WTM-Works

Weight Transmitter
USER MANUAL

V1.0

Last updated: 2015/02/10

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1. Communication

- Setting TCP/IP or the serial port for communication with WTM
- Changing the type to CAS protocol or ModBus
- Setting ID for using the serial number of WTM
- Checking information of connected WTM
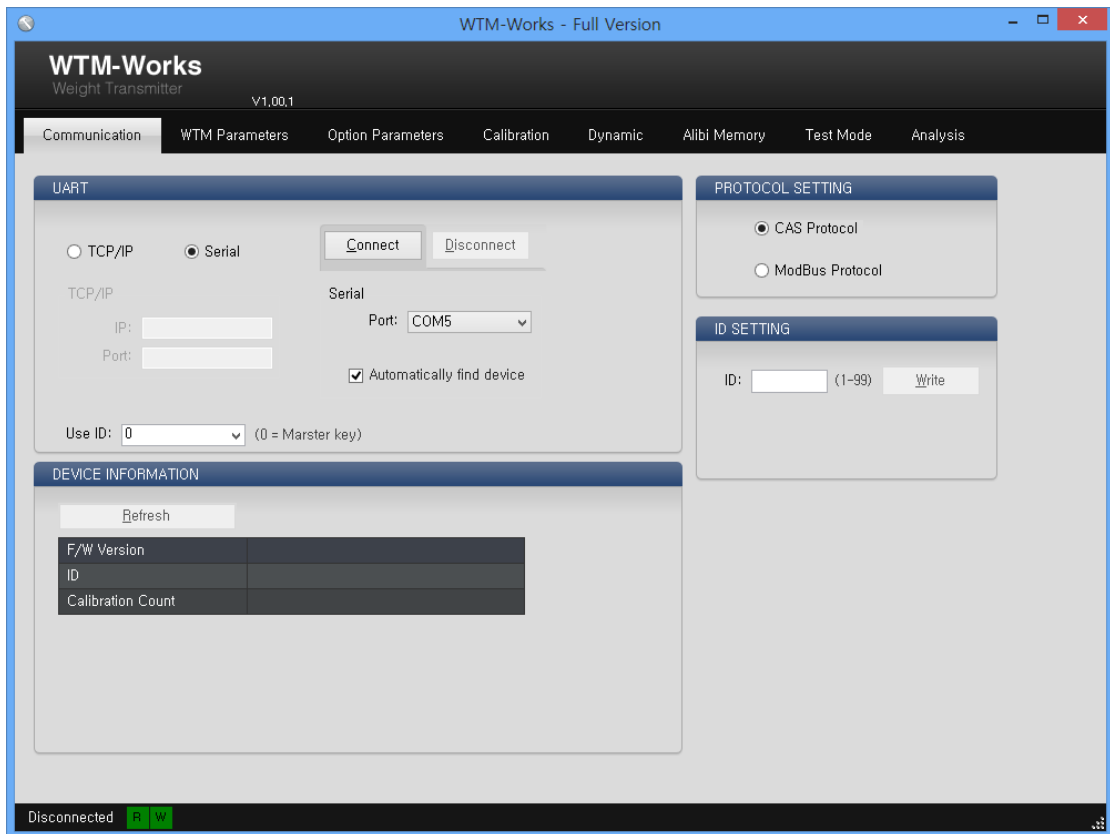
1.1. UART

- TCP/IP: For TCP/IP communication, check off "TCP/IP" and enter the IP and port number.
- Serial: For serial communication, check off "Serial."
- Port: Select the serial communication port connected to WTM. Select [Automatically find device] and click on [Connect], and the device will be automatically found and displayed on the screen.
- Use ID: This is for changing the ID of the WTM you are trying to connect. If it is set at zero (0), communication will be attempted regardless of the ID. If it is set at one (1) or higher, communication will be attempted with the WTM with the corresponding ID. (Note that in case of multiple WTM connections, communication will be difficult when zero (0) is selected.)

1.2. PROTOCOL SETTING

- CAS Protocol: This is a 22-byte type.
- Modbus Protocol: This is a 7-byte type in Modbus RTU format.

1.3. ID SETTING

In case multiple WTMs are connected without designated IDs, you may set the IDs to facilitate communication by entering the serial number of WTM. The steps to setting the IDs are as follows:

1) Choose between TCP/IP and serial communication.

2) In case of selecting TCP/IP, enter the IP and port number.

3) In case of choosing serial communication, select the communication port and uncheck the [Automatically find device] checkbox and click on [Connect].

4) Under ID SETTING, enter the serial number of the WTM in question and the desired ID.

5) Click [Write] to apply the setting.

2. WTM Parameters

- Setting for parameters of WTM
- Comunication Setting
- Device Setting
- Filter Option
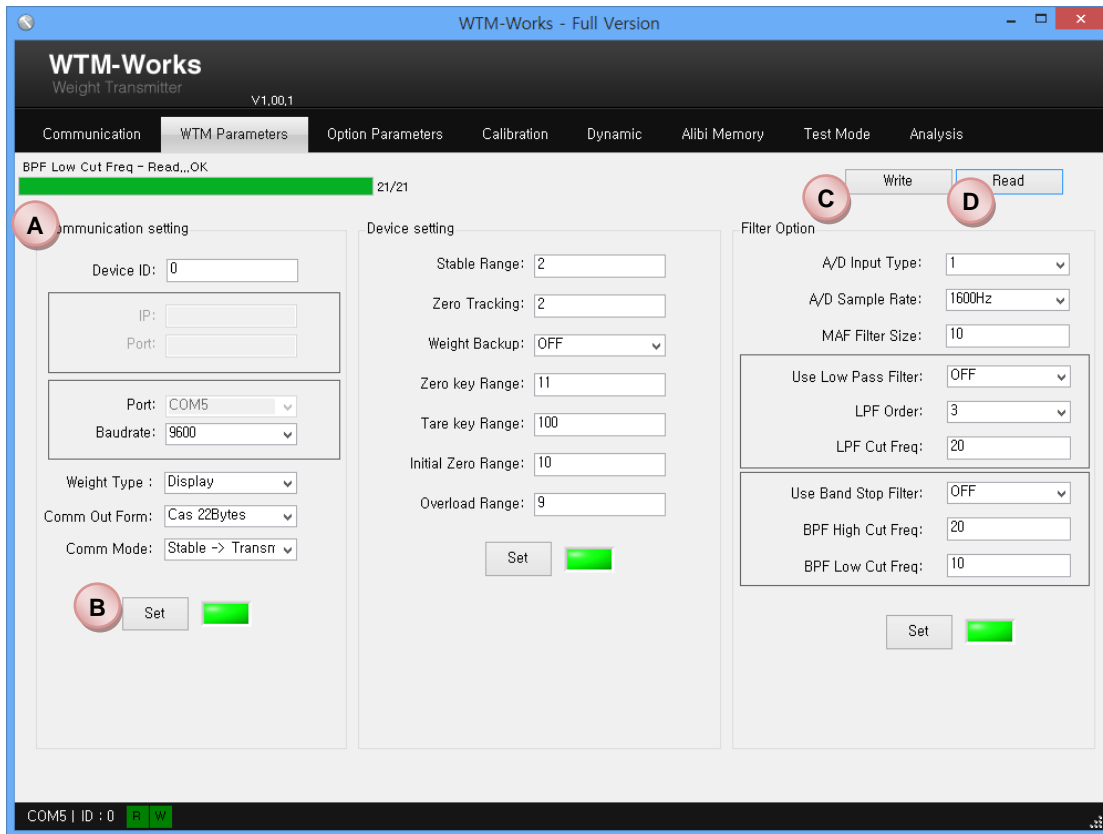
※ **At the beginning, click the "Read" button to read the data from the WTM device, after which the "Set" and "Write" buttons will be enabled.**

A. Explanation of the Parameters for Each Group

Group	Description
Communication Setting	This is used to set the communication such as device ID, Baudrate, etc.
Device Setting	This is used to set the device such as stable range, zero tracking, etc.
Filter Option	This is used to set the filter such as A/D sample rate, low pass filter, Band stop filter, etc.

B. Set button: This is used to apply the data read or written for each group.
- Black LED: The LED button will turn black in case the parameters failed to be applied properly before or after editing the parameters for each group.
- Yellow LED: The LED button will turn yellow in case of a parameter needs to be edited.
- Green LED: The LED button will turn green in case the edited parameters were updated properly.

