

Variable ISI  
Channel

# CLE1000

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**Hardware Operation Manual**  
**for**  
**CLE1000-H2K**  
**CLE1000-H2V**  
**CLE1000-S2**  
**CLE1000-A2**

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CE



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# Introduction

Thank you very much for purchasing our product. This manual contains the procedures to be followed to operate the product, the checkpoints and precautions to be observed, and so on. Improper handling may result in malfunction. Before using this product, please read through these instructions to ensure that you will operate this product correctly. After reading through the manual, keep it in a safe place for future reference.

## Safety Instruction



### Warning



In order to avoid improper handling that may result in a safety hazard, please be sure to read this manual thoroughly before using this product to learn the proper method of operation.

The following symbols are used on this product and manual.



WARNING : High voltage danger: risk of electric shock.



CAUTION : Refer to the manual



Earth Terminal



AC Voltage or Current



Caution: Comply with the following to avoid personal injury or damage to your equipment.

Do not use this product where there is a danger of ignition or explosions.

This product is for indoor use ONLY.

Static electricity gives critical damage to the product. Do not short static electricity to signal line and ground line.

Do not connect GND to voltage supply.

Do not remove the cover.

In the unlikely event that trouble or malfunction should occur, disconnect this product's power cable, and contact your dealer or an ARTEK sales representative.

This product contains some high-voltage parts. If you touch them, you may receive an electronic shock and burn yourself, so do not attempt to disassemble, repair, or remodel this product.

Do not spill liquid or drop inflammable objects or metal parts into it. Usage under such conditions may result in fire, electrical shock, or malfunction.

All copyright pertaining to this manual are the property of Artek, Inc.

This manual may not be copied in whole or in part without written permission.

The contents of this manual are subject to change without prior notice due to improvements.

The manufacture will not be liable for any damage or trouble caused by the faulty connection or operation of this product.

Use only the power cable that was specified in this product and certified in the country of use.

This product operates with 50/60 Hz ( $\pm 5\%$ ) single phase 100 to 240 Vrms ( $\pm 10\%$ ) AC power supply. Do not use it with other voltage. This machine may be damaged, and it may cause unexpected injury.

The maximum input rating of the signal input terminal is 10Vpp 200mApp. Do not apply a signal exceeding this value.

## Compliance Information

### EMC Compliance

#### Electromagnetic Compatibility (EMC) Directive Declaration of Conformity

This product meets the intent of EC Directive 2014/30/EU for Electromagnetic Compatibility. Compliance is demonstrated to the following specifications listed in the Official Journal of the European Union.

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use

-EMC requirements Part 1: General requirements. \*1

#### Test result summary

Emission \*2 \*3

Test Item	Test regulation	Basic standard	Test result
Conducted emission	EN61326-1:2013 Class A	CISPR11:2009+A1:2010	Pass
Radiated emission	EN61326-1:2013 Class A	CISPR11:2009+A1:2010	Pass

#### Immunity

Test Item	Test regulation	Basic standard	Test result
Electrostatic discharge immunity test	EN61326-1:2013 Table 2	IEC61000-4-2:2008	Pass
Radiated,radio-frequency, electromagnetic field immunity test	EN61326-1:2013 Table 2	IEC61000-4-3:2006 +A1:2007 +A2:2010	Pass
Electrical fast transient/burst immunity test	EN61326-1:2013 Table 2	IEC61000-4-4:2004 +A1:2010	Pass
Surge immunity test	EN61326-1:2013 Table 2	IEC61000-4-5:2005	Pass
Immunity to conducted disturbances,induced by radio-frequency fields	EN61326-1:2013 Table 2	IEC61000-4-6:2008	Pass
Voltege dips immunity / Short interruptions immunity test	EN61326-1:2013 Table 2	IEC61000-4-2:2013	Pass

\*1: You must use the standard accessories to ensure the compliance with all EMC standard.

\*2: Emissions exceeds the required levels may occur when the instrument is connected to a test object.

\*3: This product is intended for use in non-residential area only. Use in residential area may cause electromagnetic interference.

## Safety Compliance

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Low Voltage Directive Declaration of Conformity

This product meet EC Directive 2014/35 / EU for product safety.

Compliance is indicated by the following specifications published in the Official Journal of the European Union.

EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use

– Part 1: General requirements

EN 61010-2-030:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use

- Part 2-030: Particular requirements for testing and measuring circuits.

## RoHS Compliance

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Restriction on Hazardous Substances (RoHS) Declaration of Conformity.

This product and accessories conformity to the 2011/65/EU RoHS2 Directive.

EN50581: 2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

## Accessories

AC power cord (1)

USB control cord (1)

2.92mm (K) Connector adapter (4) – attached to the main unit of CLE1000-H2K, CLE1000-S2

1.85mm (V) connector adapter (4) -- attached to the main unit of CLE1000-H2V

Operation Manual (1)

Control Software Operation Manual (1)

Control Software CD (1)

Fuse (1) – stored in the inlet holder at the AC inlet

# 1. General

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CLE1000 is a variable ISI channel, consisted of passive differential lines, engineered for PHY testing on serial data interfaces. The patent-pending technology allows the linear adjustment from 0% to 100%.

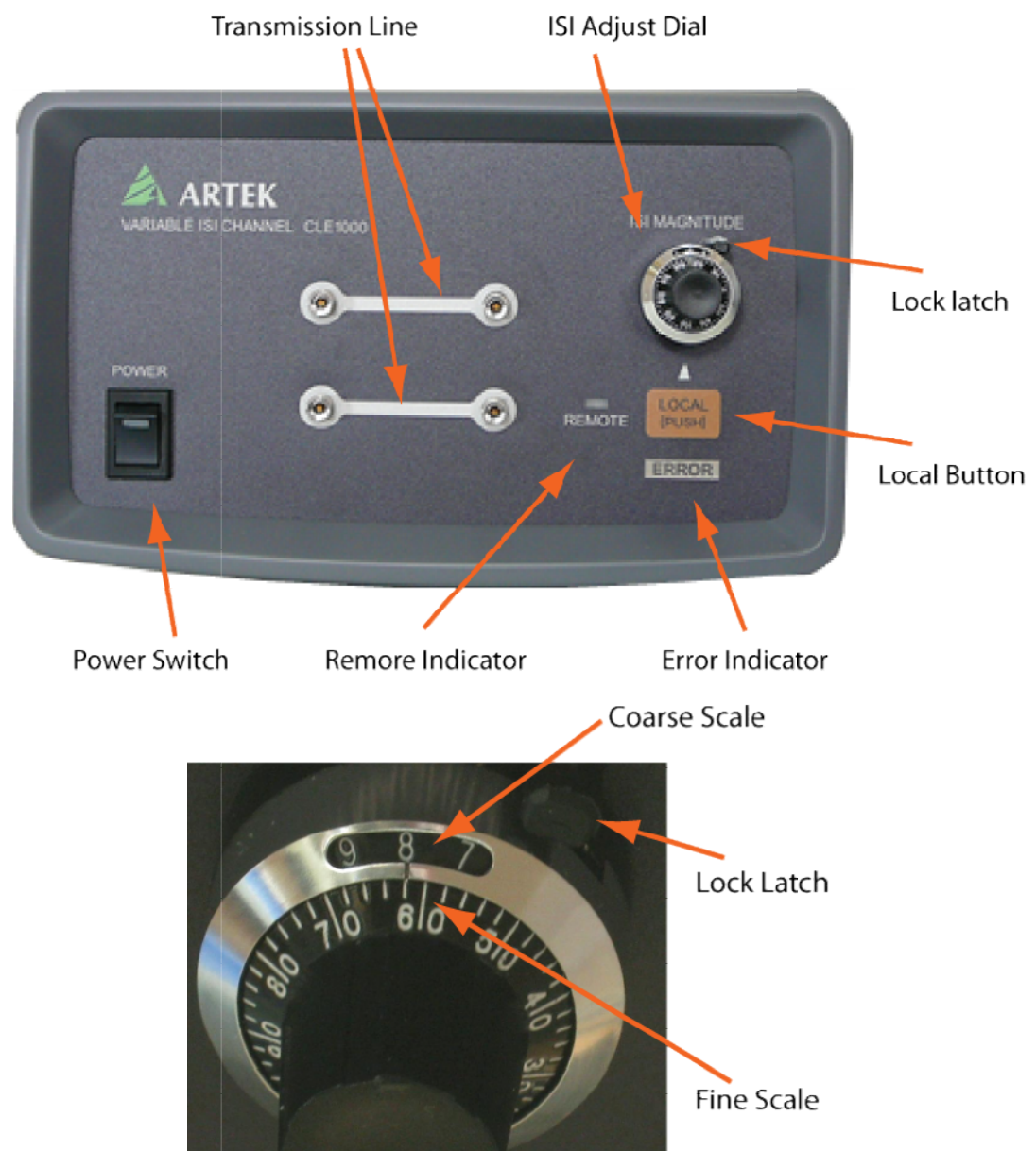
## Features

- Linearly Variable: Variable Insertion Loss from 0% to 100%
- Fully Passive: Passive Differential Transmission Lines
- DC Coupled: No Low Frequency Limit
- Remote Control via USB: enables automated operation

