User's Manual
FG410/FG420 Transferring and Outputting DLM/DL/SL Series Waveform Data
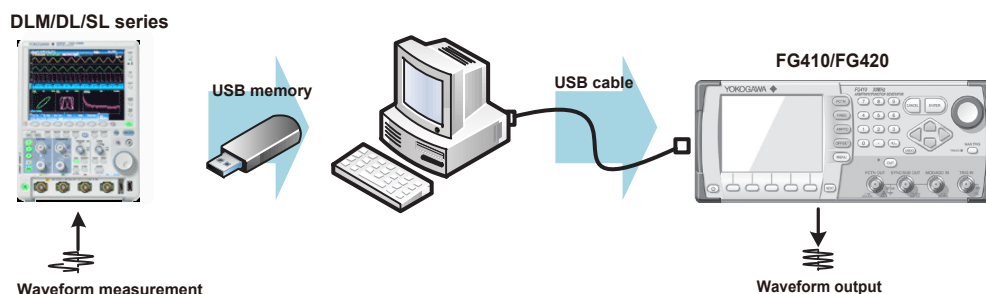
1 Introduction

This manual describes how to transfer waveform data acquired with a DLM/DL/SL series instrument to the FG410/FG420 and use it to generate arbitrary waveforms.

2 Feature and Operation

XviewerLITE is used to extract data from a waveform data file that has been saved on a DLM/DL/SL series instrument. XviewerLITE is used to select the source trace (channel), extract a section of the data, and decimate the data down to the specified number of points. Then, you can use FG410/FG420 Arbitrary Waveform Editor to transfer the data to the FG410/FG420 and output it as an arbitrary waveform.
For the DLM/DL/SL series instruments that XviewerLITE supports, see the XviewerLITE User's Manual.
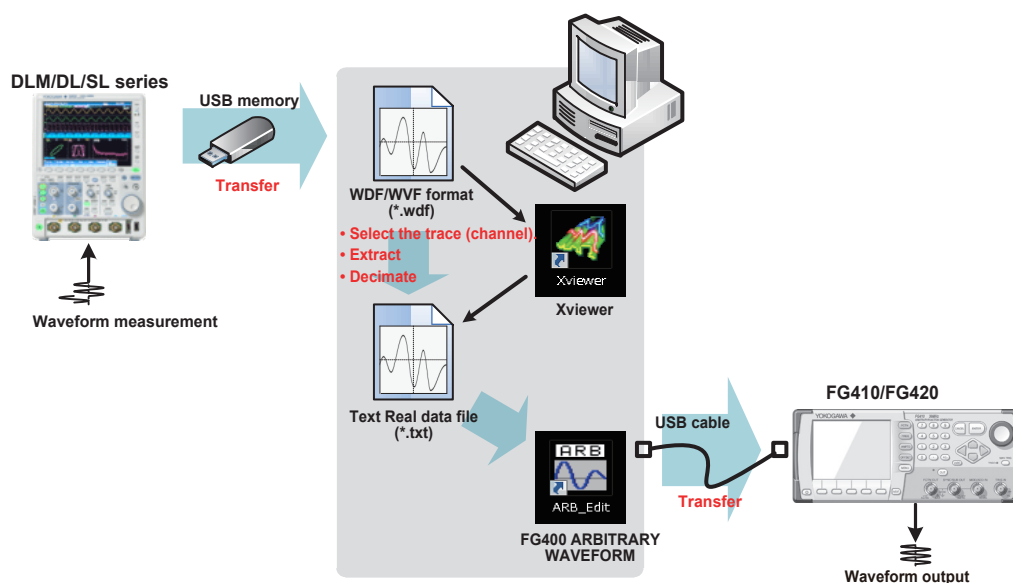
XviewerLITE

Xviewer is a software application used to view waveform data acquired on a DLM/DL/SL series instrument on a PC and convert the data into other formats. XviewerLITE is a free version of Xviewer.
Use XviewerLITE version 1.75 or later.