C. Write button: Writes the edited parameters.

D. Read button: Reads the edited parameters.
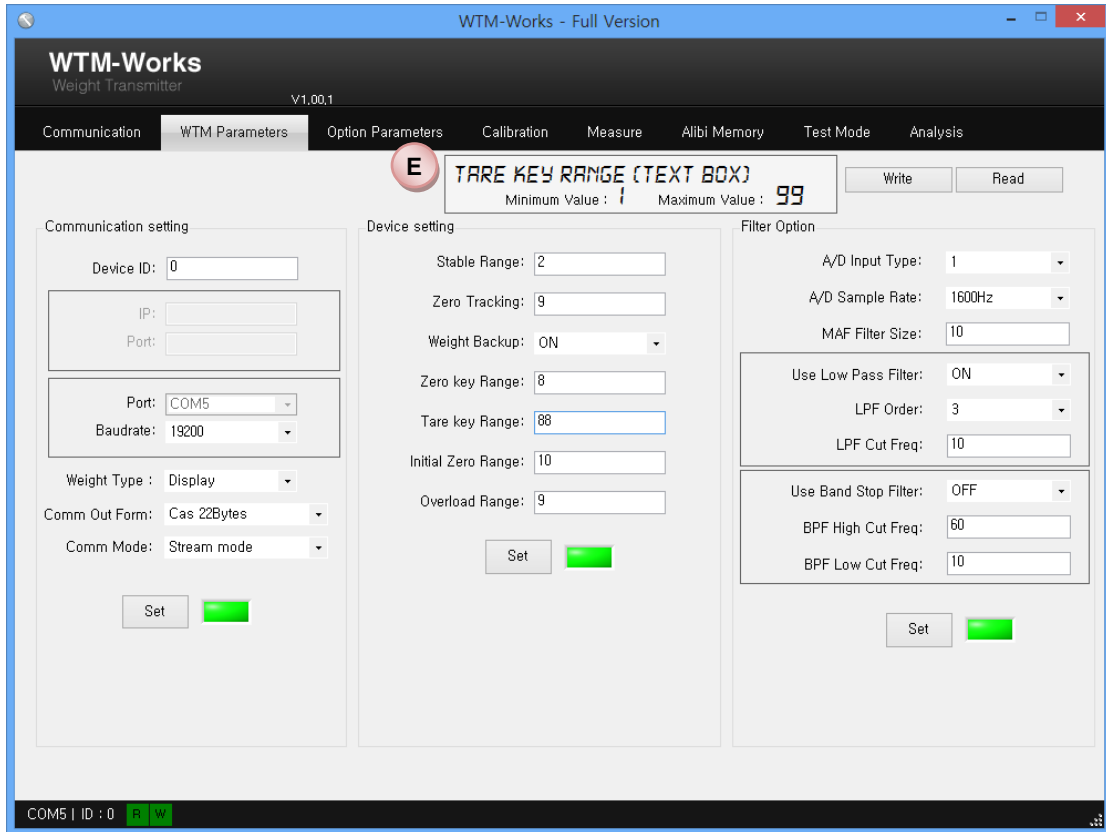
E. Parameter range (text box): Clicking on the parameters of the text box form will prompt a display of the parameter range on the upper part of the screen. In case the input value does not lie within the parameter range, a warming message will be shown on the screen.

3. Option Parameters

- Setting for option parameters of WTM
- Alibi Memory
- Alibi Memory Time
- Ext I/O
- Analog Out
- TCP/IP
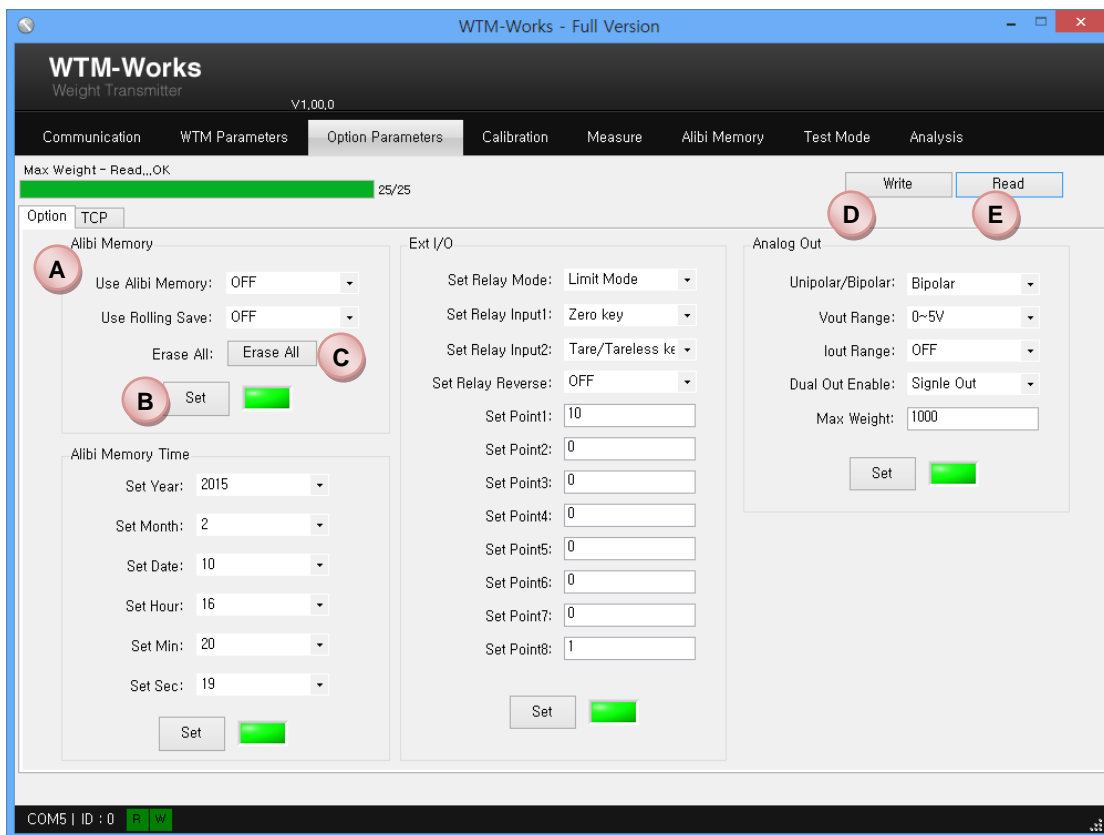
※ At the beginning, click the "Read" button to read the data from the WTM device, after which the "Set" and "Write" buttons will be activated.
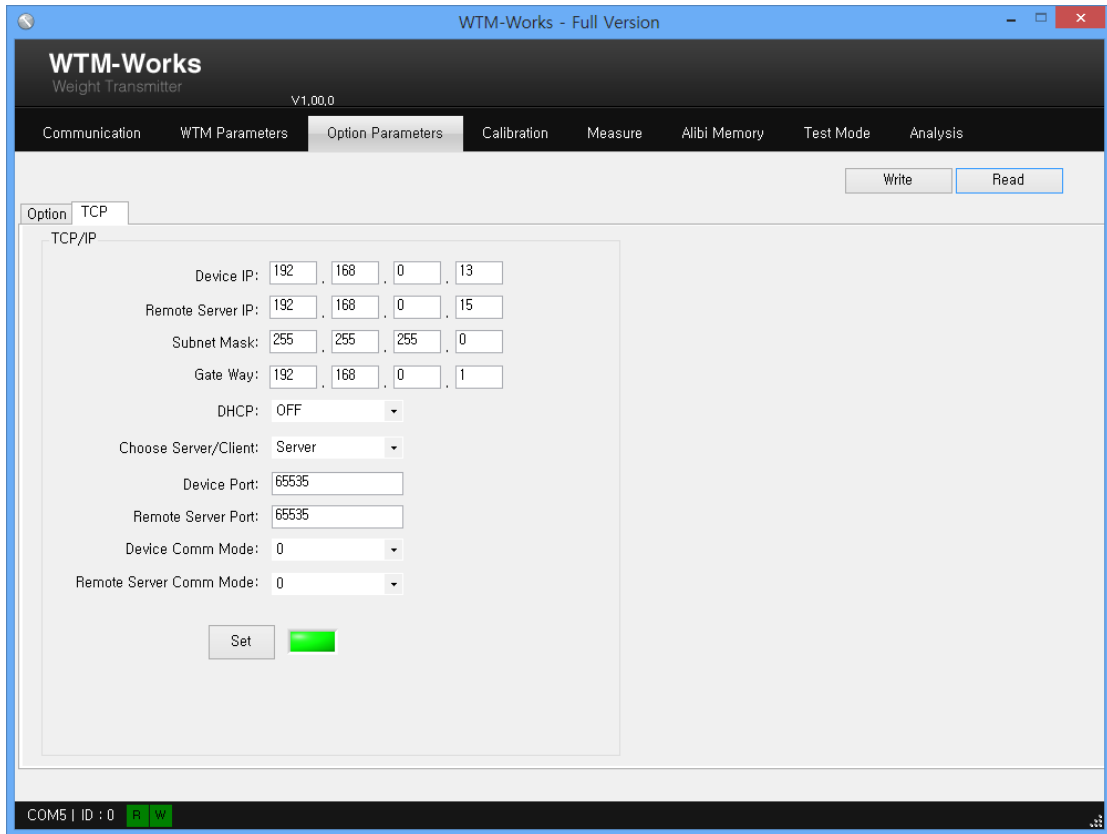
A. Explanation of the Parameters for Each Group

Group	Description
Alibi Memory	The user will be asked on whether alibi memory and rolling save, etc. should be used. Under the "Option" tab, the counter for the weight data recorded in the alibi memory will continue to be displayed. (e.g. 12 Erase All)
Alibi Memory Time	This is used to set the date and time (year, month, day, hour, minute, second) for the recording of alibi memory.
Ext I/O	This is used to set the input/output and points, etc. for the relay mode.
Analog Out	This is used to set the analog signal such as analog unipolar/bipolar, analog V-out range, etc.
TCP/IP	This is used to set TCP/IP. - Choose Server/Client: This is used to set the connected device as a server or client. - Local IP: This is used to set the connected device's IP. - Server IP: This is used to set the server IP, which is remotely connected.

B. Set button: This is used to apply the data read or written for each group.
- Black LED: The LED button will turn black in case the parameters failed to be applied properly before or after editing the parameters for each group.

- Yellow LED: The LED button will turn yellow in case of a parameter needs to be edited.
- Green LED: The LED button will turn green in case the edited parameters were updated properly.

C. Erase All button: This deletes all the data recorded in the alibi memory.
- Black LED: The LED button will turn black in case there are no data records in the alibi memory.
- The LED lamp will turn green in case there are data records in the alibi memory.

