CORNET Microsystem ED88TPlus2 Data Logging/recording function description and user guide: 07/02/2021 (ReV.1.1)

 Features:

1) Sending recorded data to PC computer by using USB to serial interface
2) 1024 data storage Buffer memory and 1024 non-volatile Flash memory for logging/recording measured RF signal level.
3) Programmable time interval (0.5sec, 1sec, 10 sec, 30 sec, 1min, 2min, and 3min.) for data recording. Up to 50 hours of recording time when using 3min. time interval.
4) The Maximum signal level/Frequency of RF signal within each time interval can be recorded in realtime.
5) Recorded data is in Excel csv format, can be saved to PC computer and used with Excel spread sheet for data analysis, chart, and documentation purpose.
6) Data Logging View mode for reviewing the Logged data on meter's LCD display without the need to connect to PC computer.
7) Can be powered by external USB Mobile Battery Pack for long data logging session.

Setup and enable the Data Logging/recording function in ED88TPlus and PC computer

1) Download and install WCH (CH340) USB to serial chip software driver for Windows from WCH.cn website (wch.cn/downloads/CH341SER_ZIP.html). The CH340 chip driver supports all Windows versions, Linux, apple Mac-OS and Android devices.

2) Download and install the **free Teraterm serial terminal software** from http://ttssh2.osdn.jp/ in your PC computer, you can use the Teraterm serial interface mode as a host program to connect your PC computer to ED88TPlus2.
3) After the CH340 chip driver and **Teraterm** terminal program are successfully installed in your PC computer, connect the ED88TPlus2 to the PC computer by using microUSB to USB Data cable.   The ED88TPlus2 will be powered by the PC through USB cable (turn off the power switch on the ED88TPlus2 to save the battery inside ED88TPlus2. the power switch is used to control the 9V battery inside ED88TPlus2 only). Run the Teraterm program, select the correct serial port devices detected by Teraterm to

connect it to ED88Tplus2's internal USB to serial UART bridge chip.   (Use Teraterm's setup/serial port command to setup the Teraterm serial port data rate to 9600, 8bit, no parity, 1 stop).   If you do not find the CH340 USB to UART Bridge device in the Teraterm, you can use the Window's device manager in control panel/system and security/ to check the COM port# assigned by Windows. After then meter is powered on, the ED88TPlus2 is setup to send the measured data to USB serial port automatically. The data is also recorded automatically in the internal data Buffer of ED88TPlus2 all the time. You should be able to see the serial data sent by ED88TPlus2 in the PC Teraterm data window after selecting the serial mode with proper serial data rate in Teraterm.

4) Use the Log function in the Teraterm to Log and save the received data from ED88TPlus2 to the Log file in PC by using the File/Log command in the Teraterm.   Teraterm will save/Log the received data in the file name specified by you. You can rename the saved Logged/saved file (teraterm.log by default) to xxx.csv and open it with Excel spread sheet program for analysis/chart and documentation purpose.
5) You can halt the ED88TPlus2 Data Logging/recording by HOLD button. Release the HOLD mode will continue the automatically data recording.
6) The measured RF mode data is recorded in the internal data Buffer automatically all the time (when the meter is not is in HOLD mode). 1024 data storage in the data Buffer memory is available to store the data. When the data Buffer is full it will wrap around and overwrite the old data.   1024 previous measured data is stored in the data Buffer memory at any time.
7) The Gauss mode and Low Frequent Electric Field mode data is not recorded in the data Buffer memory, it only works in Realtime mode.
8) The time interval is set to 0.5sec by default (you can change it).

Data Logging/Recording modes in ED88TPlus:

1) There are 3 data output modes in ED88TPlus2 Data Logging/recording function. (a) Real time mode (b) Buffer output mode (c) Flashmem output mode.
2) Six programmable recording time interval for Logging/recording is available. (0.5sec. 1 sec. 10 sec. 30 sec. 1 min. 2min. and 3 min. Measured data is recorded into the internal data Buffer memory by time interval, the Maximum signal level and Frequency of RF signal within each time interval is recorded and saved to the internal data Buffer memory. 1024 data storage location in the data Buffer is available. (if the time interval is 0.5 sec. you can record up to 500 second of data.) It is possible to store 50 Hours of data if the time

interval is set to 3 minutes. (3000 min. of data, each data storage location store the max.value within each 3 min. interval). You can turn off the automatic data logging/recording by setting the time interval to "OFF"

3) In **Real time mode**, the meter output the real time measured data to serial port each time interval. Signal level/Frequency of the RF mode signal and signal level of Gauss mode, Low Frequency Electric field mode signal is output to serial port in Real-time mode.

