

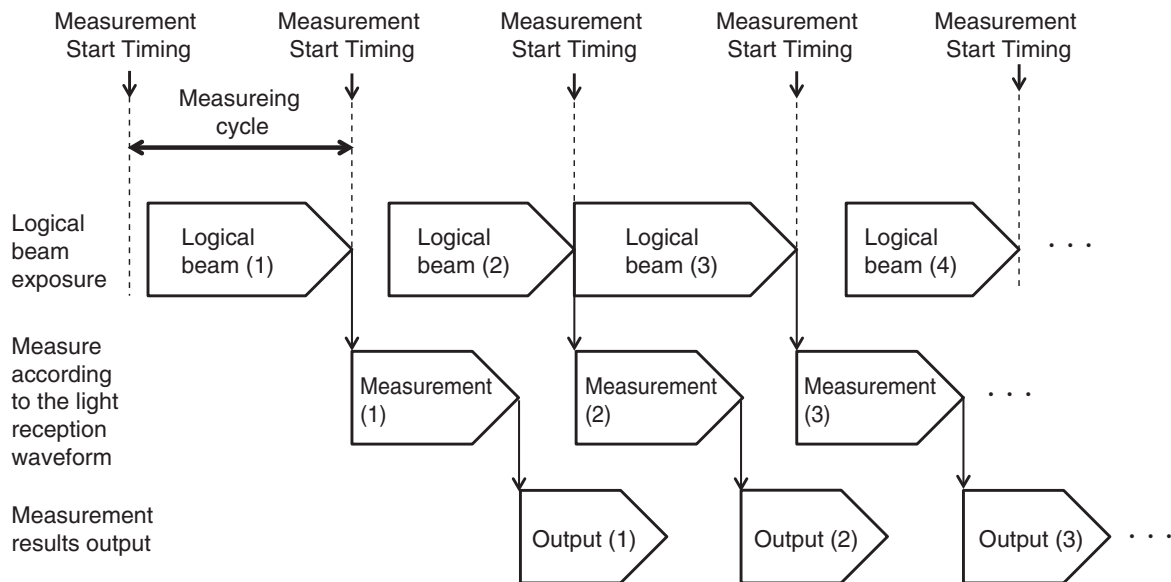
Basic Operation

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3-1 Setting the Measurement Start Timing

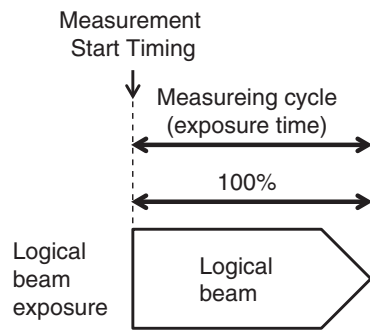
Internal Processing of Sensor Controller

The Sensor Controller performs processing in the following 3 parts according to the logical beam sent from the Sensor Head. Since each part is performed in parallel inside the Sensor Controller, the measurement cycle is determined by the part with the longest processing time. When the measurement cycle is shortened, the logical beam exposure time shortens, so the measurement accuracy of targets to measure with lower reflectivity may not meet the specification. Also, due to the processing time of measurement processing and output processing, the measurement cycle cannot be below 20 us.

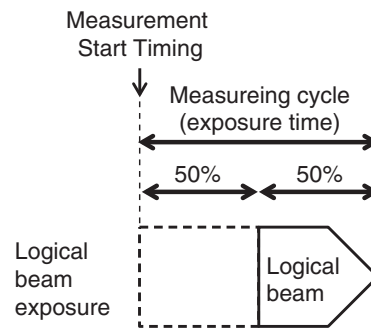


The Sensor Controller starts exposing logical beam when the measurement start timing is specified. When the light power is 100%, exposure starts when the measurement starts, but when the light power is less than 100%, there is a period with no exposure after the measurement starts. The exposure starts when the measurement starts and ends when the measurement cycle ends.

● light power is 100%



● light power is 50%



Measurement Mode and Measurement Start Timing

The procedure for specifying the measurement start timing can be selected from the following three modes. Use these modes to synchronize the measurement timing between sensors or to perform synchronization control with a servomotor or other external devices.

Item	Setting item	Setting value	Description
Sensor settings	Measurement mode	Internal synchronous measurement mode (initial value)	The measurement start timing is automatically determined according to the set measurement cycle intervals. Use this mode to perform measurements continuously with a sensor only or to shorten the measurement cycle as much as possible.
		External synchronous measurement	The measurement start timing is specified by TRIG input signals. Use this mode to perform measurements in synchronization with external signals from parallel I/O. One measurement is performed for each TRIG input signal. In the 2 area mode, measurements for 2 areas are performed continuously.
		PDO synchronized mode	The measurement start timing is determined by Sync0 signals* automatically sent from the EtherCAT master. Use this mode to perform measurements by synchronizing the EtherCAT slave and EtherCAT master slave.

- **Multi View Explore** : [System] (double-click)
 → **Edit pane** : [Sensor Settings] icon 

1 Set [Measurement mode].

Important

- Measures one by one input the external Trigger signal in External synchronous measurement mode.
- Need to input the external Trigger signal depending on the setting content of the filtering process.
Example)
When you set the Average number to 128, need the external Trigger signal to input 128 counts.
- When you set the Exposure control mode to Auto, multiple inputs of external Trigger signal are necessary after adjusting the measurement object within the measurement range for optimization of exposure status.
- The following items use parameters from External/PDO synchronous measurement mode, or outside of the Internal synchronous measurement mode so separate settings by mode is possible.

Item	Setting item
Average number of times	Average number of times
Differentiation filter	Differentiation cycle
Trigger delay mode	Delay time
	Sampling time

Note

3-1 EtherCAT Connection in Confocal Fiber Type Displacement Sensor ZW-7000 series User's Manual for Communication settings (Cat. No. Z363).

