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FLUKE®

Calibration

1620A “DewK”

Thermo-Hygrometer

User's Guide

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1 Before You Start

1.1 Symbols Used

Table 1 lists the International Electrical Symbols. Some or all of these symbols may be used on the instrument or in this manual.

Table 1 International Electrical Symbols

Symbol	Description
	AC (Alternating Current)
	AC-DC
	Battery
	CE Complies with European Union Directives
	DC (Direct Current)
	Double Insulated
	Electric Shock
	Fuse
	PE Ground
	Hot Surface (Burn Hazard)
	Read the User's Manual (Important Information)
	Off
	On

Symbol	Description
	Canadian Standards Association
CAT II	OVERVOLTAGE (Installation) CATEGORY II, Pollution Degree 2 per IEC1010-1 refers to the level of Impulse Withstand Voltage protection provided. Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation. Examples include household, office, and laboratory appliances.
	C-TIC Australian EMC Mark
	The European Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) mark.

1.2 Safety Information

Use this instrument only as specified in this manual. Otherwise, the protection provided by the instrument may be impaired.

The following definitions apply to the terms “Warning” and “Caution”.

- “Warning” identifies conditions and actions that may pose hazards to the user.
- “Caution” identifies conditions and actions that may damage the instrument being used.

1.2.1 Warnings

To avoid personal injury, follow these guidelines.

- **DO NOT** use this unit in environments other than those listed in the User's Guide.
- Follow all safety guidelines listed in the User's Guide.
- Calibration equipment should only be used by trained personnel.
- The AC adapter can present safety concerns if misused or damaged. To avoid the risk of electric shock or fire, do not use the AC adapter outdoors or in a dusty, dirty, or wet environment. If the cord, case, or plug of the adapter is damaged in any way, discontinue its use immediately and have it replaced.
- Never disassemble the AC adapter. Use only the AC adapter provided with the instrument or equivalent adapter recommended by the manufacturer of this instrument.
- The AC adapter has circuits with high voltage inside that could present danger of electrical shock or fire if exposed. If the AC adapter is damaged in any way or becomes hot, discontinue its use immediately, disconnect it from any AC supply, and have it replaced. Do not attempt to open, repair, or continue using a damaged or defective AC adapter.

- The instrument battery can present danger if not handled properly. To avoid the risk of exposure to dangerous substances or explosion, immediately remove the battery and discontinue use if it leaks or becomes damaged. Never allow the battery to be shorted, heated, punctured, or dropped. If the instrument is physically damaged, immediately remove the battery to insure that it does not become shorted. While removed from the instrument, store the battery in a location so that it will not come into contact with metal or fluids that might short circuit the battery and where it is safe from excessive temperatures.
- Used batteries must be disposed of properly. Check your local regulations for additional information. Never dispose of batteries in fire which may result in explosion with the possibility of personal injury or property damage.

1.2.2

Cautions

- If the instrument is dropped, struck, or handled in a way that causes internal or external physical damage, immediately unplug the AC adapter, remove the battery, discontinue use, and contact an Authorized Service Center. Do not attempt to disassemble or repair the instrument, battery, or AC adapter. Refer repairs or replacement components to an Authorized Service Center.
- The instrument and sensors are sensitive and can be easily damaged. Always handle these devices with care. **DO NOT** allow them to be dropped, struck, stressed, or overheated.
- Sensors are fragile devices which can be damaged by mechanical shock, overheating, and exposure to fluids. Damage may not be visibly apparent but can cause drift, instability, and loss of accuracy. Observe the following precautions:
 - **DO NOT** allow sensors to be dropped, struck, or stressed.
 - **DO NOT** overheat sensors beyond their recommended temperature range.
 - Keep the sensors clean and away from fluids and dust.

1.3

Authorized Service Centers

Please contact one of the following authorized Service Centers to coordinate service on your Hart product:

Fluke Corporation, Hart Scientific Division

799 E. Utah Valley Drive
American Fork, UT 84003-9775
USA

Phone: +1.801.763.1600

Telefax: +1.801.763.1010
E-mail: support@hartscientific.com

Fluke Nederland B.V.