4) In **Buffer output mode**, the 1024 recorded data in data Buffer is sent to serial port. The output data is sent beginning from the latest data first then the previous 1023 data in backward sequence.
   The data Buffer is high speed SRAM memory, the data in data Buffer will be lost when the meter is power off. You can save the data in Data Buffer memory to non-volatile Flash memory before power off the meter if you want to keep the recorded data in the data Buffer.

5) In **Flashmem output mode**, the1024 saved data in the internal Flash memory will be sent out to serial port. The output data is sent from latest data first then the previous 1024 data in backward sequence. The recorded data in Flashmem will not lost after meter is power off.

6) The Typical application sequence for Data Logging/recording in the field is: power-on meter-->measure the signal around area-->get into Data Logging view mode-->review logged data in LCD display window→get into Logger setup mode-->save the data in Buffer to Flashmem--> power off the meter--> Go back to office--> connect the MicroUSB cable from ED88TPlus to PC computer--> run Teraterm program in PC--> enable the file Log function in Teraterm--> get into meter's Logger setup mode--> select the Flashmem output mode--> start sending data to PC--> change the Logged file name from xxx.log in PC to xxx.csv --> open the renamed logged file in Excel spread sheet program using .csv format--> analyze and chart the data in Excel spread sheet.

ED88TPlus2 Data Logger/Recording setup command:

1) Push and hold the "->" key and click the "MODE" key then release the -> key to get into the ED88TPlus2 Logger setup mode, use the "->" key to move the cursor, use the "<-" key to activate the selection.

2) **Logger Setup menu**:
   (EXIT) Logger Setup --- exit the setup mode
   1) **Data2Send** -- select data from Realtime, or data Buffer or Flashmem to serial port
   2) **Send data** -- start sending the 1024 logged data from selected source to serial port, It might take a while, please wait until it is finished
   3) **Logg time** -- change the time interval of recording, (0.5 sec, 1 sec, 10 sec, 30 sec, 1 min, 2min. 3min. and OFF)
   4) **Clear Logger** – clear data Buffer to all zero, a "wait" signa will show up on screen, if it takes too long to get the clearing "done", just power off the meter, the Buffer memory will be cleared when power on, then use (7)Save to Flashmem to clear the data in Flashmem.
   5) **Save config** -- save the new Logger setup/configuration
   6) **RESET config** – RESET the Logger setup/configuration to default
   7) **Save to Flashmem** --- save the recorded data in data Buffer to Flash memory, so data will not get lost after meter power off
   8) **Read from Flash mem** – read the stored data in Flash memory to Buffer memory for displaying on LCD display window. If the Flash memory is never written before please use the (7) Save to Flashmem first to initialize the Flashmem before using the Read from Flash mem.
   *When the cursor reach the bottom of the Logger setup menu, the menu will scrow up to show the item (8) Read from Flash mem

Data Logging View mode:

The Logged data stored in the ED88TPlus2 internal Buffer memory and Flash memory can be displayed on the meter's LCD display without using the USB serial cable to connect to the PC computer, up to 50 hours of data can be stored in the ED88TPlus2 based the Logg time setup in the meter, For long Data Loggin sessions in the field with long period of recording time (such as overnight logging session) a high capacity rechargeable 9V Li-on battery with 650mAh capacity or a mobile battery bank is recommended. Please go to www.cornetmicro.com then datasheet/application tab. to download the latest "CORNET ED88TPlus2 user manual" file for detail description of the Data Logging view mode operations.

Note1: You can have both 1024 new data stored in data Buffer momory and 1024 old data already stored in Flashmem at the same time, (each might have its own recording time interval). You do not have to save the new data in the data Buffer to

Flashmem (overwrite the old data already in Flashmem) if you can connect the ED88TPlus2 to PC computer's USB port without losing the power of meter, (use the internal 9v battery) and then send both the data in Buffer and in Flashmem to PC computer for analysis. This way you can effectively have 2048 data storage for Logging/recording.

