

# HUMBOLDT

## NUCLEAR GAUGES And Accessories



12.24



[www.humboldtscientific.com](http://www.humboldtscientific.com) • 1.800.537.4183



# Nuclear Gauges



HS-5001NX



HS-5001EZ-2

Choose from Two,  
High-Quality Gauge Models

## Humboldt's Moisture/Density Gauges Provide:

- High-quality gauges — built to take a beating
- Truly, field-serviceable with parts readily available
- No added cost from Humboldt for third-party calibration
- Exceptional calibration, leak test and repair services
- 24 month warranty





# Why Humboldt...



All Humboldt nuclear gauges are built rugged for the day-to-day rigors of construction projects. These gauges are built to last using high-quality Noryl® PPO material, which is one of the most dimensionally stable thermoplastics available. This produces a gauge housing that is less brittle than the competition resulting in less breakage. Humboldt also pays strict attention to sealing our gauges against dirt and dust, providing a better design and less electronic problems due to dust. Humboldt gauges are also “Field Serviceable”. If you have a problem with your Humboldt gauge, chances are we can quickly get a part out to you, which you can install on your own, saving you lots of time and money. Other manufacturers require you to send your gauge back to the factory for calibration. We don't. You can send your gauge back to us or you can allow a third party to calibrate your gauge without incurring any charges from Humboldt.

With Humboldt, you get:

- High-quality gauges, built to take a beating
- Truly, field serviceable with parts readily available
- No added cost from Humboldt for third party calibration
- Exceptional calibration, leak test and repair services

Humboldt Nuclear Gauges have been used for years in many tough and demanding applications. They have always proven to be: easy-to-operate, easy-to-power, easy-to-service and the most rugged gauges in the industry. They also feature our innovative trigger release handle that eliminates pinched fingers while providing smooth operation. Unlike some competitors, all Humboldt Nuclear Gauges are manufactured with 100% new parts — no refurbished parts, sold as new. Humboldt Nuclear Gauges are available in two models: the new **NX** Gauge, and the **EZ-2** Gauge.

The **EZ-2** Gauge features a large display screen that can still be seen in bright sunlight, with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation.

The **NX** Gauge, provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the **NX** Gauge brings you a host of features aimed at making your job easier. Featuring an enhanced user interface and color touch-screen, the **NX** Gauge provides intuitive operation of all gauge operations. It also provides touch-pad operation as an alternative control method.



# HS-5001NX Nuclear Gauge


## HS-5001NX

Humboldt's New HS-5001NX Moisture/Density Gauge provides more efficient operation, data collection and processing than any other gauge in its class. The HS-5001NX brings you a host of new features aimed at making your job easier. Featuring a color touchscreen, the **NX** Gauge provides intuitive operation of all gauge operations. It also provides touch pad operation as an alternative control method.

The New **NX**'s versatility allows it to measure density through direct transmission, backscatter, thin lift and trench modes, as well as providing moisture determinations. The gauge uses an advanced microprocessor-based technology to provide highly accurate measurements of density and moisture that are automatically computed for direct readouts of wet density, dry density, moisture content, percent of moisture, percent of compaction (Proctor or Marshall), void ratio and air voids. The New **NX** Gauge complies with all pertinent standards: ASTM D6938, D2950, C1040 and AASHTO T310, T355 and all other international standards. The gauge is calibrated by the Five-block calibration method ASTM D7013, D7759.



 **Touch Screen Operation**

 **Direct Readouts**

 **Enhanced User Interface**

HS-5001NX

## KEY FEATURES:



### Touch-Screen or Touch Pad —

Color touch-screen, which provides complete control or you can also use the menu-driven touch pad.



### Temperature Sensor —

Auto recording of ambient temperature at test



### Wireless Communication —

The **NX** gauge can connect to any PC, Android® or Apple® smartphone/tablet for easy transfer of test results up to 30 feet.



