NANORANGER

MODEL: NR-01: AUTO-RANGING DC AMMETER-
QUICK START GUIDE (Rev 6.6 dated 20 Feb 21)
For Software V2.01 and above

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

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.

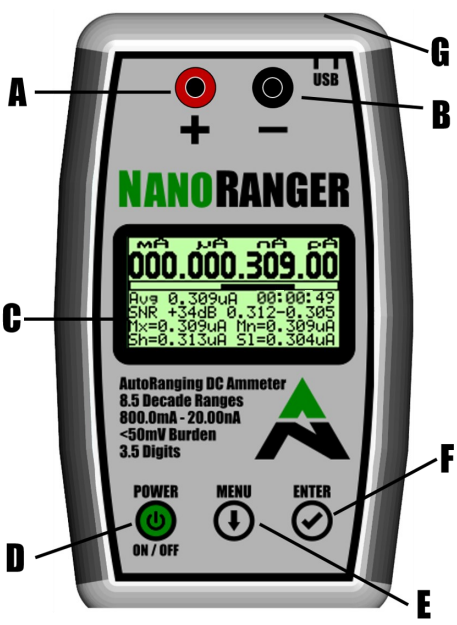
Do Not drop, expose to shock, or place heavy objects on unit.
Do Not apply pressure to display.

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.

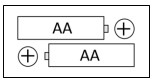




A - Positive Terminal
B - Negative Terminal
C - Display Screen
D - On / Off Button
E - Menu Navigation
F - Select Button
G - Isolated USB Interface
H - Battery Compartment

BEFORE USE





INSERT 2 x AA BATTERIES

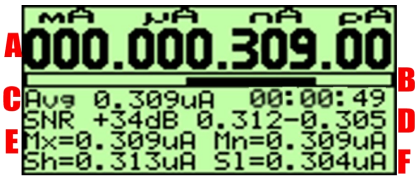
1. Remove battery compartment cover (**H**) applying gentle pressure to finger pad.
2. Ensure clean contacts on batteries.
3. Insert new batteries, observing polarity instructions in battery compartment.
4. Replace battery compartment cover.

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 - A small, lower Range Bar shows which ranges are in use. An upper, longer Range Coverage Bar will show range movement. The surrounding box shows any User-input range constraint. In this example, no constraints have been set.

C - A running Average of current readings over the whole measurement period, along with the measurement duration.

D - 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.

E - Maximum (Mx) and Minimum (Mn). The Mx and Mn Readings shown are those that have occurred since this measurement started.

F - The highest (Sh) and lowest (Sl) Samples are shown, from which the Readings have been derived.

GETTING STARTED - TAKE A READING



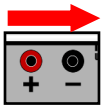
WARNING. Use NanoRanger with cables less than 3 metres in length.

STEP 1: POWER ON



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

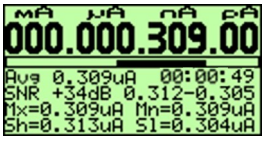
STEP 2: CONNECT LEADS



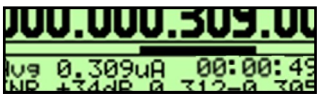
Connect Positive terminal (RED) to the higher voltage side of the current to be measured.

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 3: TAKE MEASUREMENTS



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



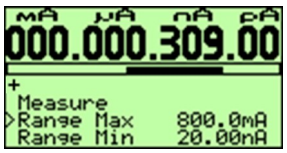
A Range Bar underneath the digits shows which ranges are in use. The Range Bar oscillates after each reading to show how quickly readings are occurring and to provide a visual confirmation that the device is functioning correctly.

STEP 4: POWER OFF



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

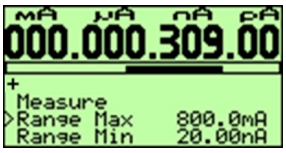
NANORANGER - BASIC MENU FUNCTIONS



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
- Powerdown
- LCD Light
- Details

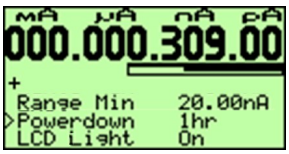
(Select **Measure** to exit the **Menu**)



RANGE MAX / MIN

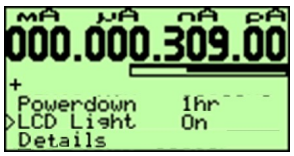
Use these options to set the *upper* and *lower* limits over which NanoRanger will Auto-Range during operation.

If not constrained by the User, NanoRanger will exploit it's full measurement range.



POWERDOWN

Use this option to select the time interval before NanoRanger automatically powers off.



LCD LIGHT

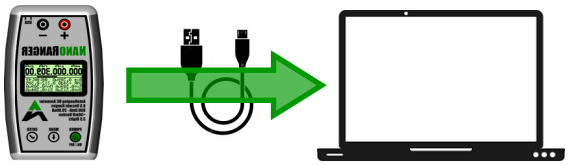
Use this to toggle NanoRanger's back-light on and off.

DETAILS

Under this Menu option, find information about your NanoRanger:

- Software version
- Serial number
- Calibration date
- Calibration status

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

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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.

ALTONOVUS

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 11:2015 inc A1:2016)

Basic Immunity Requirements: EN61326-1:2013 Table 1

Electrostatic Discharge: EN61000-4-2:2009
Radiated RF Immunity: EN61000-4-3:2006 inc A1:2008 & A2:2010
Voltage Dips and Interruptions: EN61000-4-11:2004 inc A1:2017

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

ALTONOVUS LTD / MADE IN THE UK

MODEL NR-01 / WWW.ALTONOVUS.COM