Customer Support Services
Science Park Eindhoven 5108
5692 EC Son
NETHERLANDS

Phone: +31-402-675300
Telefax: +31-402-675321
E-mail: ServiceDesk@fluke.nl

Fluke Int'l Corporation

Service Center - Instrimpex
Room 2301 Sciteck Tower
22 Jianguomenwai Dajie
Chao Yang District
Beijing 100004, PRC
CHINA

Phone: +86-10-6-512-3436
Telefax: +86-10-6-512-3437
E-mail: xingye.han@fluke.com.cn

Fluke South East Asia Pte Ltd.

Fluke ASEAN Regional Office
Service Center
60 Alexandra Terrace #03-16
The Comtech (Lobby D)
118502
SINGAPORE

Phone: +65 6799-5588
Telefax: +65 6799-5588
E-mail: antng@singa.fluke.com

When contacting these Service Centers for support, please have the following information available:

- Model Number
- Serial Number
- Voltage
- Complete description of the problem

2 Introduction

Fluke's Hart Scientific Division's 1620A is a low-cost, high-accuracy, digital thermo-hygrometer. Its unique combination of features makes it suitable for a wide variety of applications from laboratory to industrial ambient measurement. Features of the thermo-hygrometer include:

- Two channels measure ambient temperature to ± 0.125 C and %RH to $\pm 1.5\%$
- Two sensor capability (second sensor optional), each measuring temperature and relative humidity; each is detachable, cable-extendable, and interchangeable, with self-contained calibration; each may be assigned a unique 16-character identification
- Display resolution is user selectable up to 0.001 C and 0.01% RH
- On-board memory holds up to 400,000 time/date-stamped readings
- Serial RS-232 interface for reading measurements and access to settings
- Ethernet LAN interface provides TCP/IP communications and embedded HTML web page for reading measurements over a network
- Optional wireless RF 802.15.4 (ZigBee) for remote operation
- Visual and audio alarms for various alarm or fault conditions, alarm output port
- May be wall mounted or set on a bench top
- Detachable sensors contain their own calibration data for easy recalibrations
- Optional software logs in real-time or shows graphical/statistical data
- Password protection of settings
- Large LCD displays temperature and humidity data graphically, numerically, and statistically; 16 pre-defined, user-changeable screen setups
- Power 12 VDC from external 110-240 VAC to DC converter
- Uses a standard 9V battery backup to allow continued measuring during power interruptions

3 Specifications and Environmental Conditions

3.1 Specifications

Temperature Range	0°C to 50°C
Temperature Accuracy (“H” Model)	16°C to 24°C (60.8°F to 75.2°F): ±0.125°C (±0.225°F) [calibrated] 0°C to 16°C (32°F to 60.8°F): ±0.5°C (±0.9°F) [uncalibrated typical] 24°C to 50°C (75.2°F to 122°F): ±0.5°C (±0.9°F) [uncalibrated typical]
Temperature Accuracy (“S” Model)	15°C to 35°C (59°F to 95°F): ±0.25°C (±0.45°F) [calibrated] 0°C to 15°C (32°F to 59°F): ±0.5°C (±0.9°F) [uncalibrated typical] 35°C to 50°C (95°F to 122°F): ±0.5°C (±0.9°F) [uncalibrated typical]
Delta Temperature Accuracy	±0.025°C (±0.045°F) for ±1°C (±1.8°F) changes within 15°C to 35°C (59°F to 95°F)
Temperature Display Resolution	User selectable up to 0.001°C (0.01°C recorded)
RH Range	0% to 100% RH
RH Accuracy (“H” Model)	20% to 70% RH: ±1.5% RH (calibrated) 0% to 20% RH, 70% to 100% RH: ±3% RH (uncalibrated, typical)
RH Accuracy (“S” Model)	20% to 70% RH: ±2% RH (calibrated) 0% to 20% RH, 70% to 100% RH: ±3% RH (uncalibrated, typical)
Delta Humidity Accuracy	±1.0% for ±5% changes within 20% to 70% RH
RH Display Resolution	User selectable up to 0.01% (0.1% recorded)
Inputs	Two sensors, each measuring temperature and relative humidity; each is detachable, cable-extendable, and interchangeable, with self-contained calibration; each may be assigned a unique 16-character identification
Display	240 x 128 graphics monochrome LCD, displays temperature and humidity data graphically, numerically, and statistically; 16 pre-defined, user-changeable screen set-ups are included
Memory	400,000 typical individual time-stamped readings
Alarms	Visual and audio alarms for temperature, temperature rate, RH, RH rate, and fault conditions
Alarm port output	0 V normal, 11 to 12 V active, sources up to 20mA, 2.5mm, two-conductor sub-miniature plug
Communications	RS-232, Ethernet LAN, 802.15.4 (ZigBee) wireless (optional)
Ethernet	10 Base-T, 100 Base-TX, IP, TCP, DHCP, Ping, HTTP, HTML
Wireless Range	30 m (100 ft) typical unobstructed
Enclosure	The DewK may be wall-mounted (hardware included) or set on a benchtop
Power	12 V DC from external 100-240 V AC power supply
Battery Backup	Standard 9V battery to allow continued measuring during power disruptions
Operating Range	0°C to 50°C

