

Injection Mold Internal Measurement

*Molded Marshalling System* ■

# Instruction Manual

Model

## MPS08B

### pressure-measuring amplifier

- • Thank you for your purchasing a product of Futaba Corporation.
- To ensure safe and correct use of this product, read this instruction manual thoroughly and understand it before starting.
- After reading this manual, keep it so that you can take it out as soon as necessary.



#### With warranty

- The warranty is included in this manual.

Check the date of purchase, the name of the dealer, etc., and keep it in a safe place.

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※ Regarding the new function "Analog Voltage Output Mode" added from the Measurement Software Ver 1.2.0.0,  
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Analog Voltage Output Mode... Succession mode of out of production MPV04

# Introduction

## Features of this product

"Mold Marshaling System MPS08B" which uses strain gauge-type pressure sensors is a resin pressure measurement and monitoring system for injection molding manufactured by Futaba Corporation.

Pressure waveform observation, data storage, and alarm monitoring settings can be performed on the PC using the supplied measurement software.

- **Increasing the number of measurement points**

MPS08B can be connected up to 4 units. The number of measurement points can be increased up to 32.

- **Sensor sensitivity setting**

Sensitivity setting of the pressure sensor is easy. (Simply enter numbers and symbols.)

- **Automatic data saving**

The waveform and history data of each shot are automatically saved to the hard disk of the PC.

Data can be saved to a USB memory even when a PC is not connected. The stored data is in CSV format and can be easily loaded using commercially available spreadsheet software.

- **Alarm monitoring**

When an alarm occurs, it can be used to sort defective products by outputting a signal to the take-out robot.

13 alarm monitoring items can be set individually for each channel.

- **Template waveform**

The pressure waveform stored in the past is displayed on the screen as a "template waveform" and can be compared with the waveform being measured.

It is possible to grasp visually and in real time "waveform matching of molding condition", "pressure variation in mass production" and "pressure change when molding condition is changed".

- **Modbus interface**

This unit is compatible with Modbus compliant communication protocols. Measurement data and setting files can be uploaded to the factory network or the cloud using a commercially available gateway.

## **Additional functions and changes from previous model (MPS08)**

- MPS08B can measure 4 channels of pressure as standard. Up to 32 channels can be simultaneously measured by adding up to four MPS08B amplifiers and eight junction box "UJP04H/UCP04" and junction cable "WJP0430HB".
- Heat-resistant junction box UJP04H (L/R/C) and Junction box with cable storage space UCP04 can be used.
- MPS08B can also monitor alarms by standalone and the measured data can be saved to a USB memory.
- Compared with the previous model, the size was reduced to 40% by volume and weight. Magnet mounting is now possible.
- RS485 interface supports MODBUS communication protocols.
- By making the sampling period course, the measurement time can be set up to maximum of 120,000 seconds.
- 10 control signals can be connected for both input and output.  
The input signal to MPS08B can be selected from NPN open collector or PNP open collector.
- Added a mode to output measured values in analog voltage only. ( Succeeded from MPV04, which is no longer in production or sale)

# **Safety instructions**

These safety precautions are intended to prevent injury to yourself and others, as well as damage to property.

The precautions are indicated separately for "WARNING" and "CAUTION". Be sure to observe these precautions when using the product.



## **Warning**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



## **Caution**

Indicates a potentially hazardous situation which, if not avoided, could result in minor personal injury or property damage.



## **Warning**

- Do not disassemble or modify the product.

Failure to do so may cause a fire, electric shock, damage to the equipment or malfunction.

- Do not splash water on the sensor, amplifier, relay box, or relay cable.

Failure to do so may result in electric shock or short-circuit.

- Unplug the power cord from the power outlet before installing the equipment or connecting the cables.

Failure to do so may result in electric shock or malfunction.

- Do not use a cable with a broken wire or a damaged sheath.

Failure to do so may cause a fire, electric shock, damage to the equipment or malfunction.

- Use the supplied AC adaptor.

It may cause damage or malfunction of the equipment.



## **Caution**

- Protect the equipment to which this unit is connected by insulation using relays or grounding.

If a malfunction occurs in this unit, the connected equipment or system may be damaged.

- When used in combination with other equipment, consider the effect on this machine sufficiently.

Otherwise, the unit may not work properly, and the expected results may not be obtained.

- Before operating the machine, perform an operational check.

Failure to do so may cause equipment damage or malfunction.

# 1. System installation and wiring

## 1-1. Standard accessories

Before you set up the instrument, make sure that you have all the accessories.

The shape and the figure/name of the product may not match due to the specification change or the change of the set product.

 <p>Pressure measurement amplifier "MPS08B" 1 unit</p>	 <p>Heat-resistant junction box "UJP04H L/R/C" 1 unit</p>	 <p>Or Wiring storage type junction box "UCP04" 1 unit</p>
 <p>AC adapter "ES0024007 N-MVS08" x 1</p>	 <p>Heat-resistant junction cable (3m or 5m) "WJP0430HB" x 1</p>	 <p>LAN cable (2 m) "WCL0020" x 1</p>
 <p>Signal/I/O cable (3m) "WCI0030-D25P-Y N-MPS08B" 1 pc.</p>	 <p>Software CD-ROM "PPSB" 1 pc.</p>	 <p>Instruction Manual (Booklet) 1 pc.</p>
<p>Guarantee User Registration Sheet 1 sheet</p>		

## 1-2. System configuration

The basic system configuration of the mold marshalling system "MPS08B Series" is as follows.

Connect a strain gauge type pressure sensor to a junction box that can be connected to 4 channels and connect it to the amplifier via junction cable.

Connect the amplifier to the PC in which the measurement software is installed using LAN cable.

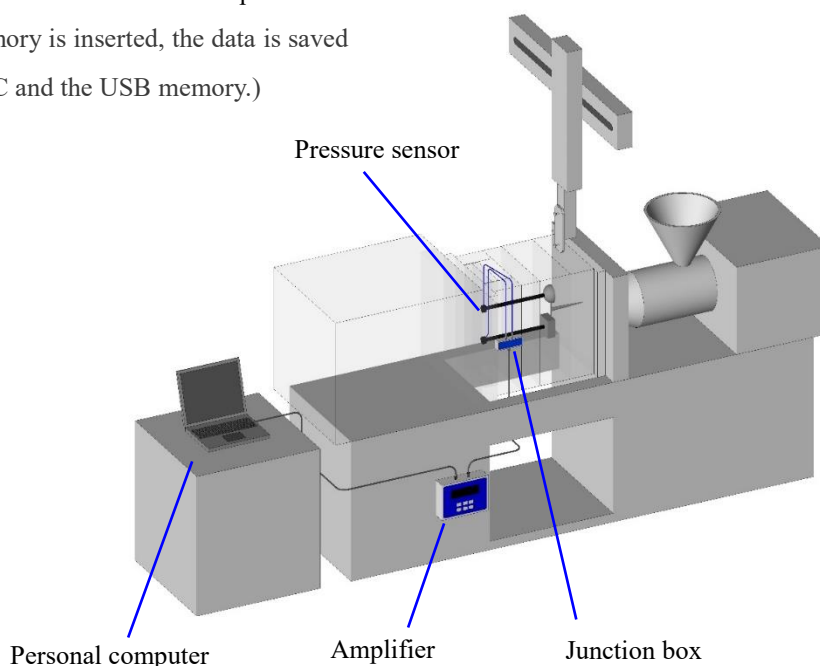
Measurement starts, alarm signal output, and alarm signal cancellation can be automated by using the supplied signal I/O cable and connecting to the machine and peripheral control equipment.

Pressure waveform measurement is also possible by connecting the optional voltage output cable to a commercially available data logger.

### (1) When connecting the amplifier (MPS08B) to a computer at all times

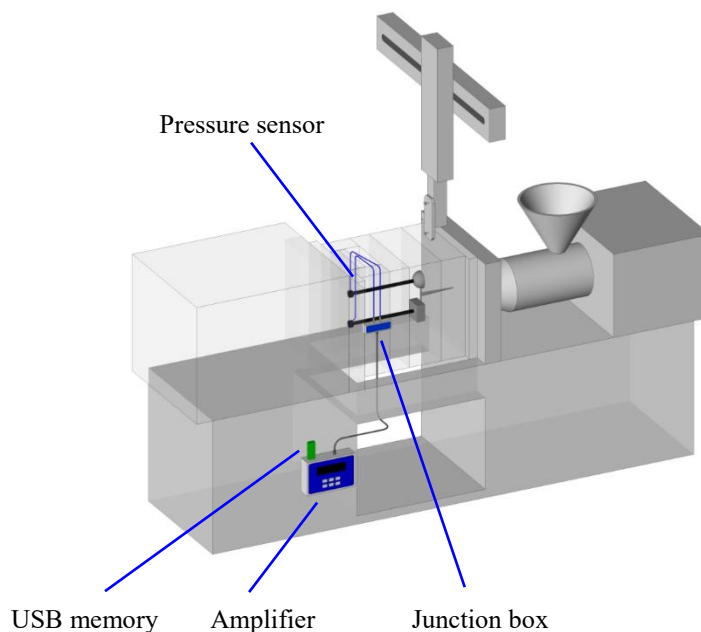
- Save the measurement data to a computer.

(If a USB memory is inserted, the data is saved in both the PC and the USB memory.)



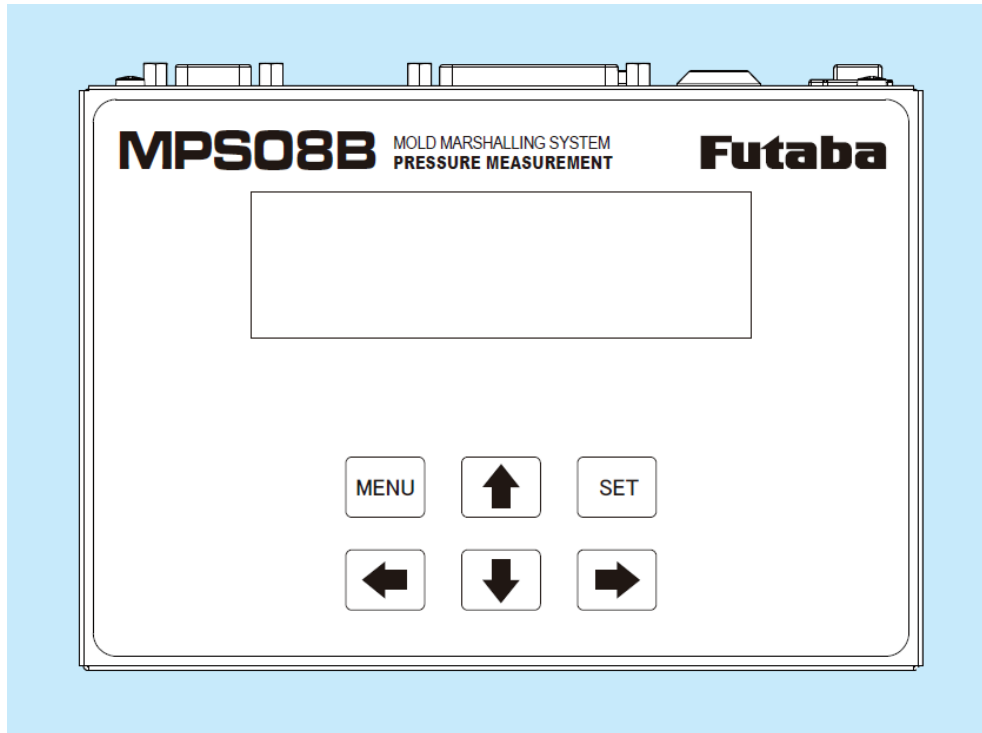
### (2) When using the amplifier alone (the PC is connected only when setting conditions)

- Saves the measured data to USB memory.



# 1-3. Names and functions of parts

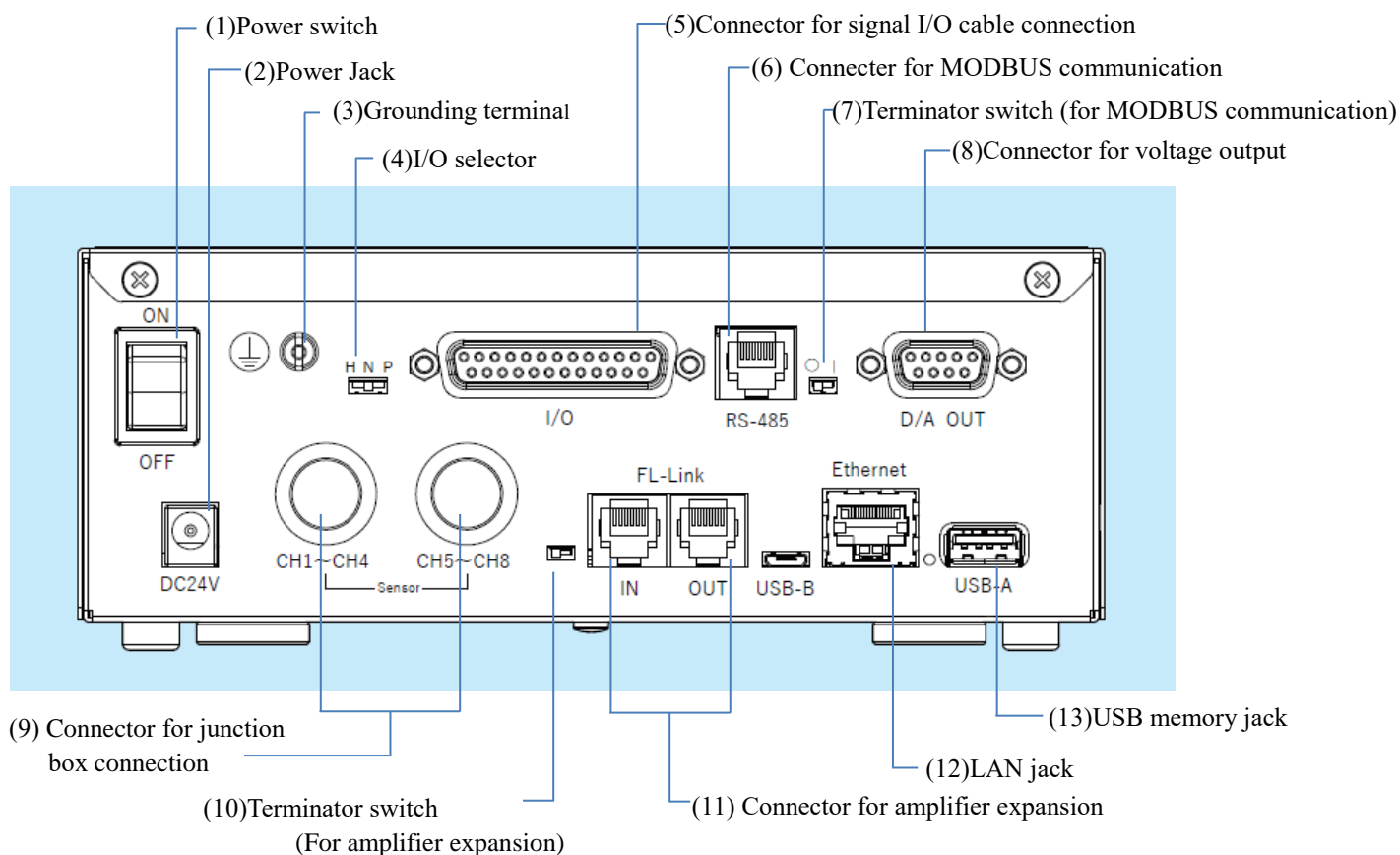
## 1-3-1. Display panel



Display panel	Displays the measurement status, setting file name, shot counter, setting conditions in the amplifier, etc.	
Operation key	「MENU」 : 「→」 / 「←」 : 「↑」 / 「↓」 : 「SET」 :	Switching of display contents. Cancels the changed value. Change Settings. Moving the cursor When changing the setting, change each selection. Normal: Confirms the changed setting. Monitor mode: Starts measurement as a manual trigger.



## 1-3-2. Connector layout



(1)	Power switch	Turns the power ON/OFF.
(2)	Power jack	Connect AC adaptor terminals.
(3)	Grounding terminal	Terminal for ground connection.
(4)	I/O selector	INPUT is switched as follows. N : NPN all IN1-10 P : PNP all IN1-10 H : IN1-5 operates in PNP, and IN6-10 operates in NPN.
(5)	Connector for signal input/output cable connection	Trigger signal input, alarm cancellation signal input, and alarm signal output.
(6)	Connector for MODBUS communication	RS-485 communication port. Connects to an external device such as a PLC.
(7)	Terminator switch (for MODBUS communication)	Used for MODBUS communication during amplifier expansion. (without expansion in ○) For amplifier expansion, only MPS08B of end of connection put in  .
(8)	Connector for voltage output	The measured pressure value is output with an analog voltage. Connects to external measurement devices such as data loggers and oscilloscopes.
(9)	Connector for junction box connection	Use a dedicated junction cable to connect to junction box. Two junction boxes can be connected to one amplifier "MPS08B".

(10)	Terminator switch (For amplifier expansion)	Used for amplifier expansion. (without expansion in ○) 2 units connected: 2 units  . 3 units connected: 1st unit and 3rd unit to  , 2nd unit to ○ 4 units connected: 1st unit, 4th unit  , 2nd unit, 3rd unit ○
(11)	Connector for amplifier expansion	Connector for connecting multiple amplifiers.
(12)	LAN connector	Use a LAN cable to connect to PC.
(13)	USB memory jack	Connect a commercially available USB flash drive (Type-A). USB 2.0 High-speed 480 Mbps FAT 32 format Allocation unit size: Use 32KB. Use a USB stick for industrial equipment. <b>USA3-008GH(D00PJ) made by Hagiwara Solutions recommended</b>

## 1-4. Installation of amplifier and junction box

### **Caution**

Do not turn on MPS08B until all connections and settings have been made.

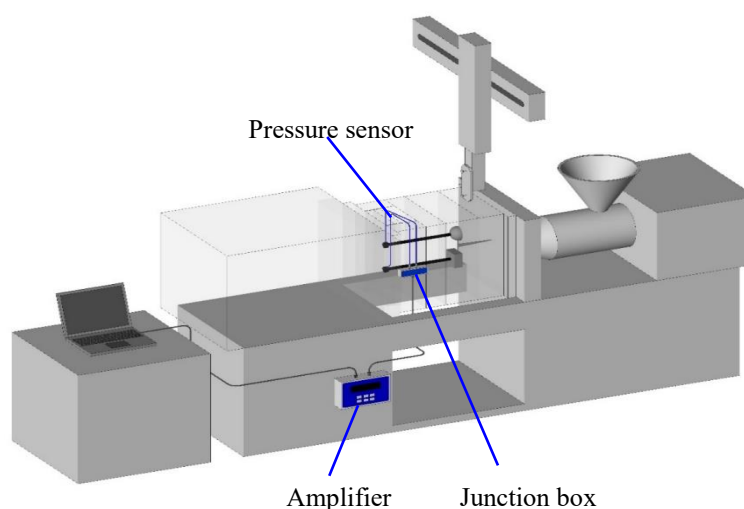
The heat resistance temperature of junction box UJP04H and Junction box with cable storage space UCP04 is 120°C, and the operating temperature of MPS08B is 0 to 50°C.

Avoid locations where temperatures exceed the specified range. Otherwise, malfunction or failure may result.

Position MPS08B main unit and junction box considering the cable routing.

Be careful not to pull or pinch the pressure sensor cable or junction cable while the molding machine is in operation.

If necessary, use commercially available cable fixing parts.



### **1-4-1. Installation of pressure sensor**

Refer to the "Pressure Sensor Installation Reference Diagram" included with the pressure sensor for instructions on how to install the pressure sensor to the mold.

### **1-4-2. Installation of junction boxes**

#### **(1) Heat-resistant junction box**

Attach to the periphery of the molding machine in one of the following ways.

- ①Screw directly onto the periphery of the molding machine. (M4 hole drilling required)
  - ②Secure onto the periphery of the molding machine using magnets (optional).
  - ③Use commercially available mounting brackets (brackets, L-shaped angles, etc.) to secure it.
- When using magnets, fix them firmly so that the magnets do not come off from junction box.
  - When installing on a mold, use at 120°C or less.

#### **(2) Wiring storage type junction box**

Attach to the mold.

- Refer to "UCP04 Wiring Assembly Procedure" for more information on how to install.
- Use at a mold temperature of 120°C or less.

### **1-4-3. Amplifier installation**

Place it on a dedicated stand or attach it to the periphery of the molding machine with the magnets on the bottom.

- Pay attention to the ambient temperature of MPS08B (0 to +50°C).

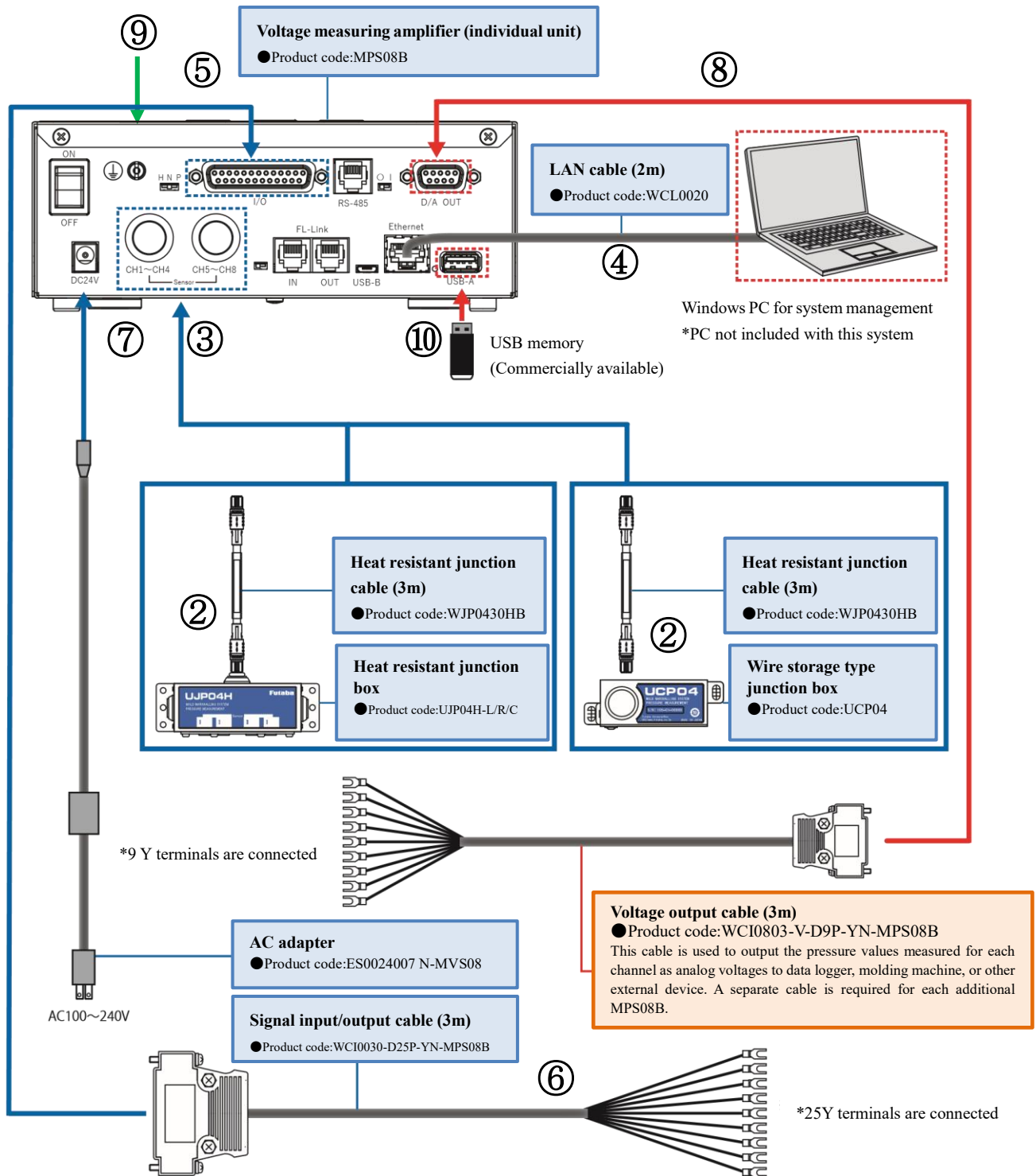
# 1-5. Connecting the pressure sensor and each cable

Connect each device as shown in the basic configuration diagram below.

Connect the power supply only after all connections have been completed.

Refer to "Connecting the power supply" (page 15).

## 1-5-1. Basic configuration diagram



Up to 32 points can be measured by connecting up to 4 MPS08B and 8 junction boxes.

## 1-5-2. Connecting devices

Follow the procedure below to connect the devices. (The following procedure numbers correspond to the numbers in the basic configuration diagram.)

### (1) Connecting the pressure sensor to the junction box

Connect the plug of the pressure sensor to the 【CH1】 ~ 【CH4】 port of junction box.

Align the red mark on the plug of the pressure sensor with the red mark on the plug insertion slot of junction box and insert it firmly as far as it will go.

※When disconnecting the sensor from the junction box, slide the sensor in the direction opposite to the direction marked with red.

Pulling out the cable may cause cable breakage or damage.



### (2) Connecting the junction cable and junction box

Connect the connector without the ferrite core of junction cable to the rear port of junction box.

Align the direction of the junction cable connector and insert it all the way.

※When disconnecting the junction cable from the junction box, slide the cable connector part in the opposite direction of the insertion point and pull it out.

Pulling out the cable may cause cable breakage or damage.



### (3) Connecting MPS08B to the junction cable

Connect the connector with the ferrite core of junction cable to MPS08B.

Insert the cable connector into the 【CH1 - CH4】 or 【CH5 - CH8】 port, aligning the direction of the connector.

●If the number of sensors to be measured is 4 or less, connect it to the 【CH1 ~ CH4】 .

※When disconnecting the junction cable from the MPS08B, slide the slide mechanism of the cable connector part in the opposite direction to that of insertion and disconnect it.

Pulling out the cable may cause cable breakage or damage.



#### **(4) Connecting LAN cable to MPS08B and PC**

Connect LAN cable to LAN port on MPS08B and to LAN port on PC.

#### **(5) Connecting the I/O cables to MPS08B**

Connect the I/O cable to the [I/O] port on MPS08B. Tighten the screws on both sides of the connector to secure it.

#### **(6) Connecting MPS08B to the molding machine**

Connect MPS08B to the molding machine using the input/output cable.

Refer to "Circuit-Specification of I/O Signals" (P.13).

#### **(7) Connecting AC adaptor and MPS08B**

Connect AC adaptor into MPS08B's power jack.

#### **(8) Connecting MPS08B to an external measuring instrument**

Connect to external measuring equipment as necessary. Voltage corresponding to the pressure value can be output.

(20 MPa = 1 V)

Connect the optional "Voltage output cable (3 m)" (Product code: WCI0830-V-D9P-Y N-MPS08B) to the D/A output port on the MPS08B.

#### **(9) Connect to the grounding terminal**

Be sure to ground the product to ensure stable operation.

#### **(10) Connecting a USB memory**

Connect them if necessary.

If both PC, USB are connected, the measurement will be saved in both.

If both PC and USB are connected, the measurement data will be saved in both.

※The format of the USB memory used should be File System: FAT32, Allocation Unit Size: 32KB.

Use USB memory for industrial equipment. The USB memory device we have tested is USA3-008GH (D00PJ) for industrial equipment made by Hagiwara Solutions. (2s cycle, 1s measurement, 1ms sampling)

There are a wide variety of USB memories on the market. These commercially available USB memory devices may cause write delays or data loss due to the write speed to the USB memory device. These are not covered by the warranty.

※The "Selection function of saved data (ALL/ALM/INT)" is not reflected in saving data to USB memory.

Saving data to USB memory requires a measurement cycle (interval from start trigger input to next trigger input) of 2 s or longer.

### **1-5-3. Connecting input signals**

An input signal is a signal that is input to MPS08B from an external device such as a molding machine.

There are three types of signals : "Start trigger signal", "Alarm clear signal" and "Control signal".

#### **(1) Start trigger signal**

It is required to start measurement.

Connect the incoming signal with no pressure loaded on the sensor. This is because "zero-point reset" is performed at the same time as the start trigger signal is input.

- If there is no special reason, connect the "mold close signal"

## (2) Alarm clear signal

Connect when clearing (canceling) alarm signals being output from the MPS08B.

Connect it as necessary.

- The alarm signal can be automatically cleared by specifying the time in the software settings.
- If there is no problem in operation due to automatic cancellation by the specified time, the connection of the alarm clear signal can be omitted.

## (3) Control signal

Connected when controlling MPS08B using external signals.

Connect them if necessary.

There are three selectable options: "Trigger disabled", "Alarm disabled" and "Save disabled".

If there is no control from an external device, the connection of control signals can be omitted.

## (4) Clear continuous alarm

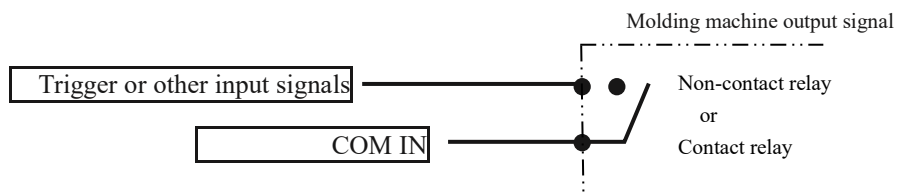
Connect when clearing (canceling) the continuous alarm signal being output from the MPS08B.

Connect as necessary.

### Input circuit

For input (trigger, alarm clear) to the MPS08B, use a no-voltage signal that is output on/off by a contact relay. MPS08B may not operate properly when the variable voltage is applied.

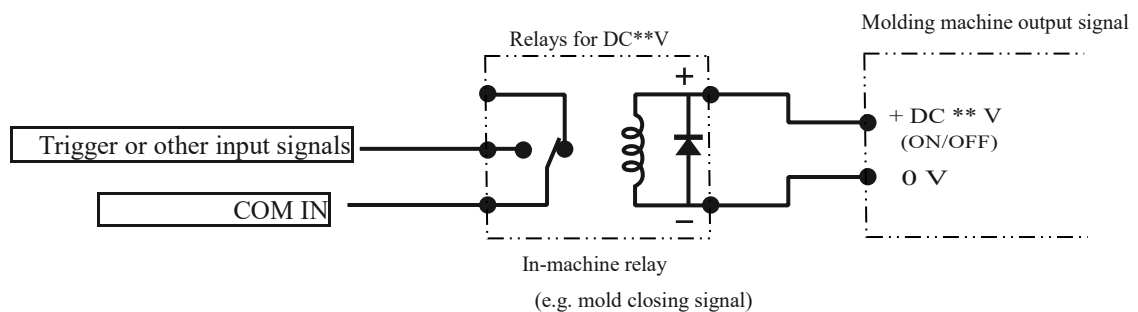
Example 1: When the output signal of the connected molding machine is "Contact output."



Example 2: When the output signal of the connected molding machine is "voltage output."

Connect via a relay that matches the voltage of the machine output signal.

When using a contact relay, use a type with a built-in circuit for absorbing coil surge.



## 1-5-4. Connecting Output Signals

The output signal is the signal that is output from MPS08B to an external device such as a molding machine.

### (1) Alarm output signal

An alarm signal is output when the monitoring range set by the software is exceeded.

Used to determine defective products, stop the molding machine, or control external devices.

- Monitoring can be set individually for 8 channels, and alarm output signals can also be output individually. (with 10 output ports)

### (2) Control signal

Used to output signals for shot end, production complete, continuous error, and alarm enable.

- Threshold settings for various control signals are made in the system settings.

(A control signal is output at the set threshold value.)

### (3) Waveform monitoring

Used for V-P switching signal or for mold opening signal by mold internal pressure.

- The pressure-threshold setting for V-P switching is set by alarm monitoring condition setting.

(The control signal is output at the timing when the set pressure value is reached.)

### (4) OK signal

Signal is output when the alarm is within the alarm monitoring range.

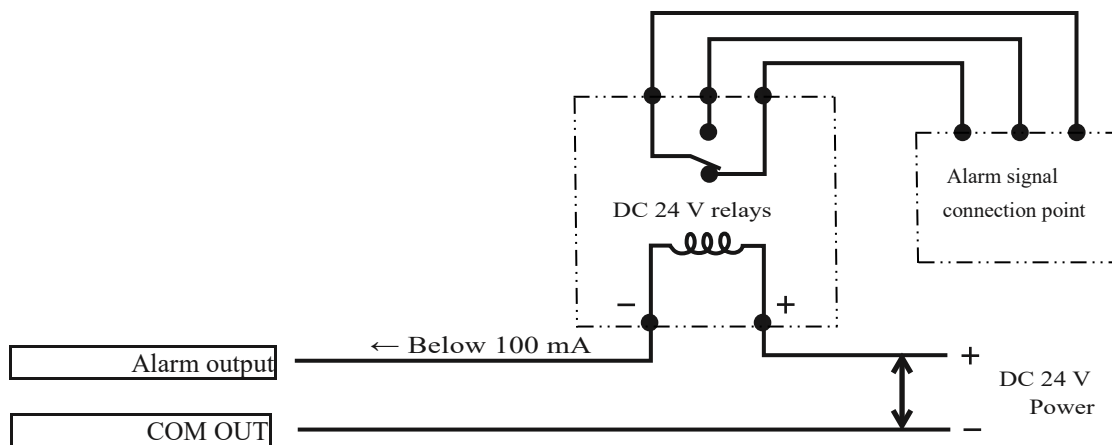
## Output Circuit

The alarm output from MPS08B is a contact output by the photo relay. Use a compatible device as the output destination.

In addition, use a separate power supply for that equipment that is on a different system from that of the molding machine, with the - side connected to GND.

e.g. using DC 24 V power and DC 24 V relays

When using a contact relay, use a type with a built-in circuit for absorbing coil surge.



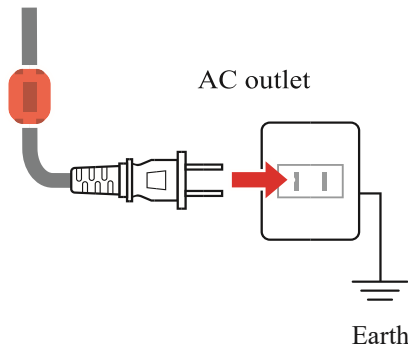


## 1-5-5. Connecting to the power supply

### **Caution**

AC adaptor that comes with the camera has a AC100 ~ 240 V line voltage. When the power supply voltage is outside the above voltage range,

Do not connect if each terminal voltage of the power supply has a potential that exceeds the power supply voltage with respect to the earth (ground).



- Use only the supplied AC adapter. Do not use the AC adapter for other equipment.
- MPS08B has a power switch. Turn on the switch after the connection is completed.
- Allow the system to warm up for at least 30 minutes after turning on the power.
- If the warm-up is insufficient, the measured values may not be stable.
- The power supply and measured values may not be stable at sites where noise-producing equipment such as induction motors and electric welding machines are used. Depending on the situation, implement noise countermeasures by using a commercially available noise cut transformer or similar device.

# 1-6. Pin number of the connector for connection

## 1-6-1. Connector for I/O "DSUB25 connector"

Wire the signal cable from the machine used for signal input/output to MPS08B to the Y terminal of the signal input/output cable.

- In order to continuously measure the pressure waveform in the mold according to the molding cycle, at least wiring of the trigger signal (e.g., mold closing signal) is required.
- The zero point is reset at the same time as the trigger signal is input. It takes about 0.1 second to reset the zero point. If "Injection start signal" is set as the trigger signal, the zero point may not be reset in time and normal measurement may not be performed.
- Use a non-voltage signal that is turned on/off by a contact relay for inputting (trigger, alarm clear) to MPS08B.
- MPS08B may not operate properly when the variable voltage is applied.
- The alarm output from MPS08B can be switched between NO (normally open) and NC (normally closed).  
Use the corresponding device as the output destination. In addition, use a power supply for that equipment alone that is on a different system from that of the molding machine, with the - side connected to GND.

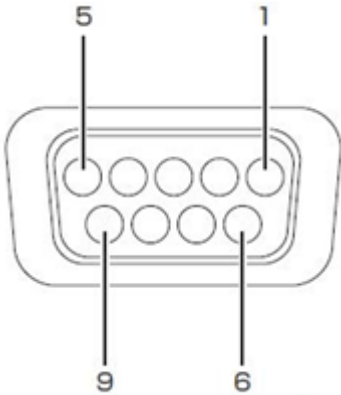
DSUB25 connector pin connection					
Terminal No.	Signal name	Mark tube Notation	Terminal No.	Signal name	Mark tube Notation
1	GND(1~5)	GI_1-5	14	GND(1~5)	GO_1-5
2	Input port 1 (Default⇒Trigger 1)	IN1	15	Output port 1 (Default⇒ Alarm)	OUT1
3	Input port 2 (Default ⇒ Alarm clear)	IN2	16	Output port 2	OUT2
4	Input port 3	IN3	17	Output port 3	OUT3
5	Input port 4	IN4	18	Output port 4	OUT4
6	Input port 5	IN5	19	Output port 5	OUT5
7	GND(6~10)	GI_6-10	20	GND(6~10)	GO_6-10
8	Input port 6	IN6	21	Output port 6	OUT6
9	Input port 7	IN7	22	Output port 7	OUT7
10	Input port 8	IN8	22	Output port 8	OUT8
11	Input port 9	IN9	24	Output port 9	OUT9
12	Input port 10	IN10	25	Output port 10	OUT10
13	Free space	(without notation)	-	-	

## 1-6-2. Analog voltage output connector

If necessary, analog voltage output to external measuring equipment is possible. Voltage corresponding to the pressure value can be output.

(20MPa=1V)

- Connect the optional "Voltage output cable (3m)" (Product code: WCI0830-V-D9P-Y N-MPS08B) to the 【D/A Output】 port of MPS08B.

Terminal No.	Signal name	DSUB9 connector Pin connection
1	CH1 analogue voltage-output	
2	CH2 analogue voltage-output	
3	CH3 analogue voltage-output	
4	CH4 analogue voltage-output	
5	CH5 analogue voltage-output	
6	CH6 analogue voltage-output	
7	CH7 analogue voltage-output	
8	CH8 analogue voltage-output	
9	Common to GND	

## 1-7. Connecting when expanding the amplifier (increasing the number of channels)

By connecting up to four MPS08B, up to 32 points can be measured.

For details on how to expand the amplifier, see "8-3. Amplifier expansion setting" (P.95).

# 2.Preparing the software

## 2-1. Recommended computer system requirements

OS (Japanese compatible)	Windows8(32bit・64bit) Windows8.1(32bit・64bit) Windows10(32bit・64bit)
Processor	Intel-manufactured CPU Core i5 or higher
Required memory	More than 4GB
Other	The Ethernet port must be included and .NET Framework 4.8 or higher must be installed.

### ※Recommended PC

Regarding the PC on which the measurement software is to be installed, we have provided the recommended specifications, but we assume that the PC is to be used exclusively for measurement.

In addition, the operation warranty does not cover problems regarding shutdowns caused by PC settings or Windows OS, or problems caused by high-load operation or high-load communication by other applications.

## 2-2. Installing PPSB measurement software

### 2-2-1. Installation by executable file

There is no installer. Executable file method (extension: .exe).

Execute the executable file when starting the measurement software.

- A CD-ROM containing the executable file (MPS08B\_Application) is enclosed in this manual.
- Create a folder named MPS08B on the desktop, etc. and store the executable file.

※The latest version of the current software is "Ver:1.3.0.5".

The latest version can be downloaded from our HP.

<https://mms.mtb.futaba.co.jp/>

### 2-2-2. Data saving folder

This section describes the folder for saving measurement data.

#### (1) MMS\_DATA

This folder stores waveform data and numeric history data.

- It is stored in a folder in the same hierarchy as the executable file.
- Do not change or delete.

## (2) Settings

This is the folder where the setting file is saved.

The Settings folder is automatically created when the "Settings" button is clicked on the main operation screen of the measurement software.

- The location created is in the folder that contains the executable file.
- The setting file stores sensor sensitivity information, measurement conditions, alarm monitoring conditions, and other information in a batch.**

**Normally, a setting file is created and managed for each mold.**

## 2-2-3. Setting storage file

### (1) Init.xml

This file is used to store various settings.

Save the last setting (conditions such as the color of the pressure axis and measurement channel, and the shading of the waveform) when the measurement software is finished. Init.xml is automatically generated when you exit PPSB.

- The location created is in the folder that contains the executable file.

## 2-2-4. Folders and files

The following folders and files are saved in the folder where the executable file is stored.

Name	Date modified	Type	Size
MPS08B_Application_20210427_1_0_0_0.e...	4/27/2021 2:22 PM	Application	12,730 KB
init.xml	4/28/2021 5:01 PM	XML Document	5 KB
Settings	4/28/2021 10:45 AM	File folder	
MT_UnitSpace	4/28/2021 10:46 AM	File folder	
MT_Settings	4/28/2021 10:46 AM	File folder	
MMS_DATA	4/28/2021 11:23 AM	File folder	

## 2-3. Network settings

MPS08B and measuring PCs are connected by LAN (Ethernet) communication.

Network settings for communication are required.

The procedure is described below. (This section describes the steps for Windows10.)

### 2-3-1. Connecting MPS08B and measuring PC

Connect the supplied LAN cable to the LAN port of each MPS08B and measuring PC.

Both MPS08B and the computer start up.

### 2-3-2. Checking IP address of MPS08B

Press ↓ key on MPS08B main unit (press ↓ key once from the startup screen) to open IP address screen.

