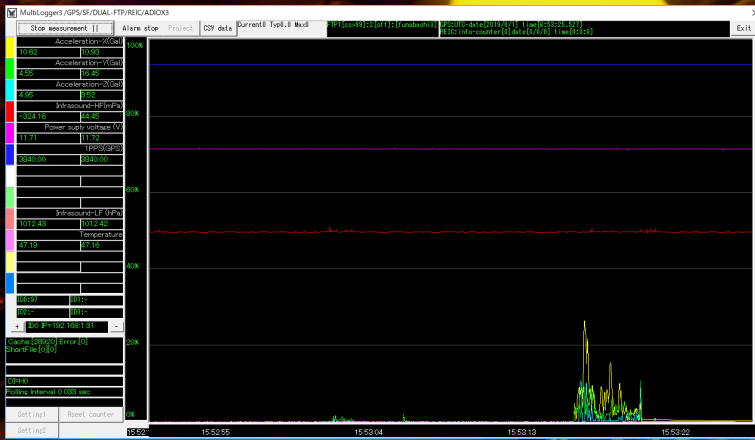


Multifunction-I/O XIII



Data logger software MultiLoggerX3 user manual

Update 2019-9-24

SAYA Inc.

Table of contents

1. Overview	2
2. Installation and first work	3
3. Startup and termination	4
4. Initialization (setting 1)	4
5. Initialization (setting 2)	7
6. Alarm mail and setting	9
7. Project setting	9
8. Operation (measurement and log)	9
9. Activation (USB Keyless Security)	11
10. Content, etc	12
11. Added features (Operation Lock)	12

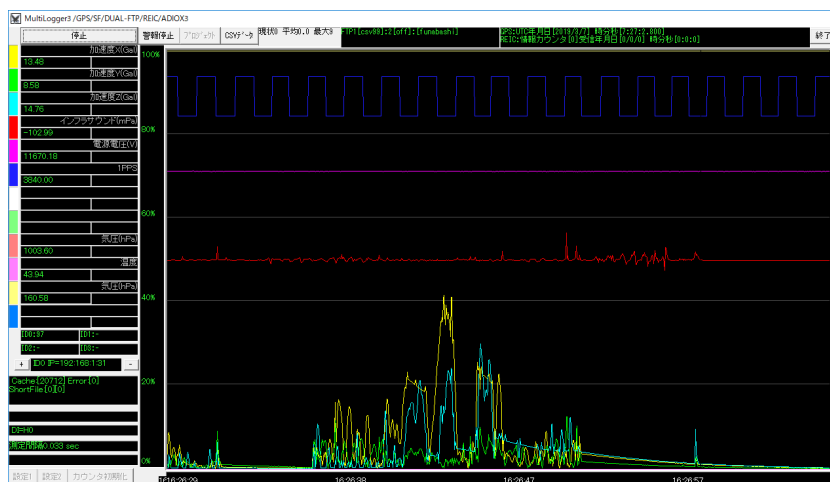
The following abbreviations are often used in the text.

- **ADXIII42LE-CORE, ADXIII42LE-TERM, ADXIII42LE-MI** are collectively called **ADXIII42LE**.
- **ADXIII42FE-CORE, ADXIII42FE-TERM, ADXIII42FE-MI** are collectively called **ADXIII42FE**.
- **The ADXIII01LE** series is collectively called **ADXIIIINF01**.
(※This software can not be used with RS232C models)
- **The ADXIII04LE** series is collectively called **ADXIIIINF04**.
(※This software can not be used with RS232C models)
- Furthermore, all these are collectively called **ADXIII*****.

1. Overview

This software is a data logger application for Windows for **ADXIII*****. This software is equipped with the following features. **(Note that multiple WiFi ad hoc communication models, ADXII 42 FE *** cannot be used)**

- Data acquisition can be performed with any number (1 to 4) of **ADXIII*****.
- Logger in CSV file format, trend graph, instantaneous value display, alarm, burnout monitoring of 4-20 mA and thermocouple, various settings.
- The target source of the logger is selected from analog 8ch, encoder counter / infrasound 4ch, digital input, GPS (infrasound).
- Automatically disconnects **ADXIII ***** lost due to power cut-off, communication interruption, failure, etc., temporarily removes it from the measurement group and continues measurement.
- Reconnect lost **ADXIII ***** regularly, and if successful, add to the measurement group and collect data.
- For each **ADXIII ***** channel,
 - I. Setting of sensor and input range (setting of counter type in case of pulse counter)
 - II. Scaling setting (converts the input value mV or mA to another physical constant)
 - III. Alarm setting (over, under, within range (in-range alarm), out of range (out-range alarm))
 - IV. Calibration position setting, and zero & span calibration can be performed from this software (Calibrator is required)
- FTP transfer is possible at maximum 2 places of CSV log
- E-mail function for alarm event
- Supported versions are Windows XP, Windows Vista, Windows 7, Windows 8, Windows 8.1, Windows 10



2. Installation and first work

[Introduction]

Requires a resolution of 1366 x 768 or higher. Also, when using alarm mail, ".NET Framework" is required, so please install it in advance. To use the FTP function of this software, you need a gateway (router) to the WAN and an FTP server. You need a mail account to use the alarm mail function of this software.

[Install(copy)]

There is no installer, so copy the following folder to any location on the target computer. Hereafter, these copy destination folders will be referred to as "application folders".

ADXIII42LE	64bit Windows	CDROM\MFIOX3¥Application64LE
ADXIII42LE	32bit Windows	CDROM\MFIOX3¥Application32LE
ADXIIIINF01	64bit Windows	CDROM\MFIOX3¥Application64INF01
ADXIIIINF01	32bit Windows	CDROM\MFIOX3¥Application32INF01
ADXIIIINF04	64bit Windows	CDROM\MFIOX3¥Application64INF04
ADXIIIINF04	32bit Windows	CDROM\MFIOX3¥Application32INF04
ADXIII42FE	64bit Windows	CDROM\MFIOX3¥Application64FE
ADXIII42FE	32bit Windows	CDROM\MFIOX3¥Application32FE

These folders have drivers and some initial settings, so they are easy to use.