3-2 Switching operation modes

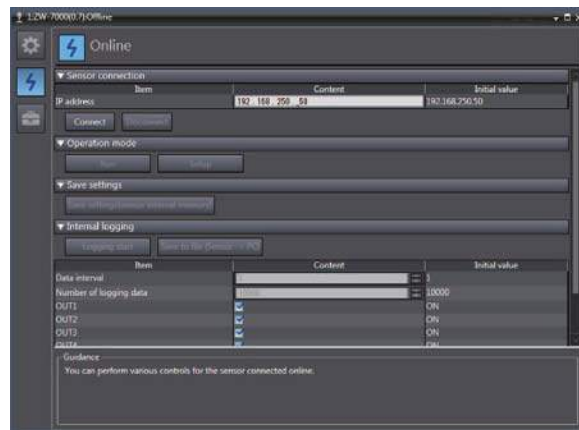
The Sensor Controller has two operation modes. One is RUN mode/Setup mode and the other is FUNC mode. Switch to the desired mode depending on purpose.

(The Sensor Controller always starts up in the RUN mode when the power is turned on.)

Item	Setting item	Mode	Description
Online	Operation mode	RUN	Switches to RUN (operation) mode. Normal operation mode.
		FUNC	Switches to FUNC mode. Mode for setting the measurement conditions.

- ▶ **Multi-view explorer** : [Device Group] | [(Sensor Name)] (double click)
- **Edit pane** : [Online] icon (⚡)

1 Select the operation mode with [Operation mode].




Important

- When operating the Sysmac Studio, regardless of its operation mode (RUN or Setup), always set the operation mode of the Sensor Controller to RUN.

Note

The operation mode of the Sensor Controller can be switched only with a key operation.

 7-4 Switching operation modes p.202

3-3 Displaying Measured Values and Received Light Waveform

The measurement values and received light waveform can be displayed.

► **Multi View Explore** : [Device Group] | [(Sensor Name)] (right-click)

1 Select [Sensing monitor].

On the edit pane, the [Sensing monitor] window appears.



2 According to the items for result display, add or delete [Display item].

Click the [add target data] icon (+).

To delete the target data from the list, select the line, and then click [Delete].

The screenshot shows the 'Display Item' configuration table with columns: Item1, Item2, Unit, Font size, and Comment.

Item1	Item2	Unit	Font size	Comment
Measurement value	Task1	μm	20	
Incident level		%	25	
Light power		%	20	

Item1	Item2	Unit	Description
Amount of received light	-	None	Amount of received light in a specified area.
Amount of emitted light		%	Amount of emitted light in a specified area.
Measurement value	TASK1/TASK2/TASK3/TASK4	μm, mm	Measurement value of a specified TASK.
Judgment upper limit value		μm, mm	Judgment upper limit value of a specified TASK.
Judgment lower limit value		μm, mm	Judgment lower limit value of a specified TASK.
Resolution		μm, mm	Resolution of a specified TASK.
Current value	-	mA	Output current value
Voltage value		V	Output voltage value
Absolute distance		μm, mm	Value of distance to a workpiece surface.
Current bank		-	Current bank number

Note

Can change the font size (9 to 40) for each item.
Also can enter comment and change the number of items displayed on each line.

Item	default value	Range
Font size	20	9 to 40
Number of displayed item by one line	2	1 to 5

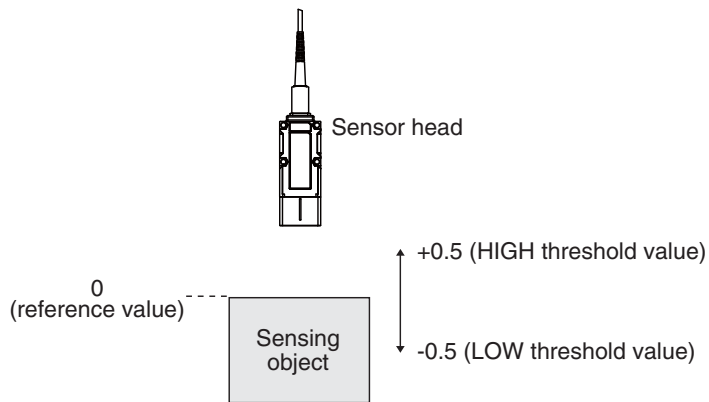
3-4 Perform the Zero Reset

Zero reset

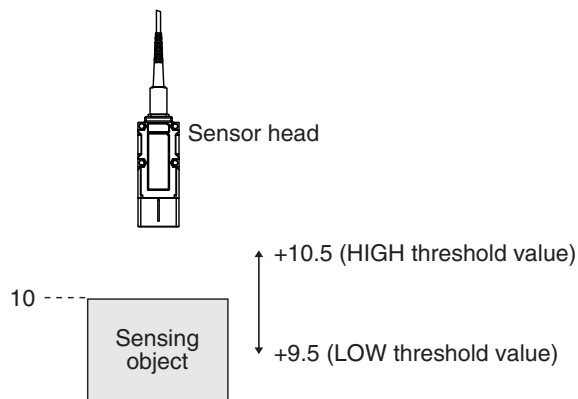
What is Zero Reset?

This function allows resetting the measured value to “0” at any timing during measurement in the RUN mode. The measured value can be displayed and output as a positive or negative deviation (tolerance) from the set reference value “0”.

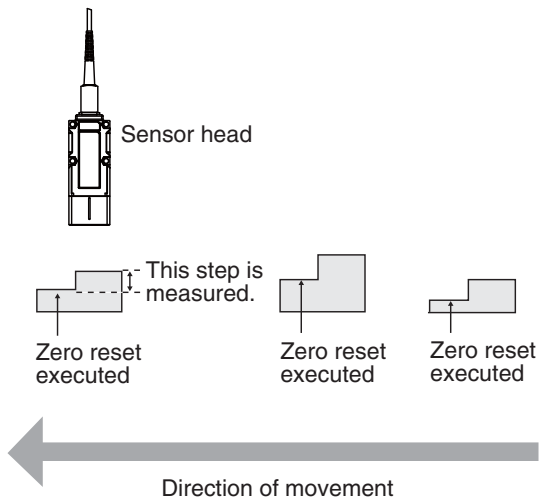
Example 1: Use the height of the sensing object as a reference value and the deviation is the measured value.