- The default values are as follows:

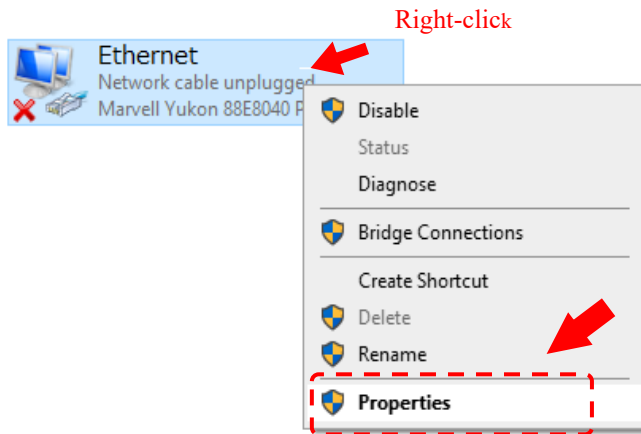
**IP address :192.168.2.3**

**Subnet mask: 255.255.255.0 (fixed)**

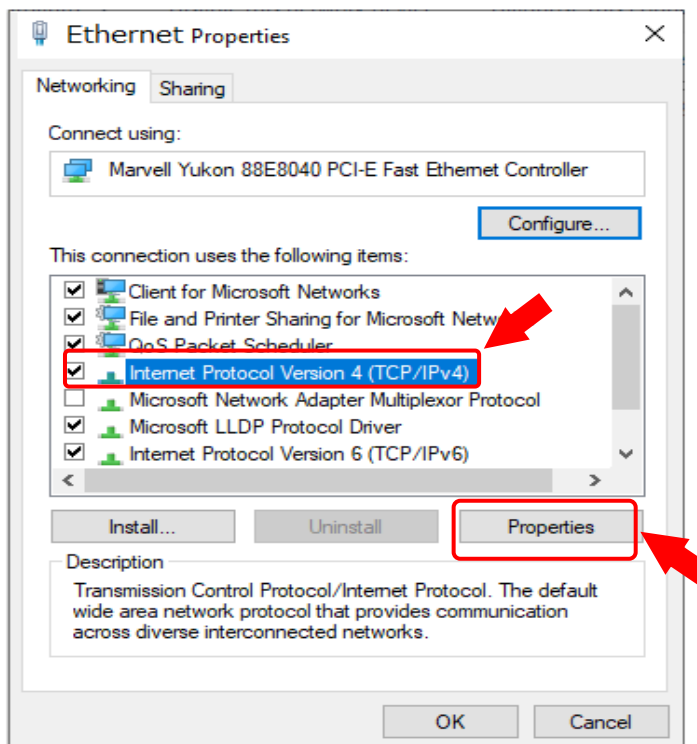
### 2-3-3. Set IP address of the measurement PC.

- (1) Start menu ⇒ Control Panel ⇒ Network and Sharing Center  
⇒ Open Change Adapter Settings. "Ethernet" is displayed.

- (2) Right-click Ethernet ⇒ Open Properties.

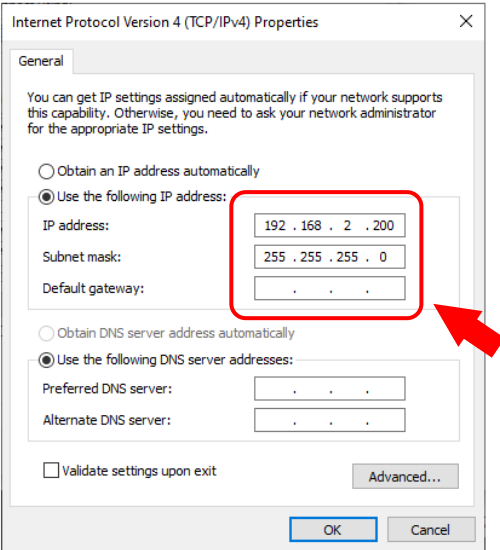


- (3) Click "Internet Protocol Version 4 (TCP/IPv4)" and then click "Properties".



(4) In the General tab, click Use the following IP address and type

**IP address: 192.168.2.200**  
**Subnet mask: 255.255.255.0 (fixed)**  
**Default gateway: None**

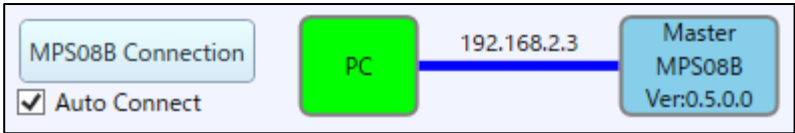


**2-3-4. Start PPSB measurement software.**

Establish communication between PPSB and MPS08B.

Select the "Auto Connect" checkbox at the top of PPSB window or press "MPS Connect" to perform communication.

When communication is established, "MPS08B" is displayed in light blue as shown in the figure below.



※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

- If there is no particular reason, put a  in "Auto connect".

Communication will be performed automatically at the next software startup.

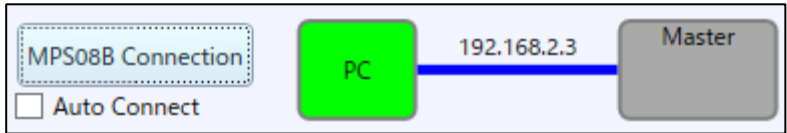
**2-4. Communication and operation check**

Check the operation of each device after network setting is completed.

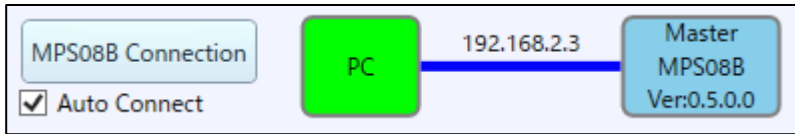
**2-4-1. Communication check**

The communication status can be checked by the color of the indicator on the measurement software operation screen.

(1) State in which communication is not in progress



(2) Communicating status

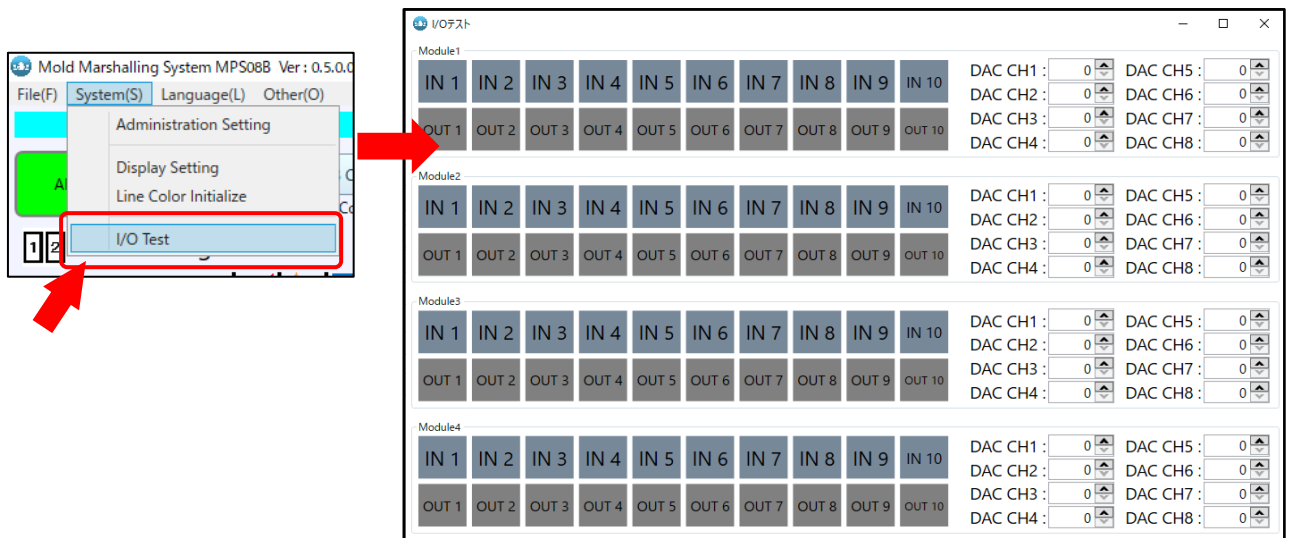


※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

## 2-4-2. I/O status (I/O test) and voltage-output operation check

Check the operation of I/O and voltage-output signals between MPS08B and connected devices.

Clicking "System" ⇒ "I/O Test" in the File menu to display the "I/O Test" window.



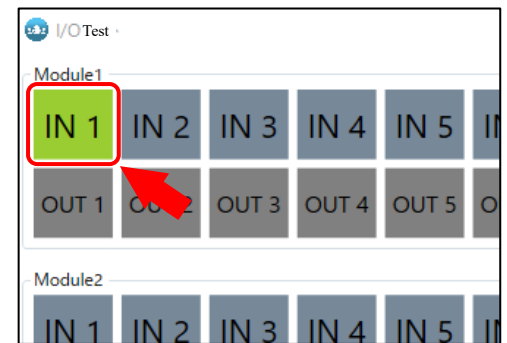
(1) Input signal detection check

(1) Input signal detection check

Inputs the input signal (trigger or alarm clear) manually.

(Example: Short-circuit No.1 and No.2 of the signal I/O cable, etc.)

When input is correct, the corresponding signal name lights yellow green.



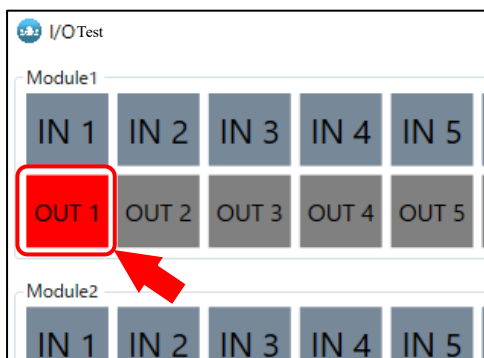
(2) Output signal detection check

Outputs an output signal (alarm) manually.

When the "OUT" button is pressed, the background color of the corresponding signal name is changed to blue and an alarm signal is outputted.

Check whether MPS08B is outputting signals normally on the device of the output destination.

(Example: Connecting a patrol light or buzzer, etc.)



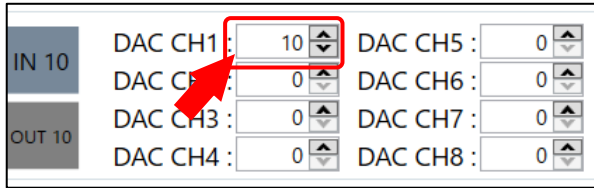


### (3) Voltage output operation check

Outputs the analog voltage manually.

Connect a commercially available data logger or digital multimeter using a voltage output cable (sold separately) and input any output voltage value to each channel.

Check if the voltage output from MPS08B is received properly.



## 2-4-3. Simple operation check of pressure measurement

To perform a simple check to see whether the sensor is operating or not, refer to "8-2 Measurement in maintenance mode" (p. 94).

## 2-5. MPS 08 B updating firmware

The software in the MPS08B (hereinafter referred to as "firmware") and the measurement software in the PC must always be a combination of the latest versions.

When the measurement software is updated, be sure to update the firmware of the amplifier.

- Care should be taken when performing measurements on a PC containing the latest measurement software and the amplifiers introduced in the past.

The procedure is described below.

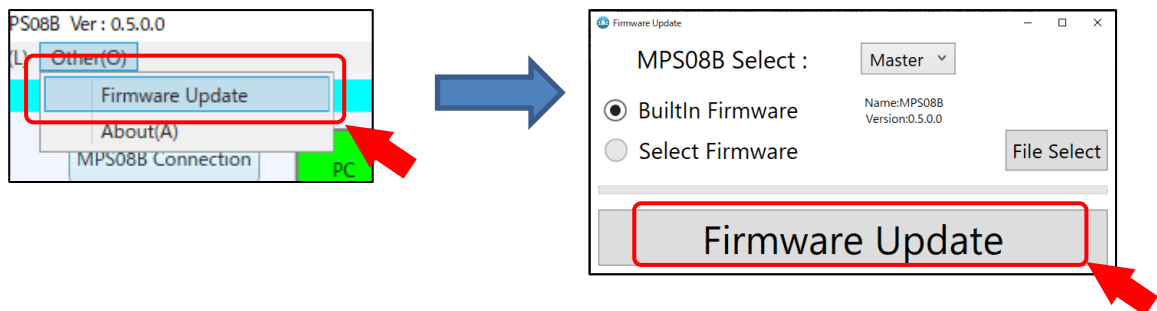
### 2-5-1. Prepare the newest PPSB

Activate the PPSB and establish communication with the MPS08B.

### 2-5-2. Specifying and updating firmware

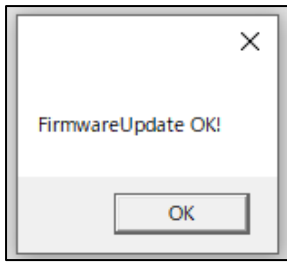
(1) From the File menu, click Other ⇒ Firmware Update.

- Typically, select Built-in Firmware.
- Do not turn off the power of the main unit while updating the firmware.



※ Updated from the software version shown above, the current version is "Ver:1.3.0.5".

(2)The unit restarts and the update are completed.

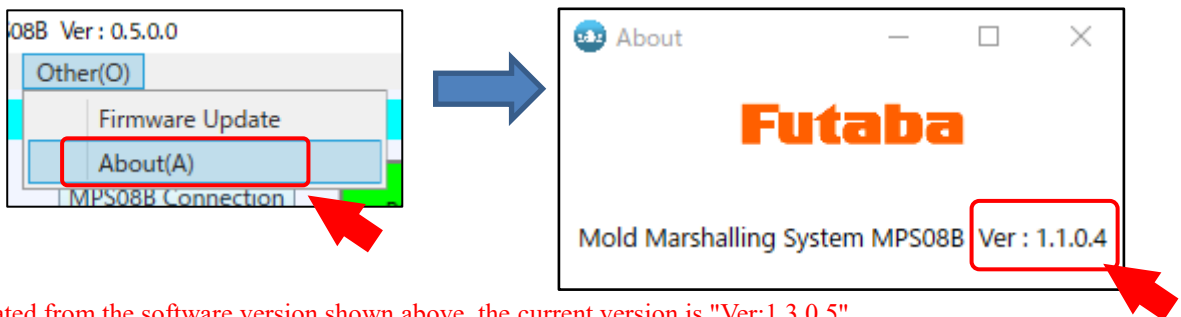


### 2-5-3. Checking the measurement software and firmware version

Check whether the version number is the same.

(1) Checking the version of the measurement software

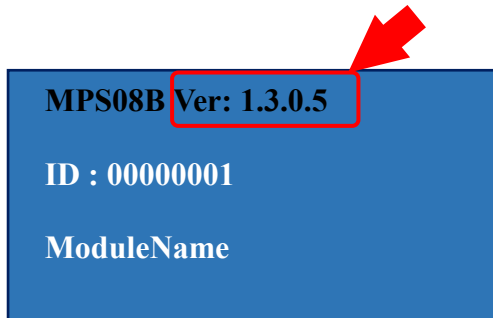
From the File menu, click Other ⇒ Version Information.



※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

(2)Checking the firmware version

The version can be checked by pressing a key on the MPS08B. Press the ↓ key seven times from the startup screen.



# 3. Operating the amplifier (MPS08B)

This section describes the basic operations of this machine.

## 3-1. Starting the amplifier

Turn on the power switch.

The start-up screen is displayed on the liquid crystal display on the display panel.

- The power switch should be turned ON after all wiring has been completed.

## 3-2. Key switch and liquid crystal display

This is used when checking or changing MPS08B setting, or when starting measurement manually.

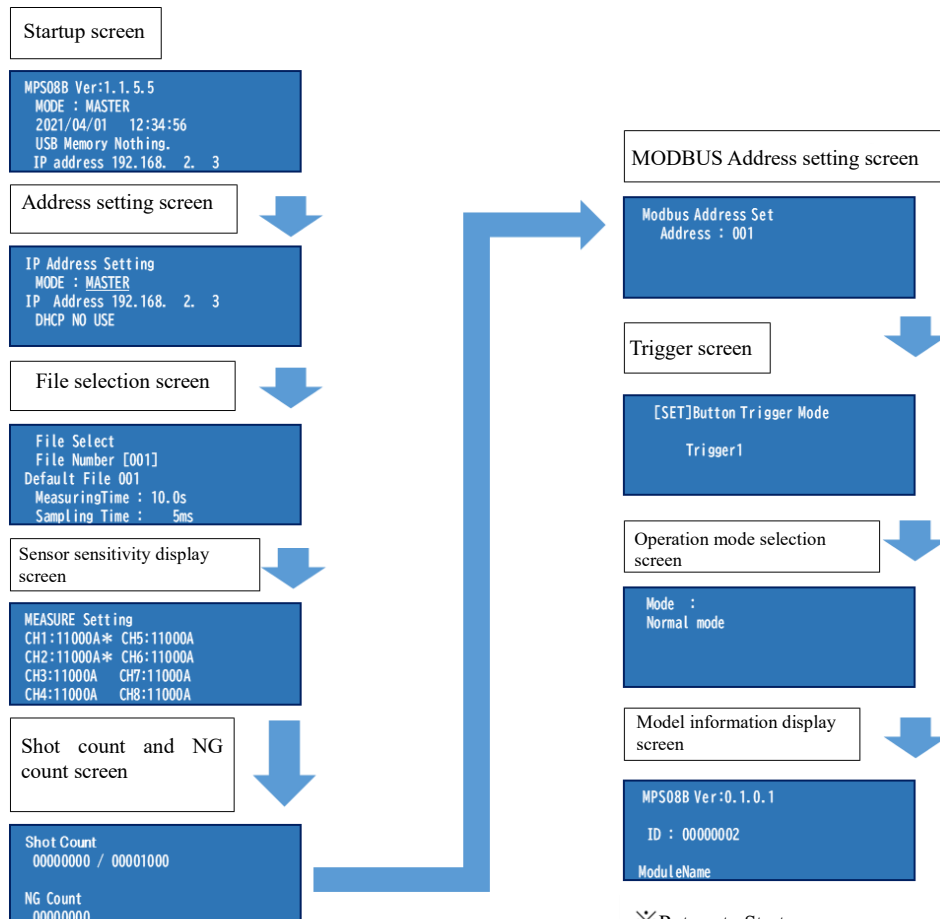
- Pressing the MENU key allows the user to move between screens.
- The → key allows the user to select an item, the MENU key allows the user to cancel the changed value, and the SET key allows the user to confirm the value.
- Initialize the device by pressing and holding the ↑ and ↓ keys at the same time and turning the power switch OFF-ON.

The screen transition and setting method are shown below.

### 3-2-1. Screen transition

Pressing the MENU key allows the user to move between screens.

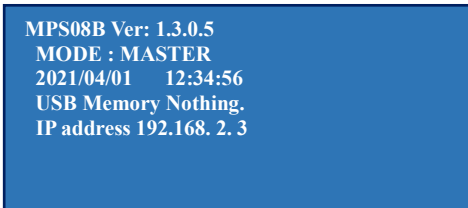
The display transitions in the following order.



### 3-2-2. Startup screen

On the startup screen, you can check the model version, operation mode, date and time, presence or absence of USB, and presence or absence of LAN.

- When LAN is connected to this unit, the set IP address is displayed.



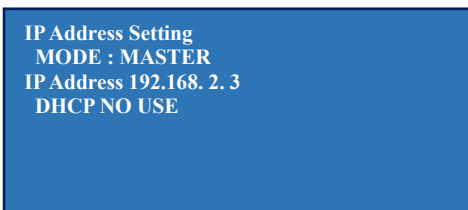
Press MENU to open the "Address Setting" window.

### 3-2-3. Address setting screen

In the address setting screen, the master-slave mode, address, and DHCP can be set. The currently selected item will flash and a \_ will appear below it.

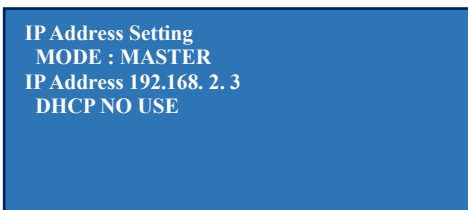
#### (1) Setting MASTER (Base Unit) or SLAVE (Slave Unit)

Press the → key to blink MASTER, use the ↑ and ↓ keys to change to MASTER, SLAVE1, SLAVE2, or SLAVE3, and press the SET key to set.



#### (2) IP address change

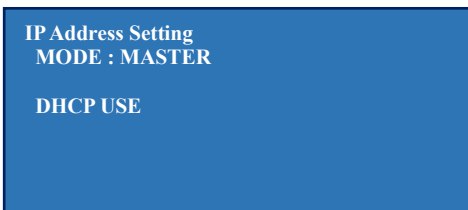
Press the→ key twice to change the IP address. Select a digit with the ←key and → key, change the value with ↑ key and ↓ key, match the desired IP address, and then press the key SET to set the IP address. The currently selected number blinks and a \_ appears below.



#### (3) Configuring DHCP

When → key is pressed again after the end of the IP-address is pointed, DHCP can be set.

Use ↑ or ↓ key to change the setting to USE or NO USE and press the SET key.



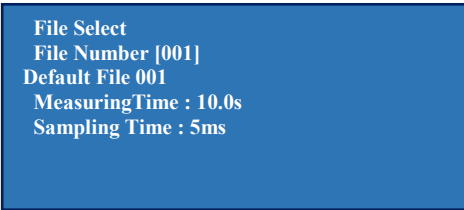
※DHCP: IP address auto assignment function

Press MENU to open the "File Selection" screen.

### 3-2-4. File selection screen

The file selection screen allows the user to check the number and name of the currently selected setting file.

In addition, the measurement time and sampling time can be checked.

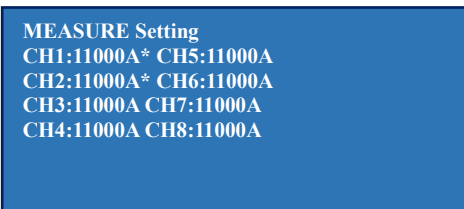


● Press the → key, select the setting file number with the ↑ key or ↓ key, and press SET key to set.

Press MENU to open the "Sensor sensitivity display" screen.

### 3-2-5. Sensor sensitivity display screen

The sensor sensitivity setting can be checked. \* is displayed for CH connected to the sensor.



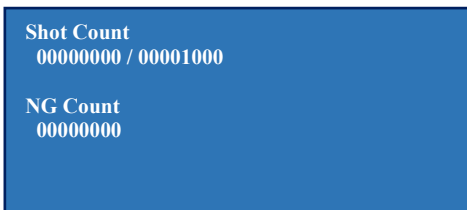
Press MENU to open the "Shot Count and NG Count" screen.

### 3-2-6. Shot count and NG count screen

Shot count and NG count can be checked.

The default shot count is the number of shots produced (1000).

To change the setting, use the measurement software.



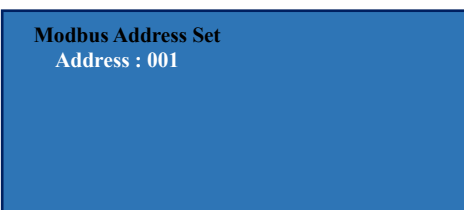
Press the ↓ key to open the "MODBUS address setting" screen.

### 3-2-7. Modbus addressing display

Allows you to set Modbus addressing.

● → Press to set Modbus.

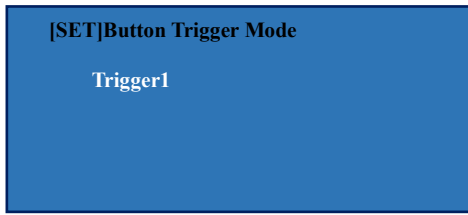
Use the ↑ key or the ↓ key to change the setting, and press SET key.



Press MENU to open the "Trigger" screen.

### 3-2-8. Trigger screen

Trigger presets can be changed, and triggers can be displayed on the software.



- Select the trigger number with the →key and ← key, and the trigger signal is output at the timing when the SET key is pressed.

Press MENU to open the "Operation mode selection" screen.

### 3-2-9. Operation mode selection screen

Normal mode and Analog voltage output mode can be set.

#### ※What is "Normal mode" and "Analog voltage output mode"

- Normal mode → Normal measurement mode using PC.

It is set to Normal Mode at the factory.

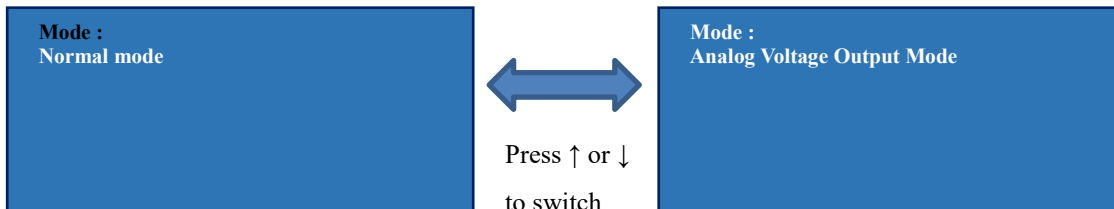
- Analog voltage output mode

→Mode in which only voltage output is performed. Various settings can be made with the amplifier without PC connected.

(Succeeded from MPV04, which is no longer in production).

- Press the → key to set Normal mode and Analog voltage output mode.

Use the ↑ key or the ↓ key to change the mode, and press SET key.

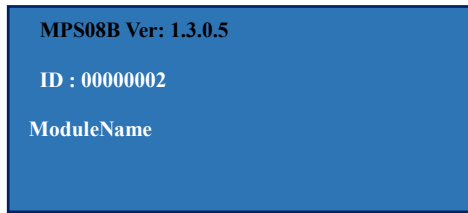


※Refer "P31 3-5. Analog voltage output settings" for detailed Analog voltage output mode settings.

Press MENU to open the "Model information display " screen.

### 3-2-10. Model information display screen

The model version, model ID, and model name can be checked.



Press MENU to open the "Startup" screen.

### 3-2-11 Initialization method

- (1) Turn OFF the power with MPS08B unit.
- (2) Turn ON MPS08B while pressing both the ↑ and ↓ keys.
- (3) After the display panel lights up for about 20 seconds, the system shifts to normal startup.

This resets the factory default settings.

## 3-3. Using the amplifier alone

MPS08B can monitor on its own even if it is not always connected to a PC.

However, when using for the first time, you need to connect to a PC and save the setting file to the amplifier.

The setting file is created and saved using the measurement software.

- 100 setting files can be saved in the amplifier.

### 3-3-1. Operation flow

The following describes the operation procedure when using the amplifier alone.

- (1) After connecting all the devices, start the measurement software to set the measurement conditions.
- (2) Save the settings changed by the measurement software to MPS08B and exit the measurement software.
- (3) Turn OFF the power with MPS08B unit.
- (4) Disconnect LAN cable from MPS08B.
- (5) Turn ON MPS08B.
- (6) Select the measurement conditions to be used by operating MPS08B.

This completes the setup, and when the trigger is input, measurement starts (and monitoring, if monitoring is set).

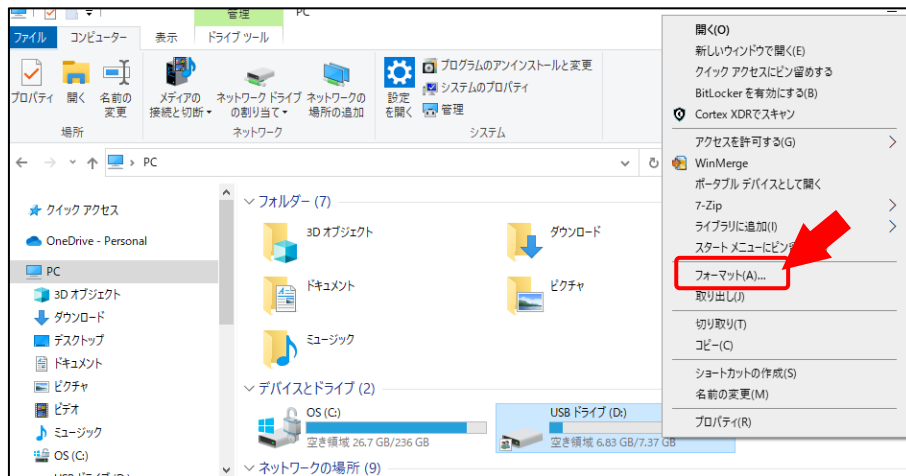
## 3-4. Saving data to USB memory

Waveform data and log files can be saved to USB memory when MPS08B is used alone.

- Insert USB memory while the amplifier is turned off.
- Format should be FAT32, Memory 64GB, Allocation Unit Size 32KB.
- Use USB memory for industrial equipment.

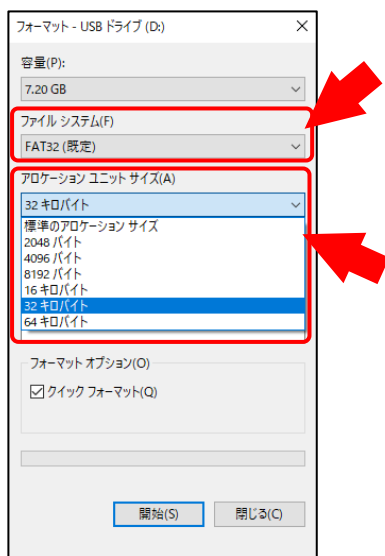
※ How to change the file system and allocation unit size of USB memory

(1) Insert the USB memory into the PC to be used, and select "Explorer" ⇒ "USB drive" Right-click ⇒ "Format".



(2) Set "File System" ⇒ FAT32, "Allocation Unit Size" ⇒ 3KB, and "Start".

※ Note that the data saved in USB memory is deleted when it is formatted.



※ The USB memory we have tested is USA3-008GH (D00PJ) manufactured by Hagiwara Solutions for industrial equipment, and we have confirmed its operation (2s cycle, 1s measurement, 1ms sampling).

Various types of USB memories are available on the market.

Writing delays, data loss, etc. may occur due to the writing speed of these commercially available USB memory devices and are not covered by the warranty.

※ The "Selection function of saved data (ALL/ALM/INT)" is not reflected in saving data to USB memory.

Saving data to USB memory requires a measurement cycle (interval from start trigger input to next trigger input) of 2 s or longer.



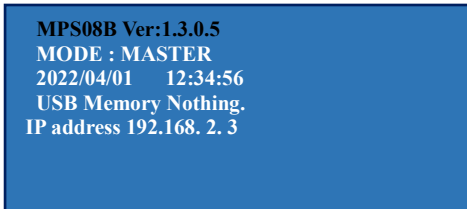
### 3-4-1. Data save destination folder

When measurement is started while using the amplifier alone, a folder for measurement data (folder name: MMS) is automatically created in the USB memory.

### 3-4-2. Liquid crystal display

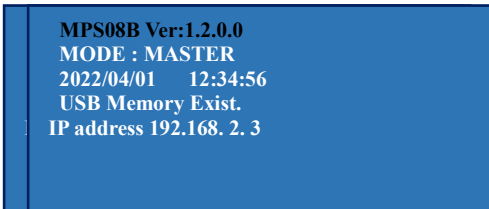
The status of USB memory inserted into the amplifiers can be checked on the liquid crystal screen (startup screen).

(1) USB memory is not inserted.



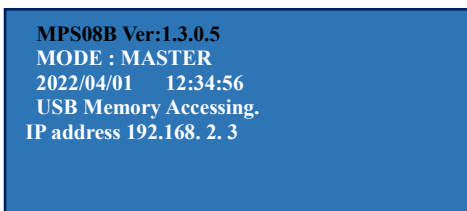
●"USB Memory Nothing." is displayed.

(2) USB memory is inserted.



●When USB memory is recognized correctly, "USB Memory Exist." is displayed.

(3) Writing data to USB memory

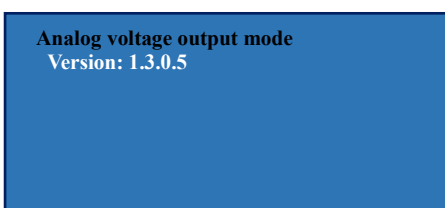


●"USB Memory Accessing." is displayed.

●Accessing is displayed from measurement starts until the measurement and the writing of the data is completed.

## 3-5. Analog voltage output mode setting

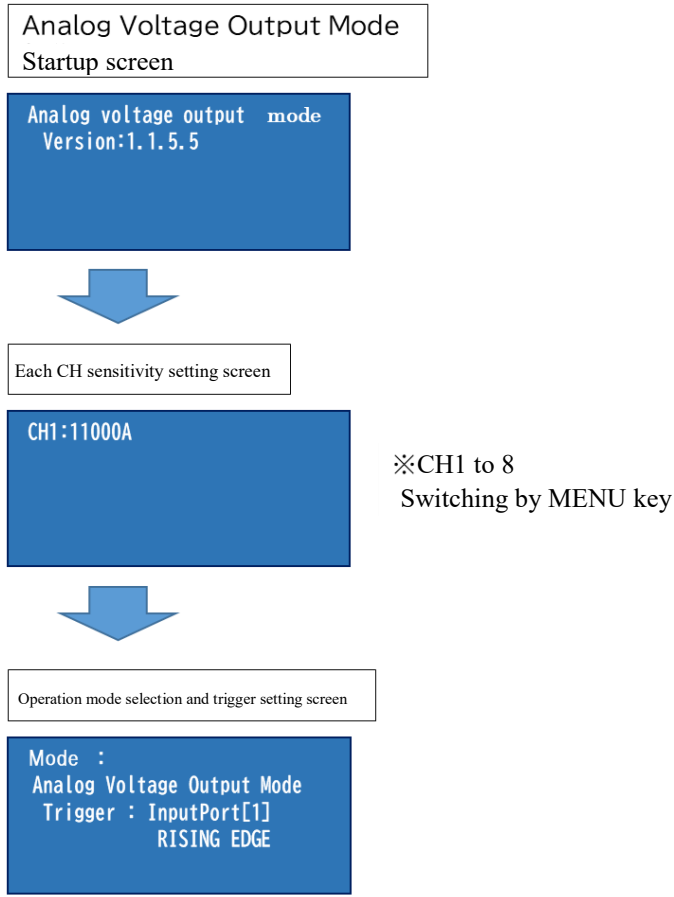
※Select "Analog voltage output mode" on "P.28 3-2-9. Operation mode selection screen.



●Screen Transitions in Analog Voltage Output Mode

Pressing the MENU key allows the user to move between screens.

The display transitions in the following order.



※CH1 to 8  
Switching by MENU key

※Analog Voltage Output Mode  
Return to Startup screen

※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

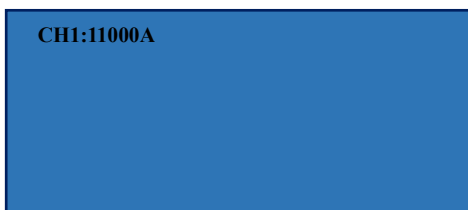
(1) Setting of CH sensitivity classification

To adjust for individual differences in the connected pressure sensor, the sensitivity classification is used as the input setting.

Sensitivity is indicated on the sensor connector (image below).



●Press MENU to move to CH display.

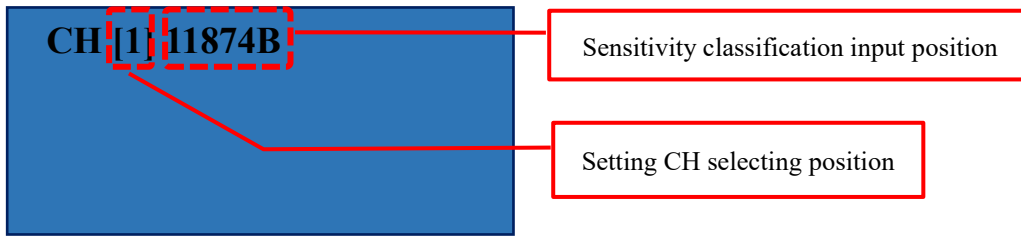


Press the → key to change the settings. The selection target (cursor) flashes.

Use the → and ← keys to align the cursor ( flashing ), and use the ↑ and ↓ keys to change the setting

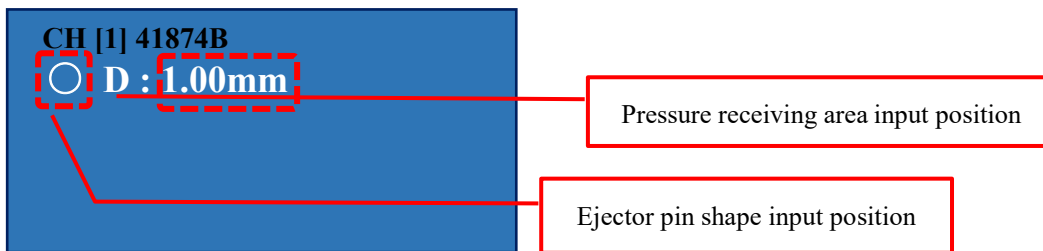
- Set the sensitivity classification of the connected sensor for each CH.

First, select the target CH number, and then enter the sensitivity classification.



- For button-type sensors.

For the pressure sensor button type, the input items of the ejector pin shape and pressure receiving area are displayed in the lower row.



○:Select when the pressure receiving surface is a round pin. Enter the diametral D mm.

[:Select when the pressure receiving surface is a square pin. Enter the dimension mm of the two sides of the pressure receiving surface.

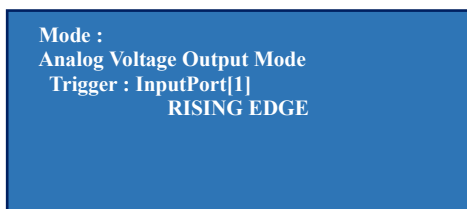
S:Select when inputting pressure receiving surface by area. Enter the area mm<sup>2</sup> of the pressure receiving surface.

- Press SET key to confirm.

※The sensitivity classification settings for Analog Voltage Output Mode can be made all at once by pressing SET after all inputs have been completed.

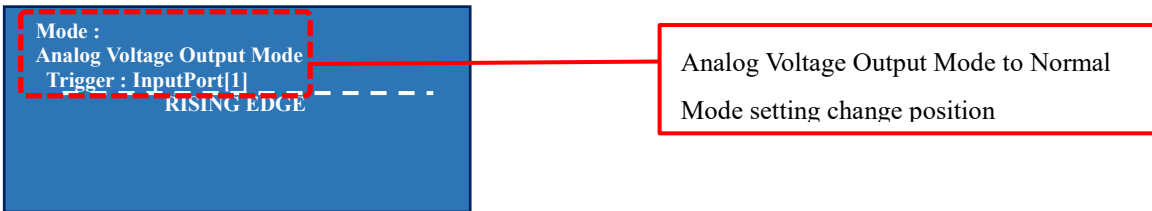
Press the MENU key to move to mode selection and trigger setting in "Analog Voltage Output Mode".

## (2) Mode selection and trigger setting in "Analog Voltage Output Mode"



- Pressing the → key once in mode selection and trigger setting moves the cursor to "Mode :".

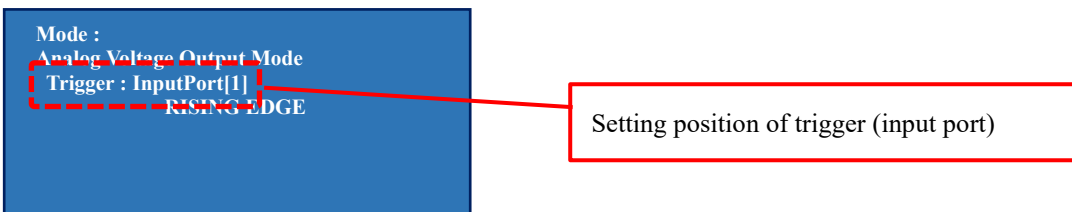
To change the setting from Analog Voltage Output Mode to Normal Mode, use the ↑ and ↓ keys to change the setting, and press the SET key to confirm the change.



● In the mode selection/trigger setting, press the → key twice to "Trigger : InputPort[1]".

The cursor moves within [].

Use the ↑ or ↓ key to change the settings, and press SET to confirm the settings.



※ There are 10 trigger (input) ports, and the default is 1.

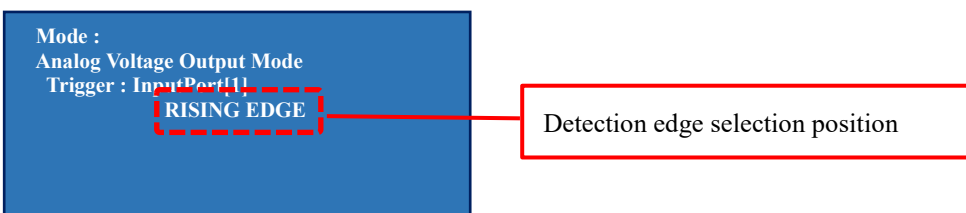
Input the mold close signal in the no-load condition at the start of measurement.

Refer to "1-5-3. Connecting Input-Signal" (P.12) for the detailed connection procedure.

DSUB25 connector pin connection (input-port only)					
Terminal No.	Signal name	Mark tube Notation	Terminal No.	Signal name	Mark tube Notation
1	GND(1~5)	GI_1-5	7	GND(6~10)	GI_6-10
2	Input port 1 (Default⇒Trigger)	IN1	8	Input port 6	IN6
3	Input port 2	IN2	9	Input port 7	IN7
4	Input port 3	IN3	10	Input port 8	IN8
5	Input port 4	IN4	11	Input port 9	IN9
6	Input port 5	IN5	12	Input port 10	IN10

● Press the → key three times in "Mode Selection/Trigger Setting" to move the cursor to "Detect Edge" selection. Select according to the specification of the input signal from the molding machine.

Use the ↑ and ↓ keys to make changes as necessary, and press SET to confirm the setting.