YOKOGAWA ◆

FG410/FG420 Arbitrary Waveform Editor

FG410/FG420 Arbitrary Waveform Editor is used to create and edit FG410/FG420 arbitrary waveforms on a PC. Arbitrary waveforms can be transferred to an FG410/FG420 through the USB interface.

Selecting the Trace (Channel)

A waveform data file that a DLM/DL/SL series instrument exports contain multiple traces (channels). From these channels (traces), you can use XviewerLITE to select the channel (trace) that you want to output from the FG410/FG420.

Extracting a Waveform

You can use XviewerLITE to extract the entire time span of a waveform or a section of it. Below are some of the ways you can extract a waveform from a waveform acquired on a DLM/DL/SL series instrument.

- Select All (the entire waveform)
- Zoom Range (the section displayed in the zoom waveform window)
- Cursor Range (the section between two vertical cursors)

Decimating a Waveform

The maximum number of data points of an FG410/FG420 arbitrary waveform is 512 kpoint (524,288 points). Data that exceeds 512 kpoint cannot be transferred. You can use XviewerLITE to decimate the waveform data down to the number of points that transferring is possible. You can set the compression rate to 5, 10, 20, 50, . . . , or 10000.

3 Preparation

Installation

1. Install Waveform Viewer XviewerLITE (free version) and FG410/FG420 Arbitrary Waveform Editor.
   - Waveform Viewer XviewerLITE (free version)
     Obtain XviewerLITE by downloading it from our website or by contacting your nearest YOKOGAWA dealer.
     You can find the download page by searching for XviewerLITE on our website. You need user registration to download XviewerLITE.
   - FG410/FG420 Arbitrary Waveform Editor
     Arbitrary Waveform Editor is contained in the accompanying CD. For the installation procedure, see the "FG410/FG420 Arbitrary Waveform Editor User's Manual."

Changing the XviewerLITE Startup Options

2. Add the startup option "-txt" to the XviewerLITE shortcut on the desktop.
   If you have deleted the shortcut, create a shortcut from "C:\Program Files\YOKOGAWA\Xviewr\ Xviewer.exe."
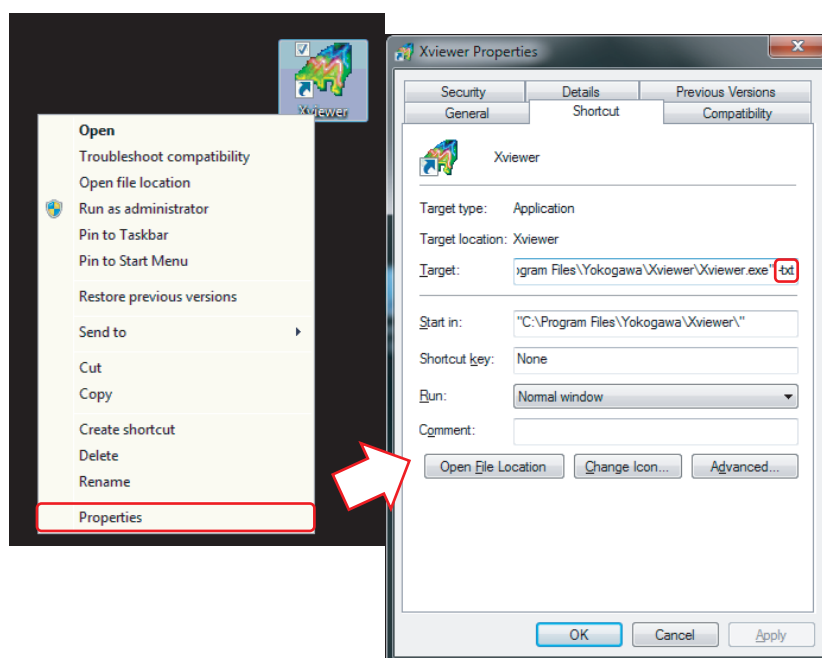
Connecting the FG410/FG420 to the PC through USB