## 2. Connectors & Switches

This section explains how you connect cables and start up for both stand-alone mode as well as remote control mode.

### 2-1 Panel Switches and Connectors







## 2-2 Wiring

### Wiring for Stand Alone

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- Make sure coaxial connectors are not connected
- Connect an earth code at the rear. Also connect the ground with the other equipment first.
- Connect a power code at the rear
- Turn the switch on the front ON
- Connect transmission cables at the front
- Fasten the connector with torque of 0.9Nm

This unit does not require power for static usage.  
Power is only required when changing the value.

### Wiring for Remote Control

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- Follow the Stand-Alone wiring
- Connect USB cable at the rear
- Start remote control from your controller

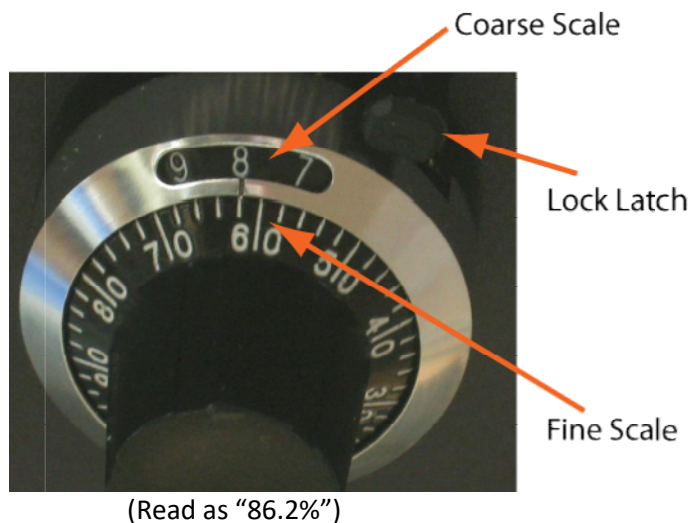
Pressing the Local Button resets to Local operation mode.

## 3. Operations

This section explains how to operate this product in both Stand-alone mode and Remote mode.

### 3-1 Stand Alone Operation

- Make sure the unit is in “Local Mode”. Pressing the “Local Button” on the front panel resets the unit to Local Mode.
- The amount of ISI (Insertion Loss) is adjusted by the volume dial on the front panel.



- Rotating the dial changes the Fine Scale
- One round for fine scale change one step at Coarse scale
- Lock Latch is to lock the dial

### 3-2 Remote Operation

Refer to the Remote Control Manual for details.

### 3-3 Tips for Local mode & Remote mode

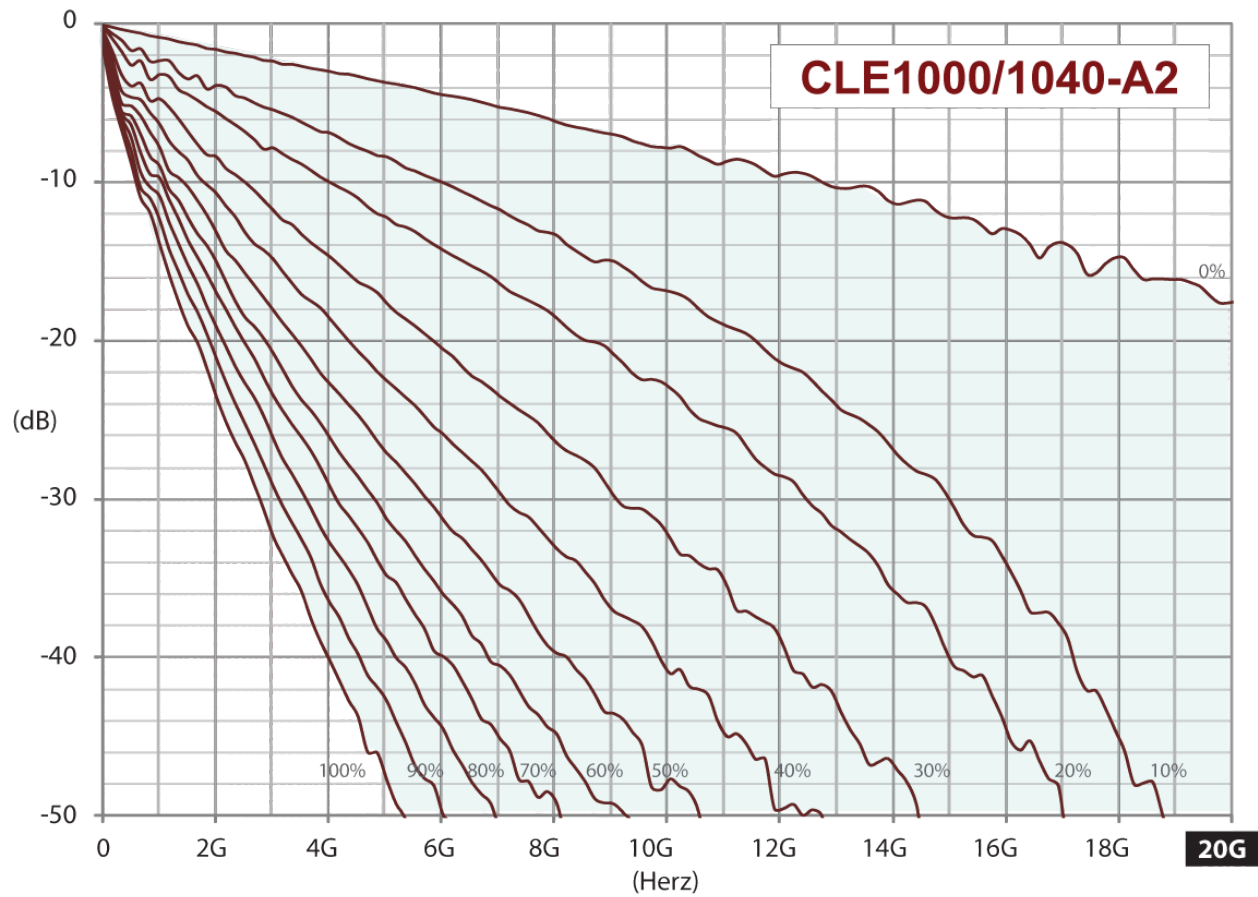
- “Local button” on the front panel is to switch the control mode from remote mode to local mode. The switching is done upon completion of currently working remote control.
- “Remote indicator” on the front panel indicates the remote mode. When flushing, the dial on the front panel does not reflect the ISI amount no matter which value it specifies. However, once Local button is pressed, the value at the dial is applied immediately.