D. Write button: Writes the edited parameters.

E. Read button: Reads the edited parameters.
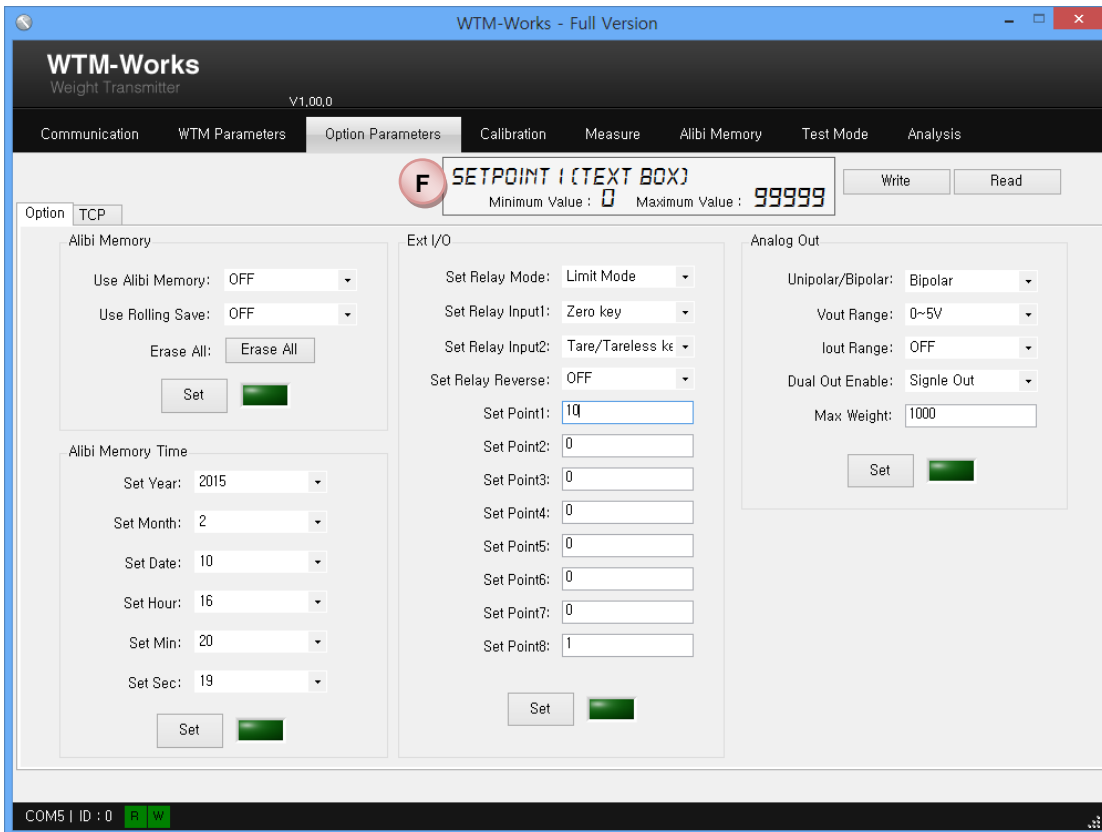
F. Parameter range (text box): Clicking on the parameters of the text box form will prompt a display of the parameter range on the upper part of the screen. In case the input value does not lie within the parameter range, a warming message will be shown on the screen.

4. Calibration

- Calibration of WTM device
- Displaying calibration measurement value in the graph
- Normal / Hopper Cal / Direct Cal Mode
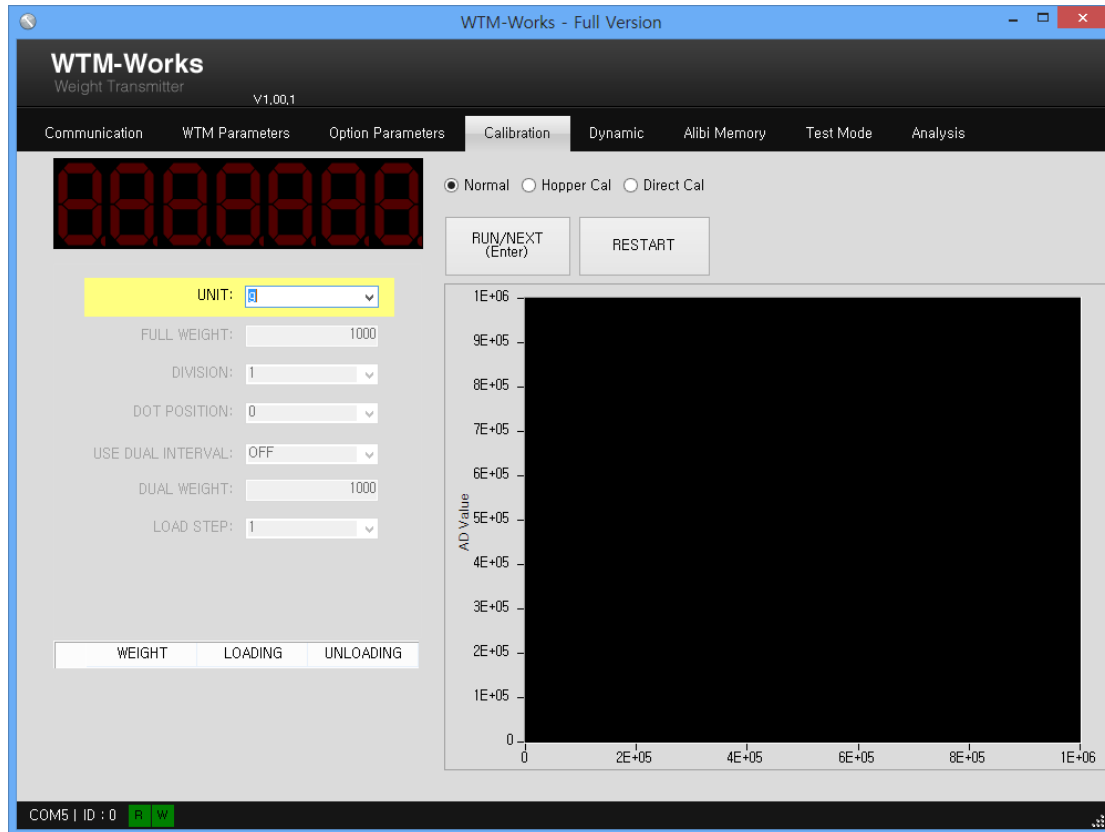

1) Select the mode.

    A. Normal mode: This is the basic mode for calibration.

    B. Hopper Cal mode: The default value for calibration may be set as any value other than zero (0).

    C. Direct Cal mode: This eliminates the post-load step process.

2) After setting the calibration functions below, click on [RUN/NEXT] (or press the Enter key).

    (However, clicking on the Restart button, you will be returned to the UNIT stage.)

    A.   UNIT: This is used to set the measurement unit such as g/lb/t, etc.

    B.   FULL WEIGHT: This is used to set the maximum measured weight

    C.   DIVISION: This is used to set the gradation/scale.

    D.   DOT POSITION: This is used to set the decimal place.

    E.   USE DUAL INTERVAL: This is used to designate whether the user wishes to use the interval point.

    F.   DUAL INTERVAL POINT: This is used to set the interval point during the use of dual intervals.

   G.   LOAD STEP: This is used to set the number of measurement steps.
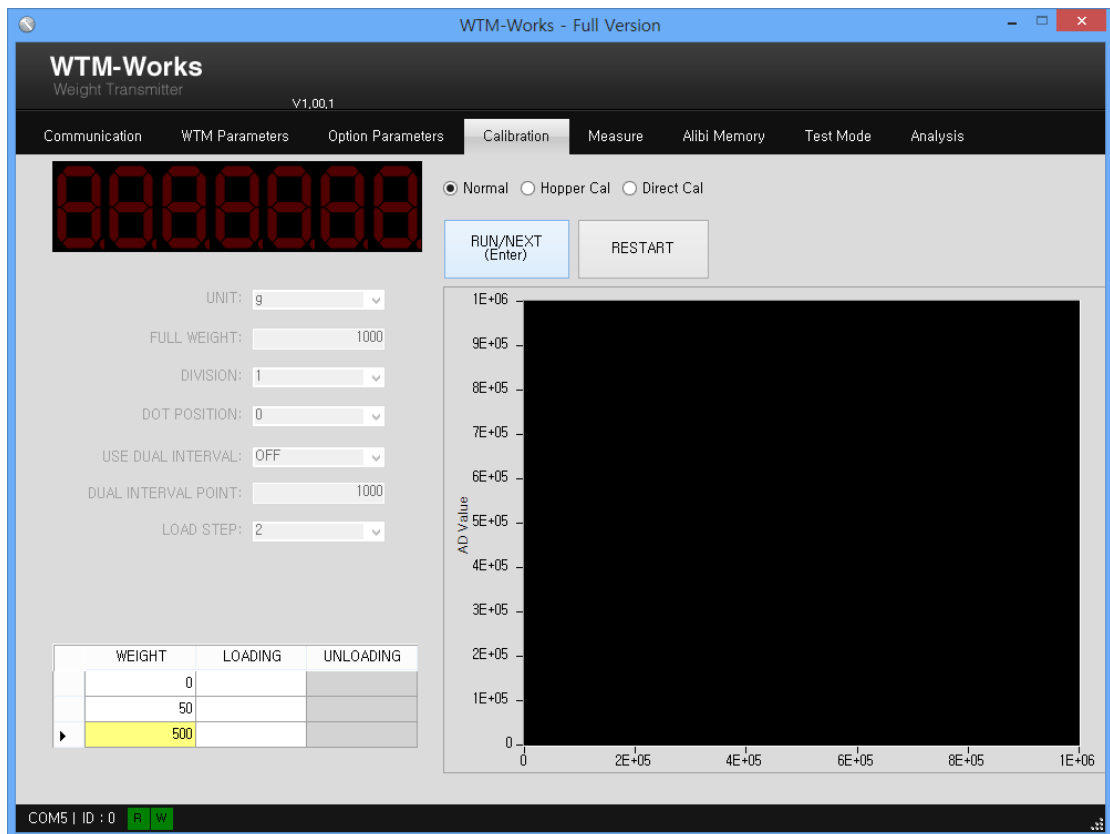
i. Normal mode: This includes the cases in which the number and default value of the load steps are zero (0). The records including one row of the default value and number of the load steps are set.

ii. Hopper Cal mode: This is used to set a default value other than zero (0). The records are set according to the number of load steps.