3. Waveform data is transferred to the FG410/FG420 through the USB interface. Connect the FG410/FG420 to the PC with a USB cable.
   Press MENU on the FG410/FG420, choose "4:Utility," and press ENTER. Choose "Remote," and press ENTER. Choose "Interface," and press ENTER to select USB.
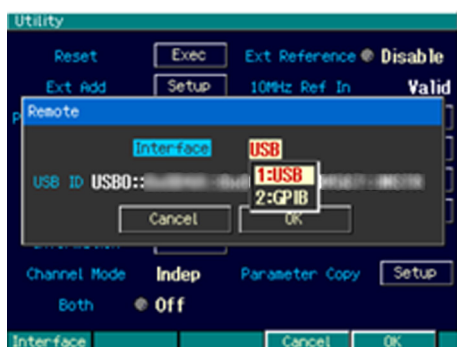
4 Procedure

4.1 Selecting the Source Trace (Channel) and Extracting a Waveform

Use XviewerLITE to extract data from a waveform data file that has been saved on a DLM/DL/SL series instrument. Select the source trace (channel), extract a section of the data, decimate the data down to the specified number of points, and save it in a text file (*.txt).
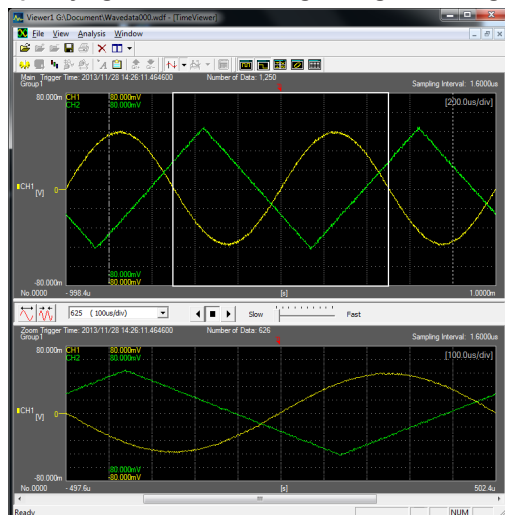
Opening a Waveform Data File

1. Double-click the XviewerLITE icon to start it. The Open dialog box appears. Select or type the name of a DLM/DL/SL series waveform data file, and click **Open**. The waveform appears.
   You can also open a file by double-clicking the file when XviewerLITE is running.
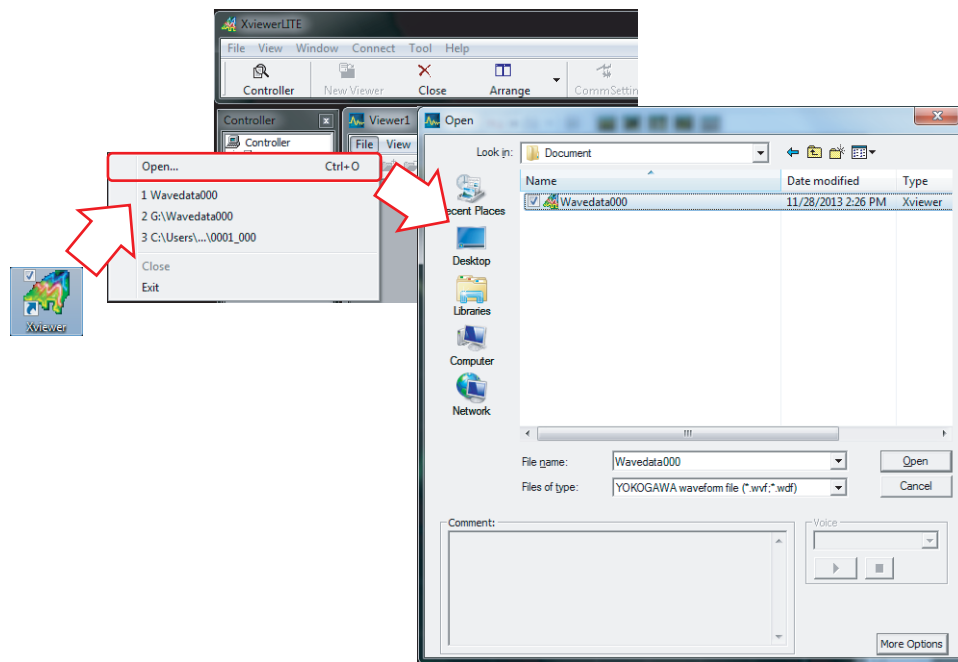
Specifying the Extraction Range

