



The Suruga OptGauge

User's Manual

H651 version

Thank you for choosing our Products.

Before using the Products, read this manual thoroughly.

After reading this manual, please keep it close for your immediate future reference.

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1 Introduction

This document is the user's manual for the companion software, "Suruga OptGauge", with the measuring

This "User's Manual" (thereafter, "this Manual") provides the information and basic operation methods for the "Suruga OptGauge."

To operate the Products effectively and safely, please read this Manual carefully and fully understand its contents before using the Products.

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The Suruga OptGauge User's manual

Issue Date	2025 September
Guide Version	V.1.1.0

Revision History

Date	Revision	Details
2024 January	V.1.0.0	1 st Version
2025 July	V.1.0.1	Installation PC System Requirements: <ul style="list-style-type: none">- Remove "Pro"- Add Windows 11 version- Add note stating it may not function correctly depending on version Symptoms and Solutions: Add details of issues where it may not function correctly depending on the Windows version and their countermeasures
2025 September	V.1.1.0	Add function: <ul style="list-style-type: none">• 1/e2, Orientation, Line Position Add functions for H651: <ul style="list-style-type: none">• LD output value setting• LD output setting for use with auto-dimming• External trigger mode



NOTICE

All information contained in this Manual is deemed correct at the time of publication.

The SURUGA SEIKI Co. Ltd. (thereafter, “the SURUGA”) reserves the right to change specifications without notice the users of the Product.

For the latest version of this Manual and the Software, you can obtain by downloading them from our website (<http://jpn.surugaseiki.com/>) or (<https://eng.surugaseiki.com/>).

1.1 Warning labels addressed in this Manual

 Warning	Serious damage, data loss, or unsafe conditions may occur.
 Careful	Unstable or unexpected results, but not fatal, may occur in the software operations.
Attention	Points users may overlook and important notes about specification limitations. Information that won't cause danger or trouble but knowing it will make operation smoother.

1.2 Overview of Suruga OptGauge

The Suruga OptGauge is the application software that you can configure parameters and monitor measurement results with the measuring instruments. You can configure parameters and monitor measurement results from the supported measuring instrument connected to a computer.

■ Functions and Features

This section describes the notable features of the Suruga OptGauge.

- Monitoring functions for measurement results
You can acquire measurement results from the supported instrument. Measurement results can be obtained in a .csv file or others.
Ex.: For the H420 Series, they are angle and divergence measurements
- Monitoring functions for the waveform of a received light.
The sensor camera detects and monitors the waveform of a light beam.
- Parameter settings
You may configure operational settings for the sensor cameras to fully detect a light beam and/or configure criteria for a pass/fail test. Multiple sets of parameter settings can be saved. You may select one for a measuring target and another, and restore it again.
Ex. : exposure time, noise threshold value and averaging out of a light beam
- Acquiring measurement results with external devices and setting parameters for them.
You can acquire measurement results or configure parameters with commands from two computers via the RS232C and/or TCP/IP communications

- Other convenient functions

You may utilize the functions such as the "Origin Offset" parameter that specifies the reference positions of a monitoring waveform or the "Automatic Brightness" control that enables automatic brightness according to your specified range of luminance of a detected light beam or the save function that you can store the image of an acquired waveform.

1.3 Software - Installation of the Suruga OptGauge



If downgrading of the Software, setting information added to a newer version may not be correctly loaded. If downgrading to an earlier version of the Software, it would not read correctly the settings only available to the newer versions so that the software would not even start up.

Therefore, please be advised to back up the folder with your option files being stored, to delete the original option file folder and then to re-installing an earlier version.

[Folder Path]

C:/Users/[*UserName*]/Documents/Suruga/OptGauge/[*Product Serial No.*]

1.3.1 Software License

To use the Suruga OptGauge (hereafter as "the Software"), the customer must consent to the following software license agreement (hereafter as "this agreement").

When installing or copying all or part of the Software on a computer, or using the Software after installation, it is considered that the customer has consented to all terms of this agreement, and the agreement is bilaterally concluded.

Article 1 (Permissions)

The Software is free of charge.

The copyright for the Software, its manual, and other documents concerning the Software belong to SURUGA SEIKI Co., Ltd. (hereafter as "the SURUGA").

The SURUGA grants all users for non-proprietary rights to the use of the Software.

Article 2 (Usage Restrictions)

The SURUGA permits the use of the Software only for the purposes of operating the Products and collecting data.

The SURUGA prohibits the use of the Software for any other purposes than that the SURUGA intended.

Article 3 (Reproduction and Modification)

The Software can be copied only to the computers using the Products. The SURUGA prohibits modification, redistribution, and reverse engineering.

Article 4 (Disclaimers)

Users make the use of the Software on their own responsibility.

The SURUGA bears no responsibility and is not liable for any direct, indirect, incidental, special, supervenient, or punitive damage including but not limited to; data loss, business interruptions, and loss of profit, incurred arising out of or failure to use the Software.

In addition, The SURUGA bears no responsibility and is not liable for any damage incurred arising out of software bugs, errors, viruses, malfunctions due to illicit third-party access, or security issues with the Software.

The SURUGA holds no responsibility and is not liable to damages incurred upon modification of the Software.

Article 5 (Support)

The SURUGA provides technical support for the Software. However, there is no guarantee that our technical support will achieve the customer's purpose.

Article 6 (Termination of Agreement)

The right to use the Software will be, immediately, terminated upon violation of the conditions of this agreement.

1.3.2 Installation PC System Requirements

[Recommended System Requirements]*¹

Hardware Requirements	Supported OS	Windows 11 64-bit, Version 24H2 or later* ⁴
	CPU	Intel Core i5 - 1345U CPU 1.6 GHz or higher 10-core 12-thread
	RAM	16GB or higher
	Storage capacity	1GB or higher
	Display resolution	1920 x 1080
	USB	USB3.0 (type A) port: 2 or more
Software Requirements	Framework	.NET8.0* ³

[Minimum System Requirements]*²

Hardware Requirements	Supported OS	Windows 10 Pro 64bit, Windows 11 64-bit, Version 24H2 or later* ⁴
	CPU	Intel Core i5 - 8265U CPU 1.6GHz 4-core 8-thread
	RAM	8GB or higher
	Storage capacity	1GB or higher
	Display resolution	1920 x 1080
	USB	USB3.0 (type A) port: 2 or more
Software Requirements	Framework	.NET8.0* ³

*1 “Recommended System Requirements” refers to a level where waiting times are minimal and operation is comfortable.

*2 “Minimum System Requirements” refers to a level where the software can start and perform basic functions.

*3 If .NET8.0 is not installed on your computer, install “.NET Desktop Runtime 8.x.x.” from the Microsoft website

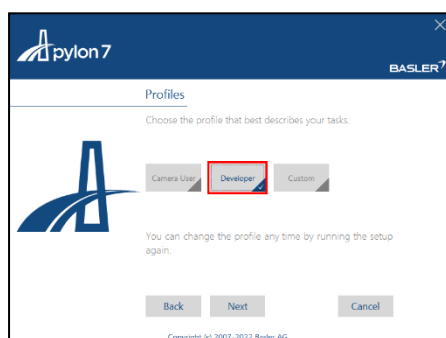
*4 we acknowledge that this software may not operate properly on Windows 11 Version 23H2 due to differences in certain system components and operating specifications. Please update to the latest Windows version (24H2 or later).

1.3.3 Installation of the USB Device Driver

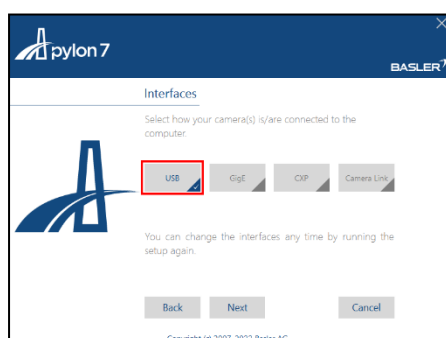
1. Double-click the "... ¥Driver" "Basler_pylon_7.0.0.24651.exe" to begin installation.



2. Consent to your installation on the confirmation screen.
3. Set the installation method (Profiles) to "Developer".



4. Set the sensor camera connection method (Interfaces) to "USB." Thereafter, use the default settings to complete the installation.



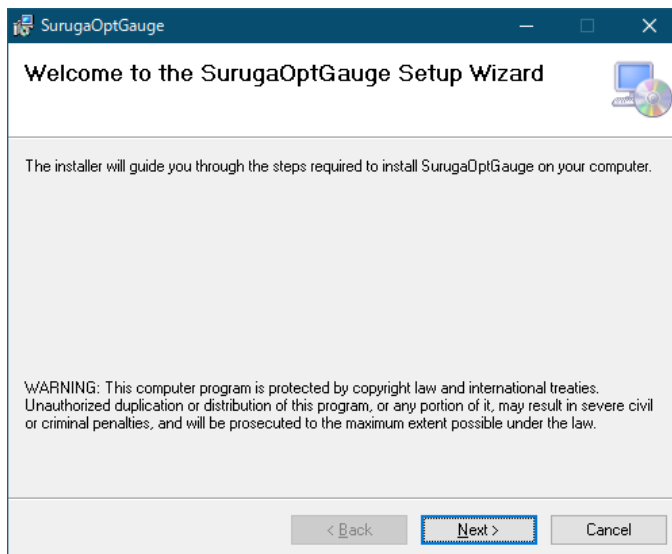
1.3.4 Installation of the Suruga OptGauge

Install the Software, the Suruga OptGauge .

1. Double-click "SurugaOptGaugeSetup_x.x.xx.msi" in the directory "... ¥Application".

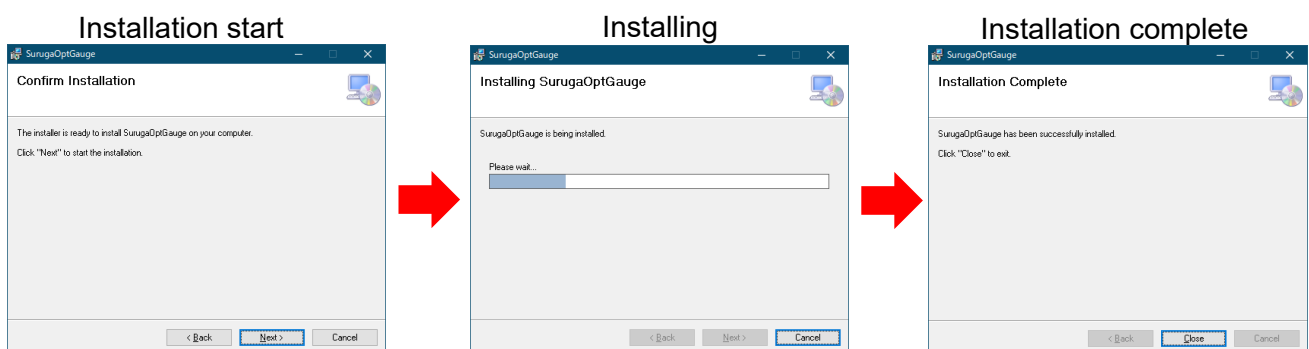
名前	更新日時	種類	サイズ
 SurugaOptGaugeSetup_x.x.x.msi	2023/11/28 19:12	Windows インストー...	61,590 KB

2. Click "Next>".



Click "Next>" to begin installation.

When installation is complete, click "Close".



3. The Suruga OptGauge will be created on the desktop. The installation is complete.



1.3.5 Copying the Device Authentication File

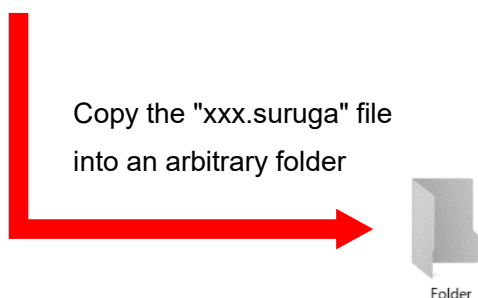
Attention

About Authentication File

For the Products, calibration values are set for each unit. Therefore, the Suruga OptGauge requires reading of a device authentication file (dot suruga extension) in which the unique information of individual device is stored.

To load the device authentication file into the installed Suruga OptGauge, copy the file "xxx.suruga" in the "... /AuthenticationFile" to an arbitrary file location.

名前	更新日時	種類	サイズ
xxx.suruga	2023/09/28 10:55	SURUGA ファイル	6 KB



Note:

If your security does not allow you to copy the device authentication file into your PC, this procedure is not necessary because the file can be read directly from the USB memory stick provided included in the Products.

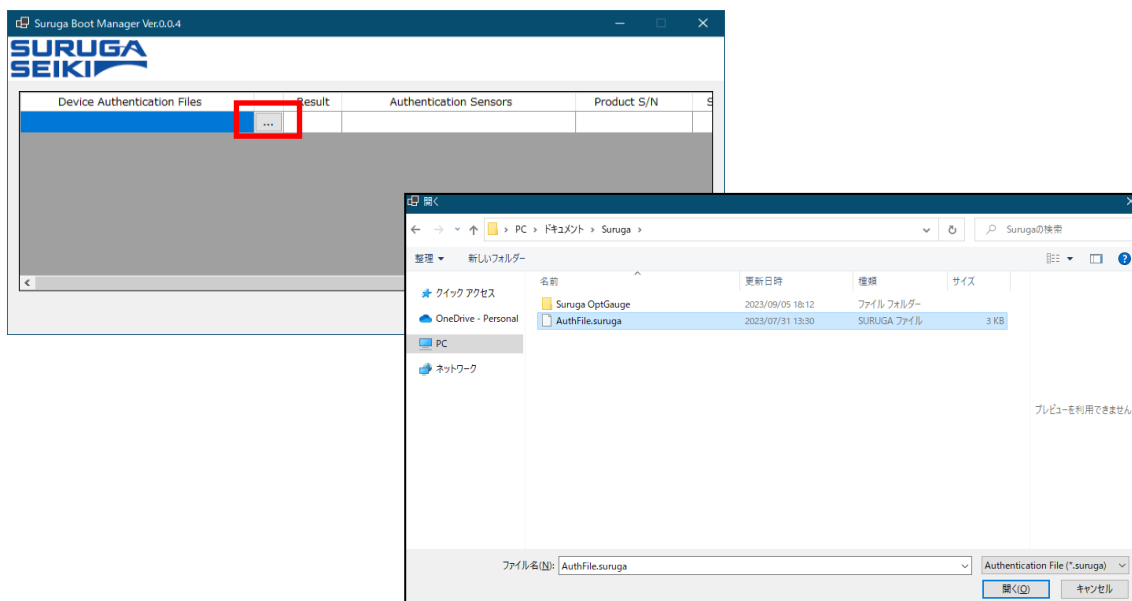
1.3.6 Starting Up and Closing the Suruga OptGauge

1. Double-click the "SurugaOptGauge" in the "...¥Desktop".

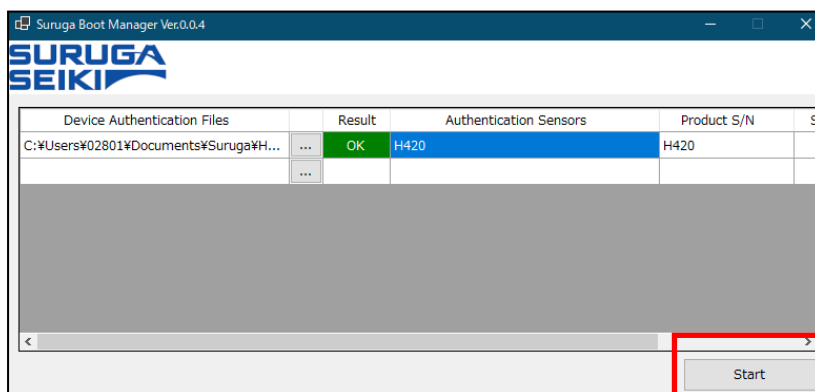


2. Click on "..." in the item "Device Authentication File" and select the extension ".suruga" in the folder in which the unique "Device Authentication File" was copied.

If not able to copy the device authentication file to your computer, select it directly from the USB memory stick.



3. Confirm that the "Result" is "OK" and click "Start".



Attention

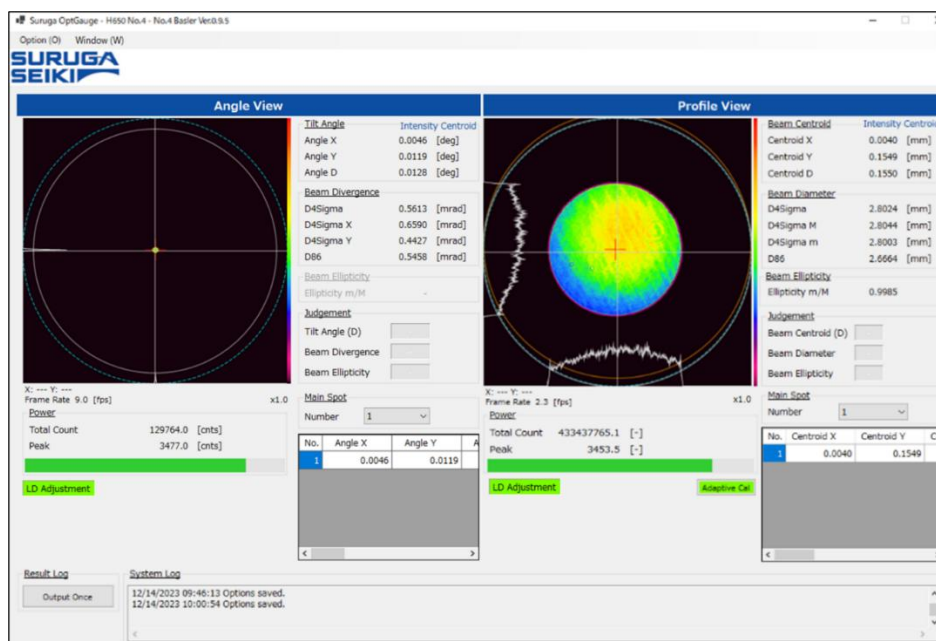
The Software incorporates TCP/IP communication control. Therefore, depending on your PC's security settings, the following warning may appear upon initial startup.

If your computer and network environment allow the TCP/IP communication permission, check all, and click "Allow access". If not, click "Cancel".

(Changes can be made after the fact in "Control Panel / All Control Panel Items / Windows Defender Firewall / Allowed Apps").

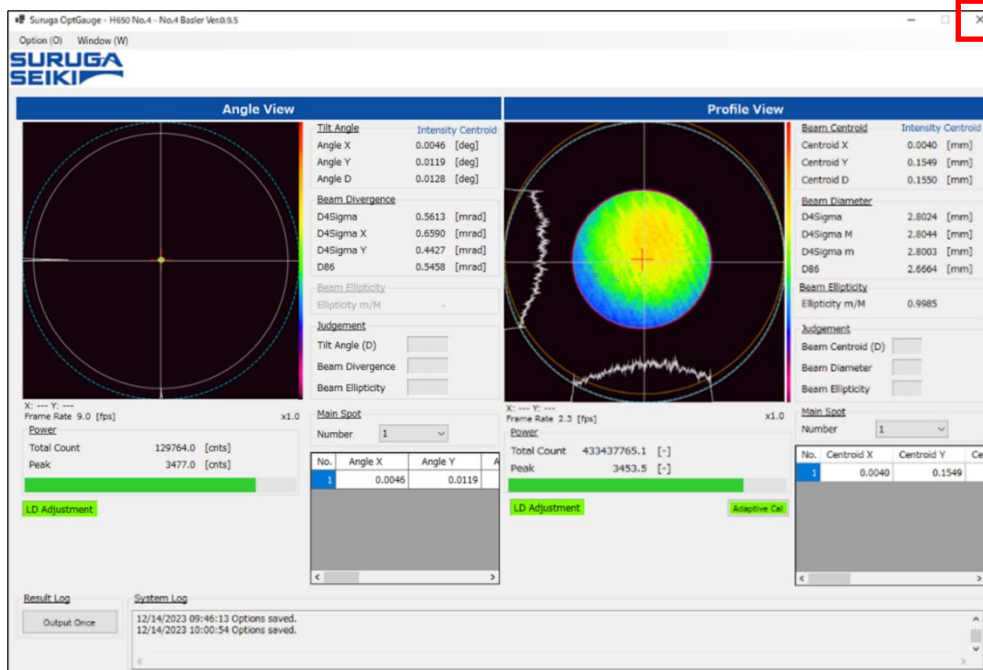


4. The application starts up.



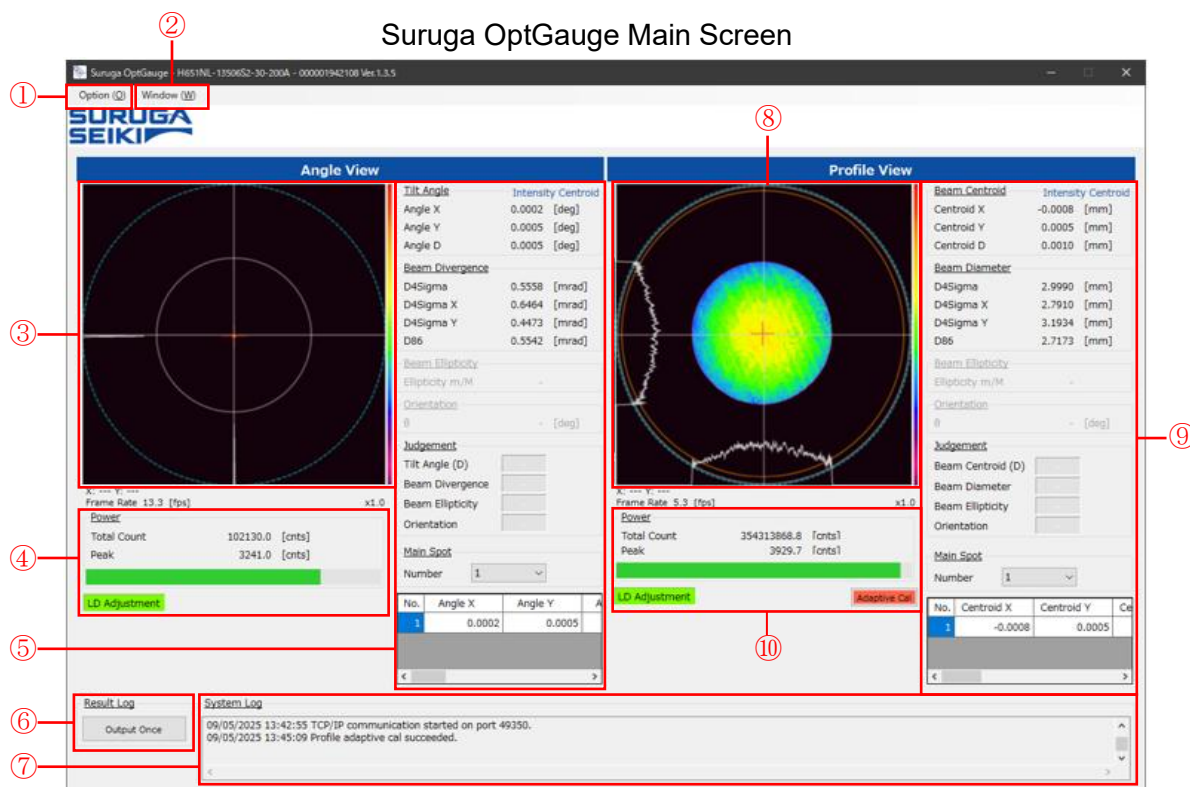
Closing the Suruga OptGauge

1. Click the "x" button to shut down the Suruga OptGauge.



2 Settings

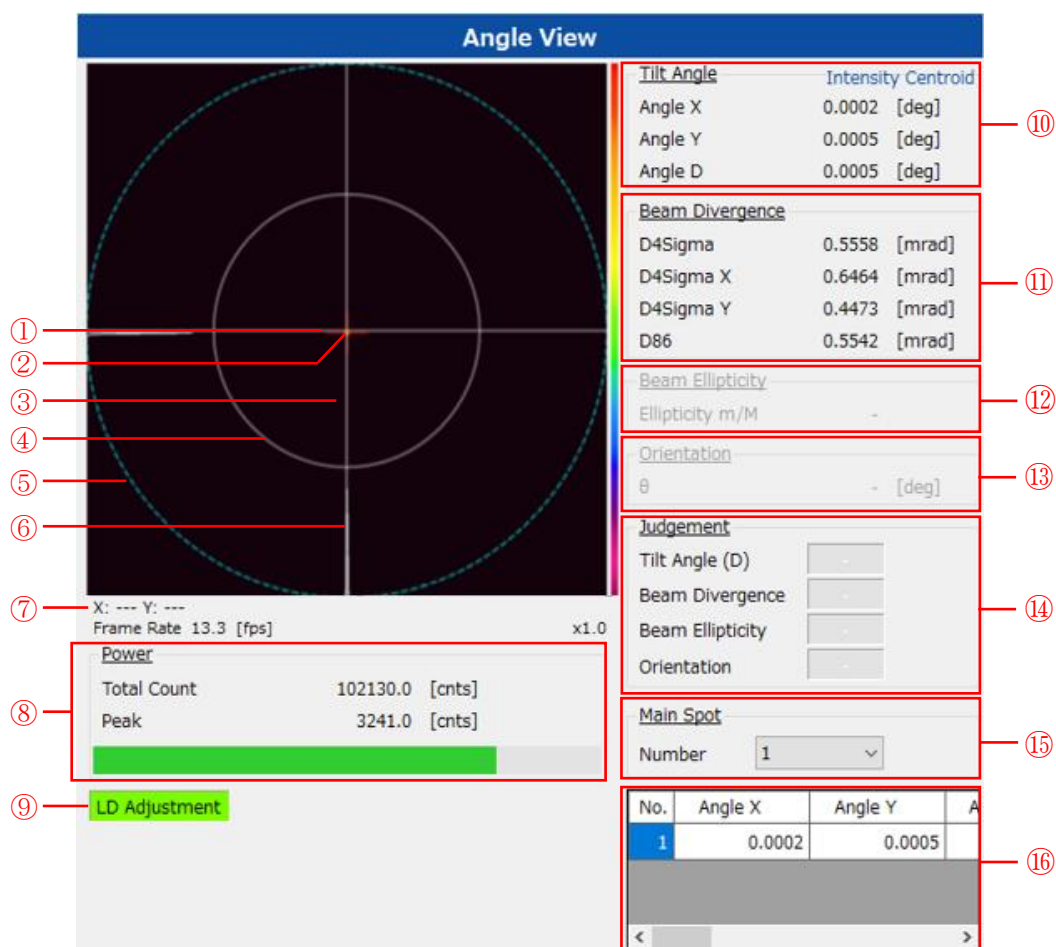
2.1 1Names and Functions in the Suruga OptGauge Software Main Screen









① Option	Opens the option dialog box
② Window	Opens the device authentication dialog box
③ Angle View	Display area for an image taken by the angle sensor camera section
④ Angle Power	Display area for beam strength measured by the angle sensor camera section
⑤ Angle Measurement Results Display	Angle measurement results display area
⑥ Result Log	Outputs measurement results and measurement images to the designated folder on the computer
⑦ System Log	Display area for the Suruga OptGauge operation log
⑧ Profile View	Display area for an image taken by the profile sensor camera section
⑨ Profile Measurement Results Display	Profile measurement results display area
⑩ Profile Power	Display area for beam strength measured by the profile sensor camera section

2.1.1 The Suruga OptGauge Main Screen Details

2.1.1.1 Angle View

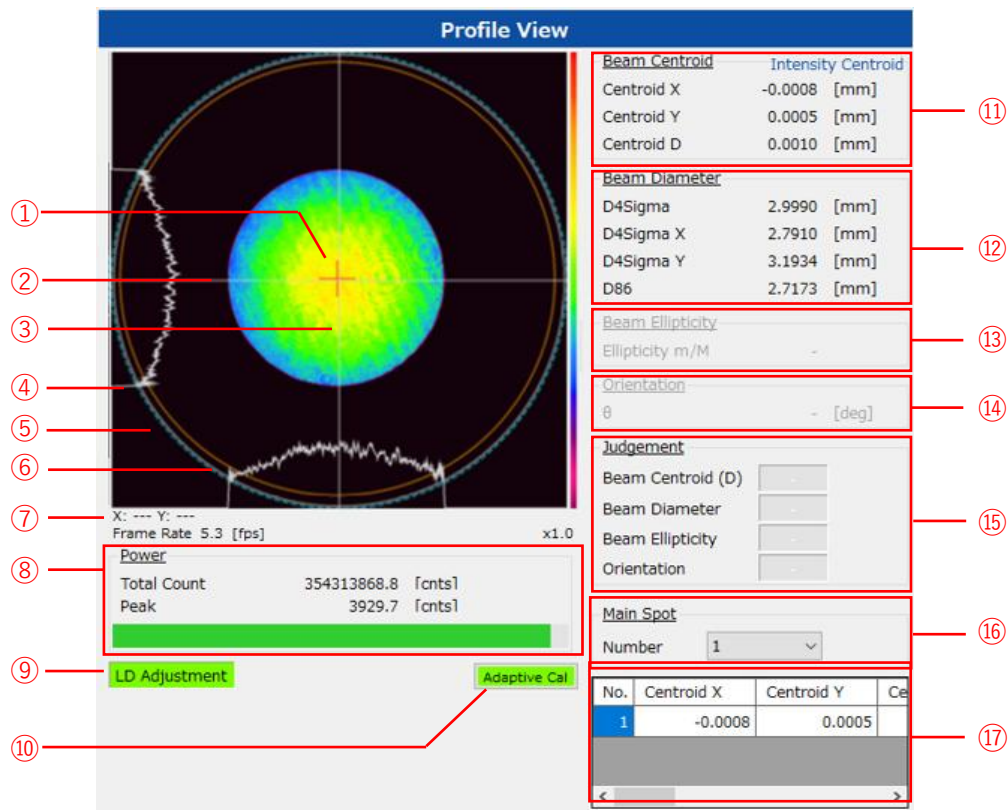








① Cross (red)		Displays the position of the light beam centroid.
② Auto Aperture (orange)		Displays the aperture if the Auto Aperture settings are enabled
③ Cross (white)		Displays the center position of the coordinate
④ Aperture (white)		Displays the range of angle measurement
⑤ ROI (blue)		Displays the aperture if the ROI settings are enabled
⑥ Profile		Displays the strength distribution of the light beam

⑦ XY Coordinates	Displays the coordinates where the mouse cursor points at	
Frame Rate	Displays the image refresh rate per second from image data acquisition to completion of measurement data calculation	
⑧ Power	Total Count	Displays the beam total count by the value from 0 to 4,429,152,000.
	Peak	Displays the maximum light beam luminance by the value from 0 to 4095. If the value is below the Peak value set in the " Judgement Settings ", the indicator turns green (OK), otherwise, it turns red (NG).
⑨ LD Adjustment	Displays the status of the dimming function (Green = Pass, Yellow = Under adjusting and Red = Fail)	
⑩ Tilt Angle	Angle X	Displays the angle X from the X-axis component of the cross (white)
	Angle Y	Displays the angle Y from the Y-axis component of the cross (white)
	Angle D	Displays the angle from the center of the cross (white)
⑪ Beam Divergence	The " Orientation " in the Option Settings is enabled, it alters the measurement mode	
	If the "D4Sigma" is selected at the beam divergence " Type " configuration in the Option Settings, it displays following.	
	D4Sigma	Displays the beam divergence by $D4\sigma$ of half angle
	D4Sigma X(M)	Displays the beam divergence by $D4\sigma$ X(M) of half angle
	D4Sigma Y(m)	Displays the beam divergence by $D4\sigma$ Y(m) of half angle
	If the "1/e^2" is selected at the beam divergence " Type " configuration in the Option Settings, it displays following.	
	1/e^2	Displays the beam divergence by $1/e^2$ of half angle
	1/e^2 X (M)	Displays the beam divergence by $1/e^2$ X(M) of half angle
	1/e^2 Y (m)	Displays the beam divergence by $1/e^2$ Y(m) of half angle
	D86	Displays the beam divergence by D86 of half

		angle.
⑫ Beam Ellipticity	Operates while the " Orientation " in the Option Settings is enabled	
	Ellipticity m/M	Displays the light beam width by $D4\sigma$ or $1/e^2$
⑬ Orientation	Operates if the " Orientation " in the Option Settings is enabled	
	θ	Displays the rotation angle of the light beam
⑭ Judgement	Operates while the measurement data to evaluate, at the " Judgement Settings " in the Option Settings, are checked, <input checked="" type="checkbox"/> , thereafter, you specify evaluation criteria for <input type="text" value="0.0000"/> .	
	Tilt Angle (D)	Displays "OK" if the configured evaluation criteria are satisfied or "NG" if not satisfied.
	Beam Divergence	
	Beam Ellipticity	
	Orientation	
⑮ Main Spot	Number	Specify the beam spots to display measurement results while measuring multiple beams.
⑯ Multi Spot Measurement Display	When multiple beams are detected, the measurement results for each beam spot are automatically listed and displayed	

2.1.1.2 Profile View

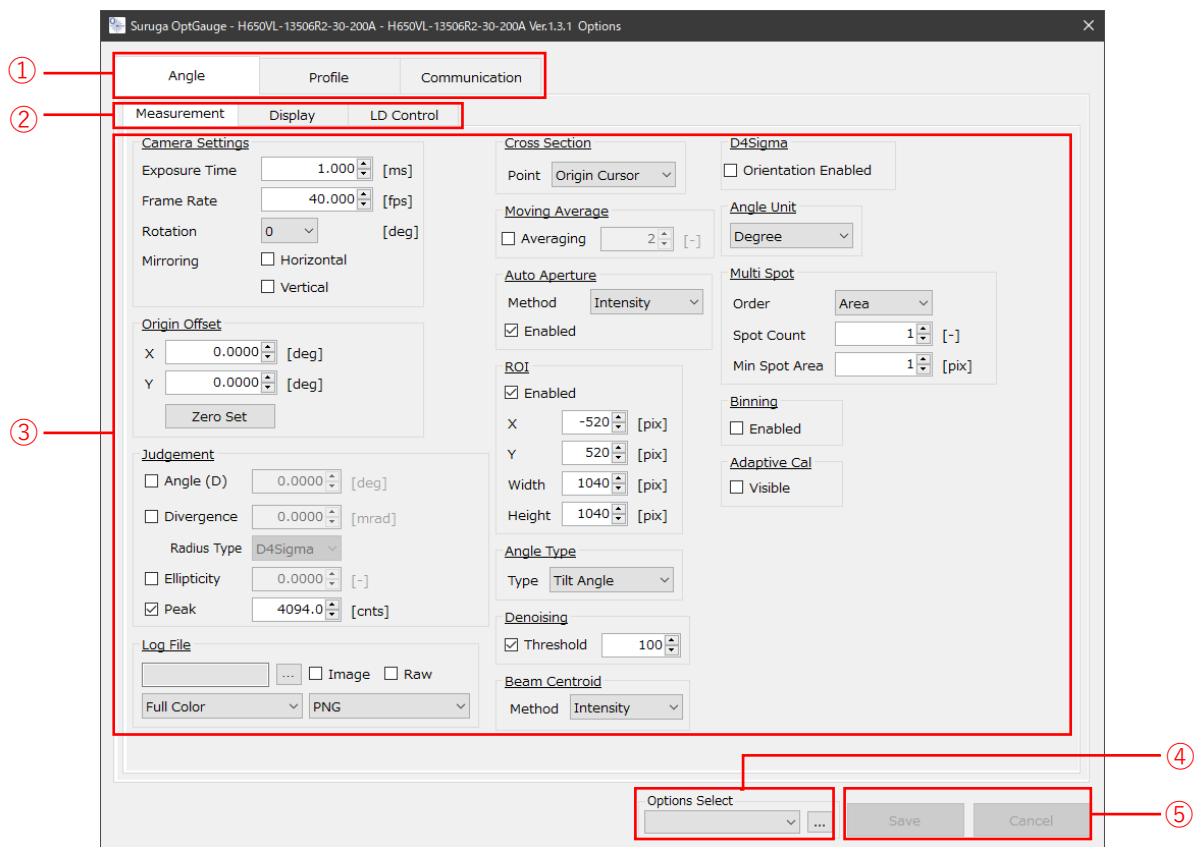


① Cross (red)		Displays beam center position
② Auto Aperture (orange)		Displays the aperture while the Auto Aperture setting is enabled
③ Cross (white)		Displays a coordinate center position
④ Aperture (white)		Displays the range of profile measurement
⑤ ROI (blue)		Displays the aperture if the ROI is enabled
⑥ Profile		Displays the strength distribution of a light beam

⑦ XY Orientation	Displays the coordinates where the mouse cursor pointing at	
Frame Rate	Displays the image refresh rate per second from image data acquisition to completion of measurement data calculation	
⑧ Power	Total Count	Displays the beam total counts from 0 to 4,429,152,000
	Peak	Displays the maximum light beam luminance by the value from 0 to 4095. If the value is below the Peak value set in the " Judgement Settings ", the indicator turns green (OK), otherwise, it turns red (NG).
⑨ LD Adjustment	Displays the status of the brightness function (Green: Pass, Yellow : Under adjusting and Red : Fail)	
⑩ Adaptive Cal	Improve calculation accuracy by removing overall noise from an image captured by the sensor	
⑪ Beam Centroid	Centroid X	The centroid X centered at the X-axis component of the cross (white).
	Centroid Y	The centroid Y centered at the Y-axis component of the cross (white)
	Centroid D	The centroid centered at the cross (white).
⑫ Beam Diameter	If the " Orientation " setting in the option menu is enabled, it alters the measurement mode	
	If the " Type " setting in the Beam Diameter is D4Sigma, it displays the following:	
	D4Sigma	Displays $D4\sigma$ beam diameter.
	D4Sigma X(M)	Displays $D4\sigma X(M)$ beam width.
	D4Sigma Y(m)	Displays $D4\sigma Y(m)$ beam width.
	If the " Type " setting in the Beam Diameter is $1/e^2$, it displays the following:	
	$1/e^2$	Displays the $1/e^2$ beam diameter.
	$1/e^2 X(M)$	Displays the $1/e^2 X(M)$ beam width.
	$1/e^2 Y(m)$	Displays the $1/e^2 Y(m)$ beam width.
	D86	Displays D86 beam width beam diameter
⑬ Line Position	Operates while the " Image Processing Mode " in the option settings is enabled.	
	Line X	Displays the linear position X centered on the X-axis

		component of the crosshair (white).
	Line Y	Displays the linear position Y centered on the Y-axis component of the crosshair (white).
⑬ Beam Ellipticity	Operates while Orientation Enabled in the option settings is checked.	
	Ellipticity m/M	Displays ellipticity of $D4\sigma$ or $1/e^2$ beam width
⑭ Orientation	Operates while the Orientation setting in the options menu is enabled	
	θ	Displays the rotation angle of the beam
⑮ Judgement	Operates while the measurement data that you want to evaluate, at the " Judgement Settings " in the option settings, are checked, <input checked="" type="checkbox"/> , and also, you specify evaluation criteria after <input type="text" value="0.0000"/> .	
	Beam Centroid (D)	Displays "OK" when the set judgement criteria are satisfied and "NG" if not.
	Beam Diameter	
	Beam Ellipticity	
	Orientation	
⑯ Main Spot	Number	Specifies the beam spots to display measurement results while measuring multiple beams.
⑰ Multi Spot Measurement Display	Automatically lists and displays beam spot measurement results for if multiple beam spots are detected.	

2.2 Names and Functions of Option Screen Components



The Suruga OptGauge Option Screen

① Option Tab	Select the tab to display options.
② Subcategory Tab	Displays subcategories for the angle and profile options, such as measurement, display, and LD control.
③ Various Settings	Changes the measurement conditions
④ Option Select	By creating an options list in advance, you can switch between the various settings in ③ (see “Options List”).
⑤ Save/Cancel	Button is enabled as the option contents (③, ④) are changed. Click the “Save” icon after settings changes to save the changes or to cancel settings changes, click the “Cancel” icon.

