

WE7111

100 MS/s Digital Oscilloscope Module

■ Overview

This module contains a digital oscilloscope with a range of basic functions. Its flash memory contains setup information required for module operations, such as ranges, time axes, and triggers. The setup information is transferred to the PC when the module is connected. The WE7111 can also be used for temporary processing of measurements.

■ FEATURES

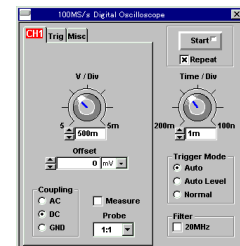
- 100 MS/s, A/D 8-bit resolution
- 40 MHz analog bandwidth (real time samples only)
- 100 k-word memory

■ FUNCTIONS

- Maximum waveform signal sampling rate: 100 MS/s
- Synchronized operations between adjacent WE7111 modules
- High speed waveform display

■ Standard Specifications

- Measurement input section
 - Number of input channels: 1
 - Input coupling: AC, DC, GND
 - Connector type: BNC
 - Input impedance: $1\text{ M}\Omega \pm 1.5\%$, about 25 pF
 - Voltage sensitivity setting range: 5 mV/div to 5 V/div (1-2-5 steps)
 - Maximum input voltage (when frequency is 1 kHz or less): 250 V (DC + AC peak) or 177 VACrms (see Note 1)
 - Maximum DC offset setting range (when probe attenuation is set to 1:1):
 - 5 mV/div to 50 mV/div: $\pm 1\text{ V}$
 - 100 mV/div to 500 mV/div: $\pm 10\text{ V}$
 - 1 V/div to 5 V/div: $\pm 100\text{ V}$
 - Voltage accuracy (see Note 2)
 - DC accuracy
 - At 100 mV/div: $\pm(1.5\% \text{ of } 8 \text{ div} + 1 \text{ LSB})$
 - At other voltage axes: $\pm(2.5\% \text{ of } 8 \text{ div} + 1 \text{ LSB})$
 - Offset voltage accuracy (see Note 2)
 - 5 mV/div to 50 mV/div: $\pm(2.5\% \text{ of setting} + 0.2 \text{ mV})$
 - 100 mV/div to 500 mV/div: $\pm(1\% \text{ of setting} + 2 \text{ mV})$
 - 1 V/div to 5 V/div: $\pm(2.5\% \text{ of setting} + 20 \text{ mV})$
 - Frequency characteristic (for sinewave input with amplitude equivalent to $\pm 4 \text{ div}$):
 - DC up to 40 MHz (-1.5 dB attenuation point (typical value (see Note 4)))
 - Low frequency -3 dB attenuation point during AC coupling (see Note 2):
 - Maximum 10 Hz (maximum 1 Hz when using separately sold 150 MHz passive probe (model 700998))
 - Skew between modules (when operating with linked modules) (see Note 2):



WE7111

2 ns per each module (typical value when settings are all the same (see Note 4))

Residual noise level (see Note 3): Larger of the two $\pm 0.7 \text{ mV}$ or $\pm 0.12 \text{ div}$ (typical value (see Note 4))

Isolation between channels (when voltage sensitivities are all the same, DC to 40 MHz, linked modules): -40 dB (typical value (see Note 4))

A/D conversion resolution: 8 bits (25 LSB/div)

Probe attenuation settings: 1:1, 10:1, 100:1, 1000:1

Bandwidth limit: 20 MHz bandwidth limit can be turned on and off.

Maximum sampling rate: 100 MS/s

Maximum record length: 100 k-words (word = data-point)

• Trigger section

Trigger sources: Input signal (including input signals from linked WE7111 digital oscilloscope modules), commercial power signal, WE bus trigger (BUSTRG1/BUSTRG2) signals

Bus trigger (BUSTRG1/BUSTRG2) signal output sources: When an input signal or commercial power signal is selected as the trigger source, the sensed trigger can be output.

Trigger type: Edge trigger

Trigger modes:

AUTO: If the trigger does not occur for more than about 100 ms, the waveform is automatically acquired.

AUTO LEVEL: If the trigger does not occur for more than about 100 ms, the trigger level is automatically set to the amplitude midpoint and the trigger is activated.