The **ADXIII42LE**, **ADXIIIINF01** and **ADXIIIINF04** binaries are common and differ only in settings.

[Specify hardware address, match PC and network group]

Please set the IP address and port number of **ADXIII***** according to the hardware manual. Match the PC's address group (IP address, gateway, subnet mask) so that you can access this IP address. If the port you want to use is blocked by a firewall, unblock it.

[Set target board in configurator]

First, start the configurator "**MultiCardIDConf.EXE**" and set the IP address, port number, and whether to use the device or not.

Registration of **ADXIII***** to use.

Enter the "IP address" and "Port number" of **ADXIII***** to be used in single-byte numbers. Next, click on "Use of device" to turn it on, and click the "Save and exit" button to confirm that it is displayed in the [Status Window].

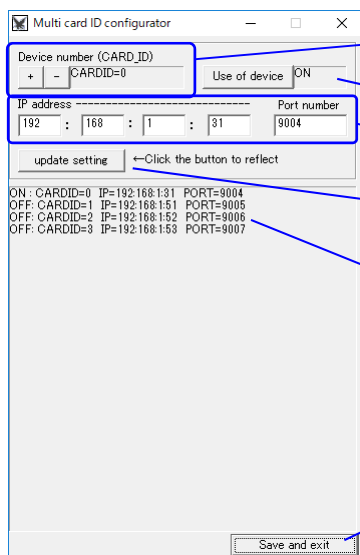
When using multiple units, change "Device number(CARD_ID)" and assign CARD_ID 0 to 3 sequentially. For the unused CARD_ID, "Use of device" must be turned off. If you accidentally turn on an unused IP, it will periodically go to access and repeat failures, which will make the operation heavy and disturb the Data acquisition of other **ADXIII*****.

Change and delete settings.

If you want to change it, change the "IP address" and "Port number" after setting the device number you want to change = CARD_ID. After that, click the "Save and exit" button to reflect it in the [Status Window] below. If you do not use registered **ADXIII*****, set Device No. = CARD_ID and then turn off "Use of device".

Setting end → Save.

If you want to save the above settings, please exit with the close (save) button. A message box of "Do you want to save?" will appear. Click "Yes" to save and exit. Click "No" to exit without saving.



It is **CARD_ID**. The unique number assigned to the device is 4-27. The following IP address, port number, and setting of device use are given to this number.

Only devices that are ON here will be measured

Edit box for entering IP address and port number

By clicking this button, the above IP address and port number will be reflected. If you advance the device number without clicking this button, the settings will be lost.

[Status Window] The status of CARD-ID 0 to 3 is displayed here. It will be saved with this display

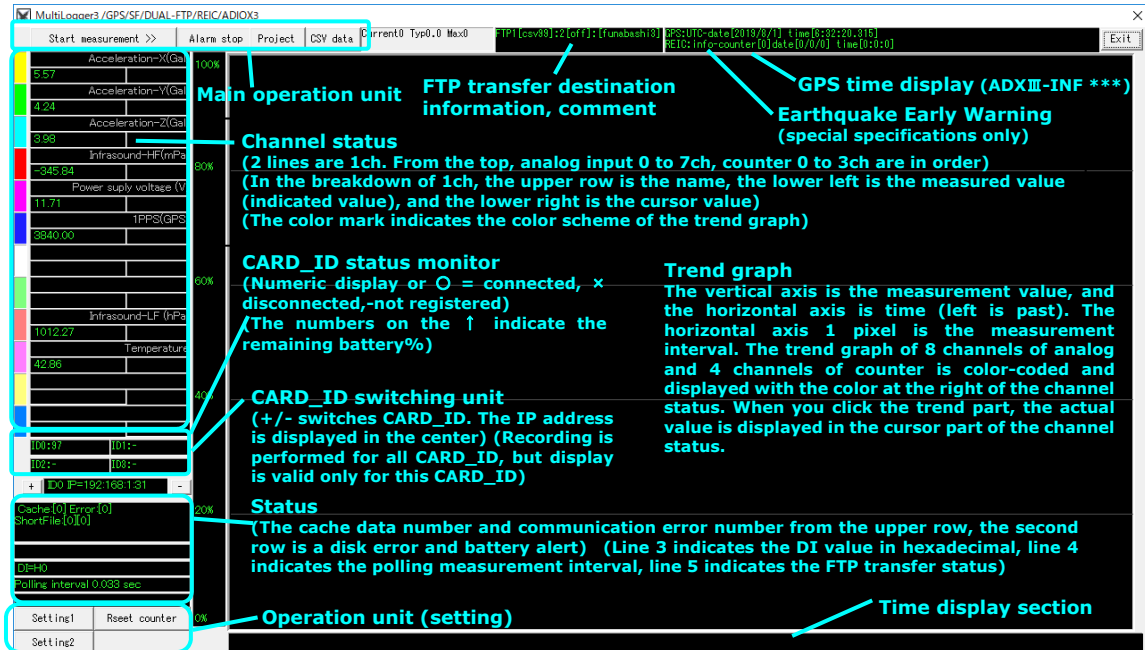
Exit button also serves as save. You can not save if you end with the ESC key etc. If you want to save, please exit from here.

setting file.

These are stored in a file called ConfId.cid in the same folder of the application. By backing up this file, you can restore even if there is a misconfiguration or PC crash

3. Startup and termination

Double-click MultiLoggerX3.exe to start it. The screen immediately after startup is as follows. The work of each part is as follows. In addition, about 5 seconds after startup can not be operated with the button grayed out (disabled).



