NF

SEQUENCE EDIT SOFTWARE

Instruction Manual

NF Corporation

DA00016813-001

SEQUENCE EDIT SOFTWARE

Instruction Manual

—— Preface ——

Thank you for purchasing the **WF1973/WF1974 Multifunction Generator.**

To ensure safe use of this product, please first read **Safety Precautions** on the following pages.

■ Before Reading This Manual

This manual is a PDF file stored in the CD-ROM. Acrobat Reader (Adobe Systems, Inc.) Ver. 5 or higher is required to view the file contents.

This manual is intended for users with knowledge for basic operation of the operating system (OS) (Microsoft Windows 2000/XP) to be used. For basic operation of the Windows OS or definitions of terms such as "click" and "drag", see the user's guide of the Windows OS.

Figures or messages shown in this manual are for the Windows XP environment, and may differ in other environments.

■ Caution Symbols Used in This Manual

The following caution symbols are used in this manual. Be sure to observe these caution symbols and their contents.

—— ⚠ **CAUTION** ——————————————

This mark indicates cautions on handling of this program.

- **This manual has the following chapter organization.**

    If you are reading this manual for the first time, start from **1. OVERVIEW**.

1. OVERVIEW

    Presents brief descriptions.

2. INSTALLATION

    Describes environmental requirements for operation as well as its installation and startup procedures.

3. SEQUENCE EDITING

    Describes the operation procedures for edit screen.

4. SEQUENCE VIEW WINDOW

    Describes the operation procedures for sequence view screen.

5. OTHER FUNCTIONS FOR SEQUENCE EDITING

    Describes the onother functions.

6. ERROR MESSAGES

    Describes the error messages.

7. MAINTENANCE

    Describes management of the CD-ROM and actions to take when the device is damaged.

— **Safety Precautions** —

To ensure safe use, be sure to observe the following warnings and cautions.
NF Corporation shall not be held liable for damages that arise from failure to observe these warnings and cautions.

● **Be sure to observe the contents of this instruction manual.**

This instruction manual contains information for the safe operation and use of this product.
Be sure to read this information first before using this product.
All the warnings in the instruction manual must be heeded to prevent hazards that may cause major accidents.

● **In case of suspected anomaly**

If the product controlled by this software emits smoke, an abnormal smell, or abnormal noise, immediately power it off and stop using it.
If such an anomaly occurs, do not use this product until it has been repaired, and immediately report the problem to the location of purchase (either NF Corporation or your distributor).

SEQ Edit

─── **Disclaimer** ───

The **Sequence Edit Software** (hereinafter, "this software") was shipped after having undergone full testing and inspection by the NF Corporation.

Should this product fail due to a manufacturing flaw or due to a mishap during shipping, contact NF Corporation or an NF Corporation sales representative.

NF Corporation takes no responsibility for any damage caused by use of this software. In addition, we assume no obligation to modify the software or provide support if this software contains flaws. Please use this software under your responsibility.

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─── **ABOUT CONTACT** ───

If a problem occurs or if you have questions, contact NF Corporation or the NF Corporation sales representative where you purchased this product.

When contacting NF Corporation or an NF Corporation sales representative, provide the model name (or product name), version number, and information as detailed as possible about the nature of the problem, conditions of use, etc.

Contents

Figures and Tables

1. OVERVIEW

1.1 General

The **Sequence Edit Software** is a program that supports a sequence function of the WF1973/WF1974 MULTIFUNCTION GENERATOR.

This software runs under the Windows 2000 and XP operating systems in a personal computer (PC), and controls transfer of control data, and sequence data on the WF1973/WF1974 MULTIFUNCTION GENERATOR via a USB interface and execution of other operations.

The following are the main functions of this software:

- Creating, editing, and saving sequence data
- Transferring sequence data to the WF1973/WF1974
- Reading sequence data to the WF1973/WF1974
- Transferring arbitrary waveform data to the WF1973/WF1974
- Previewing sequence data
- Controlling the sequence run to the WF1973/WF1974
- Displaying the progress of the currently running sequence on the monitor

For operation details of the sequence function, see the WF1973/WF1974 Application Instruction Manual.

1.2 On-line/Off-line

The Sequence Edit Software checks for connected devices at startup.

If a connected device is detected, the software starts in the "**on-line**" status where devices can be controlled.

If the specified device is not connected, the software starts in the "**off-line**" status and does not communicate with any device. **It is possible to create a device setting file or edit sequence data even in the "off-line" status.**

1.3 Conventions

The following conventions are used in this manual.

- Menu names displayed on the screen, user input strings, and other elements: block letters enclosed by square brackets ([,]).

    Examples: **[Waveform(T)]**, **[s=2*pi;]**

- Button names displayed on the screen, user's key operations, and other elements: block letters enclosed by a box (□).

    Examples: Cancel , OK , Alt

- Press one key while holding down another key: Two keys are connected by a plus (+) symbol. Example: Ctrl + O

- Press one key, release it and press another key: Two keys are divided by a comma (,).

    Example: Alt , F

2. INSTALLATION

2.1 Hardware Requirements

Before installing the **Sequence Edit Software**, check that the system satisfies all the requirements below.

2.1.1 Personal computer

- CPU: 300 MHz or faster (1 GHz or faster recommended)

- Memory: 256 MB or more (512 MB or more recommended)

- Free hard disk space: 50 MB or more

- Display: 1024 × 768 pixels or higher and 256 colors or more.

- OS: Windows 2000 SP4/XP SP2 (Microsoft)

- Disk drive: CD-ROM drive

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------ ⚠ CAUTION ------

The CD-ROM drive is required only when the software is installed.

2.1.2 USB interface

- USB 1.1 Full Speed

2.2 Installation Procedure

When installing or uninstalling the software in a Windows 2000 or XP environment, log on as a user who has an administrator privilege.

2.2.1 Installing the USB driver software

The USB driver software can be downloaded from the National Instruments Corporation website. The procedures for installing the USB driver software are described below.

1. Search for the VISA Run-time Engine page on the National Instruments Corporation website or select "VISA driver downloads" at the following URL.
   http://www.ni.com/support/visa/

2. Download VISA Run-time Engine from the VISA Run-time Engine page.
   User registration must be performed at this time. Download VISA Run-time Engine Ver. 3.3 or later.

3. The downloaded file is a self-extracting file. Extract it and install the software.

4. The USB driver software is installed when installation is successfully complete.

For details, visit the National Instruments Corporation website.

After installing the USB driver software, connect the device to the PC as follows:

a) Make sure that the device and the PC are not connected.

b) Power-on the device and connect the device and the PC using a USB cable.

c) The installation process starts automatically. Follow the guidance.

───── ⚠ **CAUTION** ─────

If GPIB is selected as the remote interface of the WF1973/WF1974, select USB and then follow the procedure described above.

For details, refer to the "WF1973/WF1974 External Control Instruction Manual".

SEQ Edit

2.2.2　Installing Sequence Edit Software

(a)　Insert the **WF1973/WF1974 MULTIFUNCTION GENERATOR** CD-ROM into the CD-ROM drive of the PC.

(b)　Execute **[English\Application\SEQ_EDIT\Setup.EXE]** on the CD-ROM or **[D: \English\Application\SEQ_EDIT\Setup.EXE]** from **[Run]** on the start menu. **[D:]** indicates the CD-ROM drive. If another drive letter is assigned to the CD-ROM driver, assign it appropriately, according to your system.

(c)　Click the Next button, following the screen guidance to start installation.

(d)　When installation has been completed, the "**Sequence Edit Software**" can be executed. Click **[SEQ_EDIT]** from Start - **[Programs] - [NFTOOL] - [SEQ_EDIT]** to execute the software.

2.2.3　Uninstalling Sequence Edit Software

To remove the Sequence Edit Software, first double-click **[Add or Remove Programs]** (in the case of Windows 2000; in the case of Windows XP, **[Add or Remove Programs]**) from the control panel. Next, click the **[SEQ Edit Software]** and the Change/Remove button.

Note that the folder in which the **Sequence Edit Software** was installed may not be removed in some cases. All the files created in the folder remain as they are. If the folder is unnecessary, delete it after uninstallation.

3. SEQUENCE EDITING

3.1 Component Names

The following editing screen appears after the **Sequence Edit Software** (**SEQ Edit**) is started.
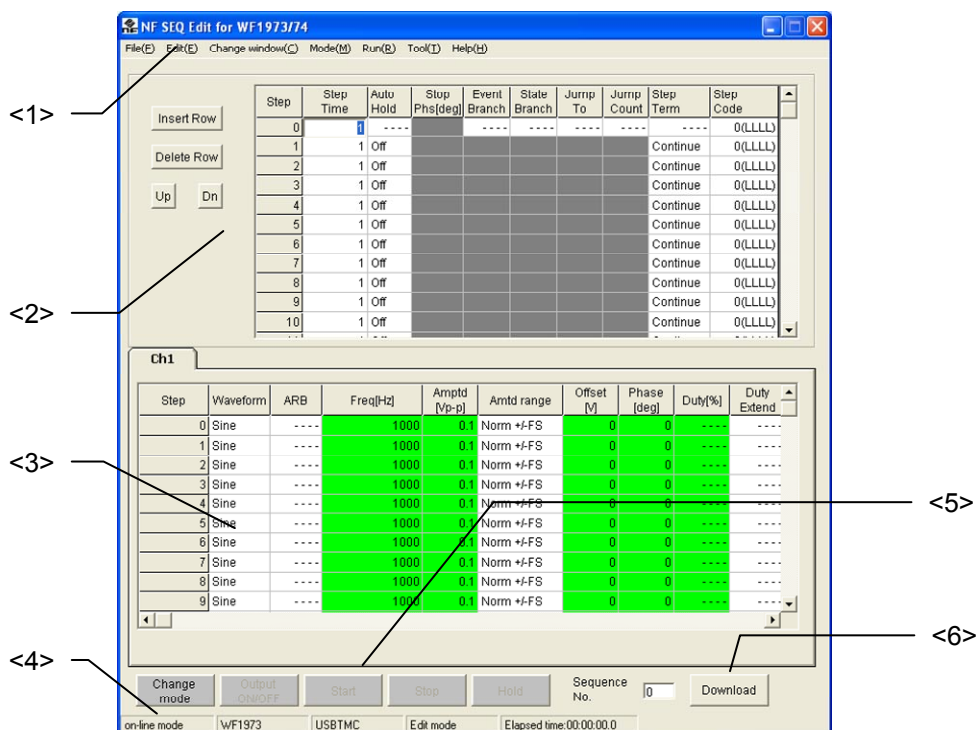
<1> Menu bar

☞ See "3.2 Menu Organization".