2. The range of data that is zoomed or the range between the vertical cursors can be extracted. If you want to extract a section of the waveform, specify the range using the zoom feature or vertical cursors.

   Click ▣ (or on the **Window** menu, click **Zoom Window**) to display the zoom window. Click ⚡ (or on the Analysis menu, click **Analysis Mode** and the **Vertical Cursor**) to display two vertical cursors.

Specifying the extraction range using zoom range

Specifying the extraction range using cursor range
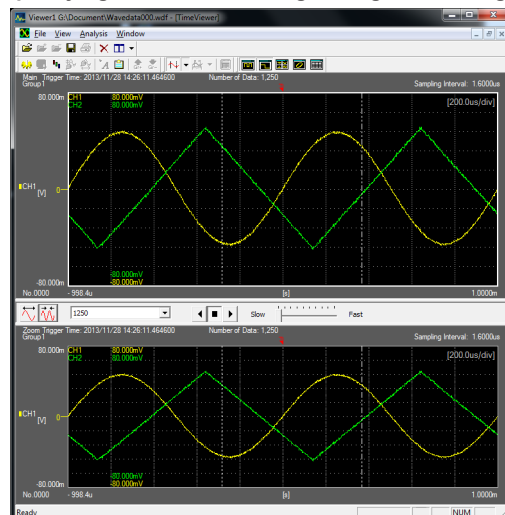
Saving the Waveform Data File

3. On the **File** menu, click **Save As**. The Save As dialog box appears. Set **Save as type** to ASCII file (*.txt).

4. Clicking More Options displays the available options. Use the Select Waveform, Data Setting, and ASCII file setting areas to select the trace (channel), specify the waveform save range, and set the compression method.
   The maximum number of data points that can be transferred to an FG410/FG420 is 512 kpoint (524,288 points). If the number of waveform data points exceeds 512 kpoint, specify the Compression and Compression Rate settings to compress the data down to 512 kpoint or less.
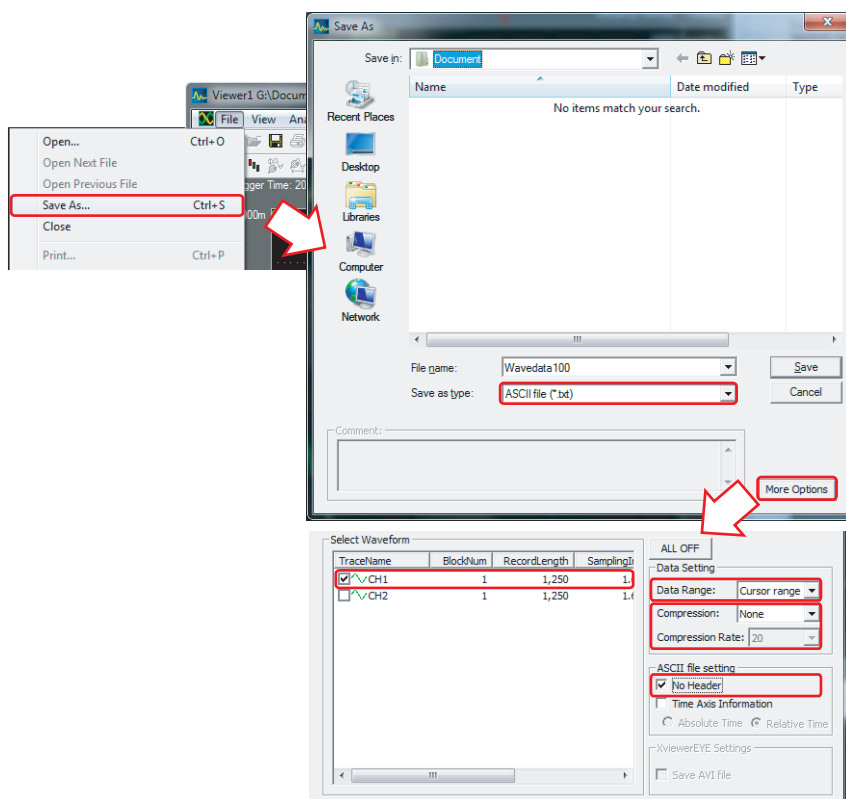
Select Waveform
Select one trace (channel) that you want to output as an arbitrary waveform from the FG410/FG420.