Size (DewK)HxWxD	125 x 211 x 51 mm (4.9 x 8.3 x 2.0 in)
Size (Probes)	79 mm H x 19 mm dia. (3.1 x 0.75 in)
Weight	0.7 kg (1.5 lb.)

3.2 Environmental Conditions

Although the instrument has been designed for optimum durability and trouble-free operation, it must be handled with care. The instrument should not be operated in an excessively dusty, dirty, or wet environment. Maintenance and cleaning recommendations can be found in the Maintenance section of this manual.

- For full accuracy, operate the instrument within the calibrated temperature and relative humidity range of the sensors.

1620A DewK

- Operating Temperature: 0°C to 50°C (32°F to 122°F)
- Relative Humidity: 0% to 70% RH

2626-H/S

- Operating Temperature: 0°C to 50°C (32°F to 122°F)
- Relative Humidity: 0% to 100% RH

AC Adapter

- Operating Temperature: 0°C to 40°C (32°F to 104°F)
- Relative Humidity: 5% to 90% non-condensing de-rating from 40°C linearly to 50% at 70°C

General to all

- Pressure: 75 kPa-106 kPa
- Vibration should be minimized
- Altitude less than 2,000 meters
- Indoor use only

4 Quick Start

This section briefly explains the basics of setting up and operating your thermo-hygrometer.

4.1 Unpacking

Carefully unpack the thermo-hygrometer and inspect the instrument to make sure all components are present and in satisfactory condition. Verify that the following items are present:

- 1620A Thermo-Hygrometer
- AC adapter and power cord
- Serial cable
- Manual
- Report of calibration
- Wall mount bracket
- Sensor
- 9V battery

If all items are not present, call your Hart Scientific Authorized Service Center. See Section 1.3.

4.2 Use Proper Care

First and most important is to understand the safety issues related to the thermo-hygrometer. Carefully read Section 1.2, Safety Information.

The thermo-hygrometer and sensors used with it are sensitive instruments that can be easily damaged. Always handle these devices with care. DO NOT allow them to be dropped, struck, stressed, or over-heated.

4.3 Learn About the Features and Components

Familiarize yourself with the features and accessories of the thermo-hygrometer by reading Section 5, Parts and Controls.

4.4 Install the Battery

To maintain uninterrupted measurement when power outages occur, you must install the included battery into the rear battery compartment. A standard 9V alkaline battery (NEDA 1604A or IEC 6LR61) is recommended. With a fresh alkaline battery installed, the thermo-hygrometer will continue to measure and record temperature and relative humidity during a power outage for up to 16

hours, typically. However, without external power, the display will be inoperable.

4.5 Connect the Sensor

The sensor for channel 1 connects to the socket at the top-right, and the sensor for channel 2, if used, connects to the socket on the right side. Either sensor may be used with an optional extension cable up to 100 feet (30 meters) in length.