2.2.1 Measurement Option Setting Details

2.2.1.1 Angle Measurement

Suruga OptGauge - H651NL-13506S2-30-200A - 000001942108 Ver.1.3.5 Options

Angle | Profile | Communication

Measurement | Display | LD Control

Camera Settings ①

Exposure Time: 1.000 [ms]

Frame Rate: 40.000 [fps]

Rotation: 0 [deg]

Mirroring: ☐ Horizontal ☐ Vertical

☐ Trigger Mode

Origin Offset ②

X: 0.0000 [deg]

Y: 0.0000 [deg]

Zero Set

Judgement ③

☐ Angle (D): 0.0000 [deg]

☐ Divergence: 0.0000 [mrad]

Radius Type: D4Sigma

☐ Ellipticity: 0.0000 [-]

☐ Orientation: 0.0000 [deg]

☒ Peak: ± 0.0000 [deg]

Log File ④

Log File: ... ☐ Image ☐ Raw

Full Color ☒ PNG

Cross Section ⑤

Point: Origin Cursor

Moving Average

☐ Averaging: 2

Auto Aperture ⑦

Method: Intensity

☒ Enabled

ROI ⑧

☒ Enabled

X: -520 [pix]

Y: 520 [pix]

Width: 1040 [pix]

Height: 1040 [pix]

Denoising ⑨

☒ Threshold: 100

Beam Centroid ⑩

Method: Intensity

Angle Type ⑪

Type: Tilt Angle

Beam Divergence ⑫

Type: D4Sigma

Orientation ⑬

☐ Enabled

Method: EllipseFitting

Angle Unit ⑭

Degree

Multi Spot ⑮

Order: Area

Spot Count: 1 [-]

Min Spot Area: 1 [pix]

Binning ⑯

☐ Enabled

Adaptive Cal ⑰


☐ Visible

Options Select

Save Cancel

① Camera Settings		
Exposure Time	Sets the sensor camera exposure time. (def. = 1.000) Setting range: 0.027 to 2000.000	
Frame Rate	Sets the sensor camera frame rate. (def. = 40.000) Setting range: 0.100 to 100.000	
Rotation	Sets image rotation.	
	0 (def.)	No image rotation
	90	Rotate 90° clockwise with the center of the sensor camera as the origin
	180	Rotate 180° clockwise with the center of the sensor camera as the origin
	270	Rotate 270° clockwise with the center of the sensor camera as the origin

Mirroring	Horizontal	Vertical	Sets image mirroring
	Disabled (def.)	Disabled (def.)	No mirroring
	Enabled	Disabled	Horizontal mirroring
	Disabled	Enabled	Vertical mirroring
	Enabled	Enabled	Vertical and horizontal mirroring
Trigger Mode	Enables or disables the external trigger input for the sensor camera.		
	Enabled	Enables external trigger input	
	Disabled (def)	Disables the external trigger input	
② Origin Offset	Offsets coordinate center position (white cross).		
	X	Sets the center of the sensor camera as “0.0000 (def.)” and adjust (Offset) the position of the cross (white) in the X direction. Setting range: - 10.0000 to + 10.0000.	
	Y	Sets the center of the sensor camera as “0.0000 (def.)” and adjust (Offset) the position of the cross (white) in the Y direction. Setting range: - 10.0000 to + 10.0000.	
	Zero Set	Offset to the current measurement coordinates	
③ Judgement Settings			
Angle	Sets OK / NG judgement on the Angle (def. = 0.0000). Setting range: 0.0000 to 10.0000.		
	Enabled	Enables the judgement	
	Disabled (def.)	Disables the judgement	
Divergence	Sets the D4Sigma or the 1/e ² or the D86 OK / NG judgement on the beam divergence. Setting range: 0.0000 to 1000.0000 (def. 0.0000)		
	Enabled	Enables the judgement	
	Disabled (def.)	Disables the judgement	
Radius Type	D4 Sigma (def.)	Sets the D4Sigma to judge the Divergence	
	1/e ²	Sets the 1/e ² to judge the Divergence	
	D86	Sets the D86 to judge the Divergence	

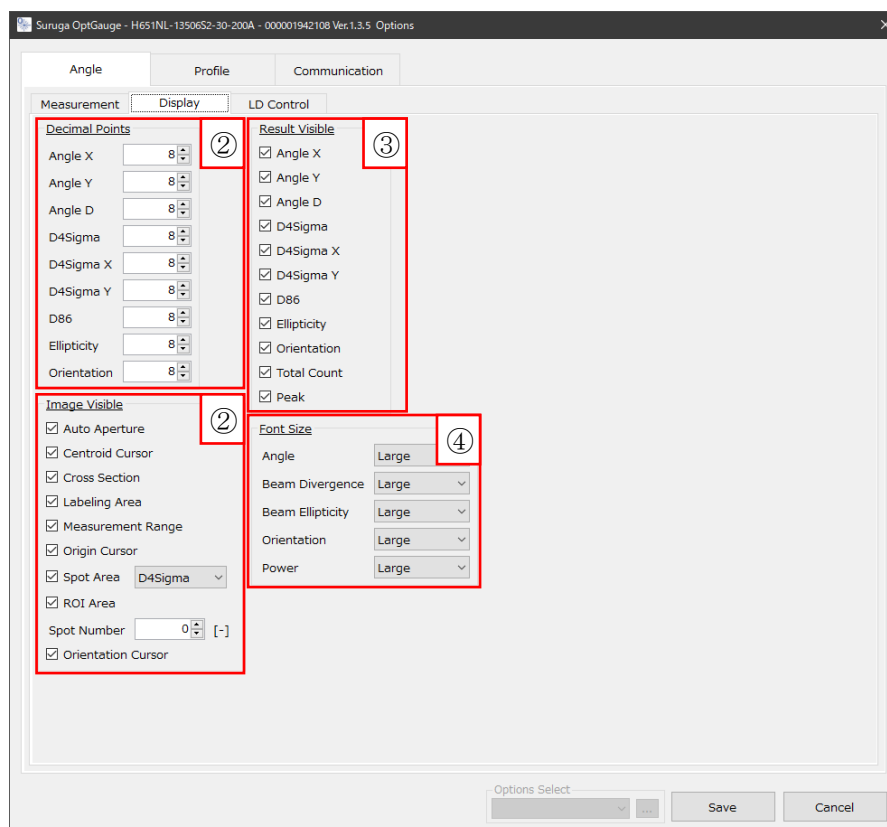
Ellipticity	Sets OK / NG judgment for the Beam Ellipticity. Setting range: 0.0000 to 1.0000 (def. 0.0000)	
	Enabled	Enables the judgement
	Disabled (def.)	Disables the judgement
Orientation	Set OK / NG determination for the Orientation Determination is made by combining the set angle and Range (\pm)	
	Set Angle: Set range: - 90.0000 to + 90.0000 (default 0.0000)	
	Range [\pm]	Sets range: -90.0000 to + 90.0000 (def.0.0000)
	Enable	Enables the judgement
	Disable (def)	Disables the judgement
Peak	Sets OK / NG judgment for the "Peak." Setting range: 0.0 to 4095.0	
	Enabled	Enables the judgement
	Disabled (def.)	Disables the judgement
④ Log File		
	To specify outputs where to save the measurement results (CSV).	
Image	Enabled	Outputs image data at the Angle View along with the measurement results (.csv)
	Disabled (def.)	Does not output Angle View image data (PNG)
	Full Color (def.)	Outputs image data in 24-bit full color
	Gray Scale	Outputs image data in 8-bit grayscale
	PNG (def.)	Outputs image data in PNG format
	BMP	Outputs image data in BMP format
	TIFF	Outputs image data in TIFF format
Raw	Enabled	Outputs Angle View raw image data (CSV)* with measurement results (CSV) * Outputs luminance values per pixel
	Disabled (def.)	Does not output raw image data (CSV) for the Angle View
⑤ Cross Section	Sets the sectional view display location.	
	Origin Cursor (def.)	Displays coordinate center position beam strength distribution.
	Beam Cursor	Displays the centroid of a beam strength distribution.

⑥ Moving Average	Sets averaging process (moving average) for measurement values. Setting range: 2 to 262144 (def. = 2)	
	Enabled	Enables the averaging process.
	Disabled (def.)	Disables the averaging process.
⑦ Auto Aperture	Sets the Auto Aperture.	
	Enabled (def.)	Enables the Auto Aperture setting.
	Disabled	Disables the Auto Aperture setting.
	Area	Sets the Auto Aperture based on the centroid position calculated with the area centroid method
	Intensity (def.)	Sets the Aperture based on the centroid position calculated by luminance weighted method
⑧ ROI	Sets the ROI. If enabled, beam lights are detected within the range of the settings	
	Enabled (def.)	Enables the ROI settings
	Disabled	Disables the ROI settings
	X	Sets the X-axis installation position of the ROI. Range: - 3000 to + 3000 (def. = - 520)
	Y	Sets the Y-axis installation position of the ROI. Range: - 3000 to + 3000 (def. = 520)
	Width	Sets the width of the ROI Setting range: 0 to 3000 (def. = 1040)
	Height	Sets the vertical height of the ROI Setting range: 0 to 3000 (def. = 1040)
⑨ Denoising	Sets thresholds. If enabled, measurements are calculated using pixels with values higher than the set threshold Setting range: 1 to 4095 (default = 100).	
	Enabled (def.)	Enables the Denoising setting
	Disable	Disables the Denoising setting
⑩ Beam Centroid	Sets the calculation method for the Centroid position of a light beam.	
	Aria	Calculates the centroid position by the area centroid method
	Intensity (def.)	Calculates the centroid position by luminance weighted method.
⑪ Angle Type	Sets targets for the angle measurement	

	Tilt Angle (def.)	Sets for the reflection angle measurement. Sets 1/2 of an incident beam as the measured target angle.
	Beam Angle	Sets for the external light angle measurement. Sets the incident beam angle as the measurement target angle.
⑫ Beam Divergence		
Type	Set the type of beam divergence	
	D4Sigma (def.)	Sets the $D4\sigma$ for the Beam Divergence
	$1/e^2$	Sets the $1/e^2$ for the Beam Divergence
⑬ Orientation		
Enabled	Enables or disables the measurement configuration of the Beam Divergence measurements, the Beam Ellipticity and the Orientation	
	Enabled	Displays the beam divergence by D4 Sigma M (major) and D4 Sigma m (minor). Enables the Beam Ellipticity. Enables the Orientation.
	Disabled (def.)	Displays the Beam Divergence by X and Y. Disables the Beam Ellipticity. Disables the Orientation.
Method	Sets the non-ISO-compliant rotation angle measurement method *Only effective the “ Type ” in the Beam Divergence is set to the $1/e^2$	
	Ellipse Fitting (def.)	Measurements are performed by the elliptical fitting method
	MaxDistanceSearch	Measurement is performed by the maximum distance of two points search method
⑭ Angle Unit	Sets the angle unit for measurement values	
	Degree (def.)	Sets the unit to decimal degree
	DegMinSec	Sets the unit to degrees-minutes-seconds
	Milliradian	Sets the unit to milli radian
⑮ Multi Spot		
Order	Sets the sorting type of measurement results displayed when detecting multiple beams.	
	Area (def.)	Sorts by beam area from the largest size
	Angle	Sorts by beam angle from the smallest angle

Spot Count	Sets the number to be displayed on the measurement results screen when detecting multiple beams. Setting range: 1 to 100 (def. = 1).	
Min Spot Area	Sets the threshold value for the beam size (pixels) conditions of the beam to be detected. Setting range: 1 to 1023 (def. = 1).	
⑩ Binning	Sets the Binning function (2x2) of the sensor camera. If enabled, the binning combines adjacent pixels to reduce camera noise and improve sensitivity. Additionally, the image size is reduced to 1/4, lowering data volume and improving frame rate.	
	Enabled	Enables binning function.
	Disabled (def.)	Disables binning function.
⑪ Adaptive Cal	Sets "Adaptive Cal" button show / hide. <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 10px;">Attention</div> Please be advised to disable the " Denoising " while the Adaptive Cal is enabled.	
	Enabled	Shows the "Adaptive Cal" button
	Disabled (def.)	Hides the "Adaptive Cal" button

2.2.1.2 Angle Display



① Decimal Points

It specifies the number of decimal places when outputting measurement results*

Setting range: 0 to 8 (default=8)

*Note: the "Outputting measurement results" refers to results output via the [Output Once] button (CSV) and output via communication for control by external devices.

Angle X	Sets the number of decimal places for the Angle X measurement output
Angle Y	Sets the number of decimal places for the Angle Y measurement output
Angle D	Sets the number of decimal places for the Angle D measurement output
D4Sigma	Sets the number of decimal places for the D4Sigma measurement output
1/e^2	Sets the number of decimal places for the 1/e ² measurement output
D4Sigma X(M)	Sets the number of decimal places for the D4Sigma X(M) measurement output
1/e^2 X(M)	Sets the number of decimal places for the 1/e ² X(M) measurement output
D4Sigma Y(m)	Sets the number of decimal places for the D4Sigma Y(m) measurement output
1/e^2 Y(m)	Sets the number of decimal places for the 1/e ² Y(m) measurement output
D86	Sets the number of decimal places for the D86 measurement output
Ellipticity	Sets the number of decimal places for the Ellipticity measurement output

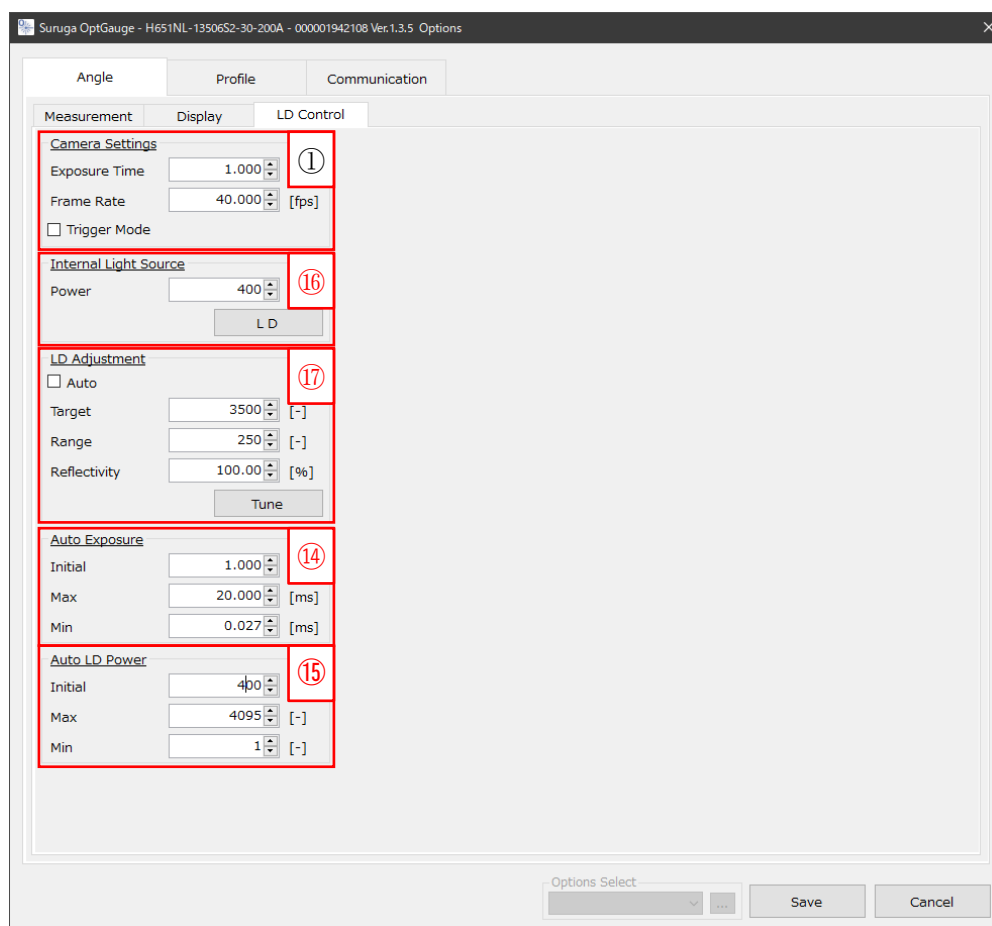
Orientation	Sets the number of decimal places for the Orientation measurement output	
② Image Visible		
Auto Aperture	Sets to display or hide the Auto Aperture	
	Enabled (def.)	<u>D</u> isplays the Auto Aperture
	Disabled	Hides the Auto Aperture
Centroid Cursor	Sets to display or hide the Centroid Cursor	
	Enabled (def.)	Displays the Centroid Cursor
	Disabled	Hides the Centroid Cursor
Cross Section	Sets to display or hide the Cross Section	
	Enabled (def.)	Displays the Cross Section
	Disabled	Hides the Cross Section
Labeling Area	Sets to display or hide the Labeling Area	
	Enabled (def.)	Displays the Labeling Area
	Disabled	Hides the Labeling Area
Measurement Range	Sets to display or hide the Measurement Range	
	Enabled (def.)	Displays the Measurement Range
	Disabled	Hides the Measurement Range
Origin Cursor	Sets to display or hide the Origin Cursor	
	Enabled (def.)	Displays the Origin Cursor
	Disabled	Hides the Origin Cursor
Spot Area	Sets to display or hide the Spot Area	
	D4Sigma(def.)	Sets beam diameter calculation method in the D4Sigma to display the Spot Area.
	1/e^2	Sets beam diameter calculation method in the 1/e^2 to display the Spot Area
	D86	Sets beam diameter calculation method in the D86 to display the Spot Area
	Enabled (def.)	Displays the Spot Area
	Disabled	Hides the Spot Area
ROI Area	Sets to display or hide the ROI Area	
	Enabled (def.)	Displays the ROI Area
	Disabled	Hides the ROI Area

Spot Number	Sets the number of label numbers to display when beam light is detected (default = 0). The setting range: 0 to 100.	
Orientation Cursor	Set the Orientation Cursor to display or hide	
	Enabled (def.)	Displays the Orientation Cursor
	Disabled	Hides the Orientation Cursor
③ Result Visible		
Sets the display / hide of the measurement result.		
Angle X	Enabled (def.)	Displays the Angle X of the measurement result
	Disabled	Hides the Angle X of the measurement result
Angle Y	Enabled (def.)	Displays the Angle Y of the measurement result
	Disabled	Hides the Angle Y of the measurement result
Angle D	Enabled (def.)	Displays the Angle D of the measurement result
	Disabled	Hides the Angle D of the measurement result
D4Sigma	Enabled (def.)	Displays the D4Sigma of the measurement result
	Disabled	Hides the D4Sigma of the measurement result
1/e ²	Enabled (def.)	Displays the 1/e ² of the measurement results.
	Disabled	Hides the 1/e ² of the measurement result
D4Sigma X	Enabled (def.)	Displays the D4Sigma of the measurement result
	Disabled	Hides the D4Sigma of the measurement result
1/e ² X(M)	Enabled (def.)	Displays the 1/e ² Y(m) of the measurement result
	Disabled	Hides the 1/e ² Y(m) of the measurement result
D4Sigma Y	Enabled (def.)	Displays the D4Sigma Y of the measurement result
	Disabled	Hides the D4Sigma Y of the measurement result
1/e ² Y(m)	Enabled (def.)	Displays the 1/e ² Y(m) of the measurement result
	Disabled	Hides the 1/e ² Y(m) of the measurement result
D86	Enabled (def.)	Displays the D86 of the measurement result
	Disabled	Hides the D86 of the measurement result
Ellipticity	Enabled (def.)	Displays the Ellipticity of the measurement result
	Disabled	Hides the Ellipticity of the measurement result
Orientation	Enabled (def.)	Displays the Orientation measurement result
	Disabled	Hides the Orientation measurement result

Total Count	Enabled (def.)	Displays the Total Count of the measurement result
	Disabled	Hides the Total Count of the measurement result
Peak	Enabled (def.)	Displays the Peak of the measurement result
	Disabled	Hides the Peak of the measurement result

④ Font Size		
Angle	Sets the display font size for the Angle measurement results	
	Small	Sets the small front size to display the measurement results
	Medium	Sets the small front size to display the measurement results
	Large(def.)	Sets the small front size to display the measurement results
Beam Divergence	Sets the display font size for the Beam Divergence measurement results	
	Small	Sets the small front size to display the measurement results
	Medium	Sets the small front size to display the measurement results
	Large(def.)	Sets the small front size to display the measurement results
Beam Ellipticity	Sets the display font size for the Beam Ellipticity measurement results	
	Small	Sets the small front size to display the measurement results
	Medium	Sets the small front size to display the measurement results
	Large(def.)	Sets the small front size to display the measurement results
Orientation	Sets the display font size for the Orientation measurement results	
	Small	Sets the Small for the display font size for the measurement results
	Medium	Sets the Medium for the display font size for the measurement results
	Large(def.)	Sets the Large for the display font size for the measurement results
Power	Sets the display font size for the Power measurement results	
	Small	Sets the small front size to display the measurement results
	Medium	Sets the small front size to display the measurement results
	Large(def.)	Sets the small front size to display the measurement results

2.2.1.3 Angle LD Control



① Camera Settings		
Exposure Time	Sets the sensor camera exposure time. (def. = 1. 000). Setting range: 0.027 to 2000.000.	
Frame Rate	Sets the sensor camera frame rate. (def. = 40. 000). Setting range: 0.1 to 100. 000.	
② Internal Light Source		
Power	Set the internal light source power (default=400). Setting range: 0 to 4095.	
LD	Set the internal light source to be on or off. The status of the internal light source is indicated by the color of the buttons and text.	
	Green	Sets the internal light source is ON
	Gray (Black txt.)	Sets the internal light source is OFF
	Gray (gray txt.)	The internal light source cannot be controlled. Please check the power supply status to the sensor.

③ LD Adjustment		
Auto	Always enables / disables the Automatic Brightness control	
	Enabled	Keeps enabling the Automatic Brightness control
	Disabled (def.)	Keeps disabling the Automatic Brightness control.
Target Value	Sets the upper limit of the Peak luminance (def. = 3500). The setting range: 1000 to 3500	
Range	Sets the range of the dimming adjustment complete (def. = 250) It adjusts [light beams] within the target dimming range. The setting range: 100 to 1000	
Reflectivity	Sets the reflectance of the measuring target (def. = 100). Sets the reflectance of the measuring object optimizes the time required for light adjustment. The setting range: 0.05 to 100	
Tune	If the Auto feature is not enabled, clicking the Tune button will activate auto-brightness each time.	
④ Auto Exposure Time		
Initial	Sets the initial exposure time applied in the auto-brightness control for the first time (default = 1.000). Setting range: 0.027 to 20.000	
Max	Sets the maximum value for the exposure time adjusted at the automatic brightness (def. = 20.000). Its setting range: 0.027 to 20.000	
Min	Sets the minimum value for the exposure time adjusted at the automatic brightness (def. = 0.027). Its setting range: 0.027 to 20.000	
⑤ Auto LD Power		
Initial	Sets an initial value of the exposure time of the automatic brightness executed for the first time (def. = 400). Its setting range: 1 to 4095	
Max	Sets the maximum value for the power adjusted upon automatic brightness (def. = 4095). Its setting range: 1 to 4095	
Min	Sets the minimum value for the power adjusted upon automatic brightness (def. = 1). Its setting range: 1 to 4095	

2.2.1.4 Profile Measurement

Suruga OptGauge - H651NL-13506S2-30-200A - 000001942108 Ver.1.3.5 Options

Angle Profile Communication

Measurement Display LD Control

Camera Settings ①

Exposure Time 1.000 [ms]

Frame Rate 40.000 [fps]

Rotation 0 [deg]

Mirroring ☐ Horizontal ☐ Vertical

☐ Trigger Mode

Origin Offset ②

X 0.000 [mm]

Y 0.000 [mm]

Zero Set

Judgement ③

☐ Beam Centroid (D) 0.0000 [mm]

☐ Beam Diameter 0.0000 [mm]

Diameter Type D4Sigma

☐ Ellipticity 0.0000 [-]

☐ Orientation 0.0000 [deg]

☐ Line Position ± 0.0000 [deg]

☒ Peak 4094.0 [cnts]

Log File ④

Full Color PNG

Cross Section ⑤

Point Origin Cursor

Moving Average ⑥

☐ Averaging 2

Auto Aperture ⑦

Method Intensity

☒ Enabled

ROI ⑧

☒ Enabled

X -520 [pix]

Y 520 [pix]

Width 1040 [pix]

Height 1040 [pix]

Denosing ⑨

☒ Threshold 1

Beam Centroid ⑩

Method Intensity

Beam Diameter ⑪

Type D4Sigma

Orientation ⑬

☐ Enabled

Method EllipseFitting

Length Unit ⑬

Millimeter

Multi Spot ⑮

Order Area

Spot Count 1 [-]

Min Spot Area 1 [pix]

Binning ⑯

☐ Enabled

Adaptive Cal ⑰

☒ Visible

Image Processing Mode ⑱

☒ Enabled


Threshold 80

Options Select

Save Cancel

① Camera Settings		
Exposure Time	Sets the sensor camera exposure time. (def. = 1.0). Setting range: 0.027 to 2000.000	
Frame Rate	Sets the sensor camera frame rate (def. = 40.000). Setting range: 0.1 to 100.000	
Rotation	Sets display image rotation	
	0 (def.)	No Rotation.
	90	Rotate 90° clockwise with the center of the sensor camera as the origin
	180	Rotate 180° clockwise with the center of the sensor camera as the origin
	270	Rotate 270° clockwise with the center of the sensor camera as the origin

Mirroring	Horizontal	Vertical	Sets image mirroring
	Disabled (def.)	Disabled (def.)	No mirroring
	Enabled	Disabled	Horizontal mirroring
	Disabled	Enabled	Vertical mirroring
	Enabled	Enabled	Vertical and horizontal mirroring
Trigger Mode	Enables/Disables the external trigger input for the sensor camera		
	Enabled	Enables the external trigger inputs	
	Disabled (def.)	Disables the external trigger inputs	
② Origin Offset	Offsets the center position of the coordinates (the cross (white))		
	X	Sets the center of the sensor camera as 0.0000 (def.) and offsets the position of the cross (white) in the X direction. Setting range: - 20.0000 to + 20.0000.	
	Y	Sets the center of the sensor camera as “0.0000(def.)” and offsets the position of the cross (white) in the Y direction. Setting range: - 20.0000 to + 20.0000.	
	Zero Set	Offsets to the current measurement coordinates	
③ Judgement Settings			
Beam Centroid (D)	Sets OK or NG judgement on the centroid (def. = 0.0000). Setting range: 0.0000 to 20.0000 (def. 0.0000)		
	Enabled	Enables the judgement.	
	Disabled (def.)	Disables the judgement.	
Beam Diameter	Sets the OK or NG judgement on the D4Sigma or the 1/e ² or the D86. Setting range: 0.0000 to 20.0000		
	Enabled	Enables the judgement.	
	Disabled (def.)	Disables the judgement.	
Diameter Type	D4Sigma (def.)	Sets the D4Sigma for the judged diameter.	
	1/e ²	Sets the 1/e ² for the judged diameter.	
	D86	Sets the D86 for the judged diameter.	
Ellipticity	Sets OK / NG judgment on the Beam Ellipticity. Setting range: 0.0000 to 1.0000 (def. 0.0000).		

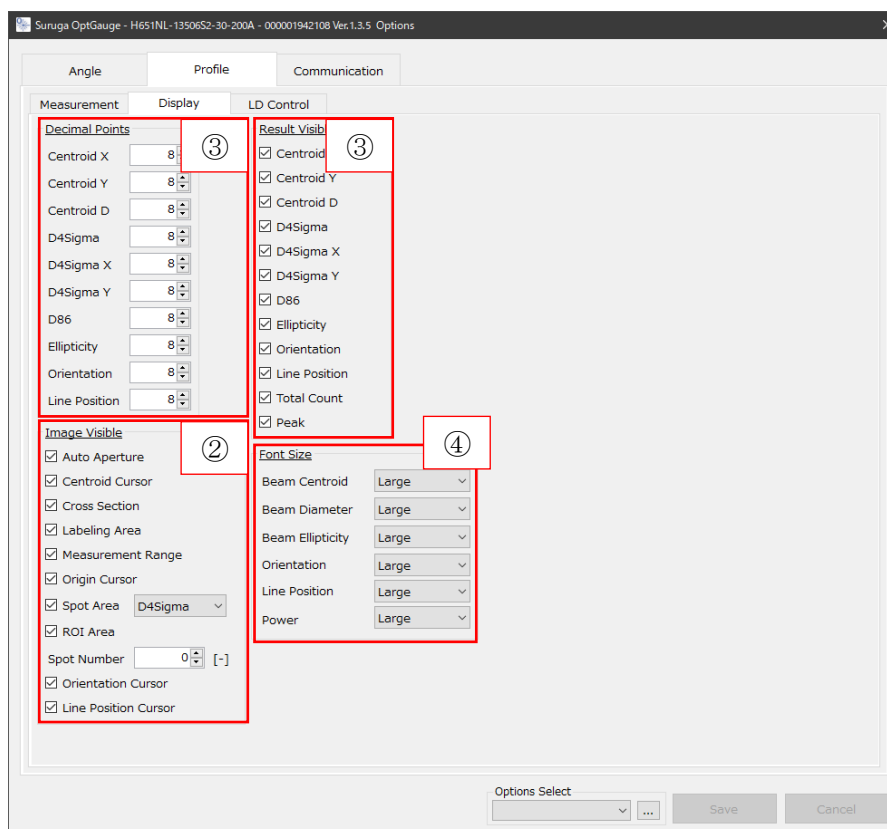
	Enabled	Enables the judgement
	Disabled (def.)	Disables the judgement
Orientation	Set OK / NG judgement on the Orientation. Decision is made by considering the set angle and range (\pm).	
	Set angle Setting range: - 90.0000 to + 90.0000 (def. 0.0000).	
	Range [\pm]	Setting range: - 90.0000 to + 90.0000 (def. 0.0000)
	Enable	Enables the judgement
	Disable (def.)	Disables the judgement
Line Position	Set OK / NG judgement on the Line Position. Setting range: - 20.0000 to + 20.0000 (def. 0.0000)	
	Enable	Enables the judgement
	Disable (def.)	Disables the judgement
Peak	Sets OK / NG judgment on the Peak (def. = 4094.0). Setting range: 0.0 to 4095.0	
	Enabled	Enables the judgement
	Disabled (def.)	Disables the judgement
④ Log File		
	Specifies the saving location for measurement results output (CSV) for the Output Once	
Image	Enabled	Outputs the Profile View image data along with measurement results (CSV)
	Disabled (def.)	The Profile View image data will not be output
	Full Color (def.)	Outputs image data in 24-bit full color
	Gray Scale	Outputs image data in 8-bit grayscale
	PNG (def.)	Outputs image data in PNG format
	BMP	Outputs image data in BMP format
	TIFF	Outputs image data in TIFF format
Raw	Enabled	Outputs the brightness value data (CSV)* from the Profile View along with measurement results (CSV). <i>*Outputs brightness values as text data in CSV format, not as binary data.</i>
	Disabled (def.)	Does not output Angle View raw image data (PNG)

⑤ Cross Section	Sets the display location for the beam intensity distribution	
	Origin Cursor (def.)	Displays the beam intensity distribution at the center position of the coordinates
	Beam Cursor	Displays the beam intensity distribution at the beam' centroid
⑥ Moving Average	Sets averaging process (moving average) for measurement values (def. = 2). Setting range: 2 to 262144.	
	Enabled	Enables the averaging process
	Disabled (def.)	Disables the averaging process
⑦ Auto Aperture	Sets the Auto Aperture	
	Enabled (def.)	Enables the Auto Aperture settings
	Disabled	Disables the Auto Aperture settings
	Area	Sets Auto Aperture from the centroid position calculated with the Area Centroid process
	Intensity(def.)	Sets Auto Aperture from centroid position calculated by luminance weighed method
⑧ ROI	Sets the ROI. If enabled, beam lights are detected within the range of the settings	
	Enabled (def.)	Enables ROI settings
	Disabled	Disables ROI settings
	X	Sets ROI X direction setting position. Range: - 3000 to + 3000 (def. = - 520)
	Y	Sets ROI Y direction setting position. Range: -3000 to + 3000 (def. = + 520)
	Width	Sets ROI horizontal width. Setting range: 0 to 3000 (def. = 1040)
	Height	Sets ROI vertical width. Setting range: 0 to 3000 (def. = 1040)
⑨ Denoising	Sets the thresholds. If enabled, the measurement value is calculated using pixels with values higher than the set threshold (def. = 100). Setting range: 1 to 4095.	
	Enabled (def.)	Enables denoising setting.
	Disabled	Disables denoising setting.

⑩ Beam Centroid	Sets the calculation method for the centroid position of a light beam	
	Area	Calculates its position by area centroid method
	Intensity (def.)	Calculate the position by luminance weighted centroid method
⑪ Beam Diameter		
Type	Set the type of Beam Diameter	
	D4Sigma (def.)	Displays the $D4\sigma$ beam diameter
	$1/e^2$	Displays the $1/e^2$ beam diameter
⑫ Orientation		
Enabled	Enables or disables the Beam Diameter measurements, the Beam Ellipticity and the Orientation	
	Enabled	Displays D4 Sigma M (major) and D4 Sigma m (minor) of the beam diameter. Enables the Beam Ellipticity. Enables the Orientation
	Disabled (def.)	Displays X and Y of the beam diameter. Disables Ellipticity. Disables the Orientation.
Method	Configure non-ISO compliant rotation angle measurement method. *Only effective if the Type in the Beam Diameter is set to $1/e^2$.	
	Ellipse Fitting(def.)	Measurements are taken using the elliptical fitting method
	MaxDistanceSearch	Measurement is performed using the maximum distance of two points search method
⑬ Length Unit	Sets the distance unit for the measurement values	
	Millimeter (def.)	Sets the unit to millimeter (mm)
	Micrometer	Sets the unit to micrometer (μm)
⑭ Multi Spot		
Order	Sets numbers to the measurement results to display When detecting multiple beam lights (default = 1). Setting range: 1 to 100.	
	Area(def.)	Sorts by beam area from the largest size
	Centroid	Sorts by Centroid values closest to the center
Spot Count	Sets the number to be displayed on the measurement results screen when detecting multiple beams. Setting range: 1 to 100 (def. = 1)	

Min Spot Area	Sets the beam size condition using the pixel threshold when detecting a beam light (def. = 1). Setting range: 1 to 1023(def. = 1)	
⑮ Binning	Sets the binning function (2x2) of the sensor camera. It combines adjacent pixels to reduce camera noise and improve sensitivity. Additionally, the image size is reduced to 1/4, lowering data volume and improving frame rate	
	Enabled	Enables the Binning
	Disabled (def.)	Disables the Binning
⑯ Adaptive Cal	Sets "Adaptive Cal" button display or hide. <div>Attention</div> Please be advised to disable the " Denoising " while enabling the Adaptive Cal.	
	Enabled(def.)	Displays the "Adaptive Cal" button.
	Disabled	Hides the "Adaptive Cal" button.
⑰ Image Processing Mode		
Enabled	Set the Image Processing Mode	
	Enabled	Enables the Image Processing Mode
	Disabled (def)	Disables the Image Processing Mode
Threshold	Adjusts the sensitivity for detecting straight lines in the Line Position. Higher values detect only clearly defined straight lines (def. = 80) Setting range: 30 to 300	

2.2.1.5 Profile Display



① Decimal Points

Designates the number of decimal places when outputting measurement results*.

Setting range: 0 to 8 (def. = 8)

**Outputting measurement results refers to both the output (CSV) generated by pressing the [Output Once] button and output via communication for control by external devices.*

Centroid X	Sets the number of decimal places for the Centroid X measurement results
Centroid Y	Sets the number of decimal places for the Centroid Y measurement results
Centroid D	Sets the number of decimal places for the Centroid D measurement results
D4Sigma	Sets the number of decimal places for the D4Sigma measurement results
1/e ²	Sets the number of decimal places for the 1/e ² measurement results
D4Sigma X(M)	Sets the number of decimal places for the D4SigmaX(M) measurement results
1/e ² X(M)	Sets the number of decimal places for the 1/e ² X(M) measurement results
D4Sigma Y(m)	Sets the number of decimal places for the D4Sigma Y(m) measurement results
1/e ² Y(m)	Sets the number of decimal places for the 1/e ² Y(M) measurement results
D86	Sets the number of decimal places for the D86 measurement results
Ellipticity	Sets the number of decimal places for the Ellipticity measurement results

Orientation	Set the number of decimal places for the Orientation measurement results	
Line Position	Set the number of decimal places for the Line Position measurement results	
② Image Visible		
Auto Aperture	Sets the display/hide of the Auto Aperture.	
	Enabled (def.)	Displays the Auto Aperture
	Disabled	Hides the Auto Aperture
Centroid Cursor	Sets the display/hide of the Centroid Cursor	
	Enabled (def.)	Displays the Centroid Cursor
	Disabled	Hides the Centroid Cursor
Cross Section	Sets the display/hide of the Cross Section	
	Enabled (def.)	Displays the Cross Section
	Disabled	Hides the Cross Section
Labeling Area	Sets the display/hide of the Labeling Area	
	Enabled (def.)	Displays the Labeling Area
	Disabled	Hides the Labeling Area
Measurement Range	Sets the display/hide of the Measurement Range	
	Enabled (def.)	Displays the Measurement Range
	Disabled	Hides the Measurement Range
Origin Cursor	Sets the display/hide of the Origin Cursor	
	Enabled (def.)	Displays the Origin Cursor
	Disabled	Hides the Origin Cursor
Spot Area	Sets the display/hide of the Spot Area	
	D4Sigma(def.)	Sets beam diameter calculation method in the D4Sigma to display the Spot Area
	1/e^2	Set the beam diameter calculation method for the Spot Area display to 1/e².
	D86	Sets beam diameter calculation method in the D86 to display the Spot Area.
	Enabled (def.)	Displays the Spot Area.
	Disabled	Hides the Spot Area.
ROI Area	Sets the display/hide of the ROI Area.	
	Enabled (def.)	Displays the ROI Area.

	Disabled	Hides the ROI Area.
Spot Number	Sets the number of serial number labels to display if light beams are measured (def. = 0). The setting range: 0 to 100	
Orientation Cursor	Sets the display/hide the Orientation Cursor	
	Enabled	Displays the Orientation Cursor
	Disabled (def.)	Hides the Orientation Cursor
Line Cursor	Sets the display/hide the Line Cursor	
	Enabled	Displays the Line Cursor.
	Disabled (def.)	Hides the Line Cursor.

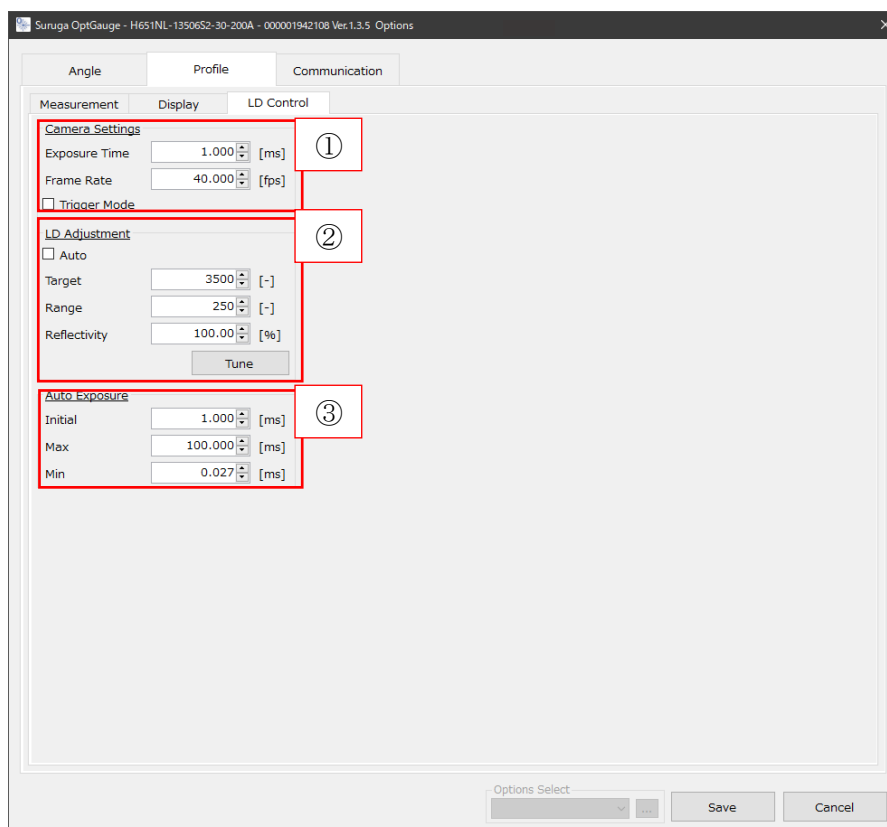
③ Result Visible		
Sets the display/hide of the measurement result.		
Centroid X	Enabled (def.)	Displays the X of a centroid measurement result
	Disabled	Hides the X of a centroid measurement result
Centroid Y	Enabled (def.)	Displays the Y of a centroid measurement result
	Disabled	Hides the Y of a centroid measurement result
Centroid D	Enabled (def.)	Displays the D of a centroid measurement result
	Disabled	Hides the D of a centroid measurement result
D4Sigma	Enabled (def.)	Displays the D4Sigma measurement result
	Disabled	Hides the D4Sigma measurement result
1/e ²	Enabled (def.)	Displays the 1/e ² measurement result
	Disabled	Hides the 1/e ² measurement result
D4Sigma X	Enabled (def.)	Displays the X of D4Sigma measurement result
	Disabled	Hides the X of D4Sigma measurement result
1/e ² X(M)	Enabled (def.)	Displays the 1/e ² X(M) measurement result
	Disabled	Hides the 1/e ² X(M) measurement result
D4Sigma Y	Enabled (def.)	Displays the Y of D4Sigma measurement result
	Disabled	Hides the Y of D4Sigma measurement result
1/e ² Y(m)	Enabled (def.)	Displays the 1/e ² Y(m) measurement result
	Disabled	Hides the 1/e ² Y(m) measurement result
D86	Enabled (def.)	Displays the D86 measurement result

	Disabled	Hides the D86 measurement result
Ellipticity	Enabled (def.)	Displays the Ellipticity measurement result
	Disabled	Hides the Ellipticity measurement result
Orientation	Enabled (def.)	Displays the Orientation measurement results
	Disabled	Hides the Orientation measurement results
Line Position	Enabled (def.)	Displays the X of D4Sigma measurement result
	Disabled	Hides the X of D4Sigma measurement result
Total Count	Enabled (def.)	Displays the Total Count measurement result
	Disabled	Hides the Total Count measurement result
Peak	Enabled (def.)	Displays the Peak measurement result
	Disabled	Hides the Peak measurement result

④ Font Size		
Beam Centroid	Sets the font size to display centroid measurement result	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result
	Large (def.)	Sets the Large font size to display measurement result
Beam Diameter	Sets the font size to display the Beam Diameter measurement result	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result
	Large (def.)	Sets the Large font size to display measurement result
Beam Ellipticity	Sets the font size to display the Beam Ellipticity measurement results	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result
	Large (def.)	Sets the Large font size to display measurement result
Orientation	Sets the font size to display the Orientation measurement result	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result
	Large (def.)	Sets the Large font size to display measurement result
Line Position	Sets the font size to display Line Position measurement results	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result

	Large (def.)	Sets the Large font size to display measurement result
Power	Sets the font size to display the Power measurement results	
	Small	Sets the Small font size to display the measurement result
	Medium	Sets the Medium font size to display the measurement result
	Large (def.)	Sets the Large font size to display measurement result

2.2.1.6 Profile LD Control



① Camera Settings		
Exposure Time	Sets the sensor camera exposure time. (def. = 1.000) Setting range: 0.027 to 2000.000	
Frame Rate	Sets the sensor camera frame rate. (def. = 40. 000) Setting range: 0.1 to 100. 000	
Trigger Mode	Enabled	Enables the external trigger input.
	Disabled (def.)	Disables the external trigger input.
② LD Adjustment		
Auto	Always enables / disables the Automatic Brightness control.	
	Enabled	Always enables the Automatic Brightness control
	Disabled (def.)	Always disables the Automatic Brightness control
Target Value	Sets the upper limit of the Peak luminance (def. = 3500). The setting range: 1000 to 3500	
Range	Sets the range of the brightness adjustment complete. (def. = 250) It adjusts [light beams] within the target dimming range. The setting range: 100 to 1000	
Reflectivity	Sets the reflectance of a measuring target (def. = 100)	

	<p>By setting the reflectance of a measuring target, it optimizes dimming time required.</p> <p>The setting range: 0.05 to 100</p>
Tune	<p>If the Automatic Brightness control is not enabled, a click on the Tune button icon executes the automatic brightness.</p>
③ Auto Exposure Time	
Initial	<p>Sets an initial value of the exposure time of the automatic brightness executed for the first time (def. = 1.000).</p> <p>Its setting range: 0.027 to 100.000</p>
Max	<p>Sets the maximum value for the exposure time adjusted at the automatic brightness (def. = 20.000).</p> <p>Its setting range: 0.027 to 100.000</p>
Min	<p>Sets the minimum value for the exposure time adjusted at the automatic brightness (def. = 0.027).</p> <p>Its setting range: 0.027 to 100.000</p>

2.3 Option List

The Suruga OptGauge can hold multiple option lists and switch between them.