Example 2: Use the measured value according to the height of the sensing object (set 10 as an offset value)



Example 3: Measure the level difference of the sensing object (execute zero reset at every measurement)

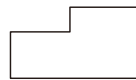


The zero reset function also allows setting the reference value to the hold value for a hold measurement or any value other than zero.

Setting the Zero Reset p.154 p.233

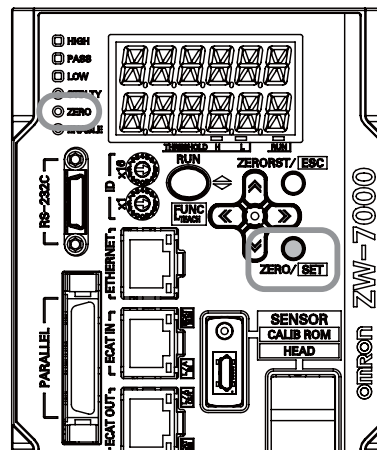
Executing Zero Reset

- 1 Place the reference sensing object in position.




- 2 Press the key.

The ZERO indicator illuminates and the current measured value is registered as 0.




Important


- When a zero reset is executed, the analog output becomes the voltage or current value at the center of the two preset points. Analog output becomes roughly 0 V or 12 mA when focus is not set.

 “2-1 Parallel I/O connection” described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

- The Zero Reset function can also be executed by supplying a ZERO signal to the 32-pole extension connector.

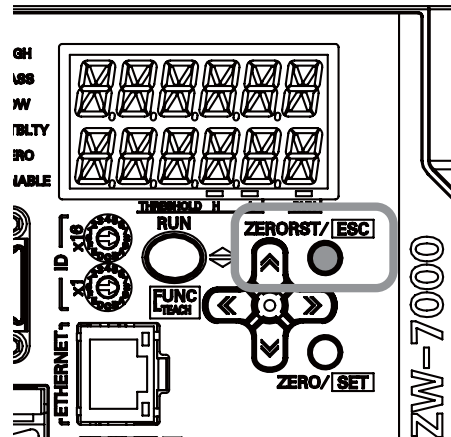
 32-pole extension connector p.69

- The Zero Reset function can also be executed by turning ON the EtherCAT ZERO input signal.

 “3-5 Perform the Zero Reset” described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

Canceling Zero Reset


- 1 Press and hold the  key for two seconds.




Important

- The Zero Reset function can also be executed by supplying a ZERO signal to the 32-pole extension connector.

 32-pole extension connector p.69

 “2-1 Parallel I/O connection” described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

- The canceling Zero Reset function can also be executed by turning ON the EtherCAT ZEROCLR input signal.

 “3-1 EtherCAT Connection” described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

3-5 Displaying measured values in graphs

The measured values can be displayed in graphs.

Important

This function can only be used with project of the displacement sensor (ZW).

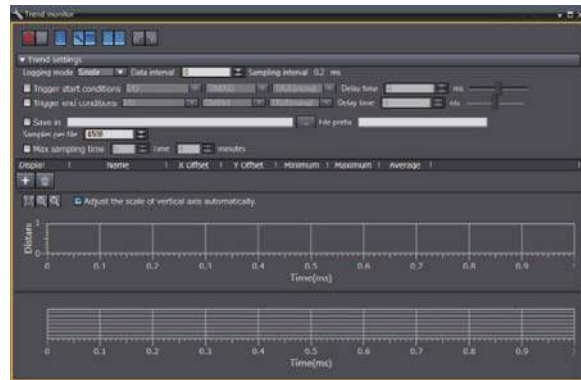
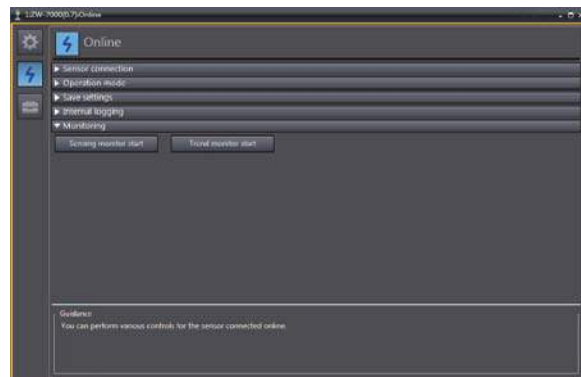
With project of the controller (NJ), you can use the "Data trace" function to display graphs of measured values.

Allowable setting range of sampling interval is 500 μs to 100 ms.

If the sampling interval is short, can miss the measurement value depending on the loaded condition.

- ▶ **Multi View Explore** : [(ZW model name)] (double click)
- **Edit pane** : [Online] icon (⚡)
- **Online setting window** : [Monitoring]-[Trend monitor start]

- 1 **Click [Trend monitor start].**
The Trend Monitor window starts up.



Display	Name	X Offset	Y Offset	Minimum	Maximum	Average
	TASKS	0	0.000000			
	PASS	0	0.000000			

- 2 **Add the data to monitor the trend for.**
Add the data to monitor the trend for to the list.

Click the logging target data display icon ()
to add to the list of data to be logged.

Click the add target icon ()

A new target data line is added.

Note

To delete target data from the list, select the line with the data to be deleted, then click the [Delete].
The maximum number to add the list is 20.

3 Select data to monitor the trend for.

Set data to monitor the trend for.

The types of data that can be set are as follows.

Item	Setting item	Description
Target data	OUT1	Measurement results assigned to OUT1
	OUT2	Measurement results assigned to OUT2
	OUT3	Measurement results assigned to OUT3
	OUT4	Measurement results assigned to OUT4
	TIMING	TIMING input signal (parallel I/O)
	ZERO	ZERO input signal (parallel I/O)
	BUSY	BUSY output signal (parallel I/O)
	ENABLE	ENABLE output signal (parallel I/O)
	HIGH	HIGH output signal (parallel I/O)
	PASS	PASS output signal (parallel I/O)
	LOW	LOW output signal (parallel I/O)
	TASKSTAT	TASKSTAT output signal (parallel I/O)
	LOGGING	LOGGING input signal (parallel I/O)
	LOGSTAT	LOGSTAT output signal (parallel I/O)
	LOGERR	LOGERR output signal (parallel I/O)
	STABILITY	STABILITY output signal (parallel I/O)
RESET	RESET output signal (Parallel I/O)	
BUFFER_ERR	Turns ON when the dropping is occurred. Dropping may be occur depending on the load factor of PC when acquirement of data from ZW-7000 series. If these dropping occurs, increase the arguments of logging.	