3) The weight data to be measured is entered into the records.
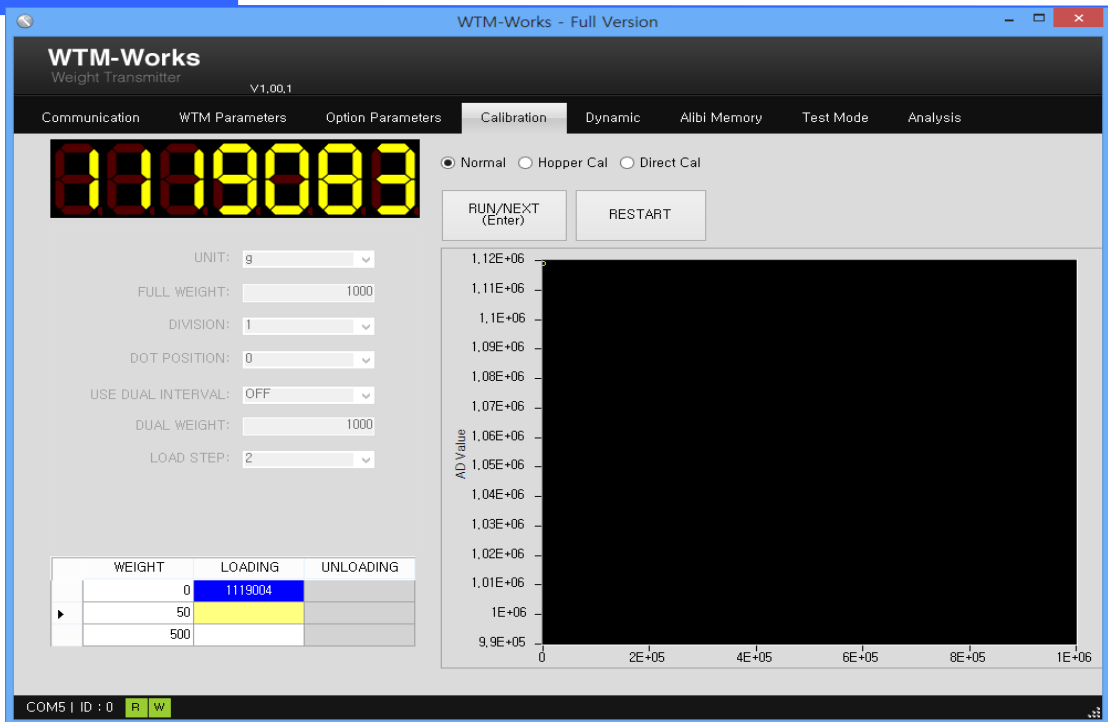
4) After the load is placed, the weight of each load is measured. Press the Enter key or click on the RUN/NEXT button after the measurement is taken. The AD value will be indicated on the graph (x-axis: measurement frequency, y-axis: AD value).
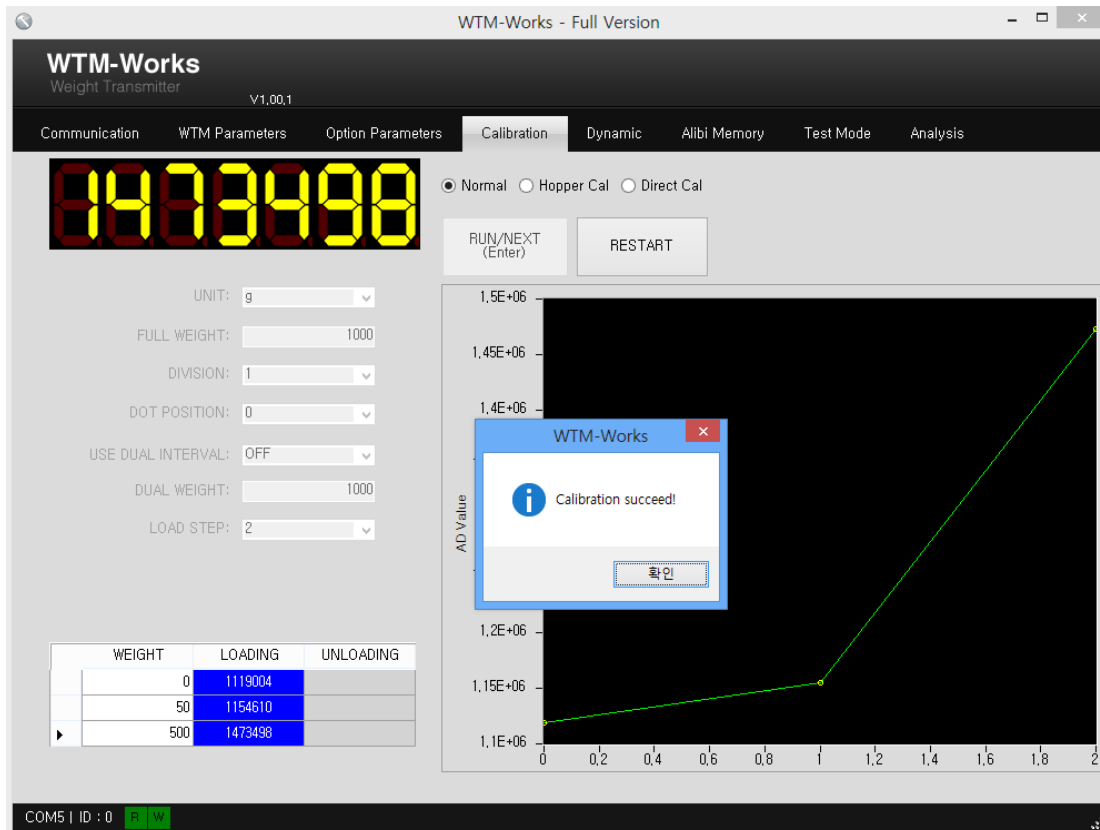
5) After completing the process, a message that reads "Calibration succeed!" will be prompted.

5. Dynamic

- Displaying changing output value of Load Cell connected with WTM device
- Setting filter (Low pass filter, Digital filter, Windows size)
- Saving display in current graph
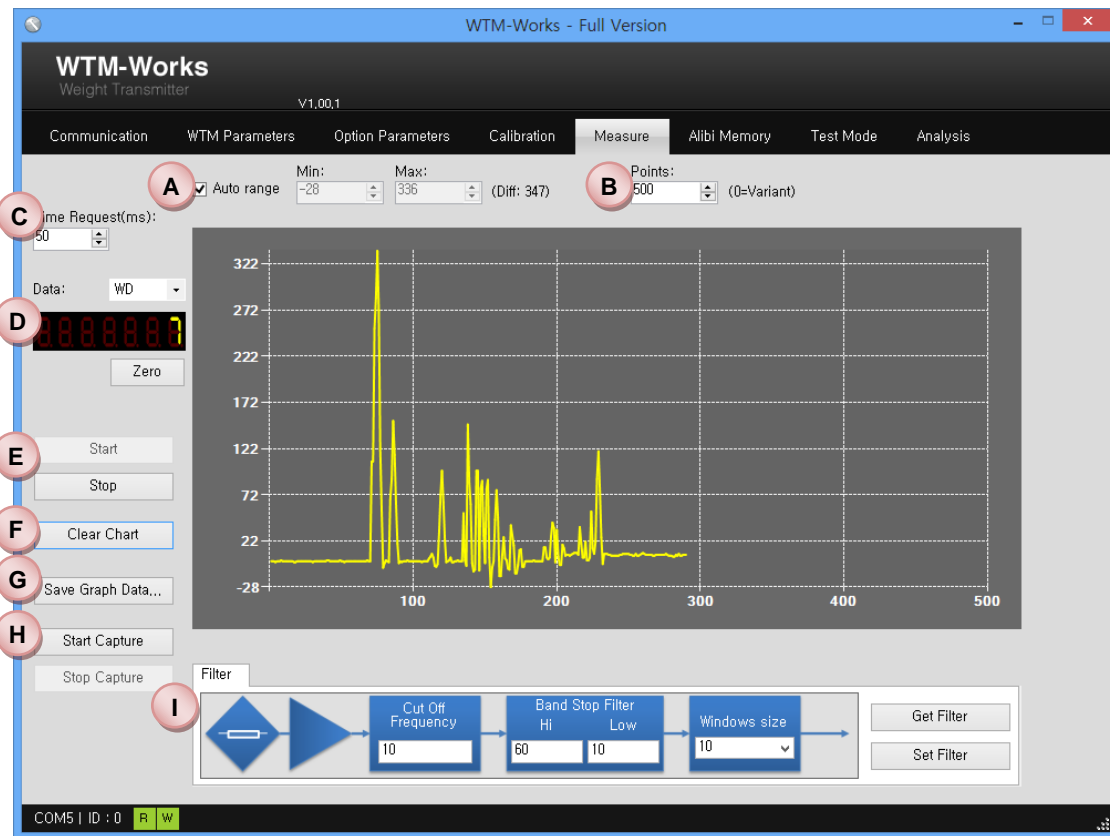
A. Auto range: This is automatically set based on the values outputted as the lower and upper limits indicated on the graph. Uncheck the box to display the graph according to the range of the input values.