4.6 Connect the Power Source

The thermo-hygrometer draws power from the provided power adapter. Plug the adapter into a wall outlet of the appropriate voltage and insert the DC plug into the DC power input of the thermo-hygrometer.

4.7 Switch the Power On

Power is turned on and off with the power switch located below the stand on the back panel. To switch the power on, toggle the power switch to the ‘**I**’ position. To switch power off, toggle the power switch to the ‘**○**’ position. The instrument takes a few seconds to power up, initialize, and begin normal operation. A self-test is performed, displaying the channel configuration and status of the system, calibration, % battery power, memory, and buttons. If the thermo-hygrometer calibration has expired and the alert message is enabled, the user is notified and must press the Enter button to continue initialization. If an error message is displayed on power up see Section 11, Troubleshooting.

4.8 Measure Temperature

After initialization, the temperature and relative humidity measurements for the enabled channels are displayed. If recording is enabled, the measurements will be automatically stored in memory. The display can be configured to display the measurements in a variety of numerical and graphical formats. For information on the various modes of operation of the thermo-hygrometer, see Section 7, Menu Functions.

5 Parts and Controls

The functions of the various features of the thermo-hygrometer are described below.

5.1 Front Panel

The front panel buttons Enter/Menu, Up/Down/Left/Right Arrows, and Exit are used to select and alter the functions of the thermo-hygrometer (see Figure 1).

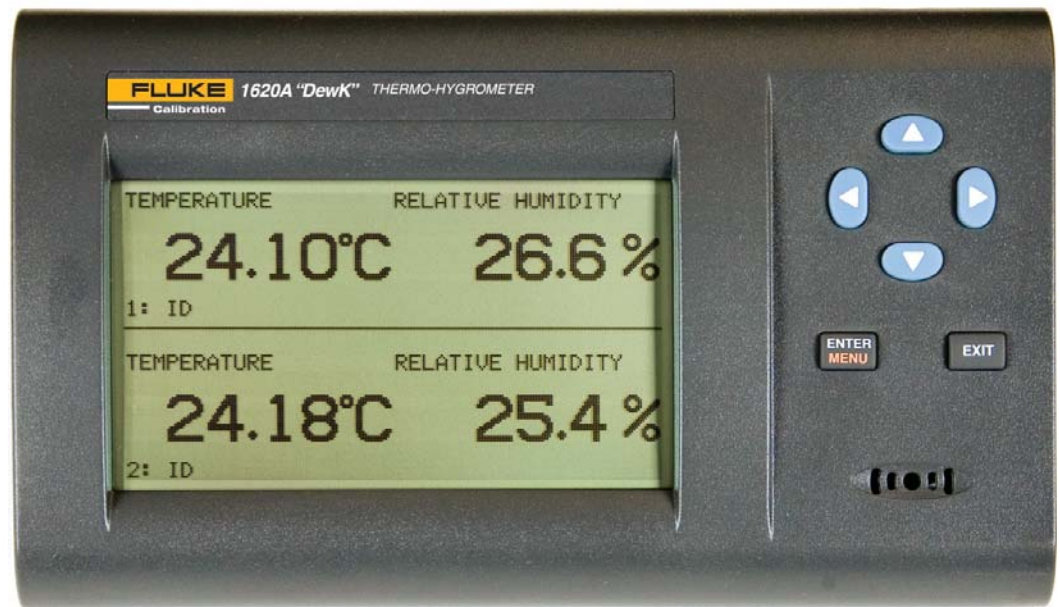


Figure 1 Front Panel

The buttons have different functions depending on whether the main screen or the menu system is displayed.

The functions of each of the buttons from the main screen are as follows:

Enter/Menu - This button is used to display the menu options.

Exit - This button is used to display the alarm window. With the alarm window displayed the Exit button can be used to return to the main screen while preserving the alarm events or the Enter button can be used to clear the alarm events and return to the main screen.

◀▶ - These buttons are used to move among enabled display layouts.

▲▼ - These buttons are used to adjust the display contrast, ▲ for darker and ▼ for lighter.

The functions of each of the buttons within the menu system are as follows: