlight the name of the setup you want.
3. Press **[F5]** (LOAD).
4. In response to the confirmation message that appears, press **[EXE]** to recall the setup.
  - To clear the confirmation message without recalling the setup, press **[ESC]**.



# Recalling setup data replaces any other data currently in the current setup memory area.

## 4-4 Program Converter

Program Converter converts an EA-100 setup you created using Setup Wizard or Advanced Setup to a program that can run on the calculator. You can also use Program Converter to convert a setup to a CFX-9850 Series/fx-7400 Series-compatible program and transfer it to a calculator.\*1\*2

### ■ Converting a Setup to a Program

A setup can be converted to a program when any one of the following conditions exists.

- After creating a new setup with Setup Wizard  
See step 7 under “To create an EA-100 setup using Setup Wizard” on page 4-2-2.
- After creating a new setup with Advanced Setup  
See step 6 under “To create an EA-100 setup using Advanced Setup” on page 4-2-4 for more information.
- While the E-CON main menu is on the display  
Performing the program converter operation while the E-CON main menu is on the display converts the contents of the current setup memory area (which were created using Setup Wizard or Advanced Setup).

The program converter procedure is identical in all of the above cases.

#### ● To convert a setup to a program

1. Start the converter operation by performing one of the function key operations described below.
  - If the final Setup Wizard screen is on the display, press **F4** (PRGM).
  - If the Advanced Setup menu screen is on the display, press **F4** (PRGM).
  - If the E-CON main menu screen is on the display, press **F3** (PRGM).

- This displays the program name input screen.



2. Input the name you want to assign to the program.



\*1 See the documentation that came with your scientific calculator or EA-100 for information about how to use a converted program.

\*2 See online help (PROGRAM CONVERTER HELP) for information about supported CFX-9850 Series and fx-7400 Series models.

3. Press **EXE**.

- This starts conversion of the setup data to a program.
- The message "Complete!" appears when conversion is complete.

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• **To convert setup data to a program and transfer it to a CFX-9850 Series/ fx-7400 Series calculator**

1. Connect the scientific calculator (CFX-9850 Series or fx-7400 Series) to the ALGEBRA calculator.
  - Perform the necessary procedure on the scientific calculator to set it up to receive data.
2. Perform steps 1 and 2 of the procedure under "To convert a setup to a program" on page 4-4-1.
3. Press **F1** (TRNS). On the sub-menu that appears, specify the type of scientific calculator (**1**: FX9850 or **2**: fx7400) for which you want to create a program.
  - Program conversion and transfer starts as soon as you specify a calculator model.
  - The message "Complete!" appears when conversion is complete.



# When you convert setup data to a CFX-9850 Series or fx-7400 Series program, any sample value storage list number greater than 5 is changed to 5.

# CFX-9850 Series or fx-7400 Series calculators support up to six lists only.  
# List 6 is used for EA-100 setup.

## 4-5 Starting a Sampling Operation

The section describes how to use a setup created using the E-CON Mode to start an EA-100 sampling operation.

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### ■ Before getting started...

Be sure to perform the following steps before starting sampling with the EA-100.

1. Connect the calculator to the EA-100.
2. Turn on EA-100 power.
3. In accordance with the setup you plan to use, connect the proper sensor to the appropriate EA-100 channel.
4. Prepare the item whose data is to be sampled.

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### ■ Starting a Sampling Operation

A sampling operation can be started when any one of the following conditions exist.

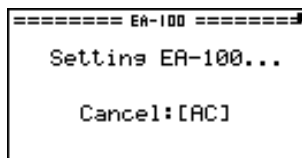
- After creating a new setup with Setup Wizard  
See step 7 under “To create an EA-100 setup using Setup Wizard” on page 4-2-2.
- After creating a new setup with Advanced Setup  
See step 6 under “To create an EA-100 setup using Advanced Setup” on page 4-2-4.
- While the E-CON main menu is on the display  
Starting a sampling operation while the E-CON main menu is on the display performs sampling using the contents of the current setup memory area (which were created using Setup Wizard or Advanced Setup).
- While the setup memory list is on the display  
You can select the setup you want on the setup memory list and then start sampling.

