SOFTWARE MANUAL

CONTENT

1. Software startup

Double-click desktop icon 

to access PC software main interface, as shown in Figure 1-1. 1 is software version number, 2 is the menu bar, 3 is quick bar to scan each measurement parameters, 4 is the data area, 5 is the data reading and parameter settings switching area.

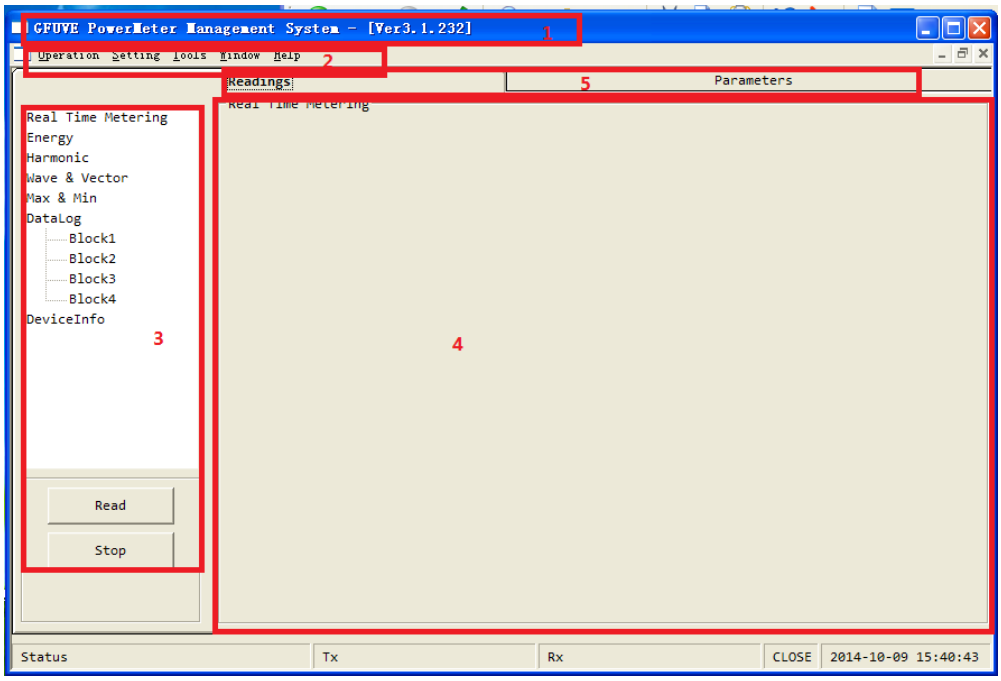


Figure 1-1

2. Software connection

Click setting, pop-up connection manager, as shown in Figure 2-1. Click connection manager, pop-up the window in Figure 2-2, then you can set the connection parameters in this window. FU2200A has two connections, the first is RS485 connection, second is the Ethernet connection.

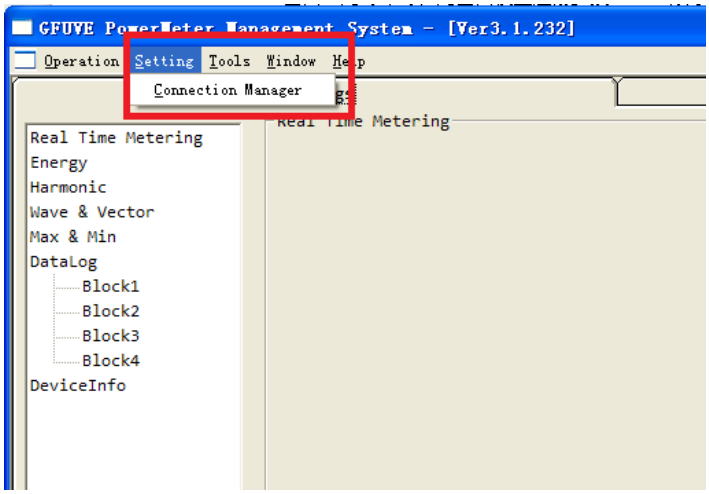
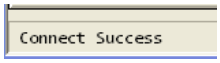


Figure 2-1

Figure 2-2

A. RS485 connection

View FU2200A table address, password, baud rate and 485 serial port number manually. Select a window shown in Figure 2-2, click close (the default address table for experiments is 1, the password is 000000, serial port number is COM1, baud rate is 38400). Click operation in the menu bar, then click connect display 

on the lower left window indicates that the connection is successful, FU2200A can communicate the 485 with the computer properly at this time.

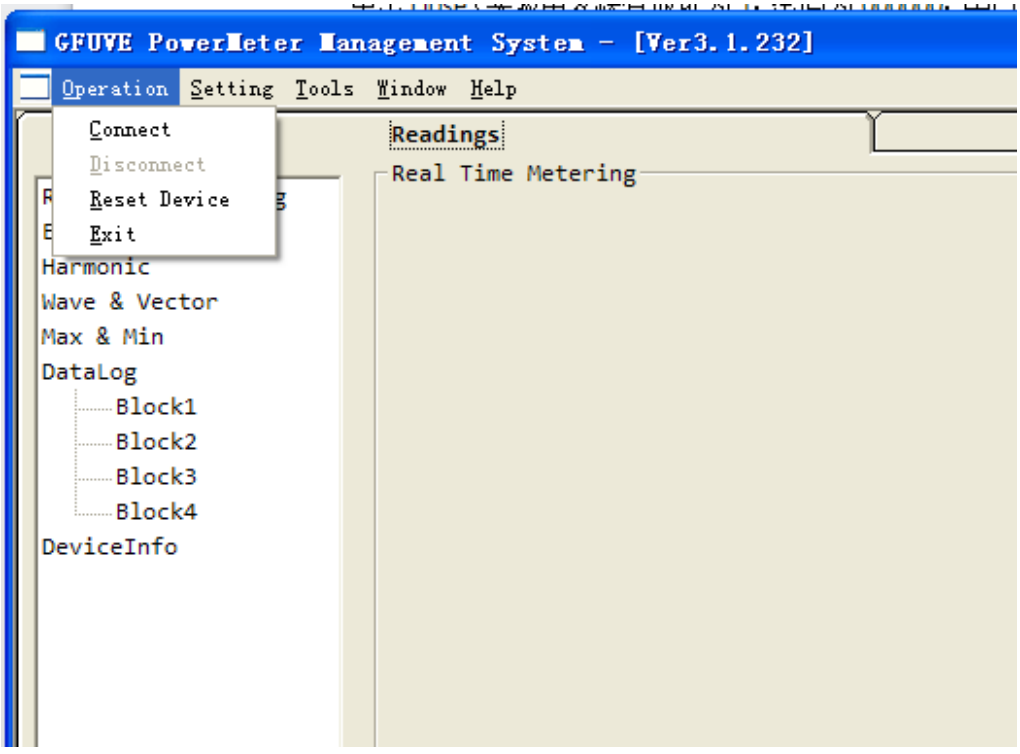
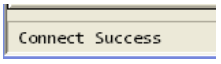


Figure 2-3

B. Ethernet connection

View FU2200A Port and IP address manually by 485 (View mode: normal connection of 485 communication, click **parameters** in figure1-1, frame 5, the net parameter will appear in quick bar to scan each measurement parameters, click **net parameter**, then click **upload** to view FU2200A **IP address**. FU2200A factory default **IP address** is 192.168.1.16, **port** is 9999, and **mask address** is 255.255.255.0). Select frame 2 shown in Figure 2-2; click **close** (experimental table **IPAddress** is 192.168.1.16, **port** is 9999). Click **operation** in the menu bar, then click connect display 

on the lower left window indicates that the connection is successful, FU2200A can communicate the 485 with the computer properly at this time.