<2> Step parameters setting area

☞ See "3.4 Sequence Edit Area".

<3> Channel parameters setting area

☞ See "3.4 Sequence Edit Area".

<4> Message display area

Displays the demo operation/on-line, device model name, interface, editing, execution mode, sequence execution time and other information.

☞ See "3.7 Message Display Area".

<5> Sequence control buttons

☞ See "3.5 Sequence Control Buttons".

<6> Sequence control button

☞ See "3.5 Sequence Control Buttons".

3.2 Menu Organization

The menu organization of the **SEQ Edit** is shown below.

Note that items indicated with an asterisk (*) cannot be used in the sequence view window.

File(F)	
New(N)*	Ctrl+N — Clears the sequence data, and initializes it to the condition enabling creation of new data.
Open(O)*	Ctrl+O — Opens the sequence data file.
Save(S)	Ctrl+S — Saves the sequence data by overwriting.
Save As(A)	— Saves the sequence data under the specified file name.
Exit(X)	— Exits this software.

Edit(E)*	
Copy(C)	Ctrl+C — Copies the selected sequence data.
Paste(P)	Ctrl+V — Pastes the copied sequence data.
Select All(L)	— Selects all the sequence data contained in the setting area being edited.
Initialize(A)	— Changes the selected cell to the initial value.
Insert Row(I)	— Adds a new row before the row being edited.
Delete Row(E)	— Deletes the row being edited.
Row Up(U)	— Moves the row being edited to one row above.
Row Down(D)	— Moves the row being edited to one row below.

Change Window(C)	
Edit Window (E)	— Displays the edit window.
Sequence View Window(V)*	— Displays the sequence view window.
Tile Vertically(T)	— Tiles the edit and sequence view windows.

Mode(M)	
Edit mode(E)	— Changes to the mode in which the sequence data can be edited.
Execution mode (R)	— Changes to the mode in which the sequence can be executed.

Run(R)	
Start(S)	— Starts execution of the sequence.
Stop(E)	— Stops execution of the sequence.
Hold(H)	— Holds execution of the sequence.
Output ON(N)	— Turns on output of the device.
Output OFF(F)	— Turns off output of the device.

Tool(T)	
Arbitrary wave form (A)	— Displays the [Arbitrary Wave Form] dialog box.
Channel setting (C)	— Displays the [Channel Setup] dialog box.
Sequence common parameter (S)	— Displays the [Sequence Common Parameter] dialog box.
System Setup(I)	— Displays the [System Setup] dialog box.

Help(H)	
About(A)	— Displays the [About] dialog box.

3.3 Start and Termination

For how to start the **SEQ Edit**, click [SEQ_EDIT] in Start – [Program] – [NFTool] – [SEQ_EDIT].

The message in "Figure 3-1" appears when the software is started for the first time or when the previously set device is not connected.

If not a single unit is connected at startup, the software is started in the off-line state.

If a unit is connected, the software starts in the on-line state. However, if several units of the same model are connected, the message shown in "Figure 3-1" is displayed.
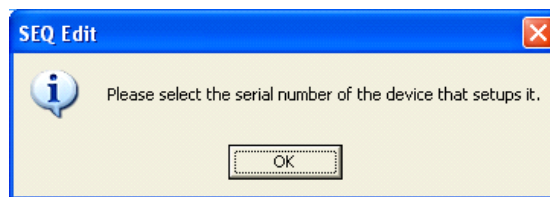
Figure 3-1 Message Displayed When Sequence Edit Software Is Started

When OK is clicked, the software is started in the off-line mode. The system setting screen is displayed. On the system setting screen, set the serial number of the unit to be set.

☞ "5.7 System Settings"

When using the WF1974, the software starts in the **on-line state** only when it is started for the first time. On the system setting screen, change the model setting. During the second and subsequent startups, an equipment connection check for the model that was used the previous time (WF1973 or WF1974) is performed.

The software is exited when **[File(F)] - [Exit(X)]** (ALT , F , X) is selected or the Close button is clicked. At this time, the data that was being edited is saved and is reflected at the next startup.

3.4 Sequence Edit Area

The sequence edit area consists of the following two areas.

<1> Step control parameters setting area
<2> Channel parameters setting area

When the "SEQ Edit" is started, the previously set values are shown. If the software is used for the first time or a sequence is newly created, the initial set values are shown. (For the initial set values, ☞ see "5.8 List of Initial Setting Values".)
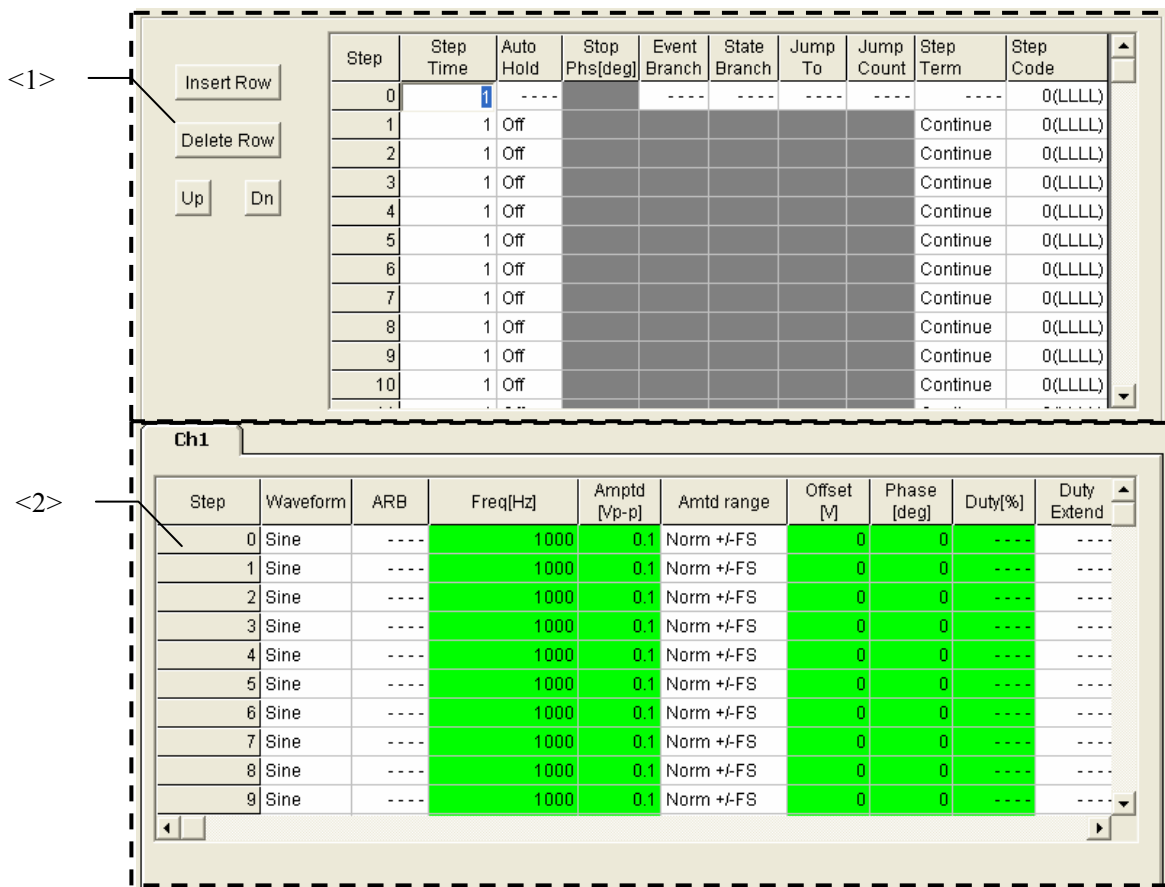The edit area when the **SEQ Edit** is started for the first time is shown in "Figure 3-2".

Figure 3-2 Sequence Edit Area

SEQ Edit

3.4.1   Setting parameters

You can set each parameter by inputting the desired value directly into the selected cell. The input values are checked for range appropriateness.

The channel parameter setting area may contain parameters that do not require setting depending on the type of waveform. "----" is displayed for such parameters and no value can be input.

Selecting **[Edit(E)] - [Initialize(A)]** can return the selected set values to the defaults.

The items that cannot be selected through direct input are described below.

a) **Setup from Combo Boxes**

To set a value in **[AutoHold]**, **[StepTerm]**, **[StepCode]**, **[Waveform]**, **[Amplitude Range]**, or **[DutyExtend]**, click the desired cell and select the value from the combo box as shown in "Figure 3-3".
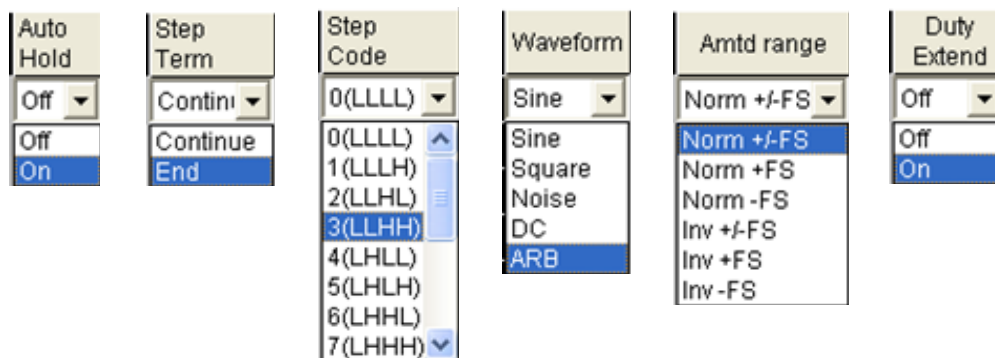
Figure 3-3 Combo Boxes

b) **Numerical input with on/off setting**

To set a value in **[StopPhs]**, **[EventBranch]**, **[StateBranch]**, **[JumpTo]**, or **[JumpCnt]**, after parameter set on/off from the radio button.

