CORNET® ED-88TPlus Electrosmog meter user’s manual v.2 02/27/2018

CORNET Microsystem Inc., ED-88TPlus Electrosmog meter is a Tri-mode device for quick measurement of both High frequency (RF) Electromagnetic wave field strength/power density level, Low frequency (LF) Magnetic field level, and Low frequency (ELF) Electric field (V/m) for living environments. It is an excellent detector for individual or company with Electromagnetic wave safety concerns. It has RF bandwidth of 100MHz to 8GHz with high sensitivity (0.5uw/m² to 1.8uw/m²), LF bandwidth of 50Hz to 10kHz (or 50Hz to 1KHz) with sensitivity of 0.1uT to 60uT (1mGauss-600mGauss) or 0.01uT to 1uT (1mGauss to 10mGauss), and E-field bandwidth of 50Hz-50KHz with sensitivity of 10v/m to 1000v/m. The RF Frequency display function (100MHz-2.7GHz) can detect very short burst of digital RF down to 10usec. Data Logging function is also included.

Applications:
- High frequency RF Electro magnetic wave field strength, power density and frequency measurement
- Low frequency LF Magnetic field measurement (Gauss meter function)
- Low frequency ELF Electric field measurement (E-field meter function)
- Mobile phone base station antenna radiation power density measurement
- Wireless communications, Analog & Digital RF (AM/FM, TDMA, GSM, DECT, CDMA,3G,4G)
- RF power measurement for transmitters
- Wireless LAN (Wi-Fi), Bluetooth, Ultra-wide-band detection, installation, optimization
- Spy camera, wireless bug finder, IOT devices
- Cellular/Cordless phone radiation safety level, Electrical Utilities SMARTER METER radiation level
- AC power line, High voltage tower, power Transformer, motors and small appliance EMF
- Microwave oven leakage detection
- Personal living environment EMF safety evaluation

Usage guide:

1. Put the 9V battery in the ED88Plus. Handle the unit with right hand in vertical direction, and turn on the volume/power switch to turn on the power, it will come up with RF meter mode.
2. The RF sensor is located in the left hand side of the ED88Plus; the LF sensor is located in the right hand top side of the ED88Plus, the E-field sensor is located in the middle top side of the ED88Plus. Please do not cover the sensor area with hand or other objects.
3. There are 4 push button on the ED88Plus: “Mode”, “Hold”, “Light”, and “Unit” button. “Mode” button is used to switch in between RF mode, LF mode, E-field mode, and RF mode. The “Hold” button is used to freeze the data reading of the ED88Plus.
4. RF mode: measured RF field strength/power density is shown on the digital LCD display (with uw/m, V/m, or mw/m²). 8 LED lights with Red, Yellow, and Green color on the right hand side of LCD window are used for quick RF signal level indications. 3 Red LEDs are used to indicate the 3 safety ranges. The power level of each LED can be found in the table on the ED88Plus back panel. Frequency of signal detected is displayed on the LCD display.
5. LF mode: measured LF magnetic field strength is shown on the digital LCD display (with uT and Gauss). Two LF modes can be selected by “Mode” button: (a) LF30mode (0.1mGauss-10mGauss) and (b) LF600 mode (1mGauss-600mGauss). 8 color LED lights are also available to show the relative strength of the magnetic field.
6. E-field mode: measured ELF electric field strength is shown on the digital LCD display with V/m. The previous 30 signal level readings are recorded and shown as moving graph on the LCD display for RF, LF, and E-field modes. It can be used for finding direction of signal source, and recording bursts from digital RF signals as signals from AC smart meter.
7. Hold SUNDT: HOLD button can be used to halt the data measurement of the ED88Plus, a “HOLD” Mark will be shown on the LCD screen to indicate the “Hold” condition. Push the “Hold” button again the ED88Plus will exit from the “Hold” condition. “Unit” button can select the mw/m²,V/m,or dBm unit.
8. MAX: Maximum measured data since the last power-on is shown on the LCD display.
9. Average: average or peak average value is displayed on the LCD with “A” or “P” mark. It can be used to estimate the duty cycle of the digital RF burst signals or the average of peak signal level.
10. Sound function & LCD backlight: Toggling the “LIGHT” button can turn on/off the LCD backlight and the Audio Sound function. (a “B” mark on the LCD indicates the sound mode is on). Volume control can be used to adjust the volume level. Audio Sound can be used to detect very low level RF signals (down to 0.5uw/m²) especially for the modern digital RF burst signals, in order to reduce the battery current consumption please remember to turn-off the LCD backlight or the sound when it is not needed.

Data Logging menu: Push and hold the “Unit” button then click the “MODE” button to go into LoggerSetup menu. Please see the “ED88TPlus Data Logging user guide” from www.cornetmicro.com for details of the Data Logging functions.