### USB Port —

For fast, test download



### 3D Accelerometer —

Auto turn off upon motion (with movement of the gauge)



### Easy Self Repairs —

The **NX** Gauge's modular design enables it to be serviced in the field by you, if necessary. No need to send the gauge in for repair, we'll send you the necessary components and walk you through many of the repair procedures if assistance is needed



### Multi-Language —

Selectable: English, French, Spanish



### Dual Power Source — 6 AA

batteries & rechargeable NiMH pack



### Micro SD Card —

Auto storage of 2GB of test data, 250 tests per project



### GPS —

Geographic coordinates and altitude information



### Real Time Clock (RTC) —

Multi-date/time formats



### Ambient Light Sensor (ALS) —

Can sense the light and automatically power on backlight



### Gauge App Compatible —

Capture and share data test results with anyone, anywhere





# HS-5001EZ-2 Nuclear Gauge



## HS-5001EZ-2

Humboldt's HS-5001EZ-2 reflects the latest in portable, electronic design for nuclear gauges, featuring a large, back-lit LCD display. Humboldt's EZ-2 Moisture/Density Gauge is just that — easy. Easy-to-operate, easy-to-power and easy-to-service. The EZ-2 gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation.

The EZ-2's versatility allows it to measure density through direct transmission, backscatter, thin lift and trench modes, as well as providing moisture determinations. The gauge uses an advanced micro-processor-based technology to provide highly-accurate measurements of density and moisture that are automatically computed for direct readouts of wet density, dry density, moisture content, percent of moisture, percent of compaction (Proctor or Marshall), void ratio and air voids. The EZ-2 Gauge complies with all pertinent standards: ASTM D6938, D2950, C1040 and AASHTO T310, T355 and is factory calibrated by the Five-block calibration method ASTM D7013, D7759.



-  **Bright Menu Display**
-  **Direct Readouts**
-  **AA Batteries (1200hrs)**



## KEY FEATURES:

HS-5001EZ-2



**USB Port —**  
For fast, test download



**Large Display —**  
Easily readable in bright sunlight  
LCD-type, TFT; Normal black



**Multi-Language —**  
Selectable: English, French, Spanish



**Micro SD Card —**  
Auto storage of 2GB of test data,  
250 tests per project



**Real Time Clock (RTC) —**  
Multi-date/time formats



**Temperature Sensor —**  
Auto recording of ambient temperature at test



**3D Accelerometer —**  
Auto turn off upon motion  
(with movement of the gauge)



**Power Source —**  
6 AA batteries



**GPS —**  
Geographic coordinates and  
altitude information



**QR-Code Driven App —**  
Capture and share data test results with  
anyone, anywhere





# SPECIFICATIONS

## Mechanical

Operating Temperature	14 to 158°F (-10 to 70°C), ambient to 347°F (175°C) Material Surface
Storage Temperature	-70 to 185°F (-55 to 85°C)
Humidity	98% without condensation, Rain-Resistant Construction
Vibration	0.1" (2.5mm) at 12.5 Hz
Materials	
Shielding	Tungsten Powder Alloy
Source Rod	440C Stainless steel, Induction, heat treated to 55 Rockwell C
Gauge Base	Computer-Machined 6061-T6 Aluminum, Hard-Coated and PTFE Impregnated
Post and Frame	Computer-Machined 6061-T6 Aluminum, Anodized for Anti-corrosion
Index Rod	7075 aluminum, Hard Coated and PTFE Impregnated
Top Shell	Injection-Molded Noryl with Integral Color
Bearing	Relieved Bronze with Neoprene Seals
Screws/Fittings	Stainless Steel and Brass

## Measurement: Density at 125 pcf (2000 kg/m<sup>3</sup>)

Direct Transmission: 6" (150mm)	15 seconds (Fast)	1 minute (Std.)	4 minutes (Slow)
Precision, pcf (kg/m <sup>3</sup> )	±0.5 (8)	±0.25 (4)	±0.13 (2)
Chemical Error, pcf (kg/m <sup>3</sup> )	±1.0 (16)	±1.0 (16)	±1.0 (16)
Surface Error, pcf (kg/m <sup>3</sup> )	-0.5 (8)	-0.5 (8)	-0.5 (8)
Backscatter, 3.5" (88mm)	15 seconds (Fast)	1 minute (Std.)	4 minutes (Slow)
Precision, pcf (kg/m <sup>3</sup> )	±1.0 (16)	±0.5 (8)	±0.25 (4)
Chemical Error, pcf (kg/m <sup>3</sup> )	±2.5 (40)	±2.5 (40)	±2.5 (40)
Surface Error, pcf (kg/m <sup>3</sup> )	-3.0 (48)	-3.0 (48)	-3.0 (48)