An end phase input example is described below.

Clicking the **[StopPhs]** cell displays the radio buttons with On (Valid)/Off (Invalid), as shown in "Figure 3-4". The stop phase can be enabled or disabled by switching the radio button setting. If Off is selected, the corresponding cell will gray out and it will not accept any entry. If On is selected, the cell will display the default value.

Figure 3-4 Step Stop Phase Setting

In the case of jump count ([JumpCnt]) only, the setting is that of [Infinity/On] and not the [On/Off] setting. Moreover, when the jump destination ([JumpTo]) setting is Off, the jump count setting cannot be done.
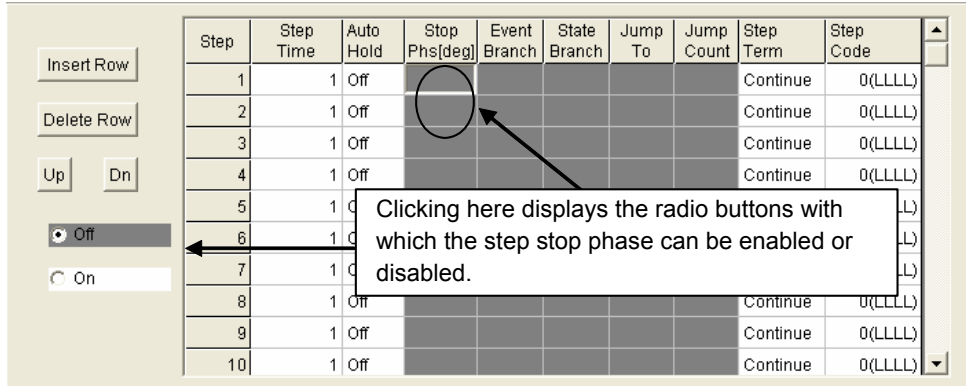
c) **Operation type setting**

In the case of the frequency, amplitude, offset, start phase, and duty, in addition to a value setting, there is also an operation type setting ([Const], [Keep], [Sweep]).

Clicking a cell in these parameters setting area displays the radio buttons with which the operational types can be set. The operational type can be enabled or disabled by switching the radio button setting.

Channel parameter setup cells, except some, in this area are color-coded according to the operational type. The cell color representing each operational type corresponds to one of the background colors of the radio buttons with which this type can be set.
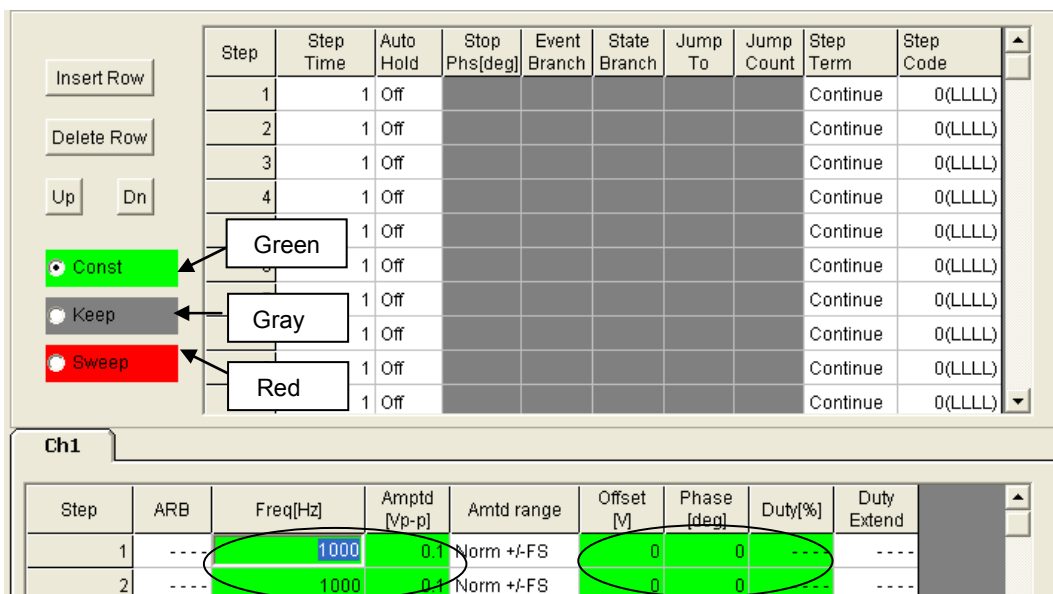
Figure 3-5 Setting the Operational Type

d) Step 0 parameter setting

Some of the parameter cannot be set for step 0. [----] is displayed for these parameters.

3.4.2　Line insertion, detection, and moving

A line can be inserted, deleted, or moved for the step line of a selected cell or a step line selected by clicking a step number cell.

Figure 3-6　Move Line Button, Add Line Button

Click the ⎣Insert Line⎦ button or select **[Edit (E)]-[Insert Line (I)]** (⎣ALT⎦, ⎣E⎦, ⎣I⎦) to insert a new line before the selected line. The default setting values are displayed on the inserted line. The line of step 255 is deleted.

Click the | Delete Line | button or select **[Edit (E)]-[Delete Line (E)**] (| ALT |, | E |, | E |) to delete the selected line. The default setting values are newly displayed on the line of step 255.

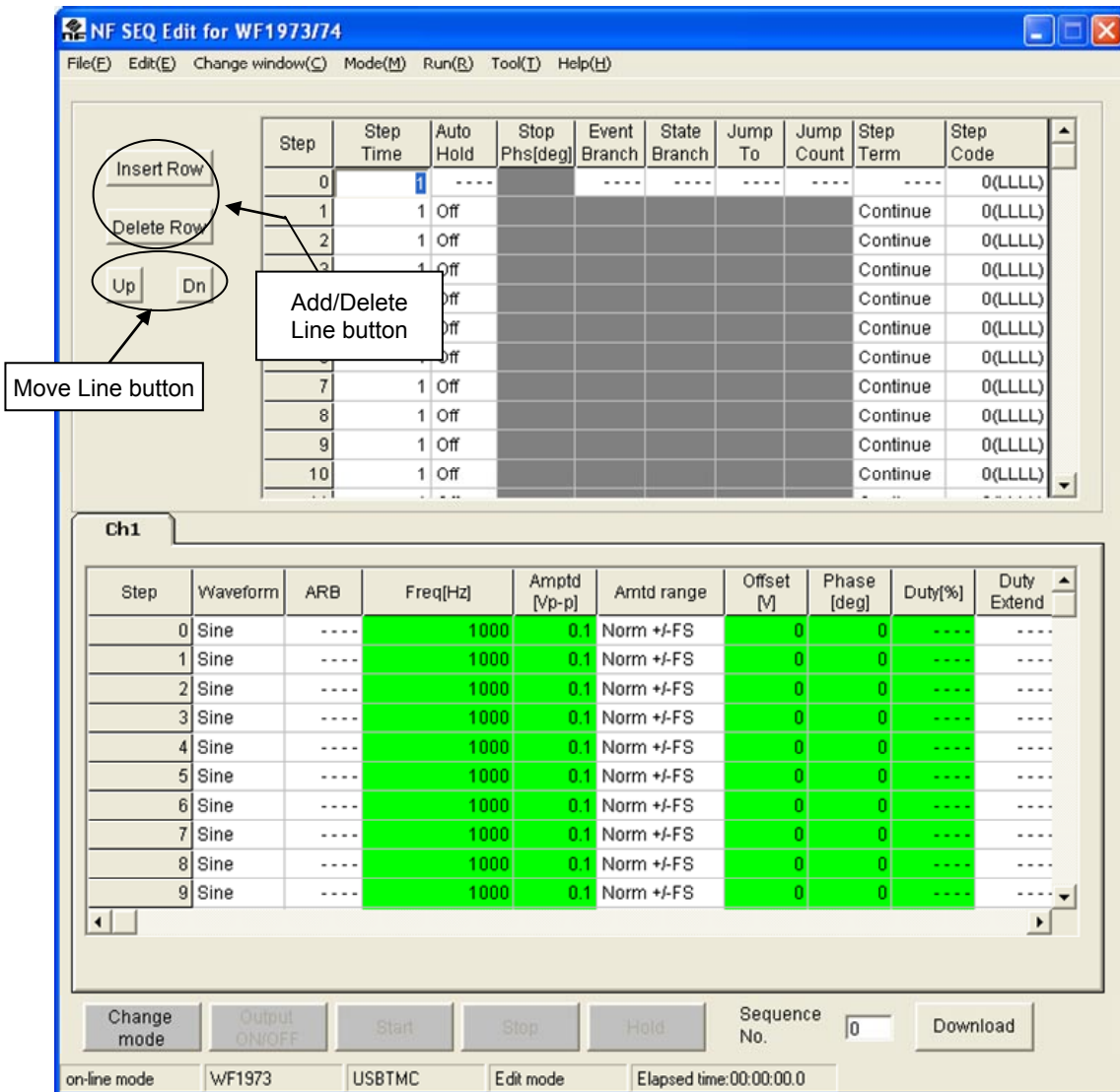Click the | ▲ | or | ▼ | move buttons to move the selected line either up or down.
This can also be done by selecting **[Edit (E)]-[Line UP(U)]** (| ALT |, | E |, | U |) or **[Edit (E)]-[Line Down (D)]** (| ALT |, | E |, | D |).

3.4.3   Copying the sequence data

The sequence data can be copied in either the step control parameters or channel parameters setting area.

