

DEVICE USE AND CARE



Do Not immerse in, or expose to liquid or dust.



Avoid extremes of temperature. Max accuracy in 20-25 degree Celsius range.



Do Not drop, expose to shock, or place heavy objects on unit. Do Not apply pressure to display.



No User-serviceable components. Do Not open unit, as it voids warranty and calibration.

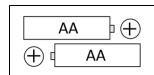


Only use a clean, dry cloth to clean unit.



Do Not exceed maximum device load of 1.0A. Higher current can cause device failure.

BEFORE USE



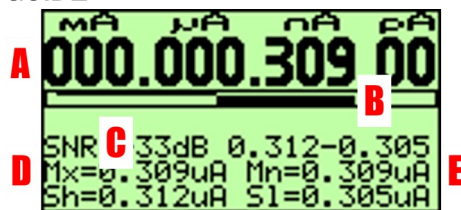
INSERT 2 x AA BATTERIES

1. Remove battery compartment cover (H) applying gentle pressure to finger pad.
2. Ensure clean contacts on batteries.
3. Insert new batteries, observing polarity instructions in battery compartment.
4. Replace battery compartment cover.

2 x AA alkaline batteries will give in excess of 150 hours of continuous operation. Treat all batteries in accordance with the manufacturer's instructions.

If desired, remove the protective film from the front of the NanoRanger unit. Peel carefully from below the **Positive** and Negative terminals. NanoRanger will still function normally, if the film is left in place.

SCREEN GUIDE



A - The current reading, displayed in mA, uA, nA, and pA. In this example, 0.309uA.

B - The small, lower Range Bar shows which ranges are in use. The upper, longer Range Coverage Bar shows movement across the ranges during the reading. The box surrounding both, shows which range constraint has been input, via the menu. In this example, none.

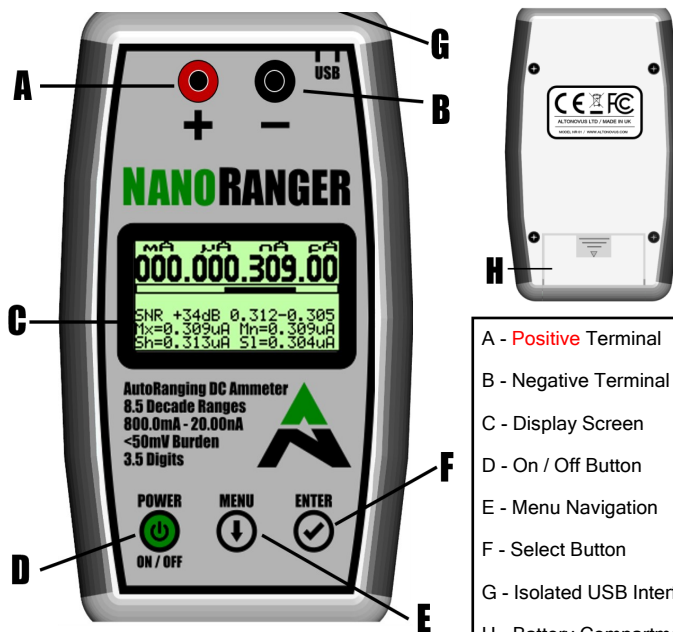
C - The Signal to Noise Ratio (SNR). The SNR indicates how much noise, variation, and AC components are in the signal, followed by Maximum and Minimum samples during the reading.

D - Maximum (Mx) and **E** - Minimum (Mn). The Mx and Mn Readings shown are those that have occurred since this measurement started. Below that, the highest (Sh) and lowest (Sl) Samples are shown, from which the Readings have been derived.

NANORANGER

MODEL: NR-01: AUTO-RANGING DC AMMETER-
QUICK START GUIDE (Rev 6.5 dated 14 Nov 20)

ALTONOVUS LTD. 37 OAST HOUSE CRESCENT,
FARNHAM, SURREY, GU9 0NP. UNITED KINGDOM



- A - Positive Terminal
- B - Negative Terminal
- C - Display Screen
- D - On / Off Button
- E - Menu Navigation
- F - Select Button
- G - Isolated USB Interface
- H - Battery Compartment

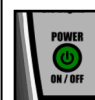
GETTING STARTED - TAKE A READING



WARNING. Use NanoRanger with cables less than 3 metres in length.

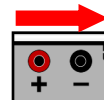


STEP 1: POWER ON



After inserting batteries as shown, press the **POWER** button to start NanoRanger.

STEP 2: CONNECT LEADS

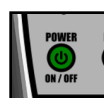


Connect **Positive** terminal (RED) to the higher voltage side of the current to be measured.