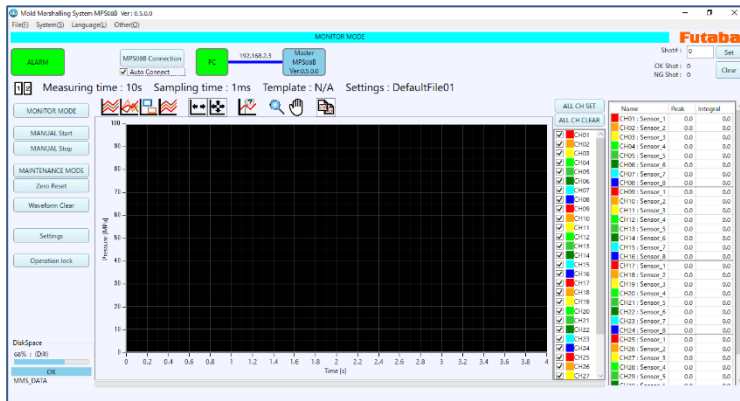


RISING EDGE : Starting measurement when the trigger signal turns from OFF to ON.

FALLING EDGE: Starting measurement when the trigger signal turns from ON to OFF.

# 4. Setting of measurement software

When the measurement software (PPSB) is started, the main operation screen is displayed.

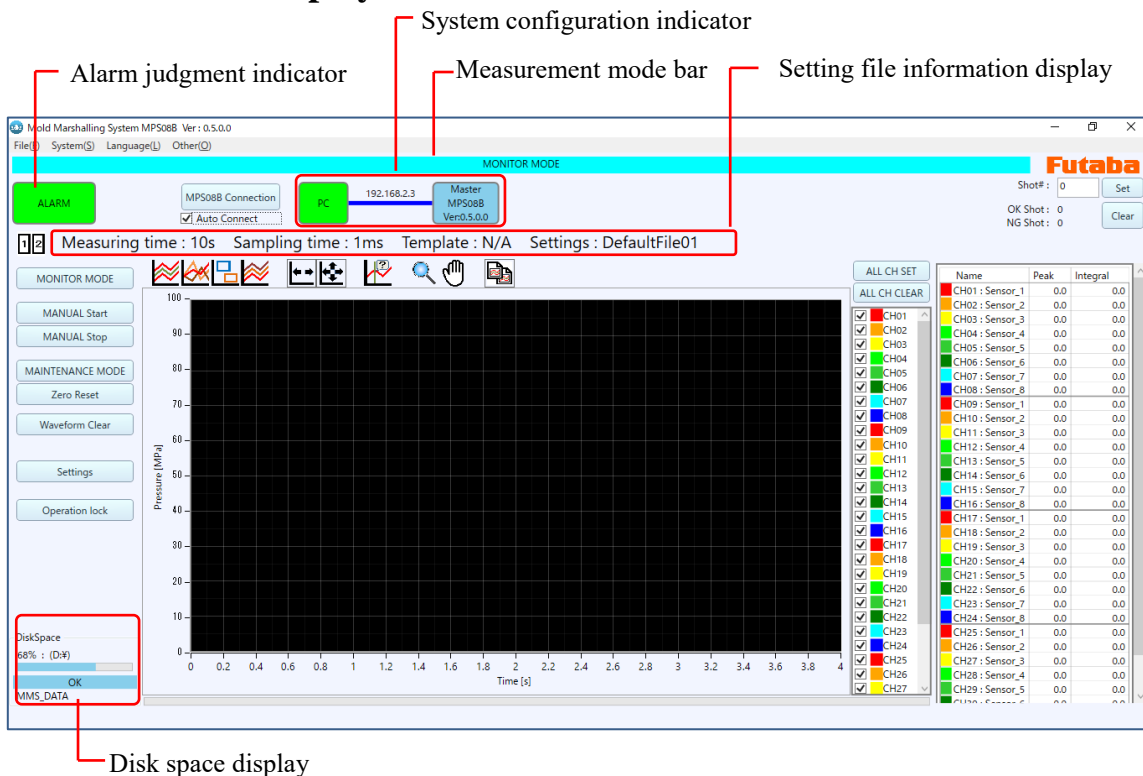


- Sections 4-1., 4-2., and 4-3. are the descriptions for the basic items of software.
- Main conditions required for pressure measurement monitoring (measurement time, sensor sensitivity, I/O signal specifications, alarm monitoring conditions, etc.) are explained in "4-4. Creation and Operation of setting files" (P.41).

## 4-1. Names and functions of screen

The outline of each display is shown below.

### 4-1-1. Information display area



(1) Measurement mode bar

Displays the currently selected mode.

Click "Monitor Mode" or "Maintenance Mode" in the operation menu to switch.



(2) Alarm indicator

Notifies the occurrence of an alarm.

- If a value that deviates from the monitoring range occurs during measurement, an alarm signal is output immediately after the end of the corresponding shot, and the display changes to red.

• Normal (no alarm) or abnormal (alarm)

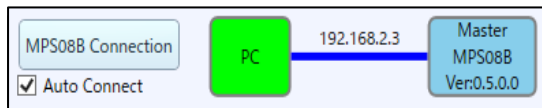


(3) System configuration indicator

Displays the currently recognized system configuration for the measurement PC (measurement software being started).

Up to four MPS08B are recognized.

- The following status indicates that a single amplifier (MPS08B) is connected to the PC.



※ Updated from the software version shown above, the current version is "Ver:1.3.0.5".

(4) Setting file information display

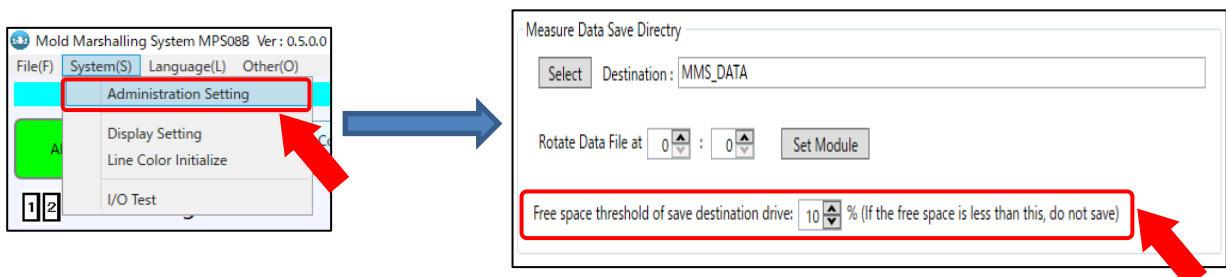
Displays the currently used setting file name, measurement time, and sampling interval.

(5) Disk space display

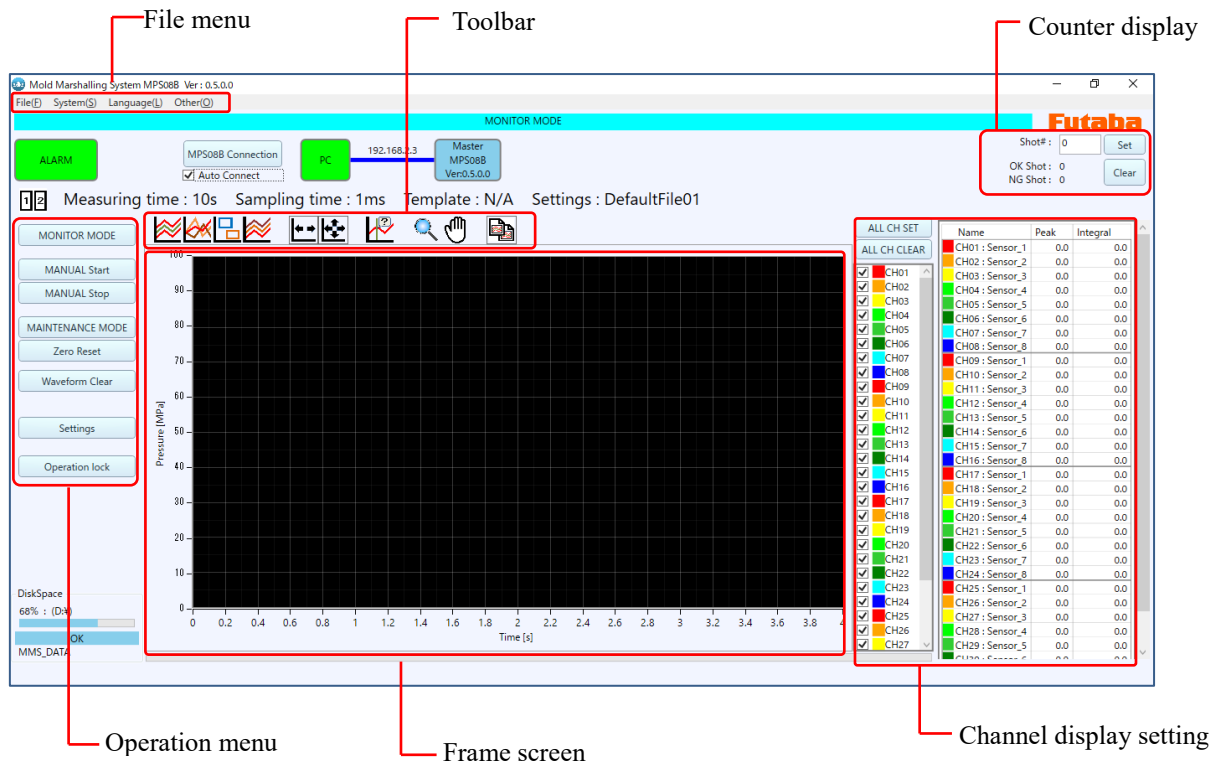
Displays the free space of the drive that is set as the storage area of the measured value.

When the free space becomes less than or equal to the set value, saving of measurement data is stopped.

- You can set the percentage of free space threshold from System ⇒ Administrator Settings on the File menu.



## 4-1-2. Operation and setting area



### (1) File menu

Check software settings such as application operation, display settings, administrator settings, and version information.

### (2) Operation menu

Switching modes and setting buttons are arranged.

### (3) Frame screen

The waveform color corresponds to the color set in the channel display setting.

### (4) Counter display

Displays the total number of shots, the number of OK shots, the number of NG shots, and the continuous alarm.

- The number from trigger signal input to measurement end is set as "1 shot", and the total number is displayed
- Number of OK shots: If no alarm is output within one shot, it is counted as "OK shot".
- Number of NG shots: When a monitoring frame is set, if a value that deviates from the monitoring frame is measured (=an alarm is output) in the shot being measured, it is counted as an "NG shot"
- Continuous Alarm: Counts the number of consecutive NG shots.

Returns to 0 when OK shot is measured.

### (5) Channel display setting

The sensors assigned to the connected MPS08B are displayed in a list.

For connected sensors, the measured information is displayed, and the items to be displayed can be selected from a pull-down menu. The waveforms are displayed in the frame screen in the color shown to the left of the check box.

## 4-2. Switching languages

The "Language" in the File menu,  
it can be switched to English, Japanese, Korean, Simplified Chinese,  
or Traditional Chinese.

(As of Jul. 2023)



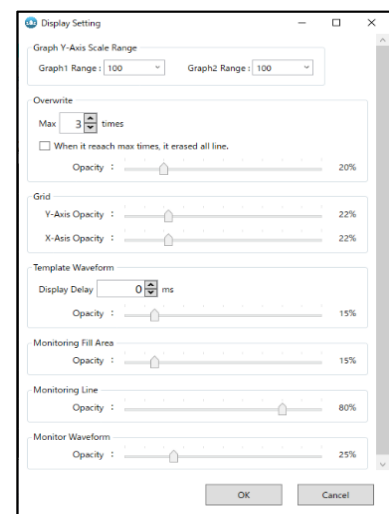
## 4-3. Initial setup of software


From the "System" menu of the File menu to save the measurement data and to  
the frame screen

Settings such as display settings and the number of times to overlay waveforms  
can be made.

### 4-3-1. Display setting

Set how the measurement waveform is displayed.

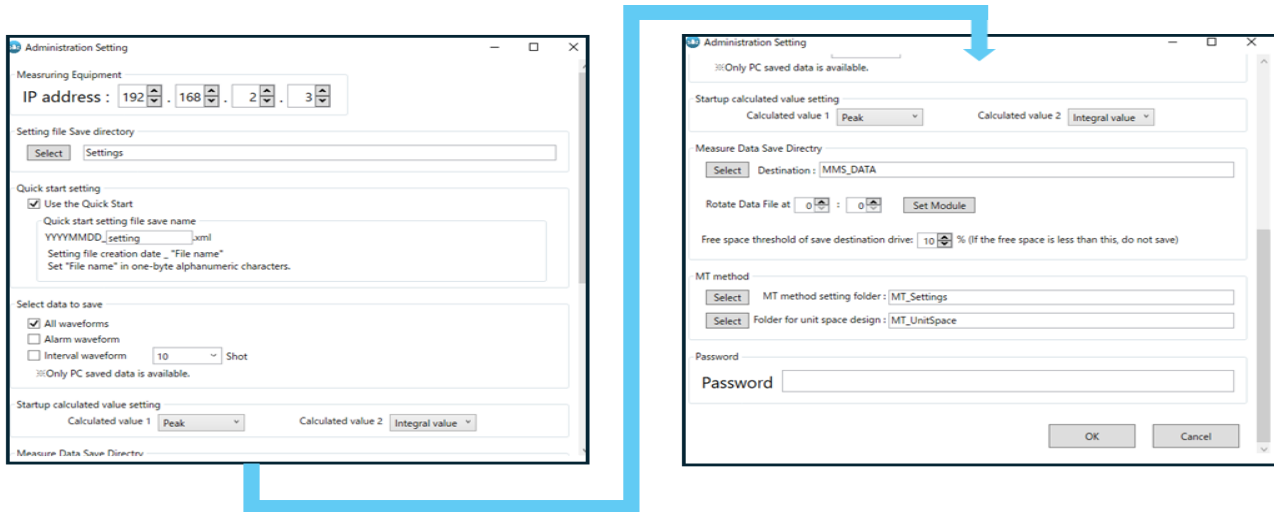


Pressure display	Graph Y-axis scale	Set the vertical axis (pressure) display range of the frame screen. Select from 5 types of 25/50/100/200/400MPa or set from direct input. If the measured waveform is displayed in one window, use Graph1Range to set the Y-axis scale. Set both Graph1Range,Graph2Range for 2-screen display. Press the button in the figure below on the main screen for 2-screen display. 
Overwriting	Maximum number	Set the maximum number of measurement waveforms to be displayed simultaneously in the frame screen. Set between 0 and 99.
	Erase all when the maximum number is reached	With check: Erase all waveforms when the set number of times is exceeded. No check: Erases from the old waveform in order when the setting count is exceeded.
	Opacity	Set the density of overwritten waveforms in the range of 0 to 100%.
Grid	Opacity	Set the density of grid (scale) in the range of 0 to 100%.
Template waveform	Opacity	Set the density of the template waveform in the range of 0 to 100%.
	Display delay	Shifts the time axis of the template waveform to be displayed.
Monitoring range Fill area Monitoring range line Monitoring waveform	Opacity	Set the density of the monitoring range in the range of 0 to 100%.



## 4-3-2. Administration setting

IP address of MPS08B, the storage location of measurement and setting files can be set.



### (1) Measuring instruments

Set IP address when connecting MPS08B for the first time.

If it is already set, do not change it unless it is necessary.

### (2) Saving location of the setting file

By default, "Settings" is specified as the location where the setting files are saved.

When changing, please set from "Selection".

### (3) Quick start setting

You can change whether Quick Start mode is used or not, and the name of the default file for Quick Start.

If the check box is unchecked, "Setting Mode Selection" will not be displayed after clicking the settings on the main measurement screen, and the display will start from the normal setting mode.

The default name of the Quick Start Settings file save is "YYYYYYMMDD\_setting.xml".

You can change the name of "setting" to any name you like. (Only half-width alphanumeric characters are accepted.)

### (4) Saved Data Selection

You can select the data to be saved from "All Waveforms, Alarm Waveforms, and Interval Waveforms."

Only the checked data is saved.

All waveforms···Waveform data for each shot

Alarm waveform···Waveform data out of the range of the monitoring setting

Interval waveform···Waveform data for each interval selected from pull-down or numeric input

●For details on data types, see "6-1. Types of saved data" (page 68) and "6-1.Saving waveform data (Measurement data)" (page 68)

●The saved data selection is only for data saved on a PC and cannot be applied to a USB memory.

### (5) Startup calculation value setting

The measurement value display items on the main screen can be selected from pull-down when the software is started.

## (6) Saving location of measurement data

MMS\_DATA is specified by default.

When changing, please set from "Selection".

### ① Rotation time

Set the time to start creating folders and log files.

Used when the operational date switching is set differently from the actual date switching.

### ② Free space threshold of the destination drive

Measurement data is not saved when the capacity falls below the set value.

- For more information on stored data, refer "6. Saving and Managing Data" (P.68).

## (7)MT method

You can change the location of the MT method settings folder and the folder for unit space design.

"MT\_Settings" and "MT\_UnitSpace" are set by default.

When changing, please set "from selection"

## (8)Password

This function allows the administrator to apply an operation lock (read-only setting) to prevent the user from changing the measurement settings.

- Although the password can be checked at any time on the administrator screen, it is recommended that the password be recorded in case the password is forgotten while the operation is locked

### ① Make read-only with a password

Enter the password set in the Main Operation Screen ⇒ Operation Menu ⇒ "Read-Only Settings".

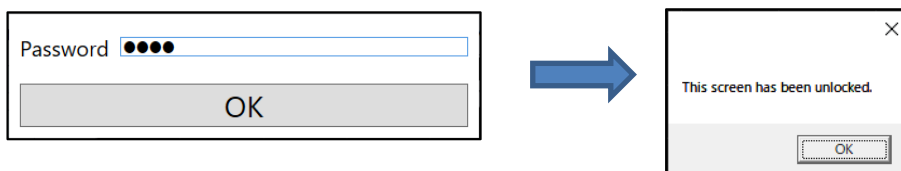
The display changes from "Read Only Setting" to "Release Read Only Setting", and the screen operation is disabled.



### ② Unlocking Operation with Password

Press "Release read-only setting" and enter the set password.

The operation lock is released and the display changes to the Read Only setting display again.



- The "Operation Lock" or "Operation Unlock" function can be activated even when no password is set.

In this case, press "OK" without entering the password.

### 4-3-3. Line color initialization

Resets the color of pressure waveforms changed in the channel display settings on the main screen to the default value.

## 4-4. Creation and operation of setting files

**<Important> Be sure to read it.**

### 4-4-0. Select quick start or normal

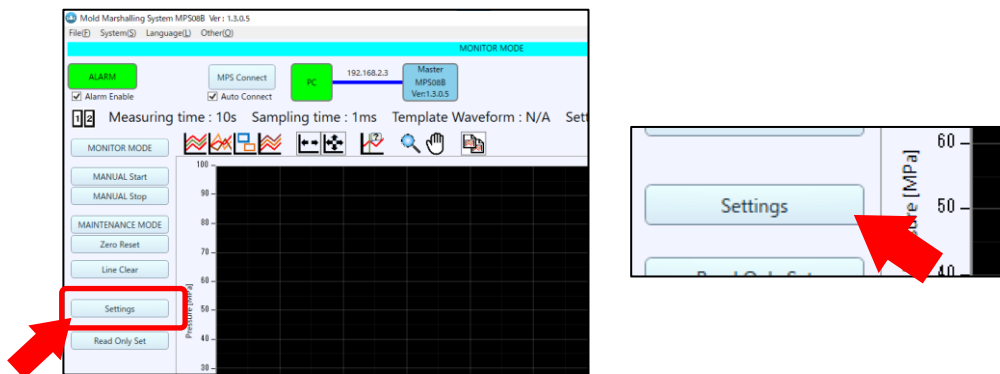
When creating a setting file, you can select either Quick Start or Normal as the creation mode.

Quick start mode is a mode that allows only minimal setup (waveform display and data acquisition) when using the pressure measurement system.

When detailed setting (monitoring frame, signal input/output, etc.) is required, please set from the normal mode.

For detailed settings of Quick Start, refer "4-9. Setting in Quick Start Mode" (P.62).

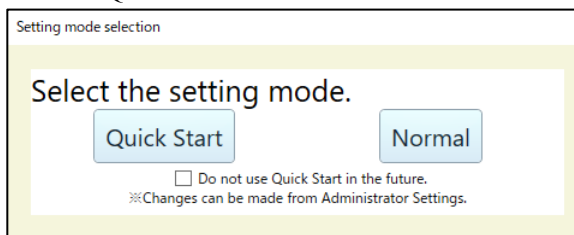
(1) Press the settings button.



(2) Select Setting mode.

The setting mode selection screen is displayed.

Select the Quick Start.



- For details on the Quick Start settings, refer "4-9. Settings in quick start mode " (P.62).
- "Do not use Quick Start in the future." is checked, you will go directly to the "Normal Mode" setting the next time you click on Settings. To use Quick Start again, please change from Administration settings. Refer to "4-3\_2. Administration settings" (P.39).

## 4-4-1. Operation of the setting file

All conditions required for pressure measurement monitoring can be stored and managed in a single file at once.

Normally, they are managed by mold (by product). However, when the alarm monitoring zone is changed depending on the season (summer, winter, etc.), multiple setting files may be created and managed using a single mold. Please devise the name of the setting file to operate.

※The setting file name can be up to 32 half-width alphanumeric characters.

## 4-4-2. Information in the setting file

The setting file contains the following four types of settings:

- (1) Channel Settings··· Sensor sensitivity, channel name
- (2) Measurement Conditions setting··· Measurement time, sampling time, pressure unit, etc.
- (3) I/O Signal Setting··· Trigger (measurement start) signal setting, alarm output signal setting, etc.
- (4) Alarm monitoring setting··· Type of alarm monitoring, pressure upper/lower limit value of the monitoring zone, time setting, etc.

## 4-4-3. Location of the setting file

### (1) Setting file in the amplifier

100 setting files can be saved in the built-in memory in the amplifier.

(DefaultFile\_01 [Frame 1] to DefaultFile\_100 [100])

- Non-volatile memory keeps the contents of the setting file in memory even after the amplifier is turned off.
- The default name setting file is saved at the time of shipment.
- At the time of shipment, the setting file for frame 1 [01] (DefaultFile\_001) is selected.

To select a different number, use the amplifier keys.

Refer to "3-2. Key Switch and Liquid Crystal Screen" (P.25 File Select screen).

- When replacing a setting file stored in the amplifier or changing the setting contents, it is done from the PC-side measurement software (Amplifier and computer connection is required).

### (2) Settings file on the PC

The newly created setting file is saved in the specified folder on the PC.

- Initially, there is no setting file in the specified folder.
- The setting file save destination can be set from "System" → "Administration Settings" in the File menu.

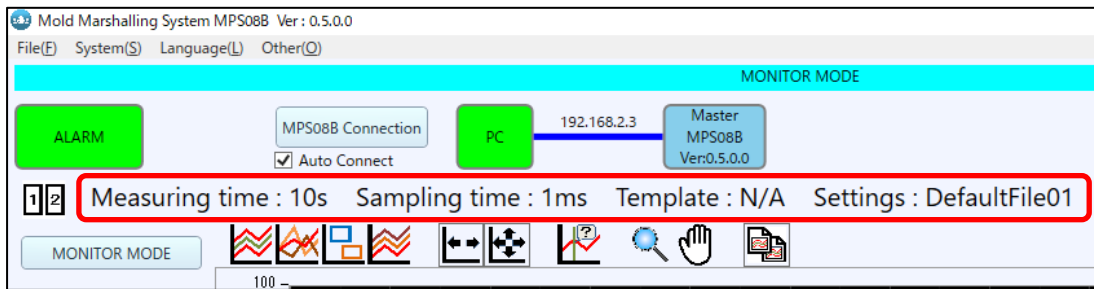
When the number of molds to be held is large, manage the setting file on the PC side.

It is convenient to sort the folders by molding machine and production location.

#### 4-4-4. Check the setting file selected in the amplifier

When you connect the amplifier to the PC and start the measurement software for the first time after purchase, the information in the default setting file (number [1]) stored in the amplifier will be read.

The information of the setting file currently selected by the amplifier can be checked on the measurement main screen.



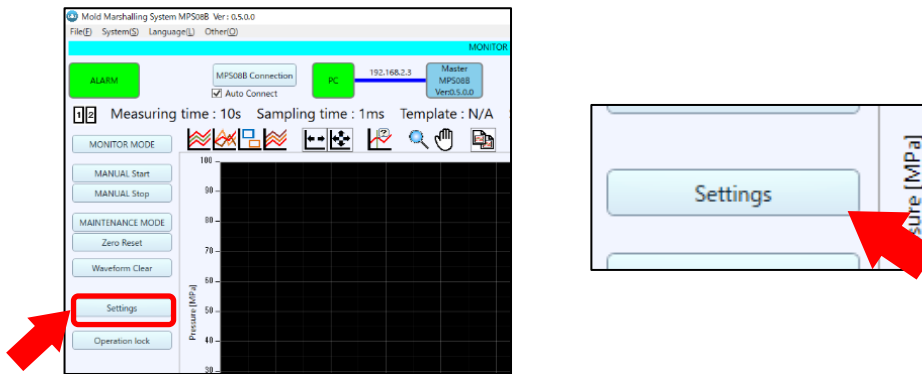
※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

Normally, the contents of the setting file (measurement time, etc.) must be changed. Set the following items.

#### 4-4-5. To updating the setting file

Describes how to modify and update the contents of an existing setting file.

(1) Press the Settings button.

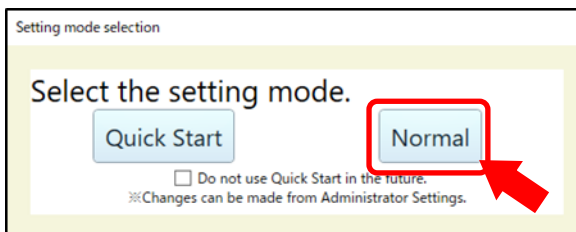


※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

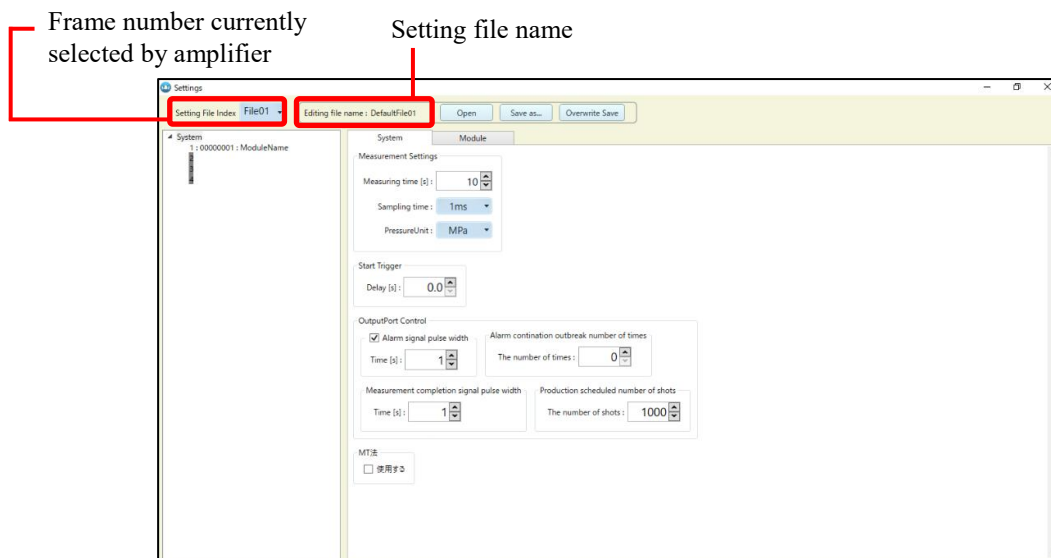
(2) Select setting mode.

The setting mode selection screen is displayed.

Select Normal.



The setting file information saved in the amplifier is loaded and the measurement condition setting screen is displayed.

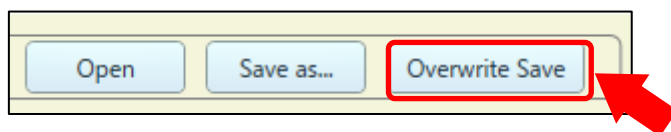


The setting file number displayed at the beginning of opening the setting screen is the frame number of the setting file selected in the amplifier. In the illustration above, there are indications as File01, so you can see that the [01] frame is selected in the amplifier. The name of the selected setting file is also displayed.

### (3) Change the conditions.

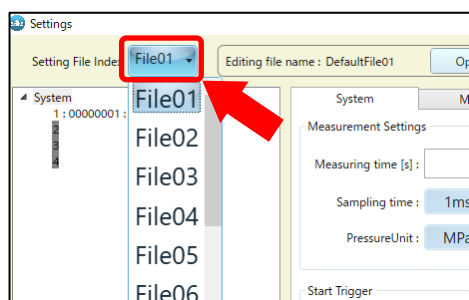
Change various conditions. Each condition setting is described in detail in Sections 4-5 to 4-8.

### (4) Press Overwrite Save.



The changed conditions are updated, and the main measurement screen reappears.

If you would like to change the setting file for another frame number in the amplifier, pull down the frame number in "Setting File Number" and select it. Subsequent operations are the same as steps (2) and (3).



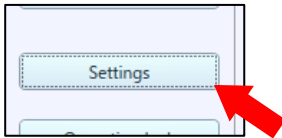
## 4-4-6. Creating a new setting file

The following describes how to create a new setting file.

Follow this procedure when making measurements for the first time in a new project (mold, molded part).

This section explains how to create a new setting file "MOLD-A" and save it to the frame number [3] inside the amplifier.

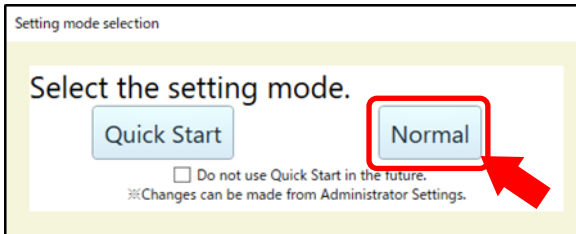
(1) Press the Settings button.



(2) Select setting mode.

The setting mode selection screen is displayed.

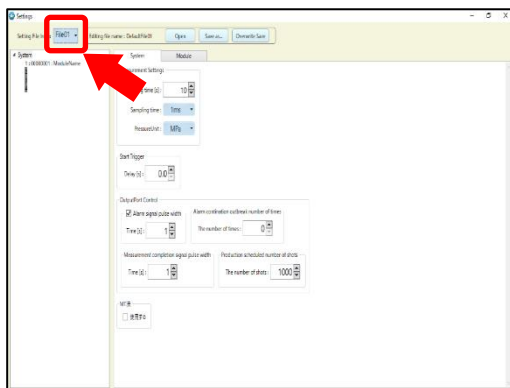
Please select Normal.



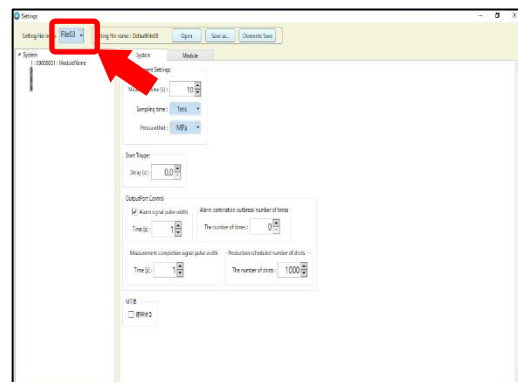
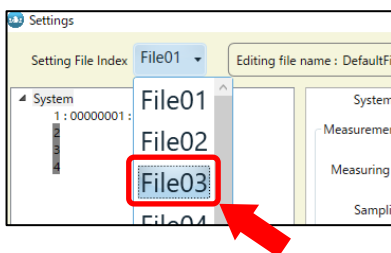
The measurement condition setting screen is displayed.

●The setting of the selected frame number in the amplifier is displayed.

(File01: Frame number [01] is displayed for the first time)



(3) Select [3] from the setting file number.

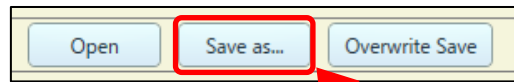


The settings in the setting file change to those of the setting file saved in File03.

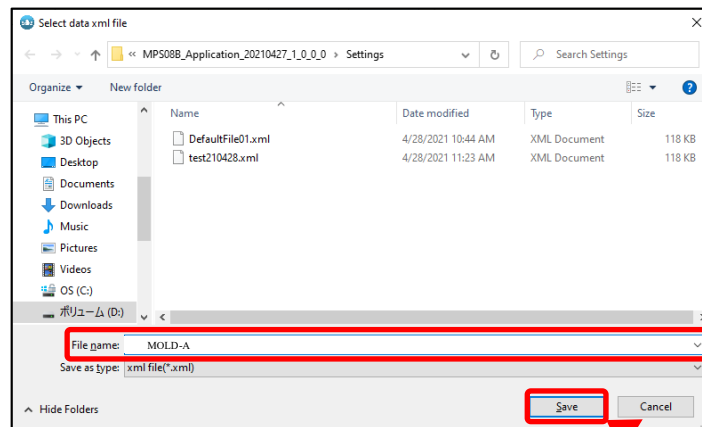
(4) Change the conditions.

Change the conditions as necessary. Each condition setting is described in detail in Sections 4-5 to 4-8.

(5) Press "Save as".



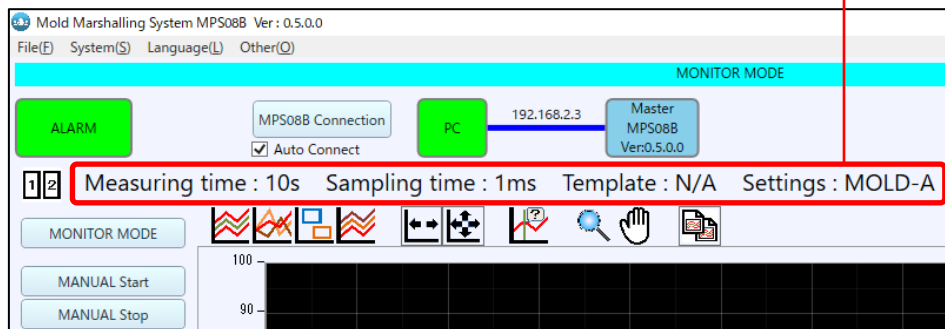
The File Name Input window is displayed.



Enter "MOLD-A" for the file name and press "Save" to return to the main measurement window.

**At this point, the setting file in the amplifier switches to frame number [1] ⇒ [3],  
the newly created setting file is saved.**

Check whether the changed content is reflected.



※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

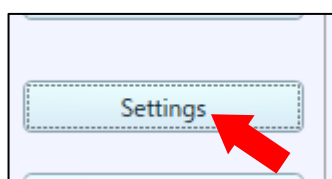
#### 4-4-7. Switching setting files

Recalls the settings file saved in the PC and saves it to an arbitrary frame number of the amplifier.

This section describes the procedure for saving the settings file "MOLD-B" stored in the computer to frame number [5] in the amplifier.

- Files initially saved in frame number [5] will be overwritten. If the setting file has not been backed up in the PC, please save it as a new file and operate it.

(1) Press the Settings.

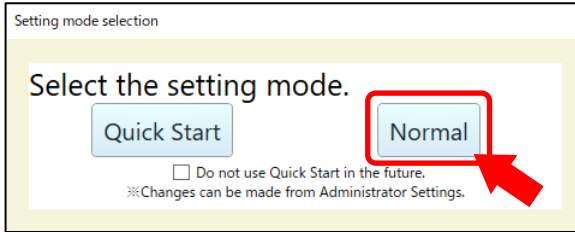




(2) Select setting mode.

The setting mode selection screen is displayed.

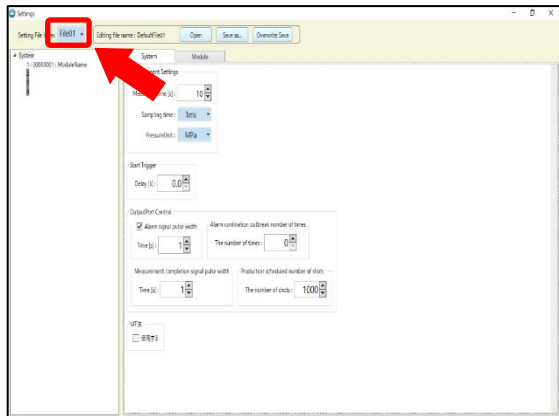
Select Normal.



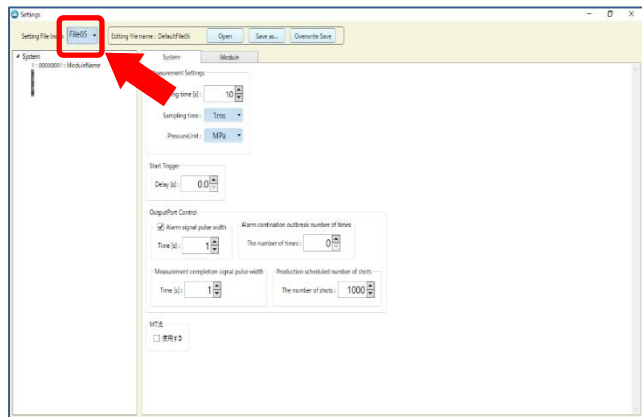
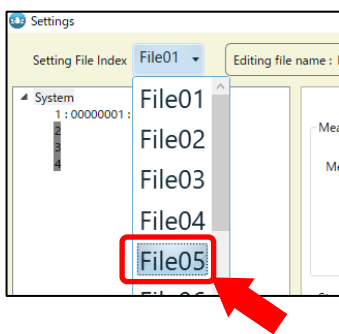
The measurement condition setting screen is displayed.

- The setting of the selected frame number in the amplifier is displayed.

(File01: Frame number [01] is displayed for the first time)



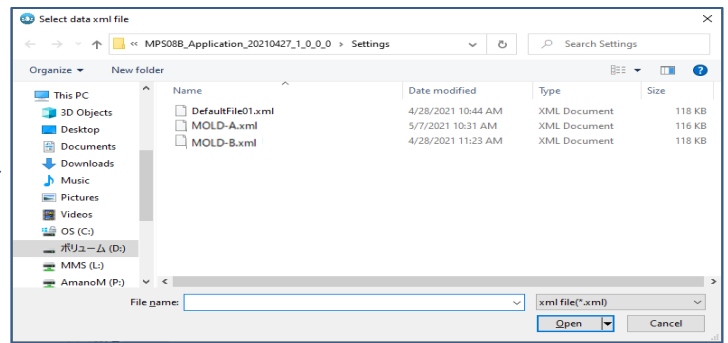
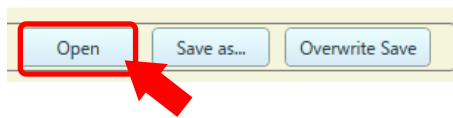
(3) Select [5] from the setting file number.



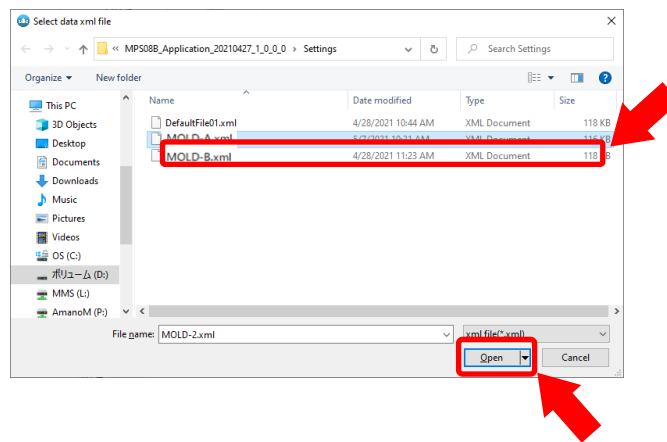
The settings in the setting file change to those of the setting file saved in File05.

#### (4) Open the setting file

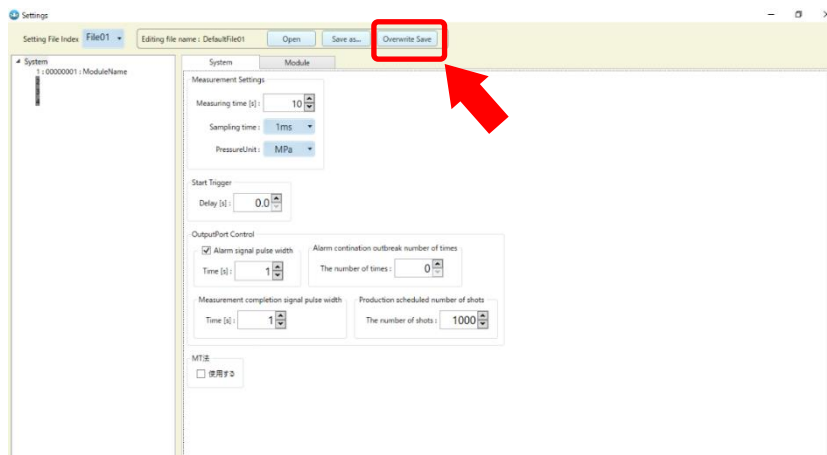
Press "Open" to open the file selection screen.



Select "MOLD-B" and press "Open" to switch to the "MOLD-B" setting.



Confirm the contents and press "Save" if there is no problem.

