Tektronix AFG1022

Tektronix AFG1022 Arbitrary Function Generator User Manual

Model: AFG1022

1. Introduction

The Tektronix AFG1022 Arbitrary Function Generator is a versatile instrument designed for generating various waveforms required in laboratory and testing environments. With a bandwidth of 25 MHz or 60 MHz and dual output channels, it provides an output amplitude ranging from 1 mVpp to 10 Vpp across its full bandwidth. This device offers a comprehensive set of features for waveform generation, making it a valuable tool for a wide range of applications.

Key features include:

- Dual-channel operation with 25 MHz bandwidth.
- Output amplitude from 1 mVpp to 10 Vpp.
- 14-bit vertical resolution and 1 µHz frequency resolution.
- 50 built-in arbitrary waveforms.
- Support for continuous, modulation, sweep, and burst modes.
- Dedicated 3.95-inch TFT LCD display for clear visualization.
- User-friendly front panel and menu navigation.

Figure 1.1: Front view of the Tektronix AFG1022 Arbitrary Function Generator. This image displays the front panel of the AFG1022, highlighting the large color display, control knobs, function buttons, and output connectors. The display shows settings for sweep time, amplitude, and offset, along with various waveform types like sine, square, ramp, pulse, arbitrary, and noise.

2. Safety Information

Before operating the Tektronix AFG1022, please read and understand all safety instructions to prevent injury and avoid damage to the instrument or other connected equipment. This device is designed for use by qualified personnel only.

General Safety Precautions:

- **Grounding:** Always ensure the instrument is properly grounded. The power cord provided has a three-prong plug for this purpose. Do not defeat the grounding-type plug.
- **Power Source:** Connect the instrument to a power source that is within the specified voltage range (100-240V AC, 50/60 Hz). Verify the line selector switch on the rear panel is set correctly for your local voltage.
- **Ventilation:** Ensure proper ventilation around the instrument. Do not block ventilation openings. Overheating can cause damage.
- **Environment:** Operate the instrument in a clean, dry environment. Avoid exposure to moisture, extreme temperatures, or corrosive gases.
- **Servicing:** Refer all servicing to qualified service personnel. Do not attempt to service the instrument yourself unless you are qualified to do so.
- **Cables and Connectors:** Use only specified cables and connectors. Ensure all connections are secure before applying power.
- **Cleaning:** Disconnect power before cleaning. Use a soft, dry cloth. Do not use liquid or aerosol cleaners.

3. What's in the Box

Upon unpacking your Tektronix AFG1022 Arbitrary Function Generator, please verify that all the following items are included:

- Tektronix AFG1022 Arbitrary Function Generator Unit
- Statement of Compliance
- CD (containing software and documentation)
- User Manual (this document)
- Fuse (2 pieces, spare)
- Cables (3 pieces, including USB and BNC cables)
- Calibration Certificate
- Power Cord

If any items are missing or damaged, please contact your Tektronix supplier or customer support immediately.

4. Setup

Follow these steps to set up your AFG1022 Arbitrary Function Generator for initial use.

4.1 Unpacking and Inspection

1. Carefully remove the instrument and all accessories from the packaging.
2. Inspect the instrument for any signs of physical damage that may have occurred during transit. If damage is found, contact your supplier.
3. Retain the original packaging materials for future transport or storage.

4.2 Power Connection

1. Locate the power inlet on the rear panel of the AFG1022.
2. Verify the **Line Selector** switch on the rear panel is set to the correct voltage for your region (110V AC or 220V AC). Adjust if necessary.
3. Connect the provided power cord to the instrument's power inlet and then to a grounded AC power outlet.

Figure 4.1: Rear view of the Tektronix AFG1022. The rear panel shows the Ref Clk Out, Ext Trig/Burst/Fsk In, Ext Mod In, and USB ports. It also includes the AC power inlet with fuse, and a line selector switch for 110V/220V AC operation. A warning about proper grounding is visible.

4.3 Connecting Outputs

1. Identify the two output channels (Out1 and Out2) on the front panel. These are BNC connectors.
2. Connect appropriate BNC cables from the desired output channel(s) to your test circuit or device under test.
3. Ensure the impedance setting on the AFG1022 matches the impedance of your load (typically 50Ω or high impedance).

5. Operating Instructions

This section provides an overview of the basic operation of the Tektronix AFG1022. For detailed instructions on specific functions, refer to the comprehensive user manual provided on the included CD.

5.1 Powering On and Initial Screen

1. Press the power button located on the front panel to turn on the instrument.
2. The display will show the Tektronix logo and then transition to the main waveform generation interface.

5.2 Basic Waveform Generation

The AFG1022 can generate various standard waveforms and arbitrary waveforms.

- **Selecting Waveform Type:** Use the dedicated buttons below the display (Sine, Square, Ramp, Pulse, Arb, Noise) to select the desired waveform.
- **Setting Frequency:** Use the numeric keypad and the rotary knob to input the desired frequency. The display will update in real-time.
- **Setting Amplitude and Offset:** Adjust the amplitude (Vpp) and DC offset (V) using the corresponding soft keys and the rotary knob.
- **Enabling Output:** Press the **On/Off** button for Channel 1 (Out1) or Channel 2 (Out2) to enable the waveform output. The button will illuminate when the output is active.

Figure 5.1: Angled front view of the Tektronix AFG1022. This image provides an angled view of the AFG1022 on a workbench, emphasizing its compact design and the clarity of its display. The display shows a sweep time setting of 25 billion seconds, indicating its wide range of capabilities. Various tools and other lab equipment are visible in the background.