(13) SysSetup menu: Push and hold the “UNIT” button then push the “HOLD” button to get into the SysSetup menu. Use the “>” button to move the cursor in the Menu and use the “<” button to enable/disable the functions in the SysSetup menu:
(a) EXIT: exit the SysSetup menu, return to normal mode.
(b) RF Field level setup: select default mw/m², V/m, or dBm mode when meter is powered on.
(c) LED level: used to adjust the color LED segment display level for custom safety standards OFF, -5, -10, or -20dB. (use -20dB for “SIRIM2008 Building Lighting Testing Methods”).
(d) Average/Frequency: select Peak, Average, or Frequency of MAX value display.
(e) MAX_Clear: if the MAX Clear is “ON” the MAX value can be cleared by toggling the “HOLD” button. If it is “OFF” the MAX value can be cleared only by power-off the meter.
(f) Alarm: ON/OFF or one of the 8 trigger levels (-5, -10, -15, -20, -25, -30, -35,-40dB) can be selected to trigger the audio Alarm. (Alarm function is used in RF mode only).
(g) SAVE: push the “<” button to save the changes of setup to EEPROM memory.

When measuring the high frequency digital/pulse type of signals.(such as switching power supply) the LF600 mode might have lower reading than the LF600 mode, this is due to the lower frequency coverage range of the LF30 mode.

(14) The LF30 mode: has high sensitivity (0.1mGauss-10mGauss), but with lower frequency range (50Hz – 1KHz) to reduce the high frequency noise. (The Histogram and LED segment display can go up to 30mG).

The LF600 mode: with sensitivity (1mGauss-600mGauss), has higher frequency coverage (50Hz - 10KHz).

Table I gives a sampling of the international and national field-strength limit values for the general public and continuous exposure (for Reference only!)

<table>
<thead>
<tr>
<th>Country</th>
<th>Standard</th>
<th>950MHz</th>
<th>1850MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Council Recommendation 1999/519/EC</td>
<td>42 V/m (4.75W/m²)</td>
<td>59 V/m (9.25W/m²)</td>
</tr>
<tr>
<td>International</td>
<td>ICNIRP Guidelines, April 1998</td>
<td>42 V/m (4.75W/m²)</td>
<td>59 V/m (9.25W/m²)</td>
</tr>
<tr>
<td>Austria</td>
<td>ÖNORM S1120</td>
<td>42 V/m (6.33W/m²)</td>
<td>51 V/m (10W/m²)</td>
</tr>
<tr>
<td>Belgium</td>
<td>Belgisch Staatsblad F.2001-1365</td>
<td>21 V/m (1.18W/m²)</td>
<td>30 V/m (2.31W/m²)</td>
</tr>
<tr>
<td>Germany</td>
<td>26. Deutsche Verordnung</td>
<td>42 V/m (7.5W/m²)</td>
<td>59 V/m (9.25W/m²)</td>
</tr>
<tr>
<td>Italy</td>
<td>Decreto n. 381, 1998</td>
<td>8 V/m (0.1W/m²)</td>
<td>10 V/m (0.1W/m²)</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>Health Council</td>
<td>51 V/m (6.92W/m²)</td>
<td>93 V/m (18W/m²)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Verordnung 1999</td>
<td>4 V/m (0.4W/m²)</td>
<td>6 V/m (0.1W/m²)</td>
</tr>
<tr>
<td>United States</td>
<td>IEEE C95.1</td>
<td>49 V/m (6.33W/m²)</td>
<td>68 V/m (12W/m²)</td>
</tr>
<tr>
<td>China</td>
<td>Draft National Quality Technology Monitoring Bureau</td>
<td>49 V/m (6.33W/m²)</td>
<td>51 V/m (10W/m²)</td>
</tr>
<tr>
<td>Japan</td>
<td>Radio-Radiation Protection Guidelines, 1990</td>
<td>49 V/m (6.33W/m²)</td>
<td>61 V/m (10W/m²)</td>
</tr>
</tbody>
</table>

Specifications:

- Sensor type: Electric field sensor and Magnetic field sensor
- Frequency range & Sensitivity:
  - RF: 100MHz to 8GHz (-60dBm to +5dBm), (0.5uw/m² to 1.8uw/m²), (14m/μm to 26.2μm)
  - LF1: 50Hz to 10kHz (0.1uT to 60uT) (1mG to 600mG)
  - LF2: 50Hz to 1kHz (0.01uT to 1uT) (0.1mG to 10mG)
  - E-field/ELF: 50Hz to 50kHz (10v/m to 1000v/m)
- RF Peak power measurement: 0.5uw/m² to 1.8uw/m²
- Display type: digital LCD graphic display
- Unit of measurement: dBm, mw/m², v/m, uT, mG, MHz
- LCD backlight: 15 seconds auto-off and manual on/off control
- Display of data: LCD 4 and 5 digit, 8 LED color segment, Moving Histogram (level/time) of previous 30 recorded data, Analog segment bar
- Error rate and Functions:
  - RF: +/- 3.5dBm, LF: 20%, E-field: 25%
  - Hold, Max, Average, Sound signature, Alarm, Frequency
- Sound & Alarm:
  - Sound off/volume control, programmable Alarm triggering level
- Safety standard indication: 3 safety range indication by 3 Red LED, adjustable LED level
- Data Logging: 1000 data storage point memory for logging/recording measured RF signal level
- Battery used: 9V alkaline battery or external power supply through USB port (5V)
- Battery life: >20 hours

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