Additional explanation about "CARD_ID switching part"

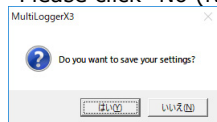
Although this software can handle multiple **ADXIII*****, one of them is selected to display the above indicated value and trend graph. Click the +/- button in this part to switch the CARD_ID to be displayed. Of course, log files are left even if CARD_ID is not displayed.

Additional description on "CARD_ID status monitor"

The status of **ADXIII***** will be displayed, and if the connection is successful, O or numerical value will be displayed. The numerical value expresses the power supply voltage or the remaining battery capacity in%. This function is always off at 100% in Infrasound sensor mode. If you do not register with "MultiCardIDConf.EXE", it will be x if you are lost. Even if it is x, it tries to reconnect regularly.

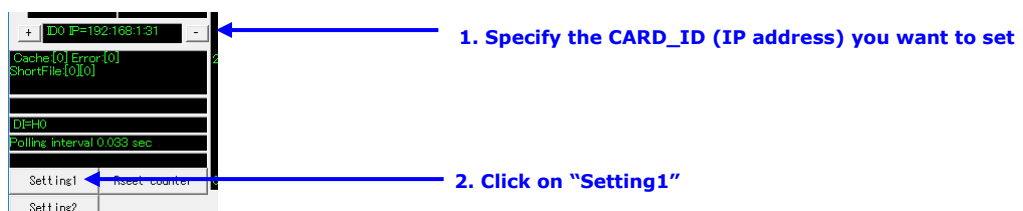
Additional explanation on "Operation"

- Start measurement >> : Start Data acquisition. It becomes a stop button during Data acquisition.
- Alarm stop : Stops playback of the alarm sound when an alarm occurs.
- Project : Opens the project setting dialog (project name, person in charge name, comment).
- CSV data : Open the folder where log file of CSV format is saved by Explorer.
- Setting 1 : Adjust the signal of **ADXIII***** of the current CARD_ID, and set the sampling interval at polling.
- Setting 2 : Set the alarm mail function, FTP transfer function, etc.
- Counter reset : Resets the counter.
- Exit : Exit the software. If you change in setting 1, the following dialog will appear. Click "Yes (Y)" only if you want to reflect it at the next startup. Please click "No (N)" otherwise.



4. Initialization (setting 1)

Firstly, no setting is done such as what kind of sensor is connected to each input, settings for scaling, alarms, etc. So, these need to be set. If multiple CARD_IDs are registered, select the **ADXIII***** that you want to set in the CARD_ID switching section, and click the "Set 1" button. In addition, in the case of **ADXIIIINF01**, necessary settings are included by default. So, you can skip setting 1 and use it as it is only if change is not necessary.



The "Signal adjustment settings" dialog pops up. At first, the button etc. are grayed out and setting is impossible including the edit box part. This can be awakened with a password. Enter "6136" in the top edit box and click the "Adjust lock release" button. Then the gray out of the button is released and it becomes possible to set.

3. Enter "6136"

4. Click on "Unlock"

5. Adjustable. (However, alarm settings and names can be changed without releasing the adjustment lock)

Setting for each channel

Perform steps 1 to 7 below. (Explanation is the next page)

procedure1

procedure2

Procedure3

procedure4

procedure5

procedure6

procedure7

procedure3B

procedure4B

<Procedure 1: Input channel setting>

Select an analog input channel or counter input channel. The input channel changes each time you click the "Channel +/-" button. The input channels are 12 channels / per unit in the order of AnalogInputCH = 0 to AnalogInputCH = 7 (analog signal) and CounterCH = 0 to CounterCH = 3 (counter / infrasound signal) from the beginning.

<Procedure 2: Setting of sensor type>

Select the sensor type (input format) for each input channel set in step 1. Click the "Sensor Type +/-" button to switch the sensor type. The sensor types are as follows. (Peach: Temperature sensor , Green: Voltage bipolar , Orange: voltage unipolar , Light blue: unused , Purple: Infrasound related)

[Analog input: AnalogInputCH = 0 to AnalogInputCH = 7]

Thermocouple-K	Thermocouple-J	Thermocouple-E	Thermocouple-T	Thermocouple-R	Thermocouple-S	Thermocouple-N	Thermocouple-B
Thermocouple-K*	Thermocouple-J*	Thermocouple-E*	Thermocouple-T*	Thermocouple-R*	Thermocouple-S*	Thermocouple-N*	Thermocouple-B*
Pt100	JPt100	±10mV	±100mV	±1V	±10V	4-20mA(500Ω)	4-20mA(350Ω)
4-20mA(47ΩOnBoard)	4.1V-unipolar		Not-used	Accelerometer(AI0-2)			
Sound level meter(Z)/INF01(AI3)			Barometer / INF01(AI4)			Infrasound-HF/INF04(AI3)	

- * Pt, JPt are platinum resistance temperature detector
- * Infrasound auxiliary sensor is displayed only when Infrasound mode is set to valid in setting 2.
- * The thermocouple with * has a narrow band and low noise level.
- * Except for acceleration, sensor layout differs between ADXIII-INF01 and ADXIII-INF04.

[Counter input: CounterCH = 0 to CounterCH = 3]

4x encoder counter (Z not used)	4x encoder counter (Z used)	2x encoder counter (Z not used)
2x encoder counter (Z used)	1x encoder counter (Z not used)	1x encoder counter (Z used)
up / down counter (Z not used)	up / down counter (Z used)	Infrasound DC /INF01(CTC0)
Infrasound-AC/INF01(CTC1)	Temperature sensor/INF01(CTC2)	Not-used
Infrasound-LF/INF04(CTC0)	Temperature sensor/INF04(CTC1)	

If you set this to unused, the corresponding channel will be excluded from measurement and will not be recorded in the CSV log file.

* If there is a designation such as (CTC0) or (AI3) at the end of letter, it can be used only with the input IO channel.