5.3 Advanced Functions

- **Modulation:** Press the **Mod** button to access modulation settings (AM, FM, PM, FSK, PWM).
- **Sweep:** Configure frequency sweeps by pressing the **Sweep** soft key.
- **Burst:** Generate burst waveforms by pressing the **Burst** soft key.
- **Arbitrary Waveforms:** The AFG1022 supports user-defined arbitrary waveforms. Refer to the full manual for instructions on creating and loading custom waveforms.

6. Maintenance

Proper maintenance ensures the longevity and optimal performance of your Tektronix AFG1022.

6.1 Cleaning

- Always disconnect the power cord before cleaning the instrument.
- Use a soft, dry cloth to wipe the exterior surfaces. For stubborn dirt, a cloth lightly dampened with mild detergent and water may be used.
- Do not use abrasive cleaners, solvents, or strong chemicals, as these can damage the plastic parts and labels.
- Avoid spraying liquids directly onto the instrument.

6.2 Fuse Replacement

If the instrument does not power on, check the fuse located in the power inlet on the rear panel. Ensure the replacement fuse matches the specified type and rating (e.g., 250V, 2A). Refer to the full manual for detailed instructions on fuse replacement.

6.3 Calibration

For continued accuracy, periodic calibration by qualified service personnel is recommended. Refer to the calibration certificate for the recommended calibration interval.

7. Troubleshooting

This section provides solutions to common issues you might encounter with your AFG1022. If the problem persists, contact Tektronix customer support.

Problem	Possible Cause	Solution
Instrument does not power on.	No power, faulty power cord, blown fuse.	Check power cord connection. Verify power outlet. Check and replace fuse if necessary. Ensure line selector is correct.
No waveform output.	Output channel not enabled, incorrect amplitude/offset settings, faulty cable, incorrect load impedance.	Press the On/Off button for the desired channel. Verify amplitude and offset settings. Check BNC cable connections. Ensure load impedance matches instrument setting.
Display is blank or frozen.	Software error, internal fault.	Power cycle the instrument (turn off, wait 10 seconds, turn on). If issue persists, contact support.
Incorrect waveform shape/frequency.	Incorrect settings, external interference.	Double-check all waveform parameters (frequency, amplitude, offset, modulation settings). Ensure proper shielding of cables.

8. Specifications

The following table lists the key specifications for the Tektronix AFG1022 Arbitrary Function Generator. All specifications are typical unless otherwise noted.

Parameter	Value
Model Name	AFG1022
Bandwidth	25 MHz
Channels	Dual-channel
Output Amplitude	1 mVpp to 10 Vpp
Vertical Resolution	14-bit
Frequency Resolution	1 µHz
Built-in Waveforms	50 Arbitrary Waveforms
Display	3.95-inch TFT LCD
Power Source	Electricity Powered

Parameter	Value
Voltage	100-240V AC (selectable)
Item Weight	4.9 Kilograms (10.8 Pounds)
Package Dimensions	17.2 x 14 x 11.4 inches
Manufacturer	Tektronix
Date First Available	July 15, 2015

9. Warranty & Support

Tektronix products are designed for reliability and performance. For specific warranty terms and conditions applicable to your AFG1022, please refer to the warranty information provided with your purchase or visit the official Tektronix website.

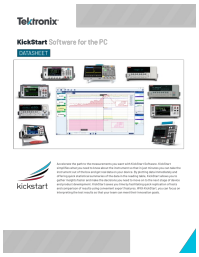
Customer Support:

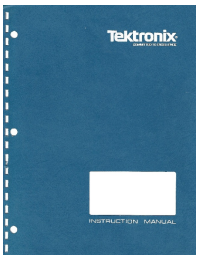
If you require technical assistance, have questions about your instrument, or need to arrange for service, please contact Tektronix customer support. Support contact information can typically be found on the Tektronix website or in the documentation included with your product.

When contacting support, please have your instrument's model number (AFG1022) and serial number ready. The serial number is located on the rear panel of the instrument.

For the latest information, drivers, software, and additional resources, please visit the official Tektronix website: **www.tek.com**

Related Documents - AFG1022

	Tektronix AFG3000 Series: 25 Applications of Arbitrary/Function Generators Explore 25 practical applications for Tektronix AFG3000 Series Arbitrary/Function Generators, covering embedded systems, RF, automotive, medical, industrial, and research fields. Enhance your electronic testing and design workflows.
	Tektronix KickStart Software Datasheet: Accelerate Measurement Efficiency Explore the Tektronix KickStart software, a powerful PC application designed for quick instrument setup, data visualization, and analysis. Discover its various apps for DMMs, AFGs, data logging, I-V characterization, power supplies, oscilloscopes, battery simulation, and high resistivity measurements. Streamline your testing workflow and gain faster insights into your data.

	AWG70001A　AWG70002A Tektronix AWG70001A　AWG70002A
	AWG70001A　AWG70002A Tektronix AWG70001A　AWG70002A
	Tektronix PPG4001 PatternPro Programmable Pattern Generator User Manual User manual for the Tektronix PPG4001 PatternPro Programmable Pattern Generator, detailing features, specifications, operation, safety, and remote programming for advanced signal generation.
	Tektronix 1410 NTSC Generator Instruction Manual Comprehensive instruction manual for the Tektronix 1410 NTSC Generator, detailing operation, specifications, installation, theory of operation, maintenance, and troubleshooting for this video test equipment.