B. Points: This is used to set the maximum point to be indicated on the graph. If the input point exceeds the maximum point, the graph will be re-drawn.

C. Time Request(ms): This is used to set the frequency of requesting ND/AD/FD data. Data are transmitted according to the requested time.

D. Data Type: This indicates the ND/AD/FD values.
- ND: This is the normal data value.
- AD: This is the analog data value.
- FD: This is the filtered data value.

E. Start/Stop: This is used to start or stop a measurement.

F. Clear Chart: This deletes the data for the present graph.

G. Save Graph Data: The present graph data are saved as a log file.

H. Start/Stop Capture: This is used to set the time point at which the measurement data are saved as a log file.

I. Filter: This is used to load or change the filter setting.

6. Alibi Memory

- Reading the data recorded in alibi memory
- Diplaying Date/Tare/Net/Unit the data recorded in alibi memory
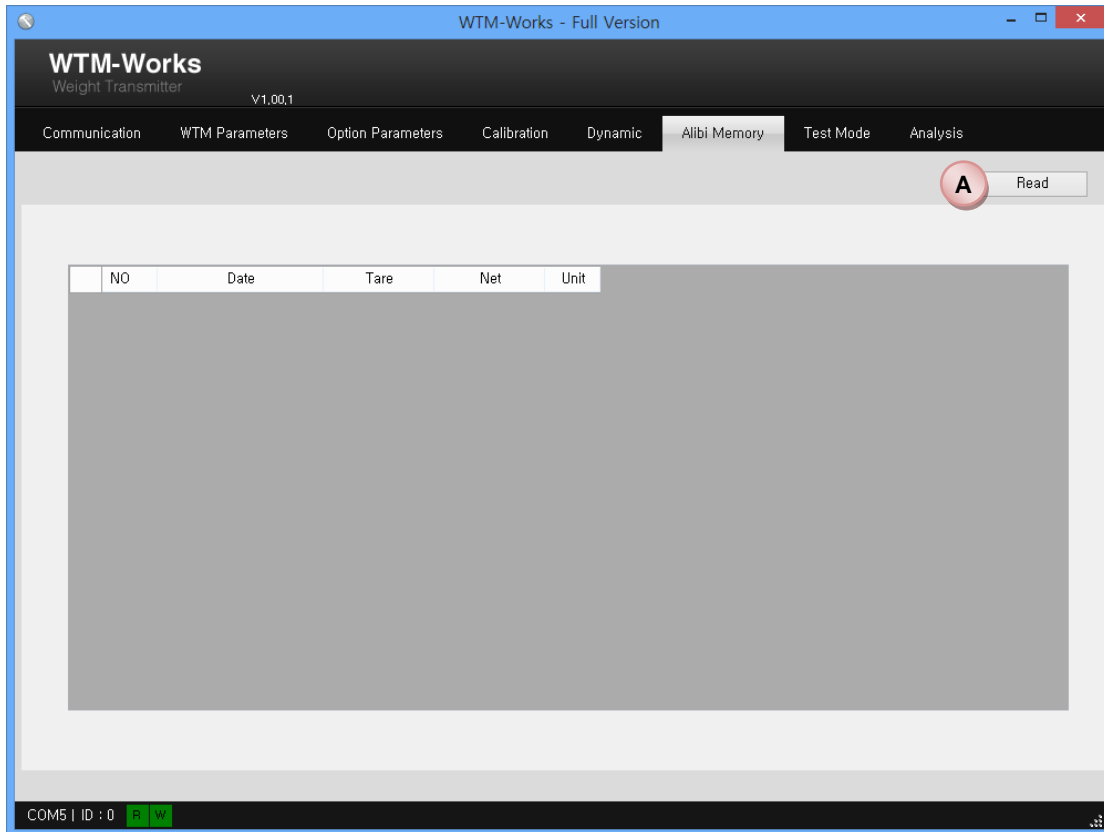
A. Read button: This is to read the data recorded in the alibi memory.
- The data, weight including the container, actual weight and unit, etc. are displayed.
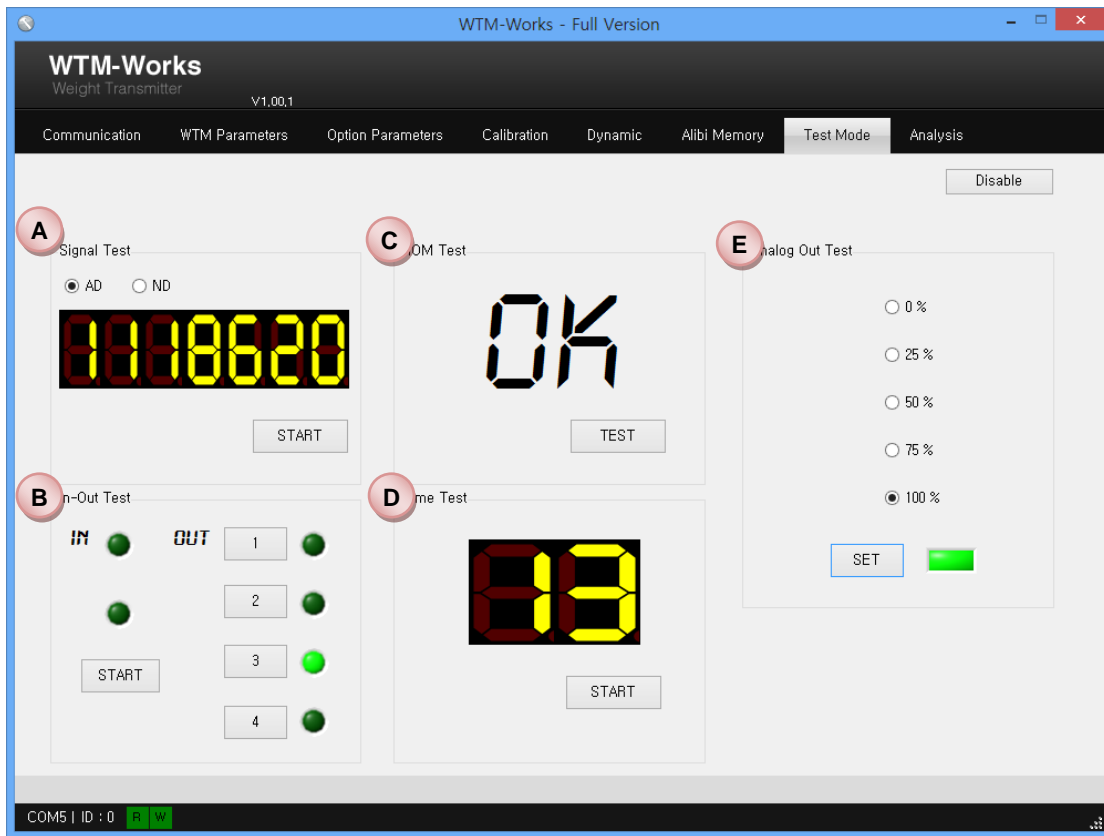
7. Test Mode

- Signal Test
- IO Test
- ROM Test
- Time Test
- Analog out Test
  (However, it is not support in Modbus Protocol mode)
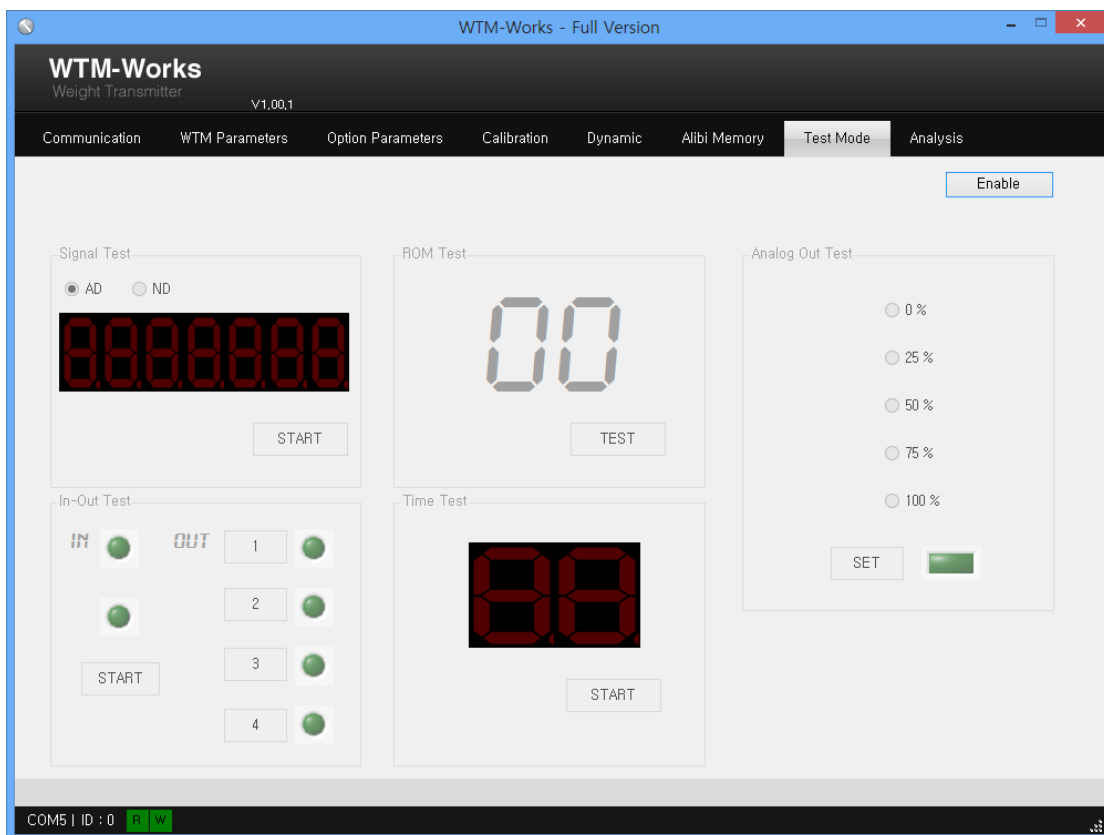
※ **At the beginning, click the Enable button to enable all of the group boxes. The text on the Enable button will be changed to "Disable." Upon completion, click on the Disable button in order to disable all of the group boxes.**

A. SIGNAL TEST: AD/ND will be selected and the signal will be displayed.

- START/STOP button: When this button is clicked, the AD/ND value will be read, and the button will be changed into a STOP button. If you want to terminate the process, click on the STOP button.