Note: IP address does not suggest changing unless have multiple power meters to organize in LAN.

3. Parameters setting

Click **parameters** as shown in Figure 3-1, frame 1.

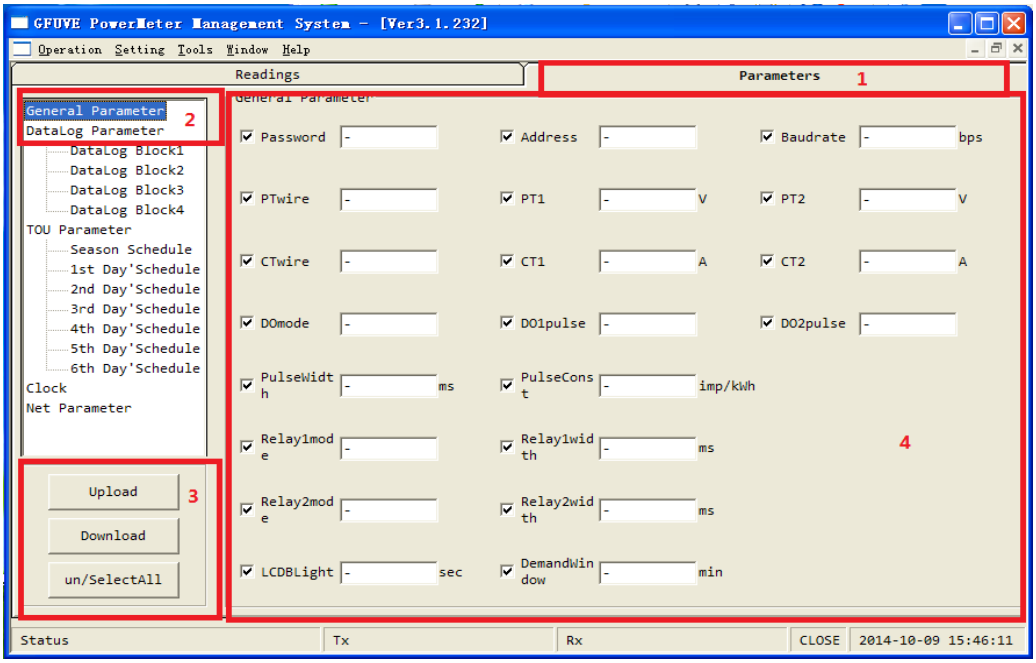


Figure 3-1

A. General parameter setting

As shown in figure 3-1, click **General Parameter** in quick bar to scan each measurement parameters, click **upload** in frame 3, it will appear as shown in Figure 3-2, Figure 3-2 shows the parameters corresponding with FU2200A, every parameter can be changed, every parameter has the automatic check box, check indicates this parameter is selected, on the contrary it is not selected. **Un / Select All** in frame 3 indicates selected all or not selected, **Download** indicates that users transmit the modified parameters into power meter FU2200A.

Note:

Download and Upload button, the parameters transmission direction are below as reference:

Download: Software-->Power meter; **Upload**: Power meter-->Software

LCDBLight cannot set as 0. As it means LCD backlight will be black all the time.

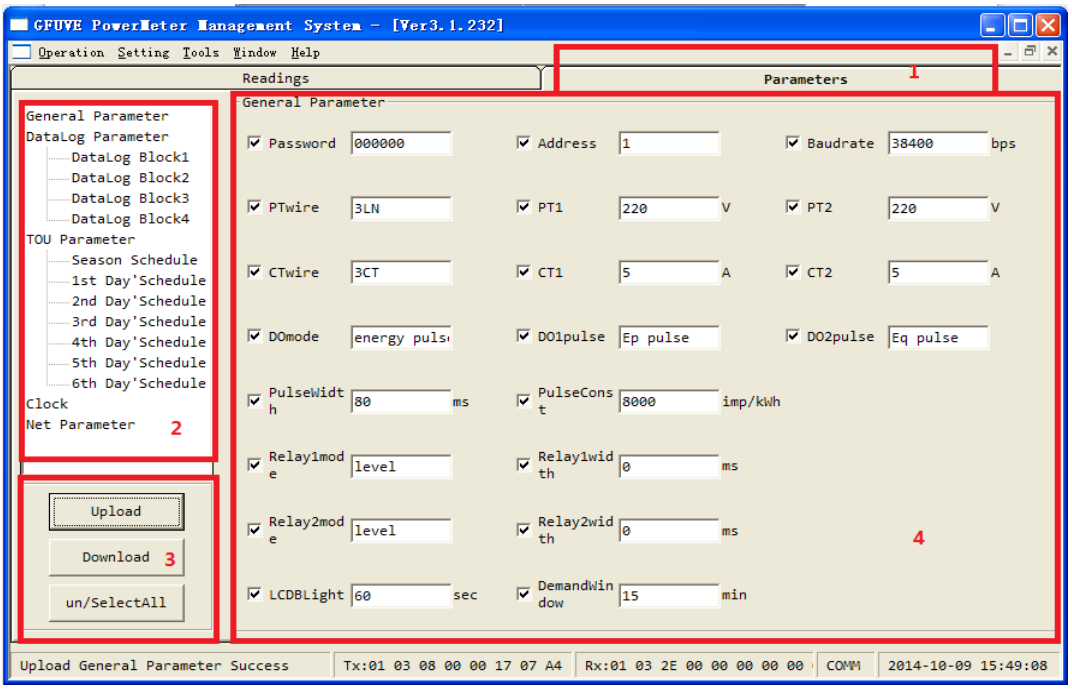


Figure 3-2

In frame 4, the main parameters have password, table address, baudrate, rated voltage wiring mode PTwire, primary side voltage PT1, secondary side voltage PT2, rated current wiring mode CTwire, primary side current CT1, secondary side current CT2, DO total output mode DOmode, DO1 pulse output mode DO1pules, DO2 pulse output mode DO2pules, Pulsewidth, pulseconst, relay mode (temporarily involved), LCD backlight time LCDBlight, demand window time Demandwindow etc. in figure 3-2.

B. Datalog parameter setting

Click the first item in submenu **Datalog block1** of **Datalog parameter** in quick bar to scan each measurement parameters, it will appear as shown in Figure 3-3, no checking in frame 3 by default. Users only need to edit some parameters in frame 3 (Record Mask, Record Size, Address Start, Address End, Actual Size without editing, you can use default values. But you can edit the remaining parameters 3 according to your needs). It is worth noting that the Record Size should not exceed 256Bytes, that is, when you have checked the every parameter, you should notice if Record Size exceed 256Bytes.

