

High Frequency Low Voltage Differential Probe

GDP-1020P (20 V / 1 GHz)

USER MANUAL



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

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S SAFETY INSTRUCTIONS

This chapter contains important safety instructions that you must follow during operation and storage. Read the following before any operation to ensure your safety and to keep the instrument in the best possible condition.

Safety Symbols

These safety symbols may appear in this manual or on the instrument.



WARNING

Warning: Identifies conditions or practices that could result in injury or loss of life.



CAUTION

Caution: Identifies conditions or practices that could result in damage to the GDP-1020P or other property.



DANGER High Voltage



Attention Refer to the Manual



Protective Conductor Terminal



Earth (ground) Terminal



Do not dispose of electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

Safety Guidelines

General Guideline • Observe the maximum input voltage to prevent electric shock.

CAUTION

- Do not use the probe in humid or potentially explosive environments.
- Ensure that the circuit under test is de-energized before connecting the probe.
- After testing, de-energize the circuit before disconnecting the probe.
- Ensure that the BNC port is properly grounded when the probe's BNC output cable is connected to an oscilloscope or another device.
- Inspect the probe's exterior before testing. If the probe is damaged, discontinue use.
- Power the probe using the supplied adapter.
- Relative Humidity: $\leq 85\%$ RH
- Altitude: $< 2000\text{ m}$
- Temperature: $0\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$

Operating Environment

(Pollution Degree) EN61010-1 specify the pollution degrees and their requirements as follows. The GDP-1020P falls under pollution degree 2.

Pollution refers to "addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity".

Storage environment

- Relative Humidity: $\leq 90\%$ RH
 - Temperature: $-30\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$
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Disposal

Do not dispose of this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.

SUMMARY

The GDP-1020P is a low-voltage differential probe with floating measurement capability. It features a maximum measurement voltage of ± 20 V (dc + peak ac), a bandwidth of up to 1 GHz, and a 10 X attenuation setting. With its 200 k Ω input impedance and ultra-low 1 pF input capacitance, it effectively minimizes circuit loading. The probe includes an overload alarm, is compatible with any oscilloscope with a 50 Ω BNC input, and is conveniently powered via USB. It is an excellent choice for high-speed power analysis, vehicle bus testing, and digital system design.

Product Characteristics

- 1 GHz Bandwidth (probe only)
- ≤ 1 pF Input Capacitance
- ± 20 V (DC + peak AC) Differential Input Voltage
- Overrange Indicator

GDP-1020P Brief Description

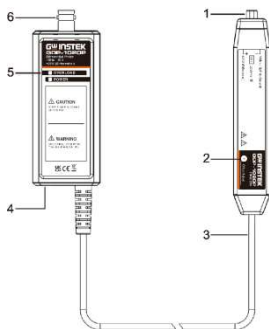
Type	GDP-1020P
Maximum input differential voltage (dc + peak ac)	± 20 V
Bandwidth	1 GHz
Attenuation ratio	10 X

AAPPLICATIONS

- Floating Measurement
 - High-speed Digital Systems Design
 - Component Design / Characterization
 - Educational Research
 - Digital Differential Bus
-

P PRODUCT AND ACCESSORIES

Probe Main Part

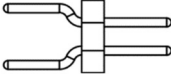
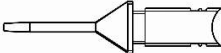
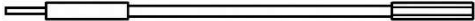
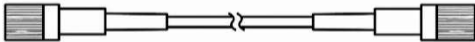
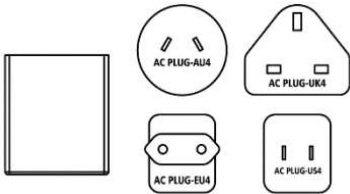


Detailed Instruction

- 1 Input Terminal: A connector with a pitch of 2.54 mm, used to measure the voltage signal.
 - 2 Offset Adjustment: Adjust the resistor to set the output offset.
 - 3 Connecting Cable: Connects the front and rear sections of the probe; approximately 70 cm long.
 - 4 Power Supply Port: A standard USB Type-C port powered by the supplied USB adapter. The probe can also be powered by an oscilloscope.
 - 5 Overload Alarm Indicator: When the measured signal exceeds the range, the overload indicator lights and the buzzer sounds.
-

- 6 Output Port: A standard BNC output port that can be connected to any oscilloscope. Set the oscilloscope input impedance to 50 Ω (recommended). Alternatively, use a 50 Ω feed-through terminator and set the oscilloscope input impedance to 1 M Ω .

Accessories

Diagram	Description
	Single Signal Pin
	50 Ω feed-through terminator
	Variable Pitch Signal Pin
	Test Hook
	Extender Lead, 0.8 mm J-P Lead, 50 mm
	Extender Lead, 0.8 mm J-P Lead, 100 mm
	BNC to BNC Cable, Insulated, 1 m
	USB Cable A to C, 1.2 m
	Power Adapter with Interchangeable AC Plugs (AU/ US/ UK/ EU)

Accessories Introduction



Item	Description	Qty.
1	Test Hooks (Red x 1, Black x 1)	2
2	Variable Pitch Signal Pins	2
3	Single Signal Pins	6
4	Extender Leads, 50 mm (Red x 1, Black x 1)	2
5	Extender Leads, 100 mm (Red x 1, Black x 1)	2
6	Power Adapter (5 V, 2.4 A USB)	1
7	Interchangeable AC Plugs (AU/US/UK/EU)	1
8	USB CABLE A-C, 1.2 m	1
9	BNC to BNC Cable, Insulated, 1 m	1
10	50 Ω feed-through terminator	1