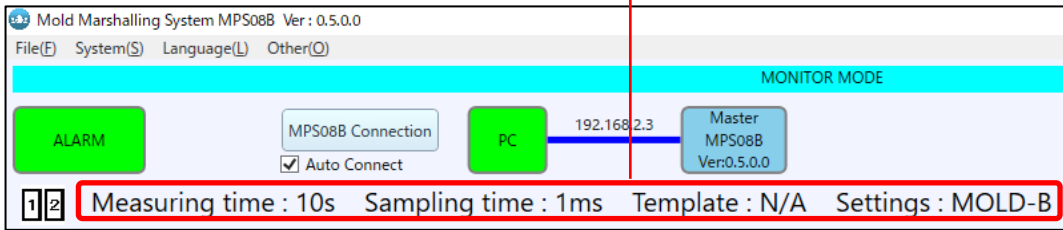


Return to the main measurement screen.

**At this point, the setting file in the amplifier switches to frame number [1] ⇒ [5],**

**The setting file "MOLD-B" is stored.**

Check whether the changed content is reflected.



**※Updated from the software version shown above, the current version is "Ver:1.3.0.5".**

>>> From here, the detailed condition setting of the setting file will be explained.

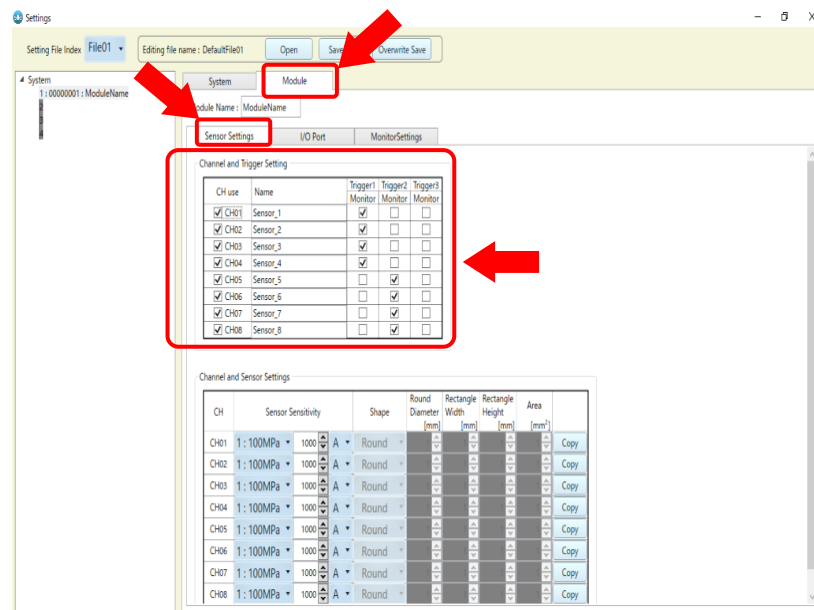
## **4-5. Channel Settings**

Press "Settings" in the operation menu.

### **4-5-1. Sensor setting**

#### **(1) Channel Trigger Setting**

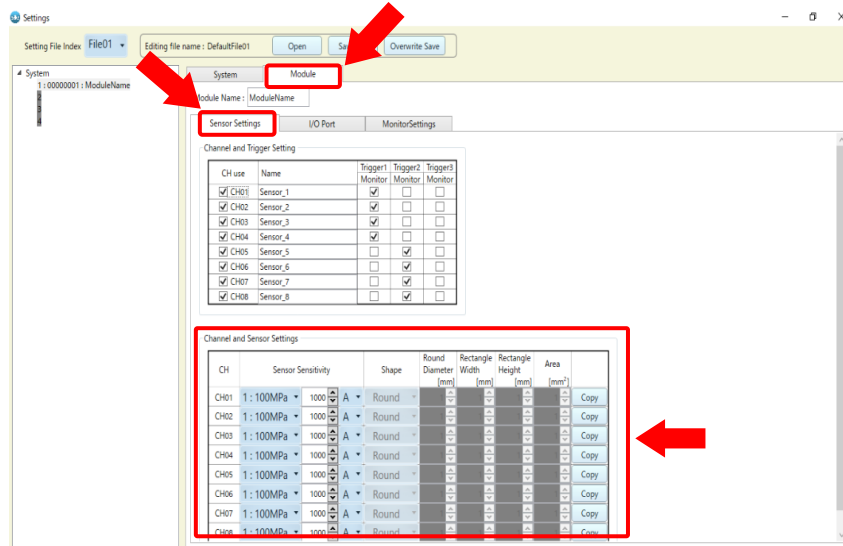
Set each measurement channel in the Module tab ⇒ Sensor Settings tab ⇒ Channel and Trigger-Settings.



- Used CH : Insert  into the channel to be measured. Even if a sensor is connected, the data will not be saved unless  is inserted in the measurement channel.
- Name : Sensor name by CH can be set. (e.g., "CAVITY 1 GATE", etc.)
- Trigger setting: A trigger can be selected for each measurement CH. (Which CH starts measurement by which trigger)
- For the horizontal molding machine, only trigger 1 should be turned  because there is one type of mold close signal.


## (2) Sensor sensitivity setting

Set the sensor sensitivity in the Module tab ⇒ Sensor Settings tab ⇒ Channel and Sensor Settings.



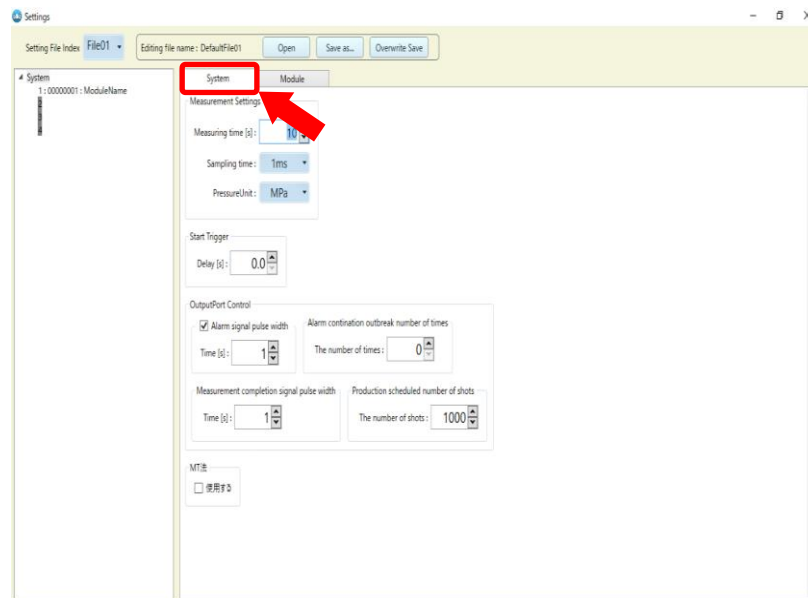
- Be sure to set the sensor sensitivity.

If the sensor sensitivity is not set or if the setting is incorrect, the pressure will not be measured correctly.

Sensor sensitivity classification	Enter the "6-digit alphanumeric characters" displayed on the sensor cable. 
Shape	It can be changed by selecting the button type sensor. Select the shape of the pressure receiving surface at the end of the ejector pin from "Round", "Rectangle" and "Area".
Circle diameter	When "Round shape" is selected for the pressure receiving surface shape, it can be changed. Enter the diameter of the pressure receiving surface at the end of the ejector pin.
Width	When "Rectangle" is selected for the pressure receiving surface shape, it can be changed. Enter the height and width of the pressure receiving surface at the end of the ejector pin.
Height	
Area	It can be changed only when "Area" is selected for the pressure receiving surface shape. Enter the cross-sectional area of the pressure receiving surface at the end of the ejector pin.

## 4-6. Setting the measurement conditions

Next, set the measurement conditions. Set the measurement conditions on the System tab.



### 4-6-1. Explanation of terms

Measurement setting	Measurement time	0.01~ It can be set up to 120000 seconds in 0.01s units. (Varies depending on the sampling interval) ※Measurement interval (measurement completion to next measurement start trigger input interval) must be 20ms or more. ※Saving data to USB memory requires a measurement cycle (interval from start trigger input to next start trigger input) of 2 s or longer. ※If the measurement cycle (interval from start trigger input to next start trigger input) is less than 1s, accurate data saving may not be possible with both PC and USB. The measurement cycle should be at least 1 s.
	Sampling interval	Can be set at 1ms, 2ms, 5ms, 10ms, 20ms, 50ms, 100ms, 200ms, 500ms, or 1000ms.
	Pressure unit	MPa, kgf/cm <sup>2</sup> , psi, bar
Start trigger	Delay	It can be set from 0.0 to 25.0 seconds in 0.1 second increments. When connecting the mold close signal, set it in 0.0 seconds.
External output function	Alarm signal pulse width	Set the alarm output time.
	Number of continuous alarms	An alarm is output when an error exceeds the specified number of times.
	Shot completion pulse width	Set the shot completion output time.
	Production scheduled number of shots	Outputs a signal when the number of production shots is reached.
MT method	Use.	Select whether to use MT method.

## 4-7. I/O signal setting

Next, set the I/O signal conditions.

There are 10 ports for each of the input and output ports. Assign these ports according to the status of use.

- One input signal for starting measurement must be connected.
- If alarm monitoring is not performed, no connection of the output signal is required.

Set in the "Module" tab ⇒ "Input/output signal" tab.

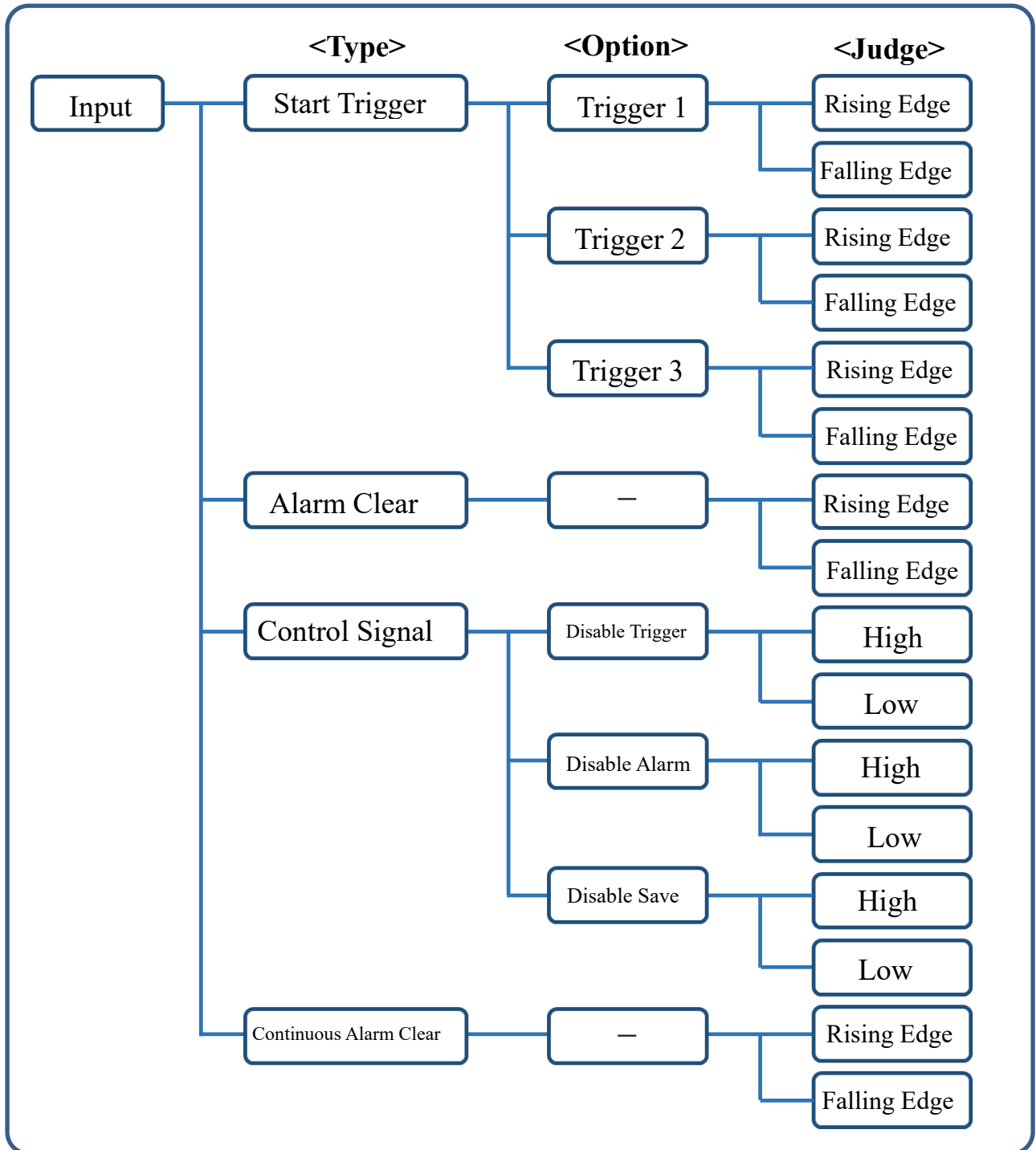
The screenshot shows the Settings application interface. The 'System' tab is selected, and the 'Module' sub-tab is active. The 'I/O Port' sub-tab is also active. The 'Input Port' table is shown below, with the following data:

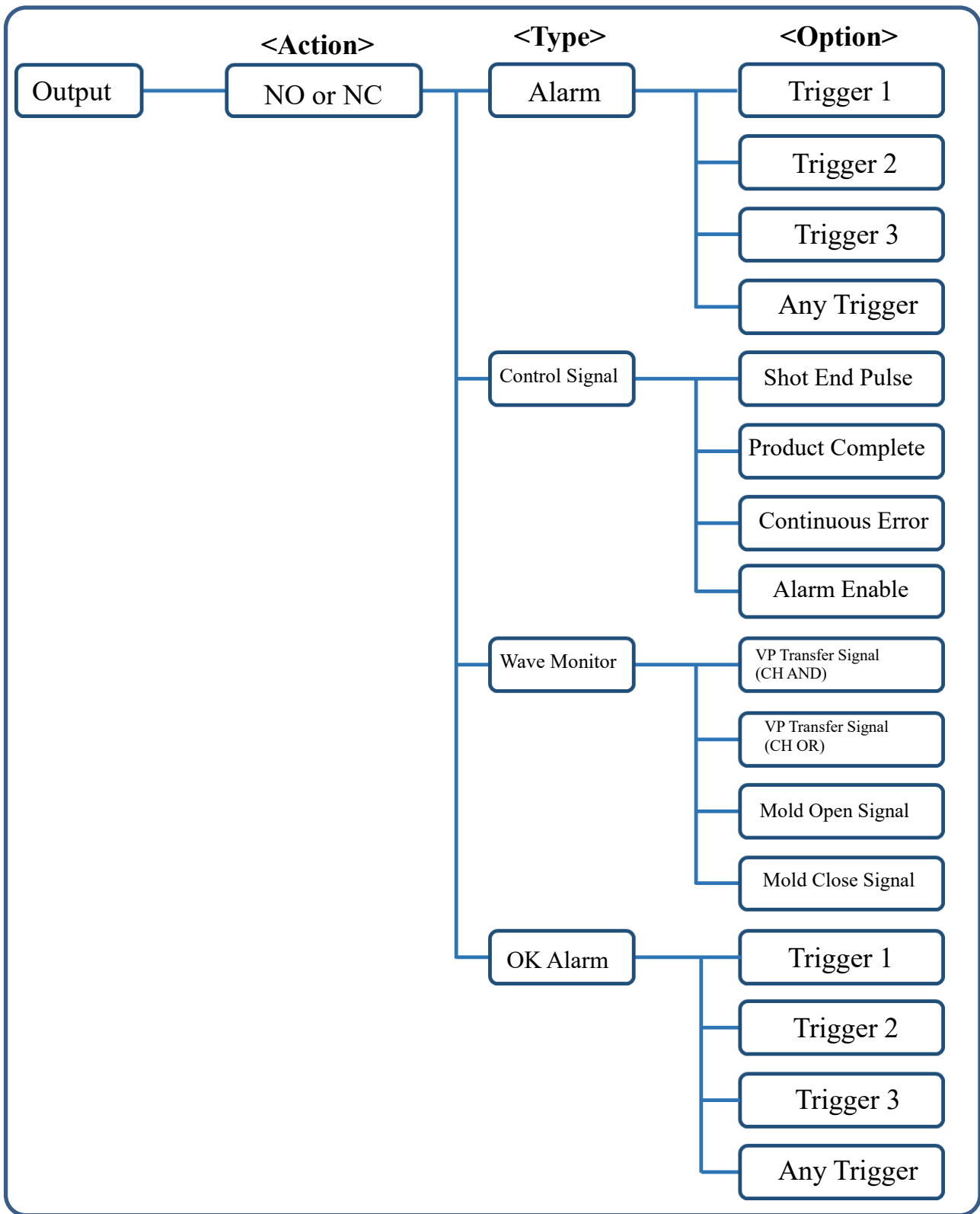
	Port01	Port02	Port03	Port04	Port05	Port06	Port07	Port08	Port09	Port10
Type	Start Trigger	Start Trigger	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet
Option	Trigger1	Trigger2	-	-	-	-	-	-	-	-
Judge	RisingEdge	RisingEdge	-	-	-	-	-	-	-	-

The 'Output Port' table is shown below, with the following data:

	Port01	Port02	Port03	Port04	Port05	Port06	Port07	Port08	Port09	Port10
Action	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Type	Alarm	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet
Option	Trigger1	-	-	-	-	-	-	-	-	-

■ Hierarchy of input/output signal selection







### 4-7-1. Default setting

The default settings are as follows:

Input Port										
	Port01	Port02	Port03	Port04	Port05	Port06	Port07	Port08	Port09	Port10
Type	Start Trigger	Alarm Clear	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet
Option	Trigger1	-	-	-	-	-	-	-	-	-
Judge	RisingEdge	RisingEdge	-	-	-	-	-	-	-	-

Output Port										
	Port01	Port02	Port03	Port04	Port05	Port06	Port07	Port08	Port09	Port10
Action	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Type	Alarm	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet	UnSet
Option	Trigger1	-	-	-	-	-	-	-	-	-
	<input checked="" type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01
	<input checked="" type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02
	<input checked="" type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03
	<input checked="" type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04
	<input checked="" type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05
	<input checked="" type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06
	<input checked="" type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07
	<input checked="" type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08
	<input checked="" type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09
	<input checked="" type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10
	<input checked="" type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11
	<input checked="" type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12	<input type="checkbox"/> CH12
	<input checked="" type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13	<input type="checkbox"/> CH13

### 4-7-2. Typical I/O signal settings

(1) Setting example 1: When the horizontal molding machine alarm is not monitored, a measurement trigger (mold close completed) is output.

Eight-point measurement/trigger 1 is used.

Start trigger is assigned to input port 1.

① Sensor setting

Sensor Settings		I/O Port	MonitorSettings		
Channel and Trigger Setting					
CH use	Name	Trigger1 Monitor	Trigger2 Monitor	Trigger3 Monitor	
<input checked="" type="checkbox"/> CH01	Sensor_1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH02	Sensor_2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH03	Sensor_3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH04	Sensor_4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH05	Sensor_5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH06	Sensor_6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH07	Sensor_7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH08	Sensor_8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

② I/O signal setting

Sensor Settings		I/O Port		
Input Port				
	Port01	Port02	Port03	
Type	Start Trigger ▾	UnSet ▾	UnSet	
Option	Trigger1 ▾	- ▾	-	
Judge	RisingEdge ▾	- ▾	-	
Output Port				
	Port01	Port02	Port03	
Action	NO ▾	NO ▾	NO ▾	
Type	Alarm ▾	UnSet ▾	UnSet ▾	
Option	Trigger1 ▾	- ▾	-	
	<input checked="" type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	
	<input checked="" type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	
	<input checked="" type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	
	<input checked="" type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	
	<input checked="" type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	
	<input checked="" type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	
	<input checked="" type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	
	<input checked="" type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	
	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	

(2) Setting example 2: Horizontal molding machine alarm monitoring Measurement trigger (mold close completed)

Eight-point measurement/trigger 1 is used.

Start trigger is assigned to input port 1.

An alarm is assigned to output port 1.

① Sensor setting

System		Module		
Module Name : <input type="text"/>				
Sensor Settings		I/O Port	MonitorSettings	
Channel and Trigger Setting				
CH use	Name	Trigger1 Monitor	Trigger2 Monitor	Trigger3 Monitor
<input checked="" type="checkbox"/> CH01	Sensor_1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH02	Sensor_2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH03	Sensor_3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH04	Sensor_4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH05	Sensor_5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH06	Sensor_6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH07	Sensor_7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH08	Sensor_8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

② I/O signal setting

Sensor Settings		I/O Port		
<b>Input Port</b>				
	Port01	Port02	Port03	
Type	Start Trigger ▾	UnSet ▾	UnSet	
Option	Trigger1 ▾	- ▾	-	
Judge	RisingEdge ▾	- ▾	-	
<b>Output Port</b>				
	Port01	Port02	Port03	
Action	NO ▾	NO ▾	NO ▾	
Type	Alarm ▾	UnSet ▾	UnSet ▾	U
Option	Trigger1 ▾	- ▾	- ▾	
	<input checked="" type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	
	<input checked="" type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	
	<input checked="" type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	
	<input checked="" type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	
	<input checked="" type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05	
	<input checked="" type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06	
	<input checked="" type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07	
	<input checked="" type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08	
	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	

(3) Setting example 3: Measurement trigger when rotary molding alarm monitoring is not performed (mold close completed)

Surface A 1 to 4ch trigger 1 is used.

Surface B 5 to 8ch trigger 2 is used.

Start trigger (trigger 1) is assigned to input port 1 and start trigger (trigger 2) is assigned to input port 2.

① Sensor setting

Sensor Settings		I/O Port	MonitorSettings		
<b>Channel and Trigger Setting</b>					
CH use	Name	Trigger1 Monitor	Trigger2 Monitor	Trigger3 Monitor	
<input checked="" type="checkbox"/> CH01	Sensor_1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH02	Sensor_2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH03	Sensor_3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH04	Sensor_4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH05	Sensor_5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH06	Sensor_6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH07	Sensor_7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH08	Sensor_8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

② I/O signal setting

Sensor Settings		I/O Port				MonitorSettings	
<b>Input Port</b>							
	Port01	Port02	Port03	Port04			
Type	Start Trigger ▾	Start Trigger ▾	UnSet ▾	UnSet ▾			
Option	Trigger1 ▾	Trigger2 ▾	- ▾	- ▾			
Judge	RisingEdge ▾	RisingEdge ▾	- ▾	- ▾			
<b>Output Port</b>							
	Port01	Port02	Port03	Port04	Port05		
Action	NO ▾	NO ▾	NO ▾	NO ▾	NO ▾		
Type	UnSet ▾	UnSet ▾	UnSet ▾	UnSet ▾	UnSet ▾		
Option	- ▾	- ▾	- ▾	- ▾	- ▾		
	<input checked="" type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01		
	<input checked="" type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02		

(4) Setting example 4: Measurement trigger for monitoring rotary molding alarm (mold close completed)

Surface A 1 to 4ch trigger 1 is used.

Surface B 5 to 8ch trigger 2 is used.

Start trigger (trigger 1) is assigned to input port 1 and start trigger (trigger 2) is assigned to input port 2.

Alarm (trigger 1) is assigned to output port 1, and alarm (trigger 2) is assigned to output port 2.

① Sensor setting

Sensor Settings		I/O Port		MonitorSettings	
<b>Channel and Trigger Setting</b>					
CH use	Name	Trigger1 Monitor	Trigger2 Monitor	Trigger3 Monitor	
<input checked="" type="checkbox"/> CH01	Sensor_1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH02	Sensor_2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH03	Sensor_3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH04	Sensor_4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH05	Sensor_5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH06	Sensor_6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH07	Sensor_7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> CH08	Sensor_8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

② I/O signal setting

The screenshot shows the 'I/O Port' configuration window. It is divided into 'Input Port' and 'Output Port' sections. The 'Input Port' section has three columns: Port01, Port02, and Port03. The 'Output Port' section has three columns: Port01, Port02, and Port03. Below the 'Output Port' section, there is a list of channels (CH01 to CH10) with checkboxes for each channel.

### 4-7-3. Explanation of terms

This section describes the terms for input and output signals.

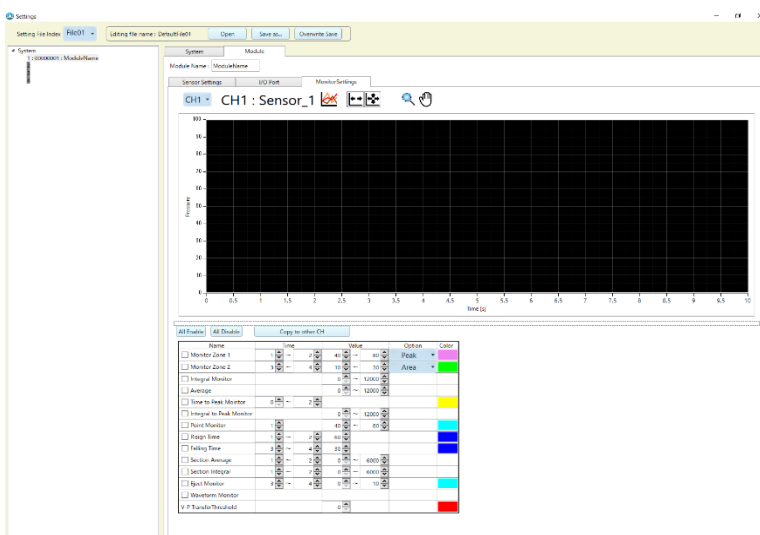
Input	<b>Signal name</b>	<b>Start trigger</b>	<b>Sets the measurement start trigger.</b>
	Option	Trigger (1~3)	Specify the trigger number to be used.
	Detected edge	Rising edge Falling edge	This can be selected according to the specifications of the input signal from the molding machine. Rising edge: Starting measurement when the signal changes from OFF to ON Falling edge: Starting measurement when the signal changes from ON to OFF
	<b>Signal name</b>	<b>Alarm clear</b>	<b>Check this box to clear the alarm by an external signal.</b>
	Detected edge	Rising edge Falling edge	Select according to the specifications of the input signal from the molding machine. Rising edge: Operation starts when the signal changes from OFF to ON Falling edge: Operation starts when the signal changes from ON to OFF
	<b>Signal name</b>	<b>Control signal</b>	<b>The following functions are disabled by external signals.</b>
	Option	Disabled trigger Disabled alarm Disabled save	Disables the trigger. Disables the alarm. Disables saving of waveform data.
	Detected edge	Rising edge Falling edge	Rising edge: Operation starts when the signal changes from OFF to ON Falling edge: Operation starts when the signal changes from ON to OFF
Input	<b>Signal name</b>	<b>Continuous alarm clear</b>	<b>Clear continuous alarm by external signal.</b>
	Detected edge	Rising edge Falling edge	Select according to the specification of the input signal from the signal output destination. Rising edge: Operation starts when the signal changes from OFF to ON Falling edge: Operation starts when the signal changes from ON to OFF

<b>Output</b>	<b>Operation</b>	NO NC	NO: Operation is started when a signal changes from OFF to ON NC: Operation is started when a signal changes from ON to OFF
	<b>Signal name</b>	<b>Alarm</b>	<b>Outputs an alarm signal.</b>
	Option	Trigger (1~3)	Specify the trigger number to be used.
	<b>Signal name</b>	<b>Control signal</b>	<b>Outputs various control signals.</b>
	Option	Shot end pulse Product complete Continuous error Alarm enable	Outputs a signal when the shot is complete. When the specified number of shots (OK shots) is reached, the signal is outputted. Outputs a signal when the specified number of alarms occurs continuously. Outputs a signal when the alarm is enabled
	<b>Signal name</b>	<b>Waveform monitoring</b>	<b>Outputs various waveform monitoring signals.</b>
	Option	VP transfer signal (CH_AND) VP transfer signal (CH_OR) Mold open signal (CH_AND) Mold open signal (CH_OR)	When all the selected CH exceed the thresholds, the signal is outputted. If at least one of the selected CH exceeds the threshold. Outputs a signal. When all the selected CH are below the thresholds, they are output. If at least one of the selected CH falls below the thresholds, a signal is output.
	<b>Signal name</b>	<b>OK ALARM</b>	<b>Outputs an alarm (non-defective) signal when the condition is within the monitoring condition.</b>
	Option	Trigger (1~3)	Specify the trigger number to be used.

## 4-8. Alarm monitoring condition setting

Set the following settings only when using the alarm setting.

For more information on the monitoring modes, refer "8-1. Supplemental Materials for Alarm Monitoring Zone Settings" (P.81).



## 4-8-1. Explanation of terms

This section describes the terms for alarm monitoring.

Monitoring zone 1/Monitoring zone 2	The monitoring zone is set according to the desired time and value, and the measured value is monitored to see if it is within the zone. Peak: Whether the maximum pressure value within the monitoring time within the monitoring pressure value. Area: Whether the entire waveform within the monitoring time within the monitored pressure value.
Integral monitor	Monitors whether the integral value (pressure waveform and area enclosed in the time axis) within the measurement time is within the set range.
Average	Calculates the average value of all measurements within the measurement time and monitors whether it is within the set range.
Time to peak monitor	Monitors whether a maximum pressure value (peak pressure value) occurs within the monitoring time.
Integral peak monitor	Monitors whether the integral value up to the maximum pressure value (peak pressure value) within the measurement time is within the set integral value range.
Point monitor	Monitors whether the pressure value at the set time (t seconds) has elapsed is within the set range.
Rising	Monitors the moment when the measured value rises to the set value within the set time.
Falling	Monitors the moment when the measured value drops to the set value within the set time.
Section average	Monitors whether the average value in the monitoring time is within the set range.
Section integral 1 Section integral 2	Monitors whether the integral value (area enclosed by the pressure waveform and time axis) within the monitoring time is within the set range.
Eject monitoring	Set the monitoring zone for the pressure applied during the post-molding ejection and monitor whether the peak pressure value and the occurrence time are within the monitoring zone.
Waveform monitor	When this check box is selected, the template waveform and its allowable amplitude (upper and lower limits) settings are applied to monitor whether the entire area of the measured waveform is within that amplitude. A monitoring waveform must be created and transmitted to the measuring instrument in advance.
V-P transfer threshold	A control signal is outputted at the moment when the measured value reaches V-P transfer threshold.

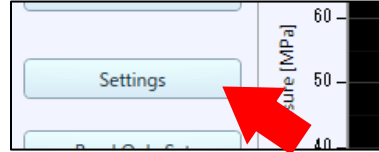
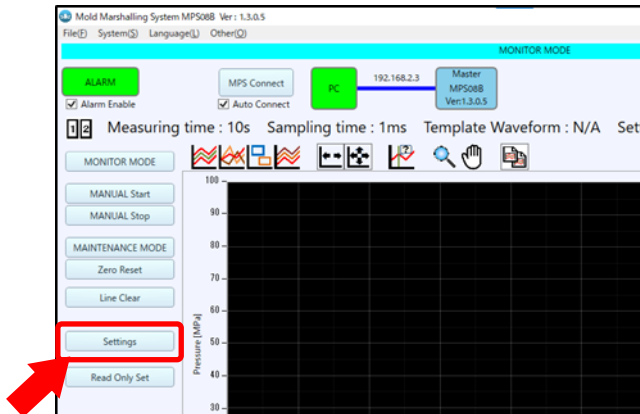
※To cancel the alarm, disable the monitoring zone from the monitoring condition setting or disable CH from the measuring screen.

※Measurement can also be performed without setting the monitoring zone. In this case, the log file of the measurement result is displayed as "-".

## 4-9. Settings in quick start mode

The procedure for setting the Quick Start Mode is described below.

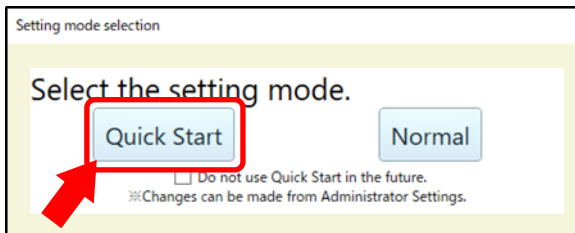
### (1) Press the Settings button.



### (2) Setting mode selection.

The setting mode selection screen is displayed.

Select Setting mode.



### (3) Setting input

The setting screen changes in the following order: "Measurement Time Setting", "Sampling Interval Setting", "Channel/Sensor Setting", and "Confirm Setting". Complete the setting after confirming the explanation on each screen.

- The setting filename is saved with the name "YYYYMMDD\_settingXXX.xml".

The saved name of the setting file (setting part of the above file name) can be changed from the Administration setting.

For details on changing the Quick Start setting file name, refer "4-3-2. Administration Settings" (P.39).

The XXX after "setting" is assigned the number stored on the creation date from 001 in descending order.

- You can change whether or not to use Quick Start from the setting mode selection screen and Administration setting.

For details on how to change whether or not Quick Start is used, refer "4-3-2. Administration Settings" (page 39).

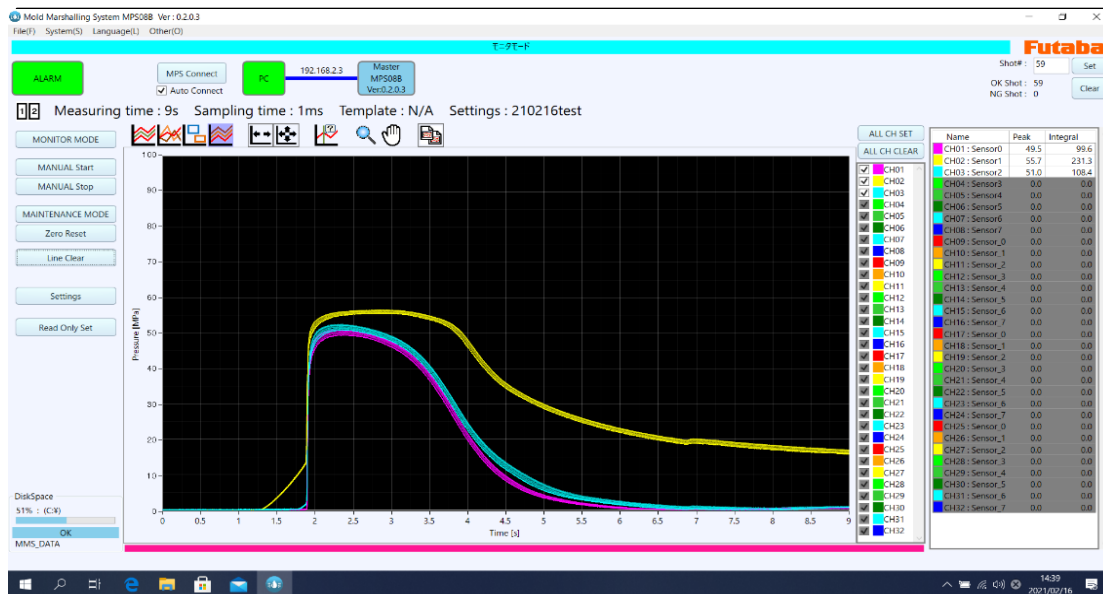


# 5. Start measurement

When the setting is completed, measurement starts.

## 5-1. Starting measurement (Monitor mode)

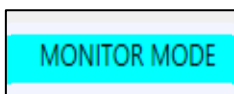
When molding starts and a trigger signal (mold close completed, etc.) is input, pressure measurement starts, and the waveform is displayed on the screen.



- If no trigger signal is connected, the measurement does not start even if the molding is started. Manual start can be performed with the "SET" key on MPS08B panel. Use this key as required.
- When the wave form is not displayed, take the action referring to "10. Troubleshooting" (P.104).

### 5-1-1. Select the measurement mode

Check that the measurement mode bar at the top of the screen is set to "Monitor mode". When it is set to monitor mode, it is in standby mode waiting for a trigger signal (measurement start signal) from the molding machine.



- The mode at startup is Monitor mode.
- When in "Maintenance mode", click "Monitor mode" in the operation menu.

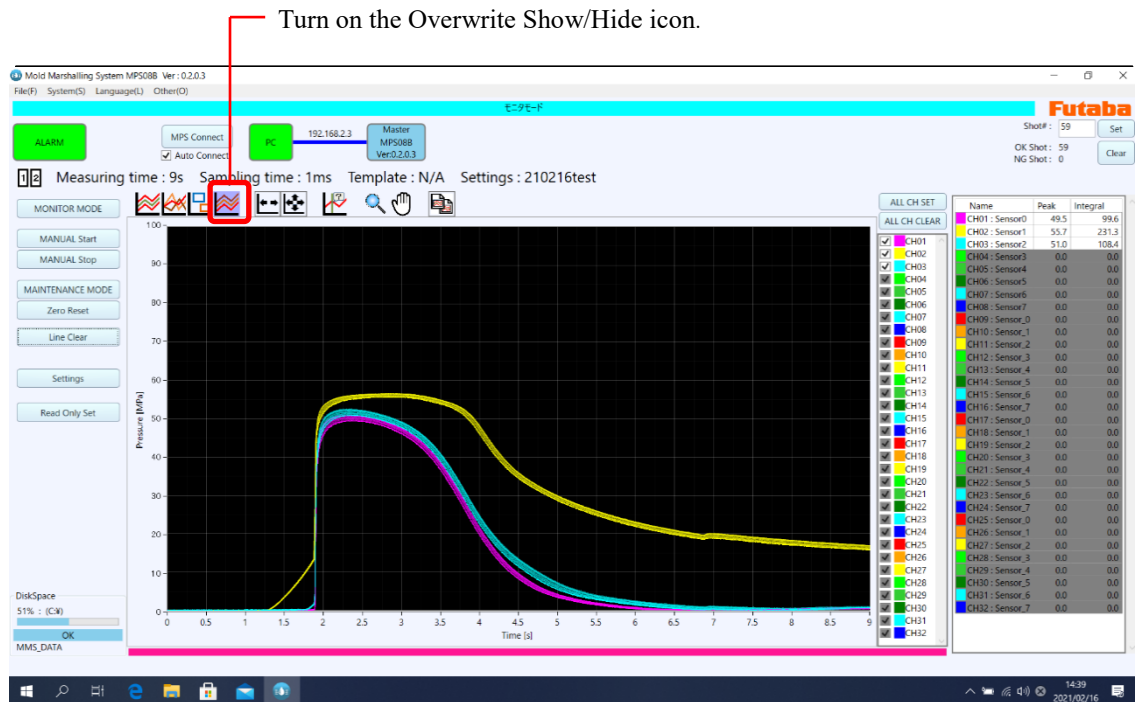
### 5-1-2. Select the setting file

When the measurement software PPSB is started, the settings are automatically loaded from the connected amplifier. To start measurement in this state, no setting is necessary.

- If the setting file needs to be changed, refer to "4-4. Creating and Operating a Setting File" (P.41) and set the setting.

## 5-2. Overlap the waveform for each shot

The measured waveform can be overwritten and displayed.



- The number of overwrite can be set in "4.3 Initial setting of software " (P.38).

## 5-3. Compare and display with the template waveform

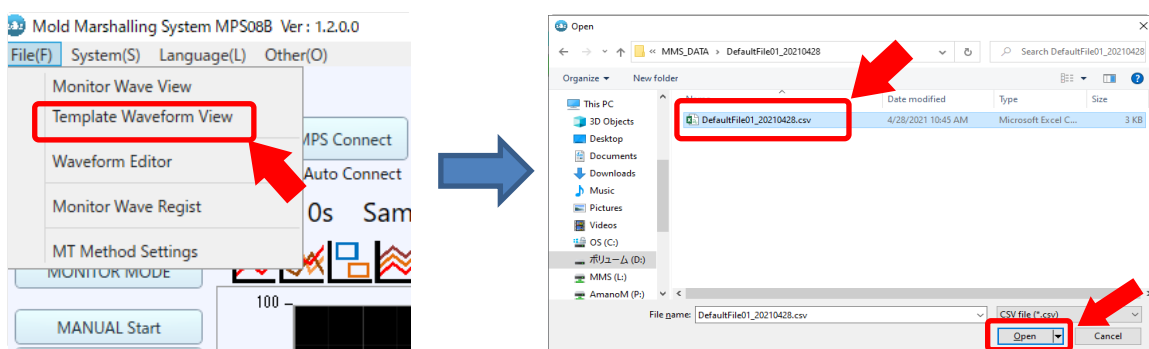
Pressure waveforms saved in the past are displayed on the screen as "Template Waveform" and can be compared with the waveform being measured.

For "waveform matching of molding conditions," "pressure fluctuation during mass production," and "pressure change when molding conditions are changed," it can be visually and in real time.