<Procedure 3: Adjustment of calibration position>

[In the case of an analog signal: AnalogInputCH = 0 to AnalogInputCH = 7]

You can change the zero calibration position and span calibration position. Write the new calibration position in half-width alphanumeric characters in the edit box. If the default is OK, this operation is not necessary.

<Procedure 3B: Adjustment of calibration position>

[In the case of pulse (counter): Counter CH = 0 to Counter CH = 3]

Enter the physical quantity per pulse count. Pulse count value × this value is the measured value.

<Step 4: Scaling>

[In the case of an analog signal: AnalogInputCH = 0 to AnalogInputCH = 7]

The scaling function can be used with ± 10mV, ± 100mV, ± 1V, ± 10V, 4.1V, 4-20mA (500Ω), 4-20mA (350Ω), 4-20mA (47ΩOnBoard), and 4.1V unipolar input formats. For example, for "4-20 mA", "Input" "Upper" is 20 and "lower" is 4, but if "Upper" after conversion is 350 and "lower" is "0", 4-20 mA is converted to 0-350 ". It will be recorded and displayed. To enable scaling, click the Settings button and turn on the static text. This setting is the upper limit value and lower limit value of the trend graph in the case of temperature. The temperature sensor which is compatible with **ADXIII42LE** and **ADXIII42FE** is useful for displaying a specific range because the input range is very wide, over 1000° C.

<Procedure 4B: Limitation of Trend Display Range of Pulse Counter>

[In the case of a counter: CounterCH = 0 to CounterCH = 3]

Set the upper limit of the trend graph. The lower limit is always 0. The counters of **ADXIII42LE** and **ADXIII42FE** have 32 bits and can count from 0 to 4294967294. But it is too wide, so use it when you want to narrow the range.

<Procedure 5: Name>

Each time you click the "Off" button on the screen, it changes as follows. "Over", "Under", "In Area (In Range) (In Range Alarm)", "Out of Area (Out Range) (Out Range Alarm)", "2 steps". An alarm occurs in the following cases. If over exceeds the value of the edit box "upper", If the under is smaller than "lower", The in-range is in the range of "upper" to "lower", The out range is out of the range of "upper" to "lower". An alarm occurs in the following cases. If over exceeds the value of the edit box "upper", If the under is smaller than "lower", The in-range is in the range of "upper" to "lower", The out range is out of the range of "upper" to "lower. Two steps of alarm. "Attention = Display Yellow" if it exceeds lower. "Warning = indication red" if it exceeds upper During operation, when an alarm occurs, the alert status will display an alarm notification and beep sound will be made.

<Procedure 6: Name>

Please enter the signal name.

<Setting to other CARD_ID>

If you only want to set up first, perform steps 1 through 6 on all channels. If you have more **ADXIII*****, please do these settings for all CARD_ID. Close this dialog with the close button to set other CARD_ID. Change the CARD_ID on the main screen and click the "Setting" button.

<Procedure 7: Calibration>

[Analog signal only: AnalogInputCH = 0 to AnalogInputCH = 7]

The **ADXIII42LE** and **ADXIII42FE** can perform calibration including signal sources. You can also calibrate the external inputs of **ADXIIIINFO *****. Specify the channel to be calibrated in step 1, enter the zero calibration value from the sensor or calibrator, and click the "Zero calibration start" button. Then enter span calibration

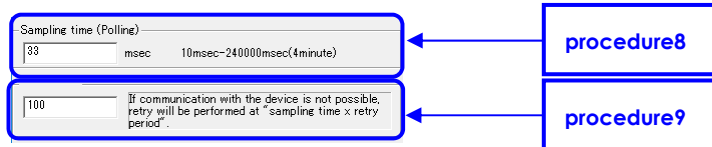
value from sensor or calibrator and click "Span calibration start" button. The measured value is displayed in "Selected channel measured value" at the top of the dialog, so check it. Since the zero and span calibrations are mutually dependent, repeat this operation (zero calibration to span calibration) to make the accuracy accurate. If you accidentally reversed the zero and span, or if you calibrated with a large deviation, click the "calibration-cancel" button to return the calibration value to the default state.

※ If you calibrate using the calibrator, you can not correct the sensor error)

Perform these tasks on the channels that need calibration. If there is more than one ADXIII***, perform the calibration settings required for all CARD_IDS.

<Common settings>

Perform steps 8 to 10 below. These are common items regardless of channel or CARD_ID.



<Procedure 8: Setting of capture cycle>

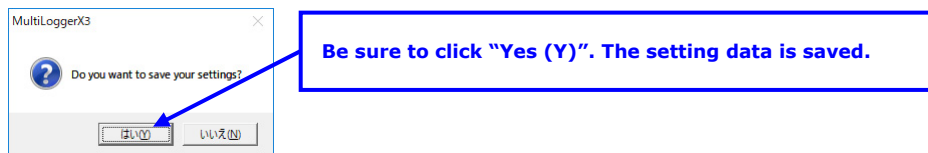
Set the capture cycle (msec) for polling. The free run before starting will use this value even when ring buffer is used. The value can be set between 10msec and 24000msec (4 minutes). The minimum sampling time that works as theoretical depends on the model and specification environment.

<Procedure 9: Retry cycle>

Specifies the interval for retrying (reconnecting) ADXIII * that has been lost (due to no response because of no power-off or communication interruption etc). This value × capture cycle will be the retry interval (hour). If the retry fails, there will be a time when there is no response, so a short number will interfere with the measurement, and a long number will make the recovery time longer.

Reflecting settings

Close this dialog with "Close button" and move to the main screen to immediately reflect the settings. However, the previous settings are still only in memory. It is necessary to terminate the application once to reflect these in the configuration file. On the main screen, click the "Exit" button to exit. At this time, a dialog box "Do you want to save your setting?" appears at the end, so be sure to click "Yes (Y)".