4 Set the logging sampling interval.

Set the logging sampling interval for the target data.

Item	Setting item	Range	Description
Sampling setting	Logging sampling interval	0 to 65535	Set the sampling interval for the target data.

5 Click the Start icon () to start the sampling.

When the sampling starts, the sampled data is displayed in the graph.

Note

You can also specify the timing (start trigger, end trigger) for the graph display.

6 Click the End icon () to end the sampling.

When the sampling ends, the graph display stops too.

Specifying the sampling start and end conditions

You can specify the conditions for starting and ending sampling.

1 Check the Trigger start conditions/Trigger end conditions checkbox.



2 Select the trigger condition.

Item	Setting item	Range	Description
Trend setting	Trigger start conditions	I/O	Specify parallel I/O Specify parallel I/O: written the belows, as the trigger condition. Parallel I/O are specified as the trigger condition the following: TIMING, ZERO, BUSY, ENABLE, HIGH, PASS, LOW, TASKSTAT, LOGGING, LOGSTAT, LOGERR, STABILIT as the trigger condition.
		Data slope	Sets the change in the measurement values for OUT1 - OUT4 as the start condition. Sets the trigger level. The time the measurement value rises above this value or falls below it is set as the start condition.
		Data window (In)	Sets the change in the measured values for Out1 to Out4 as the start condition. When the measured value is inside the range, the start trigger is issued.
		Data window (Out)	Sets the change in the measured values for Out1 to Out4 as the start condition. When the measured value is outside the range, the start trigger is issued.
	Trigger end conditions	I/O	Specify parallel I/O (TIMING, ZERO, BUSY, ENABLE, HIGH, PASS, LOW, SYNC/TRIG, SYNCFLG, TASK_ENABLE, LOGGING, LOGSTAT, LOGERR, STABILITY RESET,BUFFER_ERROR) as the trigger condition.
		Data slope	Sets the change in the measurement values for OUT1 - OUT4 as the start condition. Sets the trigger level. The time the measurement value rises above this value or falls below it is set as the start condition.
		Data window (In)	Sets the change in the measured values for Out1 to Out4 as the start condition. When the measured value is in the range, the end trigger is issued.
		Data window (Out)	Sets the change in the measured values for Out1 to Out4 as the start condition. When the measured value is outside the range, the end trigger is issued.
Number of data		The sampling data is counted from when the start condition is met and when the specified number of data points have been sampled, the end trigger is issued.	

3 Select the trigger target.

Item	Setting item	Range	Description
Trigger target	I/O	TIMING	TIMING input signal (parallel I/O)
		ZERO	ZERO input signal (parallel I/O)
		BUSY	BUSY output signal (parallel I/O)
		ENABLE	ENABLE output signal (parallel I/O)
		HIGH	HIGH output signal (parallel I/O)
		PASS	PASS output signal (parallel I/O)
		LOW	LOW output signal (parallel I/O)
		SYNC/TRIG	SYNC input signal (parallel I/O)
		SYNCFLG	SYNCFLG output signal (parallel I/O)
		TASK_ENABLE	TASK_ENABLE output signal (parallel I/O)
		LOGGING	LOGGING input signal (parallel I/O)
		LOGSTAT	LOGSTAT output signal (parallel I/O)
		LOGERR	LOGERR output signal (parallel I/O)
		STABILITY	STABILITY output signal (parallel I/O)
		RESET	RESET output signal (Parallel I/O)
	RESET output signal (Parallel I/O) BUFFER_ERR	Turns ON when the dropping is occurred. Dropping may be occur depending on the load factor of PC when acquirement of data from ZW-7000 series. If these dropping occurs, increase the arguments of logging.	
	Data slope Data window (in) Data window (out)	OUT1	Measurement results assigned to OUT1
OUT2		Measurement results assigned to OUT2	
OUT3		Measurement results assigned to OUT3	
OUT4		Measurement results assigned to OUT4	

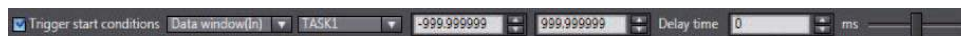
4 Set the trigger condition.

- When the trigger target is “Data slope”



Item	Setting item	Range	Description
Trigger condition	Condition	=	When the measurement results are the same value as the judgment value, the trigger condition is considered to have been met.
		≠	When the measurement results are a different value from the judgment value, the trigger condition is considered to have been met.
		>	When the measurement results are greater than the judgment value, the trigger condition is considered to have been met.
		≥	When the measurement results are greater than or equal to the judgment value, the trigger condition is considered to have been met.
		<	When the measurement results are less than the judgment value, the trigger condition is considered to have been met.
	≤	When the measurement results are less than or equal to the judgment value, the trigger condition is considered to have been met.	
	Judgment	-999.999999 to 999.999999 mm	This is the judgment value for the measurement results.