### 5-3-1. Load template waveform

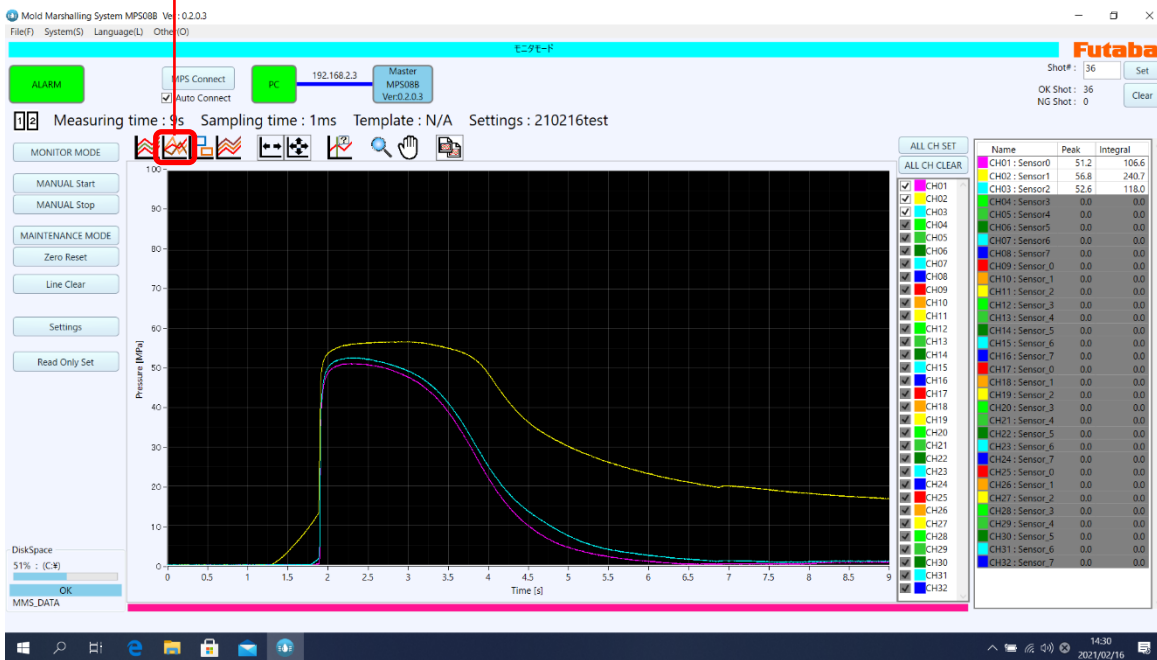
From the File menu, click Display Template Waveform.

In the file selection window, select the waveform file and press "Open".



The template waveform is displayed on the measurement screen.

Turn on the template waveform display/hide icon.



●The density of the displayed template waveform can be set.



「4-3. Refer "Initial setting of software (Display Setting)" (P.38).

## 5-4. Basic waveform display operations

The display method of the measured waveform data can be changed.

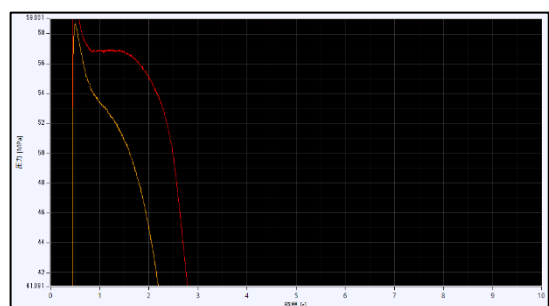
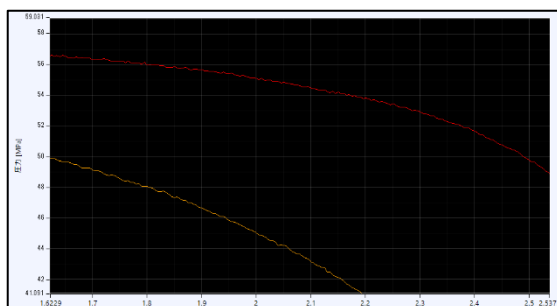
### 5-4-1. The toolbar

Commands for operating waveform display are arranged using the icon buttons.

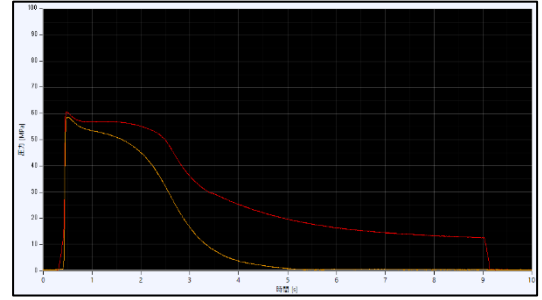
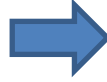
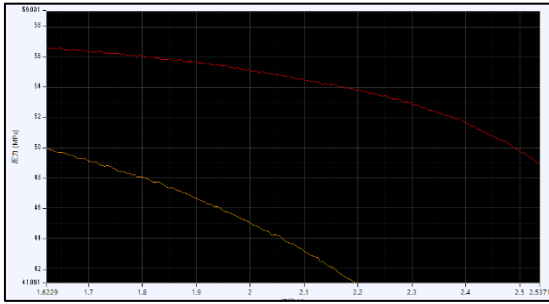
Icon name		Operation details
	Show/Hide Monitoring Waveform	Switches whether the set monitoring waveform is displayed on the frame screen or not.
	Show/Hide Template Waveform	Switches whether the loaded template waveform is displayed on the frame screen or not.
	Show/Hide Monitoring Zone	Switches between displaying/not displaying the set monitoring zone on the frame screen.
	Show/Hide Overwrite e	Switches whether the measurement waveform overwrite waveform is displayed on the frame screen.
	Zoom Out Horizontally to Full Scale	Fits the waveform's left/right full scale (measurement time) to the frame screen when the measurement waveform is enlarged and displayed. Up and down (pressure display) remain enlarged.
	Zoom Out to Full Scale	Fits the upper and lower full scale (pressure display) and left and right full scale (measurement time) of the waveform to the frame screen when the measurement waveform is displayed in the enlarged display. The entire display without enlargement is displayed.
	Cursor tool	Displays the pressure value at the cursor position.
	Zoom tool	Drag in the frame screen to enlarge the selected area to fit the frame screen.
	Hand tool	Drag to move the display area.
	Save Image	Save a screen shot of PPSB.

#### (1) Zoom Out Horizontally to Full Scale

Fits the waveform's left/right full scale (measurement time) to the frame screen when the measurement waveform is enlarged and displayed. Up and down (pressure display) remain enlarged.



## (2) Zoom Out to Full Scale

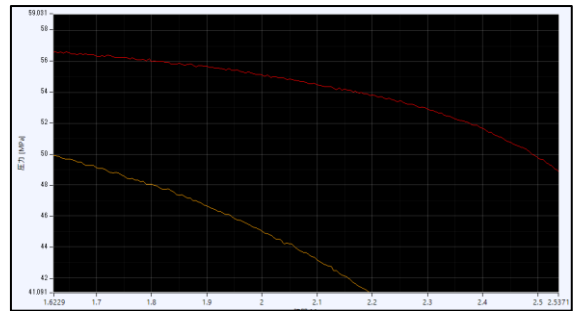
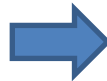
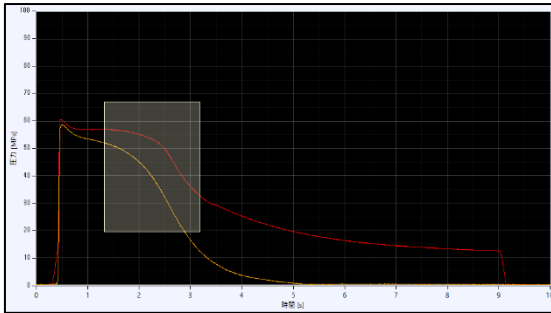


## (3) Cursor tool

Displays the time, the pressure value and integral value at the cursor position.

## (4) Zoom tool

Drag in the frame screen to enlarge the selected area to fit the frame screen.



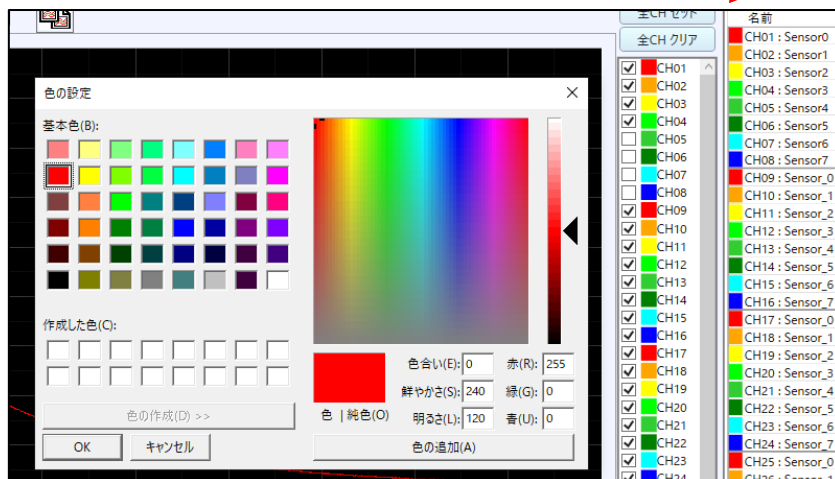
## (5) Hand tool

Drag to move the display area.

## (6) Waveform display color setting

Click the color box in the channel information display area and select the color desired.

Colors can be set individually for each channel (sensor).



# 6. Saving and managing data

## **6-1. Type of saved data**

The following three types of saved data are available.

	File name	Save destination
Setting file	Files can be saved with any file name up to 32 alphanumeric characters. (Default: DefaultFile001.xml)	It is saved in the (exe file save destination folder)/Settings folder.
Measured data	<ul style="list-style-type: none"><li>• They are saved in the order of the shot numbers.</li><li>• It can be edited with spreadsheet software.</li></ul> All waveform data: ALL_[setting filename]_[yyyymmdd]_[hhmmss]_[shot number]. csv Alarm waveform data: ALM_[setting filename]_[yyyymmdd]_[hhmmss]_[shot number]. csv Interval waveform data: INT_[setting filename]_[yyyymmdd]_[hhmmss]_[Shot number]. csv	It is saved in the (exe file save destination folder) /MMS_DATA/ Setting file name yyyymmdd folder.
Log file	<ul style="list-style-type: none"><li>• It can be edited with spreadsheet software.</li></ul> [setting filename]_[yyyymmdd].csv	

## **6-2. Saving setting file**

For details on saving the setting file, see "4-4. Creating and Operating the Setting File" (P.41).

## **6-3. Saving waveform data (measurement data)**

The waveform is stored in CSV format.

Waveforms can be easily edited and processed using commercially available spreadsheet software.

The data to be saved can be selected from the following three types.

All waveforms: Waveform data for each shot

Alarm waveform ••••• Waveform data out of the range of the set monitoring setting

Interval waveform ··· Waveform data for each interval selected from pull-down menu

Refer to "4-3-2. Administration Settings (4) Saved Data Selection" (P.39) for how to select saved data.

## **6-4. Saving historical data (log files)**

The following describes the details of the saved log files.

### **6-4-1. List of saved data items**

Display	Meaning
Date Time	Measurement start time
Interval	Trigger interval
Shot	Shot number
Result	Alarm judgment result
Error	Error judgment
MT_State	MT method error-judgment
MD	MD value
CH**_error	Alarm judgment details
CH**_integral	Integral value
CH**_peak	Peak pressure value
CH**_peak_integral	Peak integral value
CH**_peak_time	Peak time
CH**_section_average	Interval average
CH**_section_integral_1	Interval integration value 1
CH**_section_integral_2	Interval integration value 2
CH**_point monitor	Monitoring after T seconds
CH**_eject_monitor	Ejection monitoring
CH**_Rising Time	Rising time
CH**_Falling Time	Falling time

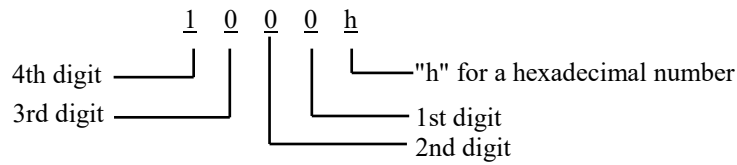
### **6-4-2. List of error contents (Error code)**

After the error content is expressed in bits, it is changed to hexadecimal notation.

Bit	Error name	Output result
0	Integral value error	0001h
1	Average value error	0002h
2	Peak arrival time error	0004h
3	Peak integral value error	0008h
4	Monitoring error after t seconds	0010h
5	Rising time error	0020h
6	Falling time error	0040h
7	Interval average value error	0080h
8	Interval integral value error 1	0100h
9	Ejection monitoring error	0200h
10	Monitoring zone 1 error	0400h
11	Monitoring zone 2 error	0800h
12	Waveform monitoring error	1000h

13	Interval integral value error 2	4000h
----	---------------------------------	-------

●For the configuration of the digits of the output result (hexadecimal notation), refer to the following example.



### 6-4-3. Details of output results

#### (1) 1st digit

Hexadecimal	Binary number	Integral value Error	Average value Error	Peak arrival Time error	Peak integral value Error
0	0000				
1	0001				×
2	0010			×	
3	0011			×	×
4	0100		×		
5	0101		×		×
6	0110		×	×	
7	0111		×	×	×
8	1000	×			
9	1001	×			×
A	1010	×		×	
B	1011	×		×	×
C	1100	×	×		
D	1101	×	×		×
E	1110	×	×	×	
F	1111	×	×	×	×



(2) 2nd digit

Hexadecimal	Binary number	Monitoring after t seconds Error	Rising time Error	Falling time Error	Interval average Error
0	0000				
1	0001				×
2	0010			×	
3	0011			×	×
4	0100		×		
5	0101		×		×
6	0110		×	×	
7	0111		×	×	×
8	1000	×			
9	1001	×			×
A	1010	×		×	
B	1011	×		×	×
C	1100	×	×		
D	1101	×	×		×
E	1110	×	×	×	
F	1111	×	×	×	×

(3) 3rd digit

Hexadecimal	Binary number	Monitoring zone 2 Error	Monitoring zone 1 Error	Ejection Monitoring error	Interval integral value Error 1
0	0000				
1	0001				×
2	0010			×	
3	0011			×	×
4	0100		×		
5	0101		×		×
6	0110		×	×	
7	0111		×	×	×
8	1000	×			
9	1001	×			×
A	1010	×		×	
B	1011	×		×	×
C	1100	×	×		
D	1101	×	×		×
E	1110	×	×	×	
F	1111	×	×	×	×

(4) 4th digit

Hexadecimal	Binary number	Spare	Interval integral value Error 2	Spare	Waveform monitoring Error
0	0000				
1	0001				×
2	0010			×	
3	0011			×	×
4	0100		×		
5	0101		×		×
6	0110		×	×	
7	0111		×	×	×
8	1000	×			
9	1001	×			×
A	1010	×		×	
B	1011	×		×	×
C	1100	×	×		
D	1101	×	×		×
E	1110	×	×	×	
F	1111	×	×	×	×

- **Error code: FFFFh: -0.99 indicates that the correct data could not be saved due to the disappearance of MASTER or SLAVE during the measurement.**

# 7. Connecting to external devices

## 7-1. Connection to analog measuring equipment

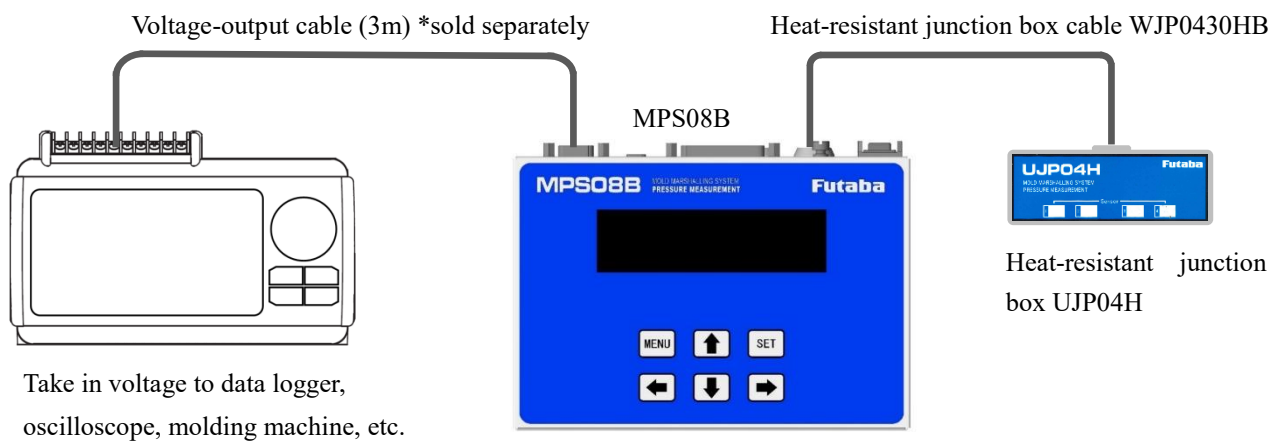
It is possible to measure waveforms and numerical values by capturing MPS08B output-voltage to an external device.

### 7-1-1. System configuration

The following figure shows the system configuration when using the MPS08B to import data to analog measurement devices (data logger, oscilloscope, etc.).

※Connect the optional 3m cable with the model number: WCI0830-V-D9P-Y N-MPS08B.

When MPS08B is expanded, it is required for the respective MPS08B.



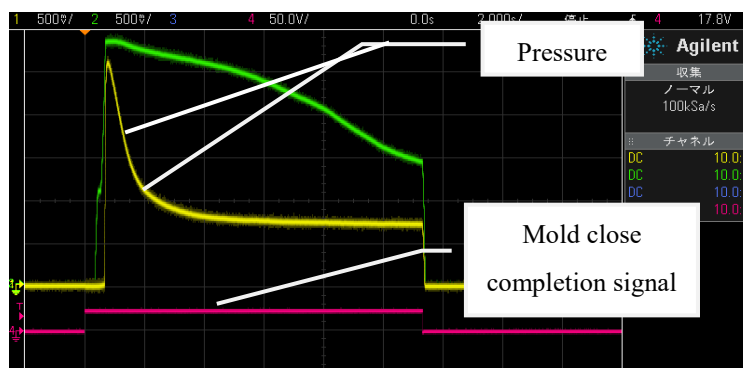
### 7-1-2. Conversion of output voltage and pressure value

Outputs 20MPa per 1V. (Ex.: When the pressure is 100MPa, it is 5V outputted.)

- The voltage-output range is 0V~10V.

### 7-1-3. Example of pressure waveform measurement

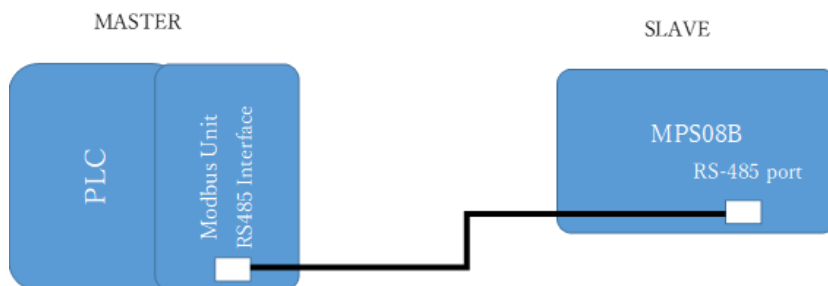
The figure below shows an example of measurement using a digital oscilloscope.



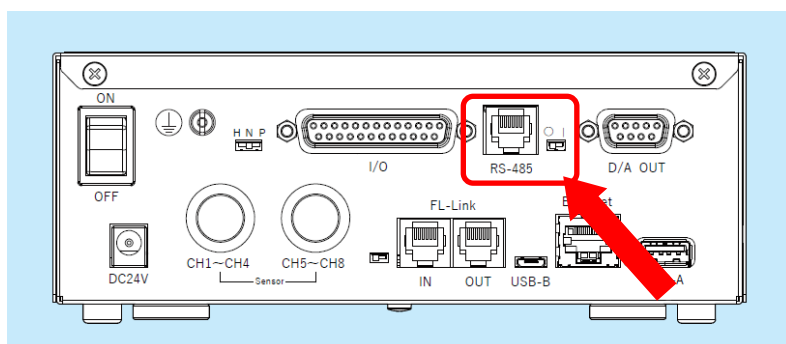
## 7-2. Data communication via Modbus communication

Internal data can be read and written by connecting the unit and PC with RS485 cables.

### 7-2-1. System configuration

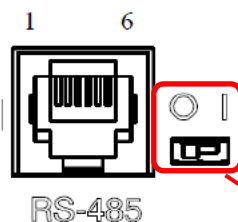


■ Connection port



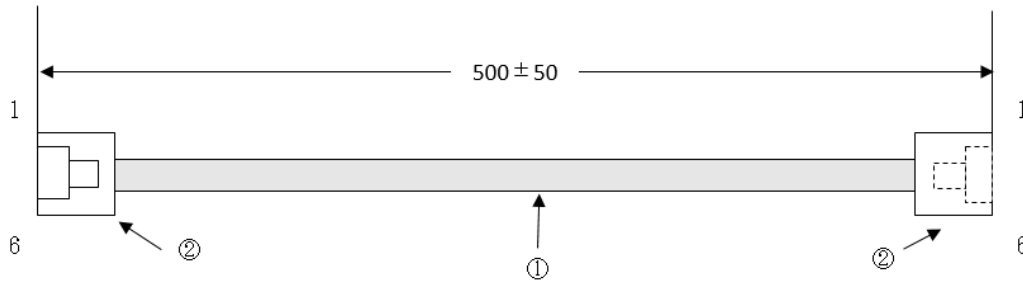
### MPS08B Modbus communication port pin assignments

Pin No.	Signal name	Remarks
1	RS485(A)	RS485 signal A (Connected internally with pin number 3)
2	0V	Ground
3	RS485(A)	RS485 signal A (Connected internally with pin number 1)
4	RS485(B)	RS485 signal A (Connected internally with pin number 6)
5	F.G.	Frame Ground
6	RS485(B)	RS485 signal A (Connected internally with pin number 4)

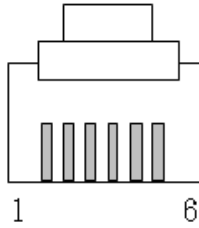


Use DIP switch. Set the terminating resistor to 0→|.

■ Link cable



Cable wiring



6	White	White	6
5	Black	Black	5
4	Red	Red	4
3	Green	Green	3
2	Yellow	Yellow	2
1	Blue	Blue	1

### 7-2-1. MODBUS communication specifications

Item No.	Item	Specifications
1	Interface	EIA standard RS485 compliant
2	Transmission path	2-wire, multi-drop
3	Transmission distance	Maximum 500 m
4	Transmission rate (bps)	19200
5	Communication method	Half duplex
6	Synchronous system	Start-stop synchronization
7	Data format	Start bit :1
		Data bit :8
		Parity bit: None
		Stop bit :1
8	Maximum number of units connected	32 units including master (constrained by physical layer)
9	Signal logic	V(A)>V(B) 0 (space)
		V(A)<V(B) 1 (mark)
10	Protocol	Modbus
11	Transmission mode	RTU
12	Function code	03H (Holding Register Read)
		08H (Communication Diagnostic Loopback Test)
13	Error control	Parity check, CRC-16
14	Error code	01H (Function code defective)
		02H (data address error)
		03H (data-value error)
		04H (miscellaneous device error)

## 7-2-2. Formatting on Read

### ■Read request from the master

Slave address		01h
Function code		03h
Start address	Upper	10h
	Lower	04h
Number of registers	Upper	00h
	Lower	02h
Error checking CRC-16 Modbus	CRC lower	81h
	CRC upper	0Ah

### ■Response from the slave

Slave address		01h
Function code		03h
Number of data bytes		04h
Data 1 (Upper)		42h
Data 1 (lower)		55h
Data 2 (Upper)		3Ch
Data 2 (lower)		0Dh
Error checking CRC-16 Modbus	CRC lower	2Eh
	CRC upper	9Eh

## 7-2-3. Formatting on Write

### ■Write request from the master

Slave address		01h
Function code		06h
Start address	Upper	01h
	Lower	20h
Number of registers	Upper	00h
	Lower	01h
Error checking CRC-16 Modbus	CRC lower	48h
	CRC upper	3Ch

■Response from the slave (When the writing finishes normally, the same command as the request is responded.)

Slave address		01h
Function code		06h
Answer message When the writing finishes normally, the same command as the request is responded.		01h
		20h
		00h
		01h
Error checking CRC-16 Modbus	CRC lower	48h
	CRC upper	3Ch

#### 7-2-4. Modbus map

Address	Item	Description	R/W
0000	Equipment number upper		R0
0001	Equipment number lower		R0
0002	Version ID upper		R0
0003	Version ID lower		R0
0004	Master address Slave address	0:Master 1:Slave1, 2:Slave2, 3:Slave3	R0
0110	Input Port Status	b[0]: Status of IN port1 . . . b[9]: Status of IN port10	R0
0111	Output Port Status	b[0]: Status of OUT PORT1 . . . b[9]: Status of OUT port10	R0
0112	OK count upper	Shot OK count	R0
0113	OK count lower		R0
0114	NG count upper	Shot NG count	R0
0115	NG count lower		R0
0116	Shot count upper	Shot count	R0
0117	Shot count lower		R0
0118	NG continuous count upper	Continuous NG	R0
0119	NG continuous count lower		R0
0120	File number used	File number 1~100	RW
0121	Read file selection (ReadFileName)	File number 1~100	RW

Nm00	Overall error status upper	Error judgment per channel 0 for success, 1 for error b[0]: Accumulated value error b[1]: Average value error b[2]: Peak time error b[3]: Peak accumulated value error b[4]: Judgment error after t seconds b[5]: Rising time error b[6]: Falling time error b[7]: Interval average value error b[8]: Interval integral value 1 error b[9]: Ejection error b[10]: Monitoring frame 1 error b[11]: Monitoring frame 2 error b[12]: Waveform monitoring error b[14]: Interval integral value 2 error	R0
Nm01	Overall error status lower		R0
Nm02	Integration value upper	Integration <float>	R0
Nm03	Integral value lower		R0
Nm04	Peak value upper	Peak-value <float>	R0
Nm05	Peak value lower		R0
Nm06	Peak integral value upper	Peak-integral <float>	R0
Nm07	Peak integral value lower		R0
Nm08	Peak time upper	Peak hours [ms]	R0
Nm09	Peak time lower		R0
Nm0A	Interval mean value upper	Interval mean <float>	R0
Nm0B	Interval mean value lower		R0
Nm0C	Interval integral value 1 upper	Interval integration 1<float>	R0
Nm0D	Interval integral value 1 lower		R0
Nm0E	Value after t seconds upper	Value after t seconds <float>	R0
Nm0F	Value after t seconds lower		R0
Nm10	Max. ejection upper	Max. ejection <float>	R0
Nm11	Max. ejection lower		R0
Nm12	Rising time upper	Rising time [ms]	R0
Nm13	Rising time lower		R0
Nm14	Falling time upper	Falling time [ms]	R0
Nm15	Falling time Lower		R0
Nm16	Interval integral value 2 upper	Interval integral 2<float>	R0
Nm17	Interval integral value 2 lower		R0
<p>n is 1,2, m is for 32ch minute of 10~2F from 0 to F.  CH01 is nm=10, CH02 is nm=11, . . . CH16 is nm=1F, CH17 is nm=20...  CH32 is nm=2F</p>			

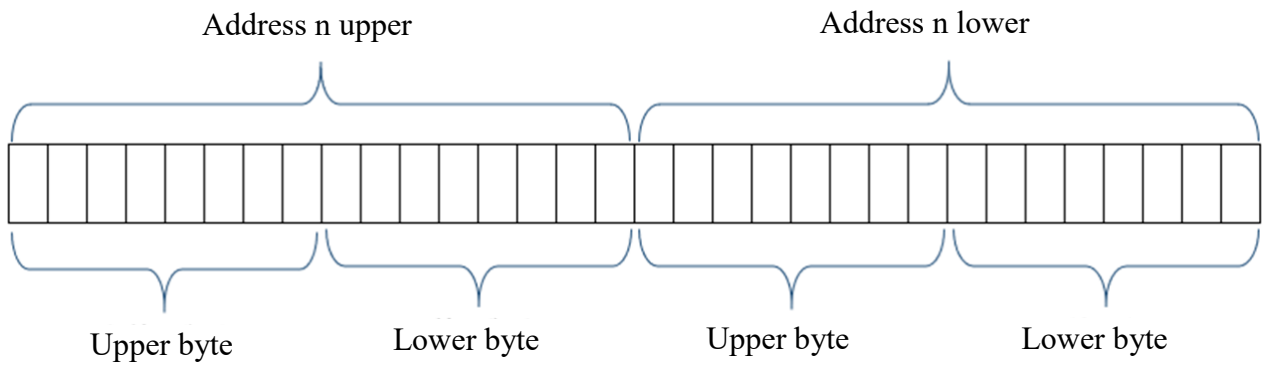
The above data is updated after the measurement is completed, and the value is retained until the measurement of the next shot is completed.



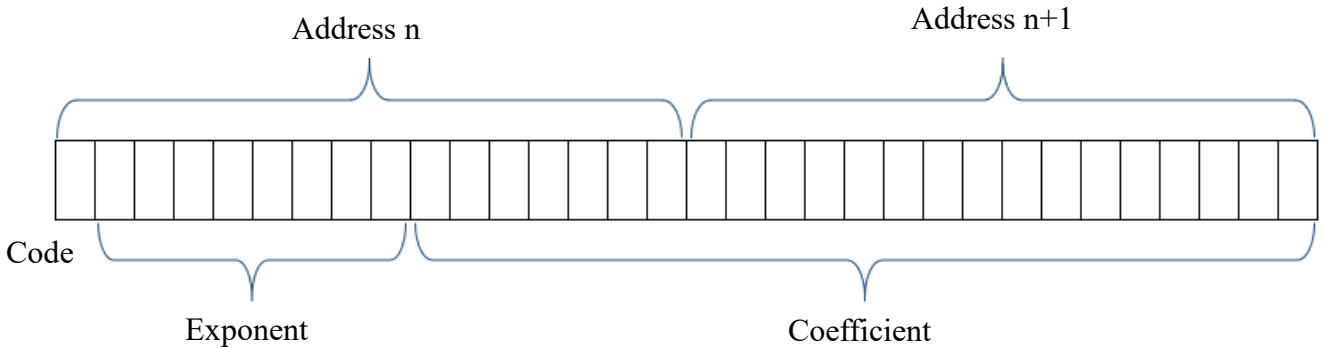
3x00	Higher measurement time	1,000[ms]~120,000[ms]	R0
3x01	Measurement time lower		R0
3x02	Sampling time upper	1[ms],2,5,10,20,50,100,200,500,1000	R0
3x03	Sampling time low order		R0
3x04	Sensor unit	0:MPa, 1:kgf/cm2, 2:psi, 3:bar	R0
x is 10 files from 0 to 9 (read file selection: ReadFileNumber) + x = file number)			

If only 3000 is used for 3x 00, and the file number is set to 121, it becomes 100 compliant.

■Data for which the address is divided into high-order and low-order (e.g. shot count, integral value, peak value)



■Addresses are divided into high and low levels, and <float> data. (Integral value, peak value, etc.)



Interfaces that can only be read in Input Status :1bit

Interfaces that can be read and written in Coil :1bit units

Interfaces that can only be read in Input Register :16bit

Interfaces that can be read and written in Holding Register:16bit units

	Function code
Read holding register	03h
Write holding register	06h

## 7-2-5. Modbus request, response

Results for peak pressure of 53.3 MPa and integral value of 86.1 MPa · s

Software version Ver.1.1.4.0

The transmission data and reception data to be described are in hexadecimal.

The transmitted data is SLAVE(MPS08B from MASTER (external device)).

### ■Data request for peak pressure value at CH1 53.3 MPa

Transmitted data 01 03 10 04 00 02 81 0A

Received 01 03 04 42 55 3C 0D 2E 9E

42553C0Dh is 53.31 for single precision floating point (float).

### ■Data request for integral value at CH1 86.1MPa · s

Transmitted data 01 03 10 02 00 02 61 0B

Received data 01 03 04 42 AC 40 50 1F 96

42AC4050h is 86.13 for single precision floating point (float).

### ■ID request for software version 1.1.4.0

Transmitted data 01 03 00 02 00 02 65 CB

Received data 01 03 04 01 01 04 00 AB CF

01010400h represents the 1.1.4.0 version4 numbers in 1-byte (2-digit hexadecimal) units.

### ■Data request for shot counts If 36

Transmitted data 01 03 01 16 00 02 24 33

Received data 01 03 04 00 00 00 1E 7A 3B

0000001Eh is 36 in decimal.

### ■To select file No.1 of the measurement condition file

Transmitted data 01 06 01 20 00 01 48 3C

Received data 01 06 01 20 00 01 48 3C

# 8. Supplementary material

## 8-1. Supplementary materials for setting alarm monitoring zone

### 8-1-1. Monitoring zone 1/monitoring zone 2

Set the monitoring zone at any time and value and monitor whether the measured value is within that zone.

(1) Check the check box to enable the alarm judgment function.

(2) Enter the time and value within the measurement time.

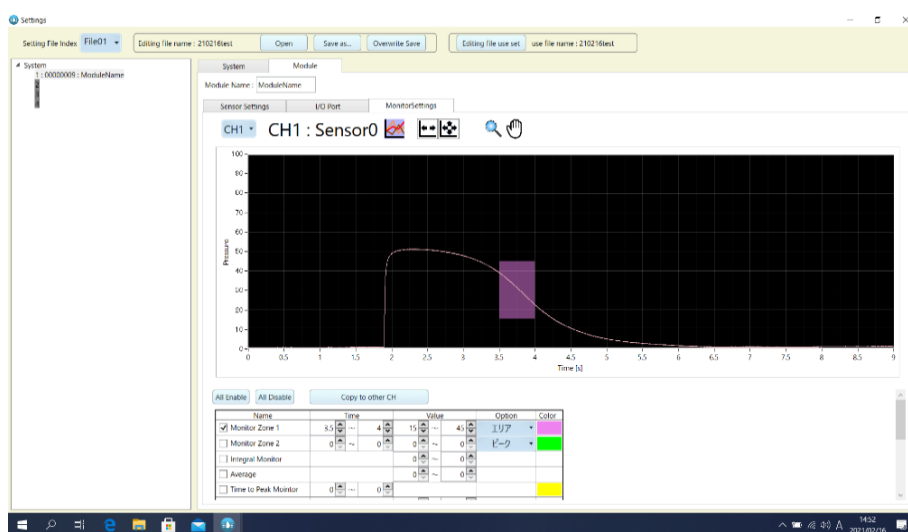
The range entered in the frame screen is displayed as the monitoring zone.

• Time: 0.00 seconds to within the measurement time can be set in increments of 0.01 seconds.

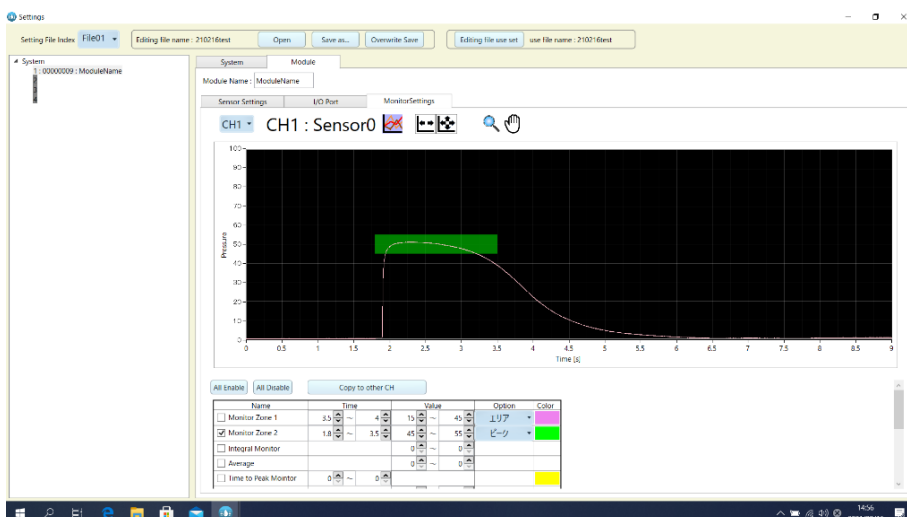
• Value: Can be set in 0.0MPa ~ 0.01MPa units.

(3) Select a peak or area from the options.

• Peak



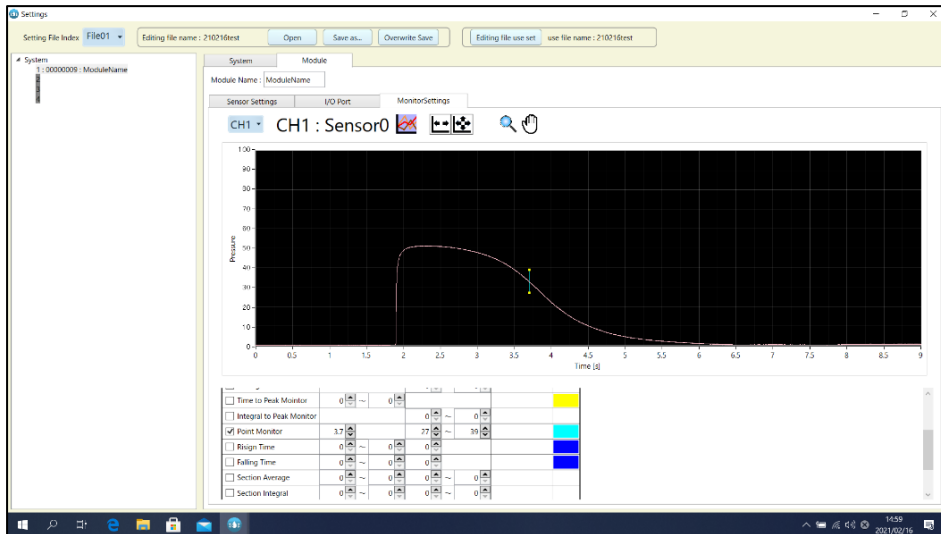
• Area



## 8-1-2. Point monitor

Monitors whether the pressure value at the set time (t seconds) has elapsed is within the monitored pressure range.

- (1) Check the check box to enable the alarm judgment function.
- (2) Enter a value directly to confirm the range.



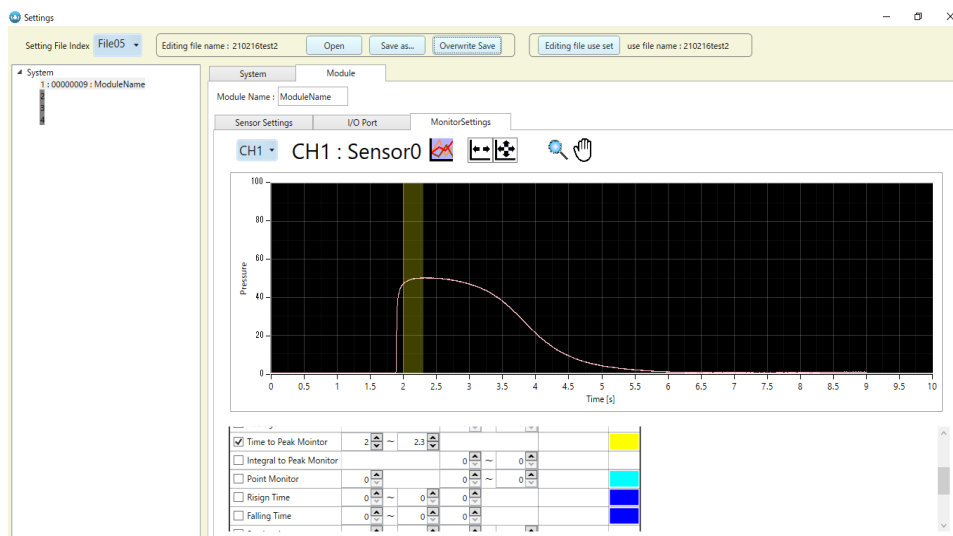
- Time: 0.00 seconds to within the measurement time can be set in increments of 0.01 seconds.
- Value: Can be set in 0.0MPa ~ 0.01MPa.

## 8-1-3. Time to peak monitor

Monitor whether the maximum pressure value (peak pressure value) in one molding cycle is within the monitoring time.

- (1) Check the check box to enable the alarm judgment function.
- (2) Enter the monitoring time within the measurement time.

The range entered in the frame screen is displayed as the monitoring range.



- Time: 0.00 seconds to within the measurement time can be set in increments of 0.01 seconds.

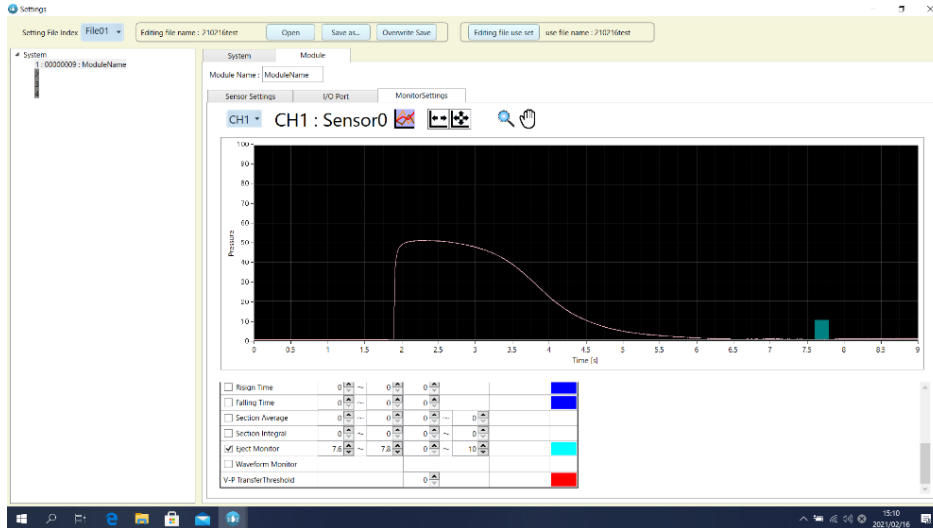
## 8-1-4. Ejection monitoring

Set up a monitoring zone for the pressure applied during ejection after molding and monitor whether the peak pressure value and time are within the monitoring zone.

(1) Check the check box to enable the alarm judgment function.

(2) Enter the time and value within the measurement time.

The range entered in the frame screen is displayed as the monitoring zone.



- Time: 0.00 seconds to within the measurement time can be set in increments of 0.01 seconds.
- Value: Can be set in 0.0MPa ~ 0.01MPa.