## Measurement: Moisture at 10pcf (160kg/m<sup>3</sup>)

Measurement Depth: 4-8" (100-200mm)	15 seconds (Fast)	1 minute (Std.)	4 minutes (Slow)
Precision, pcf (kg/m <sup>3</sup> )	±0.5 (8)	±0.25 (4)	±0.13 (2)
Surface Error, pcf (kg/m <sup>3</sup> )	-0.25 (4)	-0.25 (4)	-0.25 (4)

## Dimensions/Weight

Gauge	
Dimensions (base)	15.75" x 8.66" x 5.5" (400 x 220 x 140mm)
Handle Height	18" or 21.5" (450 or 550mm)
Weight	30 lbs (13.6kg)
Reference Standard	
Dimensions	13.8" x 7.8" x 3" (350 x 200 x 75mm)
Weight	10 lbs (4.5kg)
Transit Case	
Dimensions	31" x 14" x 19.5" (787 x 356 x 495mm)
Weight	31 lbs (11.8kg)
Accessory Case (loaded)	
Dimensions	19.7" x 9.8" x 5" (500 x 250 x 125mm)
Weight	16 lbs (7.3kg)
Total Shipping Weight	90 lbs (41kg)

## Radioactive Materials Data Needed for License Application

Radioactive Material	Chemical/Physical Form	Maximum Amount
Cesium-137	Sealed Source Humboldt 2200064	Not to exceed 11 millicuries per source
Americium-241:Be	Sealed Source Humboldt 2200067	Not to exceed 44 millicuries per source

## Electrical

Displays:	HS-5001NX	TFT, Normal Color, Sunlight Readable
	HS-5001EZ-2:	TFT, Normal Black, Sunlight Readable
Timer Stability		0.01%
Power Supply Stability		0.10%
Power Source:	HS-5001NX	Six (6) alkaline AA-size batteries and NiMH
	HS-5001EZ-2:	Six (6) alkaline AA-size batteries
Power Consumption:	HS-5001NX HS-5001EZ-2:	Active—0.9 - 24mA — Battery Life—1200 hours
Power Protection:	HS-5001NX	Regulated Supplies—Short Circuit Proof
	HS-5001EZ-2:	Main Batteries—Circuit Breaker Regulated Supplies—Short Circuit Proof
Low Battery Condition:		LOBAT Alarm and Auto Shutoff for low and dead battery conditions
Battery Life:		Remaining Battery Life Automatically Estimated at Power-up by activating TEST routine
Language		Selectable – English, French, Spanish
Micro-controller (MCU)		160MHz, 32 Bit
Real Time Clock (RTC)		Multi date/time formats
3D Accelerometer		Auto turn off on motion
Micro SD Card		Auto storage of 2GB of test Data - 250 tests per project
Shutdown		Auto / User selectable

## Radiological

Gamma Source	
Material, Type and Amount	Cs-137, 370MBq (10mCi)
Special Form Registration	USA/0356/S-96 Rev 12
ANSI and ISO Class	ANSI 77C66535
Neutron Source	
Material, Type and Amount	Am-241: Be, 1.48GBq (40mCi)
Neutron Yield	70 Knps ±10%
Special Form Registration	CZ/1009/S-96 Rev 1
ANSI and ISO Class	ANSI 77C66545
Source	
Type	Sealed Source, Special Form
Housing	Stainless Steel, Double Encapsulated
Surface Dose Rates	18.7 mrem/hr Maximum (Neutron and Gamma)
Transit (shipping) Case	DOT 7A, Type A, Yellow II Label, 0.2 TI

## Upgrade Your Old Nuclear Gauge to the EZ-2 or NX Gauge

Assembly with front Panel and Mother Board for EZ-2 HS-201080

Assembly with front Panel, Mother Board & Rechargeable Batteries for NX HS-201090