- When the trigger target is “Data window (In)”



Item	Setting item	Range	Description
Trigger condition	Judgment value 1	-999.999999 to 999.999999 [mm]	When the measurement results are greater than or equal to judgment value 1 and less than or equal to judgment value 2, the trigger condition is considered to have been met.
	Judgment value 2	-999.999999 to 999.999999 [mm]	

- When the trigger target is “Data window (out)”

Item	Setting item	Range	Description
Trigger condition	Judgment value 1	-999.999999 to 999.999999 [mm]	When the measurement results are less than judgment value 1 or greater than judgment value 2, the trigger condition is considered to have been met.
	Judgment value 2	-999.999999 to 999.999999 [mm]	

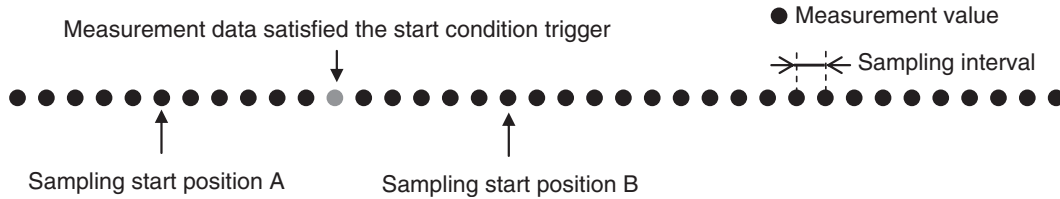
- When the trigger target is “I/O”



Item	Setting item	Range	Description
Trigger condition	Condition	TRUE (rising)	When the I/O signal rises, the trigger condition is considered to have been met.
		False (falling)	When the I/O signal falls, the trigger condition is considered to have been met.

Starting and ending sampling before and after the trigger condition is met

You can adjust how long to start or end the sampling before or after the condition for starting and ending sampling is met.



- **Sampling start position A**
To start sampling before the time when the trigger start condition is met, input a negative value for the delay time.
- **Sampling start position B**
To end sampling after the time when the trigger end condition is met, input a positive value for the delay time.

1 Input the delay time.



Item	Setting item	Range	Description
Trigger condition	Delay time	-9999 to 9999 ms	The sampling starts or ends at the time shifted by the set time from when the trigger condition is met.

Adjusting the scale of the axis in a graph automatically according to the measurement values

For the graph display of measurement values, you can adjust the scale of the vertical axis (distance) in a graph automatically according to the maximum and minimum values of measurement values.

1 Turn ON the [Adjust the scale of the axis automatically] checkbox.

To fix the scale of the vertical axis, turn OFF the checkbox.

2 Click the Start icon () to start the sampling.

When the sampling starts, the sampled data is displayed in the graph.

3-6 Saving measured values in a file

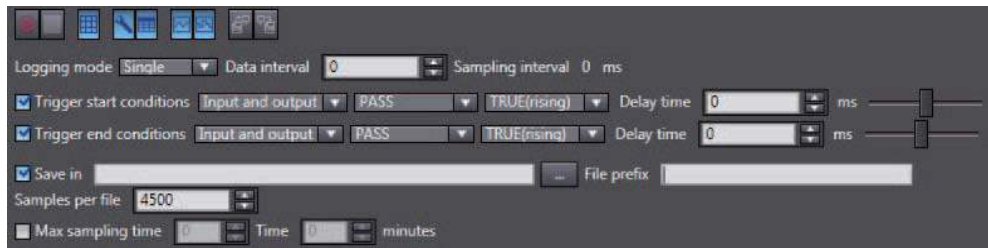
Data sampled with the trend monitor can be exported and imported as a CSV format file.

Outputting the results of sampling as a file

Sampled measured values can be saved as a CSV format file.

A file is prepared each time the trigger condition is met.

- 1 Check the checkbox for the save destination.
- 2 Set the save condition.



Item	Setting item	Range	Description
File settings	Logging mode	Single	When the trigger end condition is met, sampling stops.
		Continuous	Sampling does not stop until you press the End button. Each time the trigger start condition is met, a new file is prepared and saved.
	Logging sampling interval	(500μs/Measuring cycle-1) to (100000μs/Measuring cycle-1)	This sets the interval to save the file. If 1 is set, the file is saved in each cycle.
	Save in	-	This is the folder to save the files in.
	File prefix	-	This is the prefix for the name of the file saved.
	Samples per file	100 to 10000000	This is the number of samples saved in one file. If more samples than this set number are taken, a new file is prepared.
	Max sampling time	0:0 to 24:59	This indicates the upper limit on the interval for saving a file.

Exporting the results of sampling

Sampled measured values can be exported as a CSV format file.

Item	Output items	Description
LoggingMode	Single Continuous	Indicates the sampling mode. Single or continuous
LoggingInterval	0 to 65535	Indicates the sampling interval.
TriggerStart	True False	Indicates whether the trigger start condition is "Enabled" or "Disabled".
TriggerStartType	IO DataSlope DataWindowIn DataWindowOut	Indicates the trigger start condition. IO: I/O result DataSlope: Data slope DataWindowIn: Data window (in) DataWindowOut: Data window (out)

Item	Output items	Description
TriggerStartObject	OUT1 OUT2 OUT3 OUT4 TIMING ZERO BUSY ENABLE HIGH PASS LOW TASKSTAT LOGGING LOGSTAT LOGERR STABILITY RESET BUFFER_ERR	Indicates the target data for the trigger start condition.
TriggerStartConditions	EqualTo NotEqualTo AndMore MoreThan LessThan AndLess True (rising) False (falling)	Indicates the trigger start condition. EqualTo: = NotEqualTo: ≠ AndMore: ≥ MoreThan: > LessThan: < AndLess: ≤ True: Rising False: Falling
TriggerStartValue1	-999.999999 to 999.999999 mm	Indicates the judgment value for the trigger start condition. For data window (in/out), indicates the lower limit.
TriggerStartValue2	-999.999999 to 999.999999 mm	Indicates the judgment value for the trigger start condition. For data window (in/out), indicates the upper limit.
TriggerStartDelay	-999.999999 to 999.999999 mm	Indicates the delay time for the trigger start condition.
TriggerEnd	True False	Indicates whether the trigger end condition is "Enabled" or "Disabled".
TriggerEndType	IO DataSlope DataWindowIn DataWindowOut DataSize	Indicates the trigger end condition. IO: I/O result DataSlope: Data slope DataWindowIn: Data window (in) DataWindowOut: Data window (out) DataSize: Number of data points
TriggerEndObject	OUT1 OUT2 OUT3 OUT4 TIMING ZERO BUSY ENABLE HIGH PASS LOW TASKSTAT LOGGING LOGSTAT LOGERR STABILITY RESET BUFFER_ERR	Indicates the target data for the trigger end condition.
TriggerEndConditions	EqualTo NotEqualTo AndMore MoreThan LessThan AndLess True (rising) False (falling)	Indicates the trigger end condition. EqualTo: = NotEqualTo: ≠ AndMore: ≥ MoreThan: > LessThan: < AndLess: ≤ True: Rising False: Falling
TriggerEndValue1	-999.999999 to 999.999999 mm	Indicates the judgment value for the trigger end condition. For data window (in/out), indicates the lower limit.