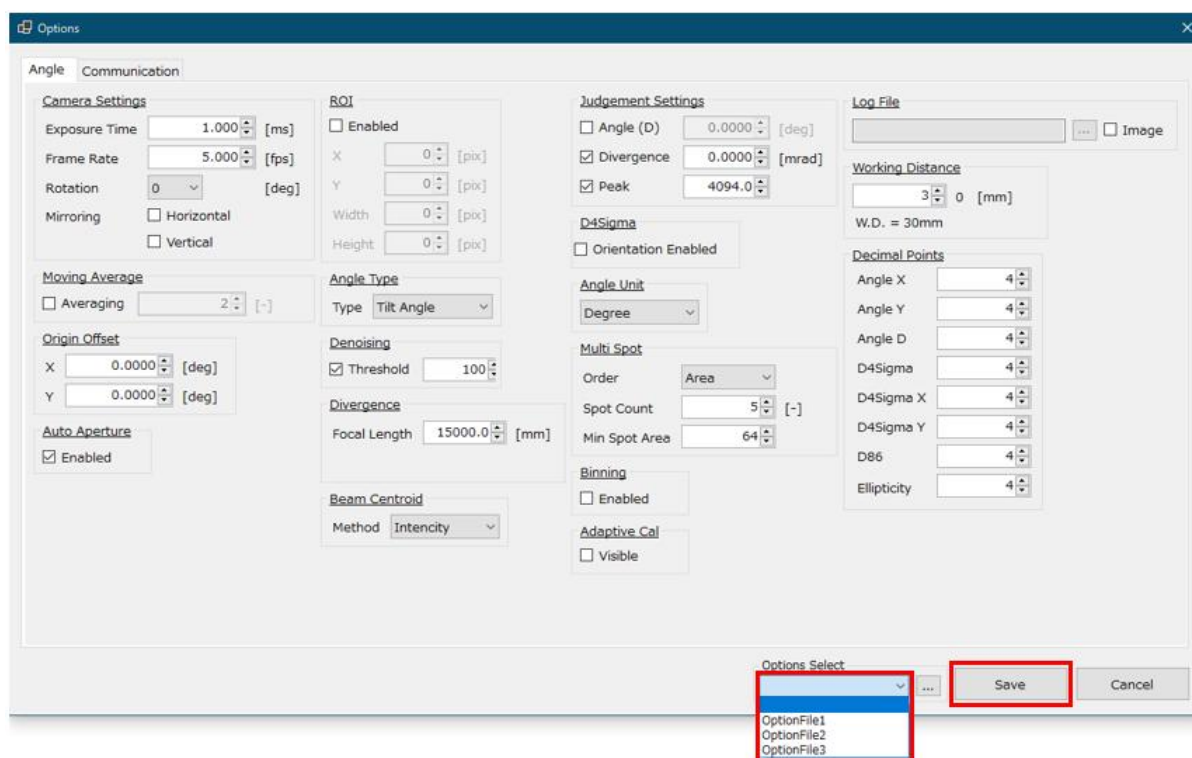
When you want to apply different option settings based on the measurement target or wavelength, you can switch option lists while the Suruga OptGauge is running.

This section describes how to switch between multiple option lists, register them, and delete them.

2.3.1 Switching Option Lists

This section explains how to switch option lists.

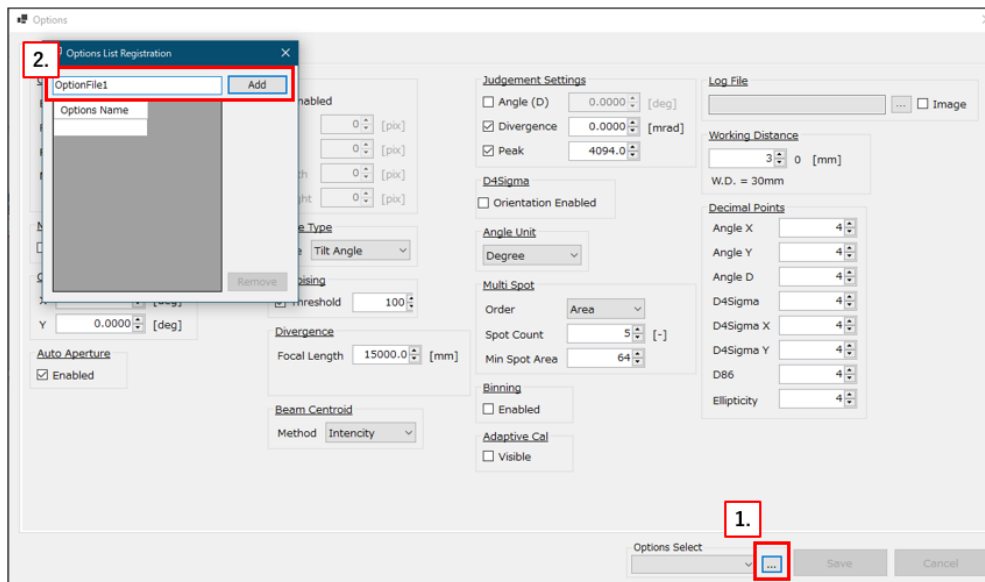
1. From the "Options Select" pulldown menu, select the desired option list name.
2. Click the "Save" button.



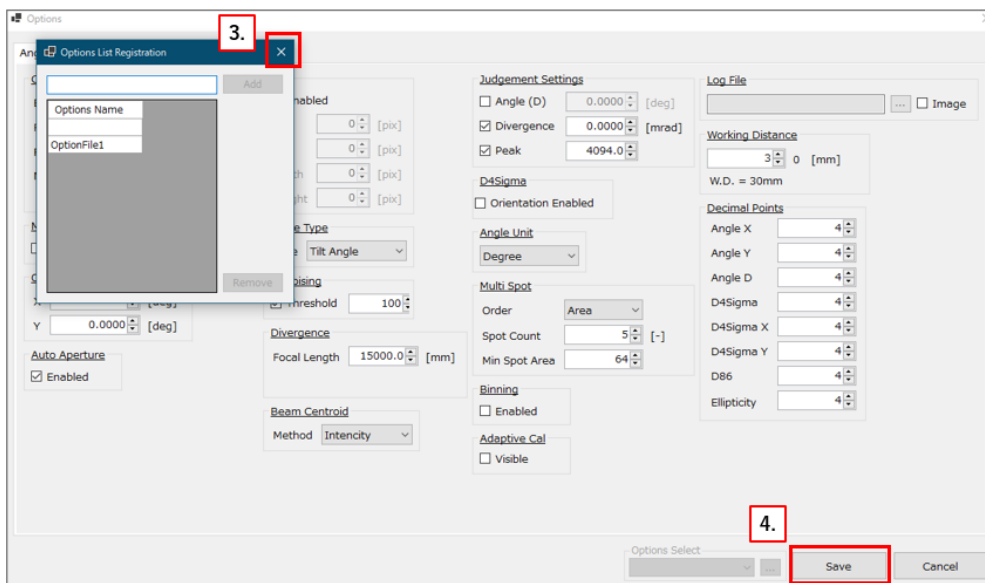
2.3.2 Registering Option Lists

This section explains how to register option lists. Up to 31 option lists can be registered.

1. Click the [...] button.
2. Enter an arbitrary option name and click the [Add] button.



3. Click the [X] button.
4. Click the [Save] button.

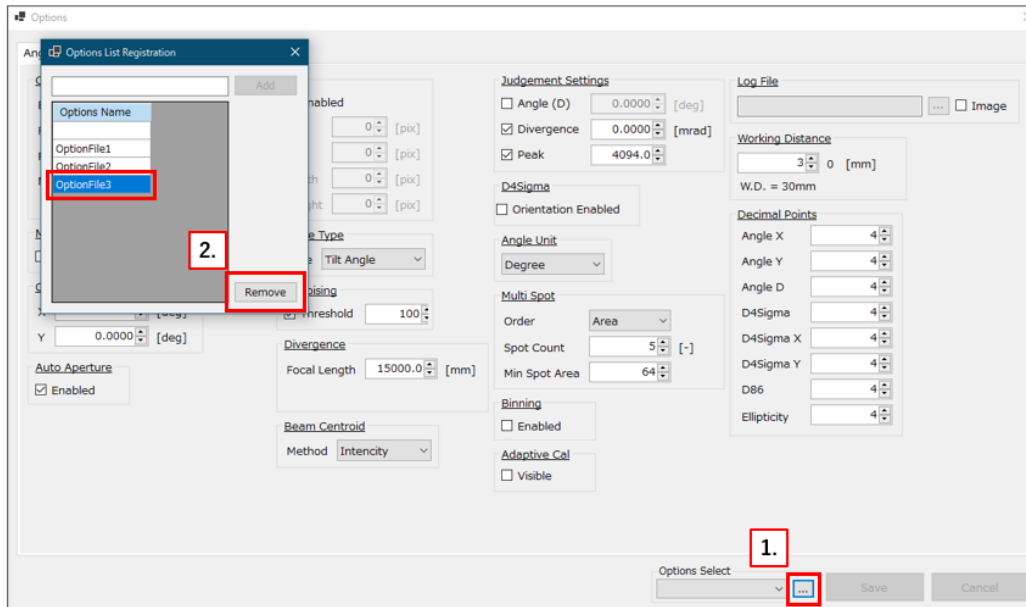


5. The list is now registered in "Options Select" for selection.
(*See "[Switching Option Lists](#)")

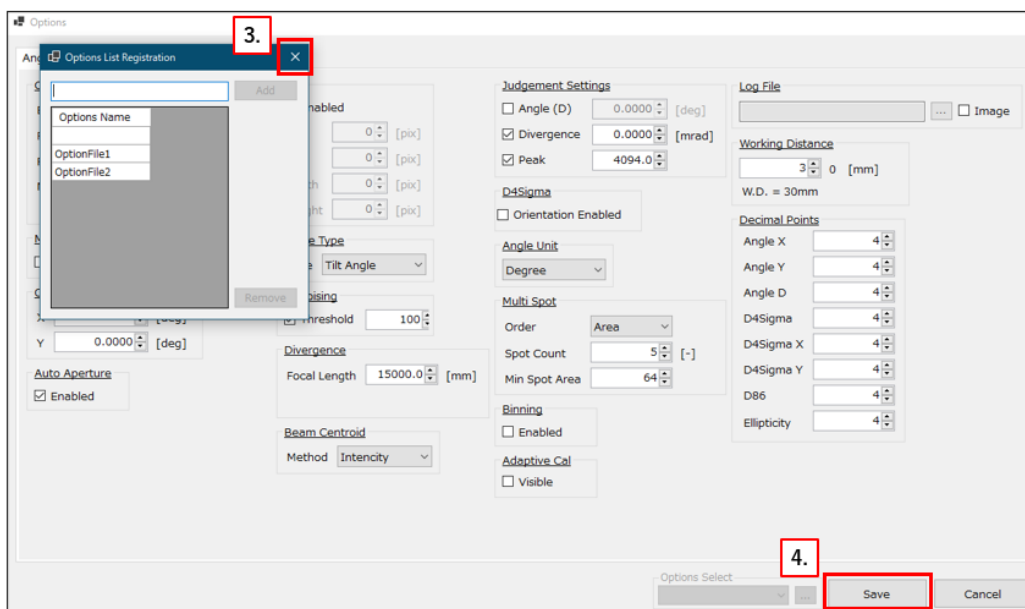
2.3.3 Deleting Option Lists

This section explains how to delete option lists.

1. Select all but the option name to be deleted and click the [...] button.
2. Select the option name to be deleted and click the [Remove] button.



3. Click the [X] button.
4. Click the [Save] button.



3 Controlling from External Devices

3.1 RS232C

The RS232C connections can be broadly categorized into two. After connecting, use terminal software* to send and receive data via serial communication with the Suruga OptGauge.

**Note: Terminal software must be provided by users.*

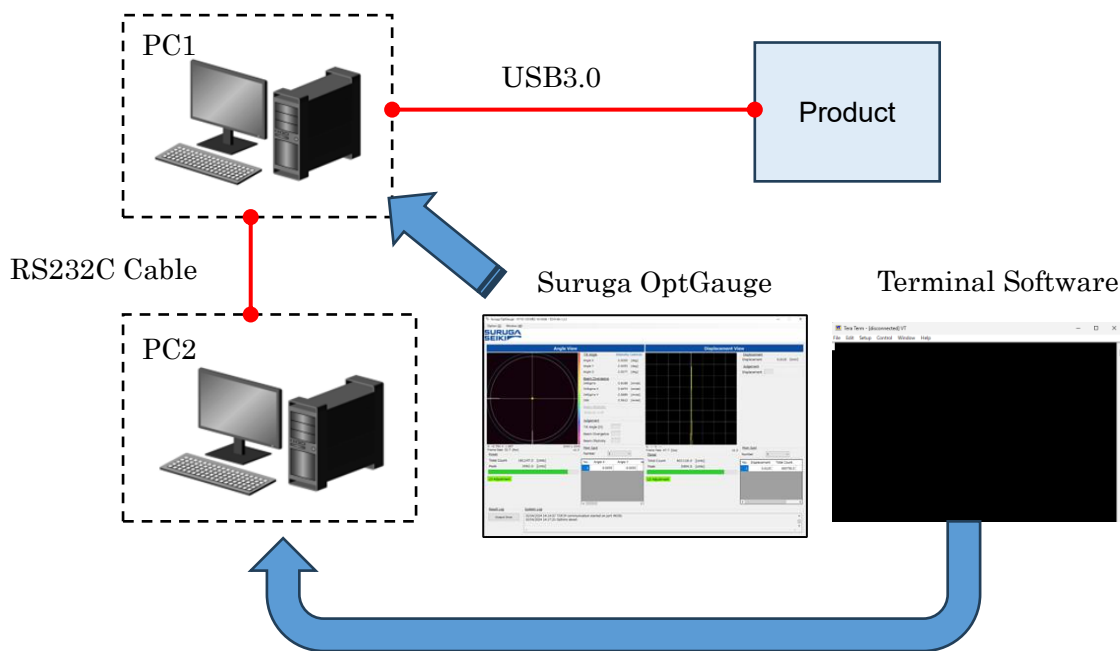
3.1.1 Communication Specifications

Item	Detail
Synchronization method	Asynchronous
Transmission code	UTF-8
Data type	8 bits
Stop bit	1 bit
Parity	None
Flow control	None
Baud rate (bps)	9600 / 19200 / 38400 / 57600 / 115200

3.1.2 Example: Connections via the RS232C Communication

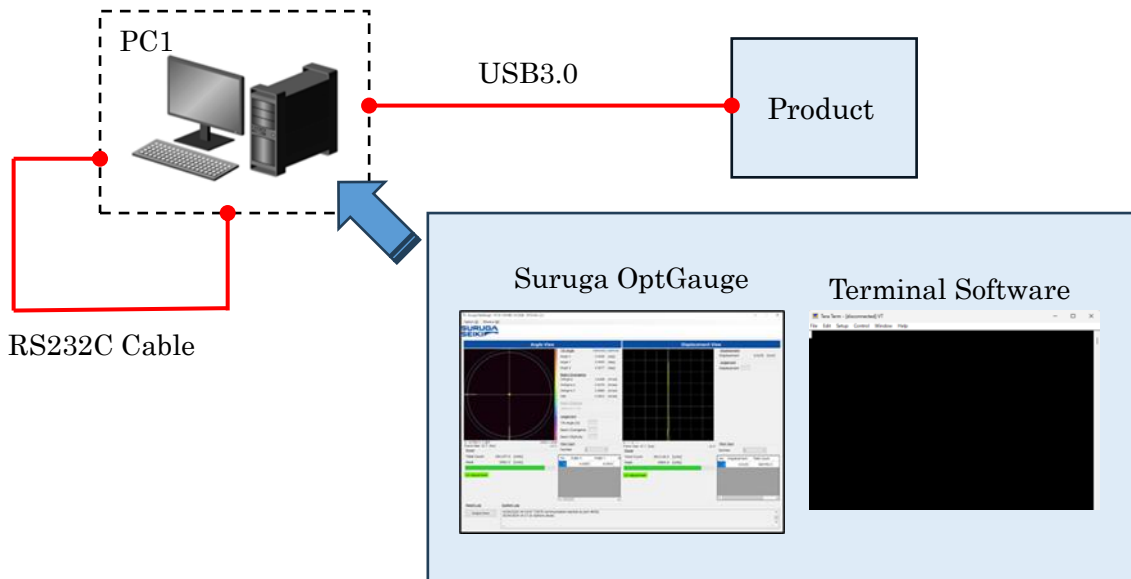
■ Using external PCs for communication

1. Set up two computers and connect with an RS232C cable.
2. Connect the Products to one of the computers, launch Suruga OptGauge, and start measurement.
3. Prepare terminal software on the other computer.
4. Set the communication settings for the command and begin communication.



■ Using the same computer for communication

1. Connect the Products to one computer and then connect the RS232C cable to your own computer.
2. Launch Suruga OptGauge and start measurement.
3. Prepare terminal software on the computer.
4. Set the communication settings for the command and begin communication.



3.1.3 Communication Commands Setting Method

This section describes how to configure the Suruga OptGauge and terminal software for command communication.

■ The Suruga OptGauge

1. Select the [Communication] tab in option settings.
2. Set the "Interface" to "COM" at the Communication Type.
3. Set "Port" and "Baud Rate" (arbitrary) in the COM settings.

*"Port" automatically displays the connected port candidates when RS-232C is connected.

The screenshot shows the 'Communication' tab of the Suruga OptGauge settings. The 'Communication Type' section has a dropdown menu for 'Interface' set to 'COM'. The 'TCP/IP Settings' section has a 'Port' field set to '49350'. The 'COM Settings' section has a 'Port' dropdown set to 'COM1' and a 'Baud Rate' dropdown set to '115200'.

■ Terminal Software

The terminal software, to be provided by the customer, is to be set as below.

1. Set the COM port which matches the "Port" setting in Suruga OptGauge.
2. Set the same baud rate as the "Baud Rate" setting in Suruga OptGauge.
3. For settings other than the above, see the "[Communication Specifications](#)".

3.2 TCP/IP

TCP/IP supports three main connection patterns. After establishing a connection, data is sent and received using terminal software* via TCP/IP communication to exchange commands with the Suruga OptGauge.

*Note: Terminal software must be provided by the users.

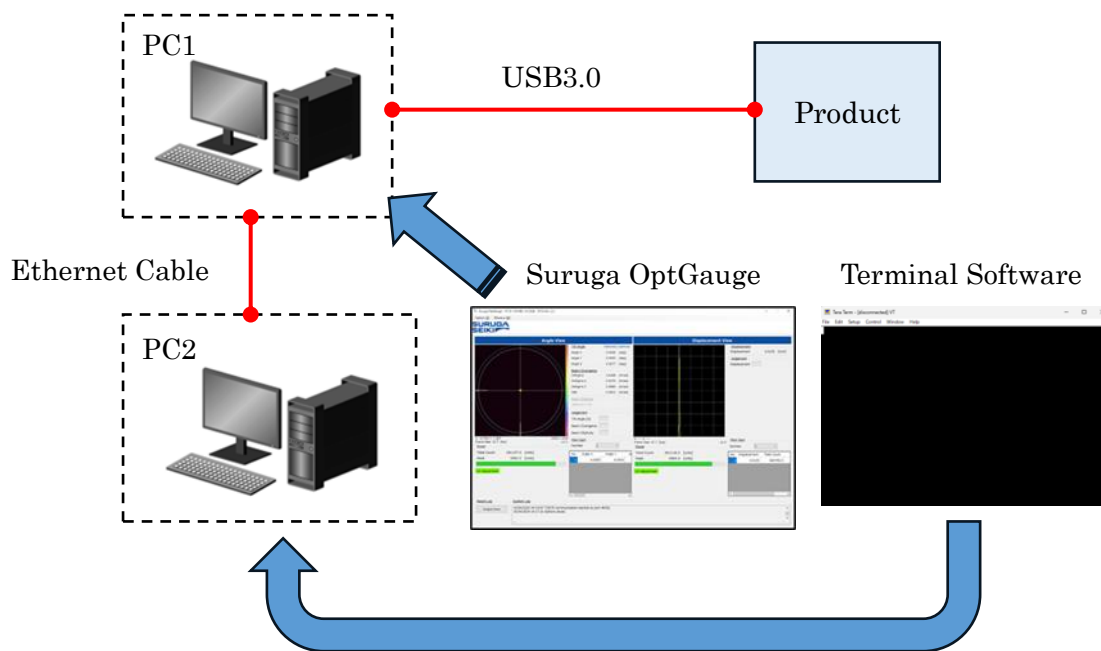
3.2.1 Communication Specifications

Item	Details
Protocol	TCP
IPv4 address	See " Command communication setting method "
Subnet mask	
Default gateway	
DNS server address	
Port Number	Private port range: 49152 to 65535

3.2.2 Example: Connections via TCP/IP Communication

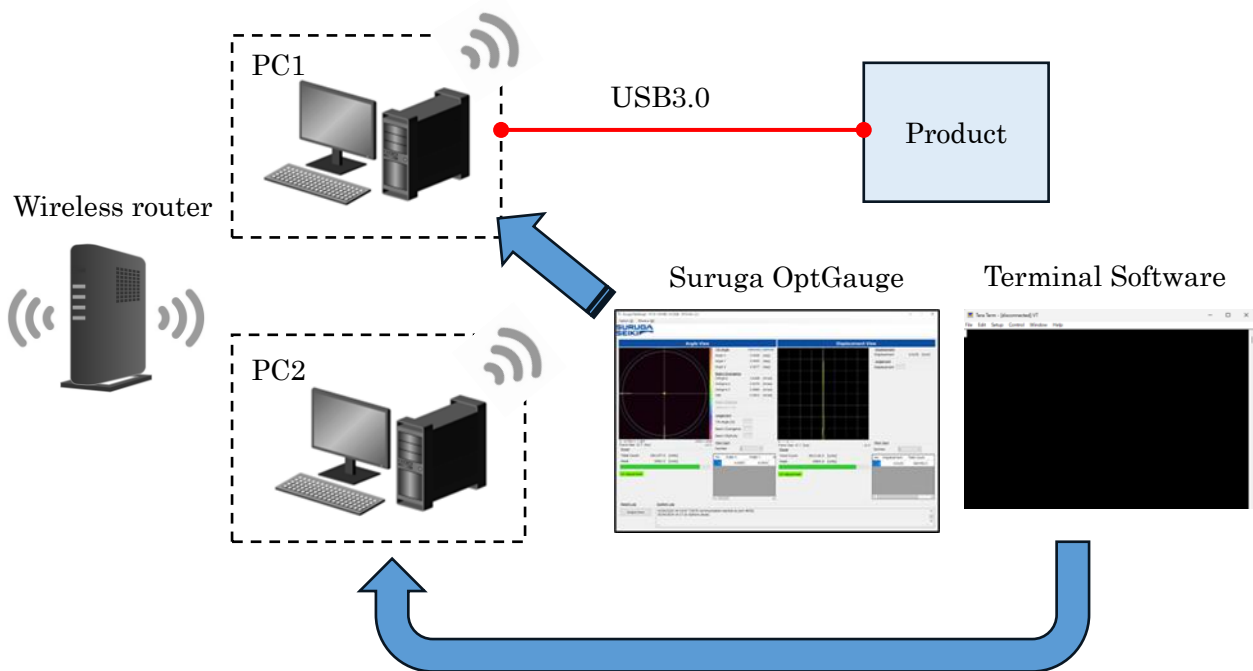
■ Using external devices for communication: Ethernet cable.

1. Set up two computers and connect them with an Ethernet cable.
2. Connect the Products to one of the computers, launch Suruga OptGauge, and start measurement.
3. Prepare terminal software on the other computer.
4. Set the communication settings for the command and start communication.



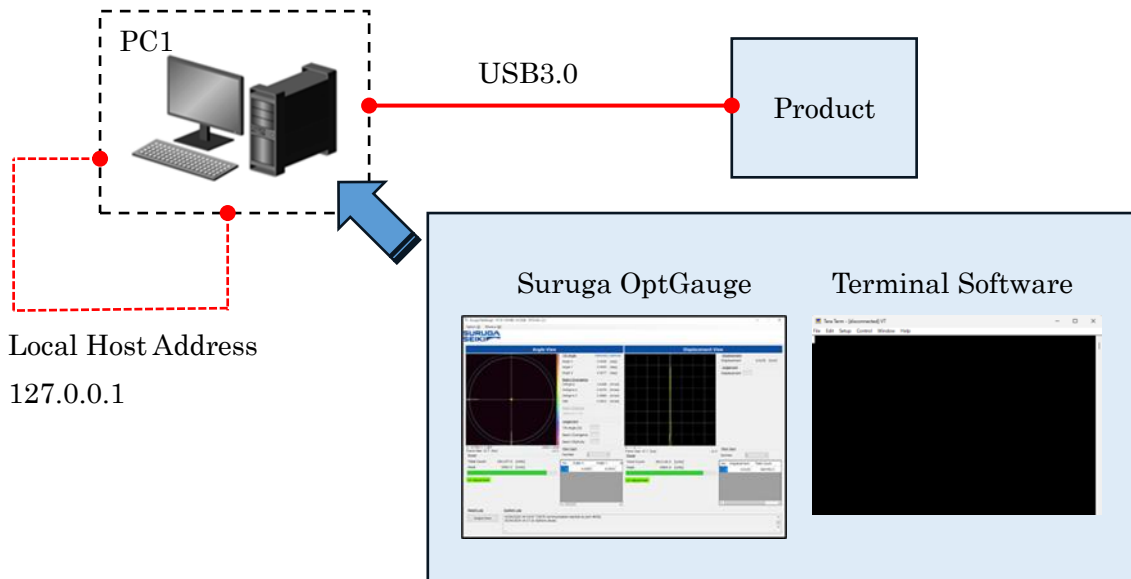
■ Using external devices for communication: Wireless router

1. Set up two computers and connect with a wireless router.
 2. Connect the Products to one of the computers, launch Suruga OptGauge, and start measurement.
 3. Prepare terminal software on the other computer.
- Set the communication settings for the command and start communication.



■ Using the same computer for communication

1. Connect the Products to one computer.
(There is nothing to connect, as the local host address is used).
2. Launch Suruga OptGauge and start measurement.
3. Prepare terminal software on the computer.
4. Set the communication settings for the command and start communication.

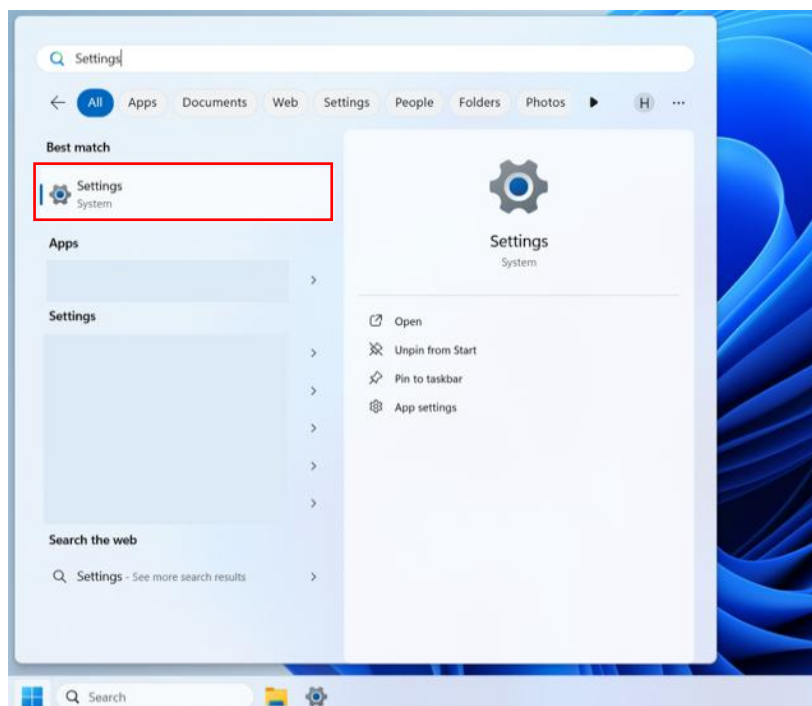


3.2.3 Command Communication Setting Method

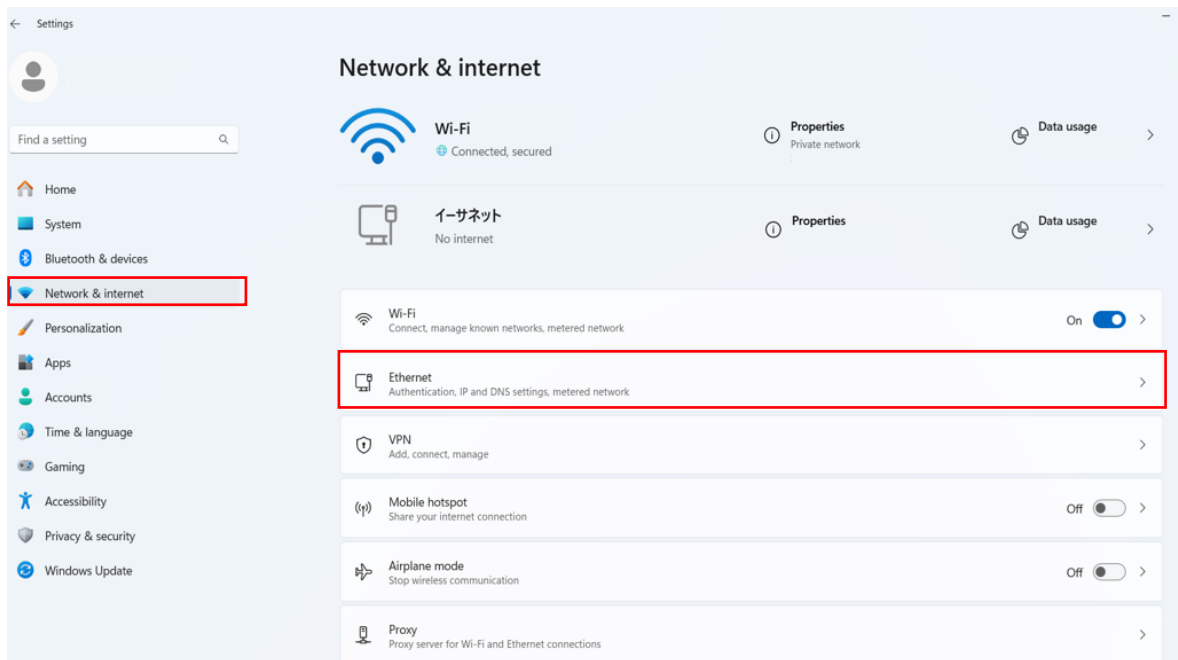
3.2.3.1 Using external devices for communication

PC Settings

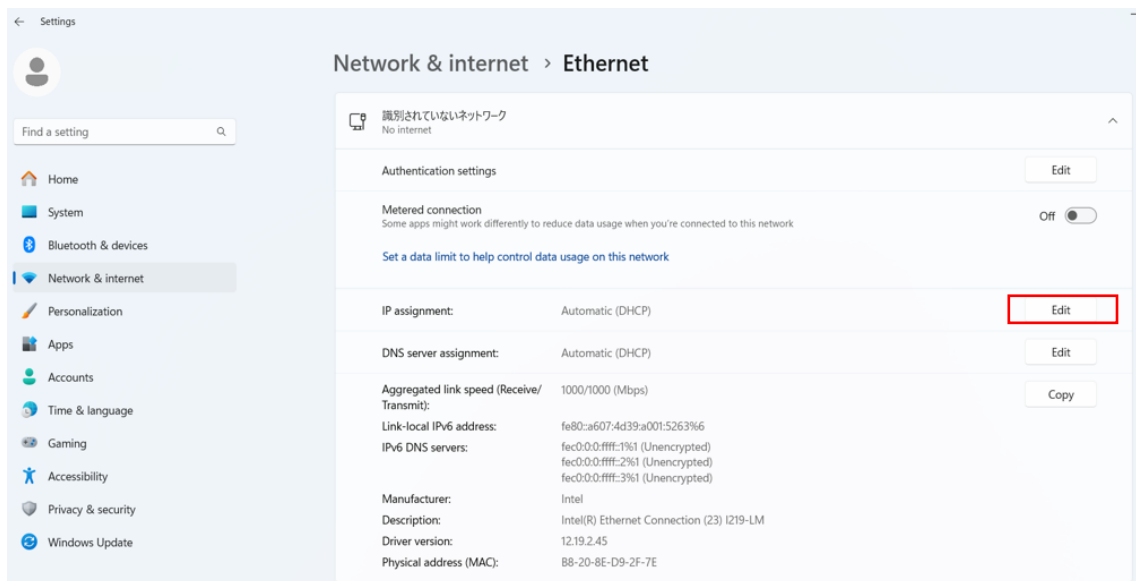
1. Click the [Start] button and select [Settings].



2. Select [Network & Internet], and then select [Ethernet]. If you are using a wireless LAN router, select [Wi-Fi] → [Hardware Properties].



3. Click [Edit] under [IP Assignment].

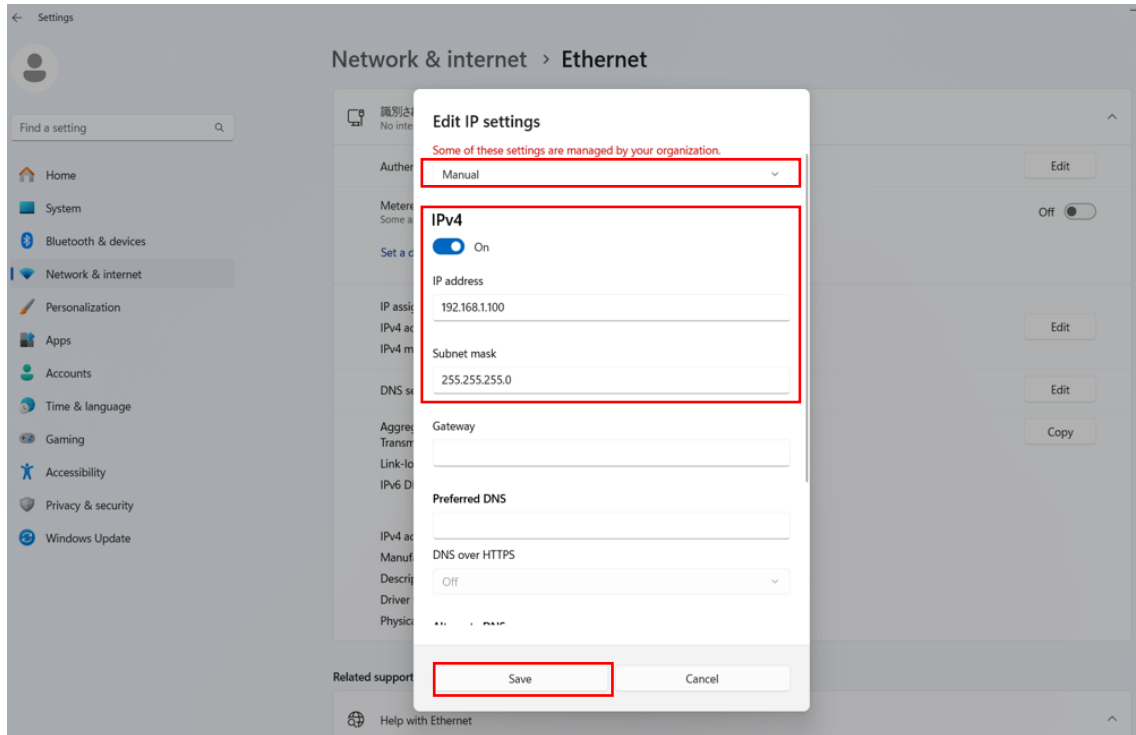


4. Select [Internet Protocol Version 4 (TCP/IPv4) and then select [Properties].

Example)

IP address: 192.168.1.100

Subnet mask: 255.255.255.0



5. Click [Save].

The settings for the PC to which the product is connected are complete.

6. Perform steps 1 through 5 on the other PC as well.

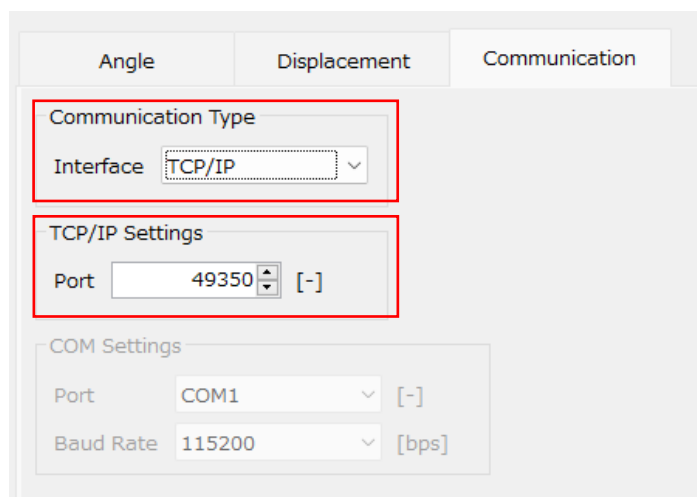
However, when configuring the IP address in step 5, ensure it does not duplicate the following:

EX. IP address: 192.168.1.101 (*change only the last number)

Subnet mask: 255.255.255.0

Setting up the Suruga OptGauge

1. Select the [Communication] tab in option settings.
2. Set "Communication Type - Interface" to "TCP/IP".
3. Set "Port" (arbitrary) in TCP/IP settings.



The screenshot shows the 'Communication' tab of the Suruga OptGauge settings. It features three main sections: 'Communication Type', 'TCP/IP Settings', and 'COM Settings'. The 'Communication Type' section has a dropdown menu for 'Interface' set to 'TCP/IP'. The 'TCP/IP Settings' section has a 'Port' field set to '49350'. The 'COM Settings' section has a 'Port' field set to 'COM1' and a 'Baud Rate' field set to '115200'. Red boxes highlight the 'Interface' dropdown and the 'Port' field in the 'TCP/IP Settings' section.

Section	Field	Value
Communication Type	Interface	TCP/IP
	Port	49350
COM Settings	Port	COM1
	Baud Rate	115200

Terminal Software

The terminal software, to be provided by the customer, is to be set as below.

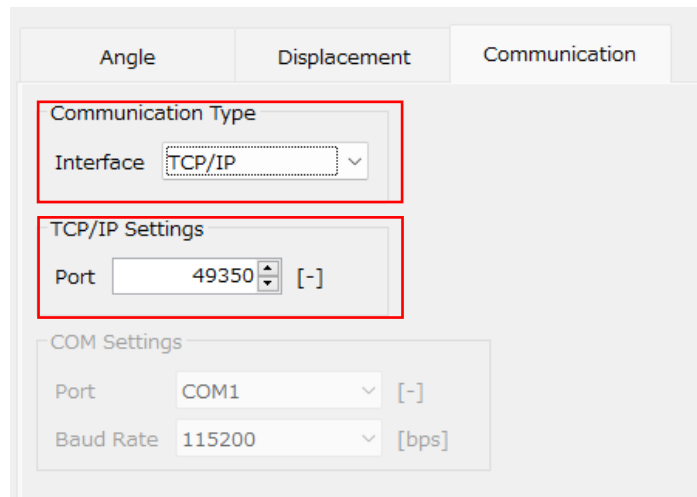
- Designate the IP address set on the computer to which the sensor head is connected, in "Computer settings - When using external devices for communication," as the connection destination.
- Set the TCP port which matches the "Port" setting in the Suruga OptGauge.

**This is the minimum configuration required for command communication using TCP/IP. As this involves network communication. The users are responsible for implementing security and other settings appropriate for their specific use case.*

3.2.3.2 Using the Same Computer for Communication

Setting the Suruga OptGauge

1. Select the [Communication] tab in option settings.
2. Set "Communication Type - Interface" to "TCP/IP".
3. Set "Port" (arbitrary) in TCP/IP settings.



Terminal Software

The terminal software, to be provided by the users, is to be set as below.

- Local host address: Set **127.0.0.1**
- Set the TCP port which matches the "Port" setting in Suruga OptGauge.