- LCD Type TFT & Selectable Multi-Language Display
- Micro SD Card
- RTC (multi-date/time formats)
- Light Emitting Sensor (backlight)
- Temperature Sensor
- 3D Accelerometer
- USB Port
- Flash Drive, equipped with GPS, QR-Code Driven App
- 6 AA Battery Power Source
- User/Radiation Safety Manuals
- ISO 17025 Accredited Calibration
- 24-Months Warranty



# CALIBRATION and repairs



## Fast and EaZy, Full-Service Nuclear Gauge Calibration, Leak Tests and Service

To support our customers and their use of our nuclear gauges, Humboldt maintains a complete service and **ISO/IEC 17025: 2017** accredited calibration facility at Humboldt Scientific in Raleigh, North Carolina. Here we provide repair and calibration services for Humboldt gauges, as well as those of the other manufacturers. All services are performed by experienced and certified technicians with over 25 years of experience. Our services are built upon providing fast and reliable turn-around of your gauge calibration and repairs while maintaining competitive prices. Humboldt nuclear gauge calibration complies or exceeds ASTM and AASHTO standards by providing five-block calibration for all gauge calibrations. We maintain multiple sets of calibration blocks, which are traceable to master NIST standards. These blocks are set up in isolated, temperature-controlled bays to reduce interference during calibration. Documentation and certificates for calibrations conform to NIST procedures and requirements. We also provide leak test analysis services, gauge rental and disposal services.

### EaZy Shipping Program

And, to make using our services as easy as possible, we have designed our EaZy shipping program. Just go to our website and fill out the calibration/repair form and we'll handle the rest. We will send you the completed shipping papers your gauge will need to have for shipping to us and directions on how to prepare and pack your gauge for shipment. We will contact the shipper and have them pick up your gauge from your designated location and ship it back to you when the calibration is completed.

### Nuclear Gauge Data Download Kit

#### Data Download Kit

Data download kit to third-party software such as LIMS (Laboratory Information Management System). Available with the purchase of a new gauge or during factory servicing.

#### Data Download Kit

LIMS add-on Kit for EZ-2/NX Gauge

HS-201056

## EaZy Shipping

**Need to ship your gauge to us  
for calibration or service?**

**Let us handle it!**

Just fill out our online form, and we'll take care of the rest!





## Nuclear Gauge - Find My Gauge Kit

Now with Humboldt's New Find My Gauge Tracking Kit, you can locate your gauge through any computer or mobile device! With this amazing GPS tracker, your gauges can be tracked to see where they are!

No need to upgrade your Nuclear Gauge to track it. Simply install the GPS tracker inside your Gauge and with a few simple steps, you will be able to find your gauge!

Humboldt will provide the GPS tracker and all the necessary mounting hardware, cabling and instructions!

It's that simple!



## KEY FEATURES:

- Outdoor and indoor use
- Built-in, sensitive, vibration sensor - even if a slight vibration for 3 seconds, the device will send alarm to owner.
- Geo-fence will help you make a safe area. When the gauge is out of the safe area, the device will send alarm to owner.
- Highly waterproof
- 6 month server storage to view historical routes in APP & Web platform at any time.
- 5000mAh rechargeable battery - device can work up to 7 days for 24/7 monitoring. (Depending on the number of inquiries per day the device will work longer.)
- Includes easy access charging port - no need to disassemble the gauge
- 3rd party tracking software can be installed on your computer or phone. Free of charge no contract required
- Includes first SIM Card \*
- Card cost as little as 5 dollars a month in USA and data SIM Card is available around the world for purchase. \*\*

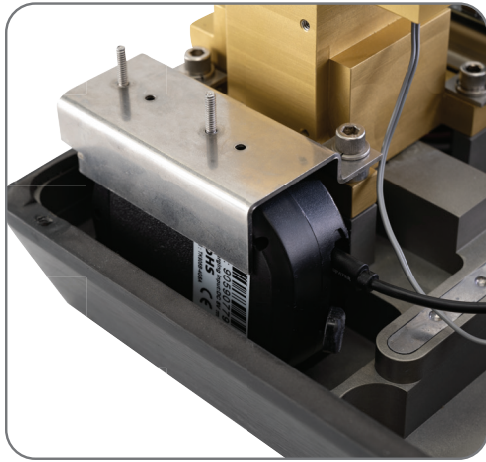
\* SIM card included is pre-configured for use within the United States. Customers located outside the U.S. must purchase a GSM-compatible SIM card suitable for their region.