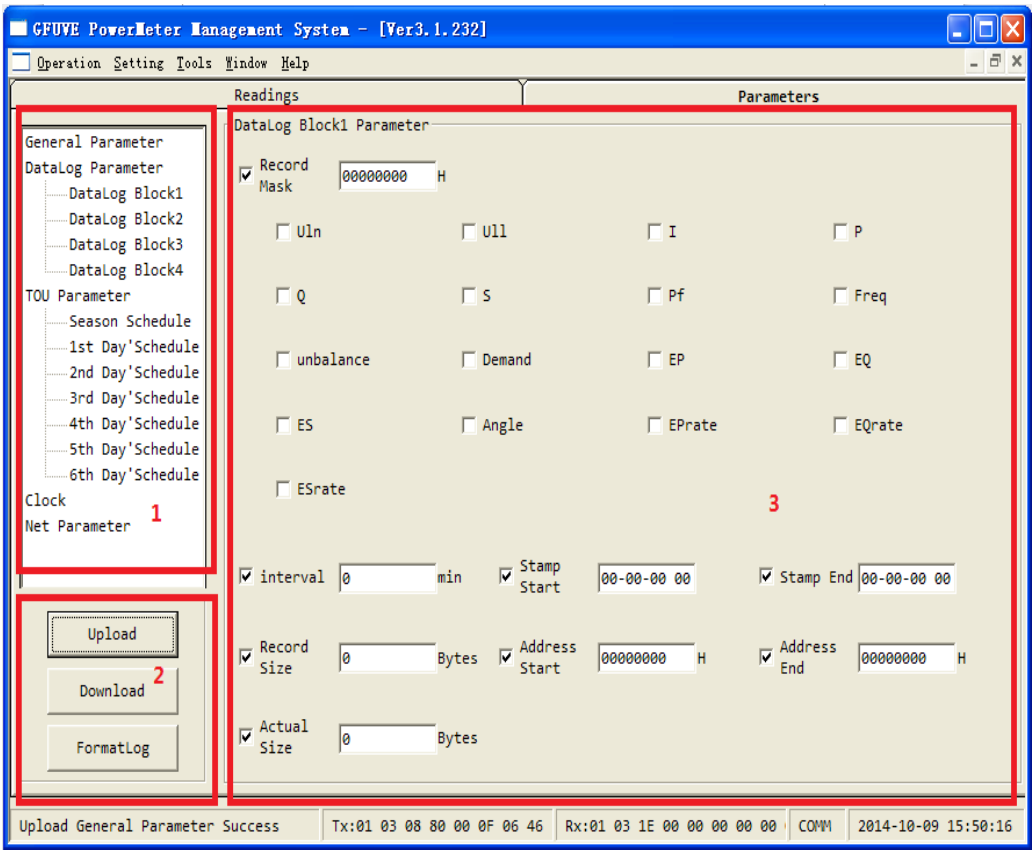


Figure 3-3

For example: Checked the experimental setting parameters in frame 1 phase voltage Uln, line voltage Ull, current I, and power P. Setting stamp interval for 1 minute in frame 3, the stamp start is at 14:54:00 on August 27, the stamp stop time is at 00:00 on August 28, 2014. Note parameters does not exceed 256Bytes in frame 4. Then click Download in frame 2, display `Download Stamp End Success` on the lower left, it indicates that the parameter download is successful, then must click Formatlog in frame 2, display `maybe take a long time, please wait...` on the lower left, it may take ten seconds, and then display `FormatLog Success` on the lower left, it indicates the formatlog succeed. Then all the data that existing in the datalog are cleared. Remember that the user must click formatlog after setting a datalog block finished downloading. To know whether the measuring parameters to download in FU2200A, you can click Upload in frame 2 to see if the setting parameters window is consistent with our settings. Read data will be described in the next chapter. The rest datalog block, users can set according to your own needs, the setting mode as above.

Note: When set the datalog with the network communications, it will display the formatlog failing on the lower left, it does not affect setting parameters. In fact, it has been set up successfully, just formatlog need take some time, probably about 15 seconds, according to the flashing lights on the upper left of FU2200A.(Note: Stamp Start and Stamp End: yy-mm-dd hh:mm:ss)

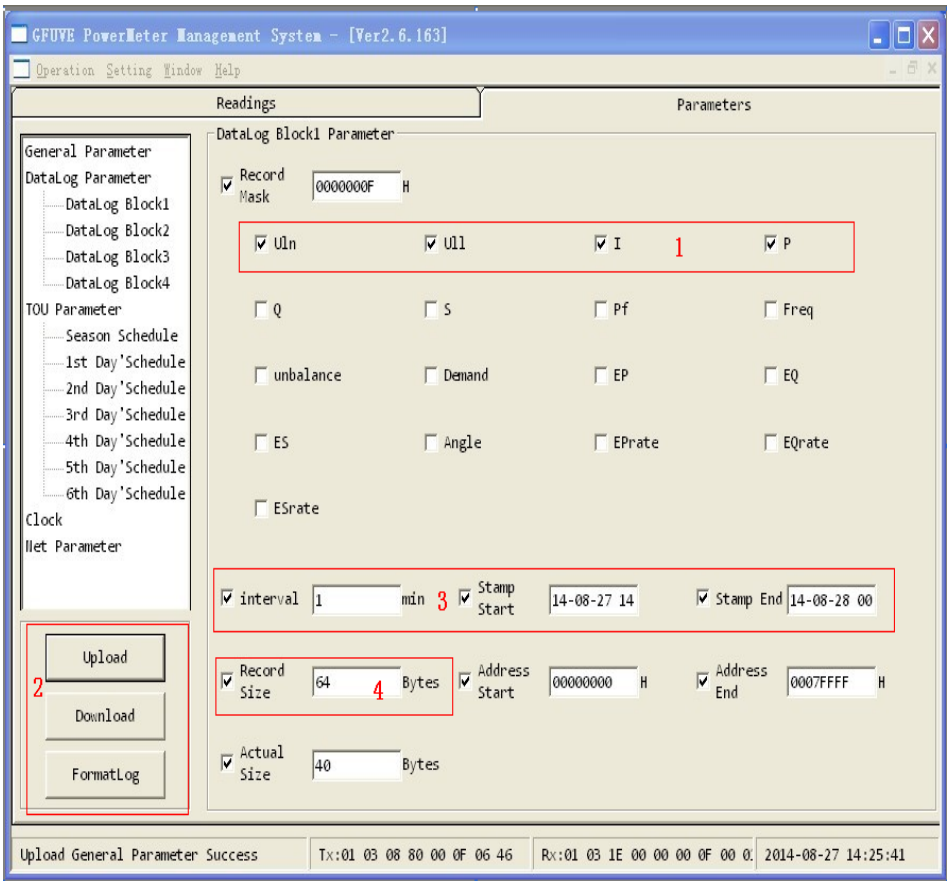


Figure 3-4

C. TOU parameter setting

Click **Season Schedule** of TOU Parameter in quick bar to scan each measurement parameters, then click Upload, pop-up the window as shown in Figure 3-5. By default, the each parameter is checked in frame 2 and each parameter value is 0. Among, Season1 (MM-DD) indicates the first season is begin, such as setting 01-10 indicates the beginning is on January 10, a total of 6 seasons can be set. Schedule No can be represented from 1 to 6, and 1-6 represent the each parameter in frame 3 in figure 3-5. Click Download in frame 1 after setting, display the `Download ScheduleNo Success` on the lower left after downloading, then the download is successful. As the same you can see whether the setup is successful by Upload in frame 1.