B. INPUT/OUTPUT TEST: This is used to test the input/output devices connected to the WTM device.

- START/STOP button: When this button is clicked, the input/output devices connected to the WTM device will be read, and the button will be changed into a STOP button. If you want to terminate the process, click on the STOP button.

- #1~4 button: Signal will be sent for each button to the devices connected to the WTM device.

C. ROM TEST: ROM will be checked for proper operation.

D. TIME TEST: The module for measuring the time of WTM will be checked for proper operation.

- START/STOP button: When this button is clicked, 1~60 sec. will be displayed, and the button will be changed into a STOP button. If you want to terminate the process, click on the STOP button.

E. SIGNAL OUTPUT TEST: The signal output test is set from 0~100%.

- SET button: Click the button after setting one of 0, 25, 50, 75 or 100%. If the new setting is applied properly, the LED button will turn green.

8. Analysis

- Reading signal file data
- Reading and Saving real-time ND(Normalized Data) data
- Reading applied filter data
- Setting and apply low pass filter
- Setting and apply band stop filter

8.1. Analysis Function Using

8.1.1. Data Getting
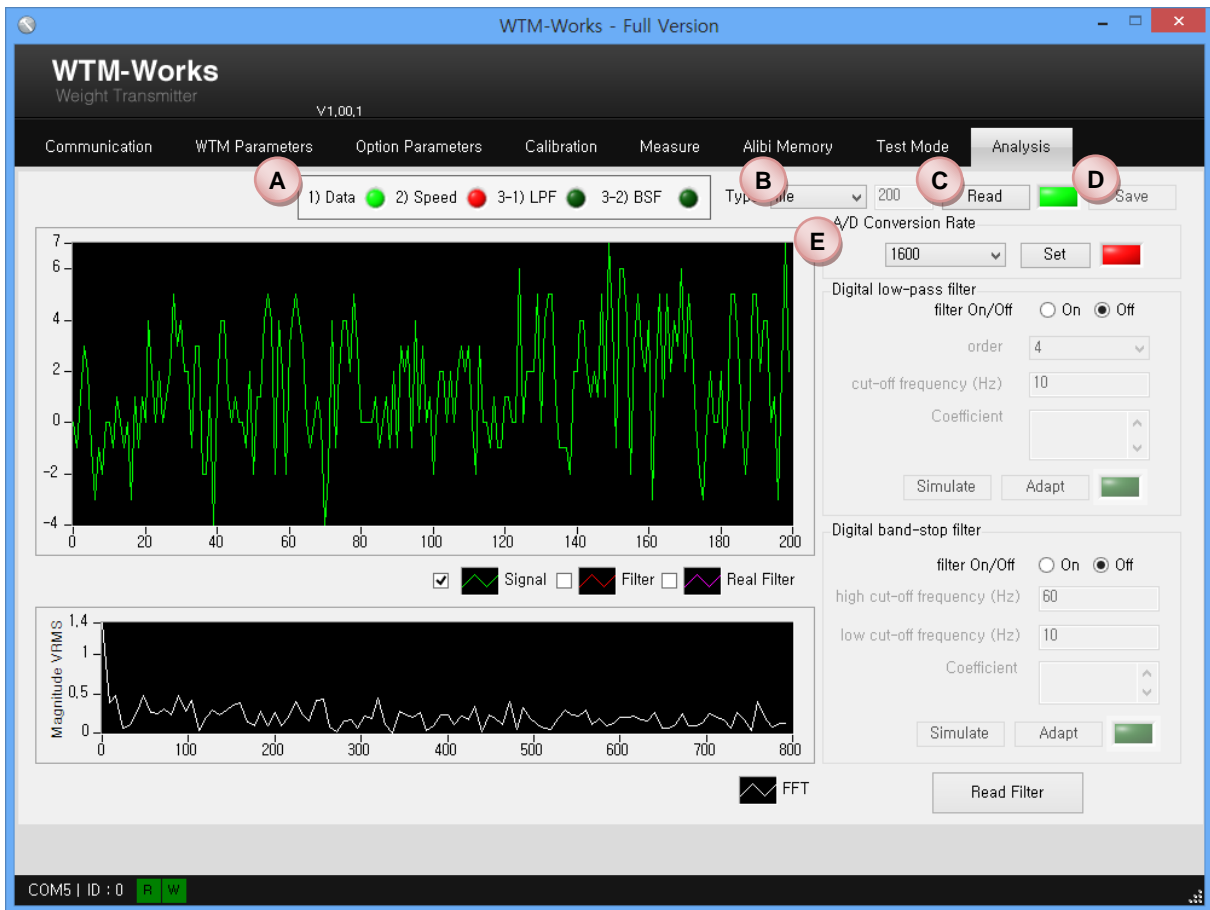
A. Sequence Table: The information on data reading, A/D conversion rate, and application of low pass filter or band stop filter, etc. is directly displayed on the upper part of the screen.

● / ▬ : Displayed prior to the application to WTM

● / ▬ : Displayed in case the analysis data are obtained from WTM and indicated in the form

when the Analysis tab is opened

🟢 / 🟩 : Displayed when the analysis data are applied properly to the WTM device

A. Type: This is used to set the data type to be indicated on the graph.

- File: The signal data recorded in [Installation Folder]/Capture.ini are read and displayed as a yellow line on the upper graph. Also, the FFT values for the signal data values are displayed as a white line on the lower graph.

B. Real: The WD data values obtained during the set time are displayed as a yellow line on the upper graph. Also, the FFT values for the signal data values obtained during the set time are displayed as a white line on the lower graph.

- Time text box: This is used to set the duration of obtaining the WD data.

C. Read button: The signal data for File, Real and Filter are read.

D. Save button: The data values read under the Real setting are saved. Such values are saved in [Installation Folder]/Capture.ini.

E. Sampling Frequency (Hz): This is used to set the A/D conversion rate value.

- Set button: If the setting is applied properly, the LED button will turn green.

8.1.2. Digital Low Pass Filter
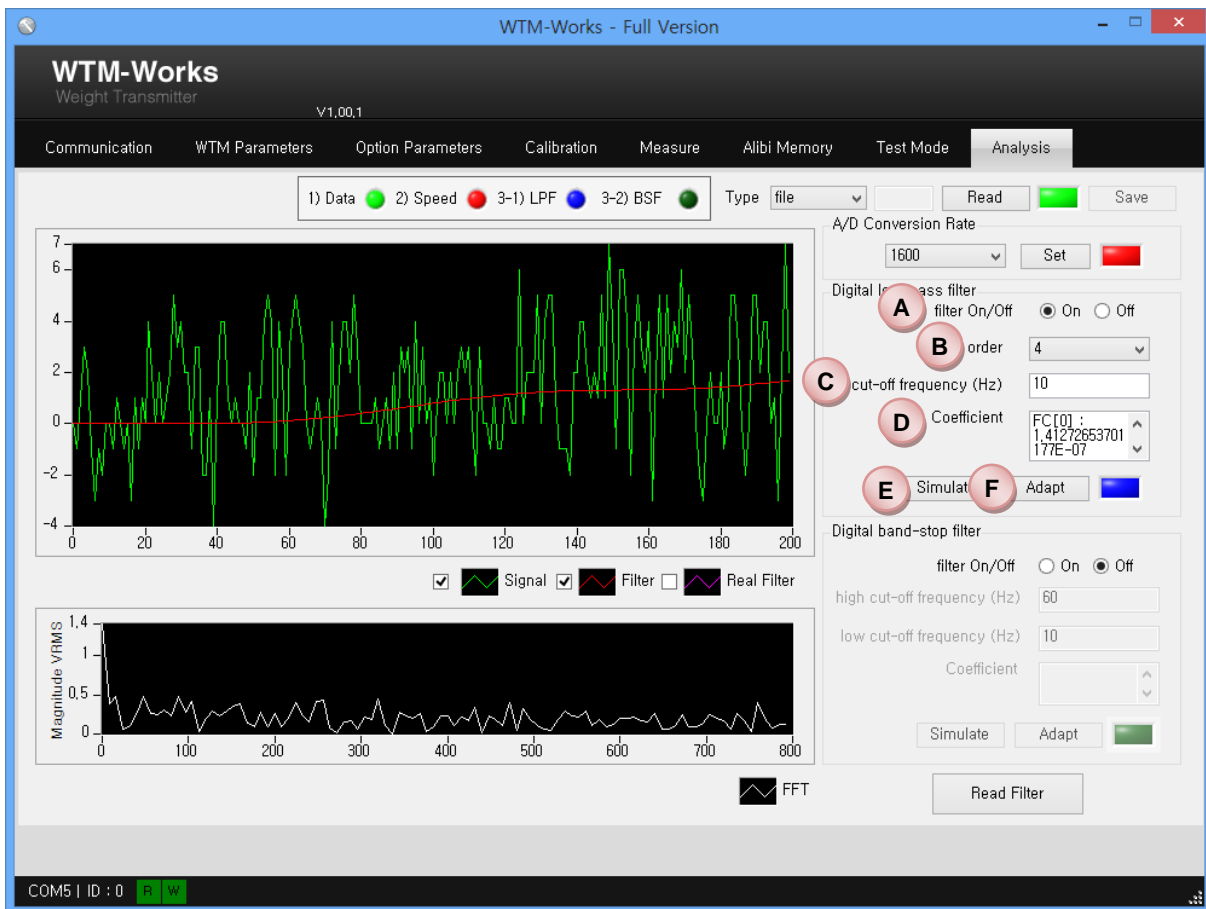
A. Filter On/Off: This turns the low pass filter on or off.