3.3 List of Commands

3.3.1 List of Read Commands

3.3.1.1 Common Command

[Read Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	VS		Reads version information
	OL		Reads option list information

3.3.1.2 Angle

[Read Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	AR		Reads measurement result
		MLT	Reads the Angle Multi Spot measurement result
		ASC	Reads the Spot Counts in the Angle multi Spot Count measurement
	AS	LAS	Reas status information of the automatic brightness
	AO	EXT	Reads the sensor camera exposure time
		FRA	Reads the sensor camera frame rate
		ROT	Reads the Rotation configuration
		MHE	Reads the Mirroring horizontal configuration
		MVE	Reads the Mirroring vertical configuration
		MAV	Reads the number of Averaging times configuration
		MAE	Reads the Averaging processing Enabled configuration
		CSP	Reads the Cross Section Point configuration
		OOX	Reads the Origin Offset X value configuration
		OOY	Reads the Origin Offset Y value configuration
		AAM	Reads the Auto Aperture Method configuration
		AAE	Reads the Auto Aperture Enabled configuration
		ROE	Reads the ROI enabled configuration
		RAX	Reads the ROI X value configuration
		RAY	Reads the ROI Y value configuration
		RAW	Reads the ROI Width configuration
		RAH	Reads the ROI Height configuration
		ANT	Reads the Angle Type configuration
		AJE	Reads the Angle Judgement Enabled configuration
		AJV	Reads the Angle Judgement Value configuration
		DJE	Reads the Divergence Judgement Enabled configuration
		DJV	Reads the Divergence Judgement Value configuration
		BRT	Reads the Radius Judgement Type configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	AO	EJE	Reads the Ellipticity Judgement Enabled configuration
		EJV	Reads the Ellipticity Judgement Value configuration
		OJE	Reads the Rotation Angle Judgement Enabled configuration
		OJV	Reads the Rotation Angle Judgement criteria Value configuration
		OJR	Read: Rotation Angle Judgement Range configuration
		PJE	Reads the Peak Judgement Enabled configuration
		PJV	Reads the Peak Judgement Value configuration
		RFP	Reads the log File output Path configuration
		IOE	Reads the image file output enabled configuration
		RAE	Reads the raw data output enabled configuration
		IOC	Reads the Image file Output Color configuration
		IOF	Reads the Image file Output Format configuration
		CNM	Reads the beam Centroid configuration
		ANU	Reads the Angle Unit configuration
		DNE	Reads the Denoising Enabled configuration
		DNT	Reads the Denoising Threshold value configuration
		DAX	Reads the number of Decimal places for the Angle X configuration
		DAY	Reads the number of Decimal places for the Angle Y Configuration
		DAD	Reads the number of Decimal places for the Angle D configuration
		DDS	(Beam Divergence) Reads the number of Decimal places for the D4Sigma or the 1/e2 configuration
		DDX	(Beam divergence) Reads the number of Decimal places for the D4Sigma or the 1/e2 X(M) configuration
		DDY	(Beam divergence) Reads the number of Decimal places for the D4Sigma or the 1/e2 Y(m) configuration
		DD8	(Beam divergence) Reads the number of Decimal places for the D86 configuration
		DEL	Reads the number of Decimal places for the Ellipticity configuration
		DOR	Reads the number of Decimal places for the Rotation Angle configuration
		MSO	(Multi Spot) Reads the Order configuration
		MSC	(Multi Spot) Reads the Spot Count configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	AO	MSM	(Multi Spot) Reads the minimum Spot Area configuration
		ACE	Reads the Adaptive Cal execution button display enabled configuration
		BDT	Reads the Beam Diameter Type configuration
		DOE	Reads the Orientation Enabled configuration
		OCM	Reads the Rotation Angle Measurement method configuration
		BIE	Reads the Binning enabled configuration
		VAA	Reads the Auto Aperture display configuration
		VCC	Reads the Centroid Cursor display configuration
		VCS	Reads the Cross Section display configuration
		VLA	Reads the Labeling Area display configuration
		VMR	Reads the Measurement Range display configuration
		VOC	Reads the Origin Cursor display configuration
		VSA	Reads the Spot Area display configuration
		IST	Reads the Spot Area Type display configuration
		VRA	Reads the ROI Area display configuration
		VOU	Readd the Rotation Angle cursor display configuration
		DSN	Reads the Spot Number display configuration
		VAX	Reads the Angle X result display configuration
		VAY	Reads the Angle Y result display configuration
		VAD	Reads the Angle D result display configuration
		VDS	(Beam Divergence) Reads the D4Sigma or the 1/e2 result display configuration
		VDX	(Beam Divergence) Reads the D4Sigma or the 1/e2 X(M) result display configuration
		VDY	(Beam Divergence) Reads the D4Sigma or the 1/e2 Y(m)result display configuration
		VD8	Reads the D86 result display configuration
		VEL	Reads the Ellipticity result display configuration
		VOR	Reads the Rotation Angle display configuration
		VTC	Reads the Total Count result display configuration
		VPE	Reads the Peak result display configuration
		FAN	Reads the Font size for the Angle configuration
		FBD	Reads the Font size for the Beam Divergence configuration
		FBE	Reads the Font size for the Beam Ellipticity configuration
		FOR	Reads the Font size for the Rotation Angle configuration
		FPO	Reads the Font size for the Power configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	AO	TRM	Reads the external Trigger Mode enabled configuration
		LDP	Reads the LD output value configuration
		LDE	Reads the LD output Enabled configuration
		LAE	Reads the Automatic Brightness execution Enabled configuration
		LAV	Reads the Automatic brightness peak target value configuration
		LAR	Reads the Automatic brightness peak target Range configuration
		LRV	Reads the Reflectance of the target applied in the automatic brightness configuration
		LEI	Reads the Initial Exposure time value applied in the automatic brightness configuration
		LEX	Reads the maximum Exposure time value applied in the Automatic brightness configuration
		LEN	Reads the configuration for the minimum exposure time value used for the automatic brightness
		LLI	Reads the LD output Initial value applied in the Automatic brightness configuration
		LLX	Reads the LD output maximum value applied in the Automatic brightness configuration
		LLN	Reads the LD output minimum value applied in the Automatic brightness configuration

3.3.1.3 Profile

[Read Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	PR		Reads the measurement results
		MLT	Reads the Profile Multi Spot measurement results
		PSC	Reads the Spot Counts in the Profile Multi Spot Count measurement
	PS	LAS	Reas the status information of the automatic brightness
	PO	EXT	Reads the sensor camera exposure time
		FRA	Reads the sensor camera frame rate
		ROT	Reads the Rotation configuration
		MHE	Reads the Mirroring horizontal configuration
		MVE	Reads the Mirroring vertical configuration
		MAV	Reads the number of Averaging times configuration
		MAE	Reads the Averaging processing Enabled configuration
		CSP	Reads the Cross Section Point configuration
		OOX	Reads the Origin Offset X value configuration
		OOY	Reads the Origin Offset Y value configuration
		AAM	Reads the Auto Aperture Method configuration
		AAE	Reads the Auto Aperture Enabled configuration
		ROE	Reads the ROI enabled configuration
		RAX	Reads the ROI X value configuration
		RAY	Reads the ROI Y value configuration
		RAW	Reads the ROI Width configuration
		RAH	Reads the ROI Height configuration
		CJE	Reads the Centroid Judgement Enabled configuration
		CJV	Reads the Centroid Judgement Value configuration
		JDE	Reads the Diameter Judgement Enabled configuration
		DJV	Reads the Diameter Judgement value configuration
		DJT	Reads the Diameter Judgement Type configuration
		EJV	Reads the Ellipticity Judgement Value configuration
		EJE	Reads the Ellipticity Judgement Enalbed configuration
		PJV	Reads the Peak Judgement Value configuration
		PJE	Reads the Peak Judgement Enabled configuration
		OJE	Reads the Rotation Angle Judgement Enabled configuration
		OJV	Reads the Rotation Angle Judgement criteria Value configuration
		OJR	Reads the Rotation Angle Judgement Range configuration
		LJE	Reads the Line Position Judgment Enabled configuration
		LJV	Reads the Line Position Judgment value configuration
		RFP	Reads the log File output Path configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	PO	IOE	Reads the image file output Enabled configuration
		RAE	Reads the RAW data output Enabled configuration
		IOC	Reads the Image file Output Color configuration
		IOF	Reads the Image file Output Format configuration
		BDT	Reads the Beam Diameter Type for calculation configuration
		DOE	Reads the Orientation Enabled configuration
		OCM	Reads the Rotation Angle Measurement method configuration
		LPE	Reads the Line Position measurement Enabled configuration
		LPT	Reads the Line Position measurement straightness Threshold configuration
		CNM	Reads the Beam Centroid configuration
		LNU	Reads the Length Unit configuration
		DNE	Reads the Denoising Enabled configuration
		DNT	Reads the Denoising Threshold value configuration
		DCX	Reads the number of Decimal places for the Centroid X configuration
		DCY	Reads the number of Decimal places for the Centroid Y configuration
		DCD	Reads the number of Decimal places for the Centroid D configuration
		DDS	(Beam Diameter) Reads the number of Decimal places for the D4Sigma or the 1/e2 configuration
		DDX	(Beam Diameter) Reads the number of Decimal places for the D4Sigma or the 1/e2 X(M) configuration
		DDY	(Beam Diameter) Reads the number of Decimal places for the D4Sigma or the 1/e2 Y(m) configuration
		DD8	(Beam Diameter) Reads the number of Decimal places for the D86 configuration
		DEL	Reads the number of Decimal places for the Line Position value configuration
		DOR	Reads the number of Decimal places for the Angle Rotation measurement value configuration
		DLP	Reads the number of Decimal places for the Line Position value configuration
		MSO	(Multi Spot) Reads the Order configuration
		MSC	(Multi Spot) Reads the Spot Count configuration
		MSM	(Multi Spot) Reads the minimum Spot Area configuration
		ACE	(Multi Spot) Reads the Adaptive Cal execution button display Enabled configuration
		BIE	Reads the Binning enabled configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	PO	VAA	Reads the Auto Aperture display configuration
		VCC	Reads the Centroid Cursor display configuration
		VCS	Reads the Cross Section display configuration
		VLA	Reads the Labeling Area display configuration
		VMR	Reads the Measurement Range display configuration
		VOC	Reads the Origin Cursor display configuration
		VSA	Reads the Spot Area display configuration
		IST	Reads the Spot Area Type display configuration
		VRA	Reads the ROI Area display configuration
		DSN	Reads the Spot Number display configuration
		VOU	Reads the Rotation Angle cursor display configuration
		VLC	Reads the Line Position Cursor display configuration
		VCX	Reads the Centroid X result display configuration
		VCY	Reads the Centroid Y result display configuration
		VCD	Reads the Centroid D result display configuration
		VDS	(Beam Diameter) Reads the D4Sigma or the 1/e2 result display configuration
		VDX	(Beam Diameter) Reads the D4Sigma or the 1/e2 X(M) result display configuration
		VDY	(Beam Diameter) Reads the D4Sigma or the 1/e2 Y(m)result display configuration
		VD8	(Beam Diameter) Reads the D86 result display configuration
		VEL	Reads the Ellipticity result display configuration
		VOR	Reads the Rotation Angle result display configuration
		VLP	Reads the Line Position result display configuration
		VTC	Reads the Total Count result display configuration
		VPE	Reads the Peak result display configuration
		FCE	Reads the Font size for the Centroid configuration
		FBD	Reads the Font size for the Beam Diameter configuration
		FBE	Reads the Font size for the Beam Ellipticity configuration
		FOR	Reads the Font size for the Rotation Angle configuration
		FLP	Reads the Font size for the Line Position configuration
		FPO	Reads the Font size for the Power configuration
		TRM	Reads the external Trigger Mode enabled configuration
		LAE	Reads the Automatic Brightness execution Enabled configuration
		LAV	Reads the Automatic brightness peak target value configuration
		LAR	Reads the Automatic brightness peak target Range configuration
		LRV	Reads the Reflectance of the target applied in the Automatic Brightness configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
RD	PO	LEI	Reads the Initial Exposure time value applied in the automatic brightness configuration
		LEX	Reads the maximum Exposure time value applied in the automatic brightness configuration
		LEN	Reads the minimum Exposure time value applied in the automatic brightness configuration

3.3.2 List of Write Commands

3.3.2.1 Common

[Write: Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	OL		Writes the Configuration for the option list

3.3.2.2 Angle

[Write: Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	AO	EXT	Writes the sensor camera Exposure Time
		FRA	Writes the sensor camera Frame Rate
		ROT	Writes the Rotation configuration
		MHE	Writes the Mirroring Horizontal configuration
		MVE	Writes the Mirroring Vertical configuration
		MAV	Writes the number of Averaging times configuration
		MAE	Writes the Averaging processing Enabled configuration
		CSP	Writes the Cross Section Point configuration
		OOX	Writes the Origin Offset X value configuration
		OOY	Writes the Origin Offset Y value configuration
		AAM	Writes the Auto Aperture Method configuration
		AAE	Writes the Auto Aperture enabled configuration
		ROE	Writes the ROI Enabled configuration
		RAX	Writes the ROI X value configuration
		RAY	Writes the ROI Y value configuration
		RAW	Writes the ROI Width configuration
		RAH	Writes the ROI Height configuration
		ANT	Writes the Angle Type configuration
		AJE	Writes the Angle Judgement Enabled configuration
		AJV	Writes the Angle Judgement Value configuration
		DJE	Writes the Divergence Judgement Enabled configuration
		DJV	Writes the Divergence Judgement Value configuration
		BRT	Writes the Radius Type Judgement configuration
		EJE	Writes the Ellipticity Judgment Enabled configuration
		EJV	Writes the Ellipticity Judgement Value configuration
		OJE	Writes the Rotation Angle Judgement Enabled configuration
		OJV	Writes the Rotation Angle Judgement criteria Value configuration
		OJR	Writes the Rotation Angle Judgement Range configuration
		PJE	Writes the Peak Judgment Enabled configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	AO	PJV	Writes the Peak Judgement Value configuration
		RFP	Writes the Log File out Path configuration
		IOE	Writes the Image file Output Enabled configuration
		RAE	Writes the Raw data output Enabled configuration
		IOC	Writes the Image file Output Color configuration
		IOF	Writes the Image file Output Format configuration
		CNM	Writes the Beam Centroid configuration
		ANU	Writes the Angle Unit configuration
		DNE	Writes the Denoising Enabled configuration
		DNT	Writes the Denoising Threshold configuration
		DAX	Writes the Decimal places in the Angle X configuration
		DAY	Writes the Decimal places in the Angle Y configuration
		DAD	Writes Decimal places in the Angle D configuration
		DDS	(Beam Divergence) Writes the Decimal places in the D4Sigma or the 1/e2 configuration
		DDX	(Beam Divergence) Writes the Decimal places in the D4Sigma or the 1/e2 X(M) configuration
		DDY	(Beam Divergence) Writes the Decimal places in the D4Sigma or the 1/e2 Y(m) decimal place configuration
		DD8	(Beam Divergence) Writes the Decimal places in the D86 configuration
		DEL	Writes the Decimal places in the Ellipticity configuration
		DOR	Writes the Decimal places in the Rotation Angle configuration
		MSO	(Multi Spot) Writes the Order configuration
		MSC	(Multi Spot) Writes the Spot Count configuration
		MSM	(Multi Spot) Writes the Minimum Spot area configuration
		ACE	Writes the Adaptive Cal execution button display enabled configuration
		BDT	Writes the Beam Diameter Type for calculation configuration
		DOE	Writes the Orientation Enabled configuration
		OCM	Writes the Rotation Angle Measurement method
		BIE	Writes the Binning Enabled configuration
		VAA	Writes the Auto Aperture display configuration
		VCC	Writes the Centroid Cursor display configuration
		VCS	Writes the Cross Section display configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	AO	VLA	Writes the Labeling Area display configuration
		VMR	Writes the Measurement Range display configuration
		VOC	Writes the Origin Cursor display configuration
		VSA	Writes the Spot Area display configuration
		IST	Writes the Spot area Type display configuration
		VRA	Writes the ROI Area display configuration
		DSN	Writes the Display Spot Number configuration
		VOU	Writes the Rotation Angle Cursor display configuration
		VAX	Writes the Angle X result display enabled configuration
		VAY	Writes the Angle Y result display enabled configuration
		VAD	Writes the Angle D result display enabled configuration
		VDS	(Beam Divergence) Writes the D4Sigma or the 1/e2 result display enabled configuration
		VDX	(Beam Divergence) Writes the D4Sigma or the 1/e2 X(M) result display enabled configuration
		VDY	(Beam Divergence) Writes the D4Sigma or the 1/e2 Y(m) result display enabled configuration
		VD8	(Beam Divergence) Writes the D86 result display enabled configuration
		VEL	(Beam Divergence) Writes the D86 result display enabled configuration
		VOR	Writes the Rotation Angle result display configuration
		VTC	Writes the Total Count result display enabled configuration
		VPE	Writes the Peak result display Enabled configuration
		FAN	Writes the Font size for the Angle configuration
		FBD	Writes the Font size for the beam spread configuration
		FBE	Writes the Font size for the beam ellipticity configuration
		FOR	Writes the Font size for the Rotation angle configuration
		FPO	Writes the Font size for the Power configuration
		TRM	Writes the external Trigger Mode enabled configuration
		LDP	Writes the LD Power output value configuration
		LDE	Writes the LD output Enabled configuration
		LAE	Writes the Automatic brightness execution Enabled configuration
		LAV	Writes the Automatic brightness peak target Value configuration
		LAR	the Automatic brightness peak target Range configuration
		LRV	Writes the Reflectance of the target applied in the Automatic brightness configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	AO	LEI	Writes the Exposure time Initial value applied in the automatic brightness configuration
		LEX	Writes the maximum Exposure time applied in the automatic brightness configuration
		LEN	Writes the minimum Exposure time applied in the automatic brightness configuration
		LLI	Writes the LD output Initial value applied in automatic brightness
		LLX	Writes the LD output maximum value applied in the automatic brightness configuration
		LLN	Writes the LD output minimum value applied in the automatic brightness configuration

3.3.2.3 Profile

[Write: Commands]

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	PO	EXT	Writes the sensor camera Exposure Time
		FRA	Writes the sensor camera Frame Rate
		ROT	Writes the Rotation configuration
		MHE	Writes the Mirroring Horizontal configuration
		MVE	Writes the Mirroring Vertical configuration
		MAV	Writes the number of Averaging times configuration
		MAE	Writes the Averaging processing Enabled configuration
		CSP	Writes the Cross Section Point configuration
		OOX	Writes the Origin Offset X value configuration
		OOY	Writes the Origin Offset Y value configuration
		AAM	Writes the Auto Aperture Method configuration
		AAE	Writes the Auto Aperture enabled configuration
		ROE	Writes the ROI Enabled configuration
		RAX	Writes the ROI X value configuration
		RAY	Writes the ROI Y value configuration
		RAW	Writes the ROI Width configuration
		RAH	Writes the ROI Height configuration
		CJE	Writes the Centroid Judgement Enabled configuration
		CJV	Writes the Centroid Judgement value configuration
		JDE	Write the Diameter judgement Enabled configuration
		DJV	Writes the Diameter Judgement value configuration
		DJT	Writes the Diameter Judgement Type configuration
		EJE	Writes the Ellipticity Judgement Enabled configuration
		EJV	Writes the Ellipticity Judgement Value configuration
		PJE	Writes the Peak Judgement Enabled configuration
		PJV	Writes the Peak Judgement Value configuration
		OJE	Writes the Rotation Angle Judgement Enabled configuration
		OJV	Writes the Rotation Angle Judgement criteria Value configuration
		OJR	Writes the Rotation Angle Judgement Range configuration
		LJE	Writes the Line Position Judgment Enabled configuration
		LJV	Writes the Line Position Judgment value configuration
		RFP	Writes the log File output Path configuration
		IOE	Writes the image file output Enabled configuration
		RAE	Writes the RAW data output Enabled configuration
		IOC	Writes the Image file Output Color configuration
		IOF	Writes the Image file Output Format configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	PO	BDT	Writes the Beam Diameter Type for calculation configuration
		DOE	Writes the Orientation Enabled configuration
		OCM	Writes the Rotation Angle Measurement method configuration
		LPE	Writes the Line Position measurement Enabled configuration
		LPT	Writes the Line Position measurement straightness Threshold configuration
		CNM	Writes the Beam Centroid configuration
		LNU	Writes the Length Unit configuration
		DNE	Writes the Denoising Enabled configuration
		DNT	Writes the Denoising Threshold value configuration
		DCX	Writes the number of Decimal places for the Centroid X configuration
		DCY	Writes the number of Decimal places for the Centroid Y configuration
		DCD	Writes the number of Decimal places for the Centroid D configuration
		DDS	(Beam Diameter) Writes the number of Decimal places for the D4Sigma or the 1/e2 configuration
		DDX	(Beam Diameter) Writes the number of Decimal places for the D4Sigma or the 1/e2 X(M) configuration
		DDY	(Beam Diameter) Writes the number of Decimal places for the D4Sigma or the 1/e2 Y(m) configuration
		DD8	(Beam Diameter) Writes the number of Decimal places for the D86 configuration
		DEL	Writes the number of Decimal places for the Ellipticity configuration
		DOR	Writes the number of Decimal places for the Angle Rotation configuration
		DLP	Writes the number of Decimal places for the Line Position configuration
		MSO	(Multi Spot) Writes the Order configuration
		MSC	(Multi Spot) Writes the Spot Count configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	PO	MSM	(Multi Spot) Writes the minimum Spot Area configuration
		ACE	Writes the Adaptive Cal execution button display Enabled configuration
		BIE	Writes the Binning enabled configuration
		VAA	Writes the Auto Aperture display configuration
		VCC	Writes the Centroid Cursor display configuration
		VCS	Writes the Cross Section display configuration
		VLA	Writes the Labeling Area display configuration
		VMR	Writes the Measurement Range display configuration
		VOC	Writes the Origin Cursor display configuration
		VSA	Writes the Spot Area display configuration
		IST	Writes the Spot Area Type display configuration
		VRA	Writes the ROI Area display configuration
		DSN	Writes the Spot Number display configuration
		VOU	Writes the Rotation Angle cursor display configuration
		VLC	Writes the Line Position Cursor display configuration
		VCX	Writes the Centroid X result display configuration
		VCY	Writes the Centroid Y result display configuration
		VCD	Writes the Centroid D result display configuration
		VDS	(Beam Diameter) Writes the D4Sigma or the 1/e2 result display configuration
		VDX	(Beam Diameter) Writes the D4Sigma or the 1/e2 X(M) result display configuration
		VDY	(Beam Diameter) Writes the D4Sigma or the 1/e2 Y(m)result display configuration
		VD8	(Beam Diameter) Writes the D86 result display configuration
		VEL	Writes the Ellipticity result display configuration
		VOR	Writes the Rotation Angle result display configuration
		VLP	Writes the Line Position result display configuration
		VTC	Writes the Total Count result display configuration
		VPE	Writes the Peak result display configuration
		FCE	Writes the Font size for the Centroid configuration
		FBD	Writes the Font size for the Beam Diameter configuration
		FBE	Writes the Font size for the Beam Ellipticity configuration
		FOR	Writes the Font size for the Rotation Angle configuration
		FLP	Writes the Font size for the Line Position configuration
		FPO	Writes the Font size for the Power configuration
		TRM	Writes the external Trigger Mode enabled configuration

Command Type	Command Parameter 0	Command Parameter 1	Command Description
WR	PO	LAE	Writes the Automatic Brightness execution Enabled configuration
		LAV	Writes the Automatic brightness peak target Value configuration
		LAR	Reads the Automatic brightness peak target Range configuration
		LRV	Reads the Reflectance of the target configuration
		LEI	Reads the Initial Exposure time value applied in the automatic brightness configuration
		LEX	Writes the maximum Exposure time value applied in the Automatic brightness configuration
		LEN	Writes the minimum exposure time value applied in the automatic brightness configuration

3.3.3 List of Execute Commands

[Execute Commands]

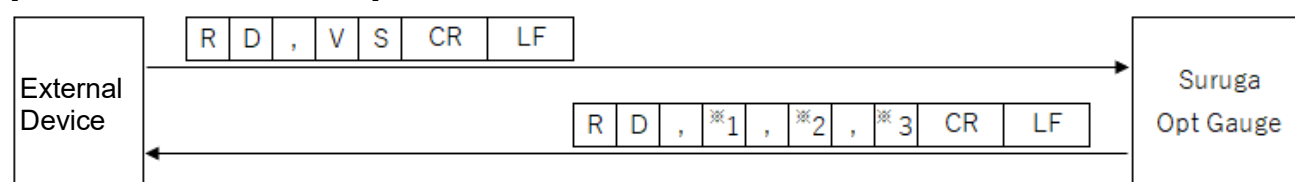
Command Type	Command Parameter 0	Command Parameter 1	Command Description
EX	SV		Executes the options save
	AL		Executes the automatic brightness for the angle measurement
	PL		Executes the automatic brightness for the profile measurement
	AR	MSN	Executes Angle Main Spot Number Switching
	PR	MSN	Executes Profile Main Spot Number Switching
	RO		Executes Measurement Result Log Output
	AZ		Executes the angle zero set
	PZ		Executes the profile zero set

3.4 Read Commands

3.4.1 Command Format

3.4.1.1 Common

[Read: Version information]

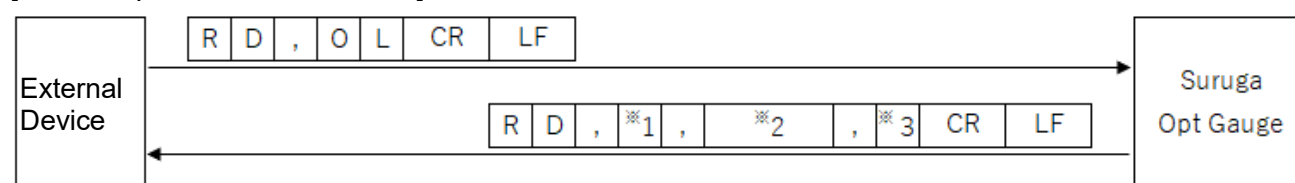


*1: Major number.

*2: Minor number.

*3: Build number.

[Read: Option List Information]



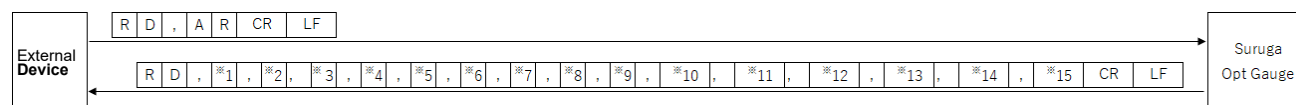
*1: Number of option lists.

*2: Option name (includes many option names as there are option lists, separated with commas).

*3: Index indicating selected options.

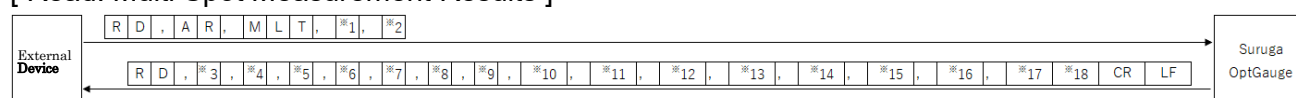
3.4.1.2 Angle

[Read: Measurement Results]



- *1: Tilt Angle/Beam Angle: Angle X measurement value.
- *2: Tilt Angle/Beam Angle: Angle Y measurement value.
- *3: Tilt Angle/Beam Angle: Angle D measurement value.
- *4: Beam Divergence: D4Sigma measurement value.
- *5: Beam Divergence: D4Sigma X(M) measurement value.
- *6: Beam Divergence: D4Sigma Y (m) measurement value.
- *7: Beam Divergence: D86 measurement value.
- *8: Beam Ellipticity measurement value.
- *9: Beam: Total count value.
- *10: Beam: Peak value.
- *11: Judgement: Tilt angle (D) judgement result (OK / NG).
- *12: Judgement: Beam divergence judgement result (OK / NG).
- *13: Judgement: Ellipticity judgement result (OK / NG).
- *14: Judgement: Peak judgement result (OK / NG).
- *15: Angle Unit (degree / DegMinSec / milli-radian).
- *16: Orientation measurement results.
- *17: Orientation judgement result.

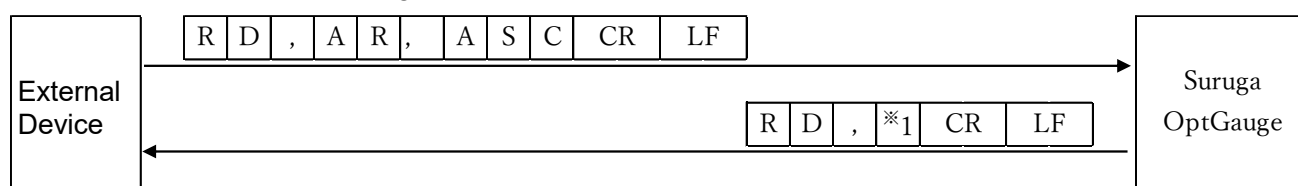
[Read: Multi Spot Measurement Results]



- *1: Acquisition Start Spot Number (1 to 100).
- *2: Consecutive Spot Count to Read from*1 (1 to 100).
- *3:Tilt Angle / Beam Angle: Angle X measurement value.
- *4: Tilt Angle / Beam Angle: Angle Y measurement value.
- *5: Tilt Angle / Beam Angle: Angle D measurement value.
- *6: Beam Divergence: D4Sigma or 1/e2 measurement value.
- *7: Beam Divergence: D4Sigma X(M) or 1/e2 X(M) measurement value.
- *8: Beam Divergence: D4Sigma Y (m) or 1/e2 Y(m) measurement value.
- *9: Beam Divergence: D86 measurement value.
- *10: Beam Ellipticity measurement value.
- *11: Beam: Total Count value.
- *12: Beam: Peak value.

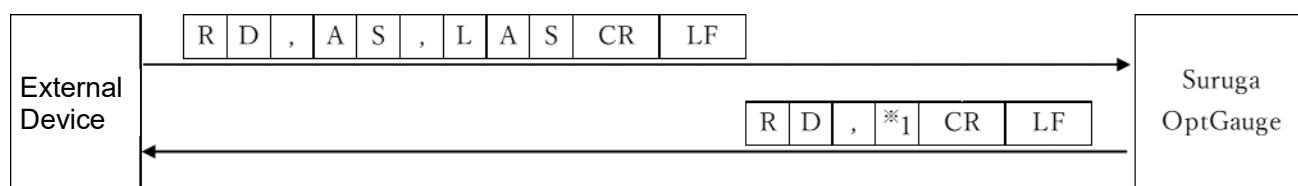
- *13: Judgement: Tilt Angle (D) judgement result (OK / NG).
- *14: Judgement: Beam Divergence judgement result (OK / NG).
- *15: Judgement: Ellipticity judgement result (OK / NG).
- *16: Judgement: Peak judgement result (OK / NG).
- *17: Angle Unit (degree / DegMinSec / milli-radian).
- *18: Orientation measurement value.
- *19: Judgement : Orientation judgement result (OK / NG).
- *20: Measurement Results of the *3 to *19 specified in *2,
(The specified number of results will be included, separated by “,”).

[Read: Spot Counts in the Angle Multi Spot Count Measurement]



*1: Spot Count (0 to 100).

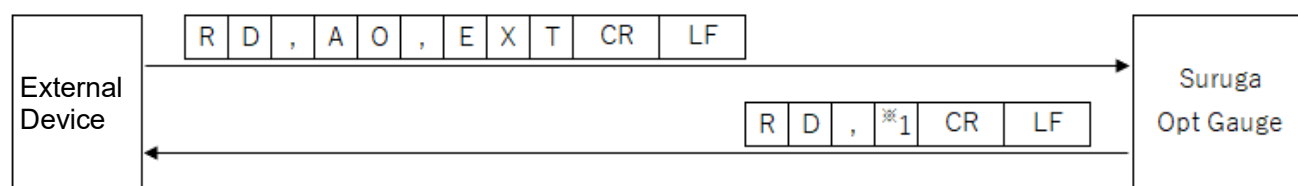
[Read: Status Information of the Automatic Brightness]



*1: Dimming status

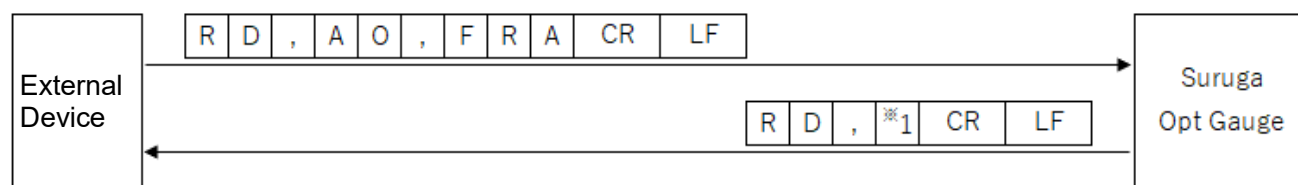
("0" = dimming complete, "1" = dimming in process, "2" = dimming failed, "3" = dimming not started)

[Read: Sensor Camera Exposure Time]



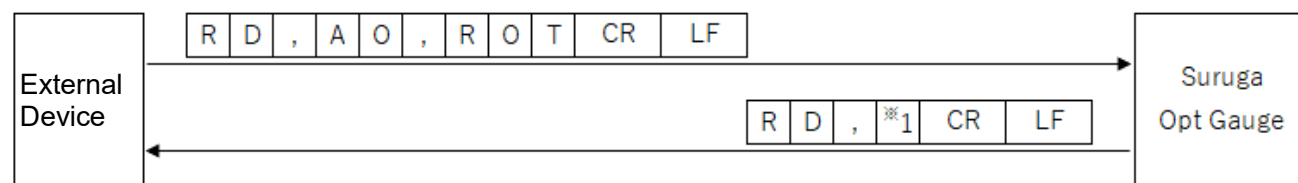
*1: Exposure time (0.027 to 2000)

[Read: Sensor Camera Frame rate]



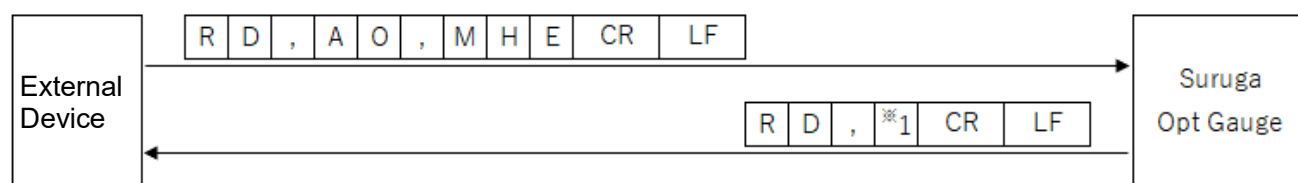
※1: Frame rate (0.1 to 100).

[Read: Rotation Configuration]



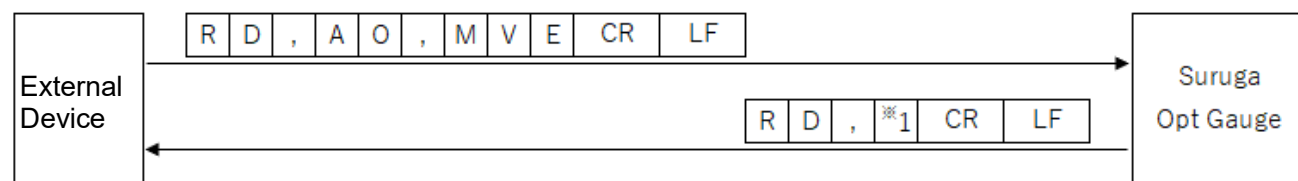
※1: Rotation ("0" = OFF, "1" = Rotation right 90°, "2" = Rotation right 180°, "3" = Rotation right 270°).

[Read: Mirroring Horizontal Configuration]



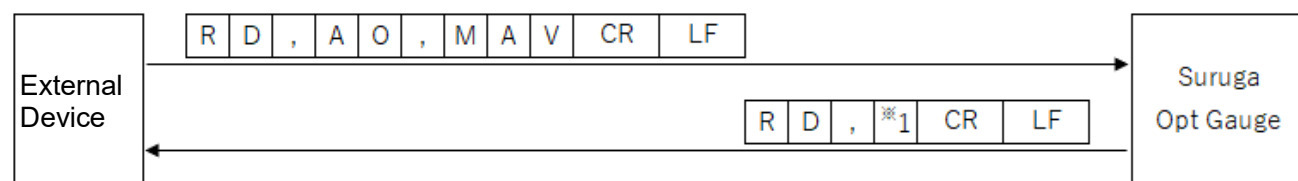
※1: Mirroring ("0" = OFF, "1" = Horizontal mirroring display).

[Read: Mirroring Vertical Configuration]



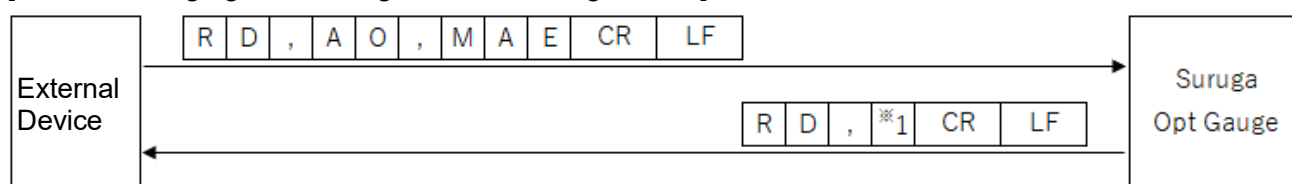
※1: Mirroring ("0" = OFF, "1" = Vertical Mirroring).

[Read: the Number of Averaging Times Configuration]



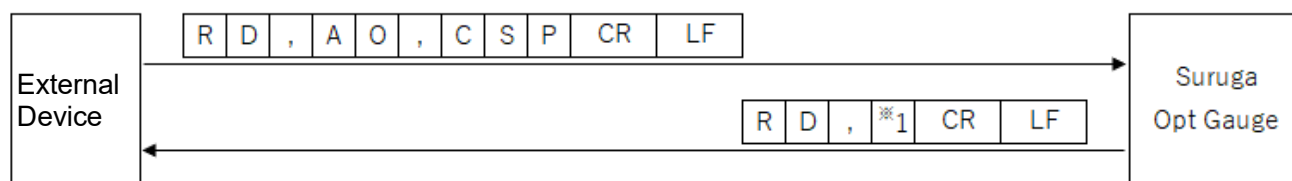
※1: the Number of Averaging times (2 to 262,144).

[Read: Averaging Processing Enabled Configuration]



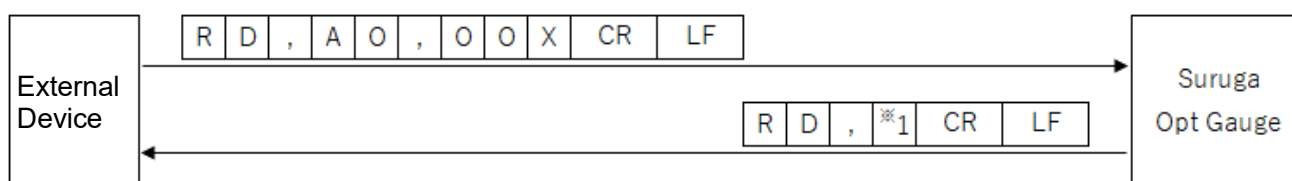
*1: Averaging processing ("0" = disabled, "1" = enabled).

[Read: Cross Section Point Configuration]



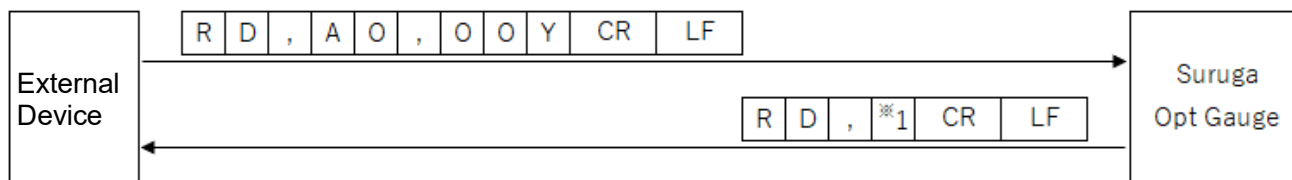
*1: Cross section point ("0" = Origin Cursor, "1" = Beam Cursor).

[Read: Origin Offset X Value Configuration]



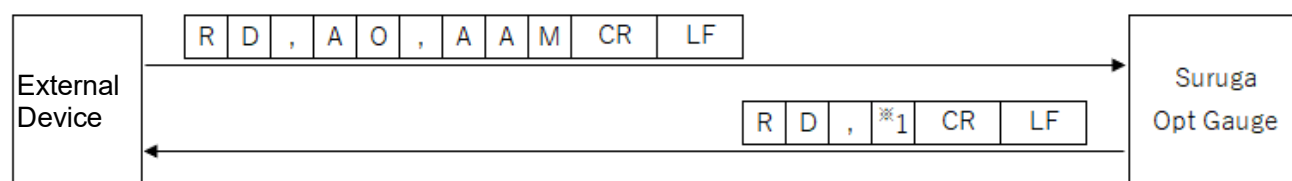
*1: Origin Offset X (- 20 to + 20).

[Read: Origin Offset Y Value Configuration]



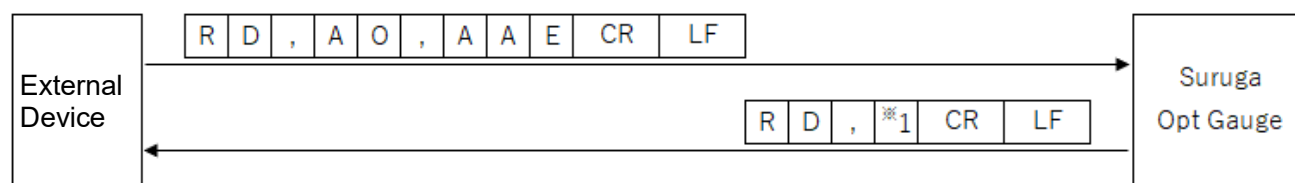
*1: Origin Offset Y (-20 to + 20).

[Read: Auto Aperture Method Configuration]



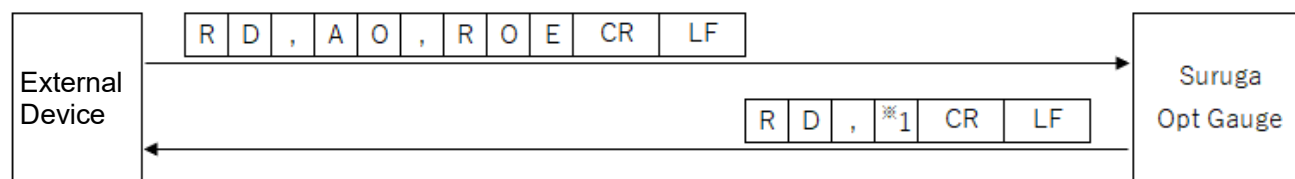
*1: Auto aperture method ("0" = Area, "1" = Luminance).

[Read: Auto Aperture Enabled Configuration]



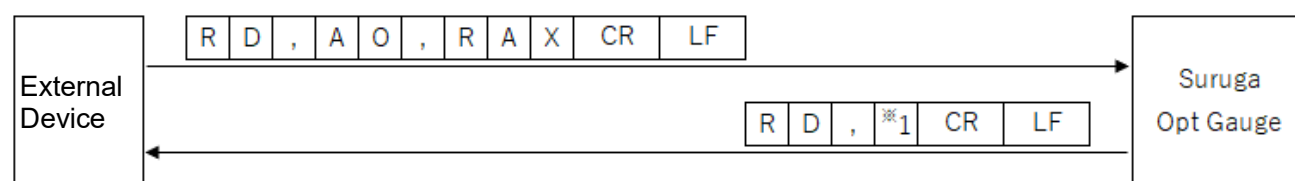
※1: Auto Aperture ("0" = disabled, "1" = enabled).

[Read: ROI Enabled Configuration]



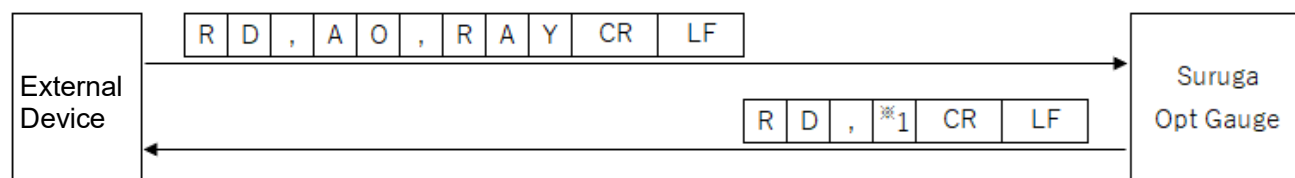
※1: ROI ("0" = disabled, "1" = enabled).

[Read: ROI X Value Configuration]



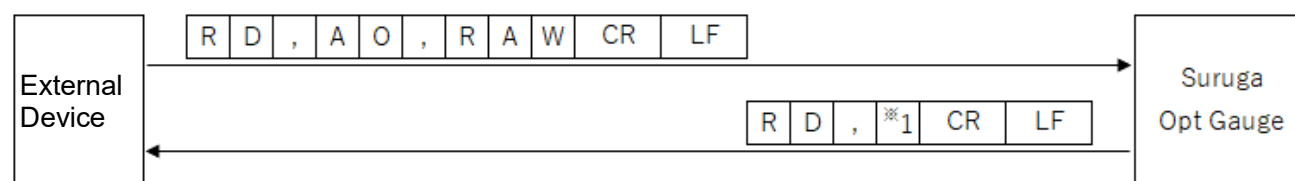
※1: ROI X value (- 3000 to + 3000) or (-1500 to + 1500) if the Binning is enabled.

[Read: ROI Y value Configuration]



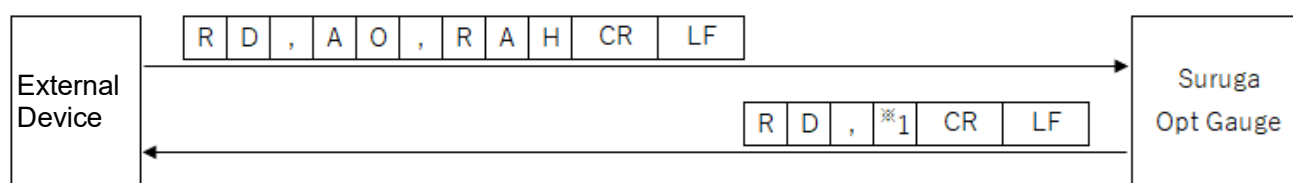
※1: ROI Y value (- 3000 to + 3000) or (-1500 to + 1500) if the Binning is enabled.

[Read: ROI Width Configuration]



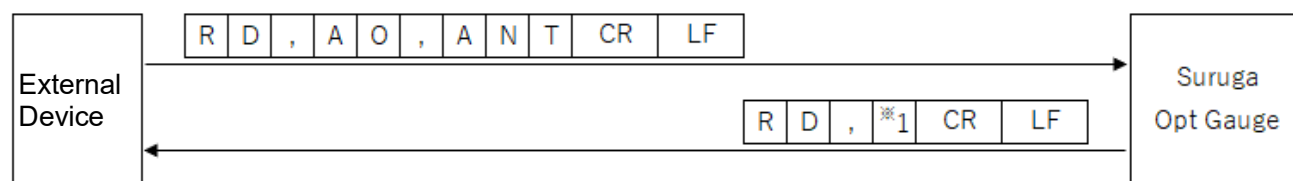
※1: ROI width (- 3000 to + 3000) or (-1500 to + 1500) if the Binning is enabled.