Item	Output items	Description
TriggerEndValue2	-999.999999 to 999.999999 mm	Indicates the judgment value for the trigger end condition. For data window (in/out), indicates the upper limit.
TriggerEndDelay	-999.999999 to 999.999999 mm	Indicates the delay time for the trigger end condition.
DataPointsvalue	1 to 2147483647	Indicates the data number of Trigger end condition.
ExternalFileStorage	Output destination of file.	Indicates the save destination of file (absolute path).
MaxSamplesPerFile	1 to 999999999	Indicates the number of samples in one file.
TargetDirectory		Indicates where the file is stored.
FilePrefix		Indicates the prefix.


- ▶ **Multi view Explore** : [(ZW model name)] (double click)
- **Edit pane** : [Online] icon (⚡)
- **Online setting window** : [Monitoring]-[Trend monitor start]

1 Select [Trend Monitor].

The Trend Monitor window starts up.

2 Execute the sampling.

Note

 "2-1 Parallel I/O connection" described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings (Z363)

3 After sampling execution, click the export icon (📄).

4 Set the name of the export file.

The data is output in the following format.


LoggingMode	Single
LoggingInterval	3600
TriggerStart	True
TriggerStartType	DataSlope
TriggerStartObject	OUT1
TriggerStartConditions	EqualTo
TriggerStartValue1	1.1
TriggerStartValue2	
TriggerStartDelay	0
TriggerEnd	True
TriggerEndType	DataWindowIn
TriggerEndObject	OUT1
TriggerEndConditions	
TriggerEndValue1	-0.5
TriggerEndValue2	0.5
TriggerEndDelay	0
DataPointsValue	0
ExternalFileStorage	FALSE

MaxSamplesPerFile	4500
TargetDirectory	C:\Omron\Data\DataTrace\
FilePrefix	

Index	(DataName1)	(DataName2)
1	1.21314	1.21314
2	1.22098	1.22098
3	0.12334	0.12334
4	-0.1211	-0.1211
5	-1.23456	-1.23456
6	-1.22222	-1.22222

3-7 Displaying saved measured values


You can import a file to which measured values were exported and display those sampling results as a graph.

- ▶ **Multi view Explore** : [(ZW model name)] (double click)
- **Edit pane** : [Online] icon ()
- **Online setting window** : [Monitoring]-[Trend monitor start]

- 1 Select [Trend monitor start].**
The Trend Monitor window starts up.
- 2 Click the import icon ()**.
- 3 Select the file to import.**
The file is imported and a graph displayed.

Note

The file of measurement values that are obtained from the internal logging function can be imported as well.

 3-8 Performing internal logging p.106

3-8 Performing internal logging

Up to 2000000 data of measurement values can be logged in the Sensor Controller's internal memory. Internal logging can be started or ended using Sysmac Studio, parallel I/O, or non-procedural communications commands.

The operating procedures for each method are shown below.

Function	Sysmac Studio	Parallel I/O	Non-procedural communications commands
Specify start timing	Press the "Logging Start" button.	LOGGING input ON	Send LS command
Specify end timing	Stops automatically after the specified number of logging data has been saved.	LOGGING input OFF	Send LE command
Output logging data	Press the "Save to file (Sensor → PC)" button.	Send LO/LG command	Send LO/LG command
Clear logging data	Cleared automatically after the "Logging Start" button is pressed.	Send LC command	Send LC command

The settings that can be enabled for each method are shown below.

Function	Sysmac Studio	Parallel I/O	Non-procedural communications commands
Overwrite mode	OFF	ON/OFF	ON/OFF
Label insert mode	OFF	ON/OFF	ON/OFF
Output data format	ASCII	ASCII/Binary	ASCII/Binary

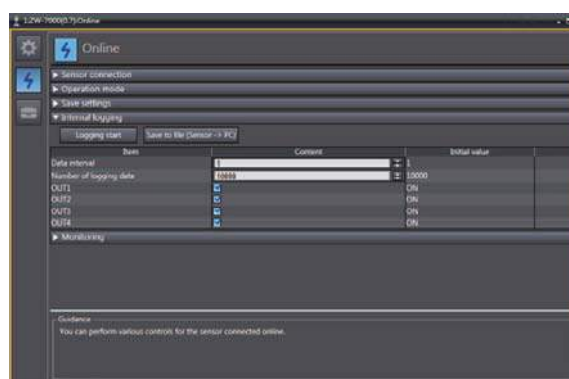
Internal logging by Sysmac Studio

Data logging conditions and logging start/end timing can be set with Sysmac Studio.

- ▶ **Multi view Explore** : [(ZW model name)] (double click)
 - **Edit pane** : [Online] icon (🔌)
 - **Online setting window** : [Internal Logging]

1 Set the logging conditions.

Enter the [Data interval], [Number of logging data], and select the stored output data.



Item	Setting item	Range	Description
Data logging conditions	Data interval	1 to 1000	Set the data storage interval. If "1" is set, all measured data is stored, and "2" is set, one measurement value is stored every two measurement. If 0 is set, data is saved only when the hold value is applied.
	Number of logging data	1 to 2000000	Set the number of data to store for the data that is assigned to each OUT.
	OUT1	OFF/ON	Set whether to store the measurement results for OUT1.
	OUT2	OFF/ON	Set whether to store the measurement results for OUT2.
	OUT3	OFF/ON	Set whether to store the measurement results for OUT3.
	OUT4	OFF/ON	Set whether to store the measurement results for OUT4.


2 Click the [Logging start] button to start internal logging.

A confirmation message is displayed. Click [Yes] to start internal logging.

When the label insert mode is OFF, the internal logging data is automatically cleared before internal logging is started.

Once internal logging starts, another internal logging cannot be started until it ends.