Follow the procedure below to copy the sequence data.

<1> Select the sequence data to be copied, including the operational type setting.
<2> Select **[Edit (E)] – [Copy (C)]** (| **ALT** |, | **E** |, | **C** |) to copy the data.
<3> Select the destination.
<4> Select **[Edit (E)] – [Paste (P)]** (| **ALT** |, | **E** |, | **P** |) to paste the data.

Although data can be selected in cell, line, and same row units, if the format of the selected data differs from that of the copy destination, paste is not possible. That is, data in one cell or column cannot be copied to a cell or column in another column.

3.5 Sequence Control Buttons
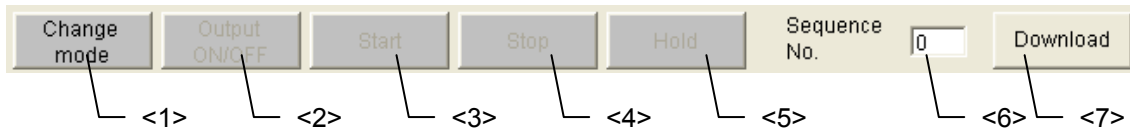
This section details the sequence control buttons.

Figure 3-7 Sequence Control Buttons

<1> [Change Mode] button

This button is used to change modes between edit and execution. When switching from the edit mode to the execution mode, the **[Sequence Name]** setting dialog box is displayed. Set a sequence name by inputting up to 20 one-byte characters. Selecting cancel in this dialog box continues edit mode. Next, the compatibility of the sequence data is checked. If the compatibility check result is OK, the following data is transferred to the unit. The transfer destination is the sequence memory specified in "<6> Sequence number".

Channel setup parameter	☞ "5.4 Arbitrary Waveform"
Arbitrary waveform data	☞ "5.5 Channel Setup"
Sequence data (including common sequence parameters)	
	☞ "5.6 Common Sequence Parameter Settings"

While the sequence is running, the mode cannot be changed.

Edit mode: Allows the sequence data to be edited. Sequences cannot be run in the edit mode.

Execution mode: Allows the sequence to be executed. Sequences cannot be edited in the execution mode.

<2> [Output ON/OFF] button

This button is used to control output of the device. If the output is turned on, this button turns green. While the sequence is running, it is not possible to change between output ON and OFF.

<3> [Start] button

This button is used to start the sequence. Clicking this button enables the Stop, and Hold buttons to operate.

If the device output is not on when the Start button is clicked, a message appears prompting that the output will be turned on, followed by the output turning on.

While the sequence is executing, it is not possible to turn on or off the output or exit the software. Click the Stop button before turning on or off the output, or exiting the software.

<4> [Stop] button

This button is used to stop the sequence. The output when the sequence is stopped is held. After this button has been pressed, the Stop, and Hold button will be unavailable. Clicking the Start button in this state can restart the sequence, beginning at step 0.

<5> [Hold] button

This button is used to stop the sequence temporarily. The output when the sequence is paused is held.

Clicking the Start button can resume the sequence from a step that has temporally stopped. Click the Stop button to terminate the sequence.

<6> [Sequence No.]

Click the Change Mode or Read button to transfer the sequence data or set the sequence number on the unit side to be read out.

<7> [Read] button

In the on-line state, the sequence data of the **[Sequence No.]** is read out from the unit. At this time, the data being edit with **SEQ Edit** is discarded and data is read out from the unit and displayed.

This Read button is valid only in the edit mode.

SEQ Edit

3.6 Monitoring the Sequence Execution

The **SEQ Edit** window allows monitoring of how the sequence is being executed.

As shown in "Figure 3-8", the current step is indicated by a change of color in the step control parameters or channel parameters setting area.

Figure 3-8 Monitoring the Sequence Execution
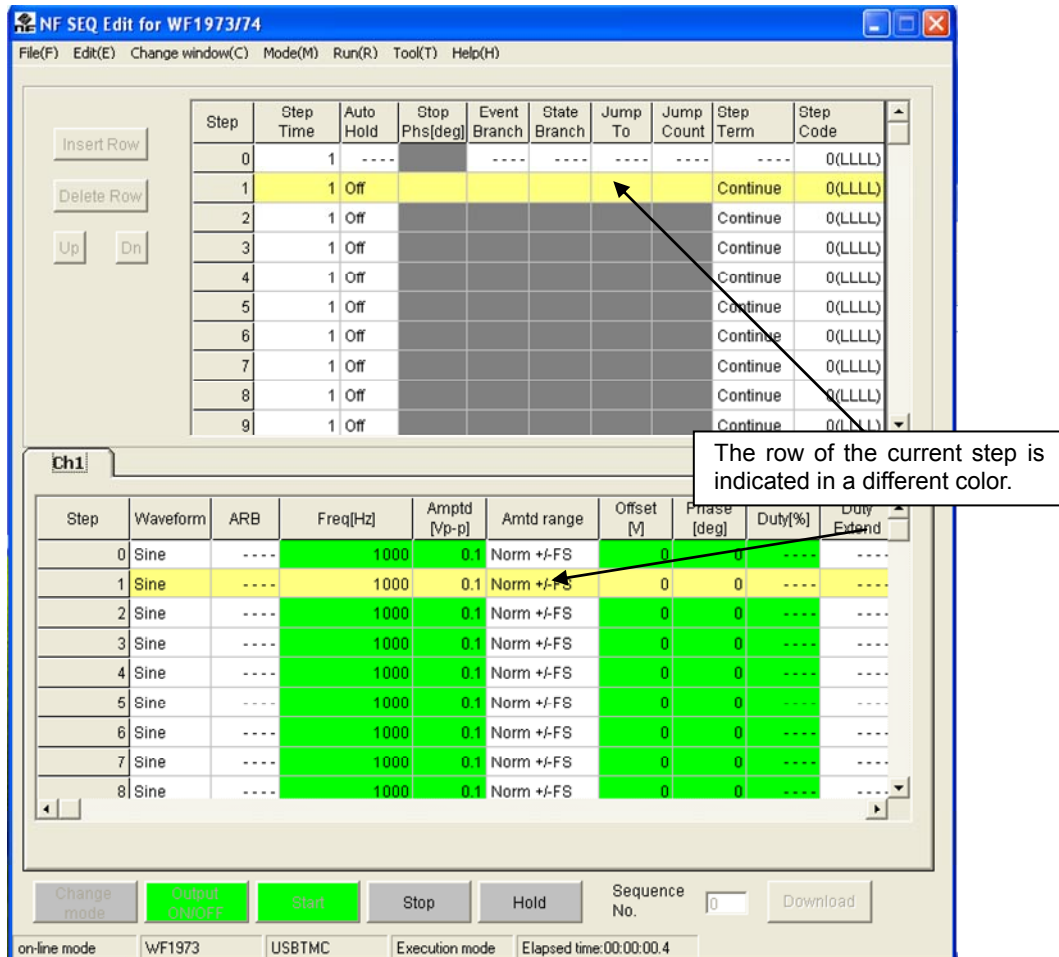
Once the sequence execution stops, the sequence execution monitor stops automatically, displaying the sequence execution stop message.

———— ⚠ **Caution** ————

- The software monitors the device output condition when the sequence is being executed. If the device output goes off while the sequence is being executed, the software displays a message, stopping the sequence execution.

3.7 Message Display Area
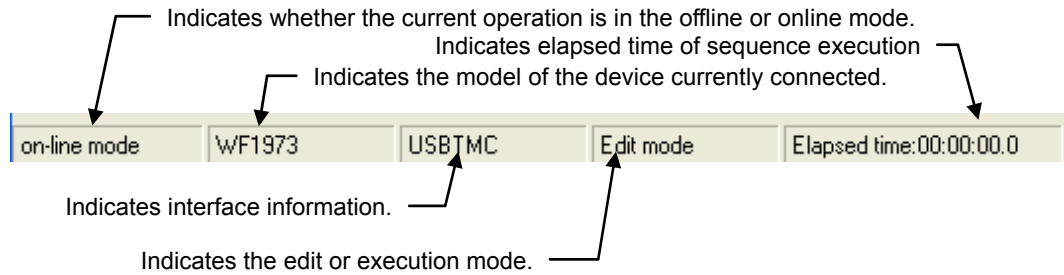
This section details the message display area.

Indicates whether the current operation is in the offline or online mode.

Indicates elapsed time of sequence execution

Indicates the model of the device currently connected.

| on-line mode | WF1973 | USBTMC | Edit mode | Elapsed time:00:00:00.0 |

Indicates interface information.

Indicates the edit or execution mode.

Figure 3-9 Message Display Area

When the sequence execution starts, the elapsed time of the sequence execution is incremented.

⚠ **Caution**

A slight error may occur in the elapsed time of the sequence. Interpret it as a reference value.