\*\* \$5 monthly fee applies to the data subscription associated with the included SIM card. Subscription is provided by third-party providers, unaffiliated with Humboldt, and the actual monthly cost may vary.

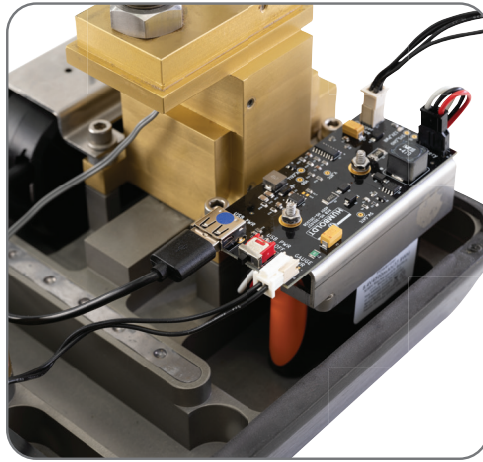




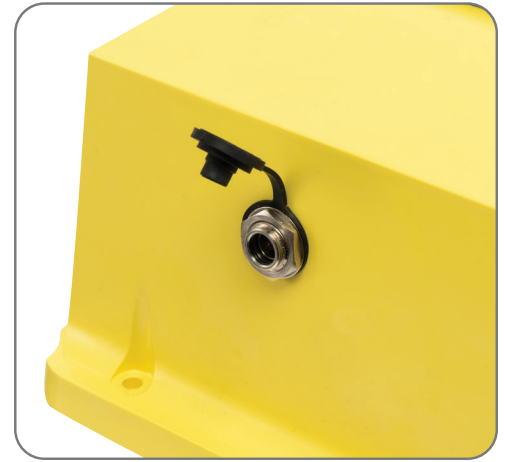
# SPECIFICATIONS



GPS Shown inside of Nuclear Gauge



Inside of Nuclear Gauge



Easy Access Charging Port

## GPS Asset Tracker (Find My Gauge) Specifications:

Dimensions	3.5"x2.8"x0.8" (90mm x 72mm x 22mm)
Weight	168g
Network	GSM / GPRS
Band	850 / 900 / 180 0/1900Mhz
GPS Sensitivity	-159dBm
GPS Accuracy	5m
Wall Charger	Input: 110-220V Output: 5V-1A
Battery	Chargeable 3.7V 5000mAh Li-ion Battery
Stand By	90 Days
Time To First Fix	Cold Status 45s Warm Status 35s Hot Status 1s
Storage Temp.	-40°F to +185°F (-40°C to +85°C)
Operation Temp.	-4°F to +131°F (-20°C to +55°C)
Humidity	5%--95% non-condensing

## GPS Asset Tracker (Find My Gauge) Options:

HS-201050	Find My Gauge Kit With GPS, SIM Card, Wall AC charger & Hardware
HS-201055	Same as HS-201050 with extra NiMH Batteries
HS-201060	Same as HS-201055 with MotherBoard
HS-201065	Same as HS-201050 with EZ-2 Front Panel Assembly & MotherBoard
HS-201070	Same as HS-201065 with extra NiMH Batteries
HS-201075	Same as HS-201050 with NX Front Panel Assembly & MotherBoard