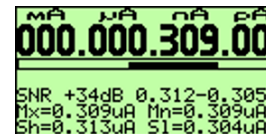
Connect Negative terminal (BLACK) to the lower voltage side of the current to be measured. Current *must* flow from **Positive** to Negative. Leads (not supplied) should be industry standard, uninsulated, 4mm banana plug. Leads of 0.3M will help minimise any noise.

STEP 4: POWER OFF



After measurements are taken, press the **POWER** button again to return NanoRanger to Standby mode.

STEP 3: TAKE MEASUREMENTS



Sampling at a high rate to eliminate mains noise, NanoRanger takes about 3 readings per second. It displays the current in mA, uA, nA, and pA. In this example, 0.309uA.



A Range Bar underneath the digits shows which ranges are in use. The Range Bar oscillates after each reading to show how quickly readings are occurring and to provide a visual confirmation that the device is functioning correctly.

NANORANGER - BASIC MENU FUNCTIONS



Press the **Menu** button to exit measuring and enter the **Menu** mode. This screen will appear. Use the **Navigate** and **Select** buttons to move through the **Menu**. The options are:

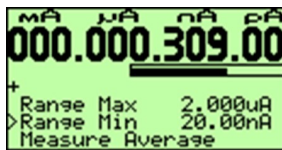
- Measure (as described on the previous page).
- Range Maximum.
- Range Minimum.
- Measure Average.
- Advanced.



RANGE MAXIMUM / MINIMUM - Use these options to set the *upper* and *lower* limits over which NanoRanger will Auto-Range during operation.

If not constrained by the User, NanoRanger will exploit its full measurement range.

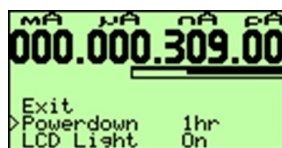
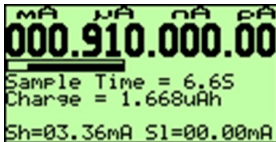
The screen may show "UNDER LOAD" if a minimum range has been set, or if nothing is connected to NanoRanger.



MEASURE AVERAGE - Use this function to calculate an average current over a time period, **within a single range**. Having prevented auto-ranging (Set Range Max and Min), press **Select** to begin, and the first screen below will be shown. Press **Select** again to end the measuring period. At the end of the period, the second screen shows:



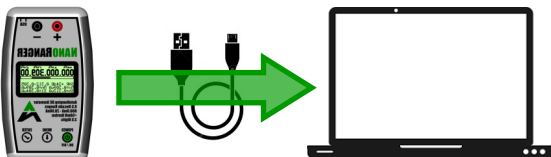
- The average current over the period (here 910.0uA).
- The sample time, shown in multiples of 200mS.
- The total charge for the period (here 1.668uAh).
- The highest (Sh) and lowest (Sl) samples taken in the period.



ADVANCED MENU FUNCTIONS -

In this element of the **Menu**, the User can configure the **Auto-Powerdown** timer and **LCD back-Light**.

USING THE FULLY ISOLATED USB INTERFACE



NanoRanger's micro-USB interface can be used to export readings and to control the device via a PC (SCPI-format). The USB interface **cannot** be used to power NanoRanger, as it is isolated from the main circuitry to prevent interference. For help connecting NanoRanger, see the guidance in our website's NanoRanger section. For SCPI instructions, please download the full **NR-01 Instruction Manual** at: www.altonovus.com

NANORANGER

MODEL: NR-01: AUTO-RANGING DC AMMETER-
QUICK START GUIDE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the User is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different that to which the receiver is connected.
- Consult the dealer, or an experienced radio/TV technician for help.



DECLARATION OF CONFORMITY

We: Altonovus Limited
Registered Address: The Little House, 88a West Street, Farnham, Surrey, GU9 7EP

Declare under our sole responsibility that the product

Product name: NanoRanger DC Ammeter
Product number: NR-01

Conforms with the following specifications

Radiated Emissions:

FCC/CFR 47: Part 15:2018 (ANSI C63.4: 2014, Class B)
Canadian Standard ICES 003:Issue 6 (CISPR 22:2008)
EN61326-1:2013 (CISPR 2011:15 inc A1:2016)

Basic Immunity Requirements: EN61326-1:2013 Table 1

Electrostatic Discharge: EN61000-4-2:2009
Radiated RF Immunity: EN61000-4-6:2009 inc A1:2008 & A2:2010
Voltage Dips and Interruptions: EN61000-4-11:2004 inc A1:2007

The product therefore conforms with the requirements of extant EU and FCC directives on Electromagnetic Compatibility (EMC) and RoHS.



Signed:

G. Dean, Managing Director (authorised signatory)

Signed:

S. Thickett, Technical Director (authorised signatory)

Farnham, United Kingdom, 9th November 2019