4. SEQUENCE VIEW WINDOW

4.1 Sequence View Window

When **[Change Window(C)] - [Sequence view window]** (ALT , C , V) is selected, the sequence view window shown in "Figure 4-1" will be displayed. The created sequence data can be previewed in the **[Sequence View(V)]** window.
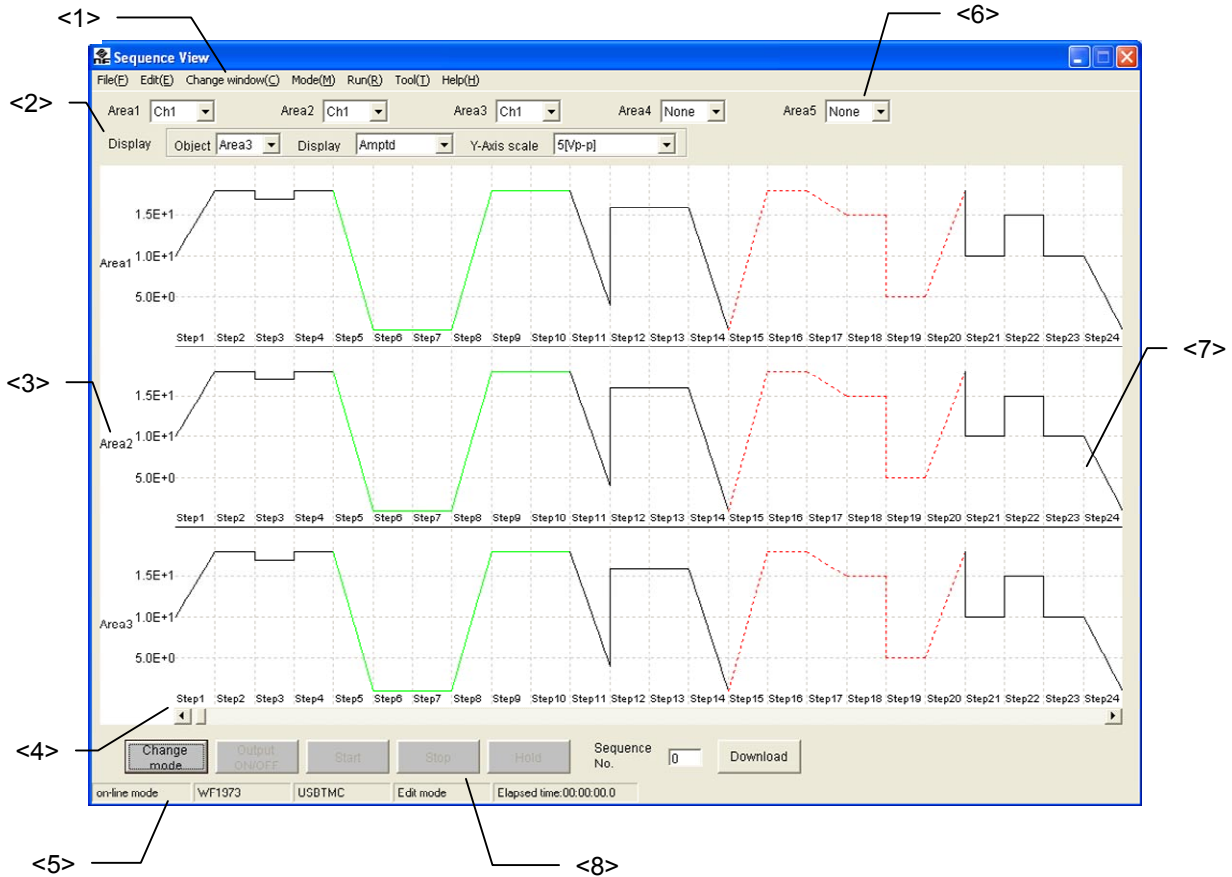

Figure 4-1 Sequence View Window

<1>   Menu bar

Same as the menu bar in the Edit window.
☞ See "3.2 Menu Organization".

<2>   Display settings

Sets the vertical axis scale and display parameters.
☞ See "4.2.2 Display settings".

<3>   Area number

<4>   Step number

<5> **Message display area**

Same as the Message display area in the Edit window.

☞ See "3.7 Message Display Area".

<6> **Selection of display area**

Sequence graphs can be displayed in up to five areas.

☞ See "4.2.1 Selecting display area".

<7> **Sequence display area**

☞ See "4.2.3 Sequence Display Area".

<8> **Sequence control buttons**

Same as the sequence control buttons in the Edit window.

☞ See "3.5 Sequence Control Buttons".

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4.2 Sequence Preview

4.2.1 Selecting display area

Select from the combo box which connected device is to be displayed in the Sequence View window. Up to five sequence graphs can be displayed the sequence display area.

Select the connected device.
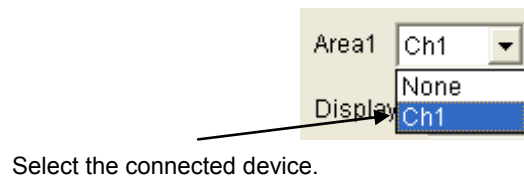
Figure 4-2 Select Display Area

If **[None]** is selected for the connected device, the sequence graph will not be displayed.

4.2.2 Display settings

For each display area, set the contents to be displayed and the vertical axis scale. The settings of these parameters will be accepted only in **[Edit mode]**.

Select the object display area.

Select the parameter to be displayed.

Select the vertical axis scale.
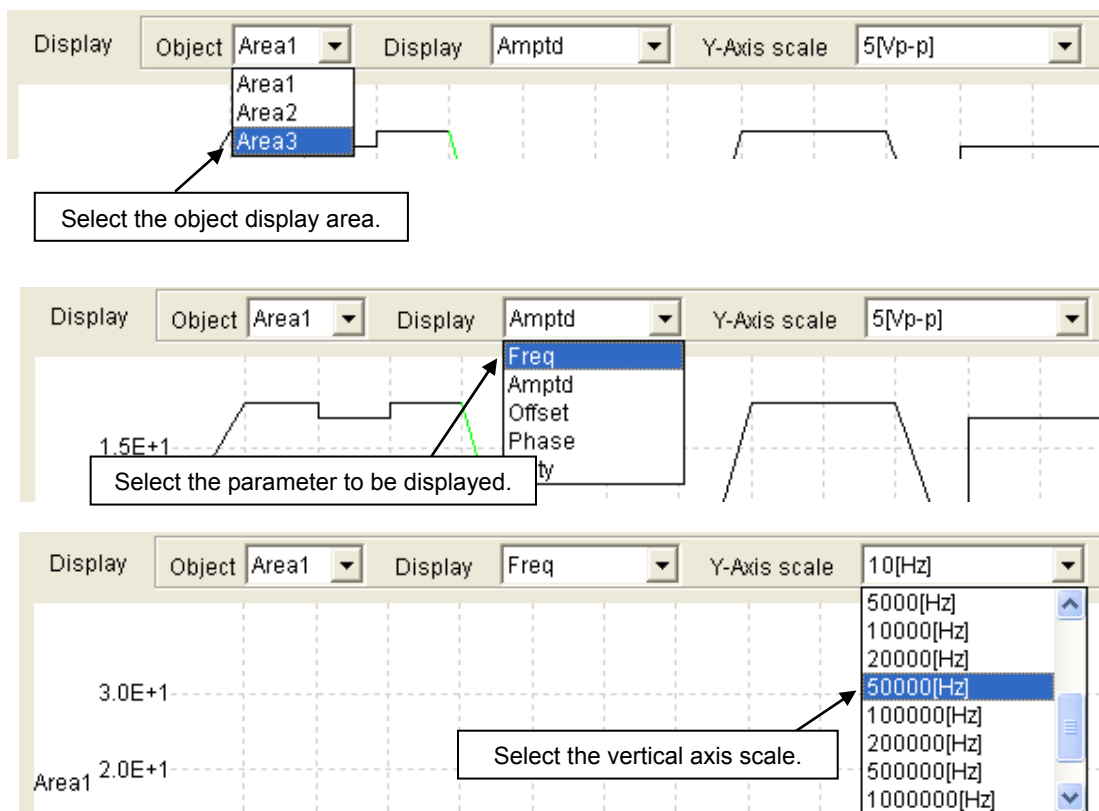
Figure 4-3 Selecting Display Area

SEQ Edit

4.2.3 Sequence Display Area

The sequence graph is displayed as shown in "Figure 4-4".

Use the horizontal scroll bar to scroll the display to see the portions that are not in the sequence display area. Any looping step is displayed only once by a green solid line. Any infinite looping step is displayed only once by a red dashed line.

If the number of steps is 24 or less, the sequence graph view will be enlarged according to the number of steps. If the number of steps is 25 or more, the width of displayed steps is fixed.
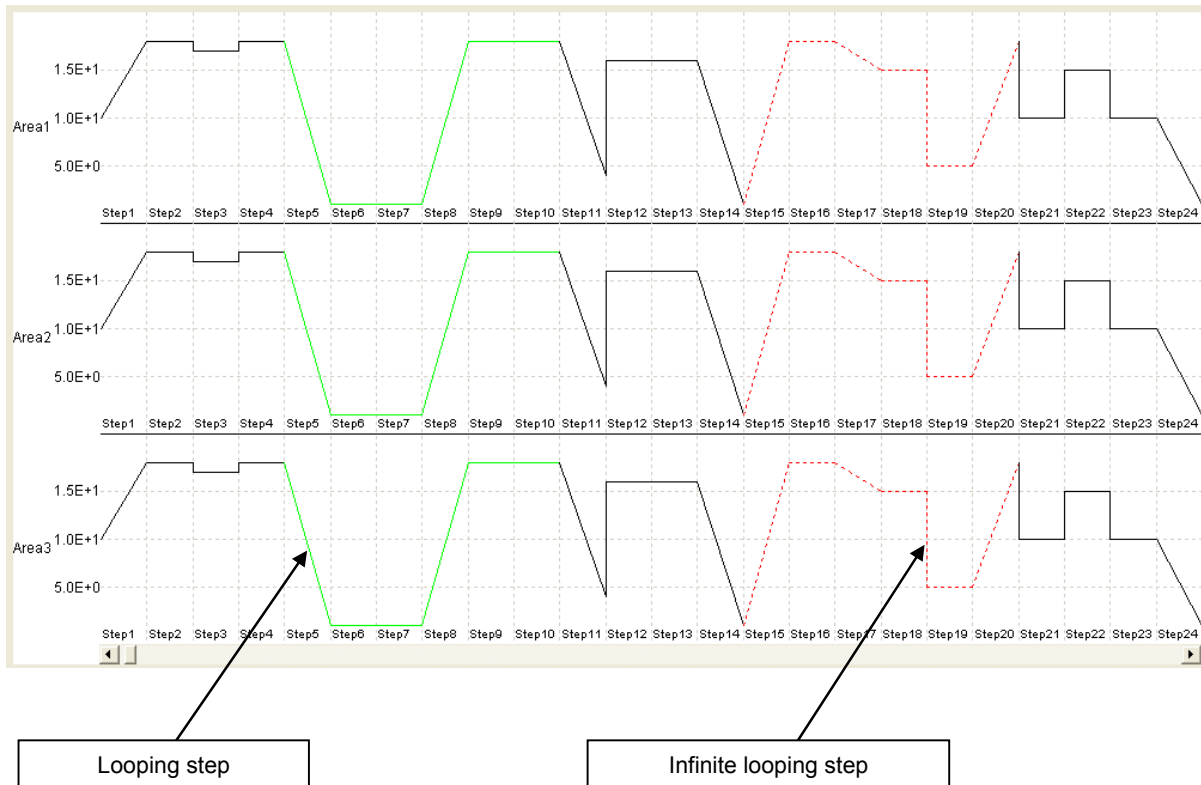
Figure 4-4 Sequence Display Area

4.3 Monitoring the Sequence Execution

When the Start button is clicked, sequence run monitoring starts as shown in "Figure 4-5". While the sequence is being monitored, the window cannot be horizontally scrolled.