[Read: ROI Height Configuration]



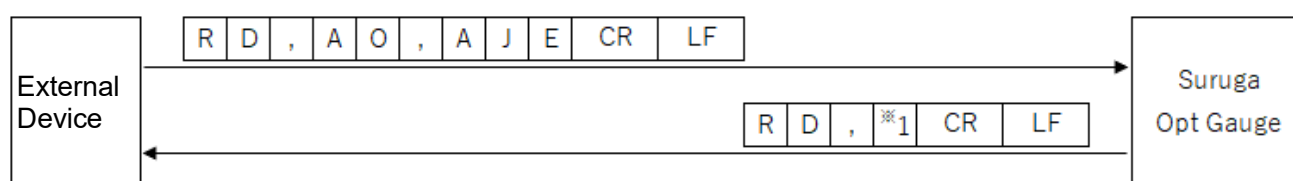
※1: ROI height (0 to 3000) or (0 to 1500) if the Binning is enabled.

[Read: Angle Type Configuration]



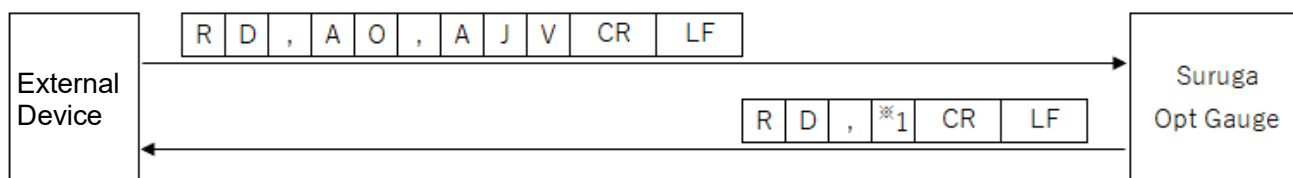
※1: Angle type ("0" = Tilt Angle, "1" = Beam Angle).

[Read: Angle Judgement Enabled Configuration]



※1: Angle judgement ("0" = disabled, "1" = enabled).

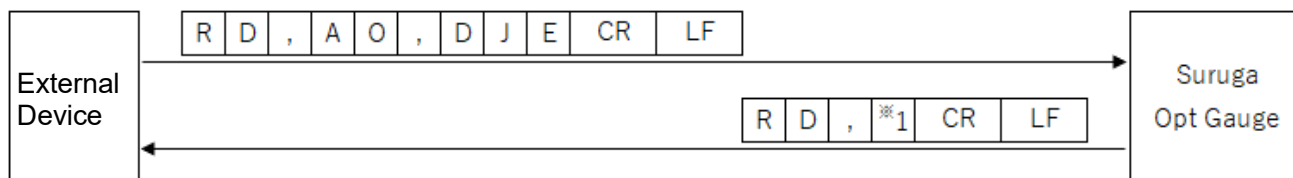
[Read: Angle Judgement Value Configuration]



※1: Angle judgement value:

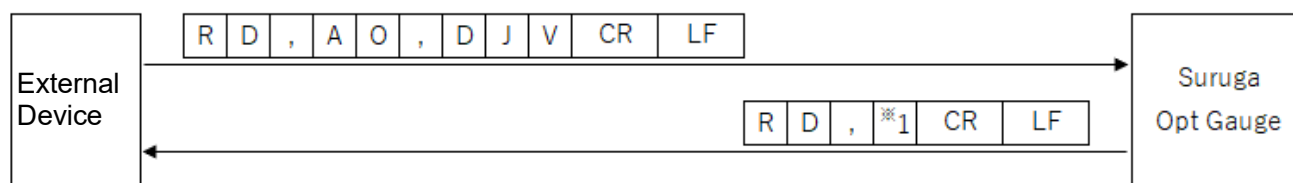
If the Angle Type = "Tilt", then (0 to 10.0000). If the Angle Type = "Beam", then (0 to 20.0000).

[Read: Divergence Judgement Enabled Configuration]



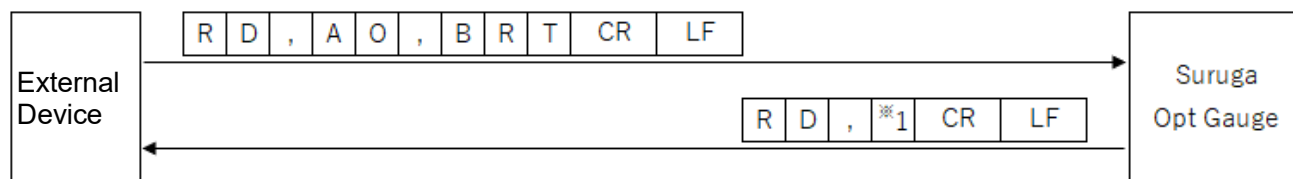
※1: Divergence judgement ("0" = disabled, "1" = enabled)

[Read: Divergence Judgement Value Configuration]



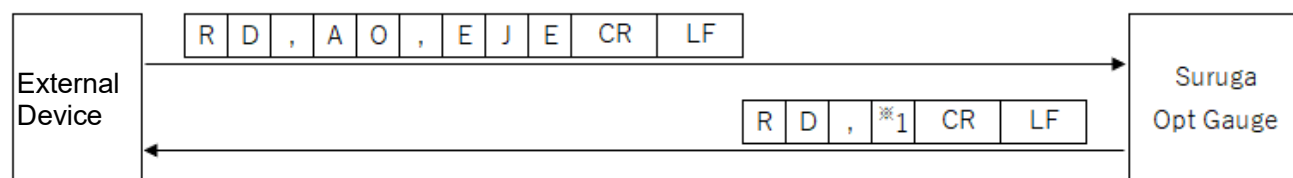
※1: Divergence judgement value (0.0000 to 1000.0000).

[Read: Radius Type Judgement Configuration]



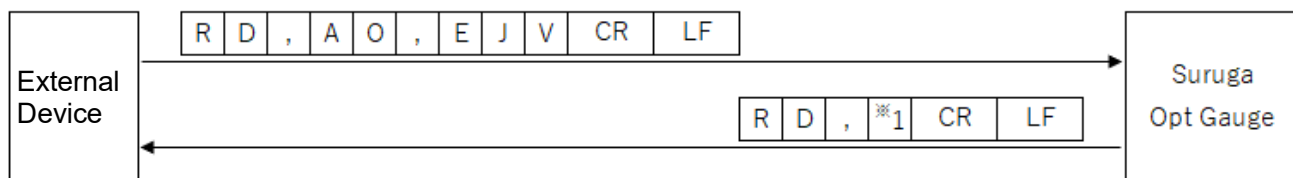
※1: Radius type judgement ("0" = D4Sigma or 1/e², "1" = D86).

[Read: Ellipticity Judgment Enabled Configuration]



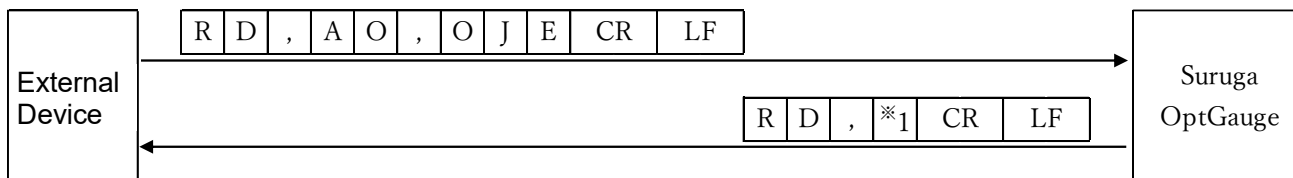
※1: Ellipticity judgement ("0" = disabled, "1" = enabled).

[Read: Ellipticity Judgement Value Configuration]



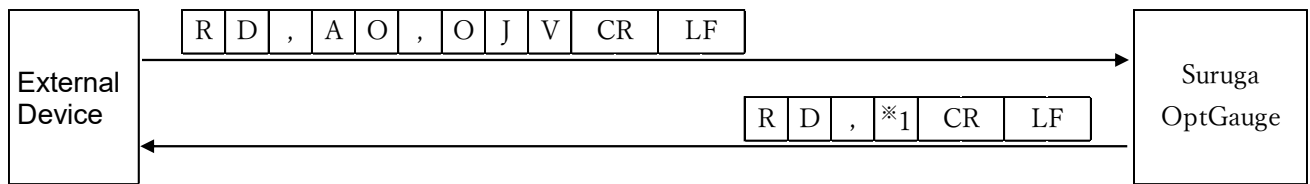
※1: Ellipticity judgement value (0.0000 to 1.0000).

[Read: Rotation Angle Judgement Enabled Configuration]



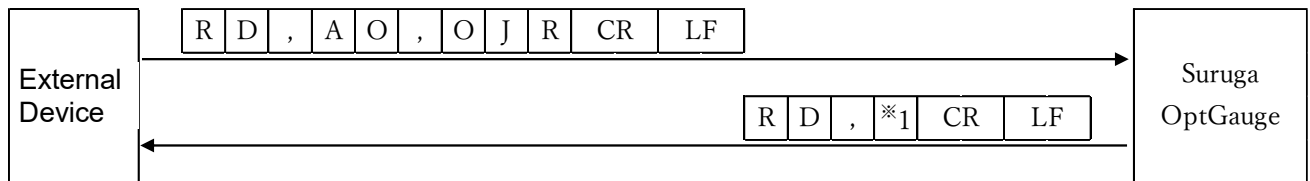
※1: Rotation angle judgement ("0" = disabled, "1" = enabled).

[Read: Rotation Angle Judgement Criteria Value Configuration]



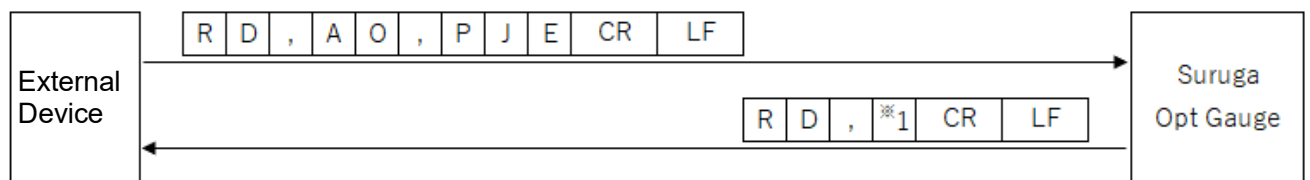
*1: Rotation angle judgement criteria value (- 90.0000 to + 90.0000).

[Read: Rotation Angle Judgement Value Range Configuration]



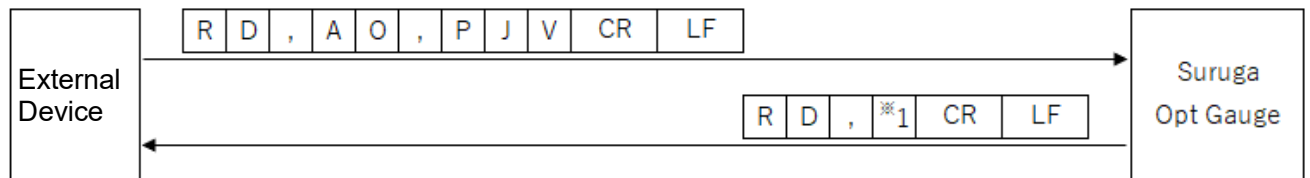
*1 Rotation angle judgement value range (-90.0000 to 90.0000).

[Read: Peak Judgement Enabled Configuration]



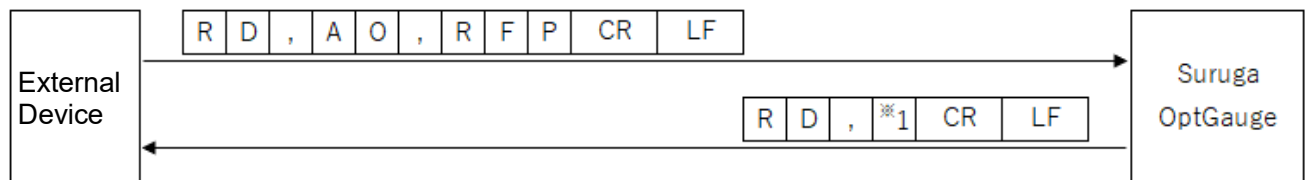
*1: Peak judgement ("0" = disabled, "1" = enabled).

[Read: Peak Judgement Value Configuration]



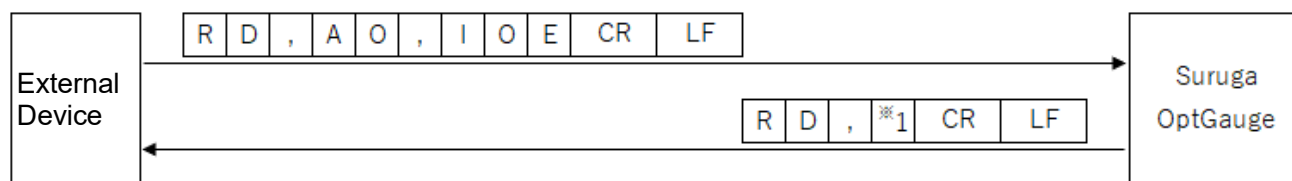
*1: Peak judgement value (0.0 to 4095.0).

[Read: Log File Output Path Configuration]



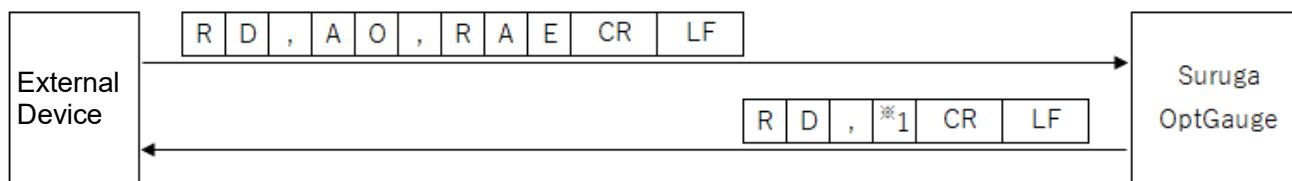
*1: Log file path strings.

[Read: Image File Output Enabled Configuration]



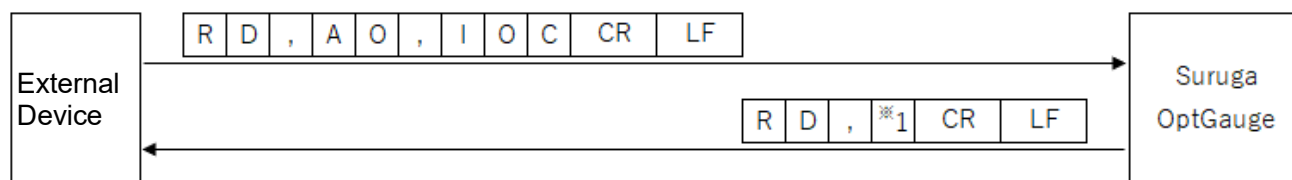
※1: Image File Output (“0” = disabled, “1” = enabled).

[Read: RAW Data Output Enabled Configuration]



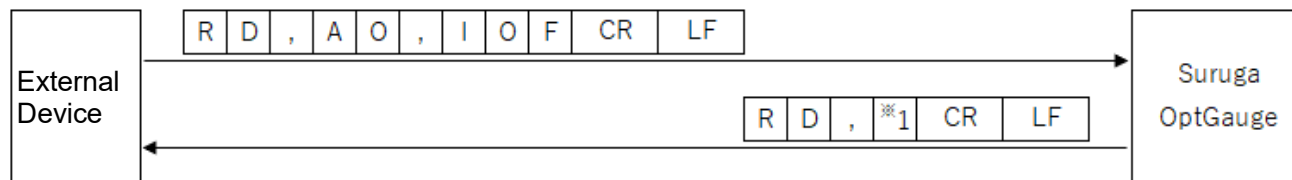
※1: RAW data output (“0” = disabled, “1” = enabled).

[Read: Image File Output Color Configuration]



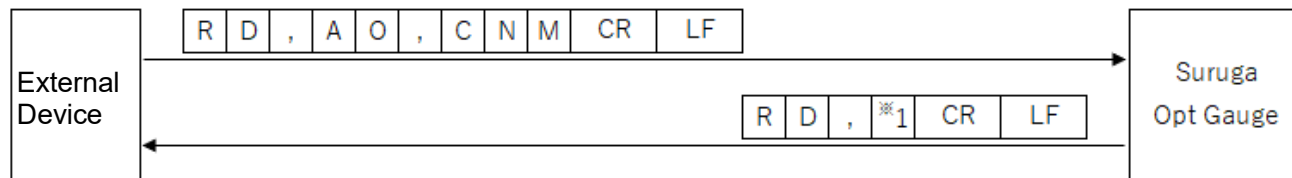
※1: Image file output color (“0”= Full Color, “1”= Grayscale).

[Read: Image File output format configuration]



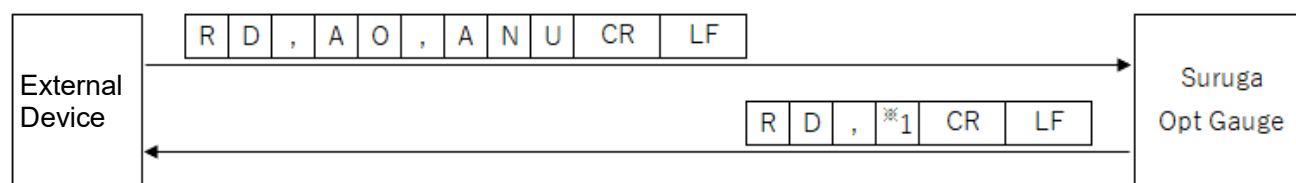
※1: Image file output format (“0”= png, “1”= bmp, “2”= tiff).

[Read: Beam Centroid Configuration]



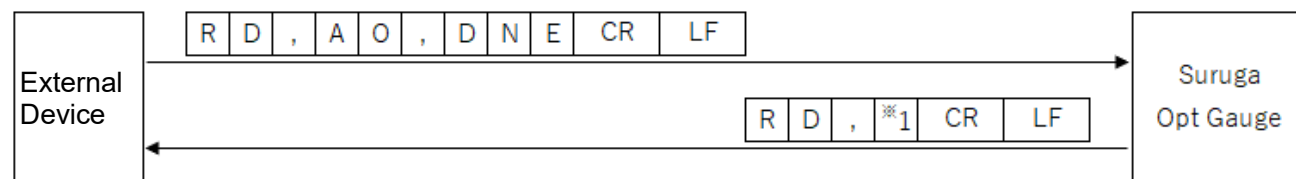
※1: Beam centroid (“0” = area, “1” = intensity).

[Read: Angle Unit Configuration]



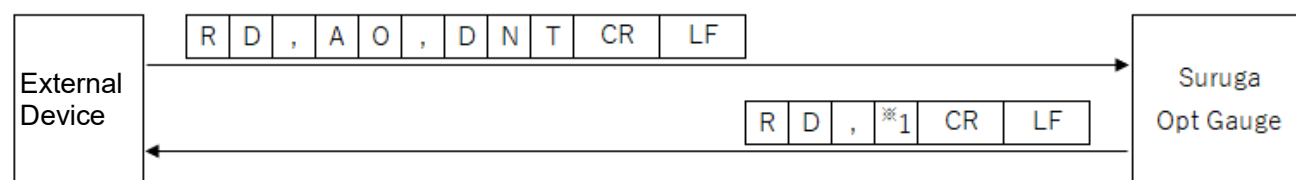
※1: Angle Unit ("0" = degree, "1" = DegMinSec, "2" = milliradian).

[Read: Denoising Enabled Configuration]



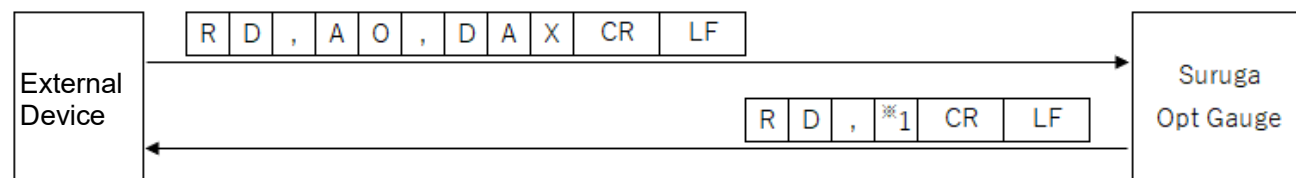
※1: Denoising function ("0" = disabled, "1" = enabled).

[Read: Denoising Threshold Value Configuration]



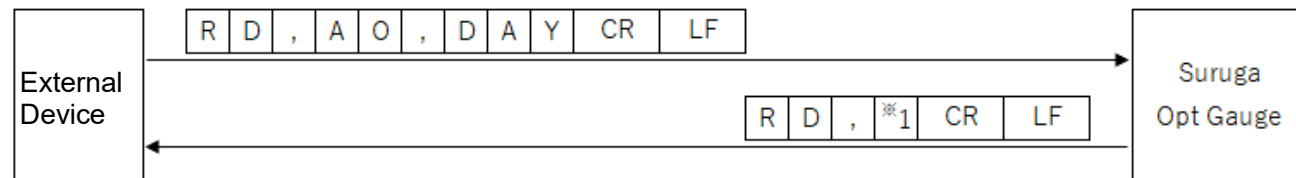
※1: Denoising threshold value (1 to 4,095)

[Read: The number of Decimal Places for the Angle X Configuration]



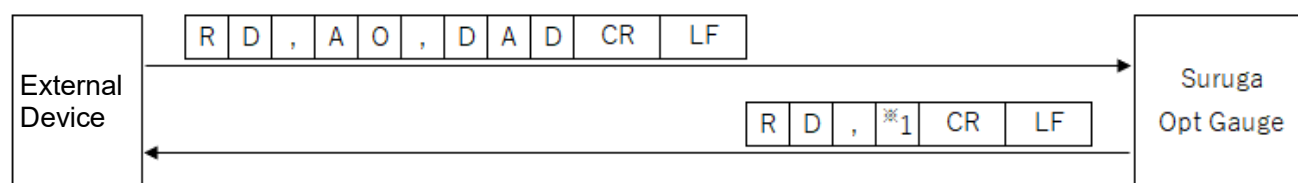
※1: Decimal places (0 to 8).

[Read: The number of Decimal Places for Angle Y Configuration]



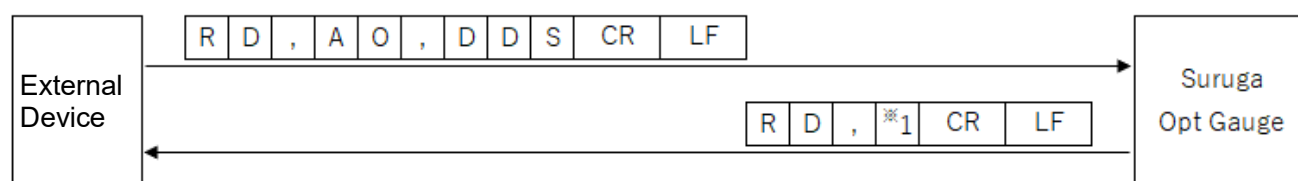
※1: Decimal places (0 to 8).

[Read: The number of Decimal Places for the Angle D Configuration]



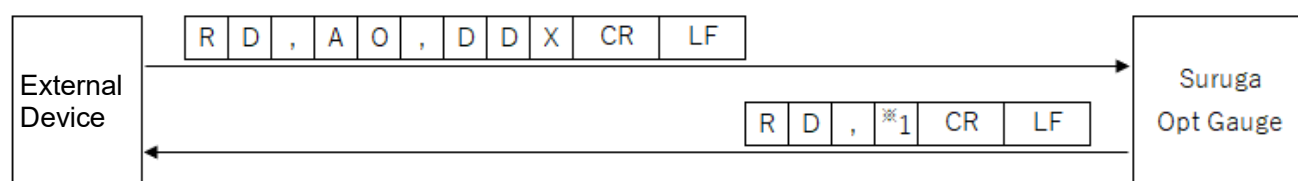
*1: Decimal places (0 to 8).

[Read: (Beam Divergence) the Number of Decimal Places for the D4Sigma or the $1/e^2$ Configuration]



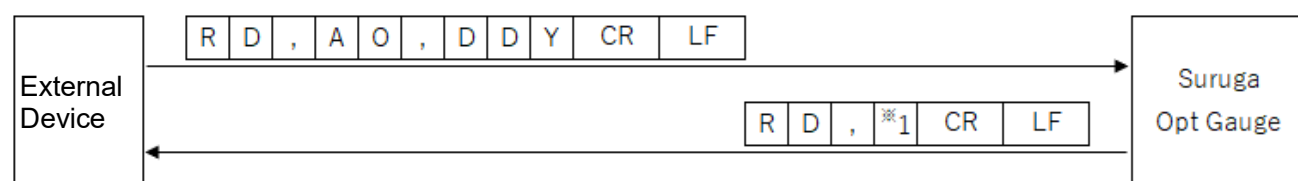
*1: Decimal places (0 to 8).

[Read: (Beam Divergence) the Number of Decimal Places for the D4Sigma X(M) or the $1/e^2$ X(M) Configuration]



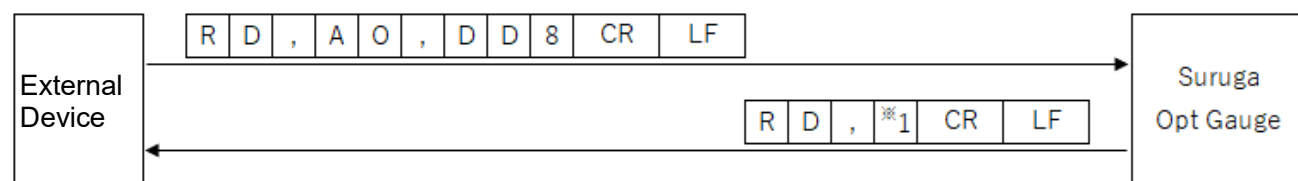
*1: Decimal places (0 to 8).

[Read: (Beam Divergence) the Number of Decimal Places for the D4Sigma Y(m) or the $1/e^2$ Y(m) Configuration]



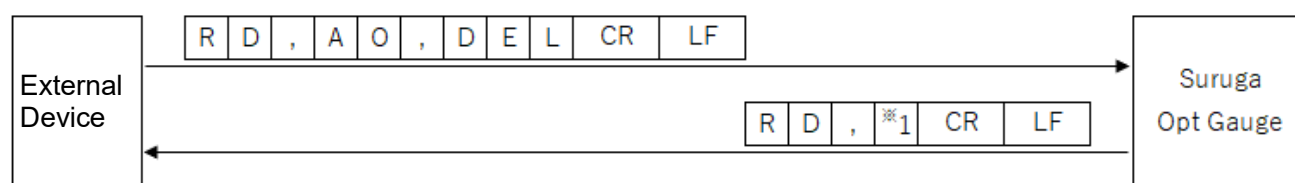
*1: Decimal places (0 to 8).

[Read: (Beam Divergence) the Number of Decimal Places for the D86 Configuration]



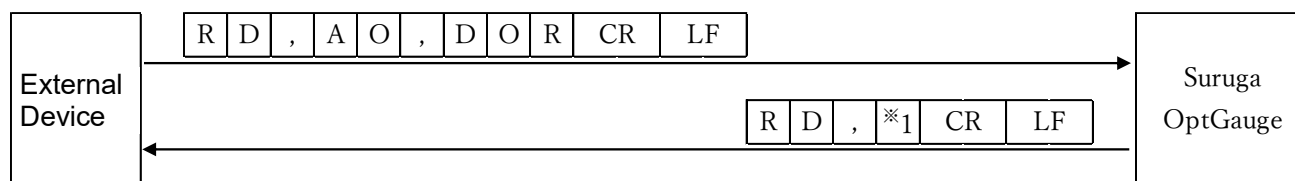
*1: Decimal places (0 to 8).

[Read: the Number of Decimal Places for the Ellipticity Configuration]



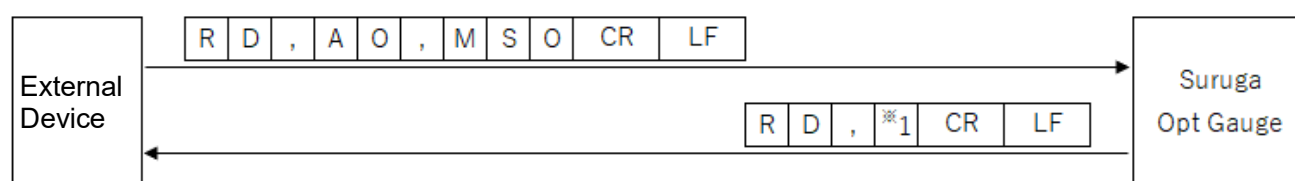
*1: Decimal places (0 to 8).

[Read: the Number of Decimal Places for the Rotation Angle Measurement Configuration]



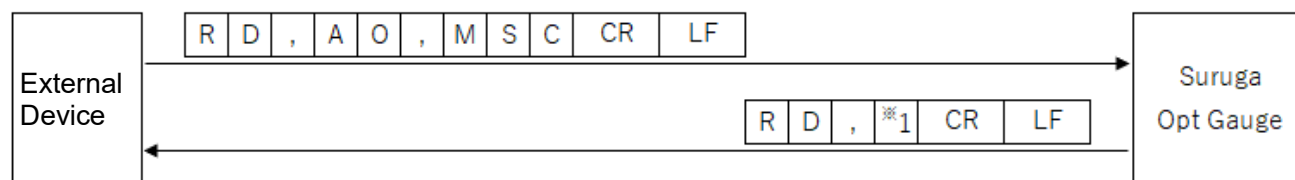
*1: Decimal places (0 to 8).

[(Multi Spot) Read: Order Configuration]



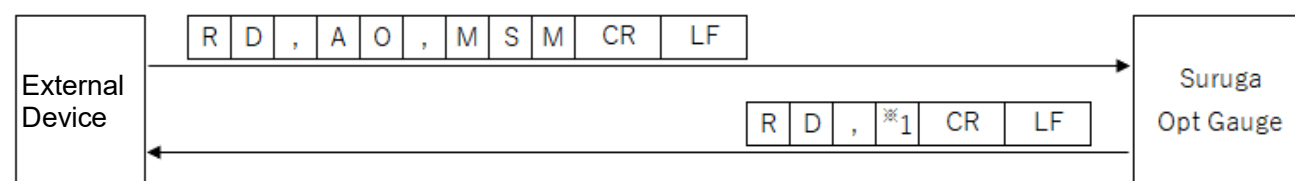
*1: (Multi Spot) Order ("0" = Area, "1" = Angle).

[Read: (Multi Spot) Spot Count Configuration]



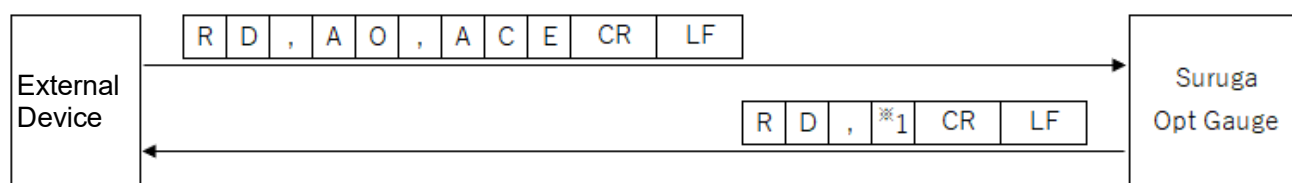
*1: Spot count (1 to 100).

[Read: (Multi Spot) Minimum Spot Area Configuration]



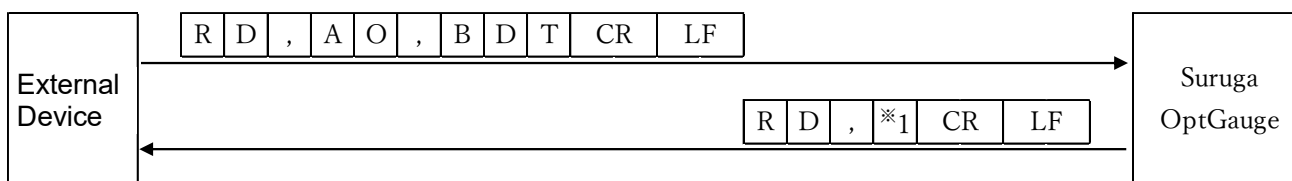
*1: Minimum spot area (1 to 1023).

[Read: Adaptive Cal Execution Button Display Enabled Configuration]



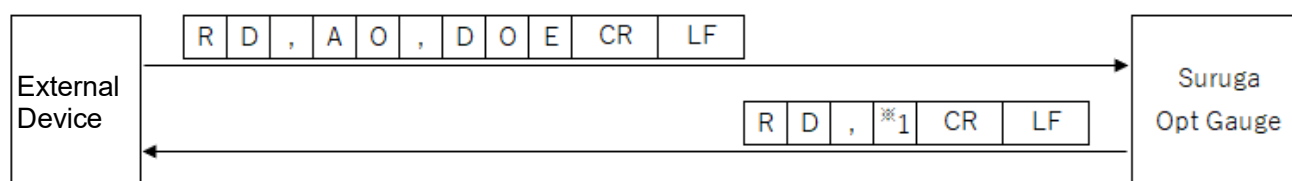
※1: Adaptive Cal execute button display (“0” = disabled, “1” = enabled).

[Read: Beam Diameter Type for Calculation Configuration]



※1: Beam Diameter Type (“0”=D4Sigma, “1”=1/e²).

[Read: Orientation Enabled Configuration]



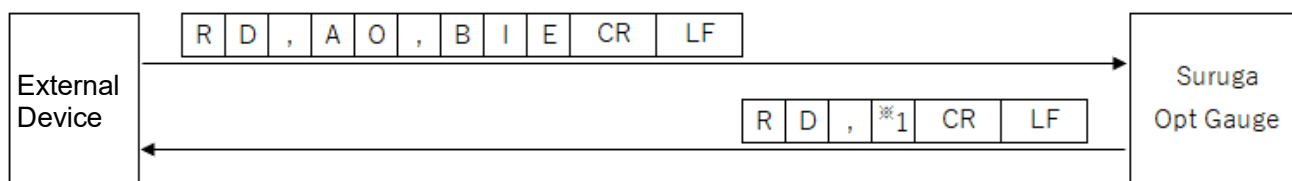
※1: Orientation Enabled (“0” = disabled, “1” = enabled).

[Read: Rotation Angle Measurement Method Configuration]



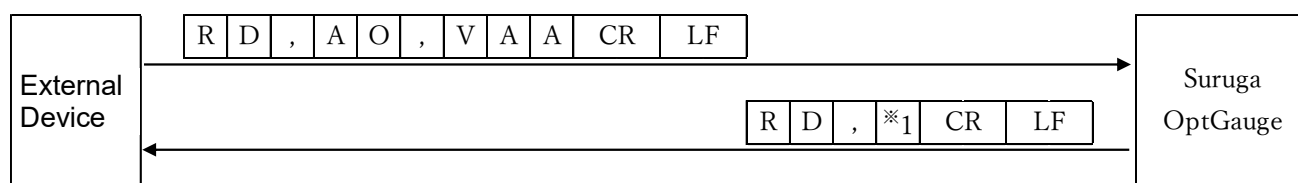
※1: Rotation Angle Measurement Method (“0”= Ellipse Fitting, “1”= Max Distance Search).

[Read: Binning Enabled Configuration]



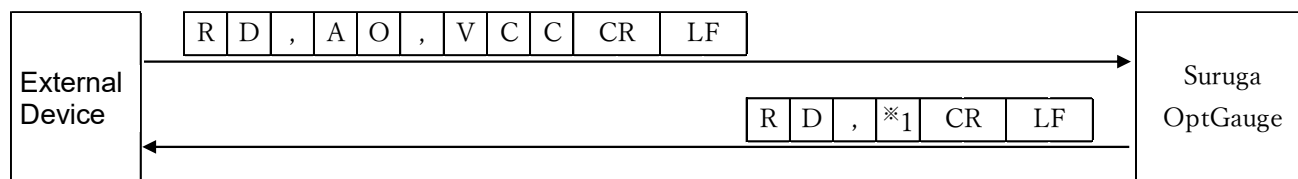
※1: Binning (“0” = disabled, “1” = enabled).

[Read: Auto Aperture Display Configuration]



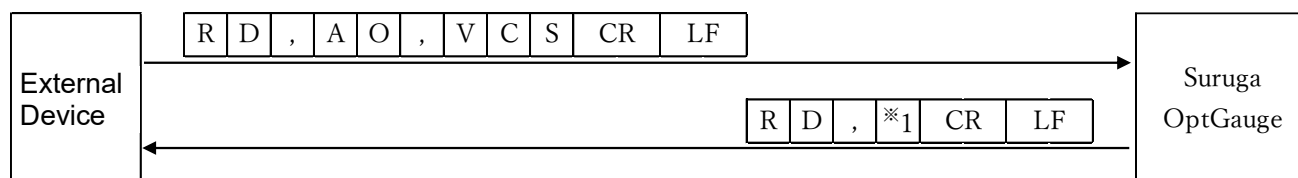
※1: Auto aperture display ("0" = disabled, "1" = enabled).

[Read: Centroid Cursor Display Configuration]



※1: Centroid cursor display ("0" = disabled, "1" = enabled).

[Read: Cross Section Display Configuration]



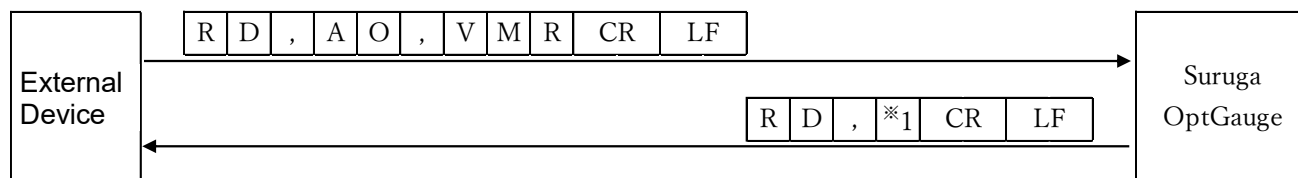
※1: Cross section display ("0" = disabled, "1" = enabled).

[Read: Labeling Area Display Configuration]



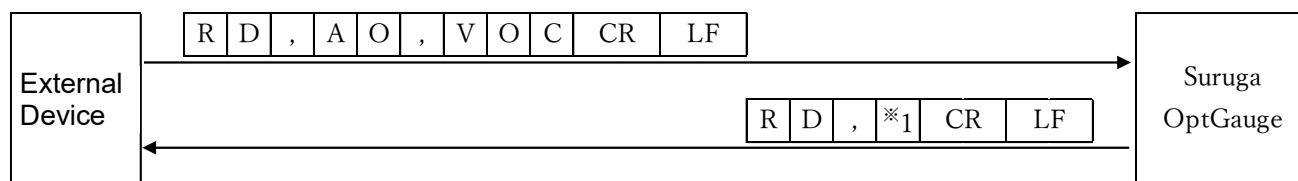
※1: Labeling area display ("0" = disabled, "1" = enabled).

[Read: Measurement Range Display Configuration]



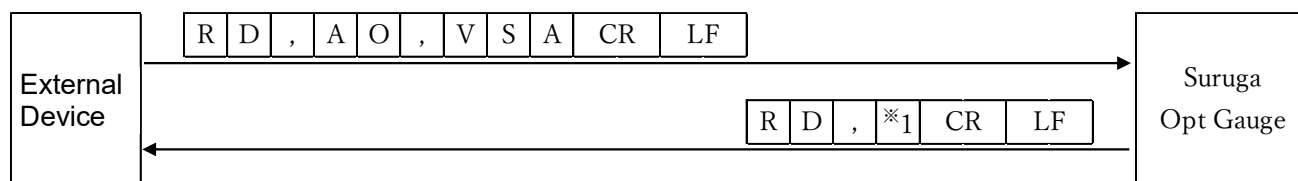
※1: Measurement range display ("0" = disabled, "1" = enabled)

[Read: Origin Cursor Display Configuration]



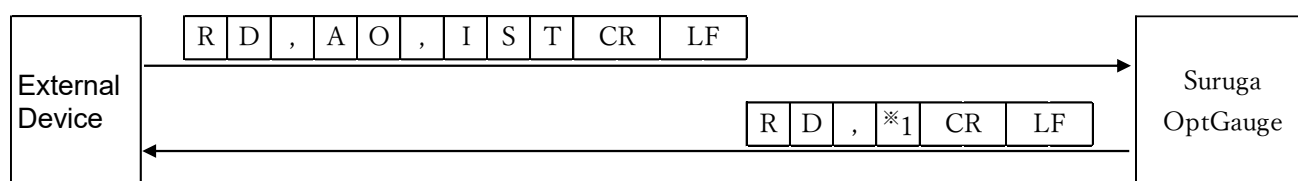
※1: Origin Cursor display ("0" = disabled, "1" = enabled)

[Read: Spot Area Display Configuration]



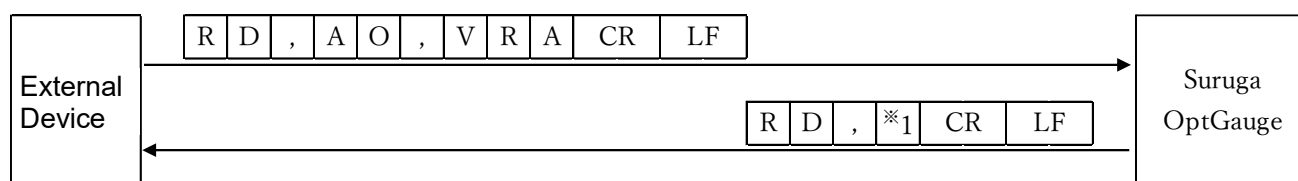
※1: Spota area display ("0" = disabled, "1" = enabled)

[Read: Spot Area Display Type Configuration]



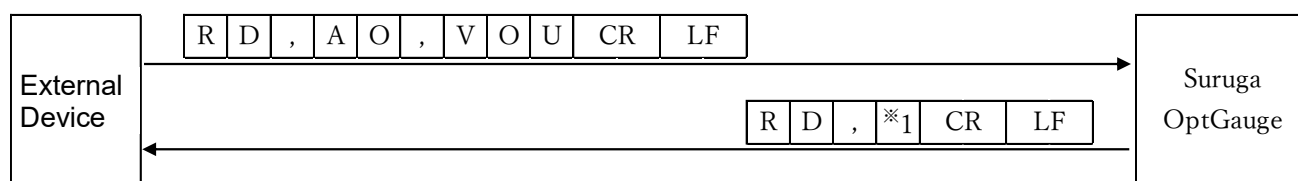
※1: Spot area type display type ("0" = D4Sigma, "1" = D86).