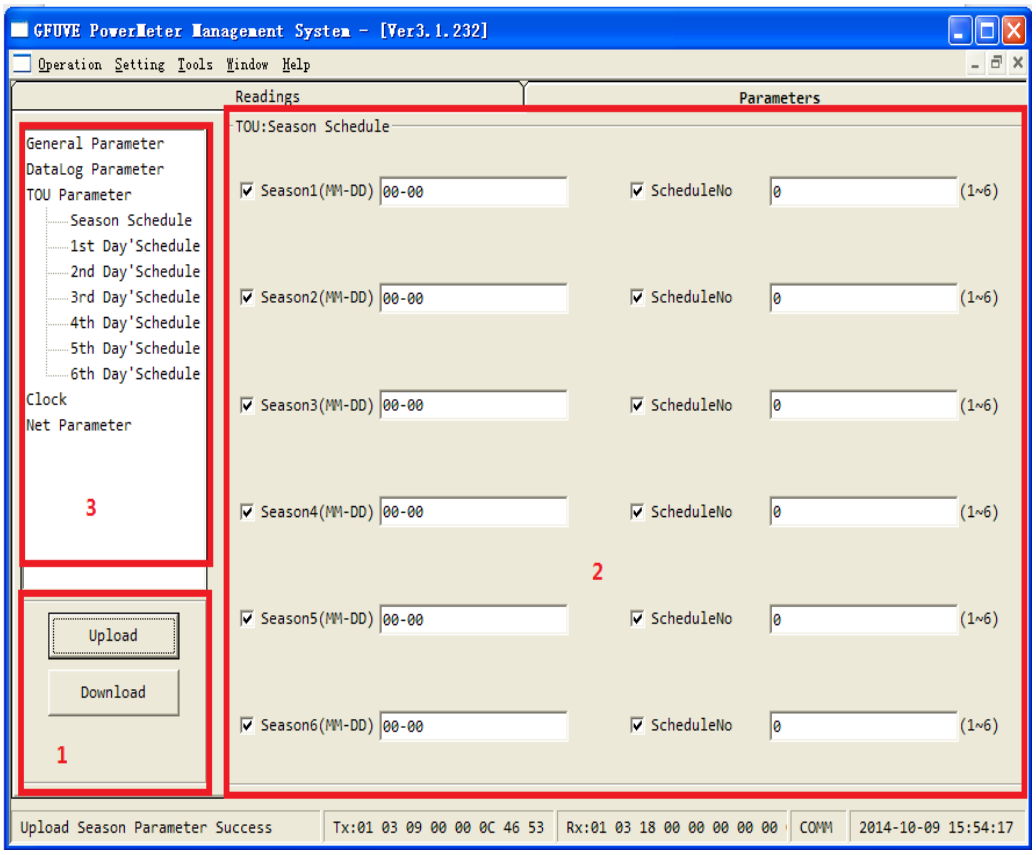


Figure 3-5

Click **Season Schedule** of TOU Parameter in quick bar to scan each measurement parameters, then click Upload, pop-up the window as shown in Figure 3-6. By default, the each parameter is checked in frame 2 and each parameter value is 0. Among, time1 indicates when the first start time, such as setting 01：00 indicates the beginning is at one o'clock, a total of 14 time periods can be set. RateNo can be represented from 1 to 4, and 1-4 represent the sharp, peak, flat and valley. Click Download in frame 1 after setting, display the `Download ScheduleNo Success` on the lower left after downloading, then the download is successful. As the same you can see whether the setup is successful by Upload in frame 1.

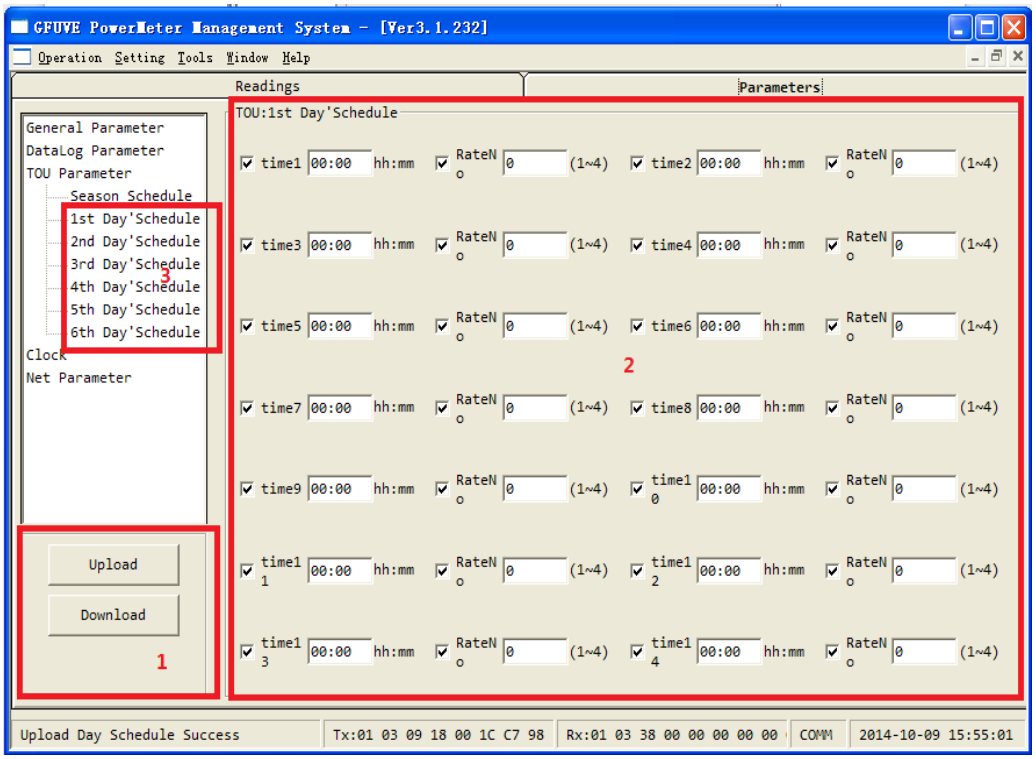


Figure 3-6

D. Clock setting

Click **Clock** in quick bar to scan each measurement parameters, then click **GetClock** in frame 1, pop-up the window as shown in Figure 3-7. At this point display the FU2200A real-time clock in figure 3-7, frame 2. Click SynClock in frame 1, if it display `Download Clock Success` on the lower left that is the synchronous clock is successful, the time is consistent with your computer time. As the same you can see whether the synchronization is successful by GetClock in frame 1.

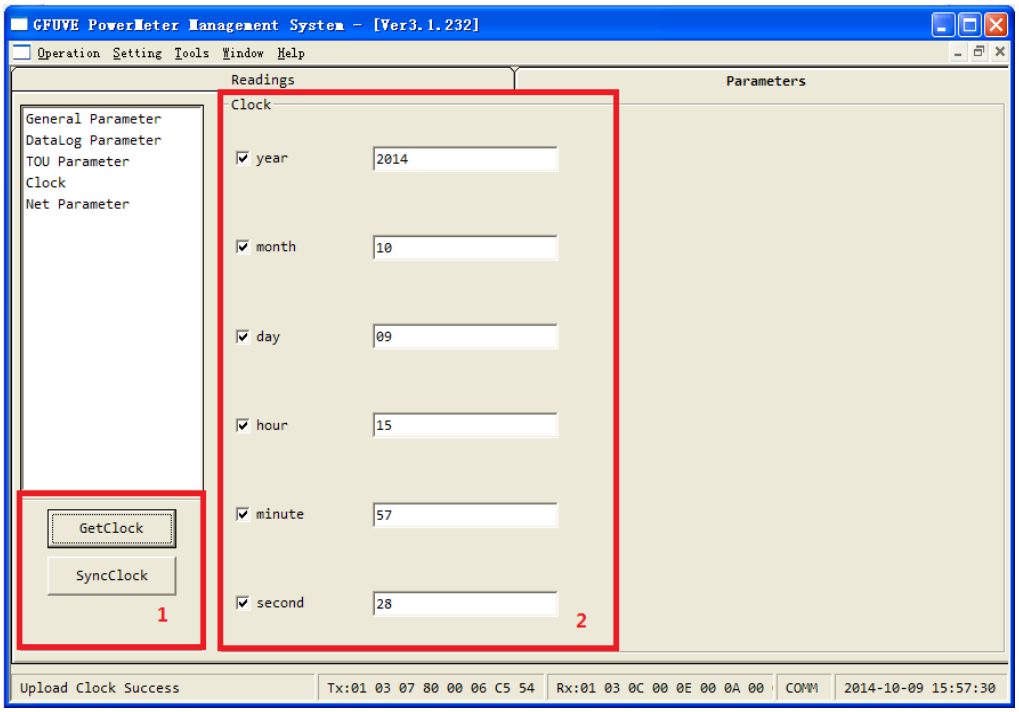


Figure 3-7

E. Network parameter setting

Click **Net Parameter** in quick bar to scan each measurement parameters, then click Upload in frame 1, pop-up the window as shown in Figure 3-8. At this point display the FU2200A real-time network parameters in figure 3-8, frame 2. Users can change different parameters according to your different needs, it is worth noting that the changed parameters is used to connect to the network, it must be corresponding, the connection will be successful. Click the **Download** in frame 1, if it display Upload Net Parameter Success on the lower left after downloading, then the download is successful. As the same you can see whether the setting is successful by Upload in frame 1, Un/SelectAll in frame 1 indicates selected all or anti-selection buttons.(Note: Mac Address can not be modify.)