## 8-1-5. Integral monitor

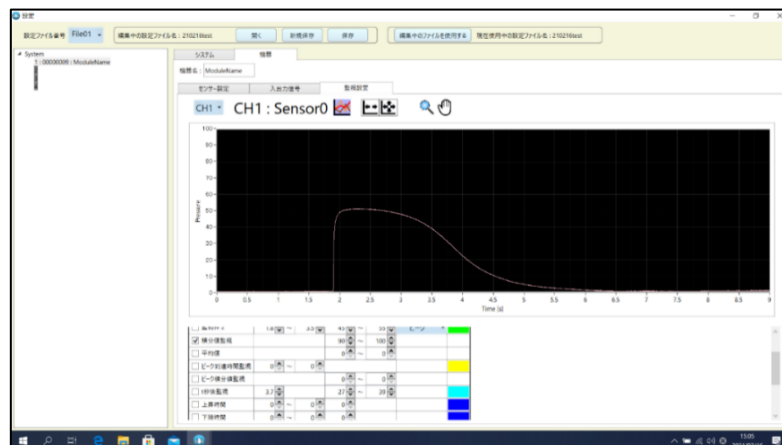
Monitors whether the integrated value (area surrounded by pressure waveform and time axis) within the measurement time is within the set range.

(1) Check the check box to enable the alarm judgment function.

(2) Enter a value.

※ There is no visible monitoring zone for integral monitor.

On the measurement screen, click the "Cursor Tool" and place the cursor at any position to display the elapsed time and integral value at that position.



- Value: Can be set in 0.0MPa ~ 0.01MPa.

## 8-1-6. Integral peak monitor

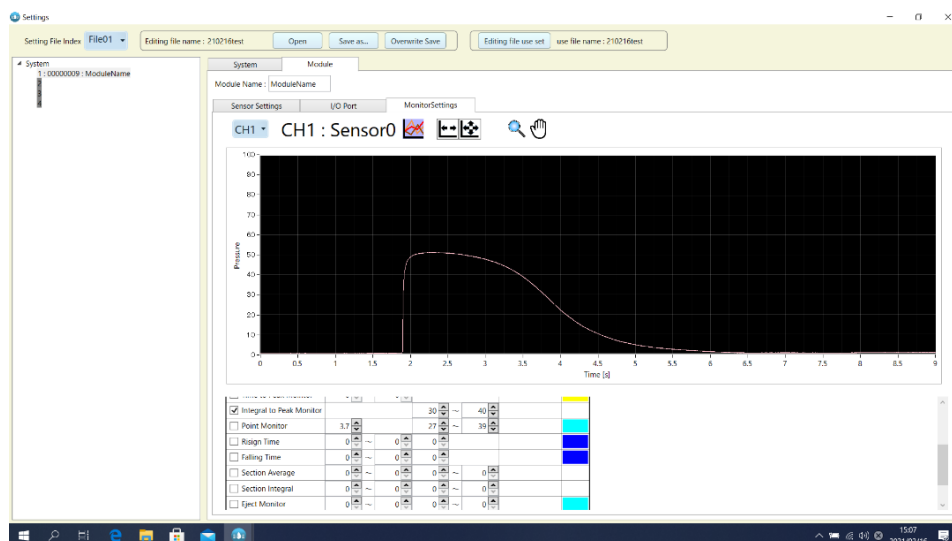
Monitors whether the integral value until the peak pressure is reached within the measurement time is within the set integral value range.

(1) Check the check box to enable the alarm judgment function.

(2) Enter a value.

※ There is no visible monitoring frame for integral value monitoring.

On the measurement screen, click the "Cursor Tool" and place the cursor at any position to display the elapsed time and integral value at that position.



- Value: Can be set in 0.0MPa ~ 0.01MPa.

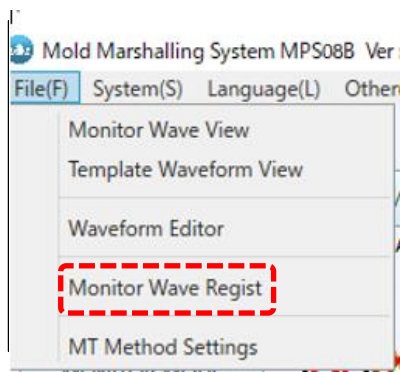
## 8-1-7. Waveform monitor

The allowable upper and lower limits are set for the template waveform, and it is monitored whether it is within the range.

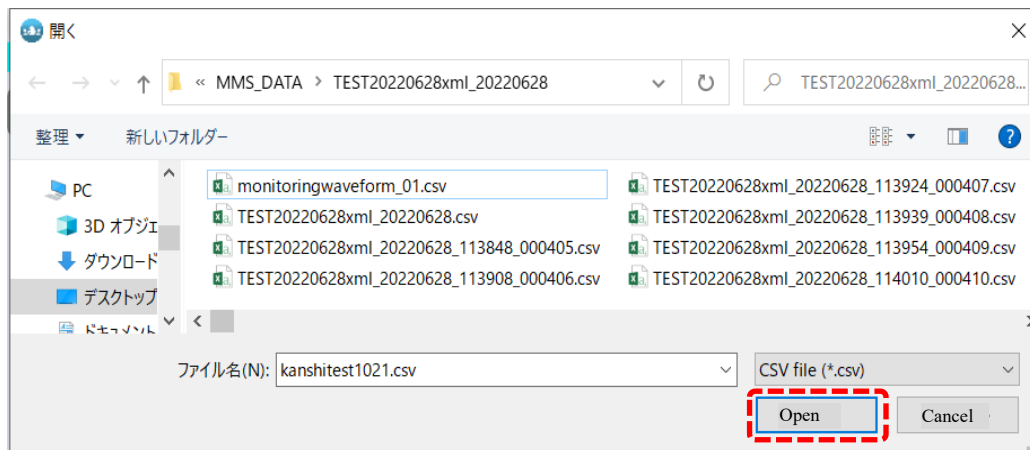
- To use this function, a monitoring waveform must be created beforehand.

■ Register the monitoring waveform

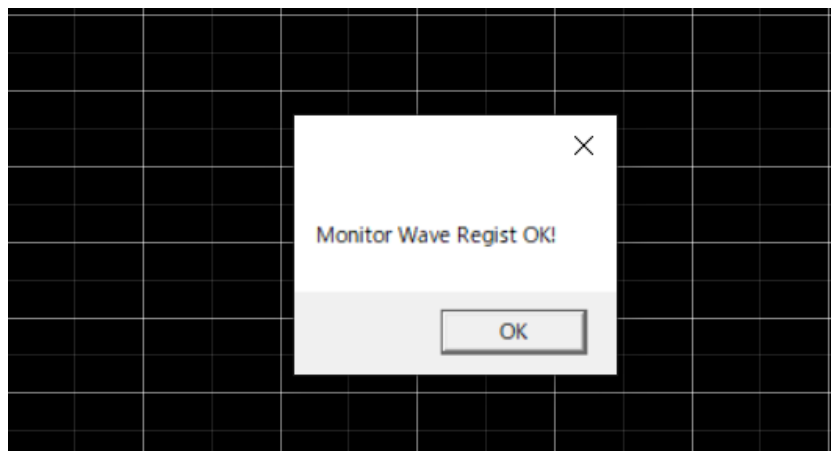
① Click "Monitor Wave Regist" in the operation menu and select the arbitrary waveform data.



- ② Select the data to be registered and press the "Open" button.



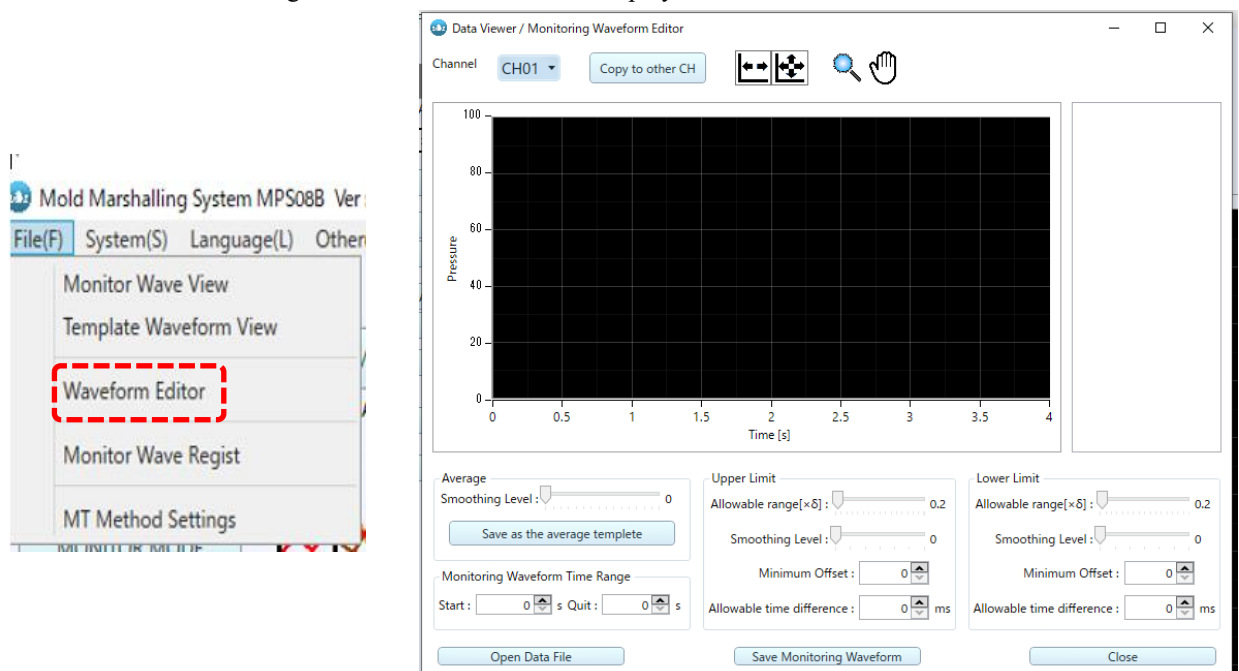
- ③ A pop-up appears when registration is complete.



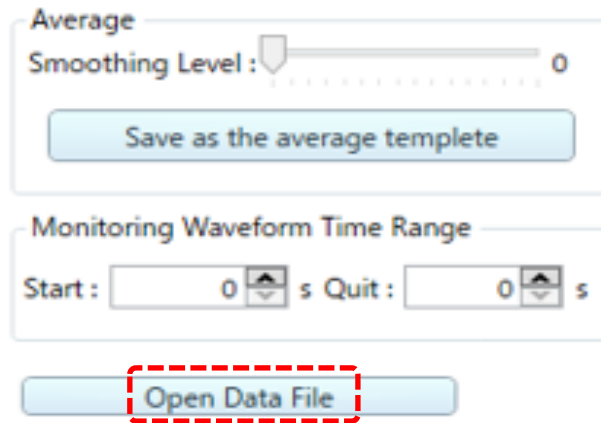
### ■Creation and setting of monitoring waveform

- ① Click "Waveform Editor" in the operation menu.

Data Viewer/Monitoring Waveform Editor screen is displayed.

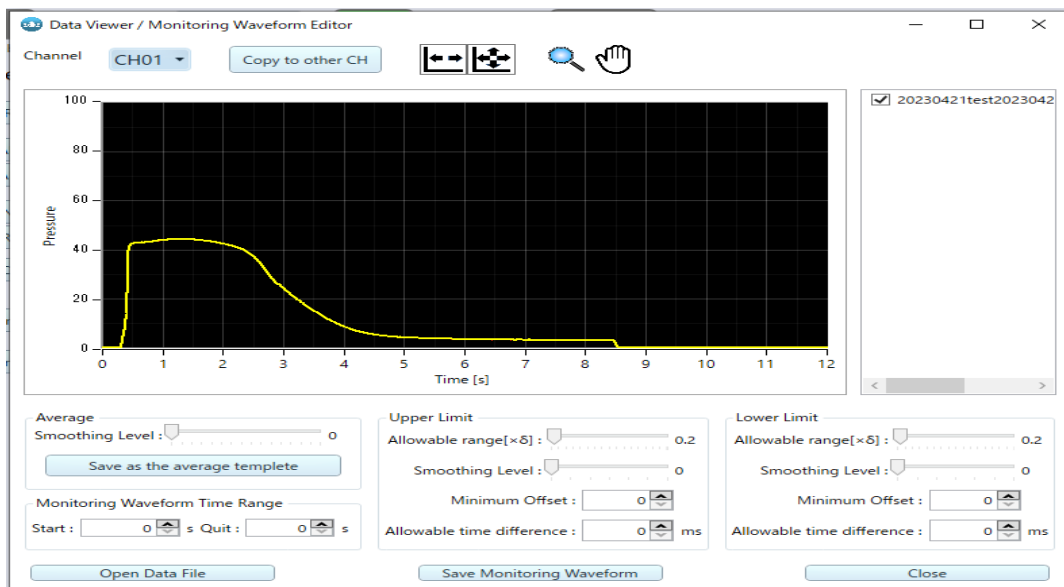
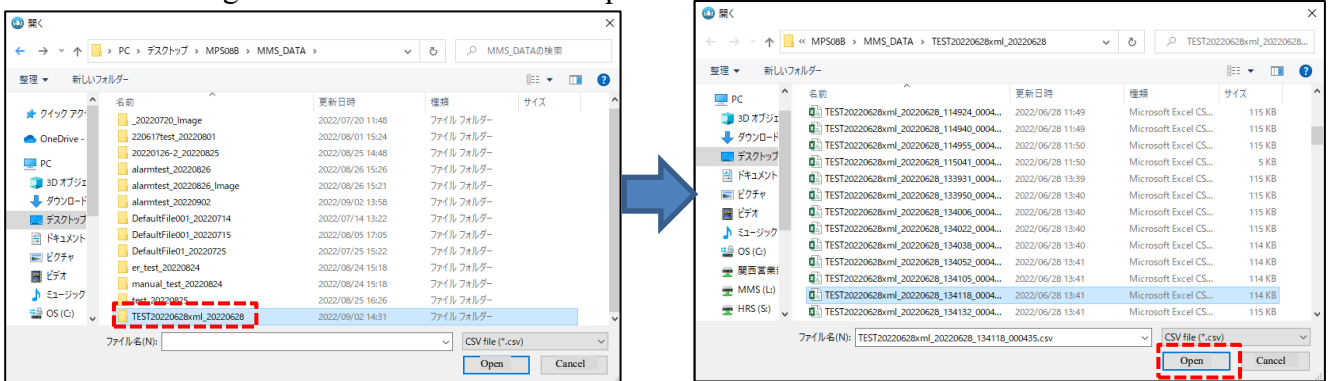


- ② Press the "Open Data File" button at the lower left of Data Viewer/Monitoring Waveform Editor screen.



- ③ The file name selection screen is displayed. Select the waveform data you want to set as the template waveform and select "Open".

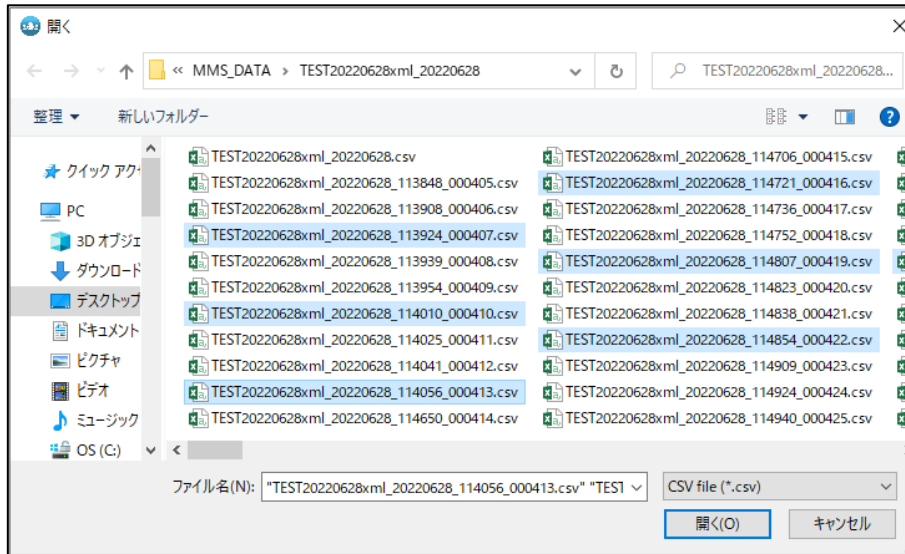
■ When using one waveform data as a template waveform



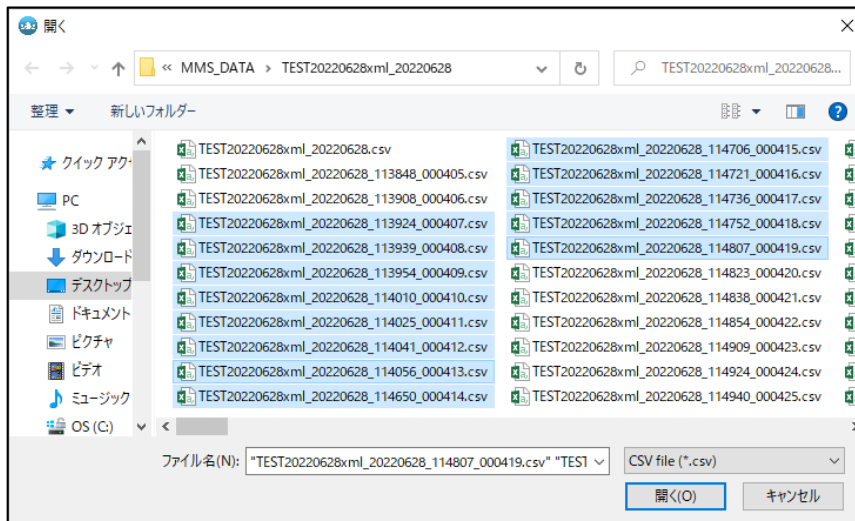


■ When creating a template waveform from multiple waveform data

※ To search for any more than one file, hold down Ctrl as you select the file.



※ To select multiple contiguous files, click on the first file, hold down the Shift key, and select the last file.

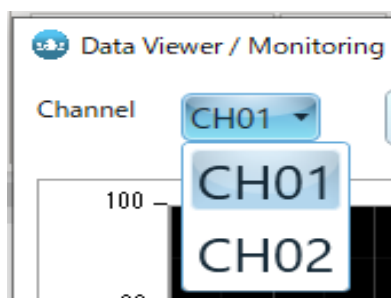


※ The average of multiple waveform data can be used as template waveform.

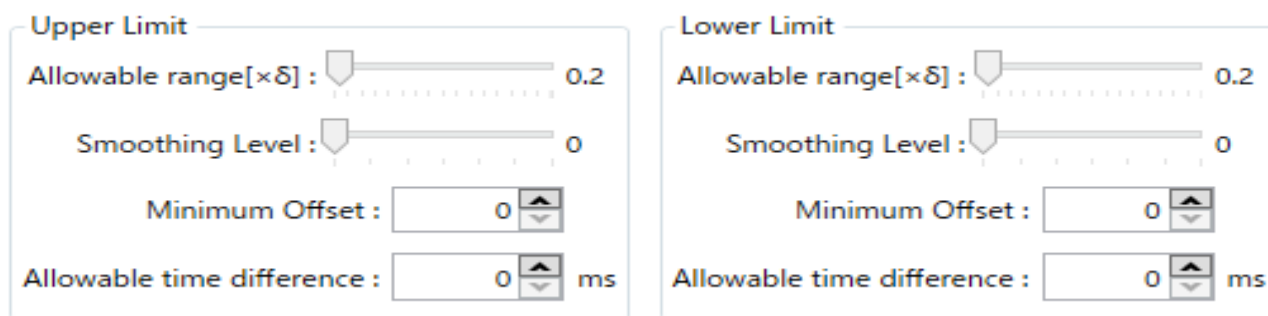
(Green: Multiple waveforms    Yellow: Template waveform based on green)



- ④ Select the channel to set the monitoring frame from " Data Viewer/Monitoring Waveform Editor " → "Channel"



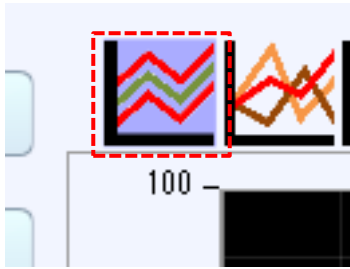
- ⑤ Set the upper and lower limits of the template waveform. ※Check the following items.



Average	Smoothing level	Replace the value of all points in the measurement data with the value obtained by taking the average with n points before and after (the value selected by the n = smoothing level) including that point.
	Save as average template waveform	The smoothed waveform is saved as the template waveform.
Monitoring waveform valid time		Set the monitoring start and end times within a shot.
Monitoring waveform upper limit / Monitoring waveform lower limit	Allowable range ( $\times\sigma$ )	The standard deviation calculated at each point is multiplied by the magnification set here.
	Smoothing level	Rewrites the value of all points of the monitoring waveform upper/lower limit to the value obtained by taking the average at the previous/next n points (value selected at n = smoothing level) including the point.
	Minimum offset	Set the lowest value of the upper/lower limit of the monitoring waveform from the template waveform.
	Allowable time difference	Set the offset in the horizontal axis (time direction) at the timing when the value changes in a short time (such as immediately after injection).
Open the measurement data		Select the waveform to be the base of the monitoring waveform from the past measurement data.
Save monitored waveforms		Saves the currently displayed monitored waveform as a new name.

## ■Monitoring waveform display/hide

Click the monitoring waveform display/hide button to switch.

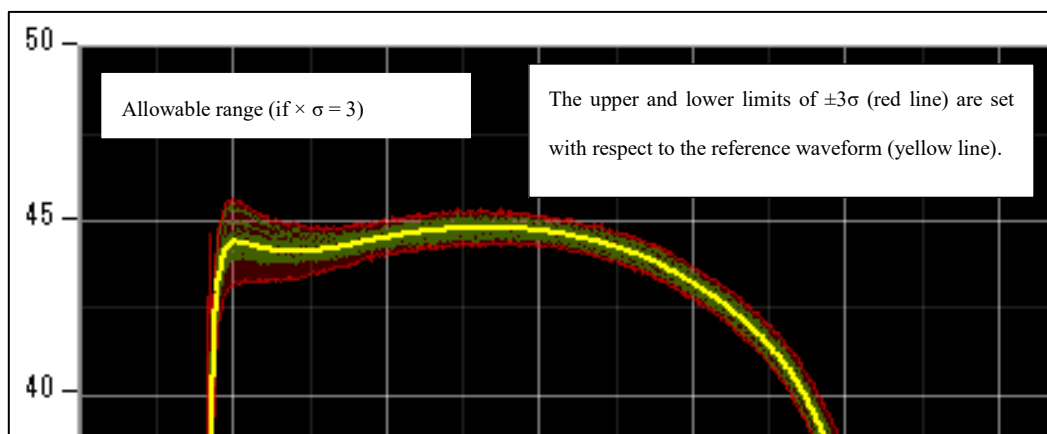
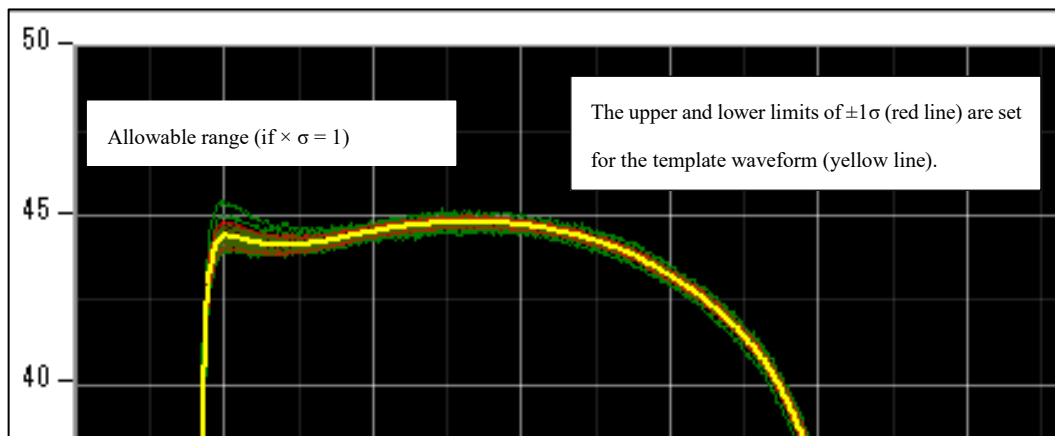


Click "Settings"→ "Module"→ "Monitor Settings" and select the checkbox of the Waveform Monitor at the bottom.

<input type="checkbox"/> Section Average	1	~	2	0	~	6000	
<input type="checkbox"/> Section Integral 1	1	~	2	0	~	6000	
<input type="checkbox"/> Section Integral 2	1	~	2	0	~	6000	
<input type="checkbox"/> Eject Monitor	3	~	4	0	~	10	
<input checked="" type="checkbox"/> Waveform Monitor							
V-P TransferThreshold				0			

## ■Allowable range ( $\times\sigma$ )

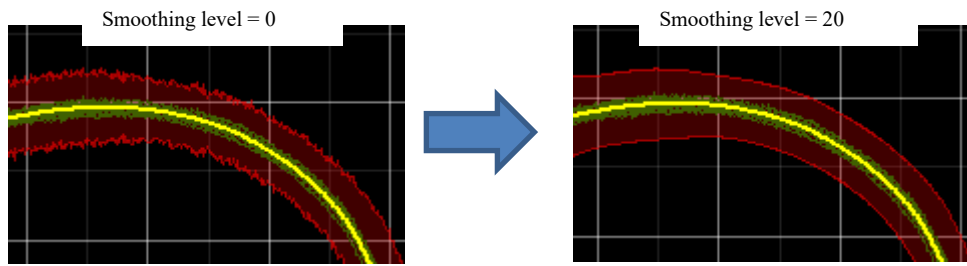
When a template waveform is set from multiple waveform data, the standard deviation at each point of the selected waveform is calculated, and the upper and lower limits are set by offsetting the standard deviation from the template waveform. The standard deviation is calculated for all points at each sampling interval. Setting values can be selected in "Allowable range ( $\times\sigma$ )".



## ■ Smoothing level

Smoothly corrects the template waveform and upper and lower limits.

Increasing the Smoothing level setting value will make them smoother.

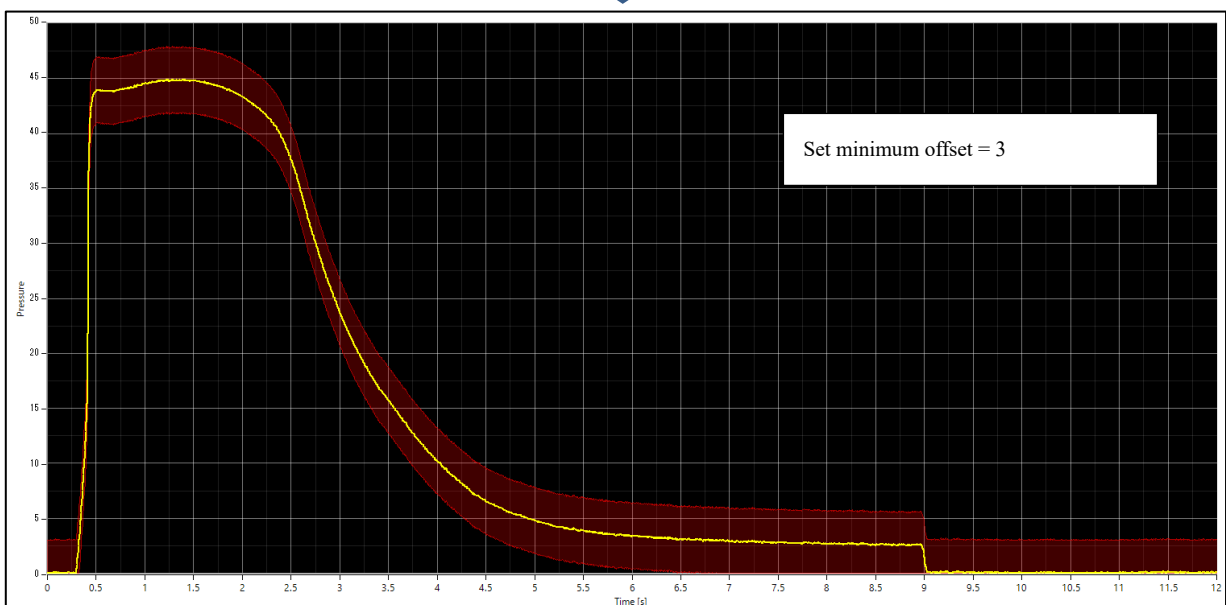
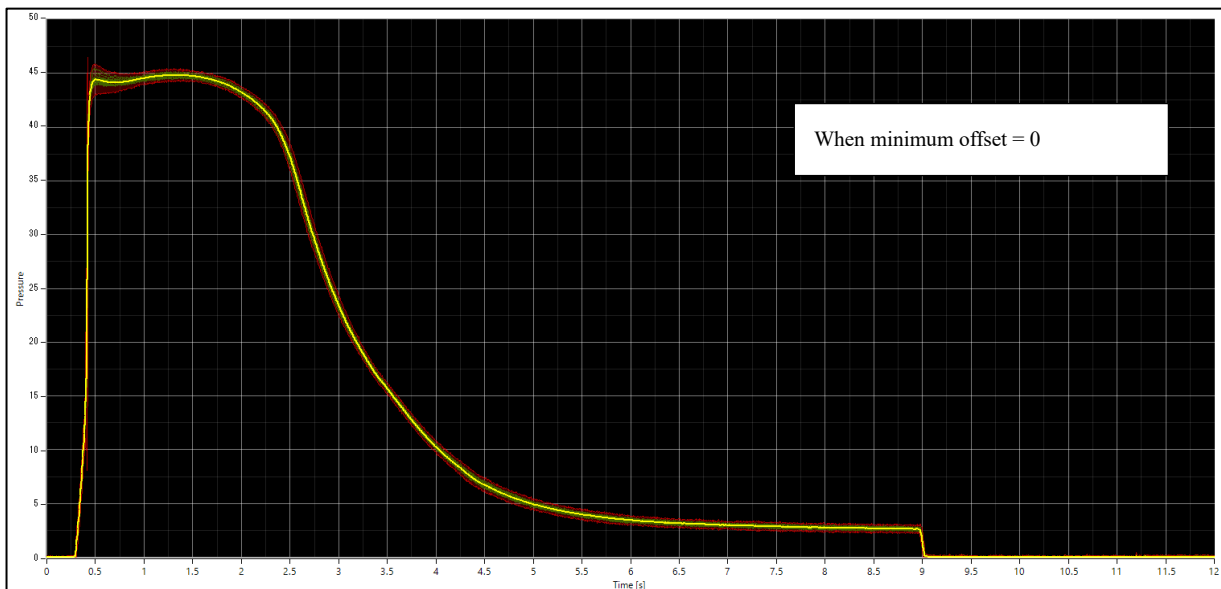


## ■ Minimum offset

If the range between the upper and lower limits of pressure is too small, specify the allowable pressure difference to increase the monitoring width.

The upper limit is offset from the template waveform in the positive direction of the Y-axis, and the lower limit is offset from the template waveform in the negative direction of the Y-axis by the specified value.

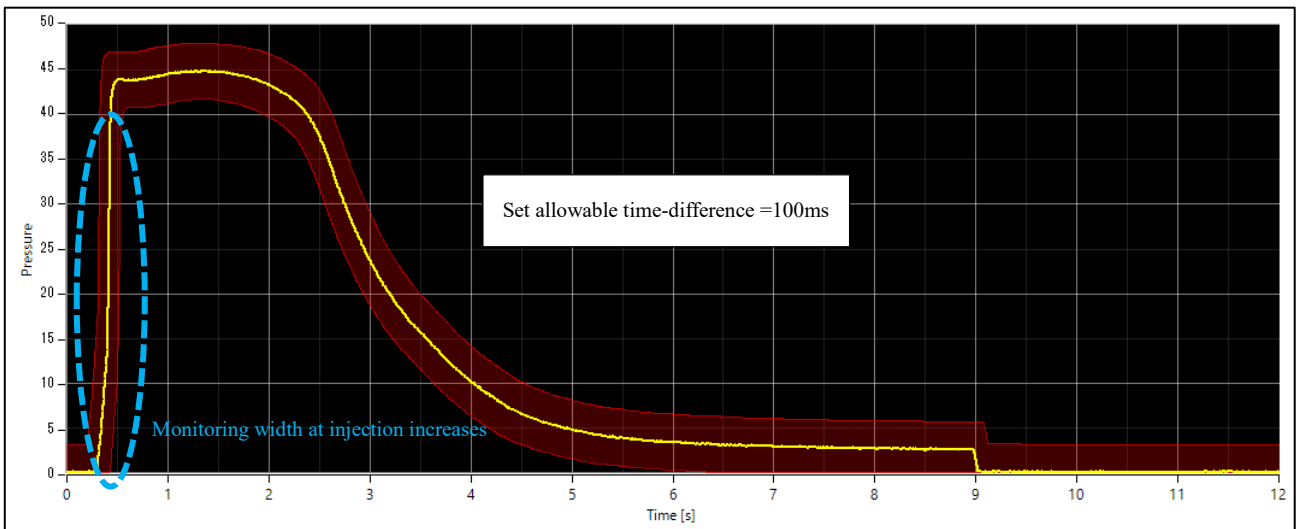
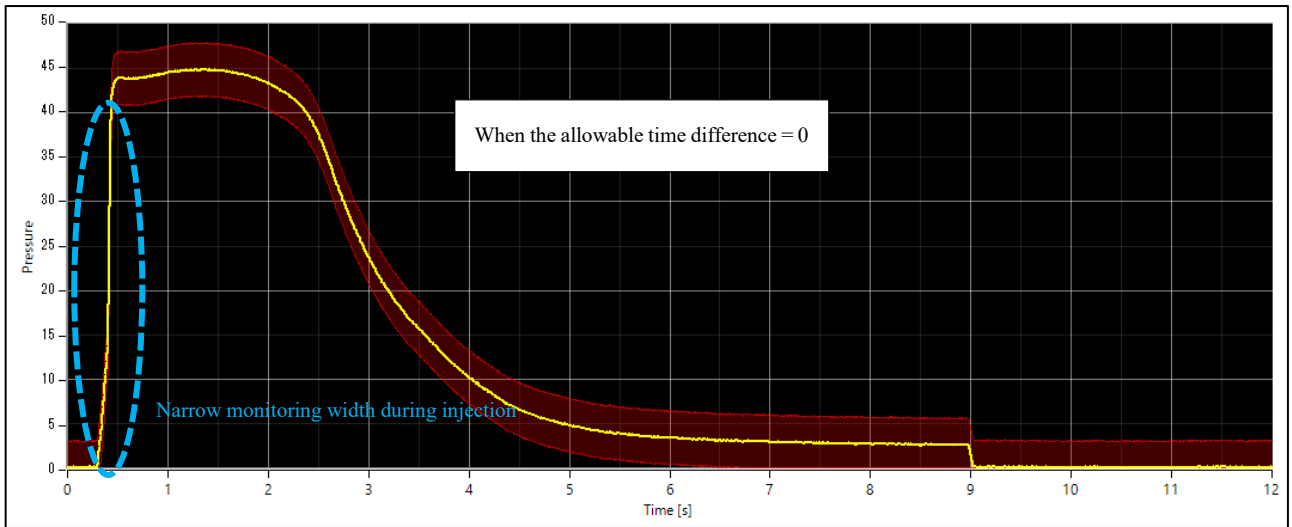
※The value set in "Minimum offset" has priority over the value set in " Allowable range ( $\times \sigma$ )".



## ■ Allowable time difference

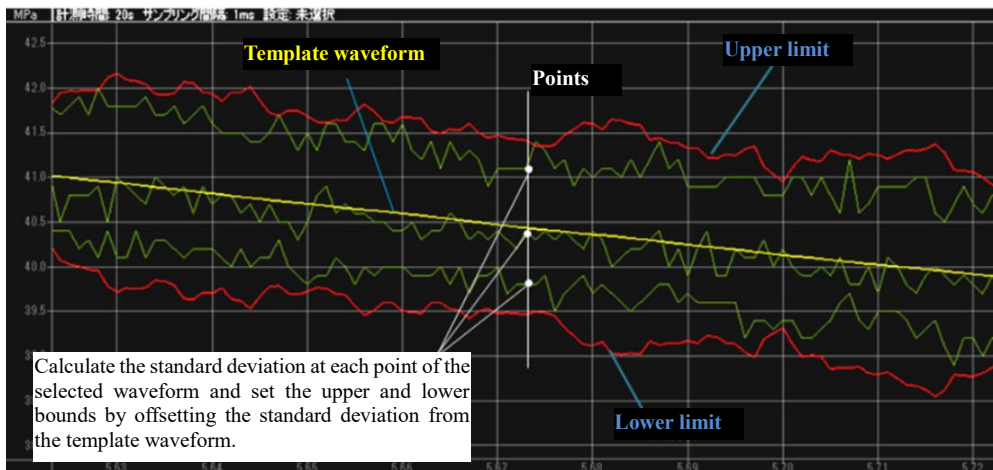
If the width of the upper and lower limits of the elapsed time is too small, set the allowable time difference to increase the width.

(This is mainly used when you would like to increase the monitoring range at injection.)



※1 Allowable range ( $\times\sigma$ )

[Offset amount from the template waveform = Setting value of allowable range  $\times$  Standard deviation at each point]

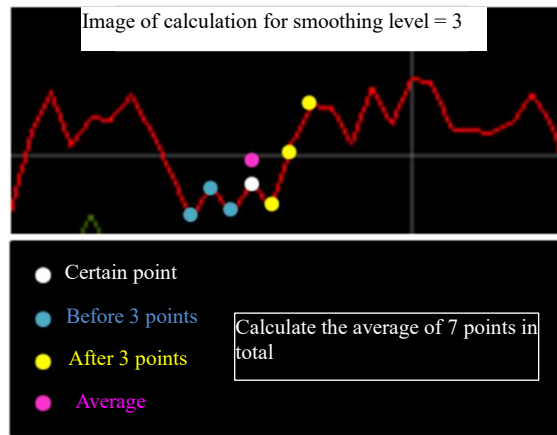


※2 Smoothing level

Smoothing is performed by using the average value of the selected point and the points before and after it as the correction value. The number of points before and after can be selected at the smoothing level.

Example : When smoothing level = 3

The average value of a point and three points before and after it (total of seven points) is taken as the value.



- Save average as template waveform

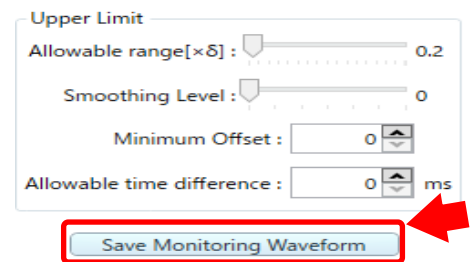
The smoothed waveform is saved as the template waveform.

- Monitoring waveform validity period

Set the monitoring start and end times within a shot.

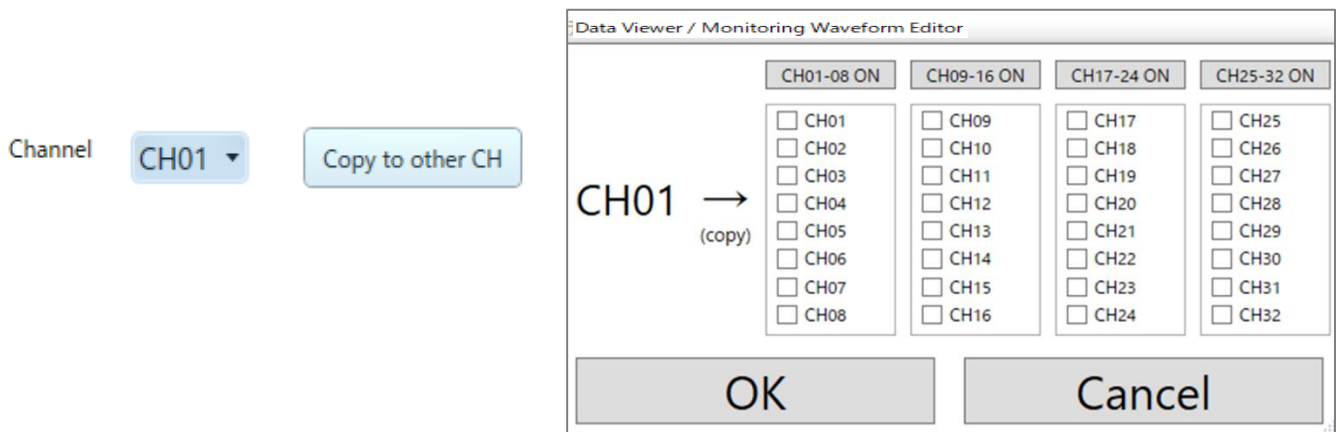
- Save the monitoring waveform

When all settings are complete, press Save Monitoring Waveform.



■ Copying Monitoring Waveform Data

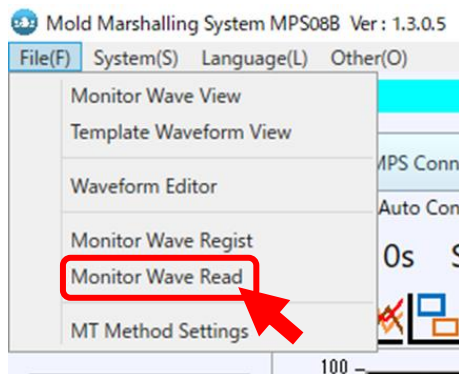
Monitoring waveform settings can be copied to other channels. Select CH of the copy source, click "Copy to other channel", select the checkbox of CH to be copied, and press "OK" to finish the copy.