- On: The low pass filter process is performed according to the order and cut-off frequency settings, etc.

- Off: This turns of the low pass filter.

B. Order: This is used to set the order of the low pass filter.

C. Cut-off Frequency (Hz): This is used to set the cut-off value for the low pass filter.

D. Coefficient: After setting the order and cut-off frequency values, click on the "Simulate" button to indicate the coefficient value for the low pass filter.

- FC: The forward coefficient value will be indicated.
- RC: The reverse coefficient value will be indicated.
- e.g. The coefficient value when the order value is 3 and the cut-off value is 20:
  ① FC[1]：0.000168210344840876
  ② FC[2]：0.000168210344840876
  ③ FC[3]：5.60701149469587E-05
  ④ RC[0]：-2.84296052420248
  ⑤ RC[1]：2.6980105275524
  ⑥ RC[2]：-0.854601442430348

E. Simulate button: The signal data values read in real-time or based on the file data according to the order and cut-off frequency values are low pass filtered and displayed as a red line on the upper graph. The LED button will turn blue.

F. Adapt button: The low pass filter application, order and cut-off frequency values are transmitted to the WTM device. If the transmission is successful, the LED button will turn green.

8.1.3. Digital Band Stop Filter
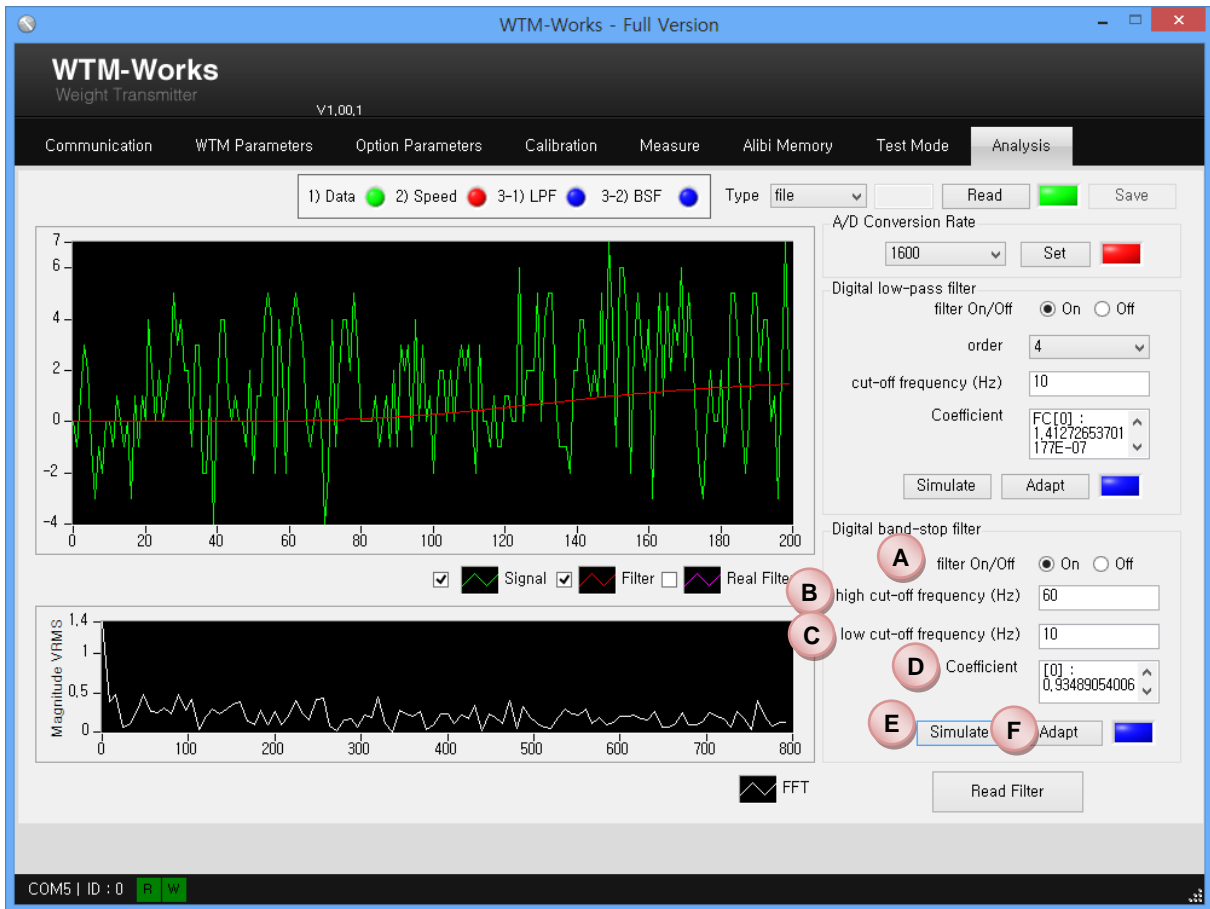
A. Filter On/Off: This turns the band stop filter on or off.
- On: The band stop pass filter process is performed according to the high/low cut-off frequency settings, etc.
- Off: This turns off the band stop filter.

B. High Cut-off Frequency (Hz): This is used to set the high cut-off frequency value.

C. Low Cut-off Frequency (Hz): This is used to set the low cut-off frequency value.

D. Coefficient: After setting the high/low cut-off frequency values, click on the "Simulate" button to indicate the coefficient value for the band stop filter.

e.g. the coefficient value when the high cut-off frequency value is 20 and the low cut-off frequency value is 10:
① [0] : 0.986304380844611
② [1] : -1.96918748914341
③ [2] : 0.972608761689222

E. Simulate button: The signal data values read in real-time or based on the file data according to the high/low cut-off frequency values are band stop filtered and displayed as a red line on the upper graph. The LED button will turn blue. (In case the low pass filter was applied beforehand, they will be applied simultaneously.)

F. The band stop filter application, order and cut-off frequency values are transmitted to the WTM device. If the transmission is successful, the LED button will turn green.

8.1.4. Read Filter
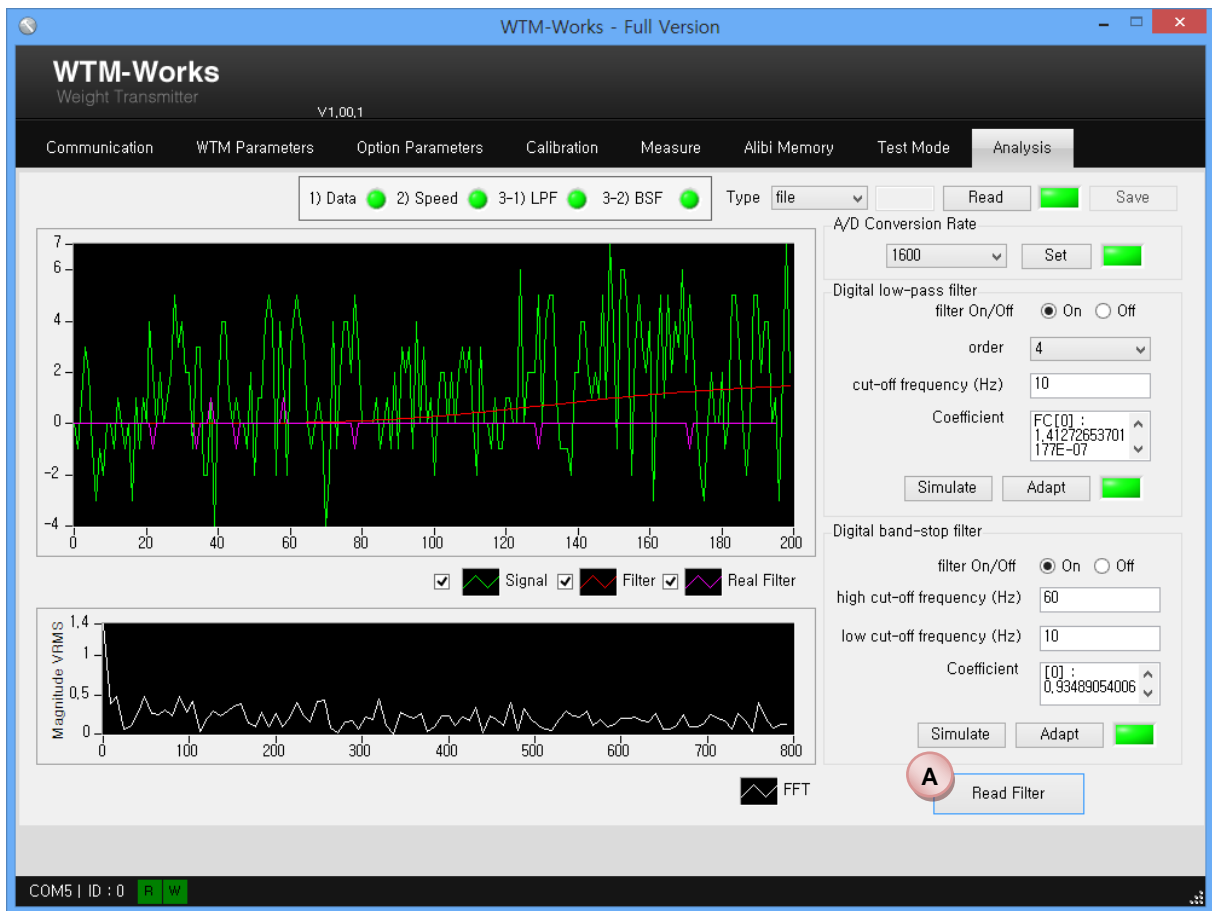
A. Read Filter button: The filtered signal obtained by applying low pass or band stop filter on the row data read as a file or real type will be displayed as a purple line on the upper graph. (However, the "Read Filter" button should be clicked after applying the Low Pass Filter or Band Stop Filter.