[Read: ROI Area Display Configuration]



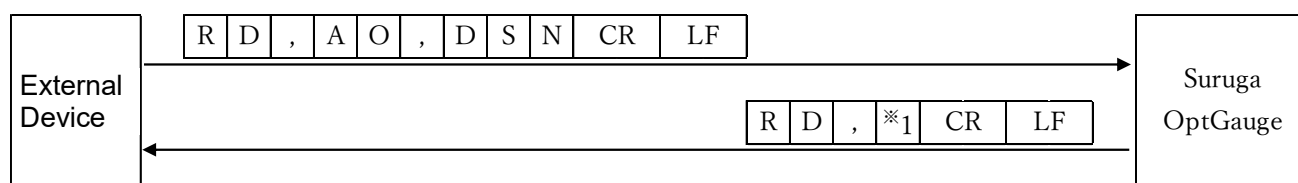
※1: ROI area display ("0" = disabled, "1" = enabled).

[Read: Rotation Angle Cursor Display Enabled Configuration]



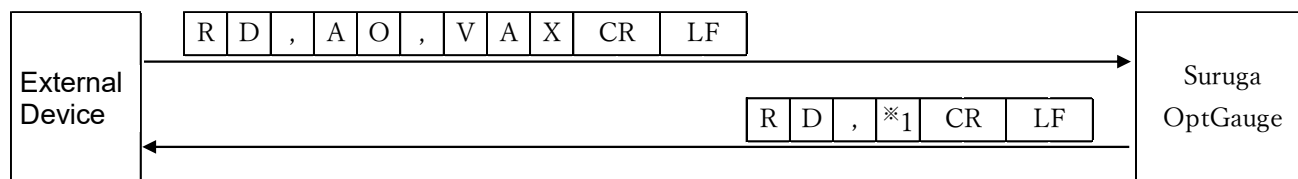
※1: Rotation angle cursor display ("0" = disabled, "1" = enabled).

[Read: Display Spot Number Configuration]



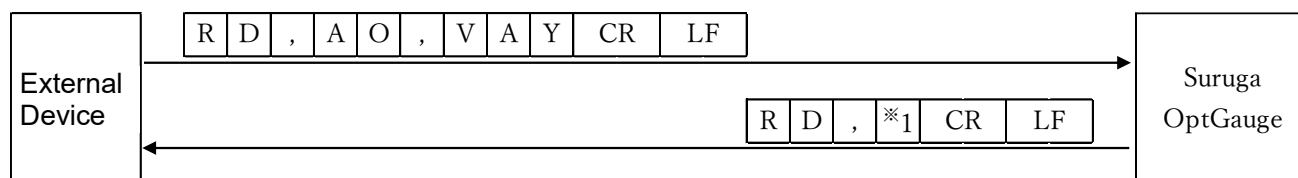
※1: Display spot number setting value (0 to 100).

[Read: Angle X Result Display Configuration]



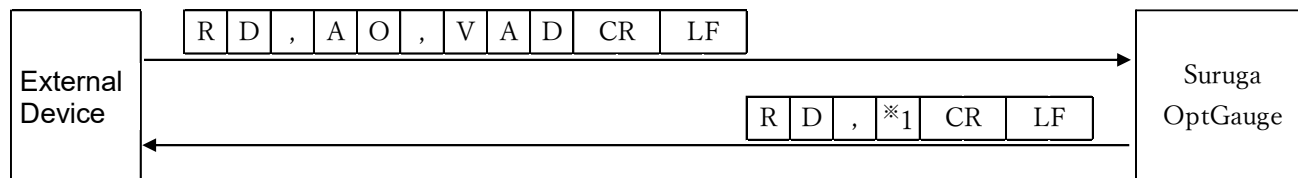
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Angle Y Result Display Configuration]



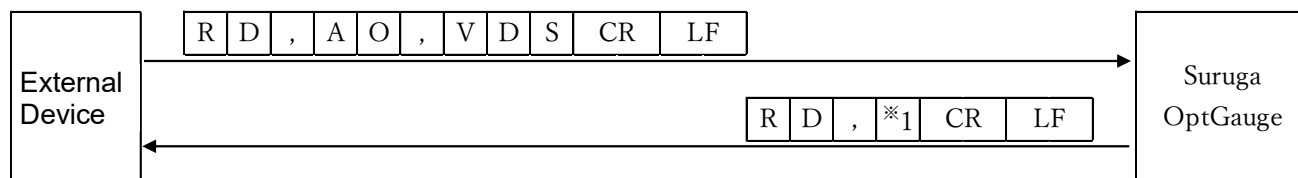
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Angle D Result Display Configuration]



※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4Sigma or 1/e² Result Display Configuration]



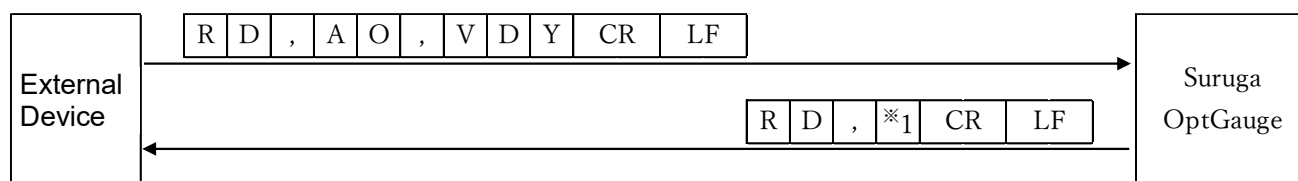
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4Sigma X(M) or $1/e^2X(M)$ Result Display Configuration]



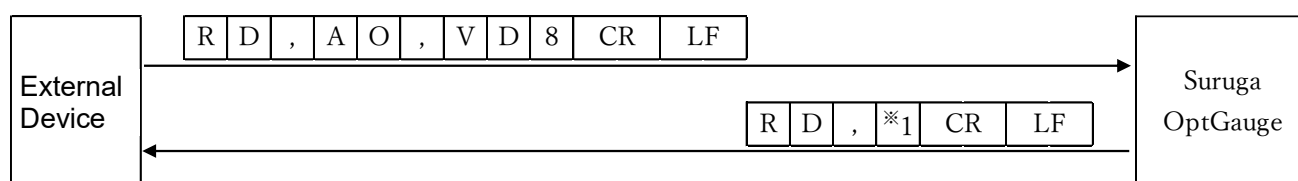
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4SigmaY(m) or $1/e^2Y(m)$ Result Display Configuration]



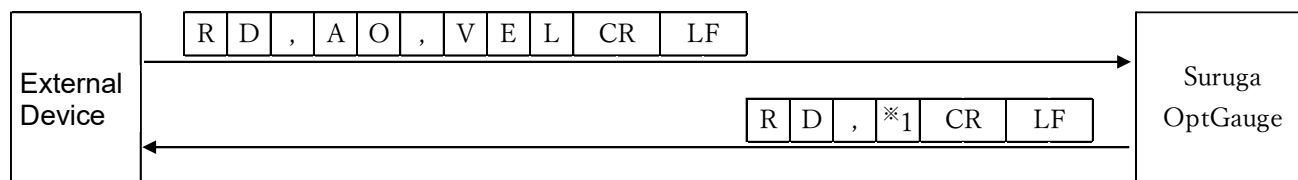
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D86 Result Display Configuration]



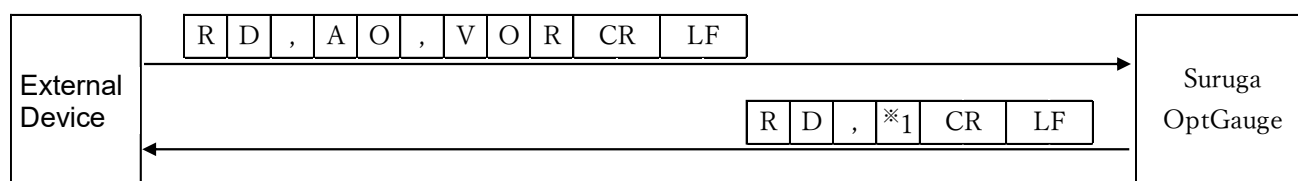
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Ellipticity Result Display Configuration]



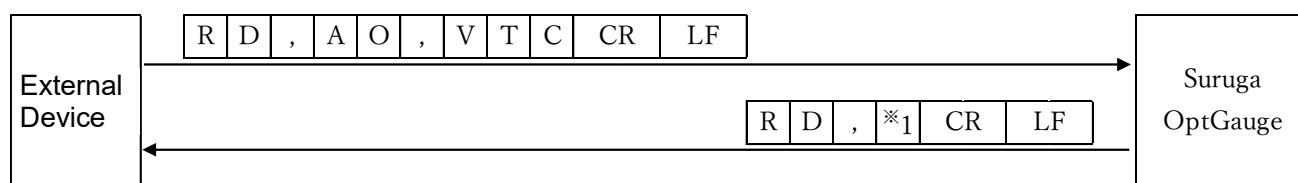
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Rotation Angle Result Display Configuration]



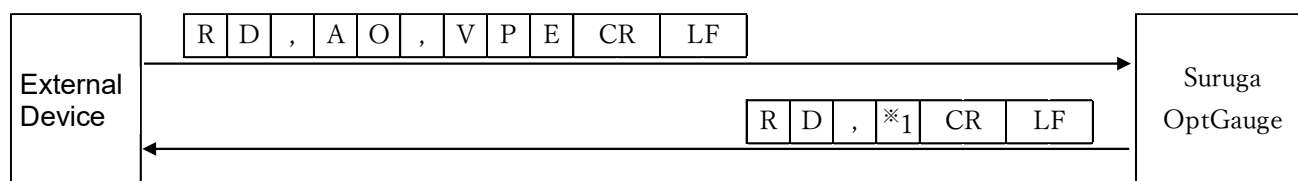
※1: Results display ("0" = disabled, "1" = enabled).

[Read Total Count Result Display Configuration]



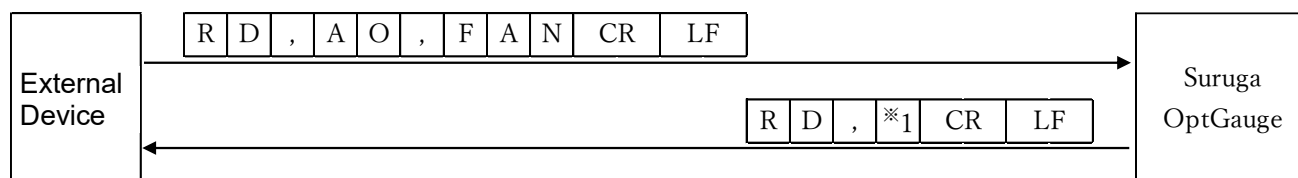
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Peak Result Display Configuration]



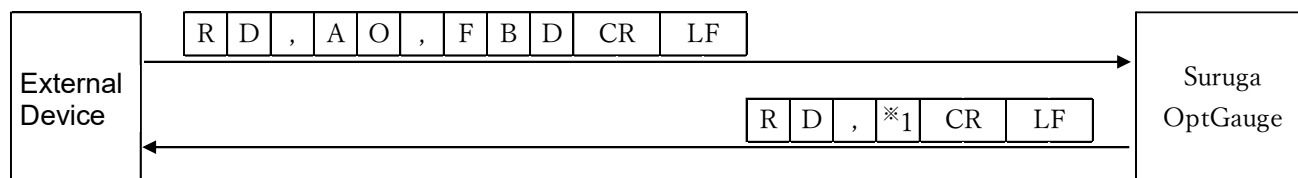
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Font Size for the Angle Configuration]



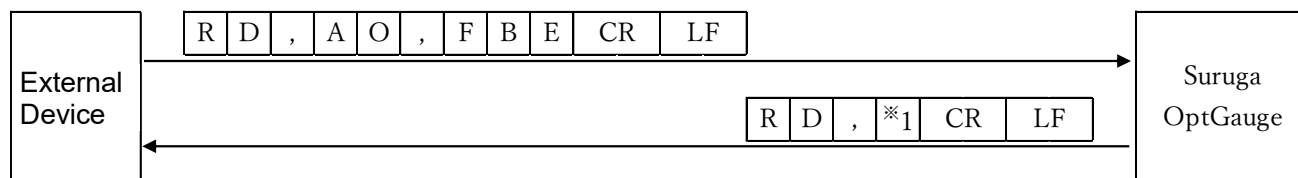
※1:Font size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font Size for the Beam Divergence Configuration]



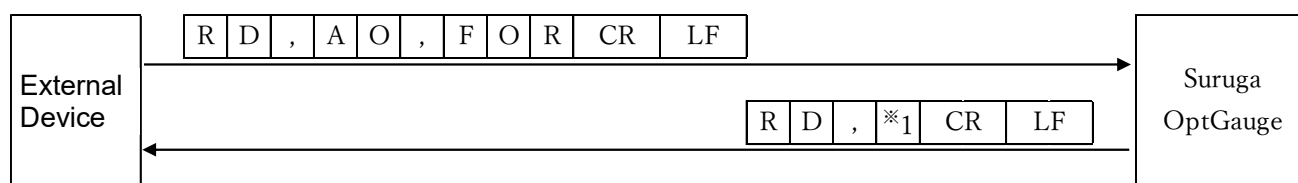
※1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font size for the Beam Ellipticity Configuration]



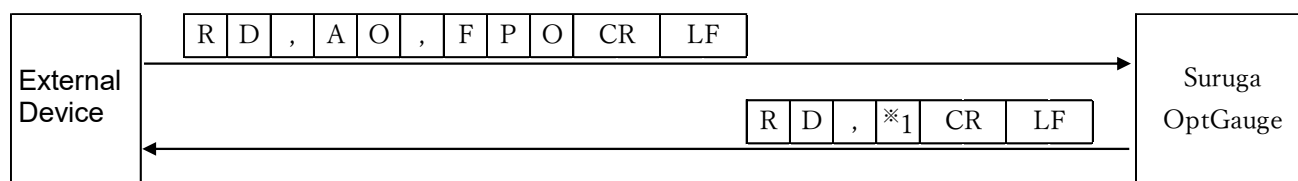
※1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font Size for the Rotation Angle Configuration]



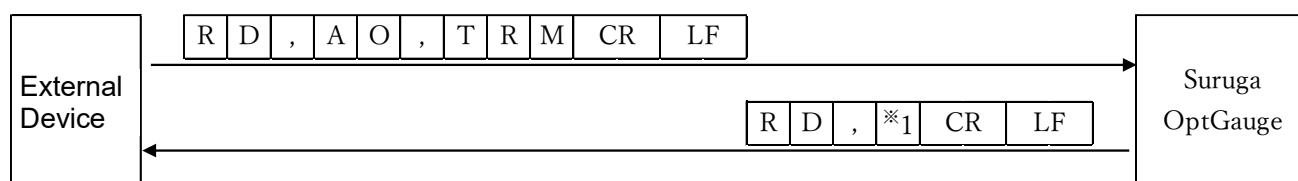
※1: Font size ("0"= Small, "1"= Medium, "2"= Large).

[Read: Font Size for the Power Configuration]



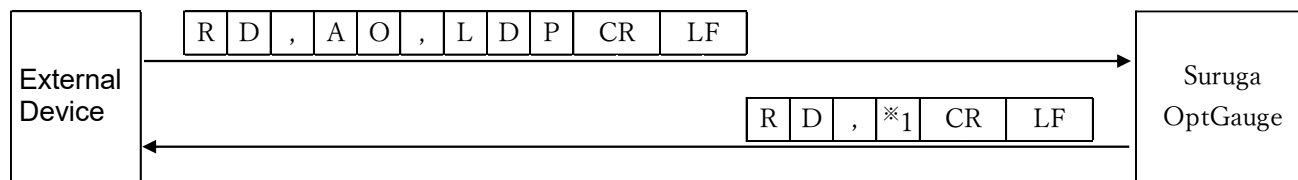
※1: Font size ("0"= Small, "1"= Medium, "2"= Large).

[Read: External Trigger Mode Enabled Configuration]



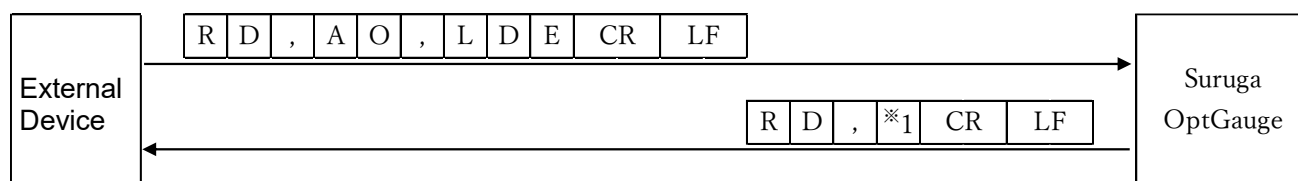
※1: External Trigger ("0" = disabled, "1" = enabled).

[Read: LD Output Value Configuration]



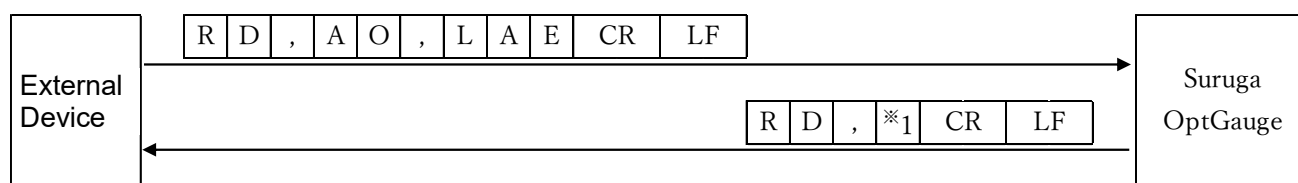
※1: LD output value (0 to 4095).

[Read: LD Output Enabled Configuration]



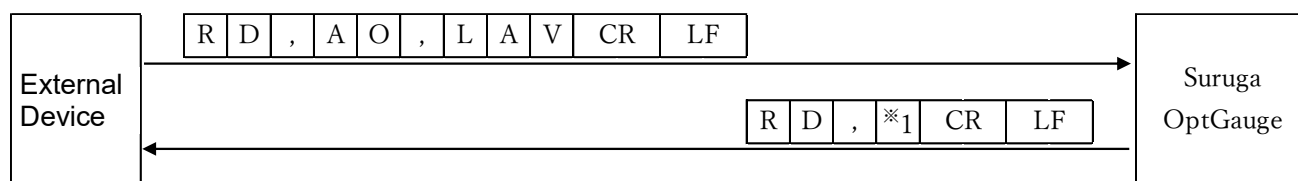
※1: LD output ("0" = disabled, "1" = enabled).

[Read: Automatic Brightness Execution Enabled Configuration]



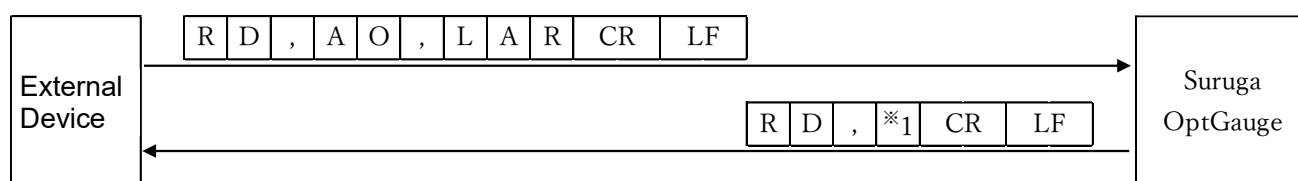
※1: Automatic brightness execution ("0" = disabled, "1" = enabled).

[Read: Automatic Brightness Peak Target Value Configuration]



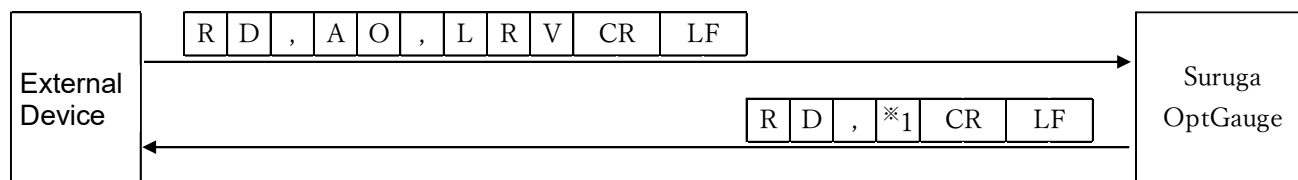
※1: Automatic brightness peak target value (1000 to 3500).

[Read: Automatic Brightness Peak Target Range Configuration]



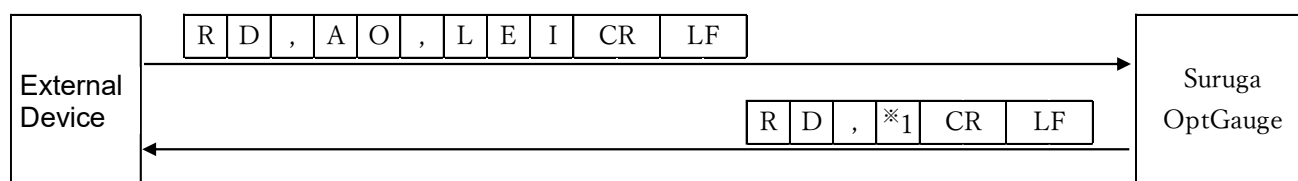
※1: Automatic brightness peak target range (100 to 1000).

[Read: Reflectance of the Target Applied in the Automatic Brightness Configuration]



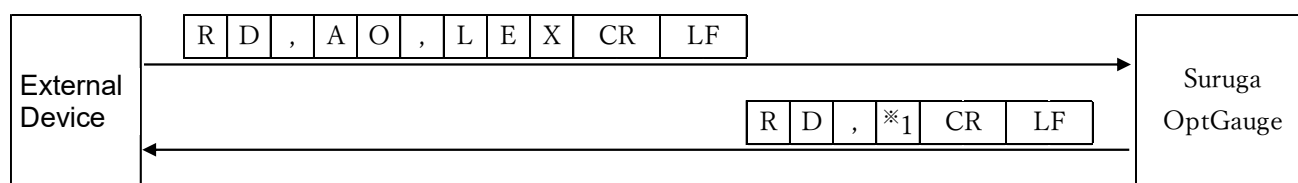
※1: Target object reflectance (0.05 to 100).

[Read: Initial Exposure Time Value Applied in the Automatic Brightness Configuration]



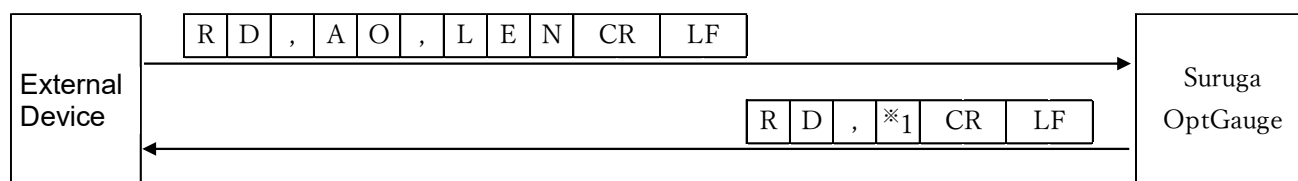
※1: Initial exposure time (0.027 to 20).

[Read: Maximum Exposure Time Value Applied in the Automatic Brightness Configuration]



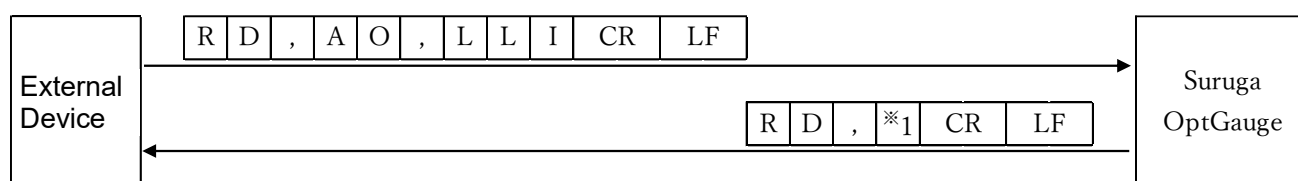
*1: Maximum exposure time (0.027 to 20).

[Read: Minimum Exposure Time Value Applied in the Automatic Brightness Configuration]



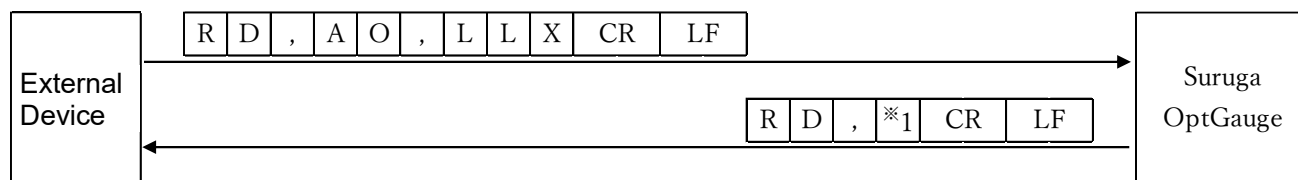
*1: Minimum exposure time (0.027 to 20).

[Read: LD Output Initial Value Applied in the Automatic Brightness Configuration]



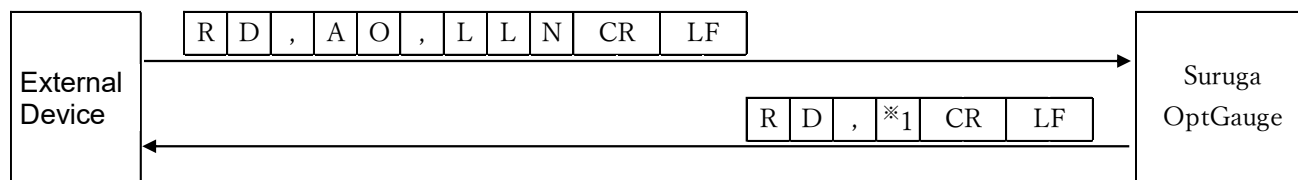
*1: Initial LD output (0 to 4095).

[Read: LD Output Maximum Value Applied in the Automatic Brightness Configuration]



*1: Maximum LD output (0 to 4095).

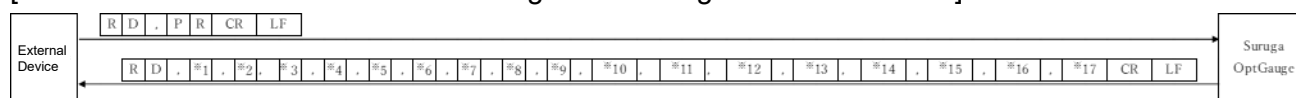
[Read: LD Output Minimum Value applied in the Automatic Brightness Configuration]



*1: Minimum LD output (0 to 4095).

3.4.1.3 Profile

[Read: Measurement Results if the Image Processing Mode is Disabled]



- *1: Beam Centroid: Centroid X measurement value.
- *2: Beam Centroid: Centroid Y measurement value.
- *3: Beam Centroid: Centroid D measurement value.
- *4: Beam Diameter: D4Sigma measurement value.
- *5: Beam Diameter: D4Sigma X(M) measurement value.
- *6: Beam Diameter: D4Sigma Y(m) measurement value.
- *7: Beam Diameter: D86 measurement value.
- *8: Beam Ellipticity measurement value.
- *9: Beam: Total Count value.
- *10: Beam: Peak value.
- *11: Judgement: Centroid (D) judgement result (OK / NG).
- *12: Judgement: Diameter judgement result (OK / NG).
- *13: Judgement: Ellipticity judgement result (OK / NG).
- *14: Judgement: Peak judgement result (OK / NG).
- *15: Distance unit (Millimeter / Micrometer).
- *16: Orientation measurement value.
- *17: Judgement : Orientation judgement result (OK / NG).

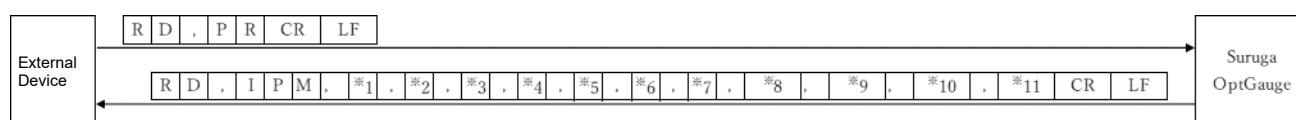
[Read (Multi Spot) Measurement Results if the Image Processing Mode is Enabled]



- *1: Acquisition Start Spot Number (1 to 100).
- *2: Consecutive Spot Count to Read from *1 (1 to 100).
- *3: Beam Centroid: Centroid X measurement value.
- *4: Beam Centroid: Centroid Y measurement value.
- *5: Beam Centroid: Centroid D measurement value.
- *6: Beam Diameter: D4Sigma measurement value.
- *7: Beam Diameter: D4Sigma X(M) measurement value.
- *8: Beam Diameter: D4Sigma Y(m) measurement value.
- *9: Beam Diameter: D86 measurement value.
- *10: Beam Ellipticity measurement value.
- *11: Beam: Total count value.
- *12: Beam: Peak value.

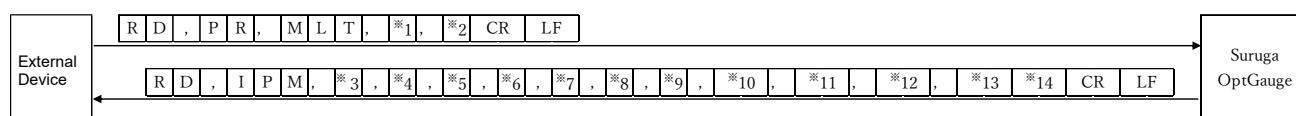
- *13: Judgement: Centroid(D) judgement result (OK / NG).
- *14: Judgement: Diameter judgement result (OK / NG).
- *15: Judgement: Ellipticity judgement result (OK / NG).
- *16: Judgement: Peak judgement result (OK / NG).
- *17: Distance unit (Millimeter / Micrometer).
- *18: Orientation measurement value.
- *19: Judgement : Orientation judgement result (OK / NG).
- *20: Measurement Results of *3 to *19 for the Number Specified in *2 (The specified number of results will be included, separated by “,”).

[Read: Measurement Results if the Image Processing Mode is Disabled]



- *1 : Beam Centroid: Centroid X measurement value.
- *2 : Beam Centroid: Centroid Y measurement value.
- *3 : Beam Centroid: Centroid D measurement value.
- *4 : Line Position : Line X measurement value.
- *5 : Line Position : Line Y measurement value.
- *6 : Beam: Total count value.
- *7 : Beam: Peak value.
- *8 : Judgement: Centroid(D) judgement result (OK / NG).
- *9 : Judgement: Line Position judgement result (OK / NG).
- *10 : Judgement: Peak judgement result (OK / NG).
- *11 : Distance unit (Millimeter / Micrometer).

[Read (Multi Spot) Measurement Results if the Image Processing Mode is Enabled]



- *1 : Acquisition Start Spot Number (1 to 100).
- *2 : Consecutive Spot Count to Read from *1 (1 to 100).
- *3 : Beam Centroid: Centroid X measurement value.
- *4 : Beam Centroid: Centroid Y measurement value.
- *5 : Beam Centroid: Centroid D measurement value.
- *6 : Line Position : Line X measurement value.
- *7 : Line Position : Line Y measurement value.
- *8 : Beam: Total count value.

※9 : Beam: Peak value.

※10 : Judgement: Centroid(D) judgement result (OK / NG).

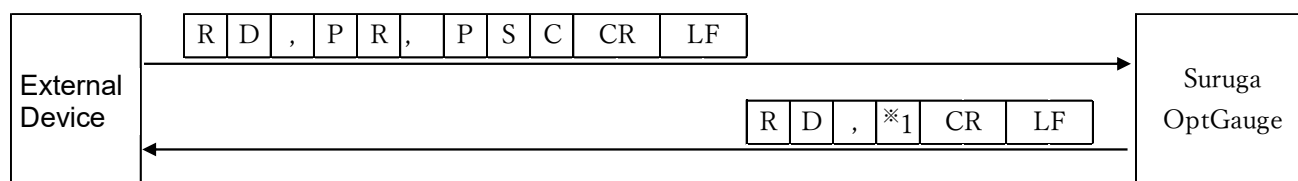
※11 : Judgement: Line Position judgement result (OK / NG).

※12 : Judgement: Peak judgement result (OK / NG).

※13 : Distance unit (Millimeter / Micrometer).

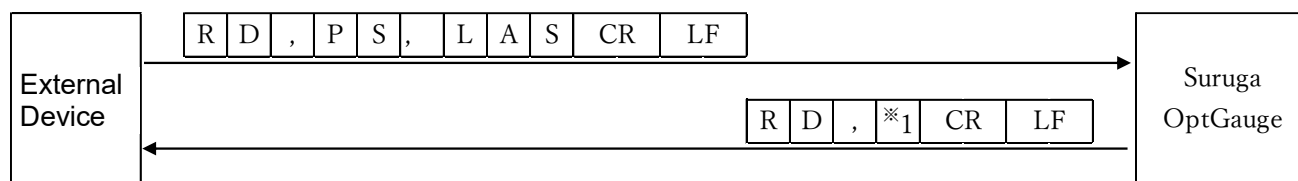
※14 : Measurement Results of ※3 to ※13 for the Number Specified in ※2 (The specified number of results will be included, separated by “,”).

[Read: Profile Multi Spot Count]



※1: Spot Count (1 to 100).

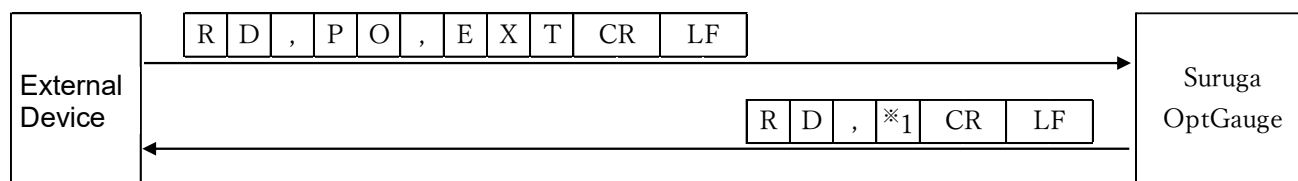
[Read: Automatic Brightness Status Information]



※1: Dimming status

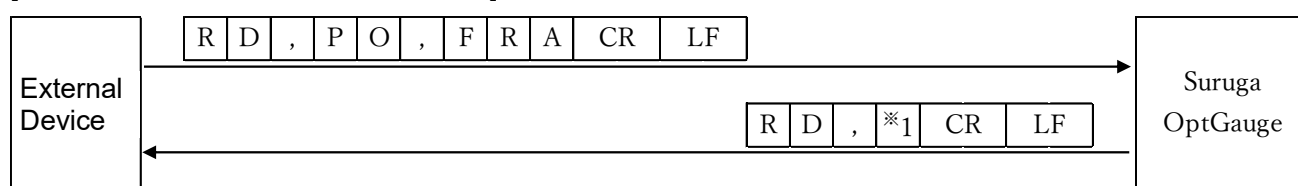
("0" = dimming complete, "1" = dimming in process, "2" = dimming failed, "3" = dimming not started).

[Read: Sensor Camera Exposure Time]



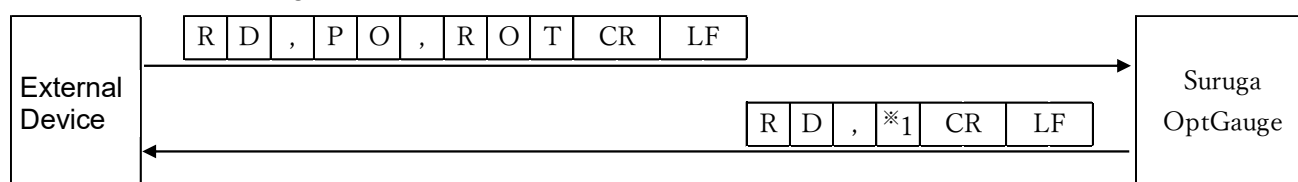
※1: Exposure time (0.027 to 2000).

[Read: Sensor Camera Frame Rate]



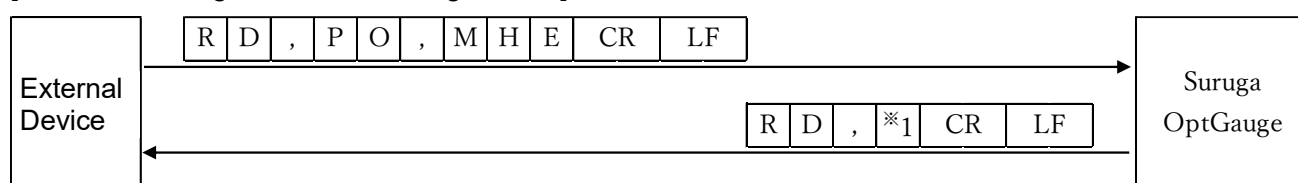
※1: Frame rate (0.1 to 100).

[Read Rotation Configuration]



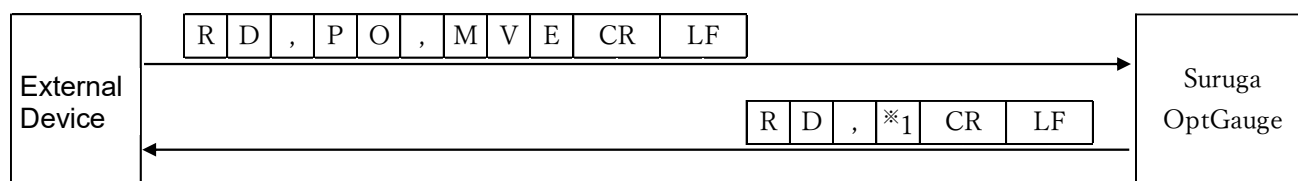
※1: Rotation ("0" = OFF, "1" = Rotation right 90°, "2" = Rotation right 180°, "3" = Rotation right 270°).

[Read: Mirroring Horizontal Configuration]



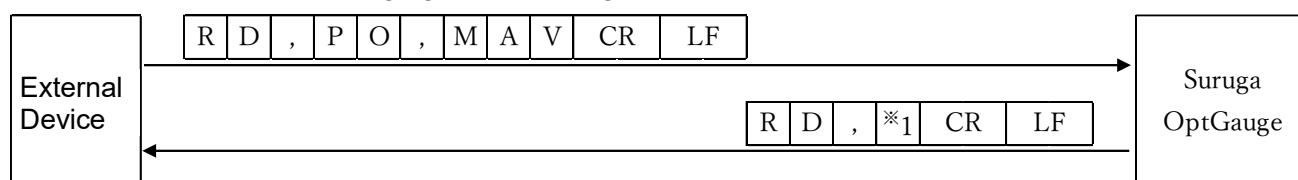
※1: Mirroring ("0" = OFF, "1" = Horizontal Mirroring display)

[Read: Mirroring Vertical Configuration]



※1: Mirroring ("0" = OFF, "1" = Vertical Mirroring)

[Read: the Number of Averaging Times Configuration]



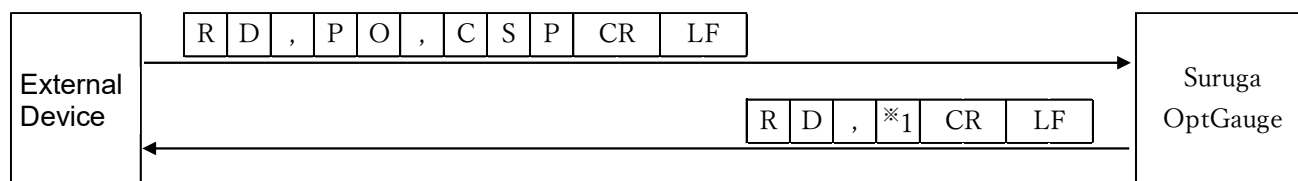
※1: The number of averaging times (2 to 262144).

[Read: Averaging Processing enabled Configuration]



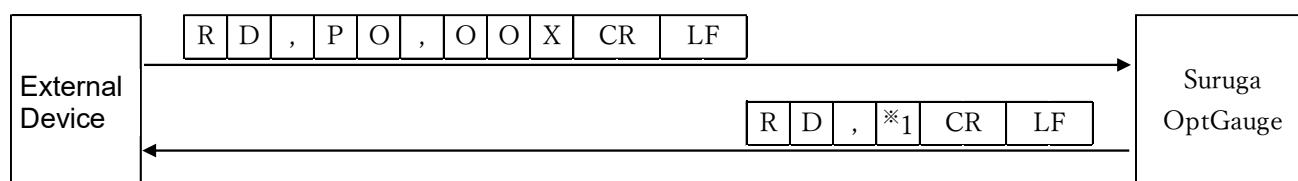
※1: Averaging Processing (“0” = disabled, “1” = enabled).

[Read: Cross Section Point Configuration]



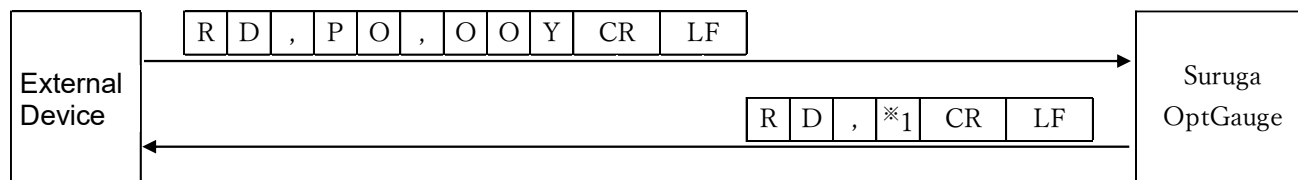
※1: Cross Section Point (“0” = Origin Cursor, “1” = Beam Cursor).

[Read: OriginOffset X value Configuration]



※1: Origin Offset X (- 20 to + 20).

[Read: Origin Offset Y value Configuration]



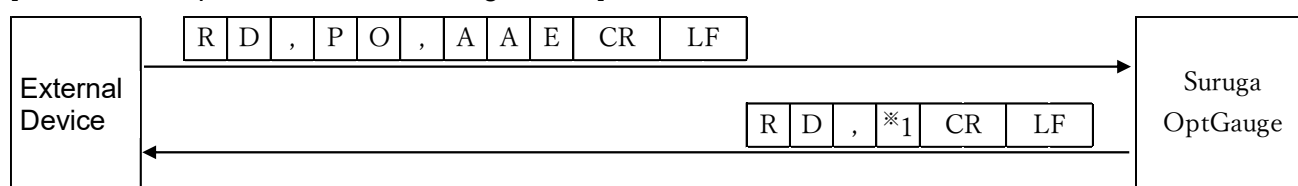
※1: Origin Offset Y (- 20 to + 20).

[Read: Auto Aperture Method Configuration]



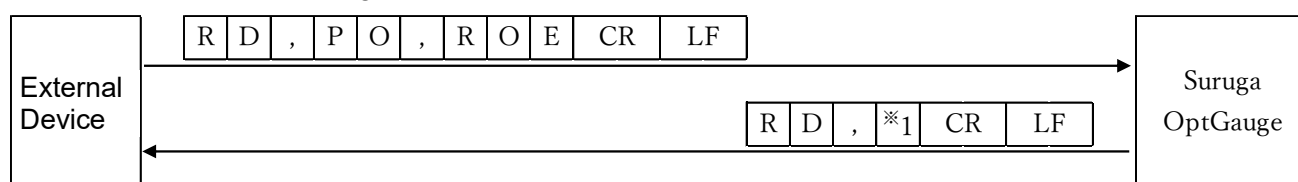
※1: Auto Aperture method (“0” = Area, “1” = Luminance).