## ■Recall a monitoring waveform

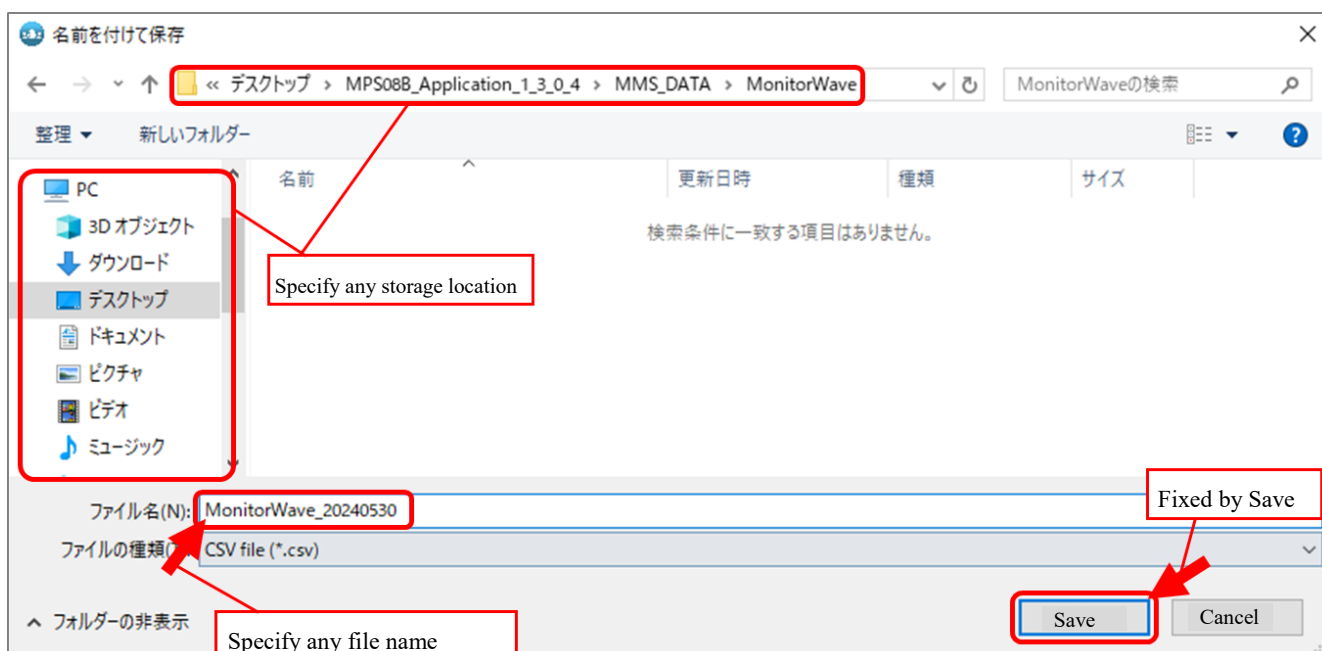
The monitored waveforms stored in the MPS08B can be saved in CSV file format on a connected PC.

- ① Click "Recall monitoring waveform" from the file menu in the Operation menu..



- ② The Explorer screen is displayed.

Specify the desired save destination and file name and confirm with "Save".



The data is saved in CSV file format. Use commercially available spreadsheet software or PPSB(MPS08B measurement software).

The display on PPSB can be displayed on the main screen in "Monitoring waveform display" from the file of the operating menu.

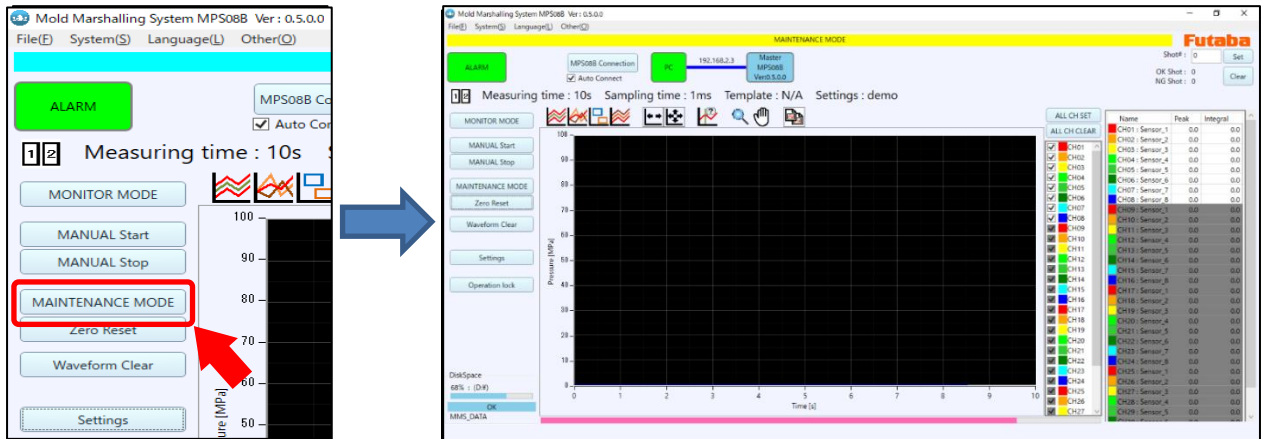
When using the saved monitoring waveform, see "8-1-7. Registering monitoring waveform" (P.84).

## 8-2. Measurement in maintenance mode

This measurement mode is convenient for checking the operation of the pressure sensor, such as installing the sensor in a mold.

### 8-2-1. Click "Maintenance Mode".

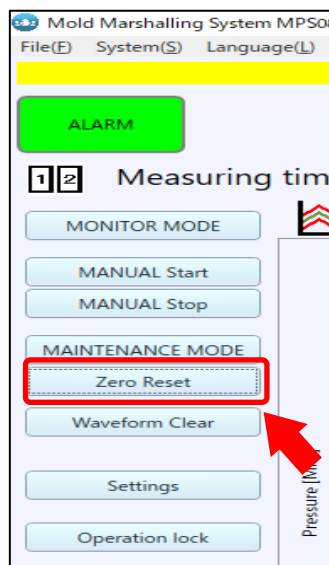
The mode switches to [Maintenance mode] and enters the constant measurement mode.



### 8-2-2. Click "Zero Reset"

Check that no pressure (load) is applied to the sensor, and click "Zero Reset".

The sensor output value is reset to zero.



### 8-2-3. Apply pressure to the tip of the sensor

The waveform is displayed if the sensor is operating.



## 8-3. Amplifier expansion setting

By connecting up to four MPS08B, up to 32 points can be measured.

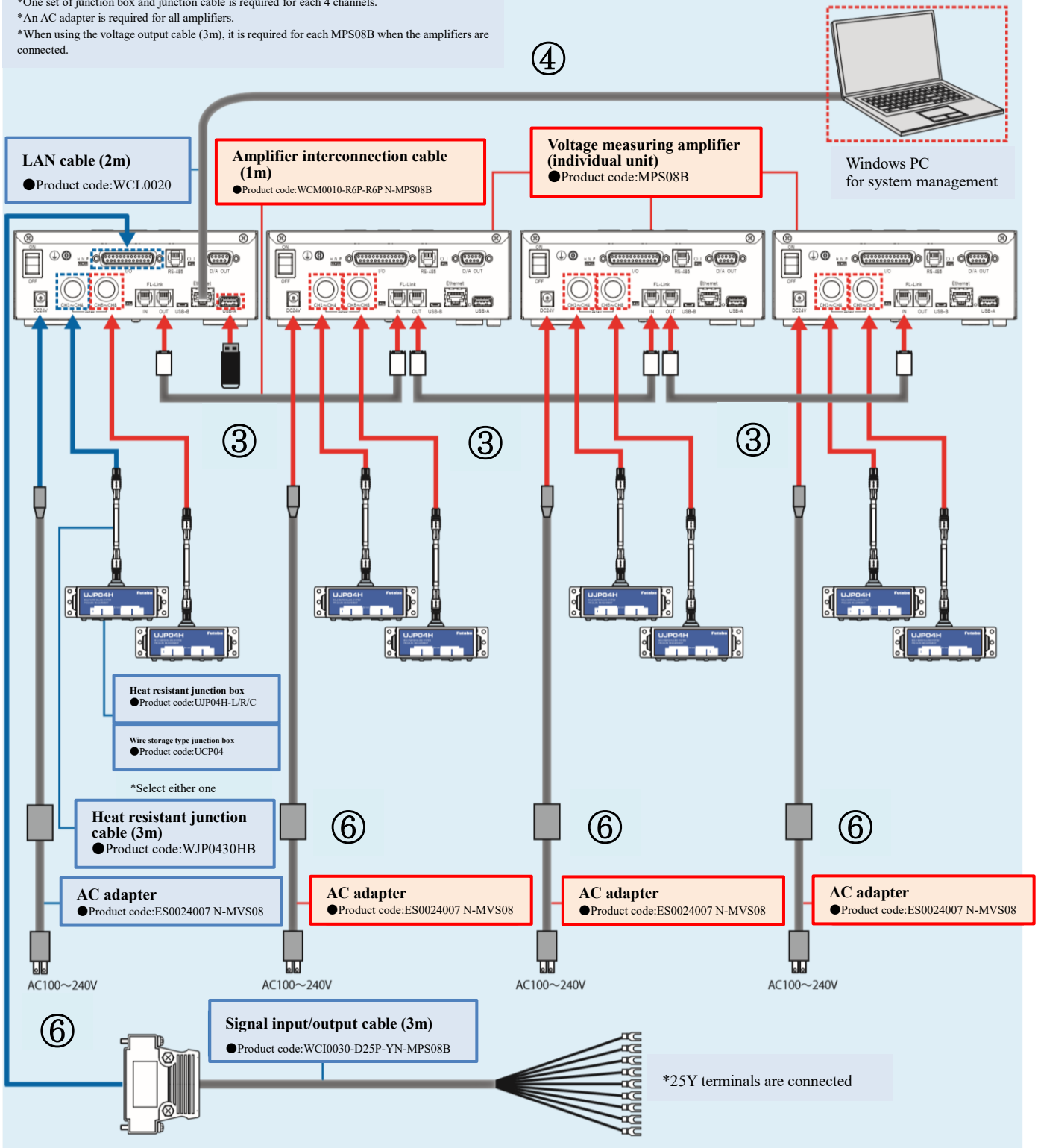
- If there are 8 or more pressure measurement points on the machine side, connect each device as shown in the basic configuration diagram below.

- Connect the power supply after completing all connections.

### 8-3-1. Extended configuration diagram

\*When you purchase the Pressure Measuring Amplifier Set MPS08B□-S, 5 items in the blue frame are included as a set.  
 \* Amplifier interconnection cables are required for the number of units to be connected.  
 \*One set of junction box and junction cable is required for each 4 channels.  
 \*An AC adapter is required for all amplifiers.  
 \*When using the voltage output cable (3m), it is required for each MPS08B when the amplifiers are connected.

\*PC not included with this system



## 8-3-2. Connecting Devices

Follow the procedure below to connect devices. (The step number corresponds to the number in the extended configuration diagram.)

### (1)MPS 08 B turn off the power

If you are expanding a system that has already been installed, turn off the power of the first MPS08B that will be the master unit.

### (2)Install a MPS08B to expand.

Install the second, third and fourth MPS08B units.

### (3) Connect the amplifier interconnection cable.

Connect the first unit to the second unit, the second unit to the third unit, and the third unit to the fourth unit.

『FL-Link OUT』 of the first unit ⇔ 『FL-Link IN』 of the second unit.

『FL-Link OUT』 of the second unit ⇔ 『FL-Link IN』 of the third unit.

『FL-Link OUT』 of the third unit ⇔ 『FL-Link IN』 of the fourth unit.

- Turn on the terminator switches of the first and last connected MPS08B to "O" → "I".

(Refer to 1-3-2. Connector Layout (P.7) for the location of the terminator switch.)

### (4) Connect LAN cable and I/O signal cable to the first MPS08B.

All networking is done through the first master unit.

Connect LAN cable and I/O cable to MPS08B of the first MPS08B.

### (5) Connect junction cables, junction boxes and pressure sensors.

Connect junction cables, junction boxes and pressure sensors to each MPS08B.

### (6)Connect the power supply.

Connect the supplied AC adaptor to the power jacks of each MPS08B.

Make sure that all devices are connected and turn ON the power.

- When expanding, each MPS08B must be powered by AC adaptor.

## 8-3-3. Software setting for expansion

Settings on the measurement software are not required.

If you are expanding the system at the same time as a new installation, first install the software and set the network settings.

Refer to "2-3. Network Settings" (page 19) to complete the network settings.

After starting the measurement software, set the expansion mode of each amplifier.

### 8-3-4. MPS08B settings for expansion

For expansion, the mode and IP address of each amplifier must be set individually.

- All connected MPS08B must have the same IP address.

The following is an example of setting. (Default IP address. Set by 192.168.2.3.)

<mode> <IP address>

First unit : **MASTER** 192.168.2.3

Second unit : **SLAVE1** 192.168.2.3

Third unit : **SLAVE2** 192.168.2.3

Fourth unit: **SLAVE3** 192.168.2.3

#### (1) Checking the mode






Check whether it is set to MASTER or SLAVE on the amplifier startup window.



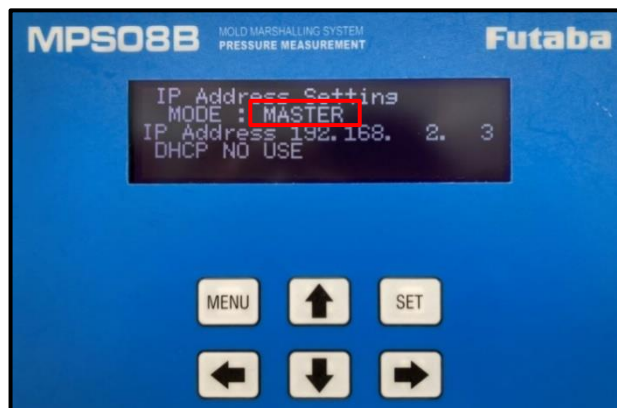
※ Updated from the software version shown above, the current version is "Ver:1.3.0.5".

#### (2) Switching modes

Switches MASTER ⇔ SLAVE.

- ①  Press once to enter IP Address Setting window.
- ②  Press the key once, and "MASTER (or SLAVE)" will blink.
- ③ Press  or  to switch MASTER ⇔ SLAVE.
- ④  Confirm with the key.
- ⑤ Restart MPS08B. Turn the power off and then on again.

- Set to MASTER



- Set to SLAVE1



### 8-3-5. Communication check

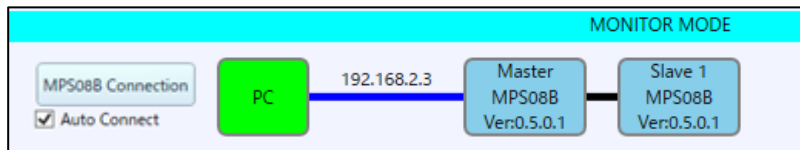
Checks that up to four MPS08B are recognized correctly.

(1) Turn ON all MPS08B

(2) Start the software on PC and check the system configuration indicators in the upper left of the screen.

The currently recognized MPS08B is displayed in blue.

- When two MPS08B are connected



※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

- If you have an expanded connection but only the first one is recognized, there is a problem with the connection.

Perform the following steps to reconfirm the connection:

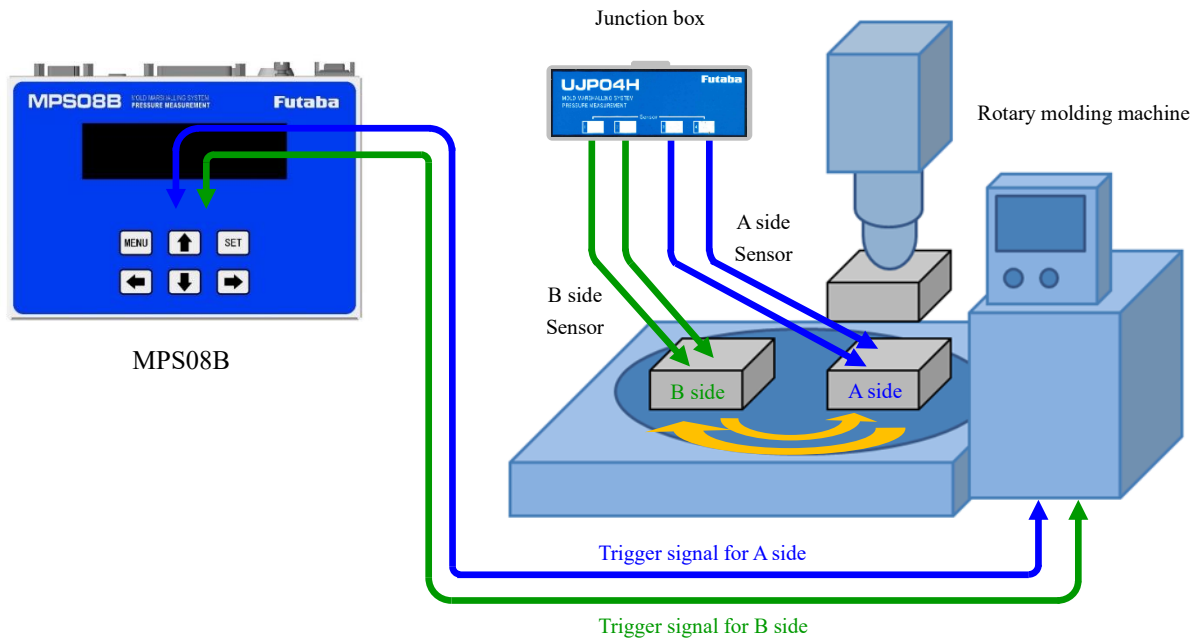
- ① Exit the software
- ② Turn off all MPS08B.
- ③ Refer to "8-3-1. Extended Configuration Diagram" (P.95) and check whether the devices are connected correctly.
- ④ Turn ON all MPS08B and start the software.
- ⑤ Refer to "2-3 Network Settings" (page 19) and check if the IP address of the MPS08 for the master is set correctly.
- ⑥ Refer to "8-3-4 MPS08B settings for expansion" (P.97) to check whether the "Modes" and "IP Addresses" of the expanded MPS08B are set correctly.

After checking everything, turn on the power again and confirm that it is correctly recognized by the system configuration indicator in the software. If it is still not recognized correctly, there may be a problem with the device.

Please contact "Contact Us" on the back cover of this manual.

# 8-4. Use in rotary molding

## 8-4-1 System configuration



## 8-4-2 Sensor settings in the setting file

Set CH1 to 4 as A side and CH5 to 8 as B side.

- This is an example of a 4-cavity setup for A side and a 4-cavity setup for B side.

(1) Setting → System → Sensor setting

→ Channel Trigger Settings

Check Trigger 1 of CH1~CH4.

Check Trigger 2 of CH5~CH8.

Sensor Settings		I/O Port	Monitor Settings		
Channel and Trigger Setting					
CH use	Name	Trigger1 Monitor	Trigger2 Monitor	Trigger3 Monitor	
<input checked="" type="checkbox"/>	CH01 Sensor_1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH02 Sensor_2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH03 Sensor_3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH04 Sensor_4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH05 Sensor_5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH06 Sensor_6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH07 Sensor_7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	CH08 Sensor_8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

(2) Settings → Module → I/O port

Set the trigger to start trigger 1 on the input Port01.

Set the trigger to start trigger 2 on the input Port02.

System		Module		
Module Name : ModuleName				
Sensor Settings		I/O Port		
Input Port				
Type	Port01	Port02	Port03	Port04
Option	Start Trigger	Start Trigger	UnSet	UnSet
Judge	Trigger1	Trigger2		
	RisingEdge	RisingEdge		
Output Port				
Action	Port01	Port02	Port03	Port04
Type	NO	NO	NO	NO
Option	Alarm	Alarm	UnSet	UnSet
	Trigger1	Trigger2	-	-
	<input checked="" type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01	<input type="checkbox"/> CH01
	<input checked="" type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02	<input type="checkbox"/> CH02
	<input checked="" type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03	<input type="checkbox"/> CH03
	<input checked="" type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04	<input type="checkbox"/> CH04
	<input type="checkbox"/> CH05	<input checked="" type="checkbox"/> CH05	<input type="checkbox"/> CH05	<input type="checkbox"/> CH05
	<input type="checkbox"/> CH06	<input checked="" type="checkbox"/> CH06	<input type="checkbox"/> CH06	<input type="checkbox"/> CH06
	<input type="checkbox"/> CH07	<input checked="" type="checkbox"/> CH07	<input type="checkbox"/> CH07	<input type="checkbox"/> CH07
	<input type="checkbox"/> CH08	<input checked="" type="checkbox"/> CH08	<input type="checkbox"/> CH08	<input type="checkbox"/> CH08
	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09	<input type="checkbox"/> CH09
	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10	<input type="checkbox"/> CH10
	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11	<input type="checkbox"/> CH11

(3) To set an alarm

Sets the trigger 1 alarm for output Port01.

Sets the trigger 2 alarm for output Port02.

## 8-4-3 Waveform data and log data

The file names to be saved are as follows.

Log file: Setting file name\_YYYYMMDD.csv

Waveform file: Setting file name\_YYYYMMDD\_HHMMSS\_shotNo.csv

# 9.MT method

## 9-1.MT monitoring and setting

MT method is based on the Mahalanobis distance (D-value), which converts multivariate information into one-dimensional information called distance, and judges normals/anomalies. Normal populations are called "unit spaces" and are used as judgment criteria.

In the design of unit space, the normal waveform file confirmed in advance is stored in the folder for unit space design, and the value of the point divided by the specified time or the integral value divided by the specified time is extracted as an item.

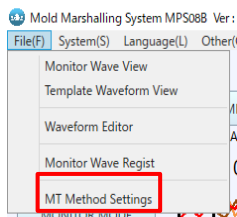
The average value, standard deviation, correlation coefficient, and threshold value of the unit space are transferred to the amplifier, and the square value (MD) of the Mahalanobis distance is calculated from the waveform data measured by the amplifier side. Then, the value is compared with the threshold value and judged. MD used for the judgment is displayed on the measurement display. The "Item Diagnostic" function is also installed to display the items that caused the abnormality for the data judged to be abnormal.

### Setting of MT Monitoring

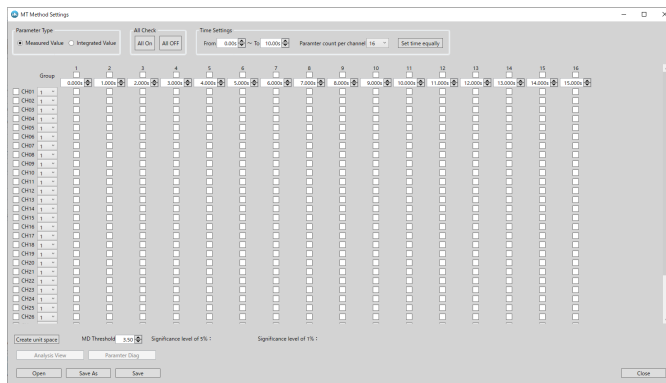
This section describes how to set up basic setting of MT monitoring.

#### 9-1-1 Indication of MT method monitoring setting

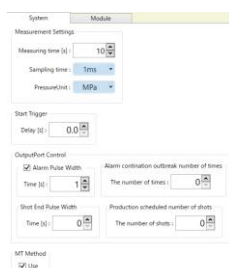
Press "File" → "MT Method Settings" on the upper left of the screen to go to MT method setting screen.



MT Monitor Setting window will appear as shown below.

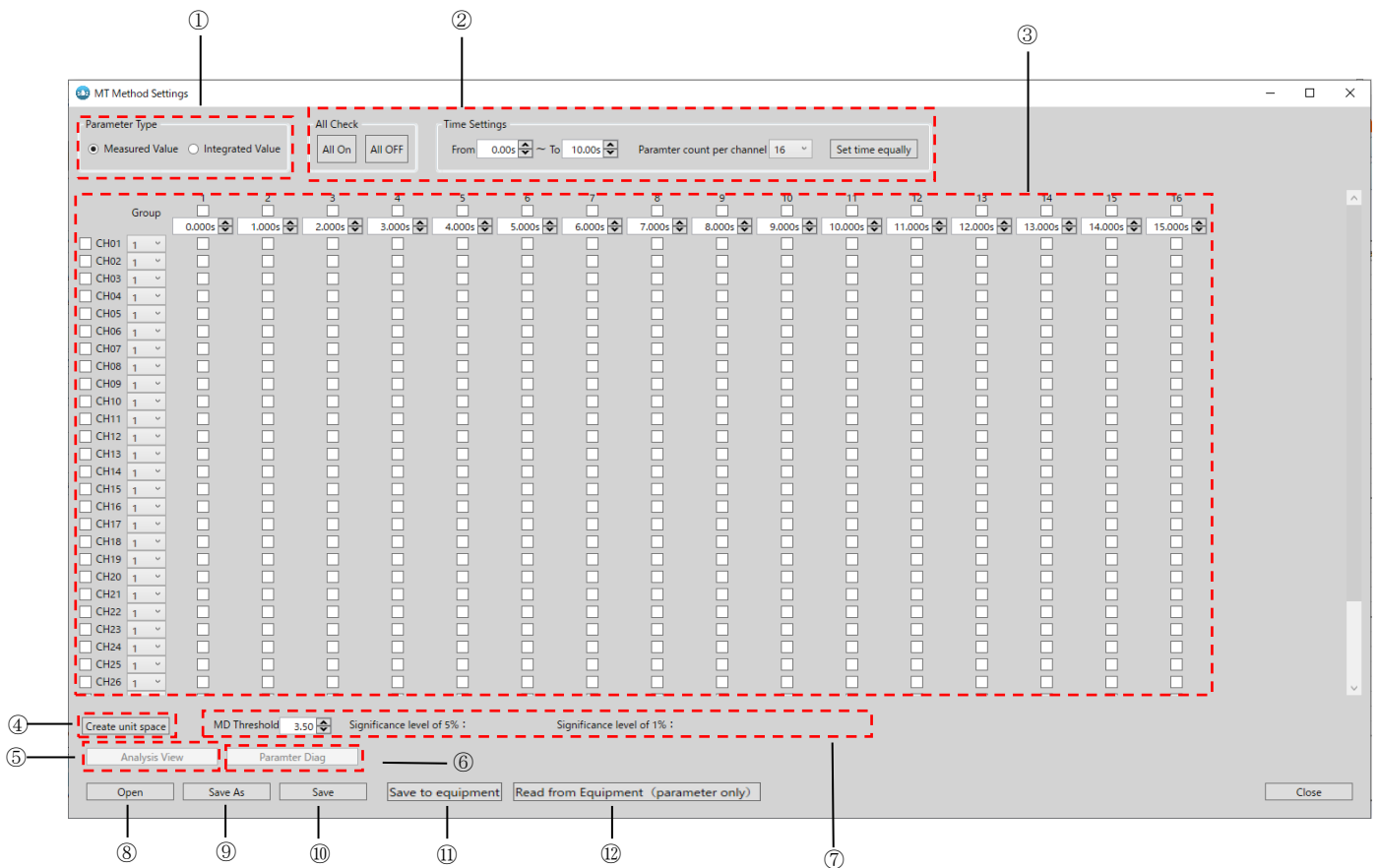


To use the MT method, go to "Settings" > "System" and check the MT method box.



## 9-1-2 Names and functions of display parts

This section describes the basic screen. In this section, please memorize the contents and overview of each part of the screen.



①	Parameter Type	Select one of two methods for calculating MD: Pressure/Integral.
②	Time Settings	Used to set the time of an item in equal divisions.
③	Item Setting	Set channel enable/disable, group setting, time setting, and enable/disable for each item.
④	Create unit space	Calculate the unit space.
⑤	Analysis View	Display the analysis result of unit space data.
⑥	Parameter Diag	Display the unit analysis of the waveform data in the file in which the selected arbitrary waveform data is stored.
⑦	MD Threshold	Set the thresholds used for monitoring MT method. The significance level 5% and 1% of MD value as a guide are displayed after analyzing the units.
⑧	Open	Refer to the saved MT method setting file from the folder.
□	Save As	Save the created MT method setting file.
⑩	Save	Save the open MT method setting file.
⑪	Save to equipment	Save the present setting file to MPS08B.
⑫	Read from equipment	Display the parameters saved in MPS08B.

### 9-1-3 Parameter type setting

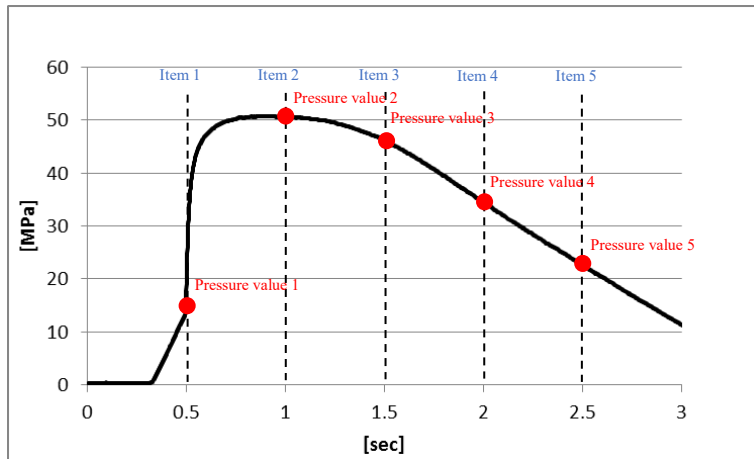
This section describes the parameter types used to calculate MD.

There are two types of parameters: pressure value and integral value. Select either one if necessary.

- Pressure value

Set the pressure value for the specified time as an item.

Used to monitor specific time variations in the waveform.

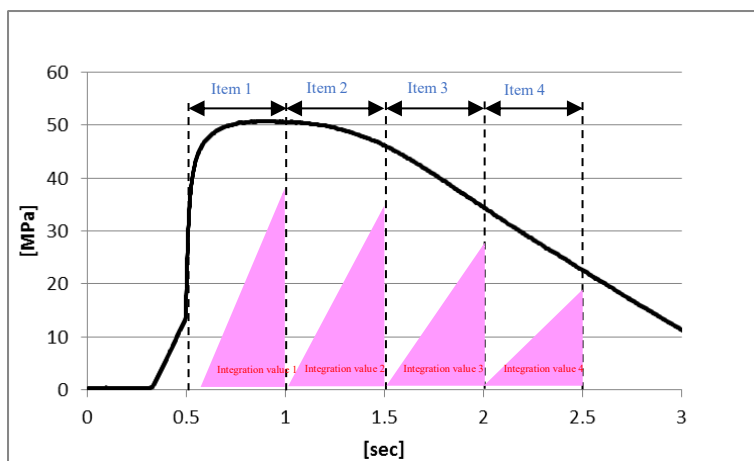


- Integral value

Sets the integral value of the specified time range as an item.

Used to monitor changes in the entire specified time range of the waveform.

Integral value = pressure x time (calculated assuming that the start position of each region is 0)



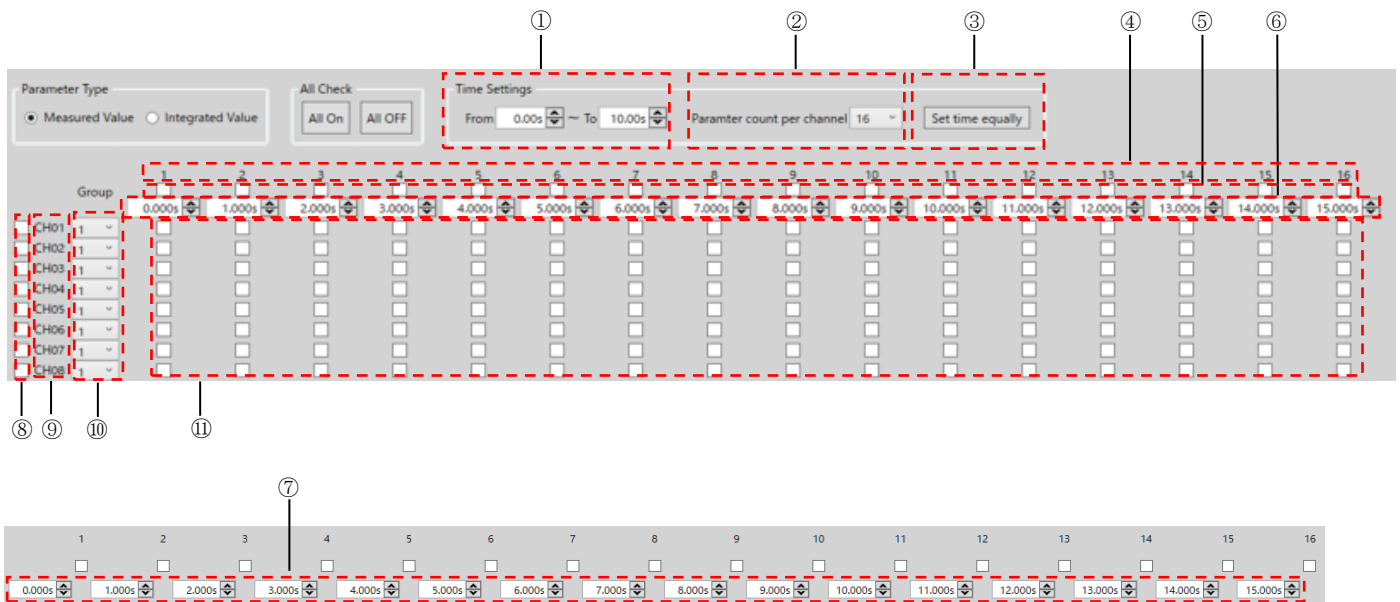


# 9-1-4 Item setting screen

This section describes how to set items.

## 9-1-4-1 Item setting screen

This section describes the item setting screen.



①	Time Settings	Enter the start and end time for equalization.
②	Parameter count per channel	Select the number of division items per channel for equal division, from 1 to 16 for the pressure value and from 1 to 15 for the integral value.
③	Set time equally	When pressing, set the equalization time.
④	Item number	Item number from 1 to 16.
⑤	Enable setting by item	When this checkbox is selected, all channels of each item are checked and enabled.
⑥	Item time setting (pressure value)	Enter the set time of each item when setting the pressure value.
⑦	Item time setting (Integral value)	Enter the start time and end time of the setting time range of each item when the integral value is set.
⑧	Enable setting by channel	When this checkbox is marked, all items of each channel are checked and enabled.
⑨	Channel number	Channel number from 1 to 32.
⑩	Group setting	Selects a group for each channel when grouping is used.
⑪	Enable setting by item, channel	Used to enable/disable each channel or item.

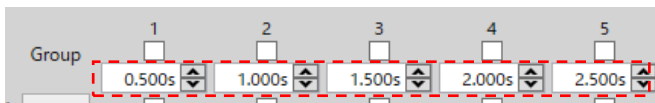
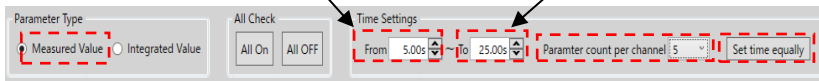
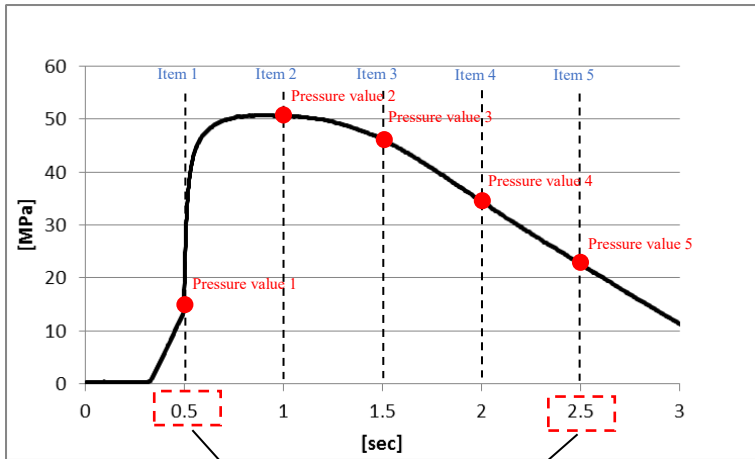
## 9-1-4-2 Time setting

There are two types of time setting of items: equal rate setting and arbitrary setting. Choose as required.

### ●Set time equally

Used to divide a specified range of times evenly by the number of items.

#### ①For pressure values



\* As shown in the figure on the left, if you would like to set the items in 5 equal divisions of 0.5 to 2.5 seconds at 0.5-second intervals, the following is what you would get.

\* Check "Pressure value"

→ Select 5 for "Parameter count per channel"

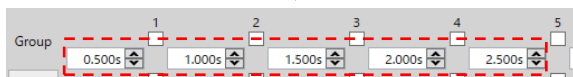
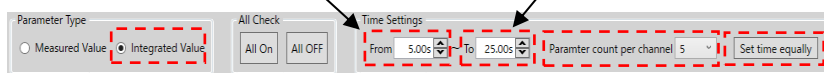
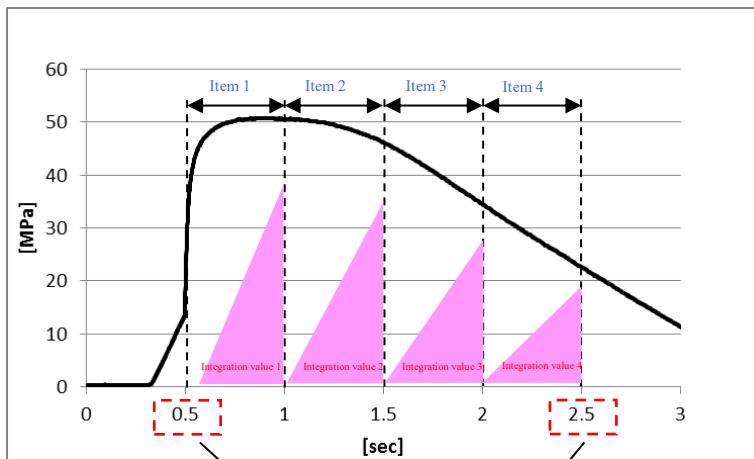
→ Enter 0.5 for "From"

→ Enter 2.5 for "To"

→ Press the "Set time equally"

→ Automatically divided

#### ②For integral value



\* As shown in the figure on the left, if you would like to set the items in 4 equal divisions of 0.5 to 2.5 seconds at 0.5-second intervals, the following is what you would get.

\* Check "Integrated value"

→ Select 4 for "Parameter count per channel"

→ Enter 0.5 for "From"

→ Enter 2.5 for "To"

→ Press the "Set time equally"

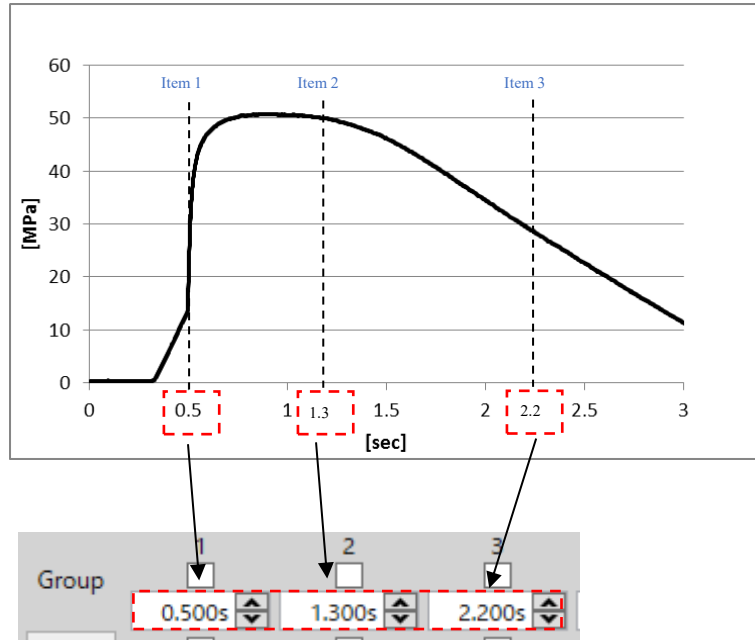
→ Automatically divided"

●Arbitrary time setting

This section describes how to set the time arbitrarily for each item.

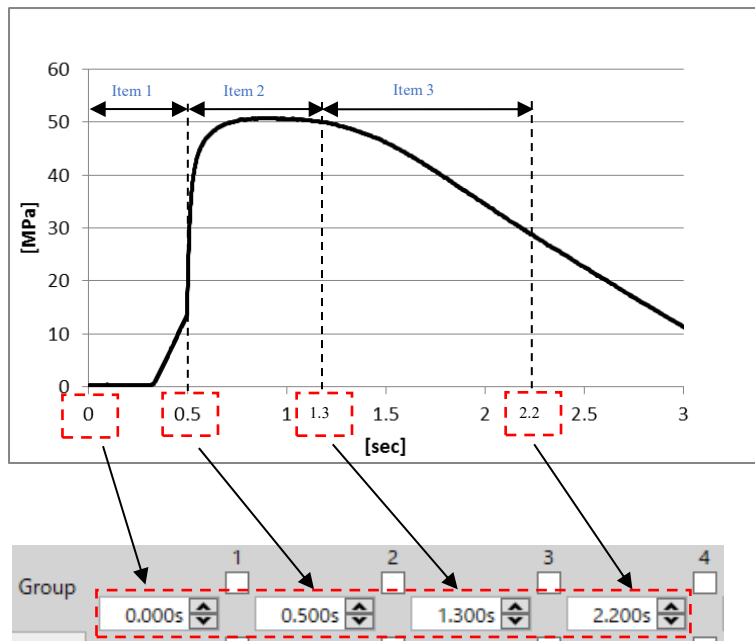
①For pressure values

To arbitrarily set the time when setting a pressure value, enter the time you would like to measure in the time input column of the item number as shown below.