Note

- Starting internal logging can also be executed by No-protocol communications or parallel I/O.
- For assigning of OUT1 to OUT4, refer to the following:
 "2-1 Parallel I/O connection" described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings (Z363).

3 After internal logging ends, click the [Save to file (Sensor → PC)] to output the data to a file.

A CSV format file in the following format is output. Unit of each output values are the following:

Measure value: nm

Amount of emitted light: 0.01% (0.01 to 100.00%)

Amount of received light: Luminance level (0 to 4095)

LoggingMode	Internal			
SamplePeriod	1			
SamplingCycleTime	0.2			
Index	OUT1	OUT2	OUT3	OUT4
0	-1938	2823	9437	-2147483648
1	-1939	2764	9401	-2147483648
2	-1940	2773	9355	-2147483648
3	-1940	2807	9523	-2147483648
4	-1941	2794	9442	-2147483648
5	-1941	2817	9497	-2147483648

Even when the label insert mode is ON, the label data is not output.

Performing Internal Logging with Parallel I/O

The logging start and end timings can be specified using LOGGING input signals from parallel I/O. When doing so, follow the procedure below to set the data logging conditions.

- ▶ **Multi view Explore** : [System] (double-click)
- **Edit pane** : [Sensor Settings] icon 
- **Sensor settings window** : [Internal logging setting]

1 Set the logging conditions for internal logging.

There are three settings: Number of logging, number of logging decimation, and overwrite mode.

Item	Setting item	Setting value	Description
Internal logging setting	Number of logging data	0 to 2000000 (default value: 100000)	Set the number of data to save for each internal logging output data.
	Internal logging settings	0 to 1000 (default value: 1)	Set the interval of saving internal logging data. If 1 is set, all data is saved. If 2 is set, one measured data is saved every two measurements. If 0 is set, data is saved only when the hold value is applied.
	Overwrite mode	OFF (default value)/ON	Set whether to make the internal logging mode run in overwrite mode. Sets the operation to be performed when the logging count exceeds the set number of logging data. OFF: Internal logging is stopped. ON: The oldest logging data is overwritten.
	Label insert mode	OFF (default value)/ON	Set the operation to be performed when logging input is turned on. OFF: No operation. ON: When logging input is turned on, inserts label into logging data.

LOGERR signal is turned ON at the following cases:

- Overwrite mode is OFF
- 2,000,000 items have already logged in the internal memory at the beginning of logging.

When continue to logging regardless number of logging while LOGGING input signal is turned ON, set as below:

- Number of logging data: 0
- Overwrite mode: ON

When the number of loggings reaches 2,000,000, past logging data is overwritten and logging continues on the latest data.

2 Set the output conditions of internal logging data.

Set the conditions for the external output using the non-procedural command LO.

Item	Setting item	Setting value	Description
Internal logging setting	Output data format	ASCII (default value)/ Binary	Select the output format for outputting internal logging data.

Note

For the response format of LO commands according to the output data format, refer to following page.



“5-1 Connecting by No-protocol Communications” described in Displacement Sensor ZW-7000/5000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

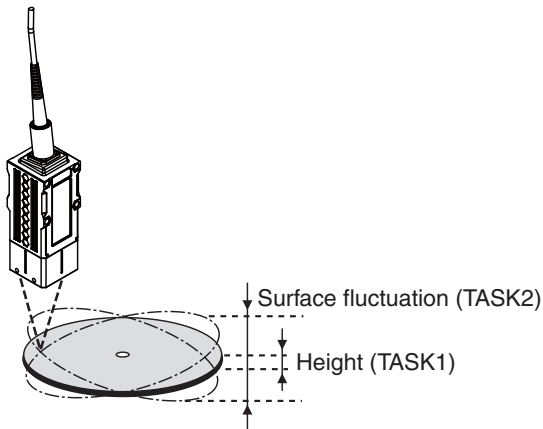
3-9 Bank switching

Multi-task and Bank Data

Multi-task Function

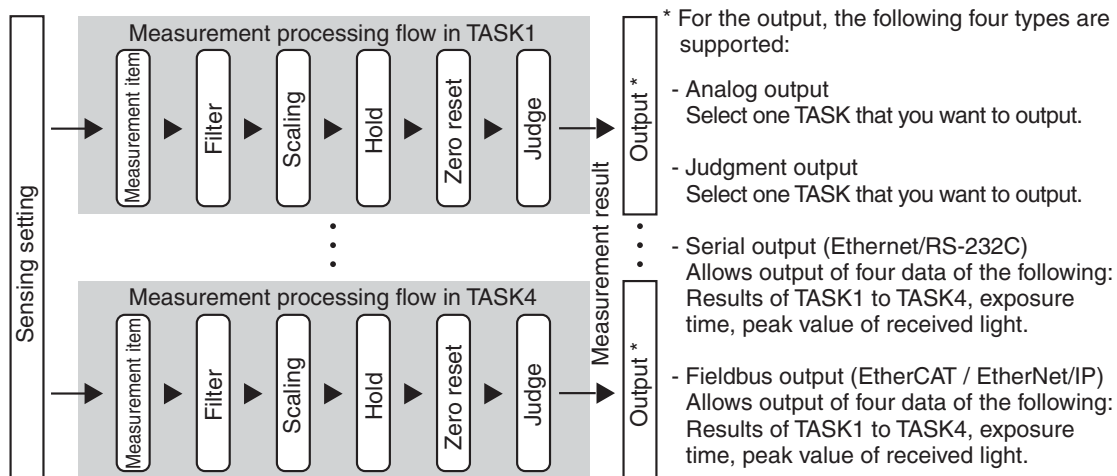
With the ZW-7000/5000 Series, you can set multiple measurement processing for one sensing setting. This measurement processing is called a “task (TASK).”

Example: When measuring height and side run-out at the same time



For tasks, TASK1 to TASK4 are available for registration.

You can measure and judge up to four characteristic points simultaneously because you can specify the desired measurement items such as height, thickness, and calculation for each task.