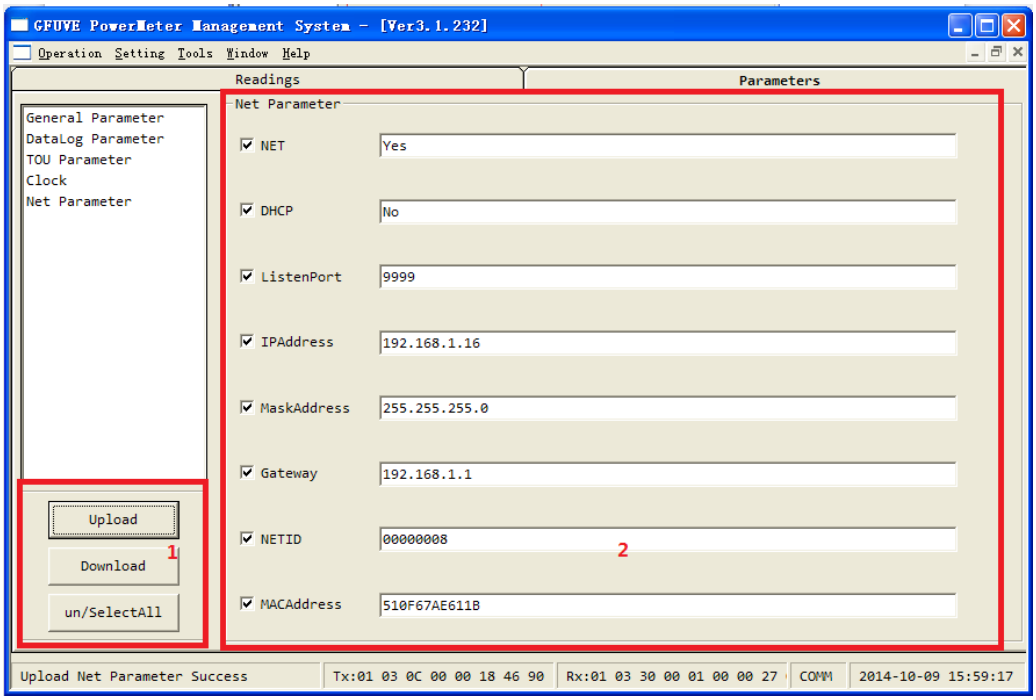


Figure 3-8

4. Data reading

As requesting, connecting FU2200A to the measuring circuit to power-on (This article is an example of A-phase, three-phase wiring is different, but the same operation), As described in chapter1, 2, connect FU2200A to software (For example 485 communication, the difference of the network communications will describe later). Click **Readings**, as shown in Figure 4-1.

A. Real-time metering

Click **Real Time Metering** in quick bar to scan each measurement parameters, click read in frame 2, the real-time measuring data will appear, including phase voltage, phase voltage average, line voltage, line voltage average, current, current average, active power, total active power, reactive power, total reactive power, apparent power, total apparent power, all power factor, frequency, load, voltage unbalance, current unbalance, every phase voltage angle, every phase current angle, active demand, reactive demand, apparent demand in frame 3.

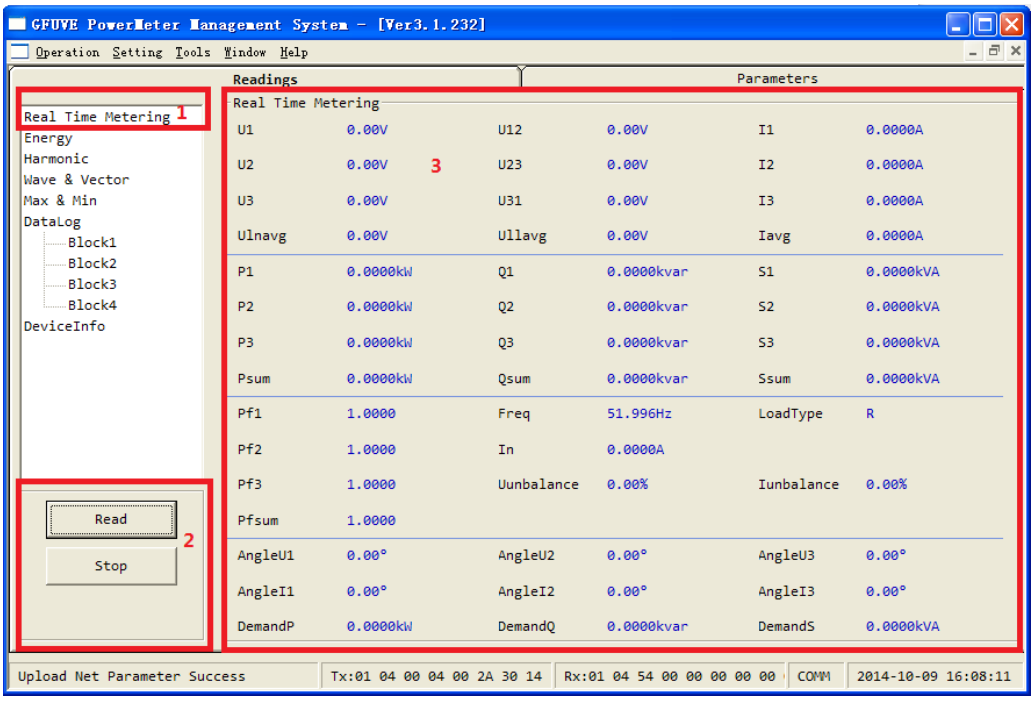


Figure 4-1

For example: As shown in Figure 4-2, only add 100V and 1.5A load on A-phase, the data will as shown: phase voltage U1 = 99.96V, phase voltage average Ulnavg = 33.32V, line voltage U12 = U31 = 99.96V, line voltage average Ullavg = 66.64V, current I1 = 1500.1MA, current average Iavg = 500.0MA, active power: 149.8W, total active power Psum = 149.8W. Apparent power is 149.8W, total apparent power Psum = 149.8W. Power factor Pf1 = Pfsum = 0.9999, frequency Freq = 50.001Hz, load type: R, voltage Uunbalance = 300.00%, Iunbalance = 300.02%, phase voltage angle: 0°, every current angle: 0° (0° that is 360°), every demand is 0 (the default is 15 minutes, which means it will calculate the demand after 16 minutes).