②For integral value

To arbitrarily set the time when setting the integral value, enter the start time of the item range on the left side of the column of item numbers and the end time on the right side, as shown below.

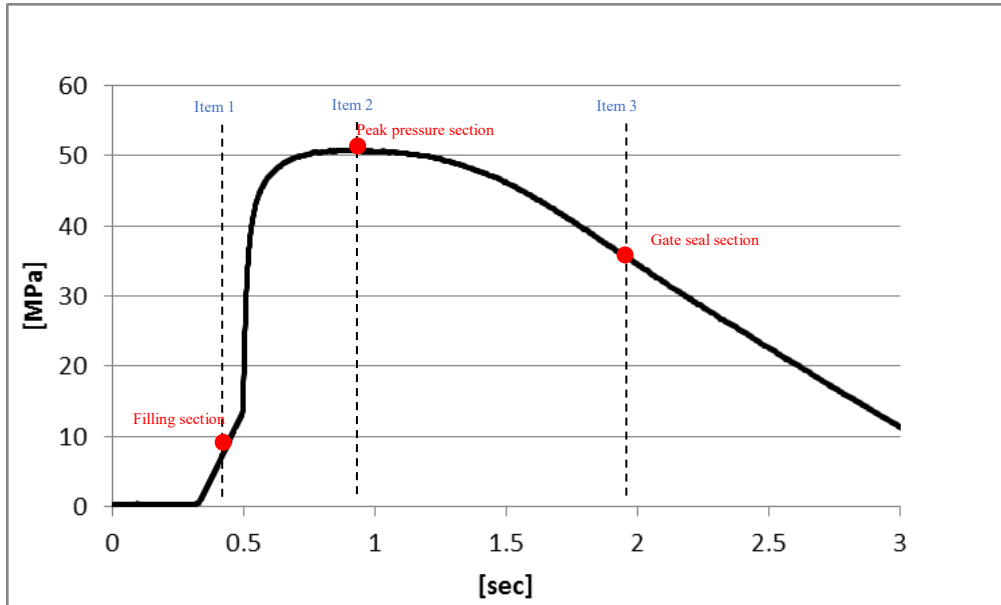


- Typical example of setting item

This section describes the typical setting items.

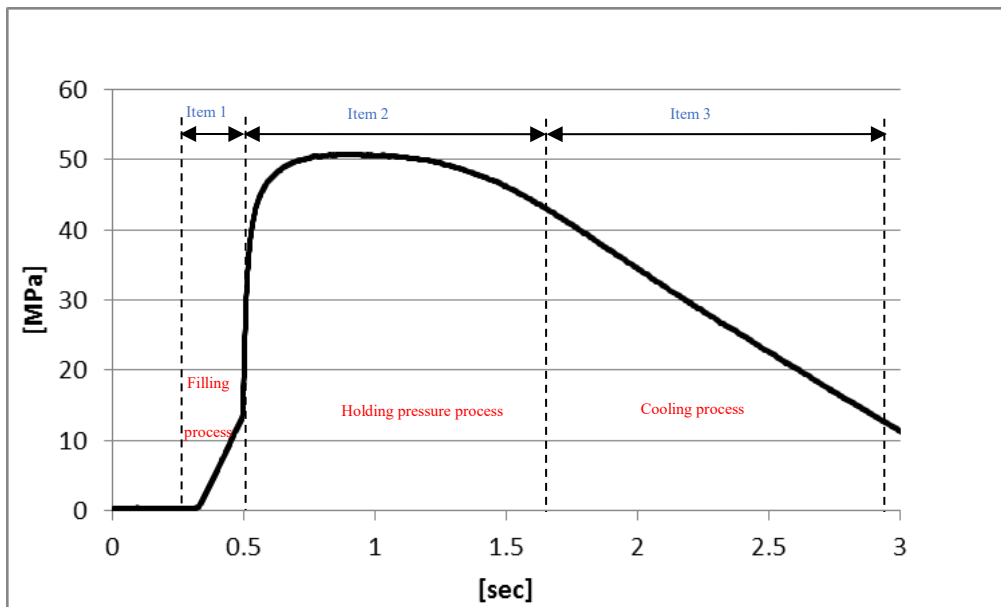
①For pressure values

Setting items in the filling section, peak pressure section, gate seal section, etc. makes it easier to identify the location and cause of the error.



②For integral value

Setting items for each process, such as the filling process, holding pressure process, and cooling process, makes it easy to identify the locations of abnormalities and factors.



### 9-1-4-3 Item enable/disable setting

Up to 16 items and up to 32 channels can be selected. You can switch between enabled and disabled by checking the checkboxes of each channel and item.

Group		1	2	3	4	5	6	7	8	9
		0.000s	1.000s	2.000s	3.000s	4.000s	5.000s	6.000s	7.000s	8.000s
<input checked="" type="checkbox"/> CH01	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH02	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH03	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CH04	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CH05	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CH06	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CH07	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CH08	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

※The figure above shows the setting when 3 channels and 4 items are enabled.

### 9-1-4-4 Group setting

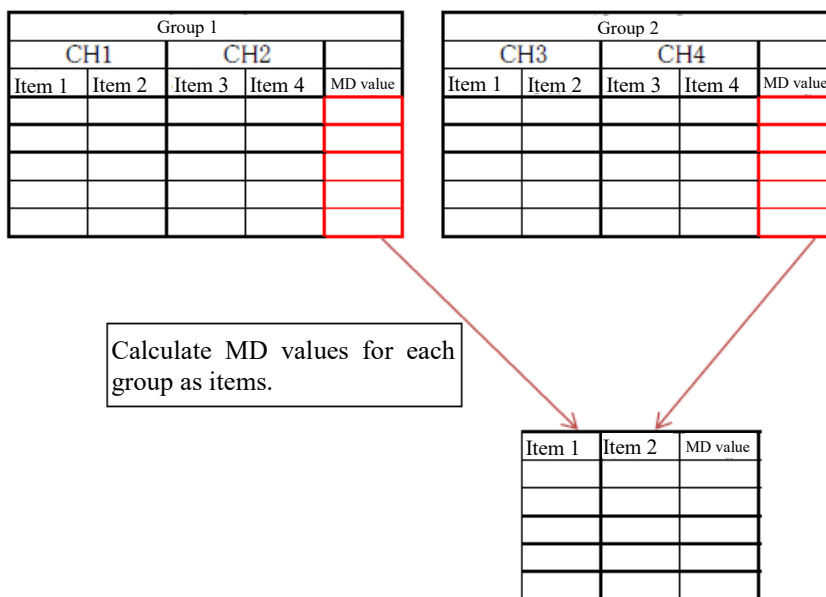
Used for grouping and processing when there are a large number of channels or when many channels are to be processed.

Use as needed.

- Select the group to which each channel belongs.

Group		1	2
		0.400s	1.000s
<input checked="" type="checkbox"/> CH01	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH02	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH03	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH04	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH05	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH06	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH07	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH08	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- The MD value is calculated for each group, and the final MD value is calculated using the MD value as the item.



## 9-1-5 Create unit space

This section describes Create unit space and MD Threshold setting.

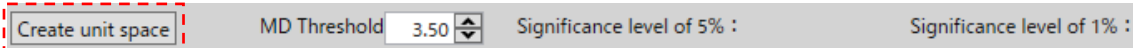
### 9-1-5-1 Create unit space

Calculates MD values for unit space data, which is the basis for the monitoring judgment.

The setting of 9-1-1~ 9-1-4 must be completed. Check it before calculation.

#### ●Calculation of MD of unit-space data

Press the "Create unit space".



Calculate MD values for waveform data stored in the folder dedicated to unit space design, and calculate threshold values at 5% and 1% significance levels.

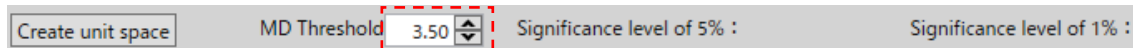
※The significance level is the standard probability for determining that an event is statistically unlikely to occur by chance (significant). Normally, 5% (0.05) is used, and 1% (0.01) is used when strictness is required.

※If the number of waveform data is insufficient or the measurement point is inappropriate, an error message will be displayed, so make adjustments by adding waveform data or changing the number of items or time settings.

※Unit space waveform Required minimum number of shots = number of channels (number of sensors) x number of items x3

### 9-1-5-2 Setting of MD Threshold

Set the threshold used to monitor MD value.



※Enter a significance level of 1% or 5% on the right or a value slightly larger than the maximum MD value in the analysis data display.

This completes the initial setup, so click "Save As" or "Save" at the bottom of the screen to save the settings. Threshold settings are saved and linked to the MPS08B condition setting file (~.xml).

## 9-2. Let's use it actually

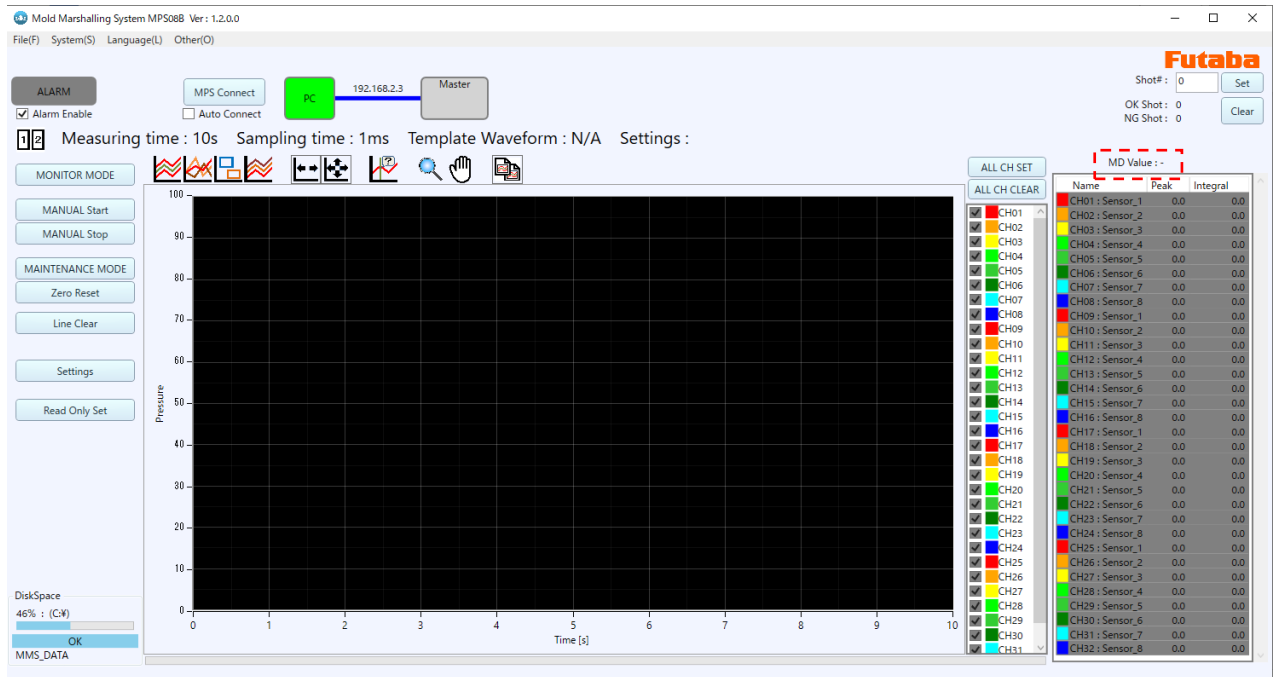
With the previous operations, all preparations for MT method monitoring settings are complete; now that all settings other than MT method have been made, actual molding is performed to verify the validity of the MT method.

### 9-2-1 Start measurement

When a trigger signal (measurement start signal) from the molding machine is input, measurement of the pressure waveform starts.

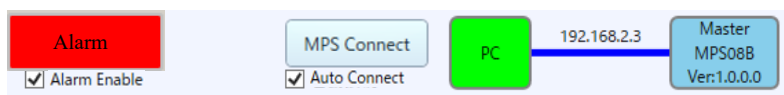
- Display MD value

After the measurement is completed for each shot, the MD value is displayed in the upper right corner of the screen.



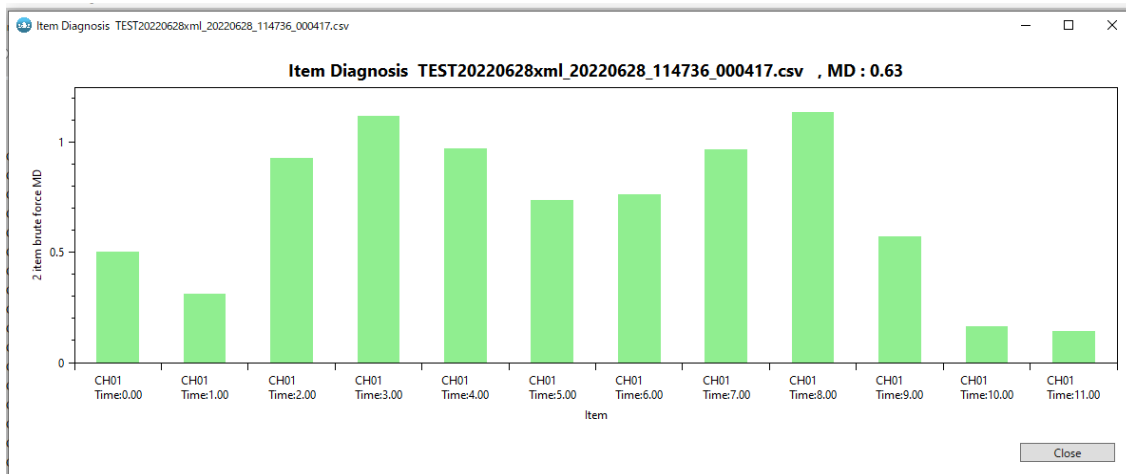
※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

- If the MD value is above the set threshold, NG is indicated, the alarm lights up red, and the item diagnosis is displayed.



※Updated from the software version shown above, the current version is "Ver:1.3.0.5".

- \* Item diagnosis is displayed at the end of measurement, and automatically closes at the start of the next measurement.  
(Refer to 3-3 for details.)



## 9-2-2 Validation

Actual molding is performed to confirm the validity of the settings.

- When NG judgment occurs

When MT method monitoring NG judgment occurs, it is checked whether it is a defective product. If it is a non-defective product, the waveform data is added to the folder for unit space design, and the unit space design is recalculated.

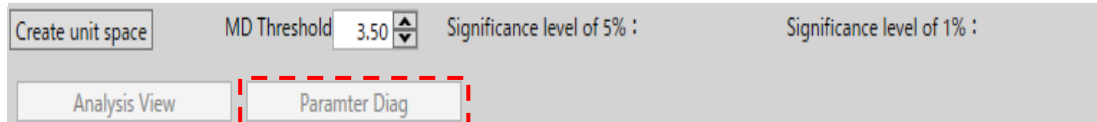
By repeating this operation, the reliability of the judgment is improved.

## 9-2-3 Item diagnosis

Item diagnosis is a function to analyze the items that caused the abnormality for the data judged to be abnormal. When NG is judged, it is displayed automatically, but it can also be checked later.

This section describes how to check later.

- Press "Analysis View" in MT method monitor setting.



Select any folder and execute.

※The unit space setting must be the same as the unit space setting of the waveform data to be diagnosed. If they are different, an error message is displayed.

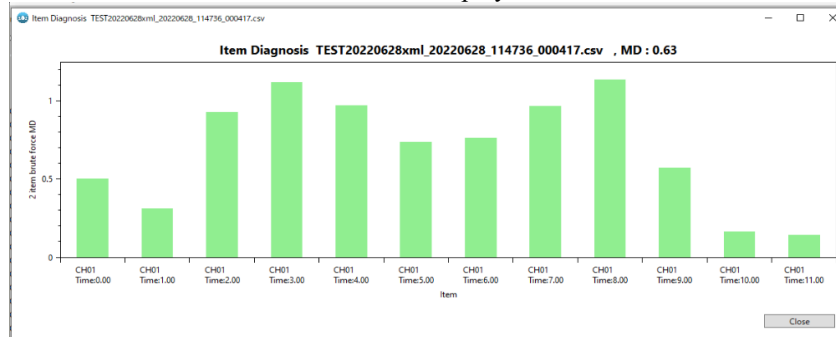
- Selecting a waveform file

The "Signal Space Data List" is displayed. Select the waveform data to be used for item diagnosis.

FileName	Group 1 MD	Group 1 CH01 0.00	Group 1 CH01 0.67	Group 1 CH01 1.33	Group 1 CH01 2.00	Group 1 CH01 2.67	Group 1 CH01 3.33	Group 1 CH01 4.00	Group 1 CH01 4.67	Group 1 CH01 5.33	Group 1 CH01 6.00	Group 1 CH01 6.67	G C
Test20240319_20240703_085719_001414.csv	1.000	0.00	0.13	0.11	0.10	0.07	0.07	0.08	0.03	0.03	0.05	0.05	
Test20240319_20240703_085747_001415.csv	1.000	0.04	0.09	43.37	51.63	50.34	41.74	24.00	4.43	1.98	1.57	1.35	
Test20240319_20240703_085855_001416.csv	1.000	0.03	0.13	53.42	55.21	54.21	47.07	30.24	10.71	5.07	4.11	3.63	
Test20240319_20240703_085959_001417.csv	1.000	0.03	0.05	48.61	53.31	51.35	42.27	23.95	4.73	2.24	1.76	1.56	
Test20240319_20240703_085954_001418.csv	1.000	0.02	0.06	0.18	0.00	0.00	0.04	0.00	0.03	0.03	0.07	0.11	
Test20240319_20240703_085941_001419.csv	1.000	0.00	0.04	0.00	0.04	0.00	0.03	0.04	0.11	0.05	0.04	0.02	
Test20240319_20240703_085955_001420.csv	1.000	0.00	0.01	0.21	0.05	0.09	0.10	0.05	0.03	0.04	0.05	0.07	
Test20240319_20240703_090015_001421.csv	1.000	0.00	0.00	0.06	0.11	0.13	0.05	0.10	0.11	0.10	0.12	0.07	
Test20240319_20240703_090038_001422.csv	1.000	0.00	0.06	49.17	53.22	51.66	43.19	26.19	6.94	3.66	2.91	2.52	
Test20240319_20240703_090159_001423.csv	1.000	0.02	0.14	0.18	0.08	0.05	0.01	0.05	0.13	0.18	0.08	0.08	
Test20240319_20240703_090134_001424.csv	1.000	0.06	0.06	49.24	53.28	51.70	43.06	26.34	6.82	3.22	2.42	2.17	
Test20240319_20240703_090142_001425.csv	1.000	0.00	0.12	0.07	0.00	0.00	0.03	0.00	0.05	0.05	0.00	0.04	
Test20240319_20240703_090157_001426.csv	1.000	0.00	0.08	49.41	53.50	52.00	43.43	26.46	6.78	3.15	2.39	2.09	
Test20240319_20240703_090211_001427.csv	1.000	0.08	0.05	64.31	68.39	65.68	55.99	39.21	20.26	11.37	8.37	7.55	
Test20240319_20240703_090228_001428.csv	1.000	0.04	0.00	59.50	63.70	61.26	51.70	34.58	15.09	6.60	5.37	4.72	
Test20240319_20240703_090242_001429.csv	1.000	0.00	0.00	58.39	62.42	60.21	51.05	34.07	14.53	6.48	5.31	4.74	
Test20240319_20240703_090207_001430.csv	1.000	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	
Test20240319_20240703_090626_001431.csv	1.000	0.04	0.00	55.30	59.00	56.62	47.60	32.32	14.51	6.88	5.71	5.16	
Test20240319_20240703_090640_001432.csv	1.000	0.00	0.00	47.23	50.63	49.15	41.14	25.21	6.40	2.66	2.02	1.74	
Test20240319_20240703_090654_001433.csv	1.000	0.04	0.00	42.07	48.63	47.45	39.57	24.37	5.27	2.20	1.63	1.24	
Test20240319_20240703_090708_001434.csv	1.000	0.02	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Test20240319_20240703_090722_001435.csv	1.000	0.00	0.07	0.05	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	
Test20240319_20240703_090736_001436.csv	1.000	0.00	0.00	0.11	0.03	0.00	0.07	0.01	0.05	0.10	0.05	0.02	
Test20240319_20240703_090751_001437.csv	1.000	0.00	0.00	0.02	0.09	0.07	0.01	0.00	0.00	0.01	0.02	0.03	
Test20240318_20240703_090806_001438.csv	1.000	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	

- Item diagnosis result display

The item diagnosis result of the selected waveform data is displayed.



※MD per unit of two items is displayed graphically. The larger the value, the greater the cause of the error.



## 9-3. Functional description

### 9-3-1 Setting the storage location

The saved data is saved in the folder specified in advance.

※For details on setting the save destination, refer "4-3-2. Administration Settings" (P.39).

### 9-3-2 Administration settings

Perform "System"-> "Administration Setting" from the main menu. The Administration Settings screen is displayed.

In the Administration Setting window, you can set IP settings of MPS08B and the settings of various storage locations (storage paths).

No.	Name	Function
①	MT method setting folder	<ul style="list-style-type: none"> <li>Set the setting folder path to be used in MT method monitor setting display.</li> <li>The default settings are as follows: MT_Settings</li> </ul>
②	Folder for unit space design	<ul style="list-style-type: none"> <li>Set the folder-path for unit-space designs to be used in MT method monitoring setting window.</li> <li>The default settings are as follows: MT_UnitSpace</li> </ul>

# 10. Trouble shooting

## 10-1. Trouble shooting

If a problem occurs while using the MPS08B, take the following measures according to the symptoms.

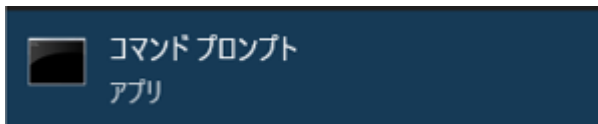
### (1)MPS08B and PC cannot communicate

Probable Causes	Countermeasures
IP address of PC is not set.	Changes IP address of PC to the specified fixed value. To communicate with the default setting MPS08B, set IP address of PC to 192.168.2.200. >> P.20" 2-3-3.Set IP address of the measurement PC "
PC is not able to recognize MPS08B.	Turn on the power of MPS08B amplifier alone and connect it to PC with LAN cable after starting up normally. >> P.21 "2-4-1. Communication Check"
The operation mode is set to SLAVE mode.	Switches MPS08B display from SLAVE mode to MASTER mode. Then, turn off MPS08B, wait for about 10 seconds, and turn on the power again. >> P.26 "3-2-3. Address setting screen"
The firewall is enabled.	Disable the firewall setting of the connected PC. If antivirus software is installed separately, the firewall may be set separately from Windows.
LAN cable is not specified.	Use the LAN cable supplied with the product. It is equivalent to a common CAT5 straight cable if only communication is used.

#### ■Checking communication between PC~MPS08B at the command prompt

If communication between PC and MPS08B is not established, please also try the following procedure.

Start Command Prompt from the Windows Start Menu.



※ You can search by typing cmd in the search bar next to Windows Start menu.

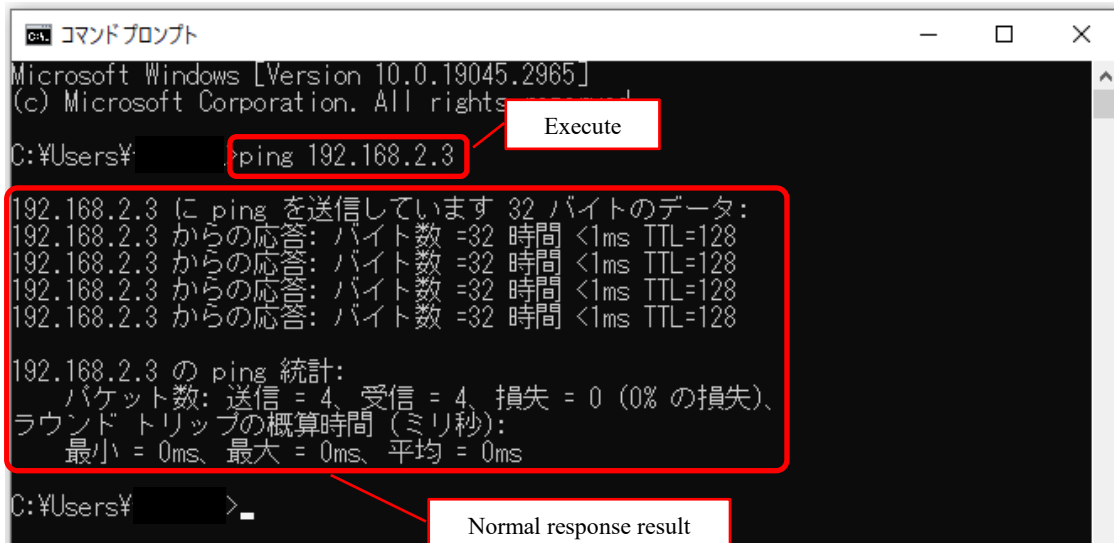


2. Execute the following command at the started command prompt and confirm the response.

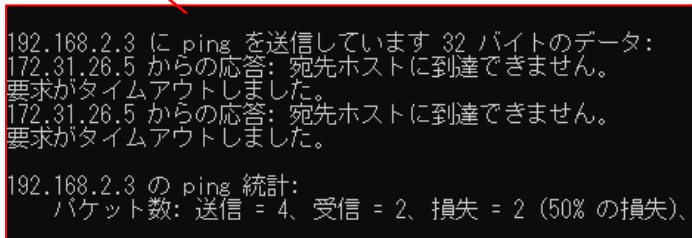
"Checking Communication Between MPS08B~PC"

Command: ping 192.168.2.3

※If the IP address on the MPS08B side has been changed, please execute the command with the changed IP address after the ping.



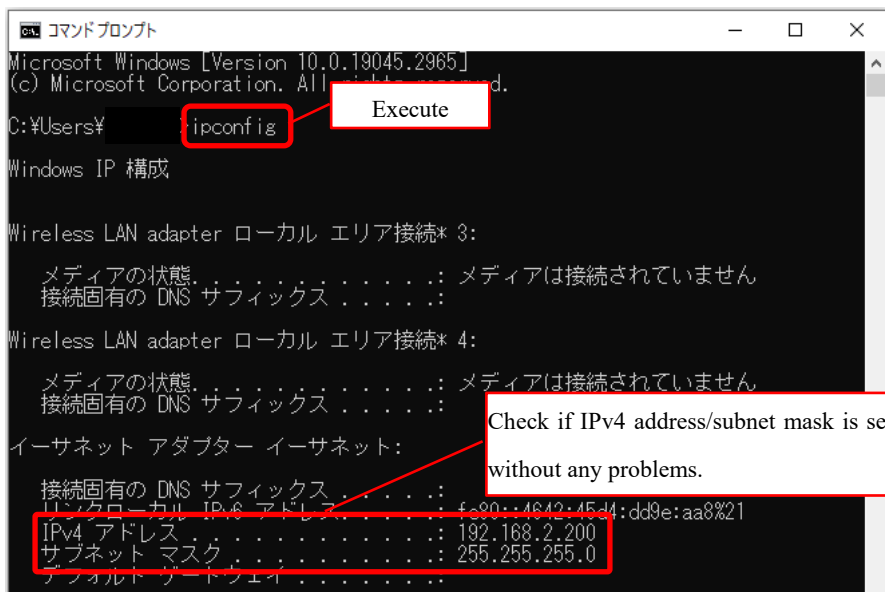
Abnormal response result



※If the response is normal but communication between the PC and the MPS08B is not established, the cause may be a firewall or anti-virus software.

"Checking IP Address Settings"

Command: ipconfig



※If the setting is incorrect, go to "2-3-3. Set IP address of the measurement PC " (P.20).

(2) Measurement does not start.

Probable Causes	Countermeasures
Trigger signal is not input.	Check if the trigger signal is input correctly. Usually connect the mold close signal. Electrically, input a non-voltage contact signal. >> P.52 "4-7. I/O Signal Setting"
Maintenance mode is set.	Perform measurement in monitor mode. >> Starting P.63 "5-1. Starting measurement (Monitor Mode)"

(3) Abnormal measurements

Symptoms	Probable Causes	Countermeasures
The value is wrong.	Sensitivity classification of the sensor is not input.	Enter the sensitivity classification indicated on the sensor for each CH. To correct the characteristics of each sensor, the sensitivity classification must be set individually. >> P.50 "(2) Sensor sensitivity setting"
	Sensitivity of the sensor is incorrect.	
	Trigger input timing is wrong	Make sure that the clamp complete signal is at the trigger input timing. >> P.52 "4-7. I/O Signal Setting"
	The trigger signal is input with a load applied to the sensor.	Make sure that the load is not applied to the sensor when a trigger is input.
Noise is generated.	The rated capacity is too large for the pressure sensor button type.	Change to a sensor with a smaller rated capacity that matches the measured value.
	The ground is not connected properly.	Connect the ground correctly. If grounding is not connected, ground the ground terminal on the MPS08B enclosure and see if the symptoms improve. >> P.15 "1-5-5. Connecting to the power supply"
	The connection is not correct.	Check that each part is connected correctly. >> P.10 "1-5. Connecting pressure sensor and each cable"
Pressure of measured waveform does not become zero.	Shrinkage of the molded product stopped while the pin of the pressure receiving area was pushed in by the resin pressure.	This is not a particularly abnormal phenomenon.

#### (4) Abnormal analog voltage output

Symptoms	Probable Causes	Countermeasures
Analog voltage output is not working	Trigger signal is not input.	Check the connection destination so that the mold close signal is at the timing of the trigger input. >>> P.52 "4-7. I/O Signal Setting"
Analog voltage change stops in the middle.	The analog voltage outputs the voltage corresponding to the measured value during the period from the input of the trigger signal to the lapse of the set measurement time. If the measurement is finished during the change, the voltage value at that point will continue to be held until the next trigger input.	It is impossible to continuously generate analog voltage while performing mass production molding and monitoring. If you would like to measure the overall analog voltage, set the measurement time to a value close to the molding cycle. Due to the file saving and communication, a certain amount of interval is required between the end of measurement and the input of the trigger signal. The interval varies depending on PC capacity, measurement time, and type of data to be saved. Check the setting while using the device.

#### (5) Initialization method

1. Turn off the power with MPS08B unit.
2. Turn on MPS08B while pressing both the ↑ and ↓ keys.
3. After the display panel lights up for about 20 seconds, the system shifts to normal startup.

This resets the factory default settings.

#### (6) Abnormal in expanded use

Symptoms	Probable Causes	Countermeasures
Cannot be expanded	MASTER/SLAVE settings are not correct.	Check MASTER/SLAVE setting. >>> P.97 "8-3-4. MPS08B Settings for expansion"
	FL-LINK IC is damaged. MPS08B is shown below.	Please contact "Contact Us" on the back cover of this manual.

The diagram illustrates the transition from a normal display to an abnormal display. On the left, the 'Normal' display shows: 'MPS08B Ver:1.3.0.4', 'MODE : MASTER', '2021/04/01 12:34:56', 'USB Memory Nothing.', and 'IP address 192.168. 2. 3'. On the right, the 'Abnormal' display shows: 'MPS08B Ver:1.3.0.4', 'MODE : MASTER', '2021/04/01 12:34:56', 'FL-LINK RS485 Error', and 'IP address 192.168. 2. 3'. A red arrow points from the 'Normal' display to the 'Abnormal' display. Below the arrow is a red box containing the text 'Display switching'.

# 11. Specifications

## 11-1. General specifications

### 11-1-1. MPS 08 B Main unit

Number of points measured	4 points (Expanded 8 points/unit: 1 junction box added) (Max. 32 points: When 4 units are connected)
Measuring range	0~200MPa
Precision	±2%F.S.
Sampling period	1ms/2ms/5ms/10ms/20ms/50ms/100ms/200ms/500ms/1000ms
Sampling time	Maximum 120 s/240 s/600 s/1200 s/2400 s/6000 s/ 12000s/24000s/60000s/120000s (sampling cycle order)
Control input	10 points: Contact input. (NPN open collector, PNP open collector switchable)
Control output	10 points: Photo relay (a-contact)
Analog output	0.0V~10.0V(20MPa/V) Impedance :100Ω
Internal storage data	100 setting files (written to non-volatile memory)
Ambient temperature	0~50°C
Ambient humidity	35~85%RH (non-condensing)
Vibration resistance	10-55Hz double-amplitude 1.5mm, 2 hours in X, Y, and Z directions
Warm-up time	Approx. 30 minutes
Power supply specifications	DC24V (Dedicated AC Adaptor, Input C100~240V) Maximum power consumption 10 W
Mass	About 1,150g

### 11-1-2. Heat resistant junction box UJP04H

Connected sensor	SS series or EPS series made by Futaba Corporation (EPS series. The optional adaptor is required.)
Operating temperature range	Mold temperature 120°C or less
Vibration resistance	10-55Hz double-amplitude 1.5mm, 2 hours in X, Y, and Z directions
Mass	About 150g

### 11-1-3. Wire storage type junction box UCP04

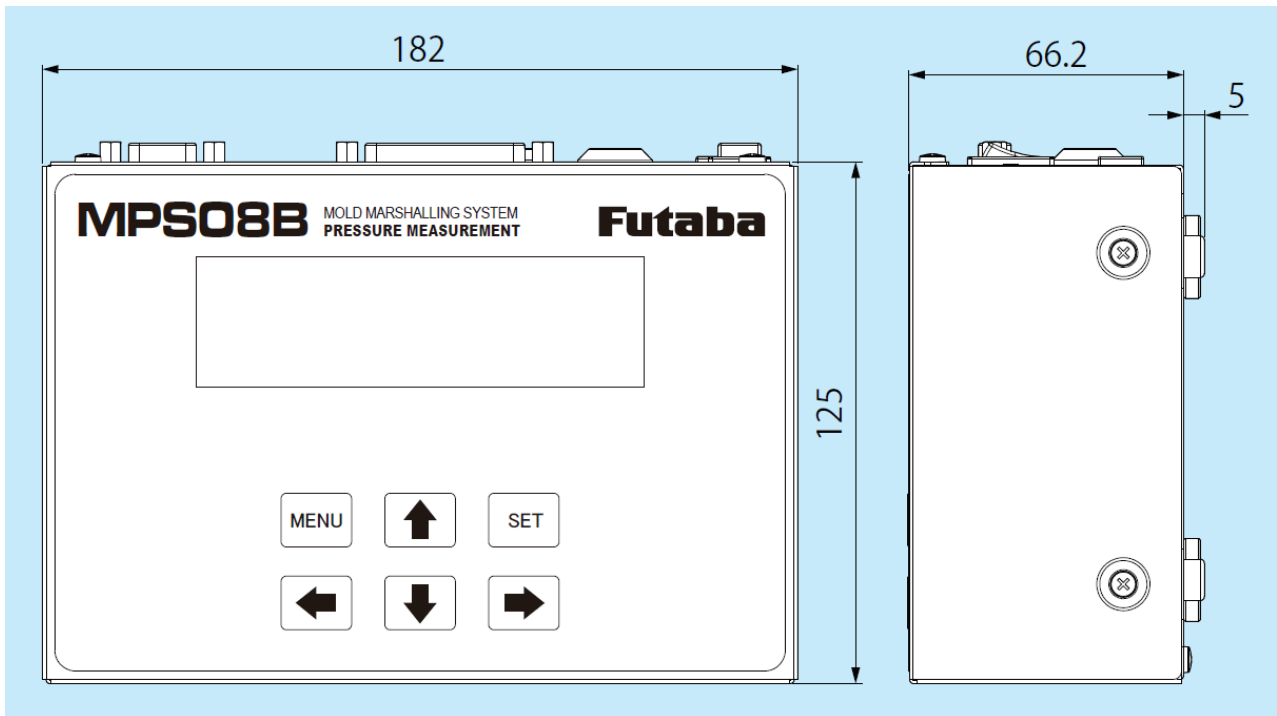
Connected sensor	SCB Series- Button Type for wire storage type junction box by Futaba Corporation
Operating temperature range	Mold temperature 120°C or less
Vibration resistance	10-55Hz double-amplitude 1.5mm, 2 hours in X, Y, and Z directions
Mass	About 85g

### 11-1-4. Heat resistant junction cable WJP0430HB

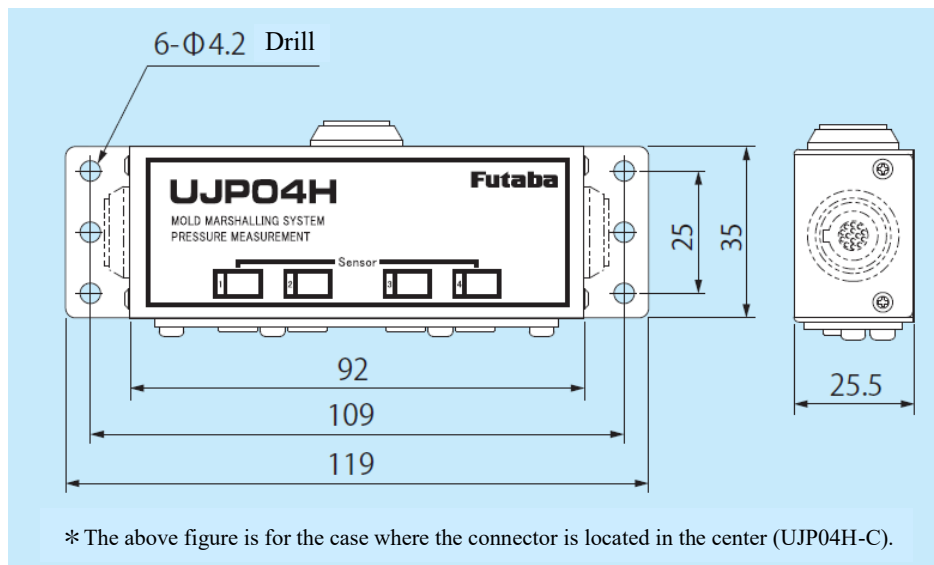
Overall length	3m
Operating temperature range	Mold temperature 105°C or less
Mass	About 160g

## 11-2. External dimensions

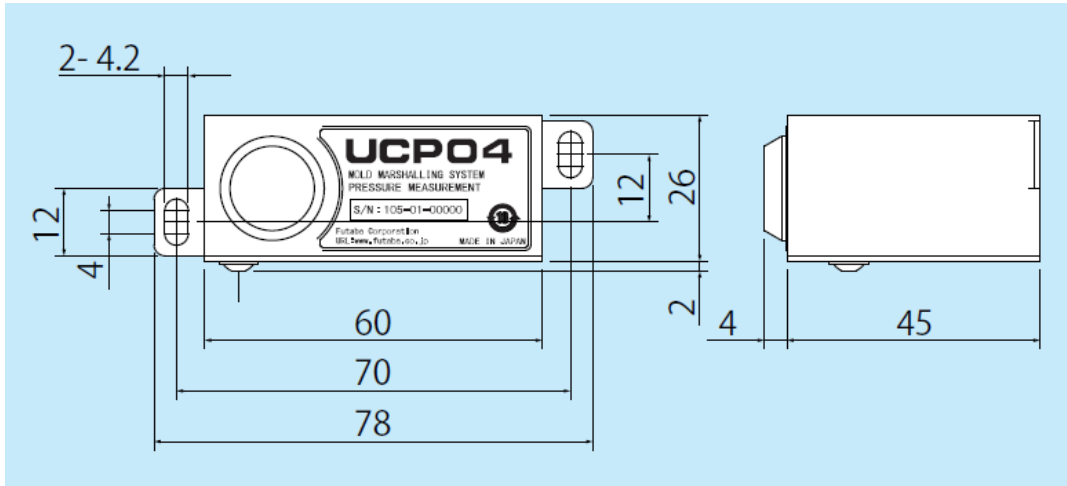
### 11-2-1. Pressure-measuring amplifier MPS08B



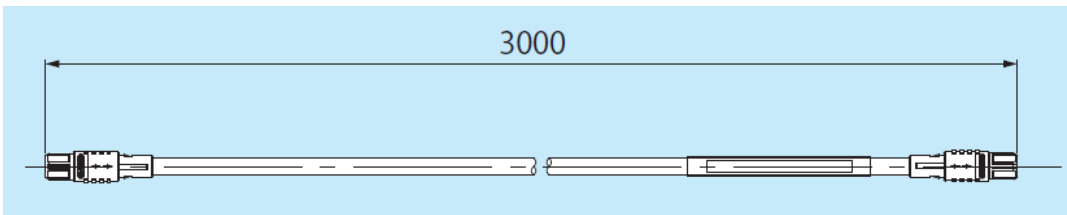
### 11-2-2. Heat resistant junction-box UJP04H



### 11-2-3. Wire storage type junction box UCP04



### 11-2-4. Heat resistant junction cable WJP0430HB



## 11-3. Timing chart

※NO Normal open		NC Normal close		Turn OFF	Turn ON	Measurement software start	Input trigger	Judge normal	Input trigger	Judge abnormal	Alarm cancel	Measurement software end	Turn OFF
Alarm signal	NO	open											
		close											
Alarm signal	NC	open											
		close											
Shot end	NO	open											
		close											
Shot end	NC	open											
		close											



[Contact Us](#)

**FUTABA CORPORATION**

Machinery & Tooling Business Center

1080 Yabutsuka, Chosei-mura, Chosei-gun, China-ken, 299-4395, Japan TEL.0475-30-0809 FAX.0475-30-0818

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