The current step area is displayed in a different color to indicate the progress of the sequence. The progress in each step is indicated by the sweep pointer.

When the sequence has started, the current step area moves from the left to the right in the window. If the current step is outside the sequence display area, the view is gradually scrolled in accordance with the progress.
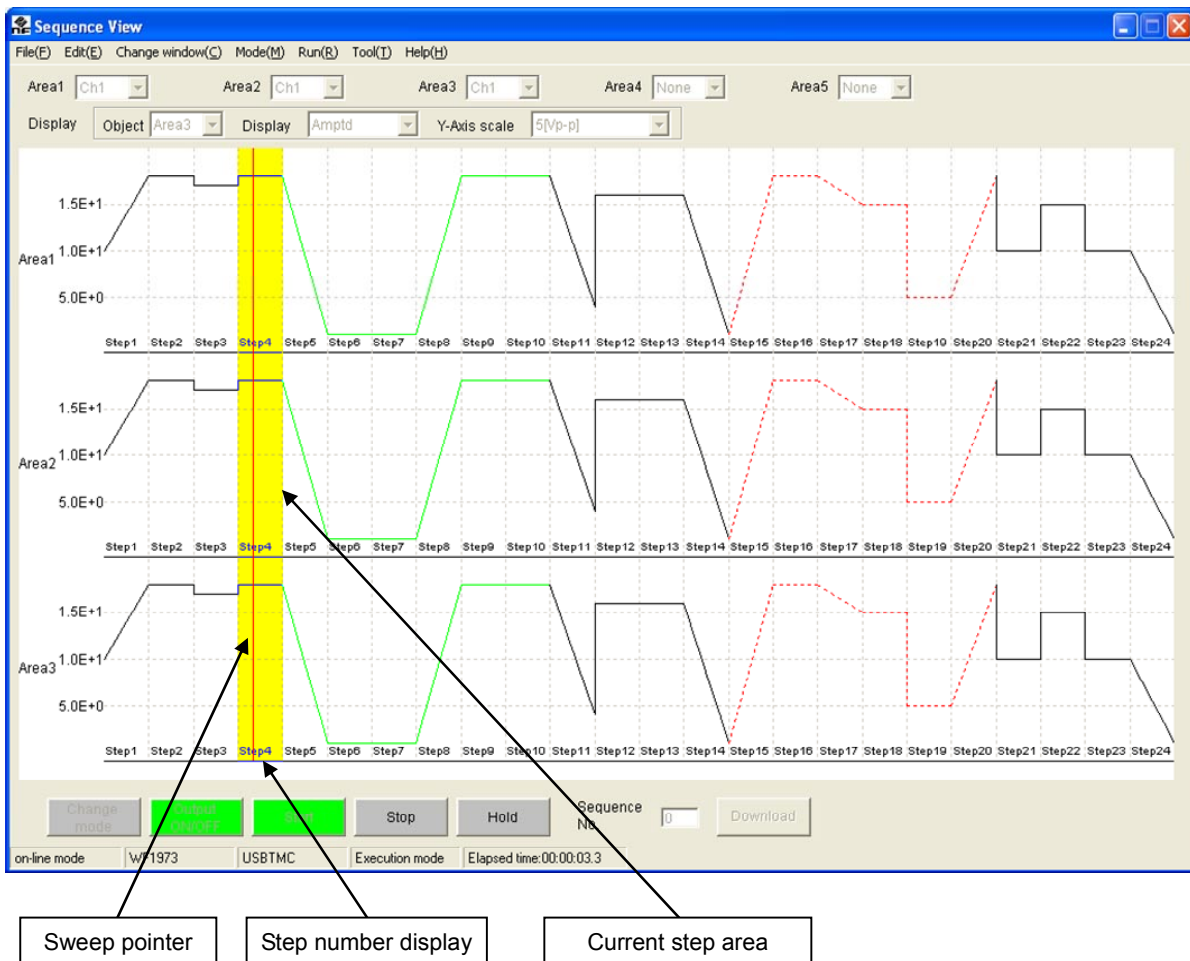
Figure 4-5 Display of the Sequence Progress

SEQ Edit

4.4 Sequence Control Buttons

The functions of the sequence control buttons are the same as those of the Edit window.

☞ See "3.5 Sequence Control Buttons".

4.5 Message Display Area

The message display function is the same as that of the Edit window.

☞ See "3.7 Message Display Area".

5. OTHER FUNCTIONS FOR SEQUENCE EDITING

5.1 Vertical Tiling

Select **[Change Window(C)] - [Tile Vertically(T)]** (ALT , C , T) to tile the **[Edit window]** and **[Sequence view window]**, as shown in "Figure 5-1".
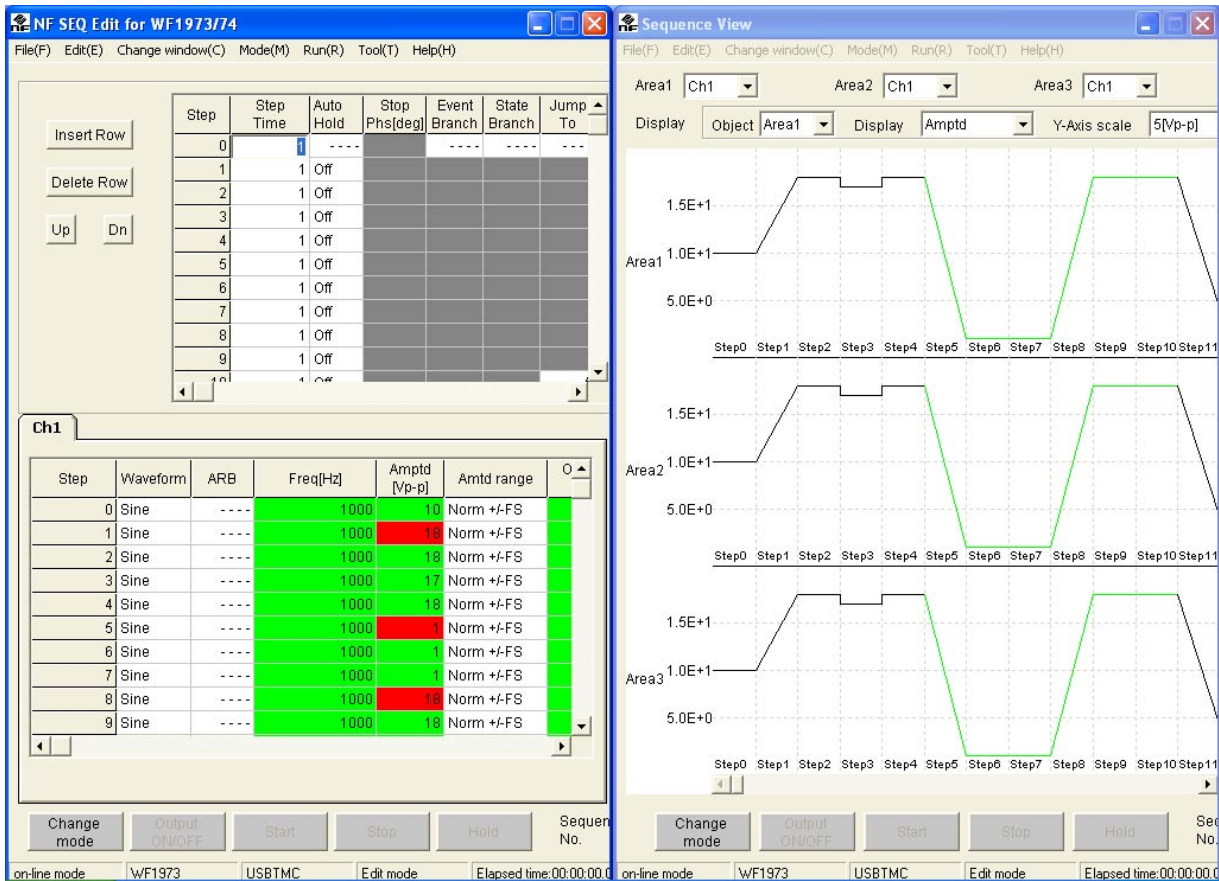
Figure 5-1 Vertically Tiling

The results of editing or modifying the sequence data in the Edit window on the left are automatically reflected in the Sequence view window on the right.

SEQ Edit

5.2 Off-line Mode

This software checks whether a device is connected at every startup. If the software cannot find the connected device, a message appears to confirm that the software is to start up in the off-line mode.

☞ See "Figure 3-1 Message Displayed When Sequence Edit Software Is Started".

⚠ **Caution**

In the off-line mode, the software operates only in the "edit mode". It is not impossible to change the mode to "execution mode" or read the sequence data.

5.3 Changes Between the Edit and Execution Modes

Edit mode and execution mode can be switched in two ways.

- Select **[Edit mode]** or **[Execution mode]** from the **[Mode]** menu.
- Click the Change mode button.

When switching from the **Edit mode** to the **Execution mode**, the software transfers the created sequence data to the device. The progress of transfer is displayed with the progress bar appearing in the center of the window.

⚠ **Caution**

Although the functions related to sequence execution can be executed in the execution mode, functions related to edit cannot be executed.