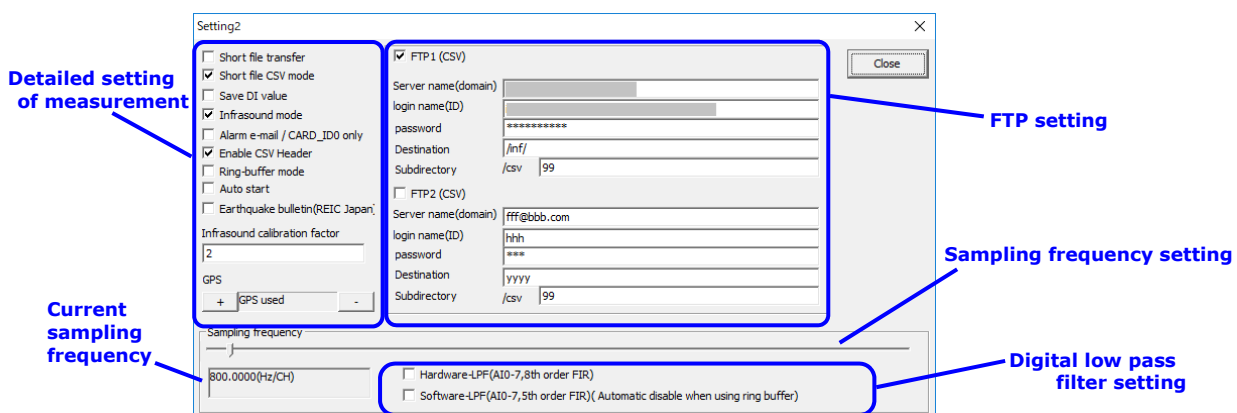
Configuration file backup

Setting data including calibration value is a file called ConfMlt.scp. You would be prepared by backing up these files.

5. Initialization (setting 2)

Setting 2 dialog

The setting 1 in the previous chapter is mainly related to the signal adjustment for each CARD_ID and each channel, but this setting 2 is for setting other peripheral functions. Click on the "Set 2" button. The following dialog will pop up.



<Detailed setting of measurement>

Short file transfer

The CSV log file accumulates 4096 samples for each channel and transfers them by FTP. Because of this, it takes time. When this check is turned on, a short file of 64 samples is generated and transferred by FTP, which is effective for highly real-time applications. (FTP transfer of normal CSV log file is also processed in parallel) Since this short file is always overwritten with the fixed

	file name shot_file.csv or short_file.bin, there is no past log. Too much frequent uploads will be blocked by the FTP server. Depending on the server, a minimum interval which is over 10 seconds is required.
Short file CSV mode	As mentioned above, it is ON when making a short file into CSV format, it is OFF when making it into binary format.
Save DI value	Check to add digital input (DI0-15) to the CSV log file.
Infrasound mode	Infra Sound Sensor Turn on when using the ADXIIIINF01 / ADXIIIINF04 .
Alarm e-mail / CARD_ID0 only	Check to send an alarm by email. Mail transfer setting is performed by ADioxSmtModule.exe that is started up simultaneously with MultiLogger X3 startup.
Enable CSV header.	The first three lines of header information for the title, project name, and signal name are included in the CSV log file. However, when this check is turned off, the header is skipped. (Because header gets in the way in file concatenation)
Ring buffer mode.	ADXIII*** has the following two data acquisition modes. If this check is ON, it will be in ring buffer mode for high speed data acquisition. Block polling Analog input 8CH, counter input 4CH, digital input, temperature, GPS (infrasound sound) is acquired in 1 sample at a time. Data is collected by polling according to the setting 1 capture cycle. Please use this to collect data on multiple machines. Ring buffer Analog input 8ch x 128 samples, counter input 4ch x 128 samples, digital input x 1 sample, temperature x 1 sample, GPS (infrasound sound) x 1 sample are collected together. By storing input data in buffer memory on the hardware and transferring it at once, high speed and low load transfer can be realized. Digital input, temperature, and GPS use the value of time at the beginning of the buffer. During transfer, Data acquisition continues with another buffer memory. Data is collected at setting 2 sampling frequency. It can not be used for Data acquisition with multiple machines. The value is displayed by block polling until the Data acquisition start. * In the ADXIIIINFO ***, infrasound input is assigned to either analog input or counter input.
Auto start	After startup, Data acquisition will start automatically without clicking the start button.
Infrasound calibration factor	Used for sensitivity calibration of ADXIIIINF01 . Please do not touch normally.
GPS	Select whether to use GPS information of ADXIIIINF01 / ADXIIIINF04 or not.

<Sampling frequency setting>

In ring buffer mode, this is the sampling frequency that writes data to buffer memory. The analog input (A/D converter), counter input, and infrasound input operate at this sampling rate. (The actual A/D conversion part is 8-ch multiplex operation, so it operates at 8 times this.) Block polling (ring buffer mode OFF) is the sampling frequency of the A/D converter. In this case, please make it shorter than the capture cycle of setting 1 (high frequency because it is frequency display). By moving the slider left and right with the mouse, you can make initial adjustments, focus on the slider and fine-tune it with the keyboard "?".

<Digital low pass filter setting>

Hardware LPF (AI0-7, 8th-order FIR)	Switches on / off the 8th-order FIR digital filter implemented in hardware. You can use either ring buffer or polling method.
Software LPF (AI0-7, 5th-order FIR)	Switches on / off the 5th-order FIR digital filter implemented in this software. It can be turned ON only for polling. Even if it turns on in the ring buffer, it is not processed.

<FTP setting>

This setting is for transferring CSV log files to an FTP server. Files are transferred to "destination directory ¥ csv arbitrary numeric value" (this is called identification number) under the domain. When uploading from multiple sites, assign identification numbers not to conflict. You can set up two FTP transfer destinations. The CSV log file to be transferred is the same as the one stored on the PC. If the FTP transfer fails, it will retry several times, and if not, it will give up.