Data Setting
- Set the save range to Select All, Zoom Range, or Cursor Range.
  - Select All: The entire waveform
  - Zoom Range: The section displayed in the zoom waveform window
  - Cursor Range: The section between the vertical cursors
- Select whether to compress the data. If you want to compress the data, select the compression method. Do not select P-P Com.
  - None: No compression (Decim)
  - Decim: The data is decimated.
- If you set Compression to Decim, set the compression rate to 5, 10, 20, 50, . . . , 10000.

ASCII file setting
Select the **No Header** check box. The Time Axis Information setting is invalid.


5. Select or type the name of the file, and click **Save**. The data is saved to the file.

4.2 Transferring the Waveform Data

Use the FG410/FG420 Arbitrary Waveform Editor to transfer the waveform data to the FG410/FG420.

Opening a Waveform Data File

1. Start FG410/FG420 Arbitrary Waveform Editor. On the **File** menu, click **Open**. The Open dialog box appears. Set Save as type to Text Real data files(*.txt). Then, select or type the name of the file that you saved in section 4.1, "Selecting the Source Trace (Channel) and Extracting a Waveform," and click Open. The waveform appears.
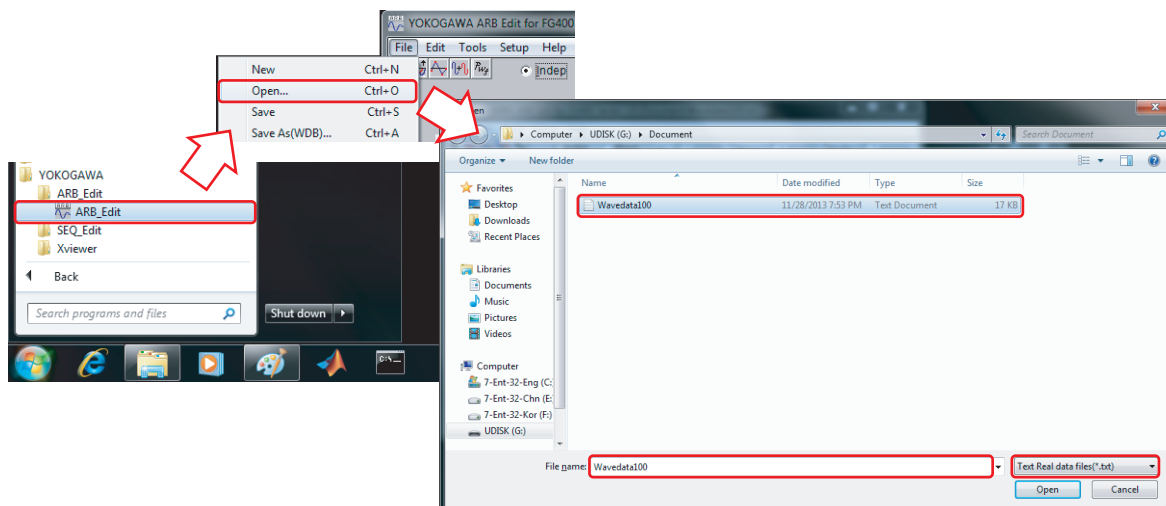
Selecting the FG410/FG420 to Transfer the Data To