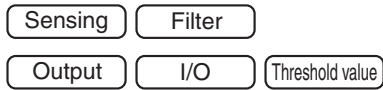


Bank Data

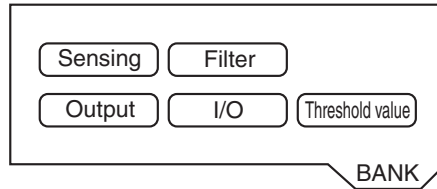
ZW-7000/5000 Series can hold up to eight sets of sensing settings, which are called “bank (BANK)”. When the setup is changed, the bank can be switched externally.

What is Bank?

The sensing settings for measurement

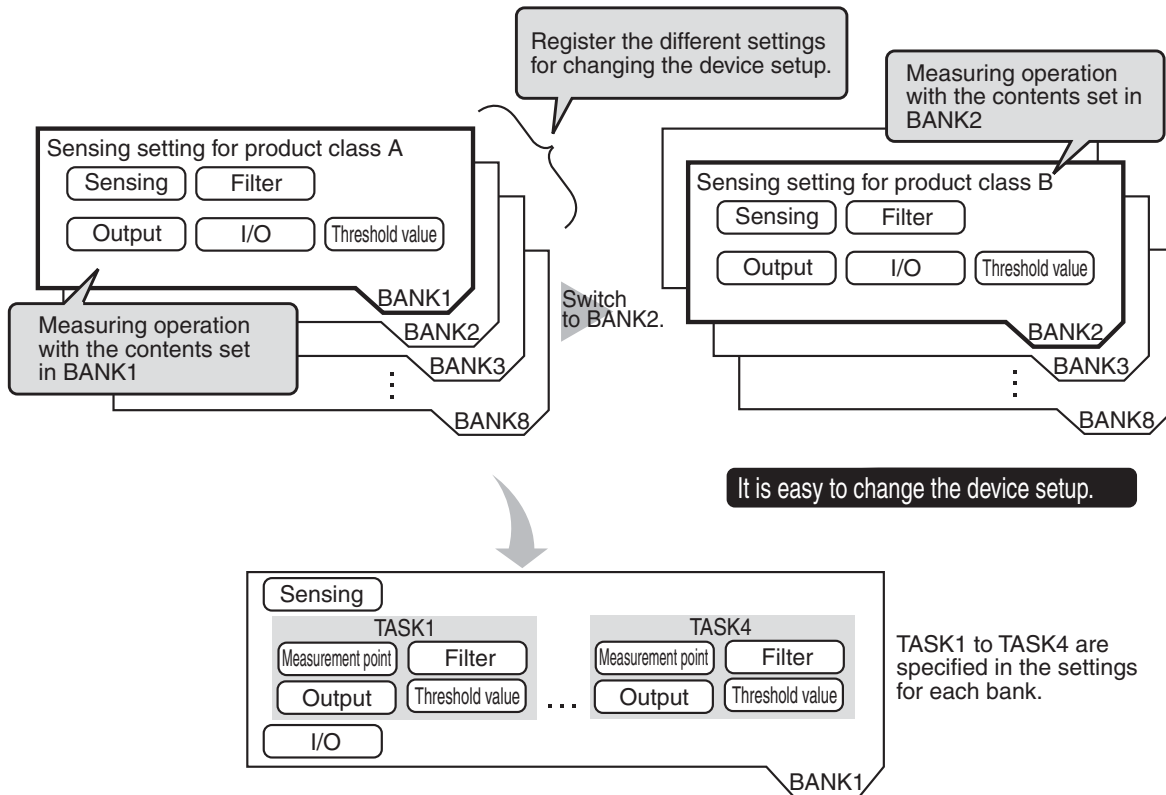


are held as one bank.



Example of switching bank for settings

If you register settings of various classes,



Important

- If you want to register multiple bank data having the same values set except for “threshold values (judgment values)”, by changing the mode of the bank, you can increase the number of banks from 8 to 32.

Setting the Bank Mode p.170

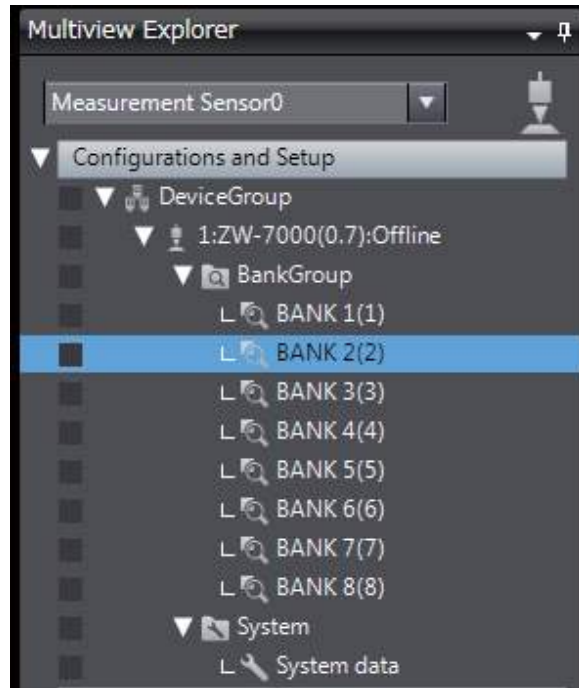
- The “output destination” (current output value/voltage output value) in the I/O setting parameters is set the same for all banks. The output destination cannot be set separately for individual banks.

“2-1 Parallel I/O connection” described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User’s Manual for Communications Settings (Z363)

Switching Banks

Switches banks.

- 1 Double click to open the bank group in the Multi View Explore.**
- 2 Select the bank data to switch and double click or right click it to select the Edit menu.**
The bank in the Bank data edit pane that is active on the Edit pane becomes the current bank.




Important

You can also switch the bank by entering the non-procedural command.

-  "5-1 Connecting by No-protocol Communications" described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings (Z363)

Note

Switching Banks can also be set by the operating keys on the Sensor Controller.

-  Switching Banks p.237

3-10 Operating with Sensor Controller

Other than using PC tools, ZW-7000 Series can also be operated using the operation keys on the Sensor Controller.

For details on how to operate with operation keys, see 7. Sensor controller operations.

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