FTP1 (CSV)	Check this when transferring a CSV log file to FTP server 1.
FTP2 (CSV)	Check this when transferring a CSV log file to FTP server 2.
Server name (domain)	Please specify a server name.
login name (ID)	Specify a login name (such as account name or ID) to the server.
password	Specify a password for authentication at login.
Destination	Specify a directory (folder) to transfer data.
Subdirectory	Please specify an identification number.

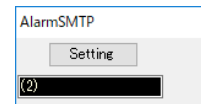
Reflecting settings

You need to restart MultiLogger X3.exe to apply the settings.

6. Alarm mail and setting

<Mail forwarding support application>

If alarm mail is enabled in setting 2, you can send mail when an alarm occurs. In this case, the sub-application ADioxSmtpModule.exe is launched at the same time when MultiLogger X3.exe is launched. This app is a helper app for mail forwarding and starts in minimized state. To view this app, please click AlarmSMTP (ADioxSmtpModule.exe) from the task bar. The launch screen of the app is as shown on the right. By clicking on the "Settings" button, the following settings screen will open.



The setting consists of the above 3 blocks

- Destination setting : You can register up to 4 e-mail addresses to which e-mails are sent.
- Source setting : It is the setting of the sending mail server. The contents are the same as general SMTP mail settings.
- Trigger event setting : Set the trigger event that triggers sending mail. Specify the alarm cause with << >> at the top. There are 13 alarm factors. AI 0 to 7 (analog input) and CTC 0 to 3 (counter input). (DI alarm cannot be used at the moment)
The following 3 settings are set to all 13 items respectively.
 - : Set whether to send an email when the alarm cause becomes an alarm state in the action. (Turn alarm mail on / off)
 - : The "Subject" is an item that will be the subject of the email.
 - : The "Text" is an item that will be the text of the email.

If you want to save the settings and exit, click the "Save" button. If you want to exit without saving the settings, click the "Cancel" button.

7. Project setting

Click the "Project" button and the following dialog will appear. Please fill in the required items. This content is reflected in the CSV log file, so it can be used later for reference. If you uncheck "Enable CSV header" in setting 2, the comment is not reflected in the CSV log file, but the last comment is added to the file name, so it can be used for identification by FTP transfer etc. In this case, please use half-width alphanumeric characters for comment because it is used for FTP transfer.

8. Operation (measurement and log)

Once initialization is complete, the operations required for operation are minimal and very easy.

start testing

When the "Measurement start" button is clicked, the button name changes to "Stop" and trend graph drawing and CSV data log operation start. During measurement, the "Project", "Setting 1", "Setting 2", and "Initialize Counter" buttons are grayed out.

Stop

Click the "Measurement stop" button. It changes to the "measurement start" button and stops the trend and CSV data logger operation.

Turn off the alarm sound

Click the "Alarm Stop" button. The alarm playback is canceled and the button name changes to "Alarm start".

Enable alarm sound

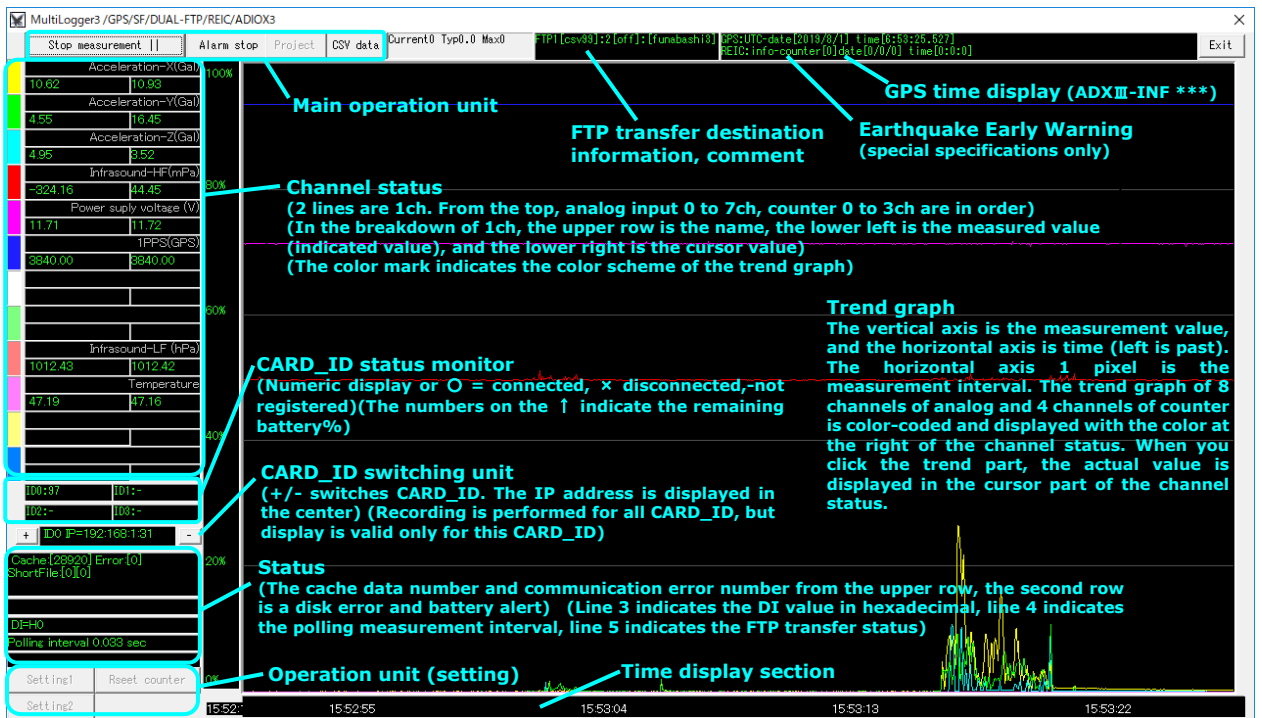
If you want to activate the alarm while the alarm is stopped, click the "Alarm start" button. The name changes to "Alarm Stop".