[Read: Auto Aperture Enabled Configuration]



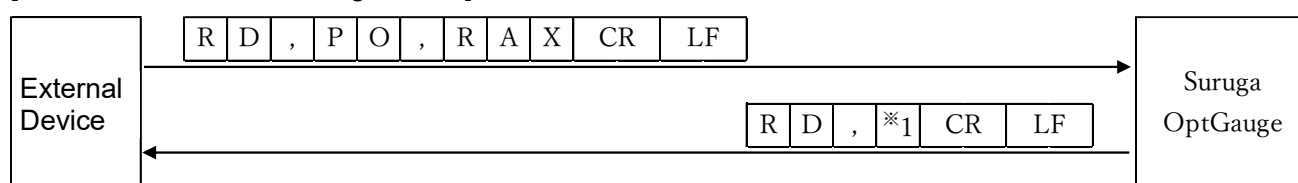
※1: Auto Aperture (“0” = disabled, “1” = enabled).

[Read: ROI Enabled Configuration]



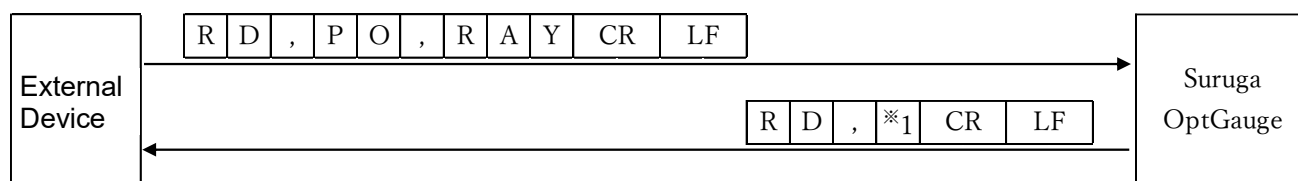
※1: ROI (“0” = disabled, “1” = enabled).

[Read: ROI X Value Configuration]



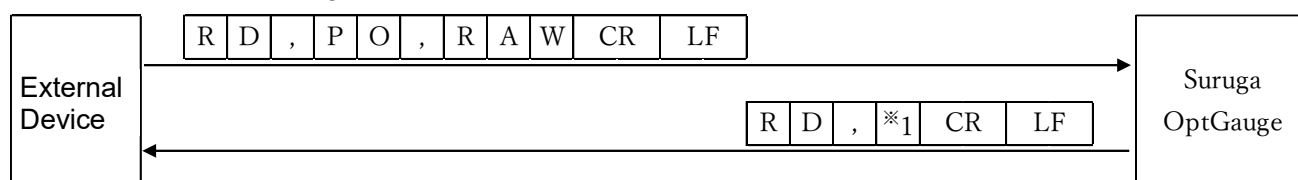
※1: ROI X value (- 3000 to + 3000) or (- 1500 to + 1500) if the Binning is enabled.

[Read: ROI Y Value Configuration]



※1: ROI Y value (- 3000 to + 3000) or (-1500 to + 1500) if the Binning is enabled.

[Read: ROI Width Configuration]



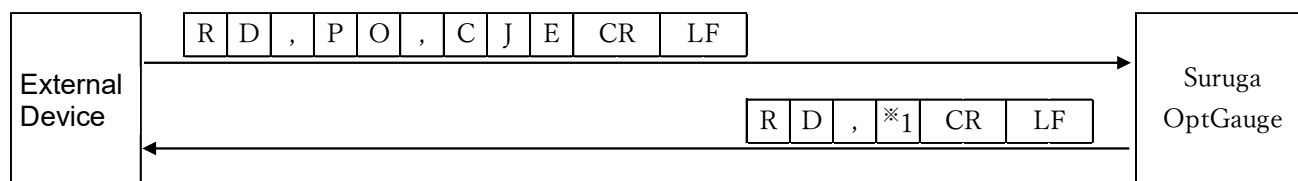
※1: ROI Width (0 to 3000) or (0 to 1500) if the Binning is enabled.

[Read: ROI Height Configuration]



※1: ROI height (0 to 3000) or (0 to 1500) if the Binning is enabled.

[Read: Centroid Judgement Enabled Configuration]



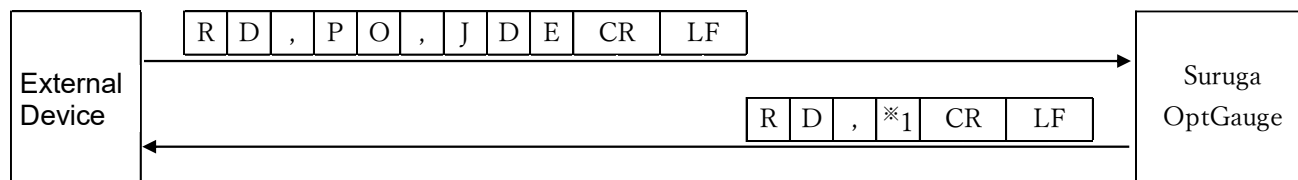
※1: Centroid judgement ("0" = disabled, "1" = enabled).

[Read: Centroid Judgement Value Configuration]



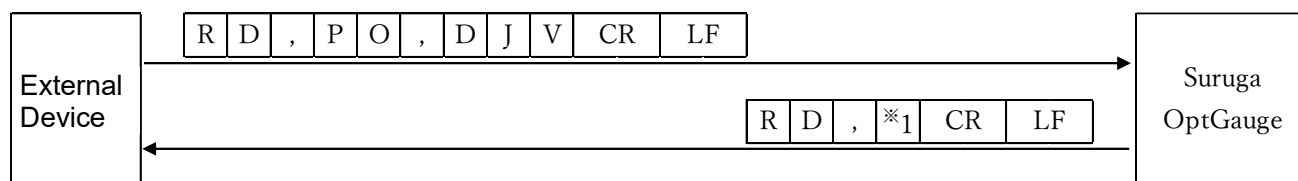
※1: Centroid judgement value (0.0000 to 20.0000).

[Read: Diameter Judgement enabled Configuration]



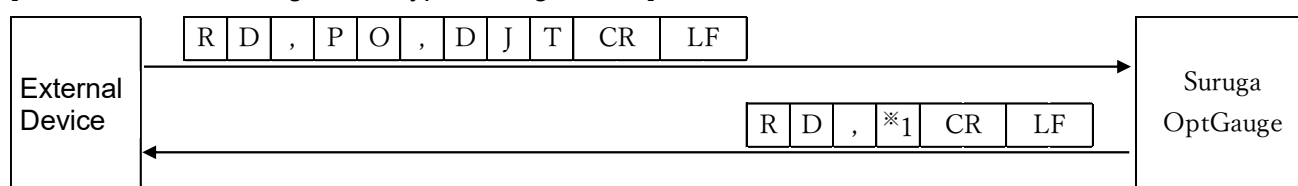
※1: Diameter judgement ("0" = disabled, "1" = enabled).

[Read: Diameter Judgement Value Configuration]



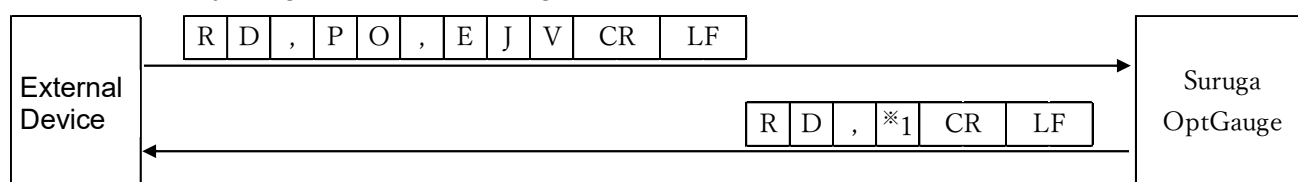
※1: Diameter judgement value (0.0000 to 20.0000)

[Read: Diameter Judgement Type Configuration]



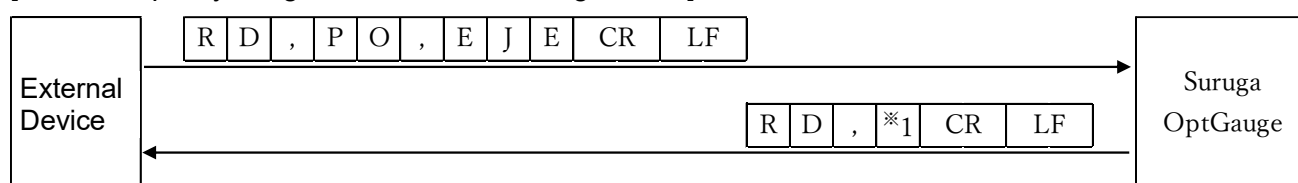
※1: Diameter Judgement Type (“0” = D4Sigma or 1/e², “1” = D86).

[Read: Ellipticity Judgement Value Configuration]



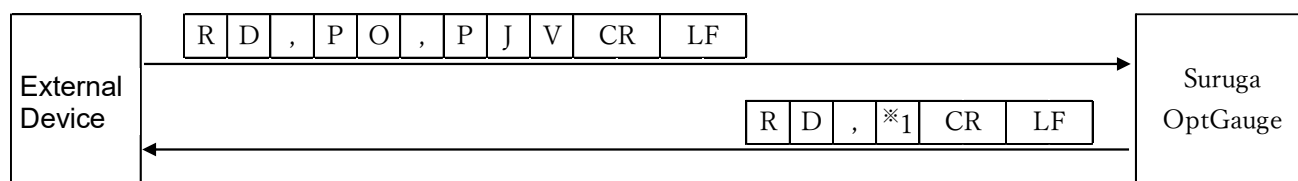
※1: Ellipticity judgement value (0.0000 to 1.0000).

[Read: Ellipticity Judgement Enabled Configuration]



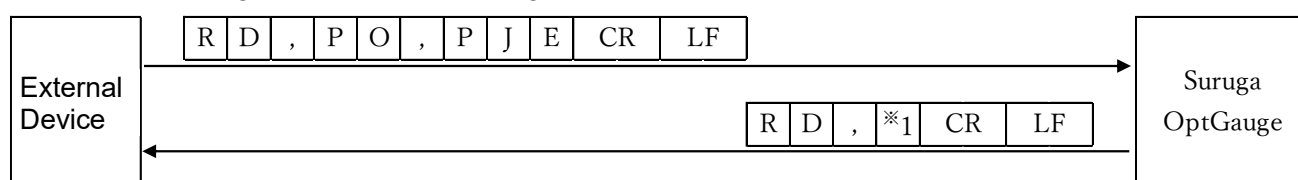
※1: Ellipticity judgement (“0” = disabled, “1” = enabled).

[Read: Peak Judgement Value Configuration]



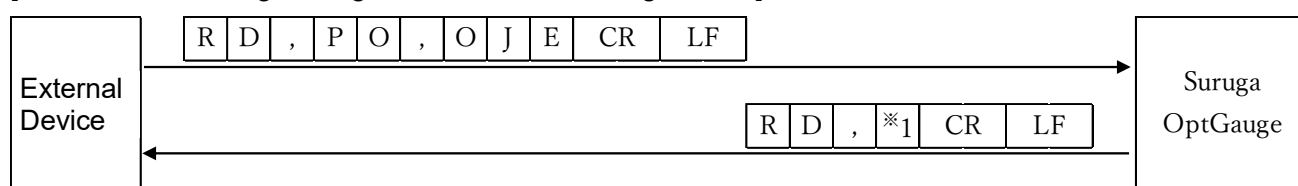
※1: Peak judgement value (0.0 to 4095.0).

[Read: Peak Judgement Enabled Configuration]



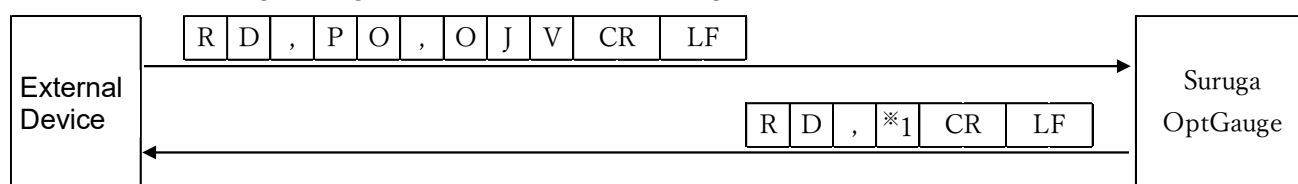
※1: Peak judgement (“0” = disabled, “1” = enabled).

[Read: Rotaion Angle Judgement Enabled Configuration]



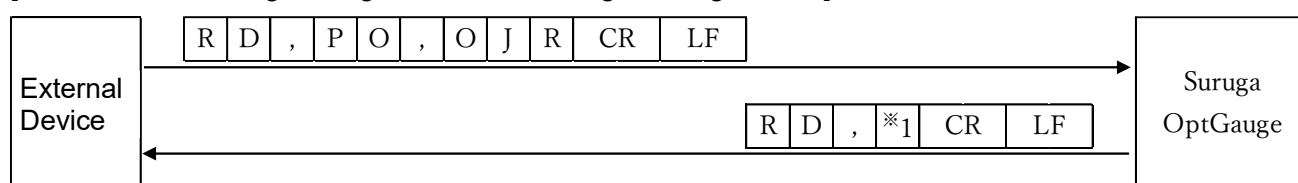
※1 : Rotaion angle judgement ("0" = disabled, "1" = enabled).

[Read: Rotaion Angle Judgement Criteria Value Configuration]



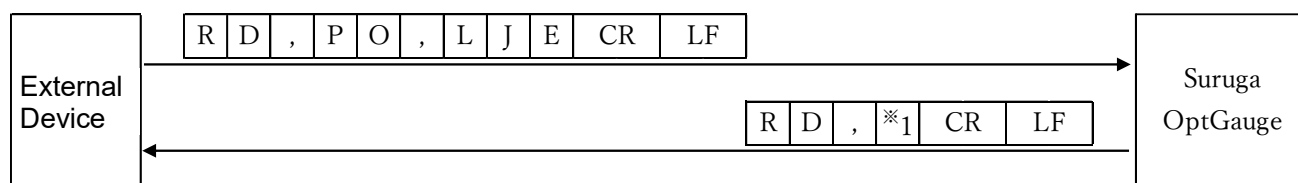
※1 : Rotaion angle judgement criteria value (- 90.0000 to + 90.0000).

[Read: Rotaiton Angle Judgement Value Range Configuration]



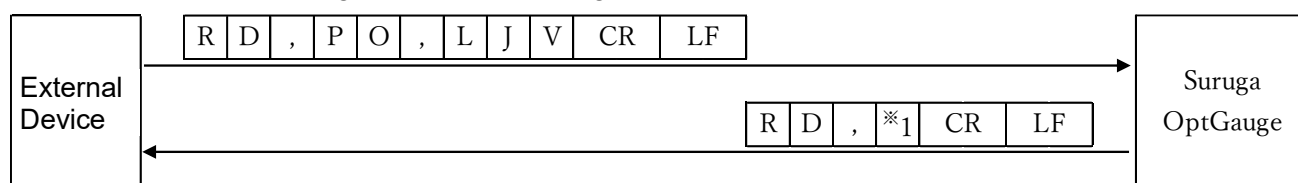
※1 Rotation angle judgement value range (- 90.0000 to + 90.0000).

[Read: Line Position Judgement Enabled Configuration]



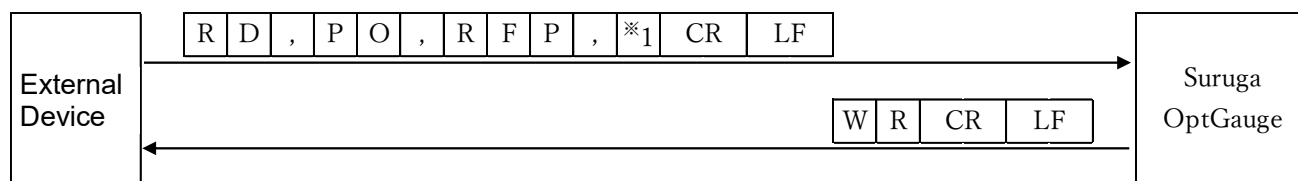
※1: Line Position judgement ("0" = disabled, "1" = enabled).

[Read: Line Position Judgement Value Configuration]



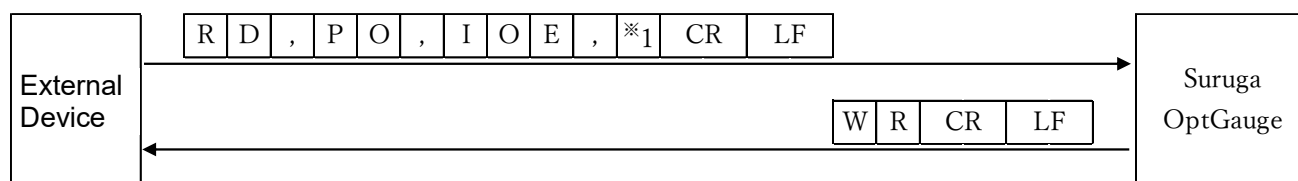
※1: Line position judgement value (- 20.0000 to + 20.0000).

[Read: Log File Output Path Configuration]



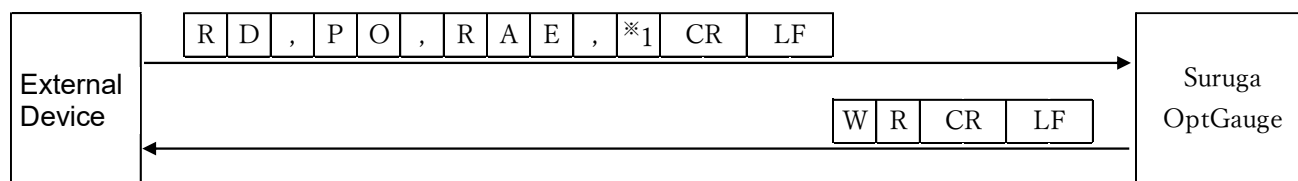
※1: Log File Path String.

[Read: Image File Output Enabled Configuration]



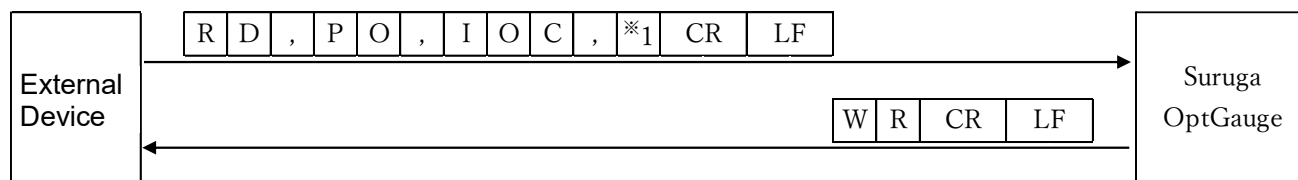
※1: Image File Output ("0" = disabled, "1" = enabled)

[Read: RAW Data output Enabled Configuration]



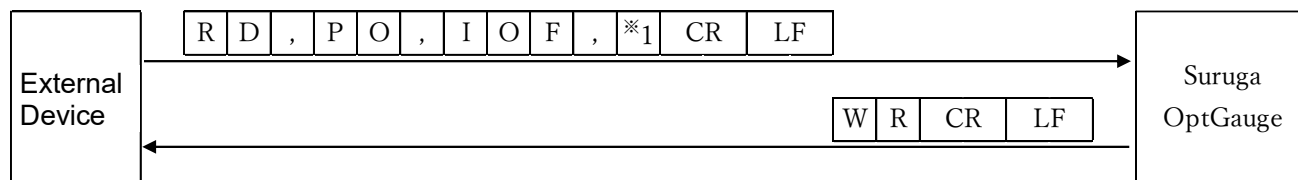
※1: RAW Data Output ("0" = disabled, "1" = enabled).

[Read: Image File output color Configuration]



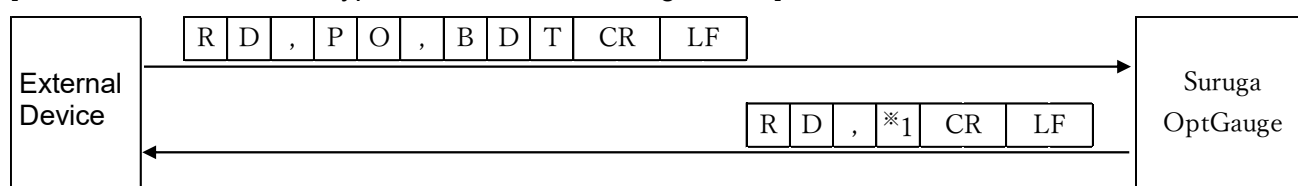
※1: Image File Output Color ("0"= Full Color, "1"= Grayscale).

[Read: Image File Output Format Configuration]



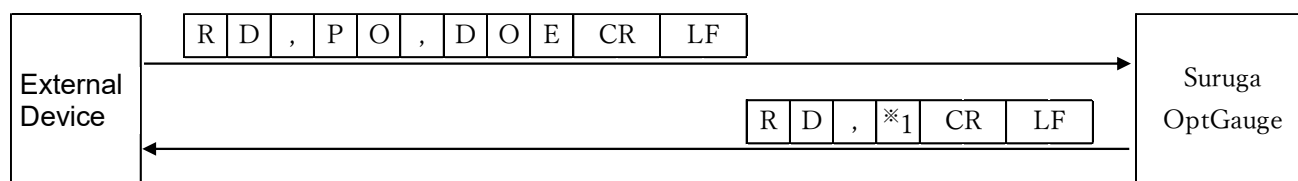
※1: Image File Output Format ("0"= png, "1"= bmp、"2"= tiff).

[Read: Beam Diameter Type for Calculation Configuration]



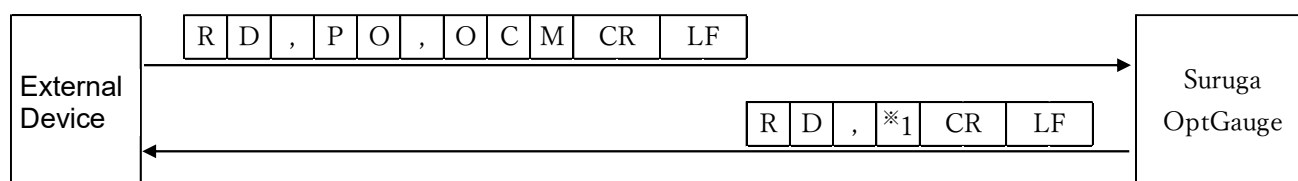
※1: Beam Diameter Type (“0”=D4Sigma, “1”=1/e²).

[Read: Orientation Enabled Configuration]



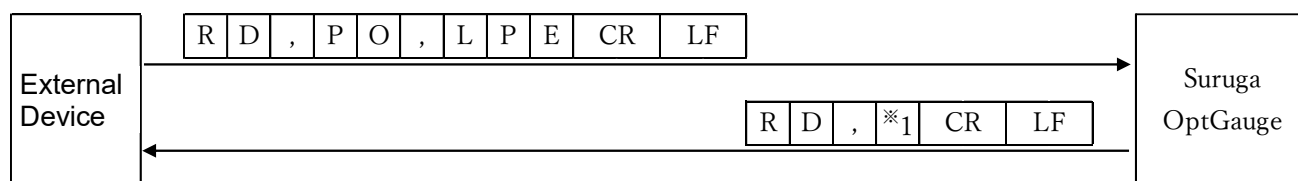
※1: Orientation Enabled (“0” = disabled, “1” = enabled).

[Read: Rotation Angle Measurement Method Configuration]



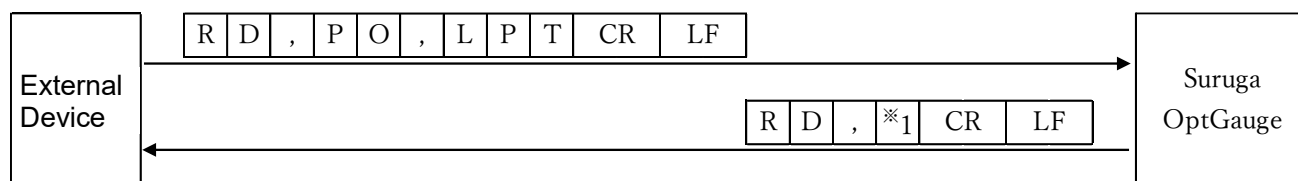
※1: Rotation Angle Measurement Method (“0”= Ellipse Fitting, “1”= Max Distance Search).

[Read: Line Position Enabled Configuration]



※1 : Line Position Enabled (“0” = disabled, “1” = enabled).

[Read: Line Position measurement straightness Threshold Configuration]



※1 : Line Position measurement straightness Threshold (- 30 to + 300).

[Read: Beam Centroid Configuration]



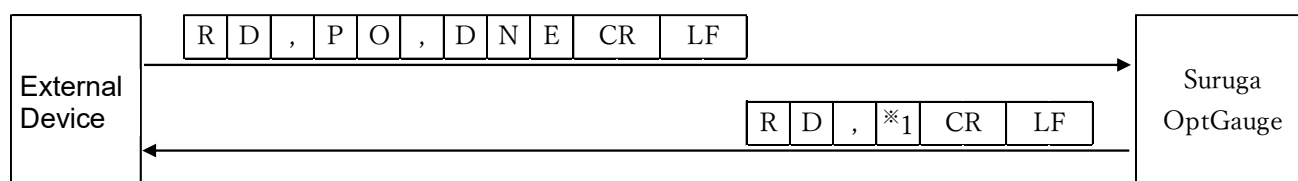
※1: Beam Centroid (“0” = area, “1” = intensity).

[Read: Angle Unit Configuration]



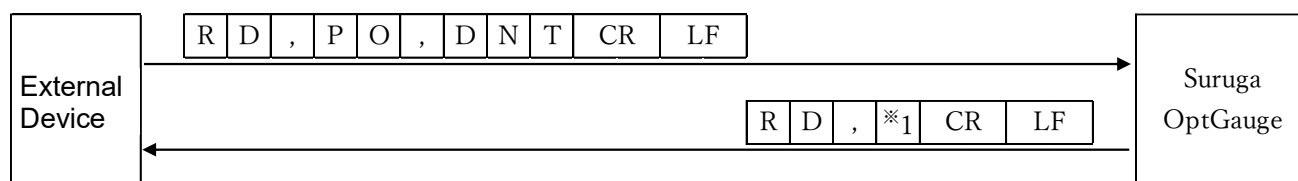
※1: Length Unit (“0” = Millimeter, “1” = Micrometer).

[Read: Denoising Enabled Configuration]



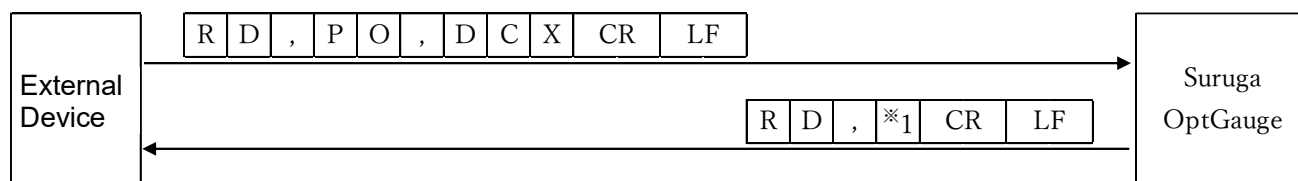
※1: Denoising function (“0” = disabled, “1” = enabled).

[Read: Denoising Threshold Value Configuration]



※1: Denoising threshold value (1 to 4095).

[Read: the Number of Decimal Places for the Centroid X Configuration]



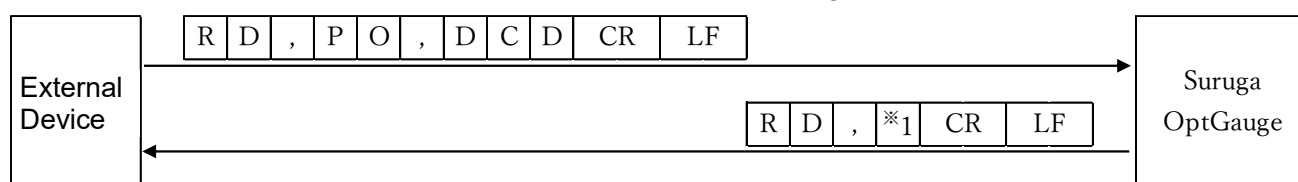
※1: Decimal places (0 to 8).

[Read: the Number of Decimal Places for the Centroid Y Configuration]



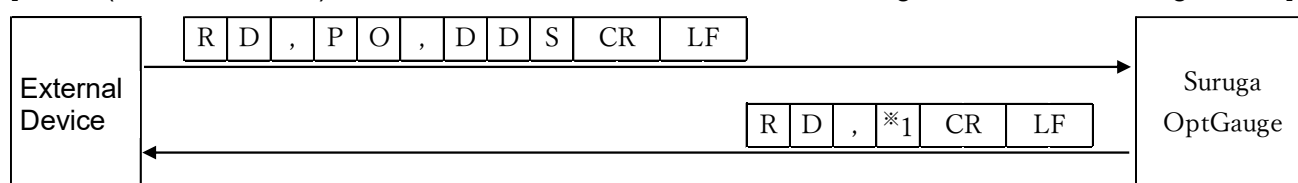
*1: Decimal places (0 to 8).

[Read: the Number of Decimal Places for the Centroid D Configuration]



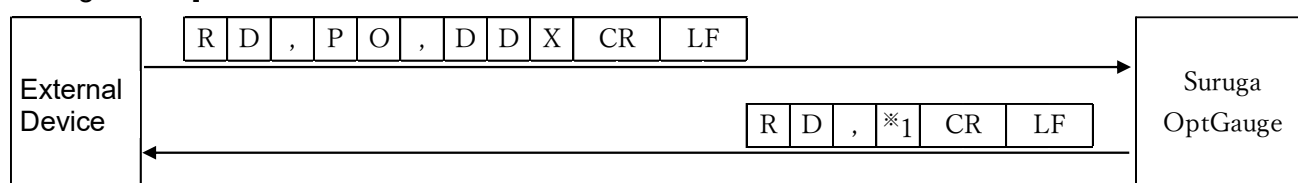
*1: Decimal places (0 to 8).

[Read: (Beam Diameter) the Number of Decimal Places for the D4Sigma or the 1/e² Configuration]



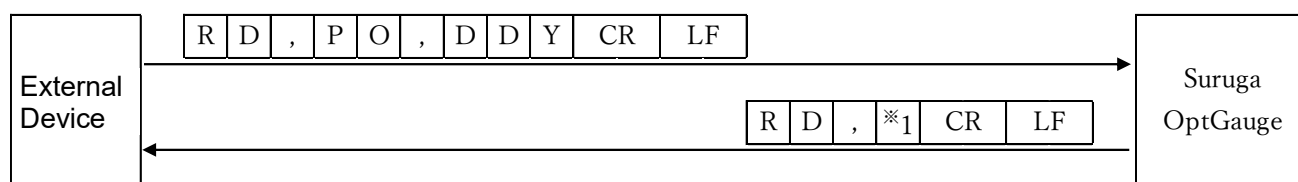
*1: Decimal places (0 to 8).

[Read: (Beam Diameter) the Number of Decimal Places for the D4Sigma X(M) or the 1/e²X(M) Configuration]



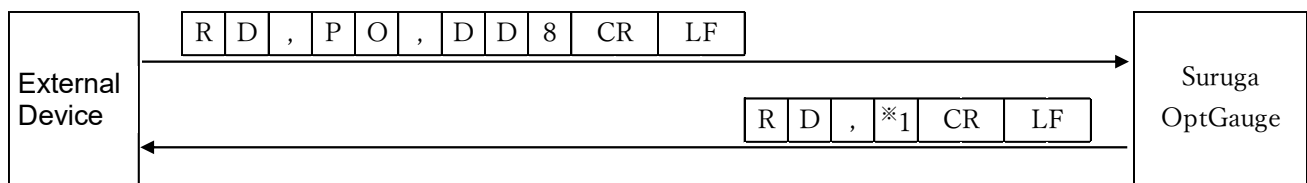
*1: Decimal places (0 to 8).

[Read: (Beam Diameter) the Number of Decimal Places for the D4Sigma Y(m) or the 1/e²Y(m) Configuration]



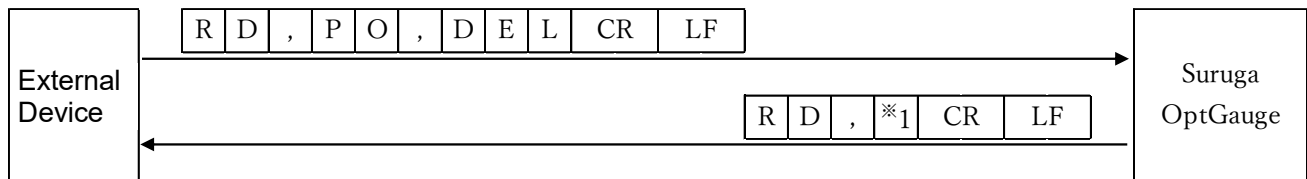
*1: Decimal places (0 to 8).

[Read: (Beam Diameter) the Number of Decimal Places for the D86 Configuration]



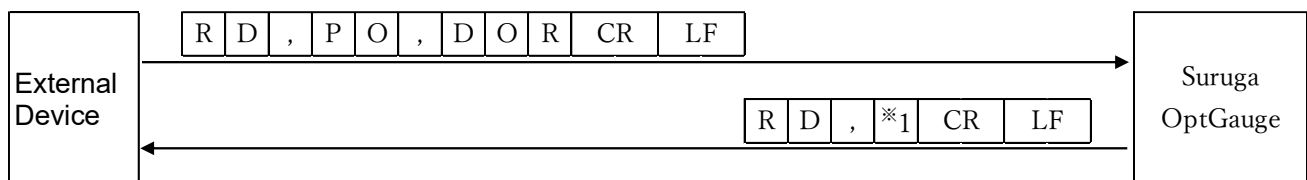
※1: Decimal places (0 to 8).

[Read: the Number of Decimal Places for the Ellipticity Configuration]



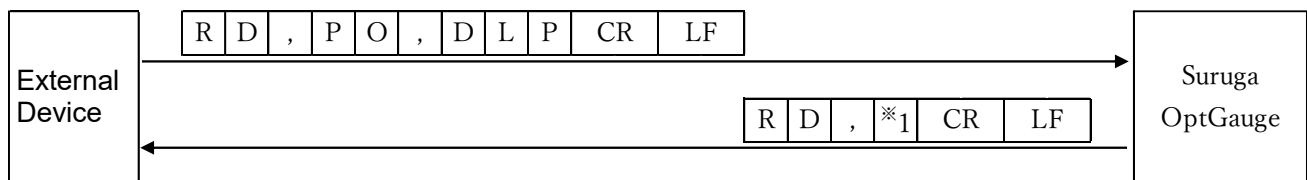
※1: Decimal places (0 to 8).

[Read: Number of Decimal Places for the Rotation Angle Measurement Configuration]



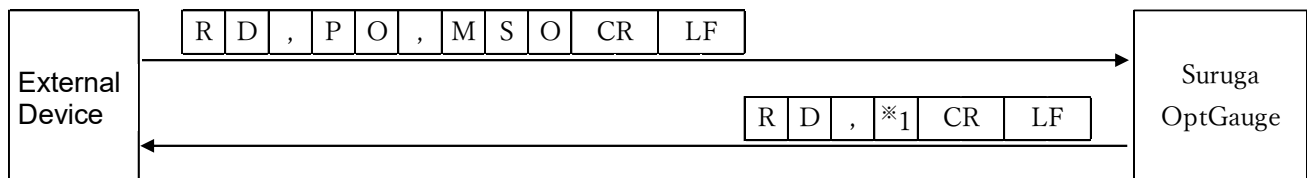
※1: Decimal places (0 to 8).

[Read: Number of Decimal Places for the Line Position Configuration]



※1: Decimal places (0 to 8).

[Read: (Multi Spot) Order Configuration]



※1: (Multi Spot) List sort type ("0" = area, "1" = centroid).

[Read: (Multi Spot) Spot Count Configuration]



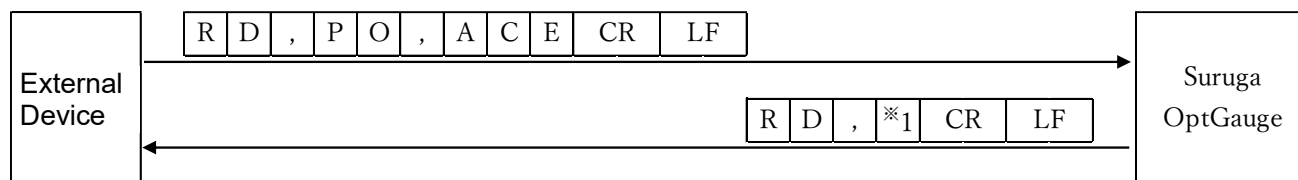
※1: Spot count (1 to 100).

[Read: (Multi Spot) Minimum Spot Area Configuration]



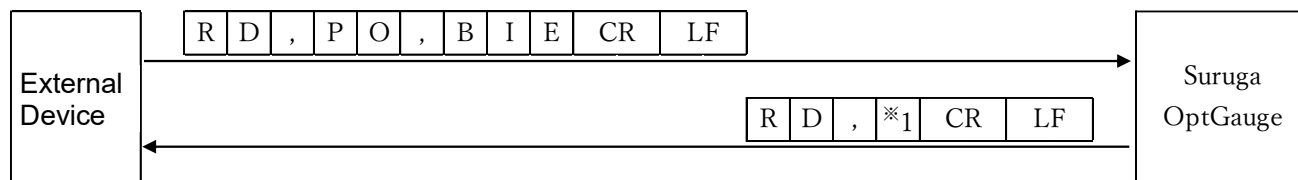
※1: Minimum spot area (1 to 1023).

[Read: Adaptive Cal Execution button display enabled Configuration]



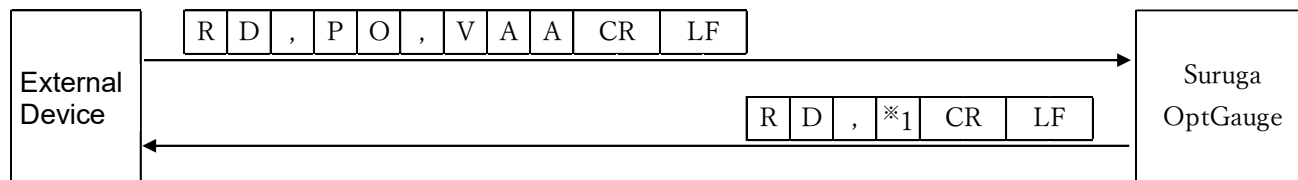
※1: Adaptive Cal execute button display ("0" = disabled, "1" = enabled).

[Read Binning Enabled Configuration]



※1: Binning setting ("0" = disabled, "1" = enabled).

[Read: Auto Aperture display Configuration]



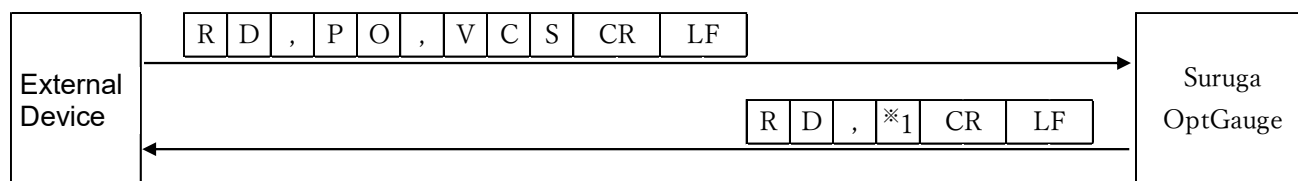
※1: Auto Aperture display ("0" = disabled, "1" = enabled).

[Read: Centroid Cursor display Configuration]



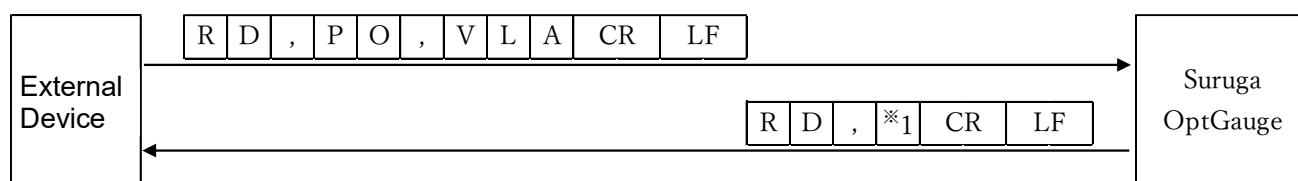
※1: Centroid Cursor display ("0" = disabled, "1" = enabled).

[Read: Cross Section display Configuration]



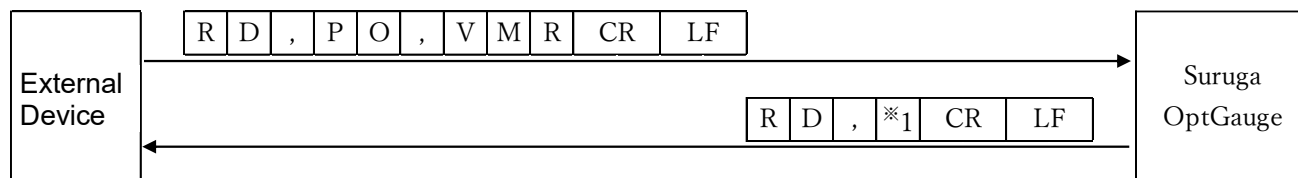
※1: Cross Section display ("0" = disabled, "1" = enabled).

[Read: Labeling Area Display Configuration]



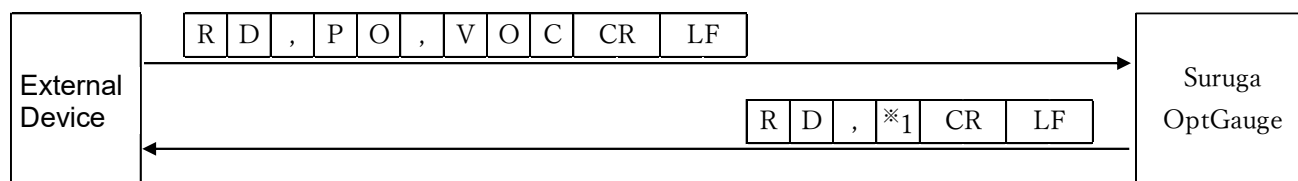
※1: Labeling Area display ("0" = disabled, "1" = enabled).