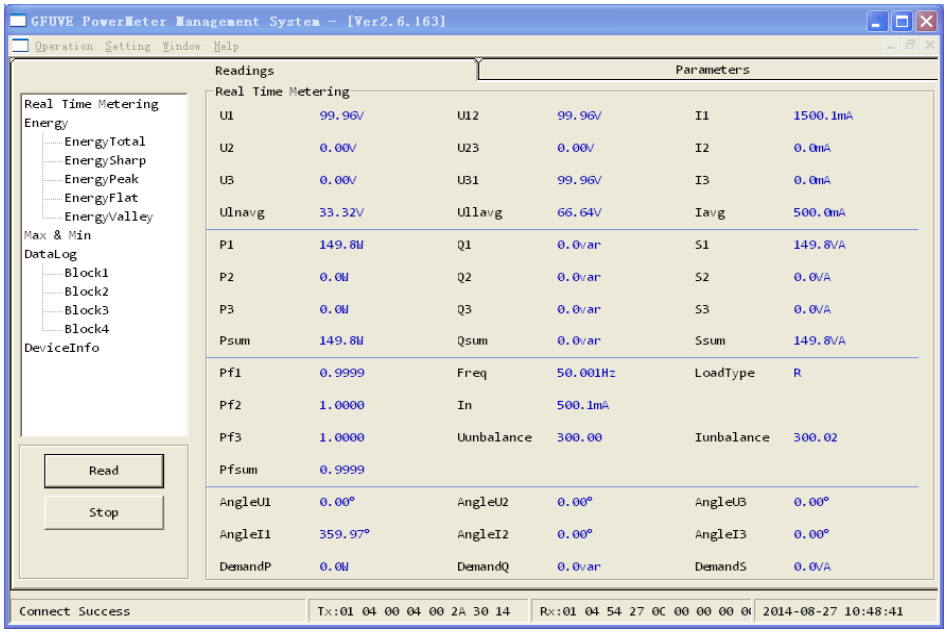


Figure 4-2

B. Energy Measurement

Click **Energy** in quick bar to scan each measurement parameters, click read in frame 1, then the real-time data of energy measuring will appear, including consumption active energy EPimp, issued active energy EPexp, absolute value of active energy EPtotal , net active energy EPnet. Consumption reactive energy EPimp, issued reactive energy EPexp, absolute value of reactive energy EPtotal, net reactive energy EPnet. Consumption apparent energy EPimp, issued apparent energy EPexp, absolute value of apparent energy EPtotal, net apparent energy EPnet, as well as the energy on sharp, peak, flat and vally in frame 2.

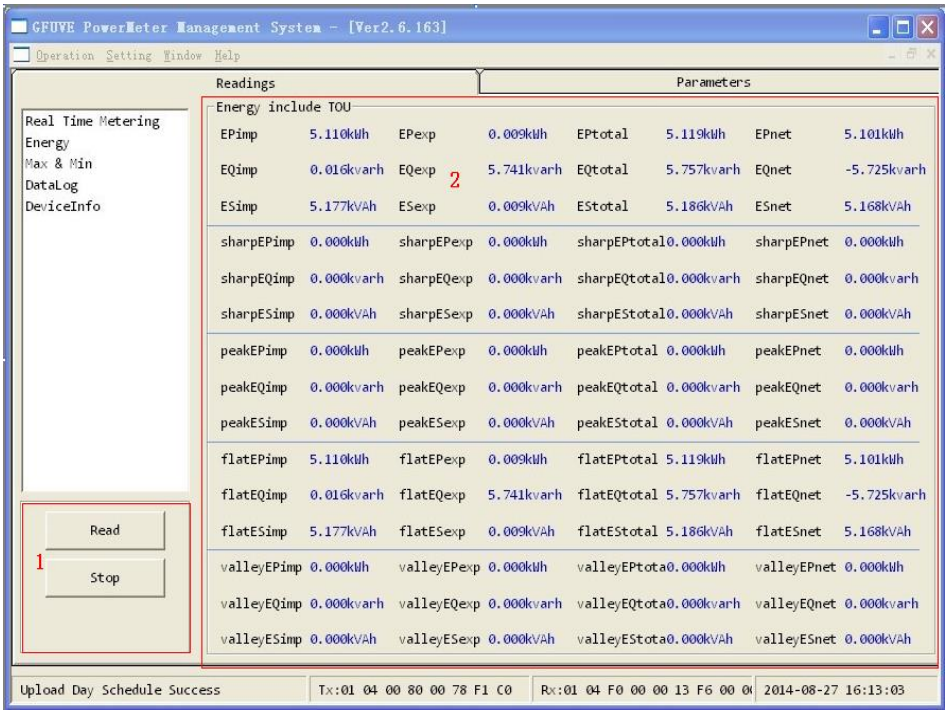


Figure 4-3

For example: The Season Schedule of TOU Parameter in the experimental setting (refer to the settings of sharp, peak, flat, vally in different seasons at part C), Season1（MM-DD）is 01-10, ScheduleNo is 1, click **Download**, which the download is successful. Then set time1 to 00: 10, RateNo to 3, time2 to 20: 10, RateNo is 1 in 1st Day'Schedule , click **Download**, then the download is successful. It means the parameter is set according to 1st Day'Schedule after Jan 10th. The 1st Day'Schedule including, it will be flat after 0:10 and sharp after 20:10 every day. As shown in Figure 4-4, add a certain voltage and current, set the above parameters, the frame 1 and frame 2 of figure 4-4 will changes compared with Figure 4-3 after a while (Note: the time is 16:23:21 August 27, 2014 on the lower right).

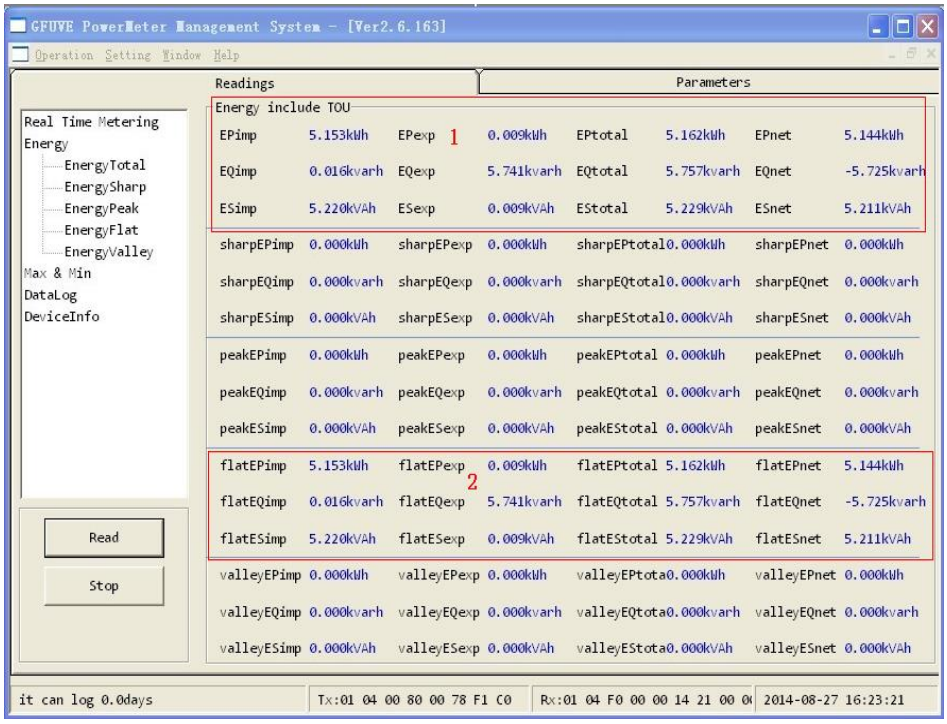


Figure 4-4

C. THD (Total Harmonic Distortion)

Click **Harmonic** in quick bar to scan each measurement parameters, click **read** in frame 1, it will appear the window as shown in Figure 4-5. THD window in frame 2, it can totally measure 49th voltage and current THD, the THD is total harmonic distortion, the 1st harmonic is the fundamental harmonic.