I want to see the log

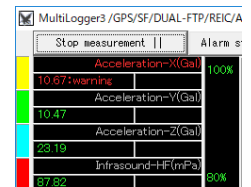
Click the "CSV data" button, Explorer will run and the CSV log file storage folder will open.

Change CARD_ID

To change the measurement display or trend display to another CARD_ID, click the "+/-" button to set it as the desired CARD_ID.



When an alarm occurs, the measured value turns red and the alarm sounds as below. The text (: Alarm) is added next to the measured value. Even if the alarm condition disappears, the red display may continue for several seconds. In addition, only the alarm of the ID of the screen that is currently active (displayed).



Infrasound mode.

The default configuration file in **ADX III INF01** is pre-assigned as follows. AIO-5, acceleration X, acceleration Y, acceleration Z, noise Z, barometric pressure, 1 PPS. Also infrasound DC, infrasound AC, infrasound (chamber) temperature in CTC 0-2. The default configuration file in **ADX III INF04** is pre-assigned as follows. AIO-5, acceleration X, acceleration Y, acceleration Z, Infrasound HF, power supply voltage, 1 PPS. In addition infrasound LF, infrasound temperature to CTC 0-1. All are GPS on by default.

CSV log file.

CSV log files are saved in the LogFile folder under the application folder. This CSV file saves 8 channels of analog input, 4 channels of counter / infrasound input, and valid channels among digital input. Data is organized into one file every 4096 samples. If the sensor type is set to "unused" in setting 1, and if setting is made not to perform DI logging in setting 2, the corresponding channel is not recorded. The file name has the following naming convention. (Red letter is variable number)

LogFile¥YYYY_MM_DD¥IDii_hh_mm_ss.csv
 (ii=CARD_ID number, YYYY=Year, MM=Month, DD=Day, hh=Hour, mm=minute, ss=second)

The contents of the CSV file are as follows.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	MultifunctionI/O Logger															
2	Infrasoundtest1 chiba-funabashi															
3	Hour-min	Second	Accelerat	Accelerat	Accelerat	Infrasound	Power su	1PPS/GP	Infrasound	Temperat	Year	Month	Dat	Hour	Minute	Second
4	16:08	18.608	4.29	4.29	2.86	-259.113	11.7257	3839.996	1012.364	47.69	2019	8	1	7	8	17.925
5	16:08	18.654	4.1368	3.8304	2.809	-282.964	11.7227	3839.996	1012.364	47.7	2019	8	1	7	8	18.025
6	16:08	18.709	5.1583	3.6772	2.86	-302.479	11.7202	3839.996	1012.364	47.7	2019	8	1	7	8	18.088
7	16:08	18.742	3.3197	5.7711	2.86	-276.459	11.7172	3839.996	1012.364	47.7	2019	8	1	7	8	18.118
8	16:08	18.771	3.3707	4.6475	2.809	-302.479	11.7132	3839.996	1012.364	47.7	2019	8	1	7	8	18.144
9	16:08	18.804	3.4218	3.575	2.86	-311.152	11.7227	3839.996	1012.365	47.7	2019	8	1	7	8	18.174
10	16:08	18.84	3.9325	4.6475	2.86	-308.984	11.7072	3839.996	1012.365	47.7	2019	8	1	7	8	18.228
11	16:08	18.875	5.609	3.8815	2.809	-335.003	11.7127	3839.996	1012.364	47.7	2019	8	1	7	8	18.26
12	16:08	18.906	2.86	5.1583	2.809	-324.162	11.7152	3839.996	1012.364	47.7	2019	8	1	7	8	18.287
13	16:08	18.942	4.6475	6.1797	2.86	-328.499	11.7187	3839.996	1012.363	47.7	2019	8	1	7	8	18.328
14	16:08	18.974	4.7497	4.954	2.809	-337.172	11.7172	3839.996	1012.364	47.7	2019	8	1	7	8	18.357
15	16:08	19.001	3.0643	3.8304	2.86	-308.984	11.7052	3839.996	1012.364	47.7	2019	8	1	7	8	18.381
16	16:08	19.034	5.9754	4.7497	2.9111	-285.132	11.7172	3839.996	1012.364	47.7	2019	8	1	7	8	18.428
17	16:08	19.069	4.3411	2.9622	2.86	-272.123	11.7202	3839.996	1012.364	47.7	2019	8	1	7	8	18.46
18	16:08	19.103	4.7497	4.4433	2.809	-241.766	11.7107	3839.996	1012.363	47.7	2019	8	1	7	8	18.48
19	16:08	19.139	3.7793	4.6986	2.86	-233.093	11.7162	3839.996	1012.362	47.7	2019	8	1	7	8	18.526
20	16:08	19.176	2.9111	4.8518	2.86	-222.252	11.7187	3839.996	1012.362	47.7	2019	8	1	7	8	18.561
21	16:08	19.201	5.8733	4.7497	2.86	-207.073	11.7022	3839.996	1012.362	47.7	2019	8	1	7	8	18.584
22	16:08	19.25	5.8733	4.954	2.809	-224.42	11.7242	3839.996	1012.362	47.7	2019	8	1	7	8	18.626
23	16:08	19.305	4.3922	4.29	2.86	-202.737	11.7212	3839.996	1012.364	47.7	2019	8	1	7	8	18.677
24	16:08	19.332	3.7283	6.7926	2.9111	-228.756	11.7242	3839.996	1012.364	47.7	2019	8	1	7	8	18.728
25	16:08	19.367	4.5454	4.5454	2.86	-254.776	11.7082	3839.996	1012.363	47.7	2019	8	1	7	8	18.76
26	16:08	19.403	3.9836	4.4029	2.86	-272.123	11.7187	3839.996	1012.362	47.7	2019	8	1	7	8	18.792

The data after the 4th line is the actual data, and the header of the top 3 lines will be cut if the "Enable CSV header" check in setting 2 is turned off. If you exit the app with less than 4096 samples, the number of samples will be adjusted to the number of remaining samples.