The following procedures explain the first three conditions described above. See “To recall a setup and use it for sampling” on page 4-3-3 for information about starting sampling from the setup memory list.



## • To start sampling

1. Start the sampling operation by performing one of the function key operations described below.
  - If the final Setup Wizard screen is on the display, press **[F1]** (YES).
  - If the Advanced Setup menu screen is on the display, press **[F1]** (START).
  - If the E-CON main menu screen is on the display, press **[F4]** (START).
  - This sets up the EA-100 using the setup data in the current setup memory area.



- To interrupt a setup while the above screen is on the display, press **[AC]**.
2. The sampling start dialog box appears after setup of the EA-100 is complete.
    - The content of the sampling start dialog box depends on the settings contained in the setup. See “Operations during a sampling operation” below for information about this dialog box and other display screens.

## • Operations during a sampling operation

Sending a sample start command from the calculator to the EA-100 causes the following sequence to be performed.

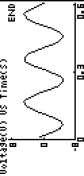
Setup Data Transfer → Sampling Start → Sampling End →  
Transfer of Sample Data from the EA-100 to the Calculator

The table on the next page shows how the trigger conditions and sensor type specified in the setup data affects the above sequence.





Starts Sampling

Sampling Type	Real-Time Sampling	Normal Sampling Press [EXE] to start.	Normal Sampling Press [TRIGGER] to start.	Trigger Start Sampling	[TRIGGER] Key Sampling	Photogate measurement
Real-Time	Yes	No				
Sampling Interval						
Start Trigger	[EXE] key		Timer		[TRIGGER] key press	Gate Status
1. EA-100 Setup	<div>===== 6#-100 ===== Setting EA-100... Cancel:[AC]</div>	<div>===== 6#-100 ===== Start Sampling? Press:[EXE]</div>	<div>===== 6#-100 ===== Press EA-100[TRIGGER] to start sampling. When sampling is done ,Press [EXE] key.</div>	<div>===== 6#-100 ===== When sampling is done ,Press [EXE] key.</div>	<div>===== 6#-100 ===== Press EA-100[TRIGGER] for each sample. When sampling is done ,Press [EXE] key.</div>	<div>===== 6#-100 ===== Start Sampling? Press:[EXE]</div>
2. Trigger Conditions						
3. Sampling		<div>===== 6#-100 ===== Sampling... Cancel:[AC]</div>				<div>===== 6#-100 ===== When sampling is done ,Press [EXE] key.</div>
4. Data Receive Trigger		Sampled values received automatically.				<div>===== 6#-100 ===== When sampling is done ,Press [EXE] key.</div>
5. Graph Drawing	Data is not graphed under the following conditions. 1. Interval: [TRIGGER] Rec Time: None 2. Motion Detector 0.02≧Sampling Interval (sec) <0.065 Rec Time: None 3. Only when Photogate sensor is used					
6. Data Store Lists	<div>===== 6#-100 ===== Time → List 1 Voltage → List 2</div>					



**# Conductivity, heart rate, and pH sensors**

Sample values produced by these types of sensors lose accuracy unless the sensors are allowed to warm up. Perform the following procedure to ensure better sampling accuracy.

**Using a Heart Rate Sensor**

1. Select [TRIGGER] as the Trigger Source item of Advanced Setup's Trigger parameter.
2. When the EA-100 is in the Ready state prior to sampling, hold down the EA-100's [TRIGGER] key for about 20 to 30 seconds, and then release it.

3. Press the EA-100's [TRIGGER] key when you want to start sampling.

**Using a Conductivity or pH Sensor**

1. Select [Yes] for the [Real-Time] setting on the Sample Setup screen of the Advanced Setup menu.

# Initial samples using conductivity, heart rate, and pH sensors are always inaccurate when starting from Setup Wizard.

# For detailed information about a sensor, see the documentation that comes with it.