2. On the **Setup** menu, click **Setup**. The System Setup dialog box appears.
   Click the **System** tab. Select FG410 or FG420 for the model. The serial number of the connected FG410/FG420 will appear. Select the serial number of the FG410/FG420 that you want to transfer the data to.
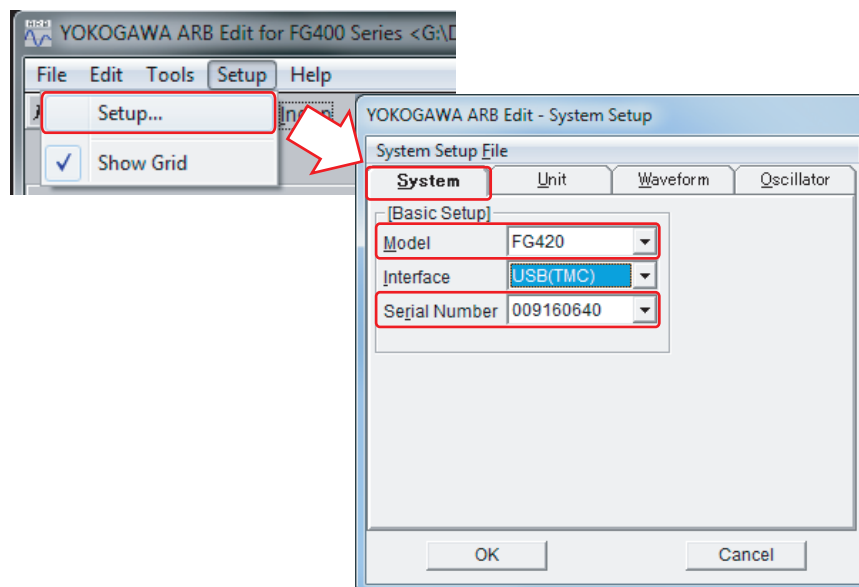
Transferring the Waveform Data

3. On the **Setup** menu, click **Setup**. The System Setup dialog box appears.

    Click the **Waveform** tab. Specify the waveform memory name, waveform memory number, transfer method, and waveform memory size. Then, click **Transfer Data**. A progress bar appears, and the waveform is transferred.

    Memory Name

    You can assign a name to the waveform using up to 20 alphanumeric characters. Specify the name.
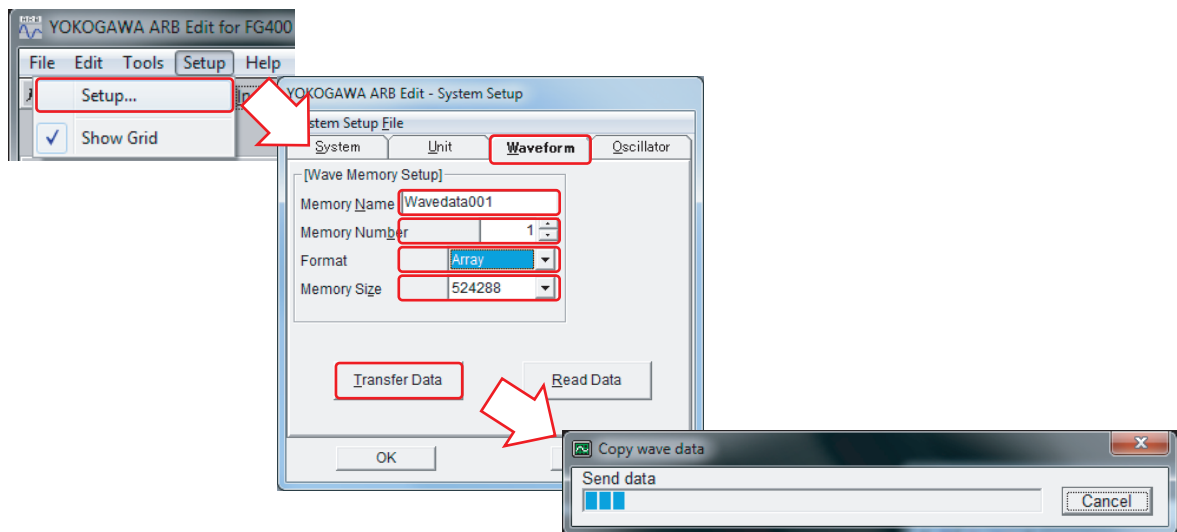
    Memory Number