PERATING STEPS

Steps

1. Estimate the voltage range before testing. A voltage that exceeds the measurement range may damage the probe or the device under test.
2. Connect the input and output cables to the probe, and then connect the probe to an oscilloscope or another test instrument.
3. The green power indicator lights when the power adapter is connected to the probe. If the measured voltage exceeds the range, the overload indicator lights and the buzzer sounds.
4. Set the attenuation ratio of the oscilloscope or other instrument according to the probe range, and set the input impedance to $50\ \Omega$. If a $50\ \Omega$ feed-through terminator is connected to the probe output, set the instrument input impedance to $1\ \text{M}\Omega$. Adjust the oscilloscope sensitivity according to the measured voltage.
5. Connect the required clips and begin testing. Keep the probe body away from high-voltage pulse circuits to minimize interference.
6. After testing, turn off the circuit under test and the probe. Disconnect both input terminals from the test points, and then disconnect the BNC connector from the oscilloscope.

**Note**

For best measurement performance when using the input extension lead wire, operate at frequencies below 150 MHz. At frequencies above 150 MHz, measurement errors may occur.

M AINTENANCE

- Keep the probe dry and clean.
 - Clean the probe with a dry cloth. Do not use chemical cleaning solutions.
 - Return the probe to its packaging and store it in a cool, clean, and dry place.
 - The original packaging provides shock protection. Keep the probe in its packaging during transportation.
 - Do not pull, excessively twist, or knot the cable.
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A

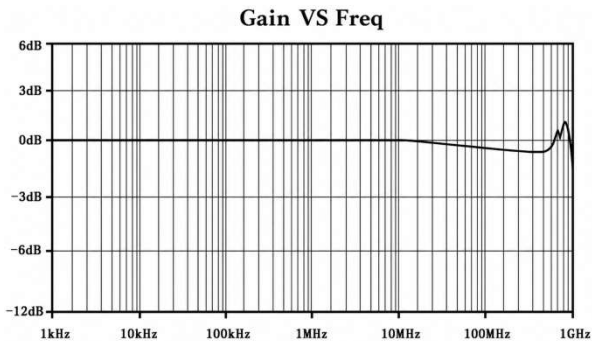
PPENDIX

Electrical Specifications

Model	GDP-1020P
Bandwidth (-3 dB)	1 GHz (see Fig. 1)
Rise time	350 ps (calculated)
Accuracy	$\pm 2\%$
Attenuation ratio	10 X
Maximum differential voltage (dc + peak ac)	$\pm 20\text{ V}$
Common mode voltage	$\pm 20\text{ V}$
Maximum Input Voltage-to-Earth (Vrms)	$\pm 30\text{ V}$
Differential Input Impedance (Typical)	200 k Ω 1 pF
Input Impedance Between Each Input and Ground (Typical)	100 k Ω 2 pF
Output voltage fluctuation	$\pm 2\text{ V}$ (50 Ω Oscilloscope Input)
Offset (Typical value)	$\pm 5\text{ mV}$
Offset adjust range (Typical value)	$\pm 20\text{ mV}$
CMRR	50 Hz and 60 Hz: > 80 dB 100 kHz: > 60 dB 1 MHz: > 50 dB 50 MHz: > 40 dB 100 MHz: > 30 dB 500 MHz: > 15 dB 1 GHz: > 10 dB
Noise (Vrms)	< 4.5 mV
Overload indicator voltage threshold	$\geq 20\text{ V}$

Delay time	Probe main: 6 ns
	BNC (1 m): 5 ns
Overload indicator	Indicator lights red when an overload occurs
Terminal load requirement	50 Ω
Power supply	5 V, 2.4 A USB Power Adapter

Fig 1: GDP-1020P
Frequency
Response Curve



Mechanical Specifications

Type		Parameter
Test Hook		58 mm × 14.5 mm × 4.5 mm
Single Signal Pin		14.69 mm × 2 mm × 0.8 mm
Variable Pitch Signal Pin		14.69 mm × 5.08 mm × 2.54 mm
BNC-to-BNC Cable		1000 mm
Extender Lead		0.8 mm J-P, 50 mm
Extender Lead		0.8 mm J-P, 100 mm
USB Cable (USB-A to USB-C)		1200 mm
Probe Dimension	Front	121 mm × 22 mm × 15 mm
	Back	104 mm × 40 mm × 27 mm
Probe Weight		122 g

Certificate of Compliance

We

GOOD WILL INSTRUMENT CO., LTD.

declare that the below mentioned product

satisfies all the technical relations application to the product within the scope of council:

Directive: EMC; LVD; WEEE; RoHS

The product is in conformity with the following standards or other normative documents:

◎ EMC	
EN 61326-1 :	Electrical equipment for measurement, control and laboratory use – – EMC requirements
Conducted & Radiated Emission EN 55011 / EN 55032	Electrical Fast Transients EN 61000-4-4
Current Harmonics EN 61000-3-2 / EN 61000-3-12	Surge Immunity EN 61000-4-5
Voltage Fluctuations EN 61000-3-3 / EN 61000-3-11	Conducted Susceptibility EN 61000-4-6
Electrostatic Discharge EN 61000-4-2	Power Frequency Magnetic Field EN 61000-4-8
Radiated Immunity EN 61000-4-3	Voltage Dip/ Interruption EN 61000-4-11 / EN 61000-4-34
◎ Safety	
EN 61010-1 :	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements

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