Note2: Check your MicroUSB cable to make sure it is the "sync cable" or "data cable" for PC communication (not "battery charging only" cable), some of the MicroUSB cable included in USB Mobile Battery Pack is only for battery charging only, not for communication to PC computer. Google search "USB sync cable" for the right cable to use.

Note3: Check your USB Mobile Battery Pack to see if it will power down by itself when the output current is lower than some number. Avoid the older type of USB Mobile Battery Pack which is designed for charging the mobile phone internal battery and it will auto power down itself when the charging is done or output current is lower than some threshold. Use a USB Mobile Battery Pack (ex. PNY AD5200) which will "not" auto power down for ED88TPlus2 for long data logging session. (the typical current consumption of ED88TPlus is 55mA in RF mode)

Note4:   In Logger Setup menu, after changing the new Logg time.   you need to select "EXIT" from the Logger Setup menu to activate the new configuration changes then back to the Logg Setup menu again (Push and hold the "->" key and click the "MODE" key then release the -> key)   then use the "Save config" to save the configuration data to memory.

Note5:   In Realtime mode, when the meter is sending the serial data to USB-to-serial chip in the end of each time interval, the audio speaker of the meter will generate "chipping" noise. Setting the Data2Send in Logger Setup to "Buffer" can disable the "chipping" noise.   (the meter default is in Realtime mode).

Note6: The Guass mode and Low Frequency Electric Field mode data can be logged in Realtime mode only, you need to connect the meter to PC computer serial port through microUSB cable to save the data to PC computer in realtime mode. The meter will not logg the data into the Buffer momory or Flash memory.

Working with Android smart phone by using USB OTG serial cable :
-Download and install Android app " USB Serial Console" from google play website,
-Connect USB OTG serial cable or USB OTG adaptor to Android smart phone and ED85EXPlus USB connector.   Set Android phone to "flymode".

-Run " USB Serial Console", setup serial port data rate to (9600, 8bit, no parity, 1 stop)
-Save the logged data to file by using "SAVE" in " USB Serial Console"

Working with Apple Mac-OS computer :
-For meter with CH340 serial to USB chip: Download and install USB to serial chip (CH340)software driver for Mac-OS and install it in your Mac-OS computer. (make sure you got the correct version of driver if you are using older version of Mac-OS). the meter serial port name is /dev/tty.wchusbserialxxxx You can use the "screen" or "minicom" command to talk to it.

1) Connect the ED88TPlus2 to Mac computer USB port using MicroUSB to USB communication cable or "Sync Cable" (not battery charging only cable),
2) In Mac "Terminal" window, type "screen /dev/tty.wchusbserialxxxx 9600" (for CH340 chip version)   you will see the data sent from ED88TPlus2 to Mac computer
3) you can also use the free "CoolTerm" serial terminal program for Mac-OS to save the logged data from ED88TPlus2, just scan and select the serial device as /dev/tty.usbmodem0001 or /dev/tty.wchusbserialxxxx" and the baud rate 9600 in the CoolTerm setup. then "connect" command in the CoolTerm to talk to serial device (the ED88TPlus2)   just google search "CoolTerm for Mac" to get the CoolTerm program.

Working with Serialplot for plotting data from serial port
Go to https://github.com/hyOzd/serialplot   to download the **Serialplot** program,
The **Serialplot** is Small and simple software for plotting data from serial port in realtime.
1) Download and install the Serialplot program in PC computer
2) Connect the meter to PC USB port through microUSB cable
3) Select the **Port** (COM# USB-SERIAL CH340) and Set the Baud Rate to 9600 in Serialplot Port setup menu, then **Open** the connection from PC to the meter
4) Set **Data Format** to ASCII, Number of Channels to 2, Column Delimiter to "comma"
5) Set **Plot** in Channel1, tick Visible, tick Gain 1   to plot data in plot window.
6) Set **Text View** tick Enable   to see the text data sent by the ED88TPlus2
7) Use cursor in Serialplot to view data, zoom, scale and take **snapshot** of the plotted data, also **Record** the data into PC file.