Line 1 Title

Line 2 Project Name, Contact Person Name, Comment

Line 3 Measurement name

4th line or later Actual data (from left: hour and minute → second (two digits of decimal point) → each signal is arranged in order. Each signal has analog input 0 to 7 from the left. It arranges in order of counter / infrasound input 0-3, digital input. (Valid signal only) The measured value will be --- at 4-20mA or when the thermocouple burns out. In the case of infrastructure sound, GPS time is recorded at the end of measurement data as follows. These are UTC times. The first two columns of time, file generation time is PC time, so there is a difference from GPS time.

Short file (csv)

The short file is a CSV file in which the header of the first three lines is always deleted from the above CSV log file, the time in the first and second columns is replaced with a serial number, and the number of lines per file is reduced to 4096 → 64. The file name is overwritten at any time by short_file.csv. The serial number is 32 bits and it takes a lot of time to make a circuit take a round.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	384	1.9918	1.5322	2.9622	53.8611	102.2932	3455.99	-995.638	-20854.3	33.3247	2018	10	13	16	18	24.81
2	385	1.8386	1.5322	2.9622	53.7761	102.2964	3455.99	-977.588	-20825.4	33.3272	2018	10	13	16	18	27.86
3	386	1.7364	1.8386	2.7579	53.3311	102.298	3455.99	-986.974	-20836.9	33.3248	2018	10	13	16	18	30.939
4	387	1.8897	1.9918	2.5536	52.6811	102.298	3455.99	-991.306	-20844.9	33.3241	2018	10	13	16	18	34.047
5	388	2.0939	1.8386	2.5536	52.0861	102.2932	3455.99	-989.14	-20846.3	33.3261	2018	10	13	16	18	1.8
6	389	2.0939	1.6343	2.6557	51.686	102.2837	3455.99	-989.862	-20844.9	33.3249	2018	10	13	16	18	4.969
7	390	1.7875	1.6854	2.7579	51.416	102.2757	3455.99	-994.194	-20845.6	33.3225	2018	10	13	16	18	8.167
8	391	1.4811	1.8386	2.809	51.206	102.2757	3455.99	-1011.52	-20853.5	33.3211	2018	10	13	16	18	11.407
9	392	1.4811	1.8897	2.809	51.1535	102.2837	3455.99	-1025.96	-20876.6	33.3229	2018	10	13	16	18	14.693
10	393	1.8386	1.7364	2.809	51.3135	102.29	3455.99	-1025.96	-20881	33.3246	2018	10	13	16	18	18.009

Short file (binary)

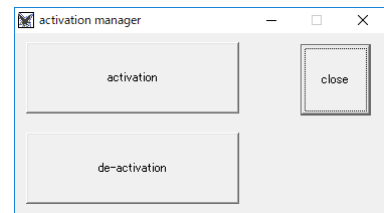
If you select a binary short file, each cell of short_file.csv is saved as binary data as it is. The file name is short_file.bin. Column A (serial number) is 32 bits unsigned int, measurement data of columns B to J is double, GPS time on columns K to O (except seconds) is 32 bits unsigned int, GPS seconds in column P are double. Repeat this structure 64 times.

9.Activation (USB Keyless Security)

Although depending on the model, MultiLogger X3.exe needs a USB guard key, it can be operated as a guard key by activating the PC itself without activation. Follow the steps below to activate and deactivate.

[Activation]

After recognizing the USB guard key, launch active_pc.exe in the installation destination folder and click the "activation" button. The activated computer behaves as if there is a guard key even if the guard key is removed. During this time, the guard key is disabled. Do not format or delete files, as guard keys will be required for the next deactivation.



[De-activation]

To restore the normal "guard key" operation, attach the "guard key" to the computer, start "active_pc.exe" and click the "de-activation" button. The "guard key" is now active and "activation" is possible again.

10. Cautions, etc.

<Product differences>

We strive to make this specification easier for users to understand, but if this specification differs from the product, the priority is given to product. In addition, the product will be prioritized in the same way for the subjective interpretation of this specification.

<Quality and Function>

We do not guarantee that the quality and function of this product will fit your intended use. Therefore, you are responsible for the selective introduction of this product, and the same applies to the use of this product and any direct or indirect damages resulting from it. Therefore, please fully verify it when incorporating it into the system.

<Version upgrade>

We offer version upgrade and correction of drivers and specifications by web, email, CDROM distribution etc. However, due to various circumstances of our company, we may not be able to take prompt action. In addition, these are not obligated to our company.

<Industrial property rights, copyright>

If there are problems with industrial property rights and copyrights of third parties due to the use of this product, we will not be liable for any issues other than our production and manufacturing issues. Please understand that. Also, without our permission, we prohibit reverse engineering of circuits, programmable device configuration data, on-board EEPROM, and driver software. We are not liable for any damages resulting from this.

<Purpose of use>

Please contact us when considering applications that require extremely high safety, such as medical devices that directly affect human life such as transportation equipment (cars, trains, ships etc.), traffic signal control, disaster prevention and crime prevention equipment, aircraft, space equipment, submarines, submarine relay equipment, nuclear power plants, military equipment.

11. Added features (Operation Lock)

Added "Operation Lock" function to prevent unexpected access to "Stop measurement Button" during measurement. When the "Operation lock" check box is set to ON, it cannot be stopped even if the "Measurement stop button" is clicked. Also, if the "Measurement stop button" is in focus and the enter key is pressed, it cannot be stopped.