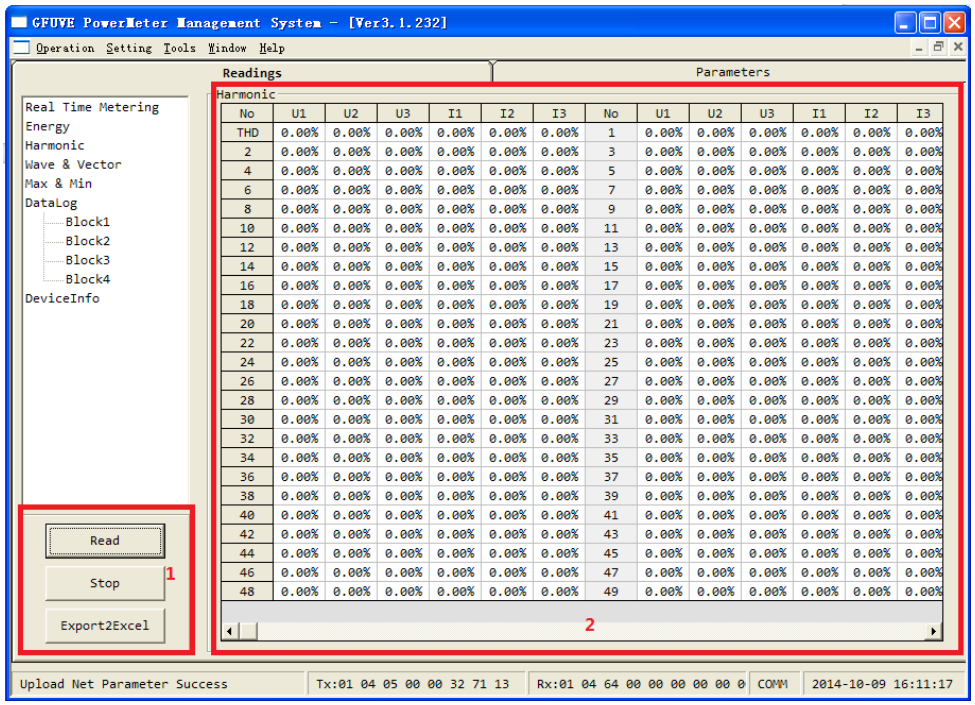


Figure 4-5

D. Every phase of the analog waveform and vector graphics

Click **Wave & Vector** in quick bar to scan each measurement parameters, click **read** in frame 1, it will appear the window as shown in Figure 4-6. Display every phase of the analog waveform, vector graphics and every phase valued of voltage and current in frame 2. Where the yellow line represents A-phase voltage, the blue line represents B-phase voltage, the red line represents C-phase voltage, a light yellow line represents A-phase current, light blue line represents B-phase current, light red lines represent C-phase current. Each square represents the 45 °angle, we can observe visually the real time angle difference from the waveform diagram and vector graphics. Notably Instructions analog waveforms of every waveform displaying, not show the amplitude.

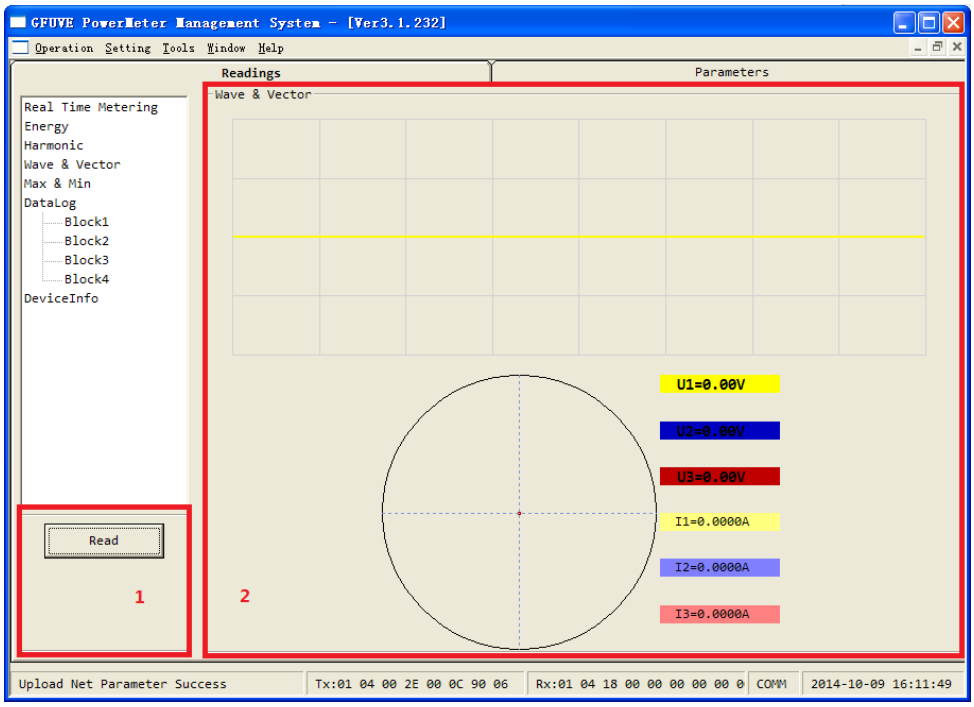


Figure 4-6

E. Maximum and minimum measuring

Click **Max & Min** in quick bar to scan each measurement parameters, click **read** in frame 1, it will appear the window as shown in Figure 4-7. Display the maximum and minimum of the real time and the date of their appear in the metering process, including the maximum of every phase voltage and the date of their appear maxU1, maxU2, maxU3, the minimum of every phase voltage and the date of their appear minU1, minU2, minU3, the maximum of every line voltage and the date of their appear maxU12, maxU23, maxU31, the minimum of every line voltage and the date of their appear minU12, minU23, minU31, and the maximum of every current and the date of their appear maxI1, maxI2, maxI3, the minimum of every current and the date of their appear minI1, minI2, minI3, the maximum of every active, reactive, apparent power and the date of their appear maxP, maxQ, maxS, the minimum of every active, reactive, apparent power and the date of their appear minP, minQ, minS, the maximum power factor and the date of its appear maxPf, the minimum power factor and the date of its appear minPf, the maximum frequency and the date of its appear maxFreq, the minimum frequency and the date of its appear

minFreq, the maximum of every active, reactive, apparent power demand and the date of their appear maxDemandP, maxDemandQ, maxDemandS, the minimum of every active, reactive, apparent power demand and the date of their appear minDemandP, minDemandQ, minDemandS and so on in frame 2. Click **ClrMaxMin** in frame 1, then all the minimum and maximum values and the date of theirs will be cleared.