5.4 Arbitrary Waveform

Select **[Tool(T)] - [Arbitrary waveform(A)]** (ALT , T , A) to display the **[Arbitrary Waveform]** dialog box, shown in "Figure 5-2".

In the **[Arbitrary Waveform]** dialog box, it is possible to specify in advance waveform data file, etc., created with **ARB Edit**, send waveform data when the execution mode is changed, and individually transfer and clear arbitrary waveform data.
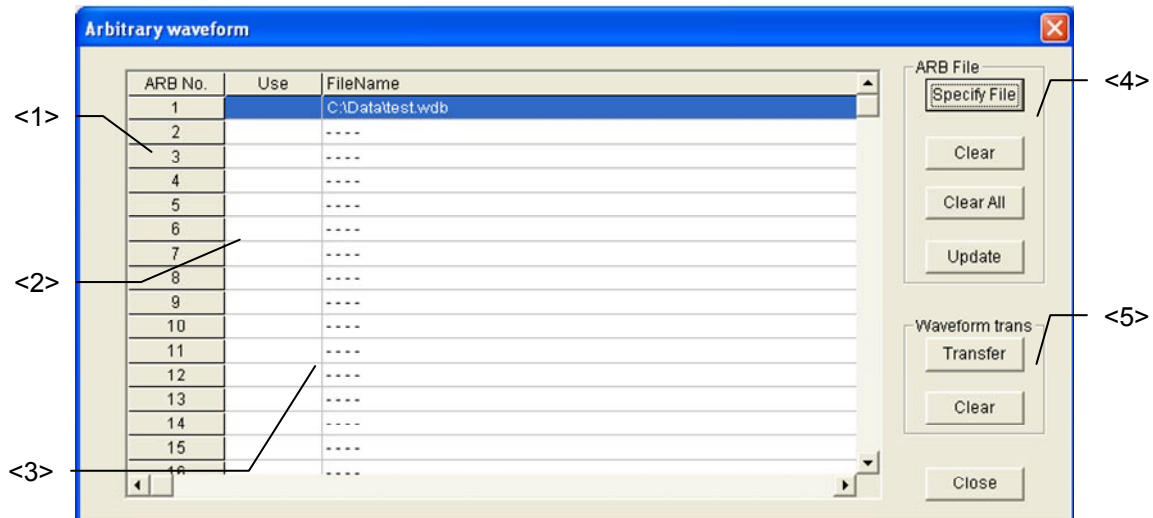
Figure 5-2 Transfer Arbitrary Wave Data Dialog Box

<1> ARB No.

This is the arbitrary waveform number (1 to 128) of the unit.

<2> Use

"1" is displayed for the arbitrary waveform of the arbitrary waveform number for which "Use" has been set in the sequence data being edited.

<3> FileName

Specifies the arbitrary waveform data file to be used in the sequence for each arbitrary waveform number. [----] is displayed for items that have not been specified.

The specified files are transferred to the unit when the execution mode changes.

<4> ARB File

☞ See "5.4.1 Arbitrary waveform management".

<5> Waveform trans

☞ See "5.4.2 Arbitrary Waveform Transfer/Clear".

The setting of the **[Arbitrary Waveform]** dialog box are reflected also the next time the software is started. They are also saved to a data file.

5.4.1　Arbitrary waveform management

The following operations can be done for the waveforms of **[ARB No.]**. Selection of the waveform number is done by clicking an item in the arbitrary wave file list.

a) Arbitrary waveform file specification

Click the �Specify File� button to display a dialog box for opening a file. There, specify the arbitrary waveform data file to be transferred.

The following two types of arbitrary waveform data files can be specified.

　Original binary format of ARB Edit (extension: wdb)

　Text file (extension: txt)

When the **[Arbitrary Waveform]** dialog box is displayed but the specified file cannot be found, the information of the corresponding portion is cleared and [----] is dipslayed.

The specified arbitrary waveform data file is transferred to the unit when the execution mode is entered. However, transfer is not done to numbers for which "1" is not displayed for **[Use]**.

b) Clear

Click the �Clear� button to delete the arbitrary waveform data file.

c) Clear all

Click the �Clear All� button to delete all the arbitrary waveform data file specifications (ARB No.1 to 128).

d) Update

Click the �Update� button to update all the file information. If the arbitrary waveform data file specification was changed, be sure to update.

The information that has been updated is also reflected at the next startup. It is also saved to a data file.

───── ⚠ **CAUTION** ─────

To output different arbitrary waveforms from CH1 and CH2 on the WF1974, transfer the waveform data to the waveform memory of the different numbers, because the waveform memory is shared between CH1 and CH2.

5.4.2 Arbitrary Waveform Transfer/Clear

The waveform of the selected **[ARB No.]** can be transferred or cleared. This is convenient for sequence execution by changing the contents of individual arbitrary waveforms.

These operations are not possible in the execution mode, and must be performed in the edit mode.

a) Transfer

When the Transfer button is clicked, the arbitrary wave data of the arbitrary waveform number the arbitrary wave data will be transferred. Arbitrary waveform data file.

b) Cancel

When the Clear button is clicked, the arbitrary wave data of the specified waveform number the arbitrary wave data will be cleared.

5.4.3 Arbitrary waveform data file

The arbitrary waveform file types that can be read with **SEQ Edit** are as follows.

- Binary file output from **Arbitrary Waveform Editor** (ARB Edit) (extension: ".WDB")
- Text file (extension: ".txt")

    Range of data: -16383 to 16383

    Contents of file: One data entry (no comma, left-justified) per line

    <Example>   -16383
                1000
                 2
                -10
                 .
                 .
                 .

    * Set the number of lines as a power of two, from 4096 to 524288

5.5 Channel Setup

Select **[Tools]-[Channel Setup (C)]** ($\boxed{\text{ALT}}$, $\boxed{\text{T}}$, $\boxed{\text{C}}$) to display the **[Channel Setup]** dialog box as shown in "Figure 5-3".

This dialog box is used to set the load impedance and the user defined units for each channel of the unit.

The setting contents of the **[Channel Setup]** dialog box affect the various setting values of the sequence editing screen. For example, when 50 is set as the **[Output Load]** (load impedance), the amplitude and offset setting ranges are reduced by half.

Click the $\boxed{\text{OK}}$ button to change the channel setting data and close the dialog box. Alternatively, click the $\boxed{\text{Cancel}}$ button to close the dialog box without updating the channel setting data.

The setting contents of the **[Channel Setup]** dialog box are transferred to the unit when the execution mode is entered.

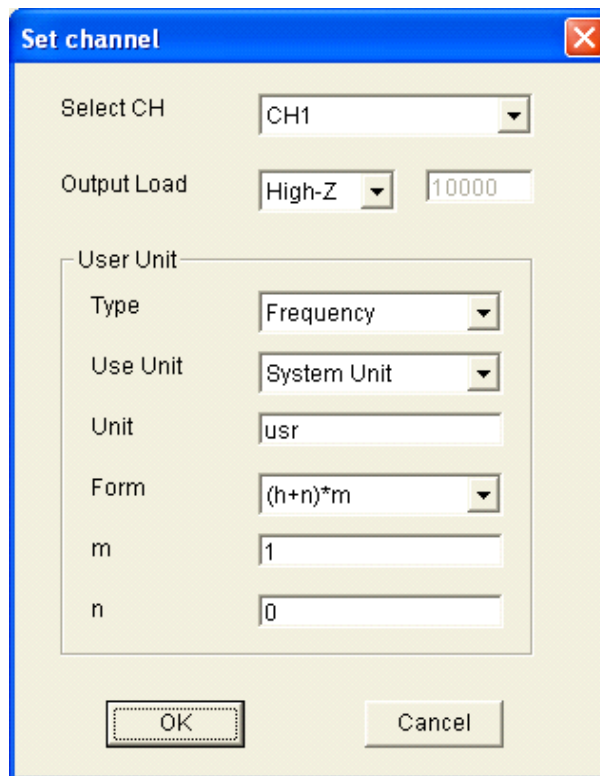In the execution mode, the channel settings cannot be changed.

Figure 5-3 Channel Setup Dialog Box

The settings of the **[Channel Setup]** dialog box are also reflected at the next startup. They are also saved to a data file.

SEQ Edit

5.5.1   Load impedance

Set the impedance of the load connected to the signal output of the unit, for the channel selected with **[Select CH]**.

Set the combo box to the right of **[Output Load]** to **[Variable]** to allow setting of the load impedance in the range of 1 to 10000 Ω.

The amplitude and offset setting ranges of the channel parameter setting area change according to the load impedance setting.

5.5.2   User-defined units

User-defined units can be set individually for the frequency, amplitude, offset, phase, and duty in the channel parameter setting area, for the channel specified with **[Select CH]**.

In **[Type]**, select the parameter to be set (frequency, amplitude, offset, phase, duty).

In **[Use Unit]**, select either **[System Unit]** (original unit system) or **[User Unit]** (user-defined unit system) for the setting unit of each parameter.

In **[Unit]**, specify the unit character string (up to 4 characters) for each user-defined unit.

In **[Form]**, select the calculation formula. "h" in the selection item is the original system unit value.

In **[m]**, specify the multiplier of the calculation formula. When "0" is input, an error results.

In **[n]**, specify calculation formula offset.
When the user-defined unit is set for usage, the setting range of the corresponding parameter in the channel parameter setting area changes.

─────── ⚠ **CAUTION** ───────

When setting a parameter for which a negative value can be set, such as offset, if **[Form]** is set to **[(Log(h)+n)*m]**, 0 and lower values cannot be set.

If the original value is 0 and **[(Log(h)+n)*m]** is specified, the corresponding parameter is displayed as **[Inf]**.

If the original value is negative and **[(Log(h)+n)*m]** is specified, the corresponding parameter is displayed as **[Over]**.

5.6 Common Sequence Parameter Settings

Select **[Tools(T)]-[Common Sequence Parameters(S)]** (ALT , T , S) to display the **[Common Sequence Parameters]** dialog box as shown in "Figure 5-4".