NORMAL: The waveform is acquired only when the trigger occurs.

Trigger slopes: Rise, fall, both

Trigger coupling: Select either DC or AC for the trigger source.

HF rejection: Bandwidth limiting (DC up to about 15 kHz) on trigger sources can be turned on and off.

Trigger level (see Note 5)

Setting range: Voltage corresponding to ± 10 div of voltage axis sensitivity

Setting resolution: 1/50 div

Accuracy: $\pm(1 \text{ div} + 10\% \text{ of trigger level})$

Trigger sensitivity (see Note 5) (see Note 6) (when trigger source frequency is DC to 40 MHz): 1 div_{p-p}

Trigger position:

Setting range: +5.0 div to -5.0 div

Setting resolution: 0.1 div

Trigger delay setting range: 0 to 9.9999999 s

Trigger hold-off setting range: 200 ns to 9.9999999 s

• Time axis

Time axis setting range: 100 ns/div to 200 ms/div

Time axis accuracy (see Note 2): $\pm(0.01\% \text{ of reading} + 500 \text{ ps})$

External clock input (EXT CLOCK IN)

Connector type: BNC

Maximum input voltage: -3 to +8 V (see Note 1)

Input frequency range: 40 Hz to 15 MHz (continuous clock only)

Input level: TTL level

Minimum pulse width: 25 ns for both high and low

Input type: Non-isolated unbalanced (with 4.7 k Ω pull-up resistance)

• Functions

Auto-setup:

Automatically sets voltage axis, time axis, trigger level.

Initialization: Restores the default settings.

Calibration: Auto-calibration and manual calibration available

Acquisition modes: Select from normal, envelope and averaging.

Record length: 1 k-word, 5 k-words, 10 k-words, 30 k-words, 100 k-words (100 k-words cannot be set in averaging mode)

Input filter: 20 MHz bandwidth limit

Calibration signal output: Square wave (about 1 kHz, about 1 V_{p-p})

■ General Specifications

Standard operating conditions

Ambient temperature: 23 \pm 2°C

Ambient humidity: 50 \pm 10% RH

Source voltage/frequency tolerance: $\pm 1\%$ of rating (after warm-up time has passed)

Warm-up time: Minimum 30 minutes

Operating conditions: Same as that of the measuring station

Storage conditions

Storage temperature range: -20 to 60°C

Storage humidity range: 20 to 80% RH (no condensation)

Power consumption: 15 VA (typical value at 100 V/50 Hz, (see Note 4))

External dimensions: About 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (protruding areas not included)

Weight: About 0.9{1.98} kg{lb}

Number of dedicated slots: 1

Accessories: User's manual (1)

Note 1: Overvoltage categories CAT I and CAT II

Note 2: Value measured under standard operating conditions after calibration with the time base set to internal.

Note 3: Value when the input section is shorted, record length: 10 k-word, acquisition mode: normal mode, accumulate: OFF, probe attenuation: 1:1.

Note 4: Typical values represents typical or average values. They are not strictly guaranteed.

Note 5: Value measured under standard operating conditions after calibration with the trigger signal set to a signal with a rate of change within 10 div/ μ s and amplitude within ± 5 div under the following settings;

Trigger mode: normal, Trigger level: within 60% of the amplitude of the trigger signal, HF rejection: OFF

Note 6: Value measured with the voltage sensitivity set to 50 mV/div when a pulse with amplitude 5 div p-p, and rising time of 1 ns is input.

Trigger coupling: DC, HF rejection: OFF

AVAILABLE MODEL

Model	Description
707111/HE	100 MS/s digital oscilloscope module

Accessories (sold separately)

Accessory	Model	Specifications	Order quantity
150 MHz passive probe	700998	Band: 150 MHz	1
Miniclip converter	B9852CR	Probe accessory (one/unit)	1
BNC adapter	B9852CS	Probe accessory (one/unit)	1
Ground lead	B9852CT	Probe accessory (one/unit)	1
50 Ω terminal equipment	700976	Through-type	1

■ DIMENSIONS

Unit: mm (inch)