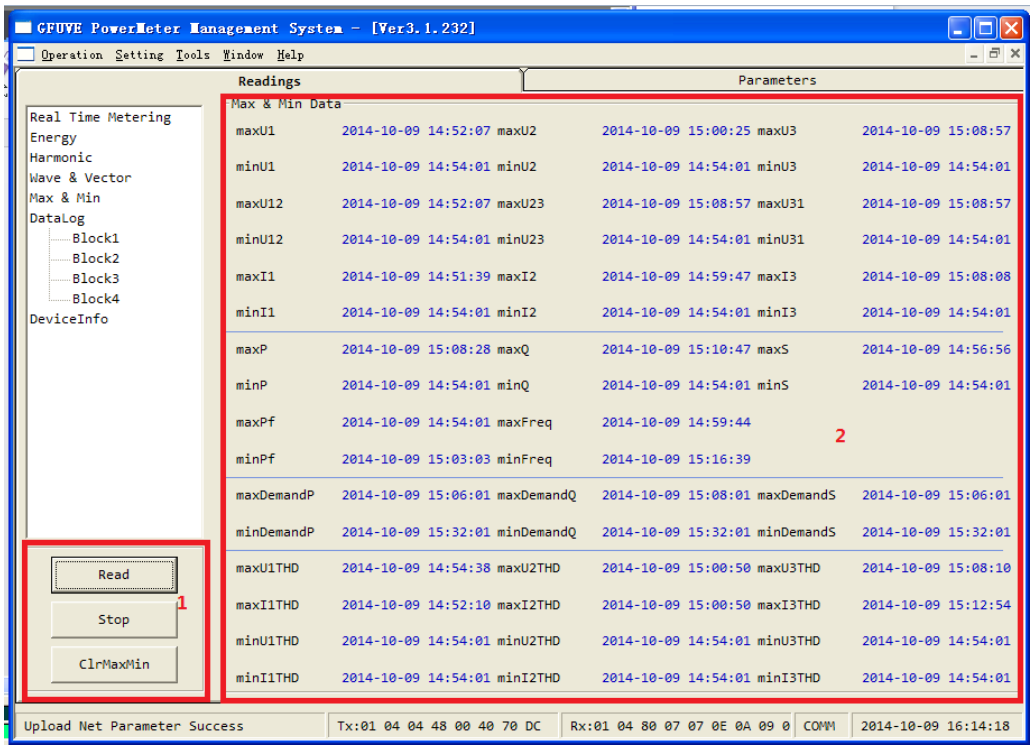


Figure 4-7

F. DataLog Measurement

Click **DataLog** in quick bar to scan each measurement parameters, click the four block of its sub-menu (Block1, Block2, Block3, Block4), click **read** in frame 1, the parameters set by the users can be extracted from the table. Meanwhile users can extract the data in the form of Excel, simply click **Export2Exce** in Figure 4-8, frame 1. Example: The Season Schedule of TOU Parameter in the experimental setting (refer to the rate setting at part C), check **DataLogBlock1**, set **interval** to 1min, the stamp start is at 16:16:00 on October 9, 2014, the stamp end is at 00:00 on August 28, 2014 , it will appear formatlog after download successful, the window as shown in Figure 4-8 will appear after formatlog successful. Click **read** in Figure 4-8 after 5 minutes, it will appear every current data and the extracted in the metering process in frame 2.

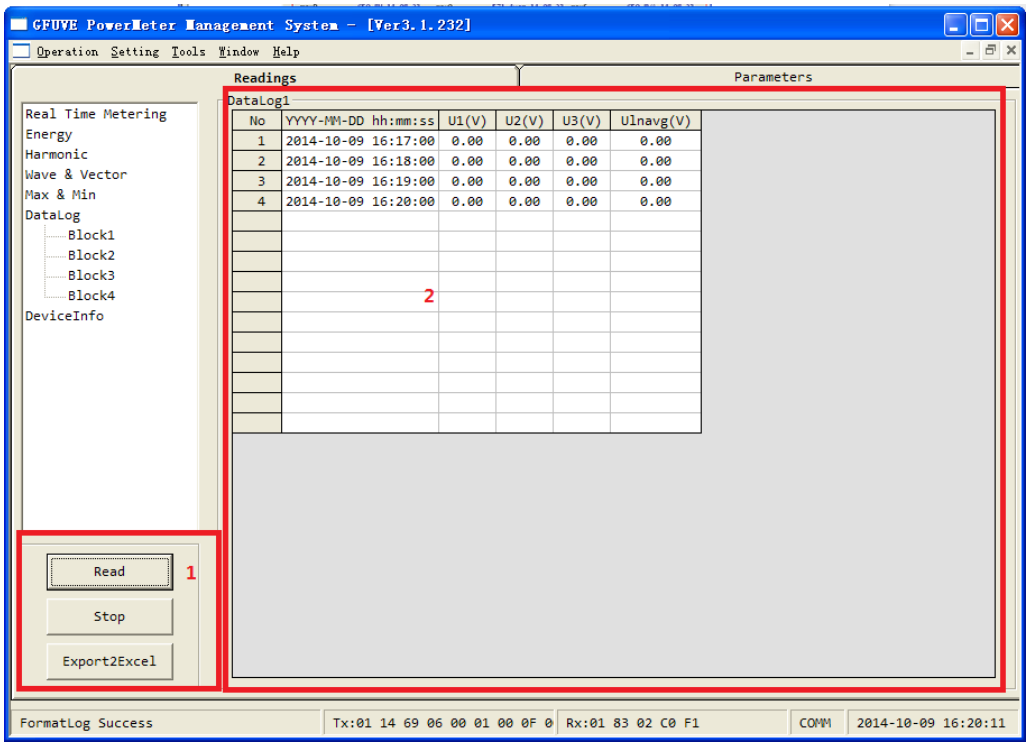


Figure 4-8

G. Reading the meters information

Click **DeviceInfo** in quick bar to scan each measurement parameters, we can read the basic information, including the software Version, table Address, Baudrate, rated voltage wiring PTwiremode, primary side voltage PT1, secondary side voltage PT2, rated current wiring CTwiremode, primary side current CT1, secondary side current CT2. As shown in Figure 4-9.

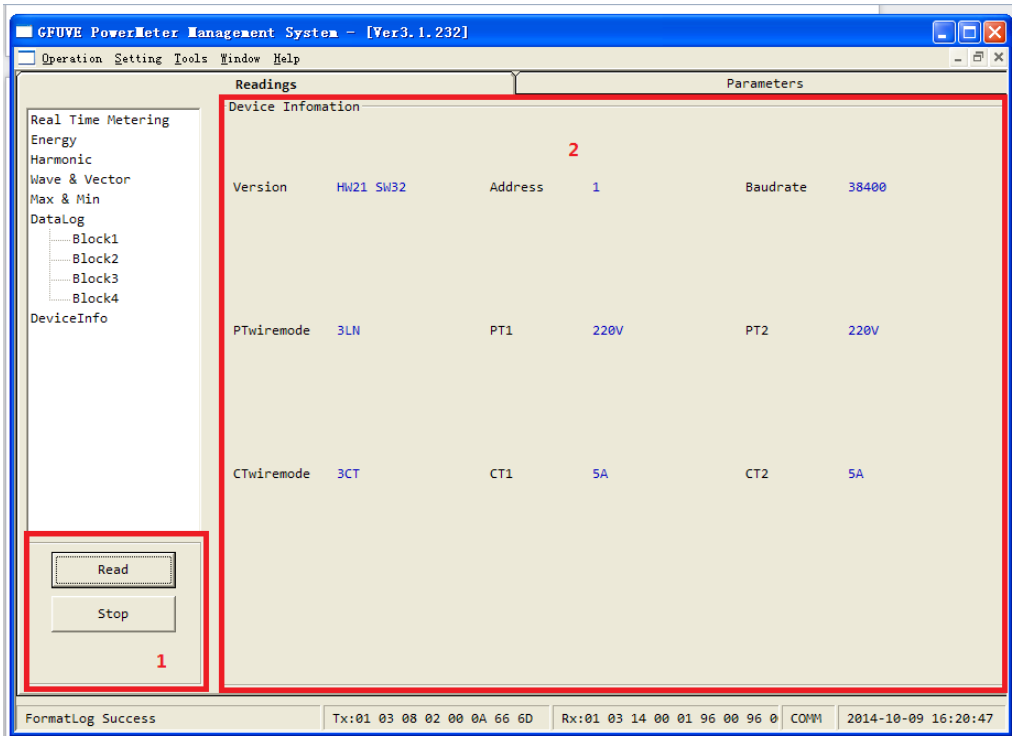

GFUVE PowerMeter Management System - [Ver3.1.232]
Operation Setting Tools Window Help
Readings
Parameters
Real Time Metering
Energy
Harmonic
Wave & Vector
Max & Min
DataLog
Block1
Block2
Block3
Block4
DeviceInfo
Device Infomation
2
Version HW21 SW32
Address 1
Baudrate 38400
PTwiremode 3LN
PT1 220V
PT2 220V
CTwiremode 3CT
CT1 5A
CT2 5A
Read
Stop
1
FormatLog Success
Tx:01 03 08 02 00 0A 66 6D
Rx:01 03 14 00 01 96 00 96 0
COMM
2014-10-09 16:20:47

Figure 4-9