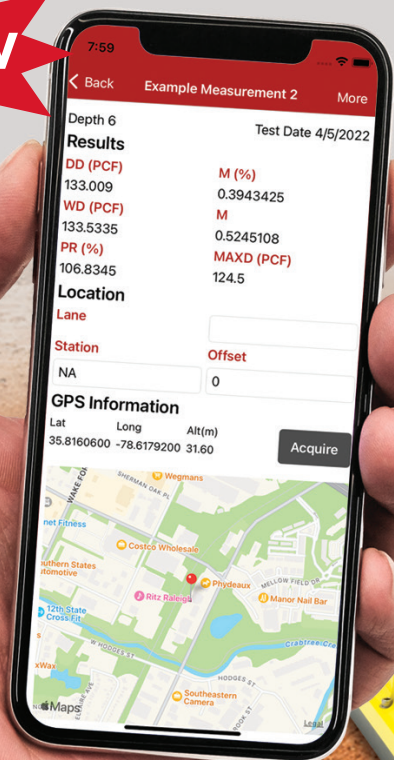






Take it to the NX level and...  
**Make it EZ, Get the App!**

**NEW**



Phone not included. App download only.

**NX Gauge &  
EZ-2 Gauge  
Compatible!**



Capture test results and share them with anyone with Humboldt's Gauge App. Now, you can transfer your test data to your device wirelessly from the **NX** Gauge or use QR codes and your phone's camera to transfer test data from the **EZ-2** Gauge. From there, share it with anyone via email, text message or cloud-sharing platforms. The app also allows the user to tag the GPS location for each measurement using the coordinates of the nuclear gauge.

With the **NX** Gauge, **EZ-2** Gauge and Gauge App, you will be able to transfer data for single readings, as well as projects and groups of projects. This is great for storing test data in multiple places to protect against data loss, as well as sharing data with the lab and supervisors while you are onsite. The gauge still stores all the test data, which can then be transferred by the app or thumb-drive with a .csv file. Take a look at the Humboldt Nuclear Gauges and Gauge App and see how easy using a nuclear gauge can be.





# MOBILE APP DETAILS

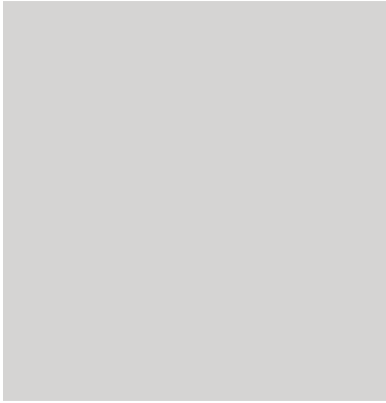
< Back Measurement 2 Continued

Depth 6 Test Date 4/5/2022

**Extended Information**

<b>DC</b>	<b>DS</b>
2191.5	3194.375
<b>MC</b>	<b>MS</b>
17.1875	338.8125
<b>VR</b>	<b>AV (%)</b>
0.2672495	20.2469

**Location Image** Capture



The extended information screen provides you with data relating to density, moisture, standard density and standard moisture counts. Also supplied is the void ratio measurement and avg. void percentage, as well as a place to add a photo of the actual test location.

< Back Example Measurement 2 More

Depth 6 Test Date 4/5/2022

**Results**

<b>DD (PCF)</b>	<b>M (%)</b>
133.009	0.3943425
<b>WD (PCF)</b>	<b>M</b>
133.5335	0.5245108
<b>PR (%)</b>	<b>MAXD (PCF)</b>
106.8345	124.5

**Location**

**Lane**

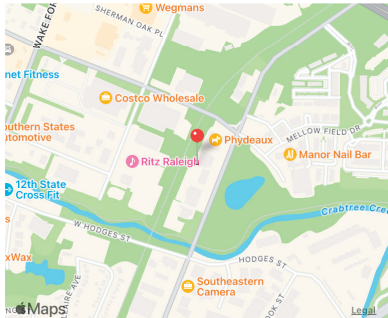
**Station**  **Offset**

NA 0

**GPS Information**

Lat Long Alt(m)

35.8160600 -78.6179200 31.60 Acquire



Typical information displayed on the phone app includes: time of test, dry density, moisture percent, wet density, moisture, percent of proctor, maximum density, as well as the location, the GPS information and a map illustrating the test location



After each test, a QR code is presented on the EZ-2 Screen. Scanning this code transfers the data to the phone app. The **NX** transfers wirelessly. Both allow you to share the data with others via email, text message or a cloud-sharing platform.

**Available to  
Download Now:**





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