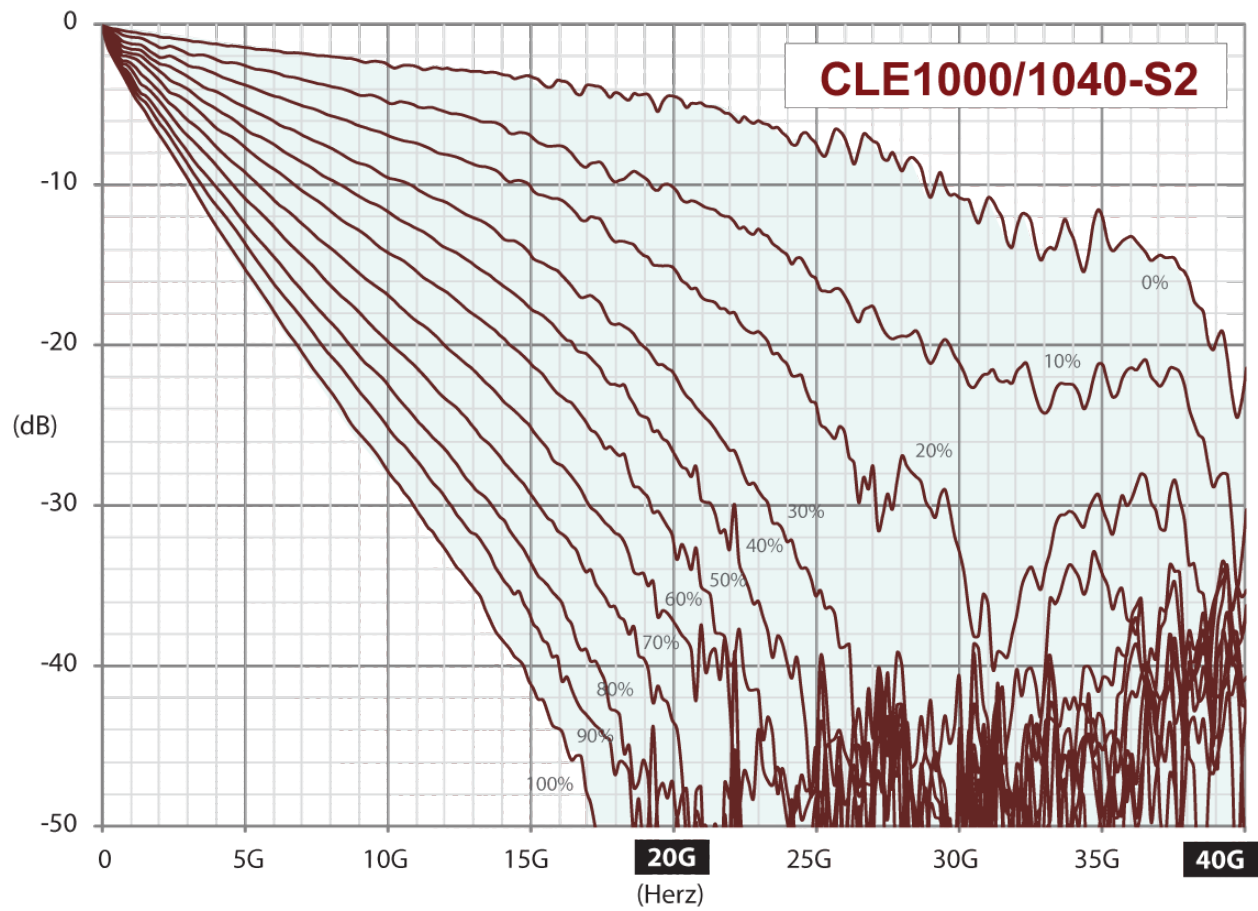
### 3-4 Additional Notes

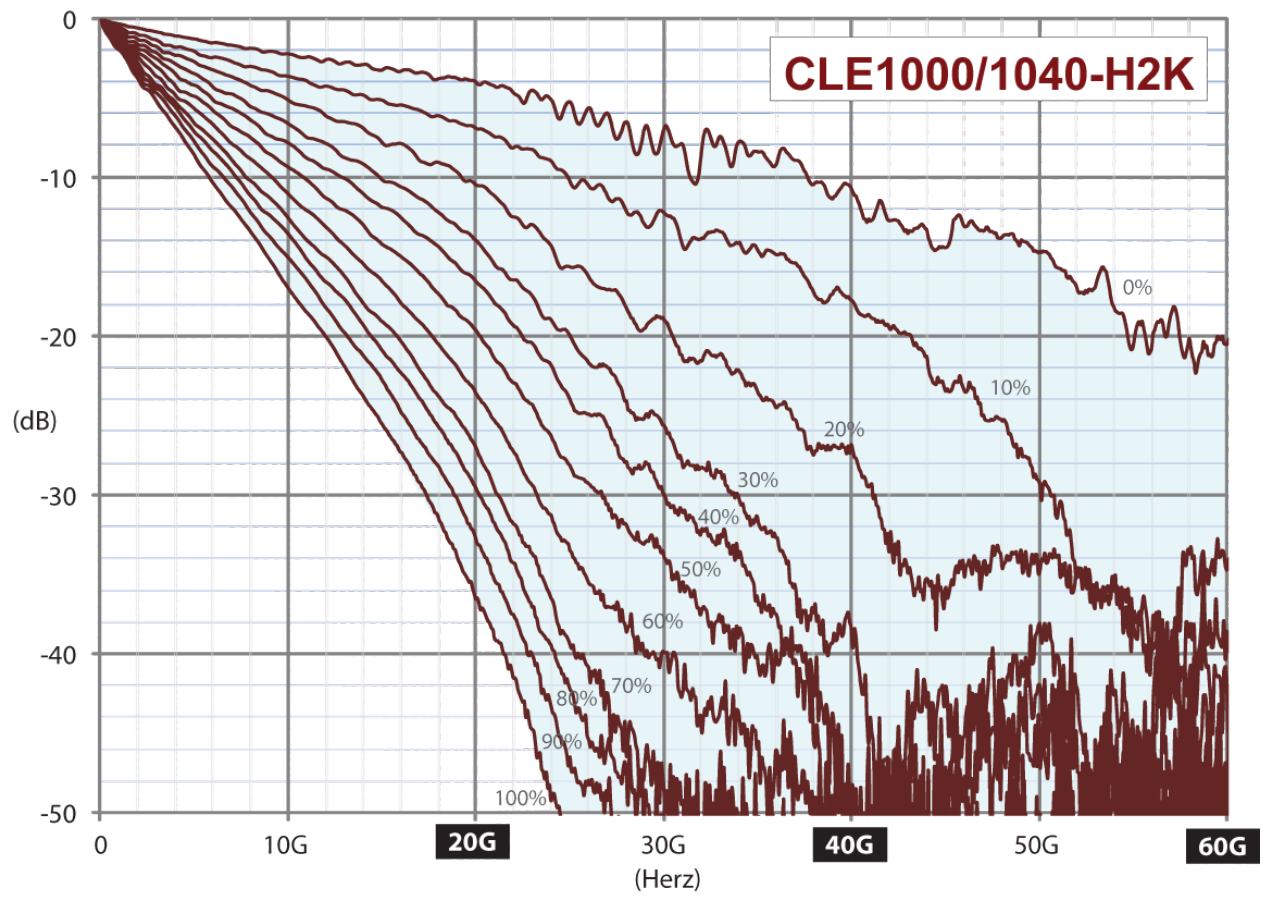
- The frame ground has the same voltage level with AC inlet ground. Connect the frame ground with other equipment’s ground, then turn on the power.
- Do not use this equipment under condensed environment.
- Release the static electricity inside of this equipment by connecting the coaxial connectors with ground.
- Place the equipment on the flat surface to secure the result.
- The transmission delay varies by the insertion loss amount.
- The differential line should be used for the same directional two lines.
- Do not remove the 1.85mm (V) connector adapters, 2.92mm (K) connector adapters or SMA connector adapters except when exchanging the adapter itself.
- Fasten the connector with torque of 0.9Nm , do not exceed 0.9Nm.