8.2. Filter Application Method
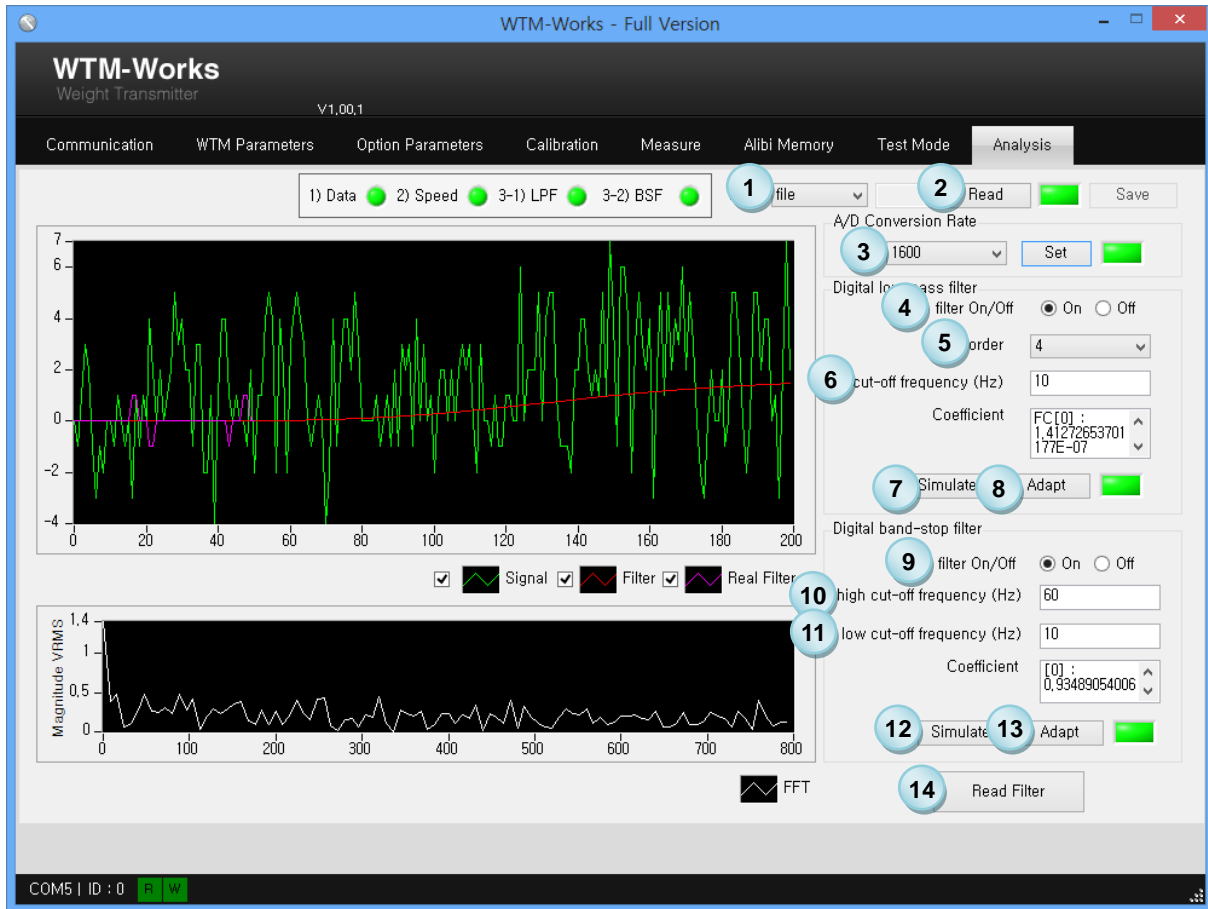
1. Set the data type (choose between file and real data. In case of choosing real data, the duration must be set.)
2. Click on the [Read] button. The signal will be indicated on the upper graph in yellow, and the FFT values will be indicated in white.
3. Set the sampling frequency value, and click on the [Set] button.
4. Turn on the low pass filter.
5. Set the order.
6. Set the cut-off frequency.
7. Click on the [Simulate] button. The signal will be indicated on the upper graph in red, and the LED button turn blue. The coefficient value will be displayed.
8. Click on the [Adapt] button. The data will be transmitted to the WTM device. If the data are applied properly, the LED button will turn green.
9. Turn on the band stop filter.
10. Set the high cut-off frequency.
11. Set the low cut-off frequency.
12. Click on the [Simulate] button. The signal will be indicated on the upper graph in red, and the LED button turn blue. The coefficient value will be displayed. (Because the low pass filter was applied beforehand,

both the low pass filter and the band stop filter will be applied simultaneously. In case the user wishes to apply only the band stop filter, the low pass filter should be turned off.)

13. Click on the [Adapt] button. The data will be transmitted to the WTM device. If the data are applied properly, the LED button will turn green.
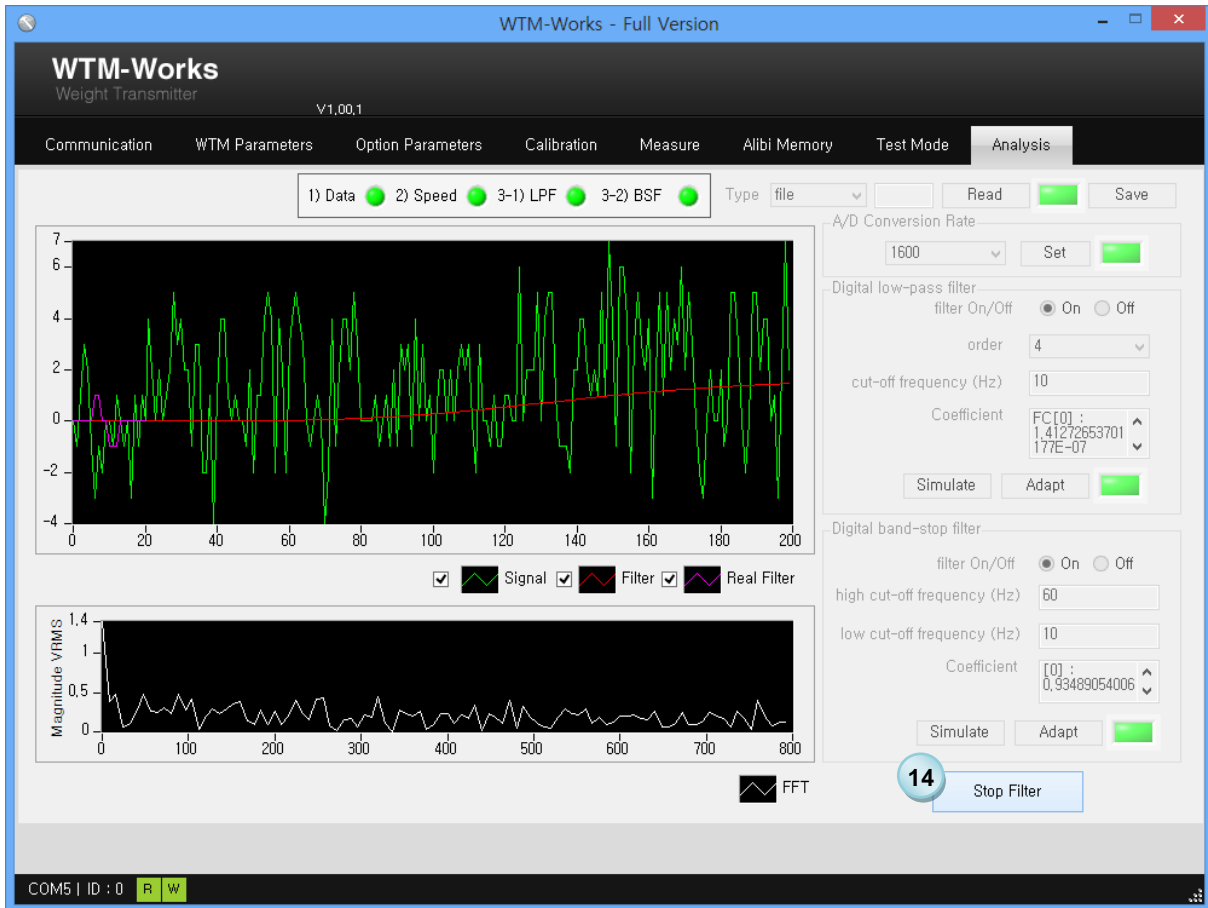
14. Click on the [Read Filter] button. The filtered signal will be displayed on the upper graph in purple, and the [Read Filter] button will be changed to a [Stop Filter] button. Click on [Stop Filter] to stop obtaining data in real-time.

End.