    Specify the memory number in the range of 1 to 128.

    Format

    Select Array.

    Memory Size

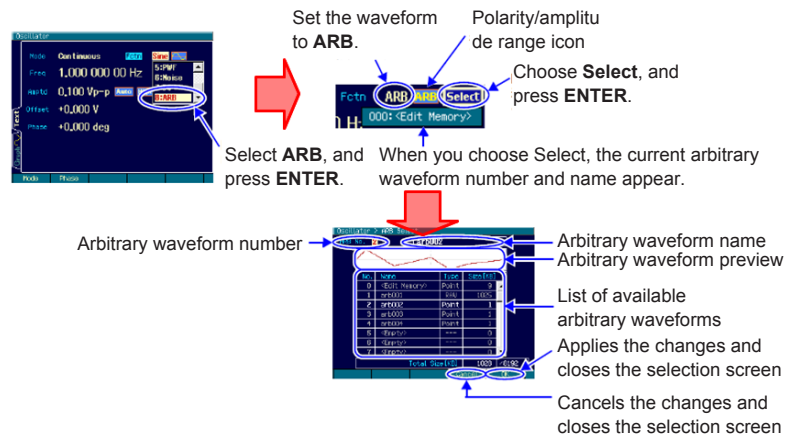   Select 4096, 8192, 16384, 32768, 65536, 131072, 262144, or 524288.

4.3 Outputting the Waveform Signal

Output the waveform data that you transferred to the FG410/FG420.

Selecting the Arbitrary Waveform

1. Use **Fctn** on the FG410/FG420 to select ARB (arbitrary waveform), and press **ENTER**. The Select button appears. Choose **Select**, and press **ENTER** to display the arbitrary waveform selection screen. Choose the waveform memory number that you transferred the data into, and press the **OK** soft key.

Set the waveform to **ARB**.

Polarity/amplitude range icon

Choose **Select**, and press **ENTER**.

Select **ARB**, and press **ENTER**.

When you choose Select, the current arbitrary waveform number and name appear.

Arbitrary waveform number

Arbitrary waveform name
Arbitrary waveform preview

List of available arbitrary waveforms

Applies the changes and closes the selection screen

Cancels the changes and closes the selection screen

Setting the Amplitude, DC Offset, and Frequency

2. The amplitude of arbitrary waveform data is normalized by the maximum and minimum values. You can set the amplitude (Amptd) and DC offset (Offset) or the high level (High) and low level (Low). In addition, you can set the output time in terms of a frequency (Freq) or period (Period).

   High level (High) and low level (Low) appear when you press the AMPTD/OFFSET soft key twice. Period (Period) appears when you press the FREQ soft key twice.

4.4 Other User's Manuals

For details on the features and operating procedures of the FG410/FG420 Arbitrary Waveform/Function Generator, FG410/FG420 Arbitrary waveform Editor, and Xviewer, see the following manuals.

- FG410/FG420 Arbitrary/Function Generator User's Manual (Basic) (IM FG410-01EN)
- FG410/FG420 Arbitrary/Function Generator Communication Interface User's Manual (IM FG410-17EN)
- FG410/FG420 Arbitrary Waveform Editor User's Manual (IM FG410-61EN)
- 701992 Xviewer User's Manual (IM 701992-01E)