## 4. Specifications

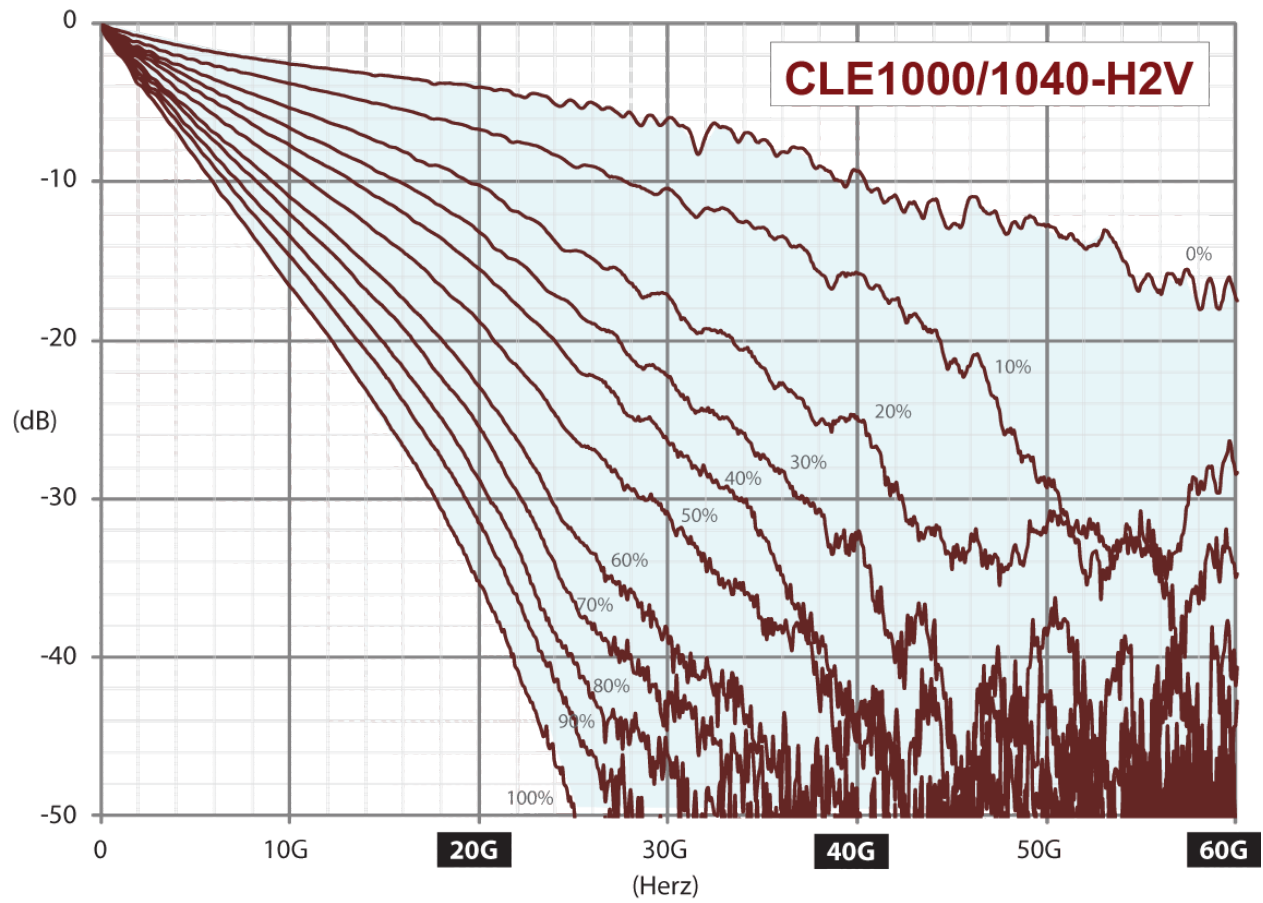
Transmission Line	2x DC-coupled Single End
Impedance	50 ohm
Connector	(H2V) x 1.95mm (V) Female (H2K /S2) 4x 2.92mm(K) Female (A2) 4x SMA
Input Tolerance	10Vpp Max
Delay	(H2V/H2K) 1.58ns +/-70ps approx. (S2) 2.2ns +/- 200ps approx. (A2) 3.8ns +/- 600ps approx.
Remote Control	USB 2.0
Power	AC 100V ~ 240V 50Hz/60Hz 70VA max Fuse(T type 1A 250V pi3x20)
Dimensions	190(w) x 110(h) x 440(d) mm
Operation Environment	25+/- 5 C, <65%RH

**Insertion Loss & Return Loss (Typical Example)**









## 5. Warranties

- This product is warranted from date of purchase against defects of materials or in workmanship for a period of 1 year.
- This warranty is extended only to the original purchase. A purchase receipt or other proof of date of original purchase will be required in order to exercise your rights under this warranty.
- If the product fails to function properly, return the product, prepaid and this warranty only covers failures due to defects in materials or workshop which occur during normal use.
- It does not cover damage which occurs in shipment; applications and used for which this product was not intended; failures or problems which are caused by products or equipment not supplied by ARTEK; accidents, misuse, abuse, neglect, misapplication, fire, water, lightning, or other acts of nature; incorrect electrical line voltage, fluctuations or surges; damage caused by improper or faulty installation; improper connection with any peripheral; product alteration or modification; improper or unauthorized repair; cosmetic damage or exterior finish; product with altered serial numbers; failure to follow operating instructions, customer adjustments, maintenance and environment instructions that are covered and prescribed in the instruction book.
- 1.85mm(V) connector adapters and 2.92mm(K) connector adapters are excluded with this warranty.

### Cautions

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- Terminate the other line even when you use one line of the differential signal.
- Avoid all possible shocks and vibrations.
- It may take approximately one second until it becomes stable once you change the setting parameters.
- Retain the power voltage within the acceptance range.

## Customer Support

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Please contact with our customer support center.

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