This dialog box is used to set the common setting items in one sequence: Start step (**[Start Step]**), external trigger polarity (**[Trig]**), external control (**[ExtCtrl]**), multi I/O connector pin 14 allocation (**[Multi I/O pin14]**), and sync output (**[SyncOut]**).

Click the OK button to change the channel setting data and close the dialog box. Alternatively, click the Cancel button to close the dialog box without updating the channel setting data.
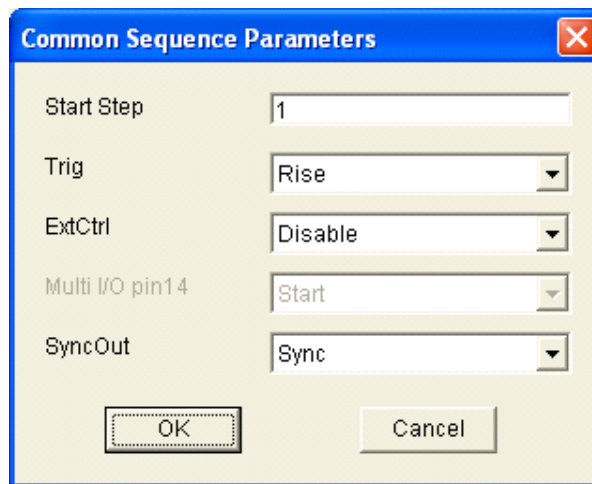

Figure 5-4 Common Sequence Parameter Setting Dialog Box

The setting of the **[Common Sequence Parameters]** dialog box are also reflected at the next startup. They are also saved to a data file.

5.7 System Settings

Select **[Tools(T)]** - **[Set System(I)]** (ALT, T, I) to display the **[Set System(I)]** dialog box, shown in "Figure 5-5".
The **[Set System]** dialog box is used to set the model whose settings are to be performed and the condition (serial number) for each unit.
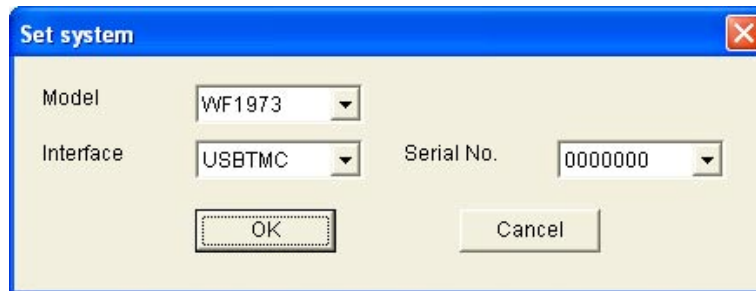
Figure 5-5 Set System Dialog Box

Each time **[Model]** is selected, whether the specified model is connected is checked, and the serial number of units that are found are list in **[Serial No.]**. Select the serial number of the model whose settings are to be performed. If no unit is connected, **[None]** is displayed.
The information of the **[Model]** selected in the **[Set System]** dialog box is also reflected at the next startup.

5.8 List of Initial Setting Values

5.8.1   Initial values of set parameters

The initial values of the sequence data are shown below.

These values are initialized by selecting **[File (F)]-[New(N)]** (ALT, F, N) in the sequence edit screen.

Table 5-1 Initial Values of Set Parameters

	Parameter Name		Initial Value	Remark
Sequence common parameter	Start Step	[Start Step]	1	
	External trigger polarity	[Trig]	Off	
	External control	[ExtCtrl]	Disable	
	Multi I/O connector pin14 allocation	[Multi I/O pin14]	Start	
	Sync output	[SyncOut]	Sync	
Step control parameter	Step time	[Time]		
	Auto Hold	[AutoHold]	Off	
	Stop phase	[StopPhs]	Off	Caution 1)
	Event Branch	[EventBranch]	Off	Caution 1)
	State Branch	[StateBranch]	Off	Caution 1)
	Jump destination	[JumpTo]	Off	Caution 1)
	Jump count	[JumpCnt]	Infinity	Caution 2)
	Step term	[StepTerm]	Continue	
	Step sync code output	[StepCode]	0(LLLL)	
Channel parameter * In the WF1974, common to CH1, CH2	Waveform		Sine	
	ARB		1	Caution 3)
	Frequency		1000	
	Operation type		Const	
	Amplitude		0.1	
	Operation type		Const	
	Amplitude range		Norm +/-FS	
	Offset		0.0	
	Operation type		Const	
	Start phase		0.0	
	Operation type		Const	
	Duty		50.0	Caution 4)
	Operation type		Const	
	DutyExtend		Off	Caution 4)

Caution 1)   1 when changed from Off to On

Caution 2)   1 when changed from Infinity to On

Caution 3)   Value when waveform changed from sine to ARB

Caution 4)   Value when waveform changed from sine to Square

5.8.2 Other parameter initial values

Initial values related to other than sequence data are shown below.

Table 5-2 Other Parameter Initial Values

	Parameter Name		Initial Value	Remark
Channel setup parameter	Load impedance	[Output Load]	High-Z	
	Unit for use	[Use Unit]	System Unit	
	Unit name	[Unit]	"usr"	
	Calculation formula	[Form]	(h+n)*m	
	Multiplier	[m]	1	
	Offset	[n]	0	
Arbitrary waveform setup	Arbitrary waveform data file	[FileName]	Not specified	Common ARB No.1 to 128
System setup	Model		WF1973	
	Interface		USBTMC	
Sequence view	Display area 1		Ch1	
	Display areas 2 to 5		None	
	Display contents of display settings		Frequency	
	Vertical axis scale of display settings		1000	[Hz]

SEQ Edit

6. ERROR MESSAGES

6.1 Sequence Edit Software Errors

The following table summarizes the error specifications of **Sequence Edit Software**.

Table 6-1 Sequence Edit Software Error Messages 1

Message	Description
Initialization file doesn't exit.	The Required to start the software, was not found in the application folder. Reinstall the software.
The sequence data file error.	The format in the sequence data file is illegal. Do not use this file.
Input value Error!	Enter the parameter within the range indicated with the error message. If a range is not shown, enter a valid numeric value.
The input value error. The value of [amplitude + offset] exceeds the maximum output level.	Check the input range of the amplitude and offset, and set them again as required.
The form of copy origin and copy destination is different.	Copying a cell or column to a different cell or column in the step control parameters or channel parameters setting area.
Can not access arbitrary waveform data. Please specify a correct file name.	Specify the correct arbitrary wave data file.
The specified arbitrary wave data file doesn't exist.	Displayed if the specified arbitrary waveform data file could not be verified.
The model information in the arbitrary wave data file is invalid.	Model information other than WF1973 or WF1974 is saved in the arbitrary waveform data file of the extension WDB format. Specify a different arbitrary waveform data file.
The arbitrary wave data size is illegal.	The data count of the arbitrary waveform data file of TXT extension format is not a power of two within the range of 4096 to 524288. Check the data file.

Table 6-2 Sequence Edit Software Error Messages 2

Message	Description
A communication error occurred.	The communication during data transfer for the specified WF1973/WF1974 was interrupted, or the USB cable was disconnected.
An error occurred during check of the sequence data on the main unit side.	When entering the [Execution Mode], an error occurred during the sequence data check on the main unit side. Check the sequence data again.
The sequence data contains an error. Check Step: n, parameter: prm.	Review parameter prm of step n in the step control parameter area.
The sequence data contains an error. Check CH: ch, step: n, parameter: prm.	Review the setting of parameter prm of channel ch, step n in the channel setting area.
The arbitrary waveform data cannot be transferred because the total size exceeds the limit.	The total WF1973/WF1974 arbitrary waveform data size exceeds the limit. Clear un-used waveforms or specify a waveform data file with a smaller data size, in the [Arbitrary Waveform] dialog box.
An arbitrary waveform that does not exist in the file is specified.	The arbitrary waveform number specified in the sequence data is blank data. Perform either of the following. - Specify a file in the [Arbitrary Waveform] dialog box. - Specify a sequence number on the unit side that has waveform data.
The waveforms used in the sequence are too numerous (too large).	Either use fewer types of arbitrary waveforms or specify a waveform data file with a smaller data size in the [Arbitrary Waveform] dialog box.
The Arbitrary Waveform Editor is running. Terminate the Arbitrary Waveform Editor and restart.	After terminating the **Arbitrary Waveform Editor**, start up the **Sequence Edit Software**.

7. MAINTENANCE

7.1 Handling CD-ROM

Handle the CD-ROM carefully as described below.

- Store the CD-ROM in a place without direct sunlight, high temperature, and high humidity.
- Use and store the CD-ROM in a place without dust.
- Do not touch the recording surface directly. It may cause damage or errors.
- If it is dirty, wipe it with a soft dry cloth. Do not use any solvent such as benzene.
- Store the CD-ROM in a vertical or horizontal position so that it would not be deformed.
- When writing on the label surface of the CD-ROM, use a felt-tipped pen (Do not use anything with a hard point such as a ball point pen or pencil.)

7.2 Replacement of Damaged CD-ROM

If the **Sequence Edit Software** CD-ROM is damaged, contact NF Corporation or your local distributor.
We will replace it with a new CD-ROM at cost.

7.3 Version Check

The **Sequence Edit Software** version number is displayed on the CD-ROM.
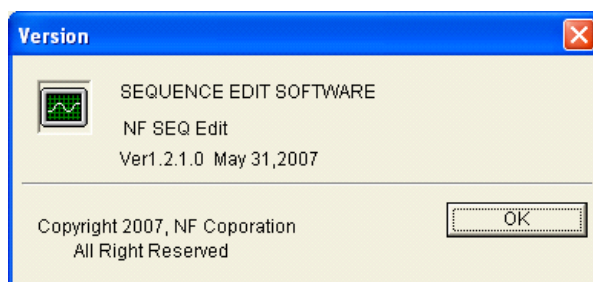The version can be displayed by selecting **[Help] - [Version]**.

Figure 7-1 Version Dialog Box