[Read: Measurement Range Display Configuration]



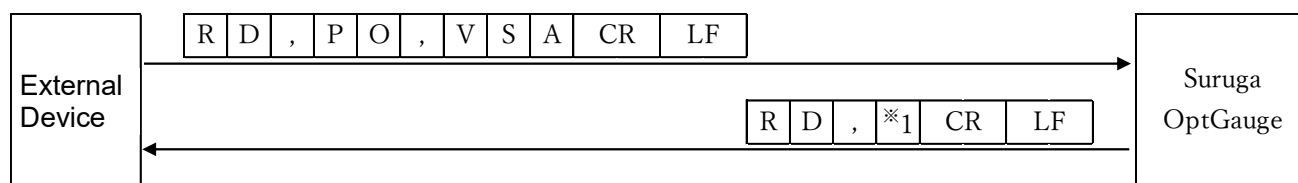
※1: Measurement range display ("0" = disabled, "1" = enabled).

[Read: Origin Cursor Display Configuration]



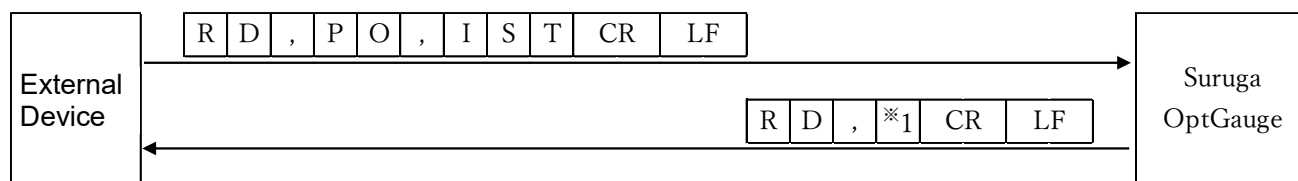
※1: Origin Cursor display ("0" = disabled, "1" = enabled).

[Read: Spot Area Display Configuration]



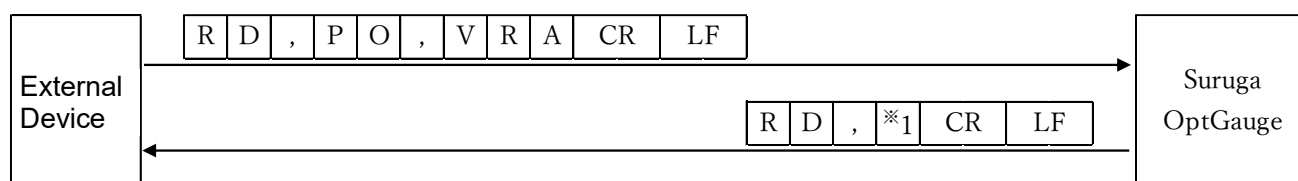
※1: Spot Area display ("0" = disabled, "1" = enabled).

[Read: Spot Area Display Type Configuration]



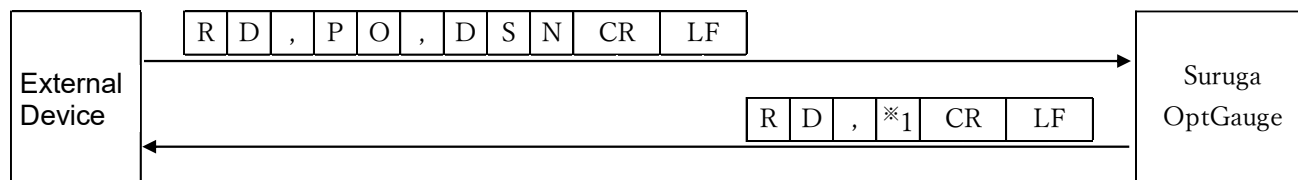
※1: Spot Area display type ("0" = D4Sigma or $1/e^2$, "1" = D86).

[Read: ROI Area Display Configuration]



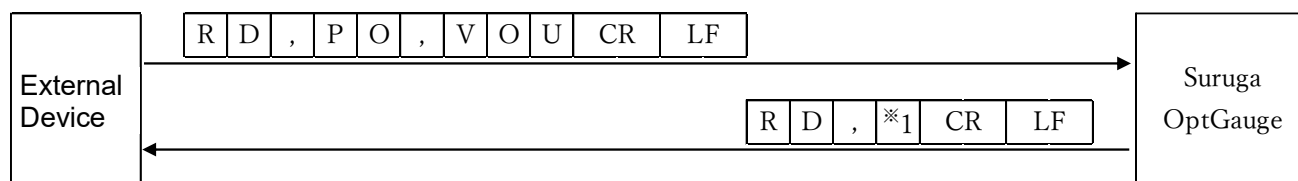
※1: ROI area display ("0" = disabled, "1" = enabled).

[Read: Display Spot Number Configuration]



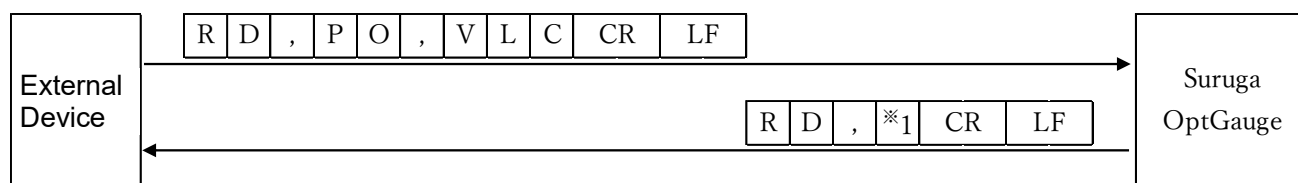
※1: Display spot number setting value (0 to 100).

[Read: Rotation Angle Cursor Display Enabled Configuration]



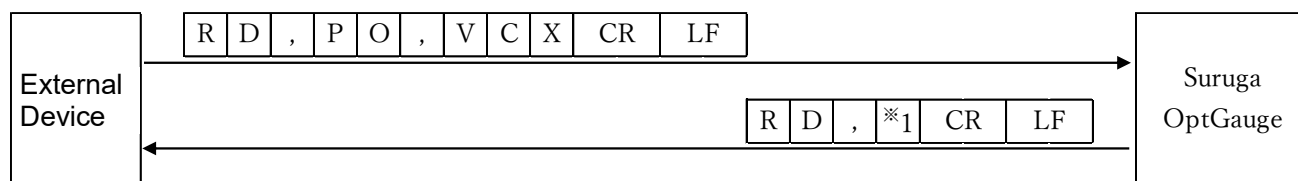
※1: Rotation angle cursor display ("0" = disabled, "1" = enabled).

[Read: Line Position Cursor Display Enabled Configuration]



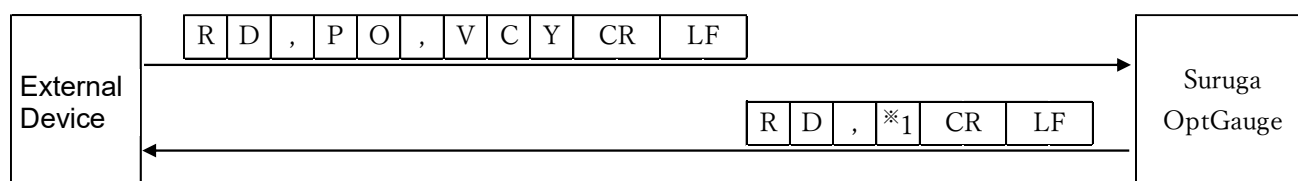
※1: Line Position cursor display ("0" = disabled, "1" = enabled).

[Read: Centroid X Results Display Configuration]



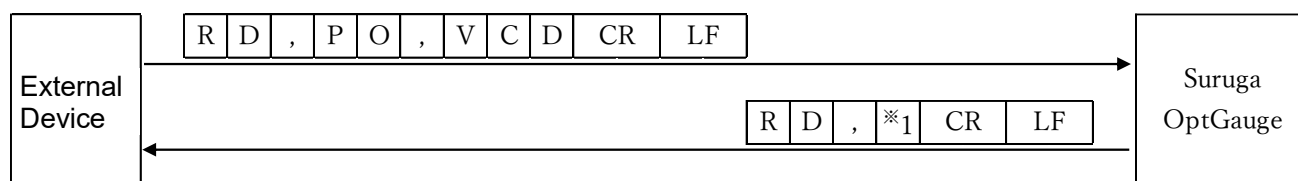
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Centroid Y Results Display Configuration]



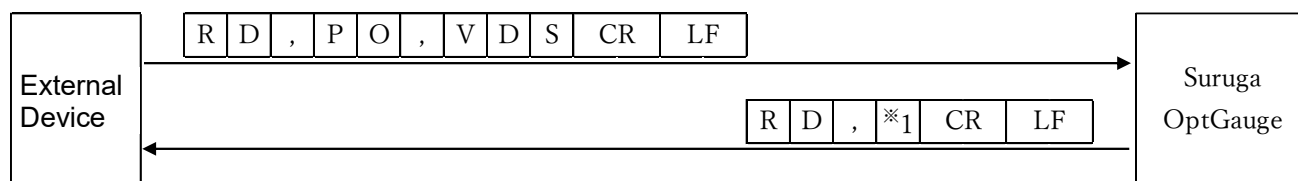
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Centroid D Results Display Configuration]



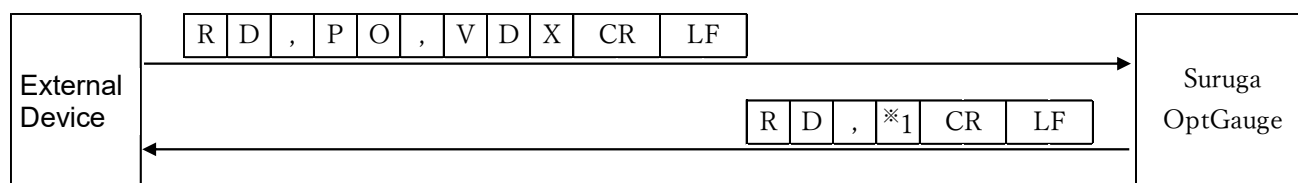
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4Sigma or 1/e² Results Display Configuration]



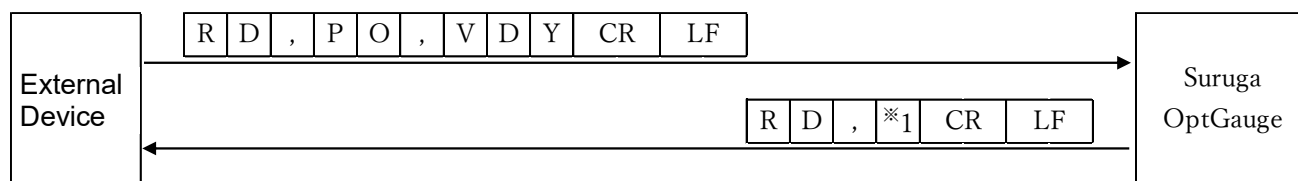
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4Sigma X(M) or $1/e^2$ X(M) Results Display Configuration]



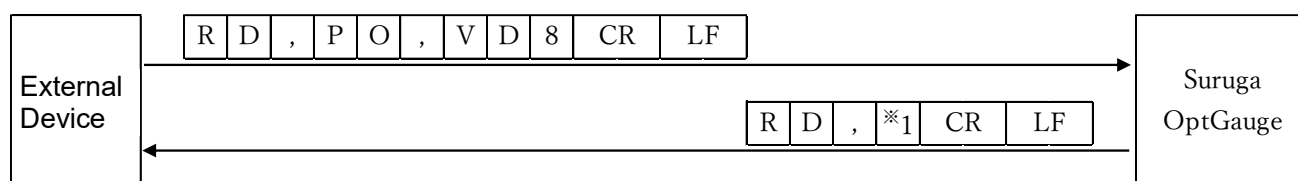
※1: Results display ("0" = disabled, "1" = enabled).

[Read: D4Sigma Y(m) or $1/e^2$ Y(m) Results Display Configuration]



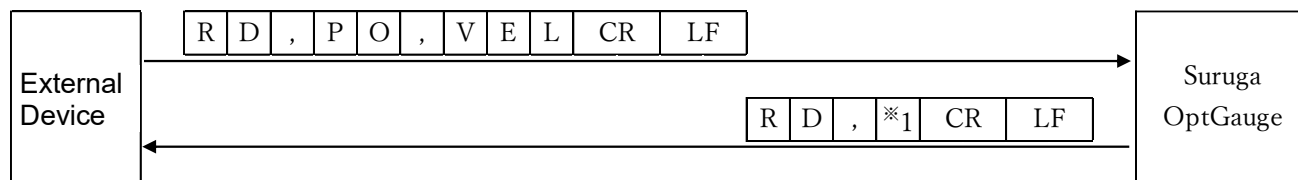
※1:Results display ("0" = disabled, "1" = enabled).

[Read: D86 Results Display Configuration]



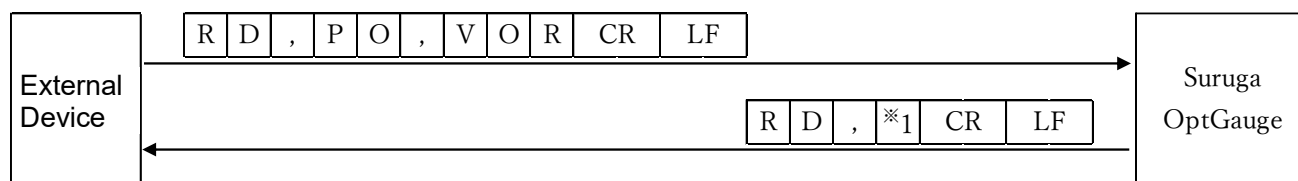
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Ellipticity Results Display Configuration]



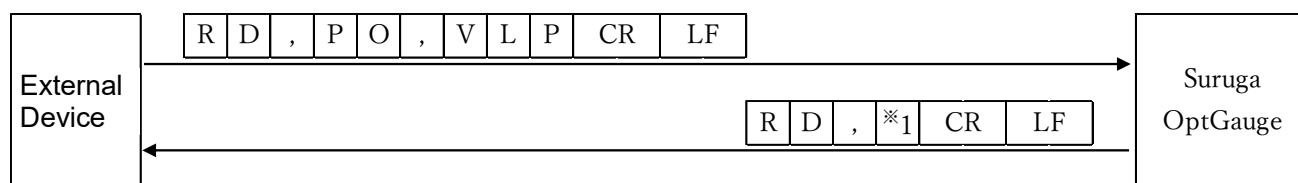
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Rotation Angle Result Display Configuration]



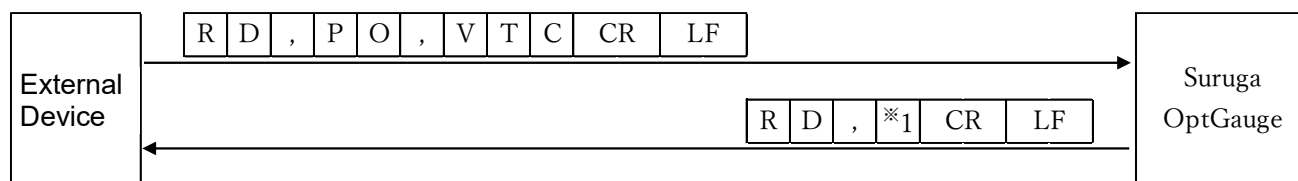
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Line Position Result Display Configuration]



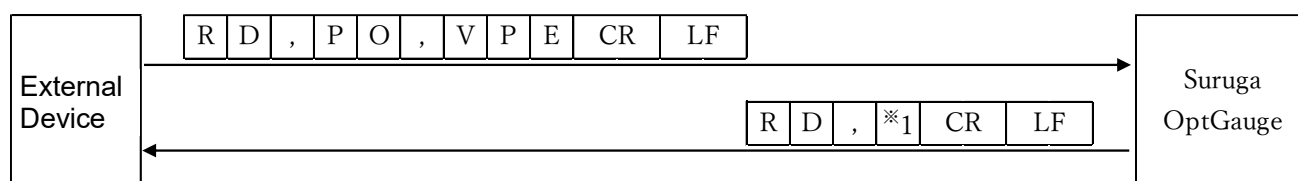
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Total Count Result Display Configuration]



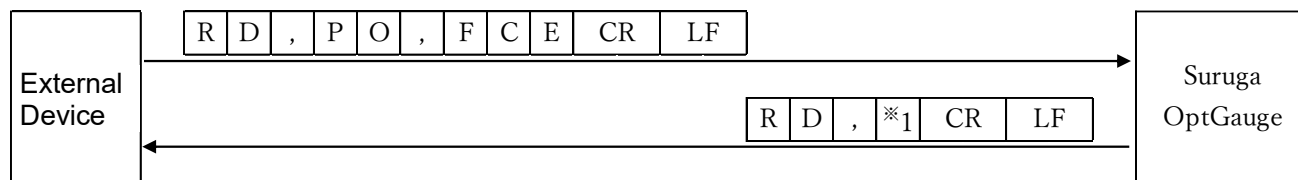
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Peak Result Display Configuration]



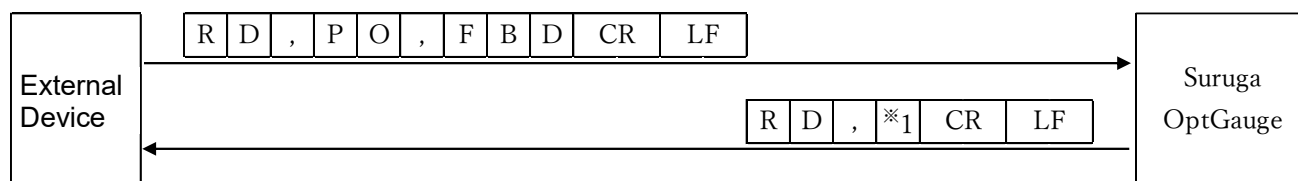
※1: Results display ("0" = disabled, "1" = enabled).

[Read: Font size for Centroid Configuration]



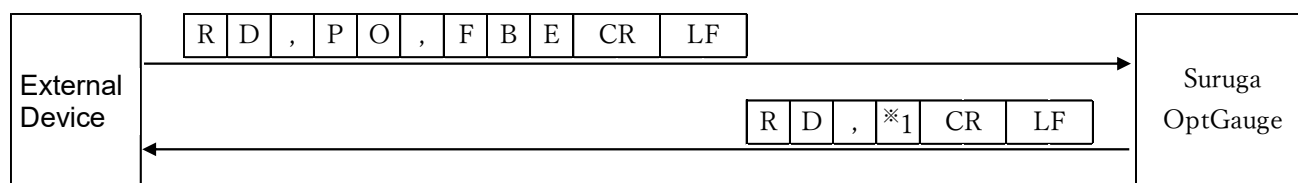
※1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font size for Beam Diameter Configuration]



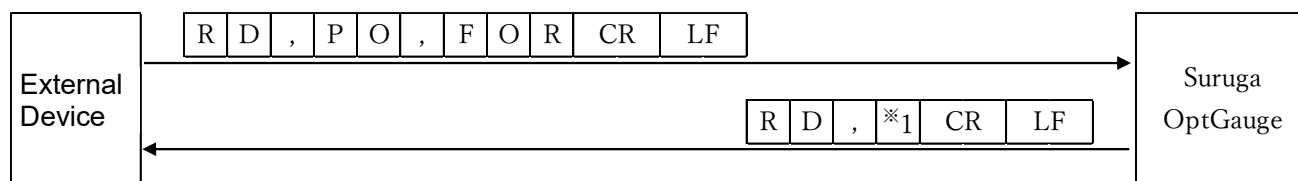
※1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font size for Beam Ellipticity Configuration]



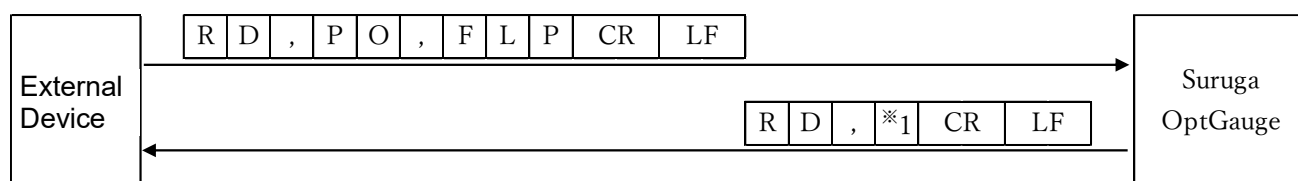
※1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font Size for the Rotation Angle Configuration]



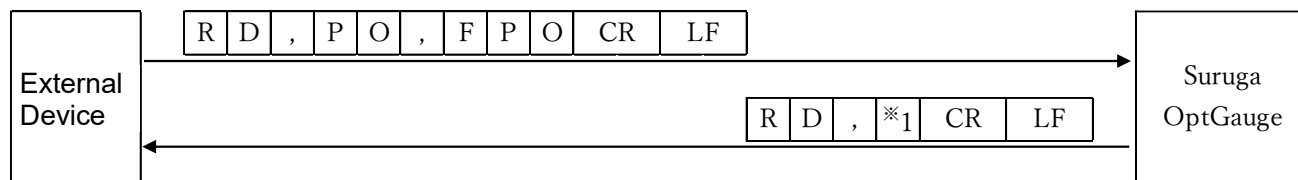
※1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Font Size for the Line Position Configuration]



※1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Read: Power Font Size Configuration]



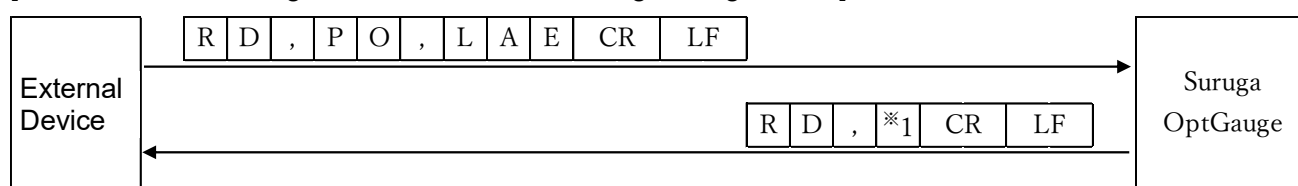
※1: Power font size ("0" = small, "1" = medium, "2" = large).

[Read: External Trigger Mode Enabled Configuration]



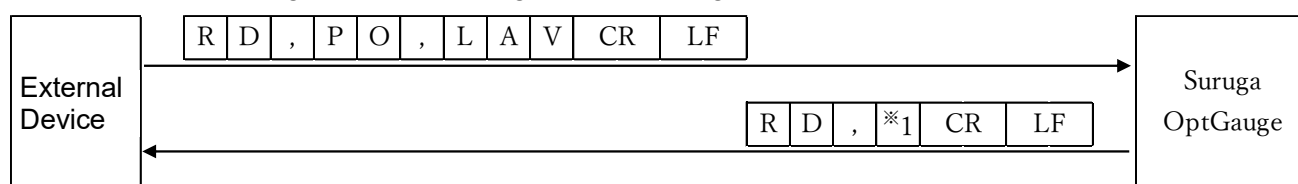
※1: External Trigger ("0" = disabled, "1" = enabled).

[Read: Automatic Brightness Execution Enabling Configuration]



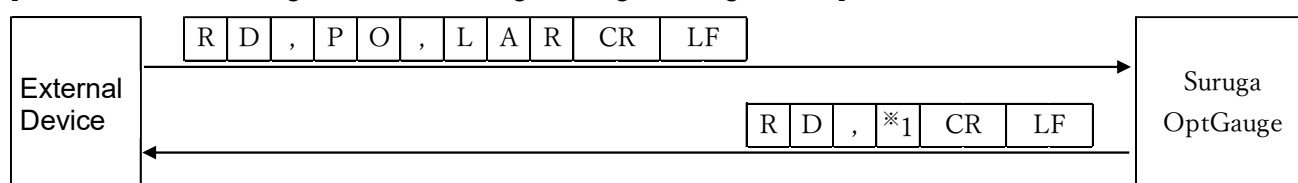
※1: Automatic brightness execution ("0" = disabled, "1" = enabled).

[Read: Automatic Brightness Peak Target Value Configuration]



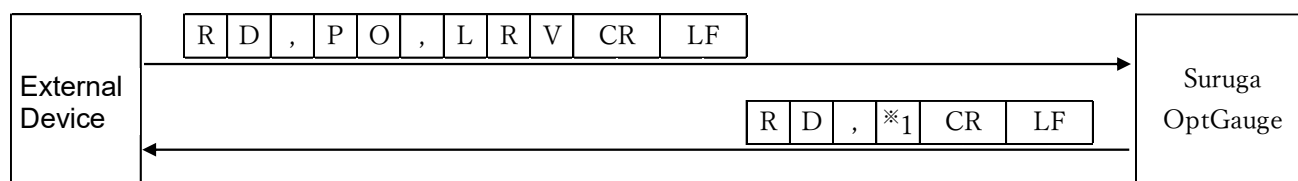
※1: Automatic brightness peak target value (1000 to 3500).

[Read: Automatic Brightness Peak Target Range Configuration]



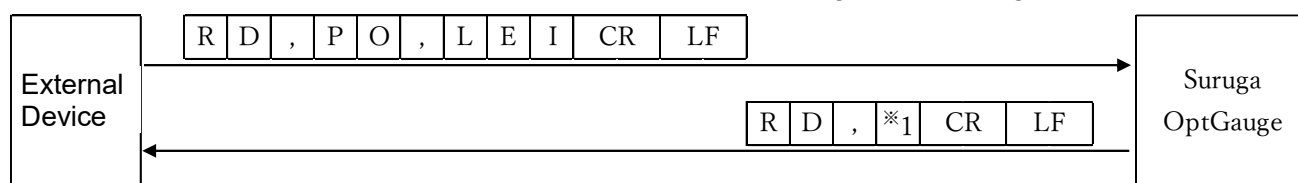
※1: Automatic brightness peak target range (100 to 1000).

[Read: Reflectance of the target applied in the Automatic Brightness configuration]



※1: Automatic brightness target object reflectance (0.05 to 100).

[Read: Initial Exposure Time Value Applied in the Automatic Brightness Configuration]



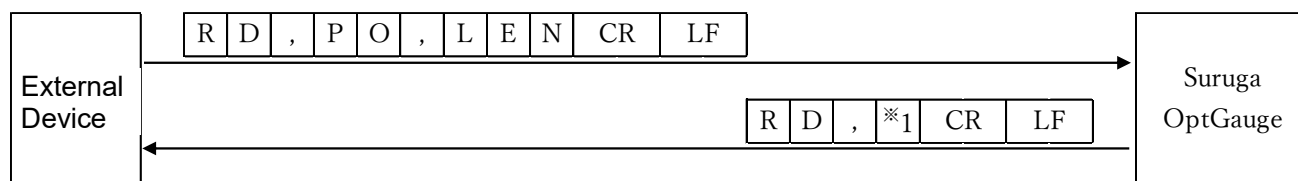
※1: Initial exposure time value used in automatic brightness (0.027 to 100).

[Read: Maximum Value Of Exposure Time Applied in the Automatic Brightness Configuration]



※1: Maximum value of exposure time for the automatic brightness (0.027 to 100).

[Read: Minimum Value Of Exposure Time Applied in the Automatic Brightness Configuration]



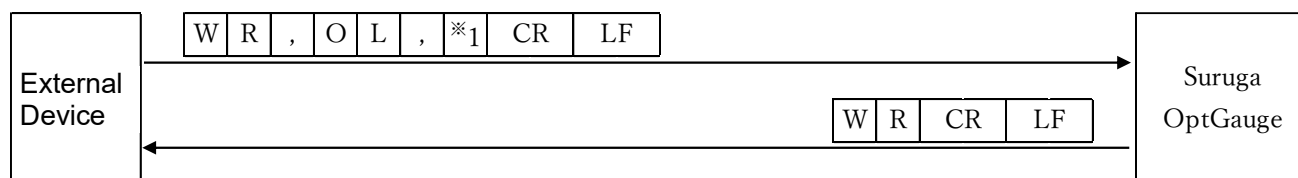
※1: Minimum value of exposure time for the automatic brightness (0.027 to 100).

3.5 Write Commands

3.5.1 Command Format

3.5.1.1 Common

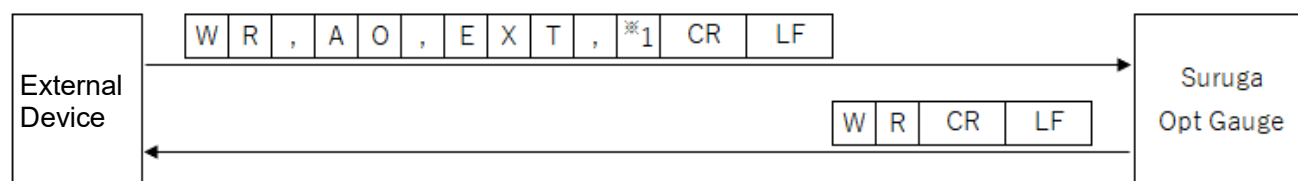
[Write: Option List Configuration]



※1: Option list index number.

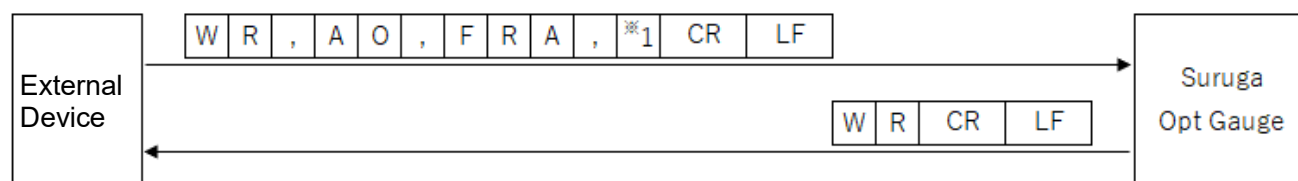
3.5.1.2 Angle

[Write: Sensor Camera Exposure Time]



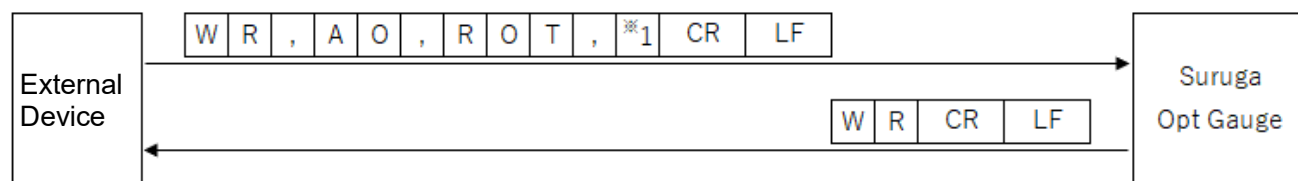
※1: Exposure time (0.027 to 2000).

[Write: Sensor Camera Frame Rate]



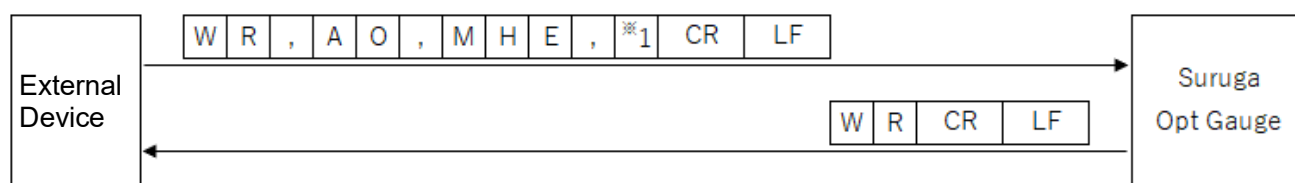
※1: Frame Rate (0.1 to 100).

[Write: Rotation Configuration]



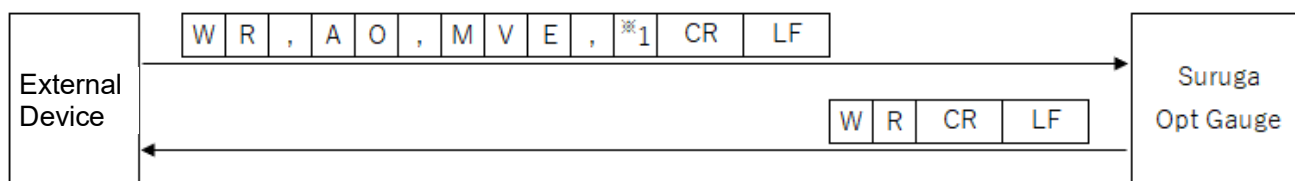
※1: Rotation ("0" = OFF, "1" = Rotation right 90°, "2" = Rotation right 180°, "3" = Rotation right 270°).

[Write: Mirroring Horizontal Configuration]



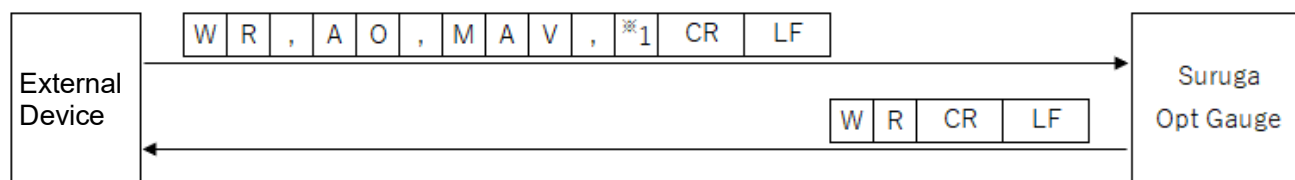
※1: Mirroring (“0” = OFF, “1” = horizontal mirroring).

[Write: Mirroring Vertical Configuration]



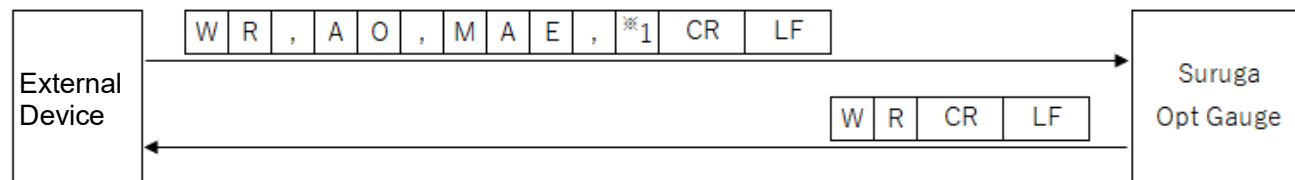
※1: Mirroring (“0” = OFF, “1” = vertical mirroring).

[Write: The Number of Averaging Times Configuration]



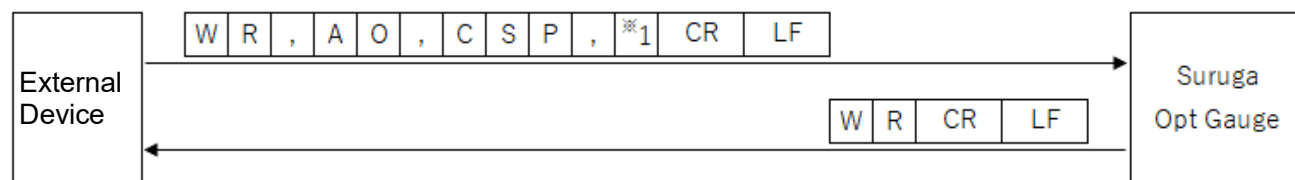
※1: The Number of Averaging Times (2 to 262,144).

[Write: Averaging Processing enabled Configuration]



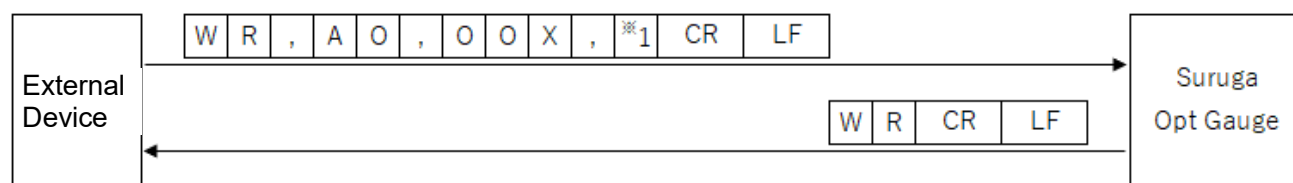
※1: Averaging Processing (“0” = disabled, “1” = enabled).

[Write: Cross Section Point Configuration]



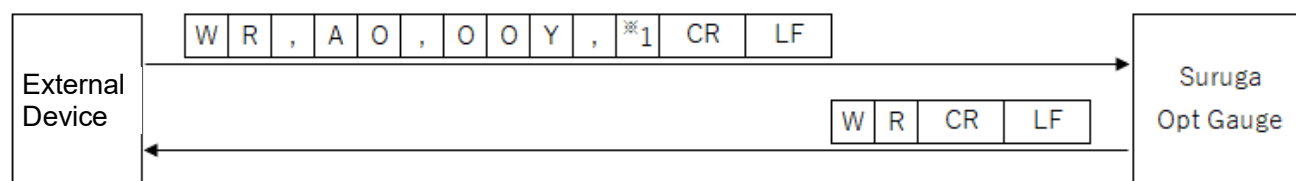
※1: Cross Section Point (“0” = Origin Cursor, “1” = Beam Cursor).

[Write: Origin Offset X Value Configuration]



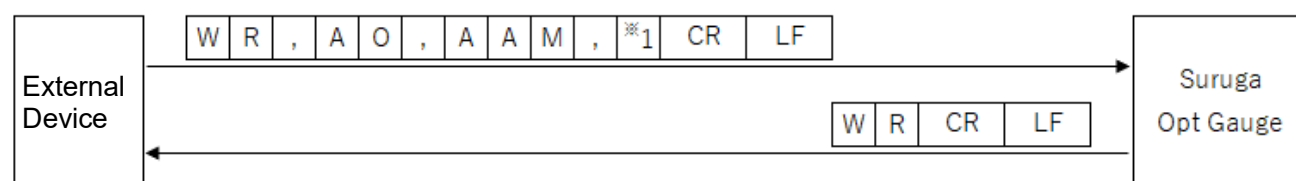
※1: Origin Offset X (- 20 to + 20).

[Write: Origin Offset Y Value Configuration]



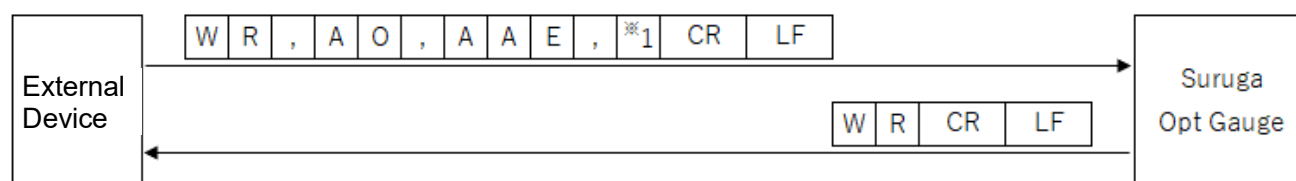
※1: Origin Offset Y (- 20 to + 20).

[Write: Auto Aperture Method Configuration]



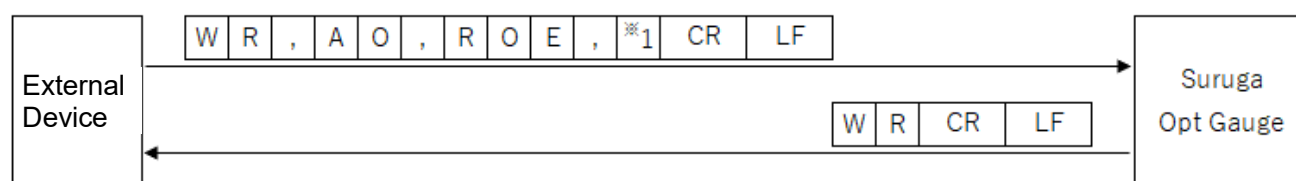
※1: Auto Aperture Method ("0" = area, "1" = luminance).

[Write: Auto Aperture enabled Configuration]



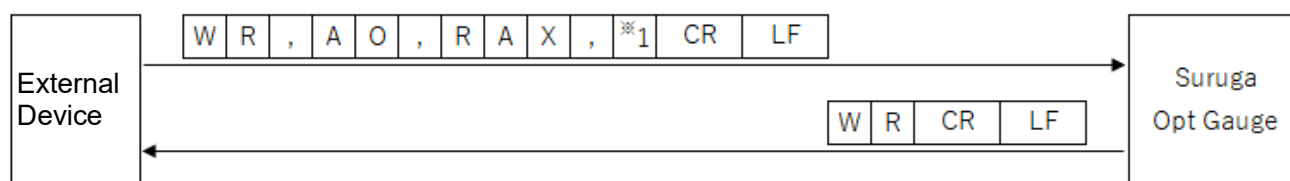
※1: Auto Aperture ("0" = disabled, "1" = enabled).

[Write: ROI enabled Configuration]



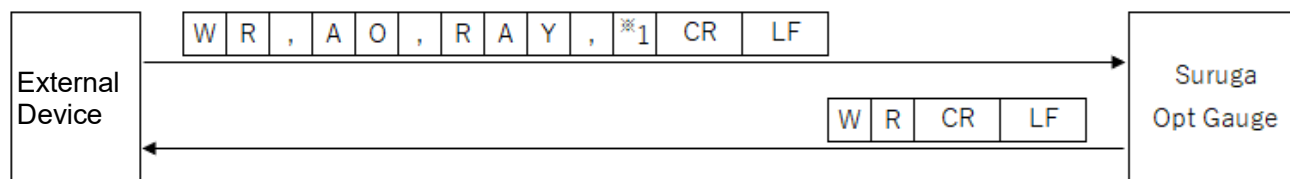
※1: ROI ("0" = disabled, "1" = enabled).

[Write: ROI X Value Configuration]



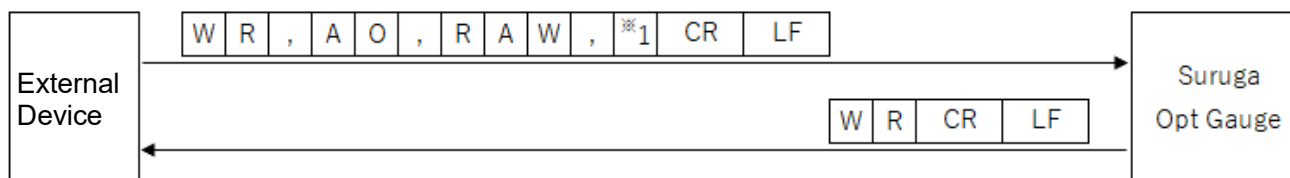
*1: ROI X value (- 3000 to + 3000) or (- 1500 to + 1500) if the Binning is enabled.

[Write: ROI Y Value Configuration]



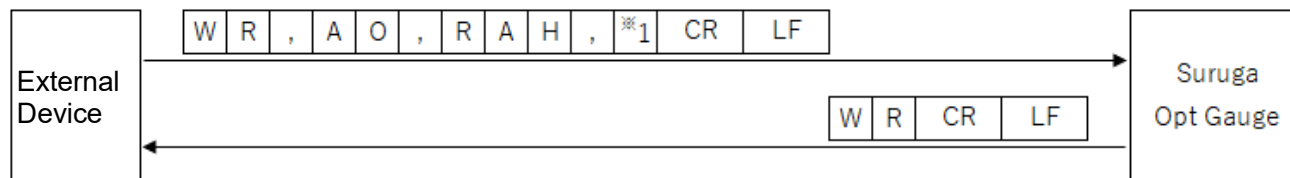
*1: ROI Y value (- 3000 to + 3000) or (- 1500 to + 1500) if the Binning is enabled.

[Write: ROI Width Configuration]



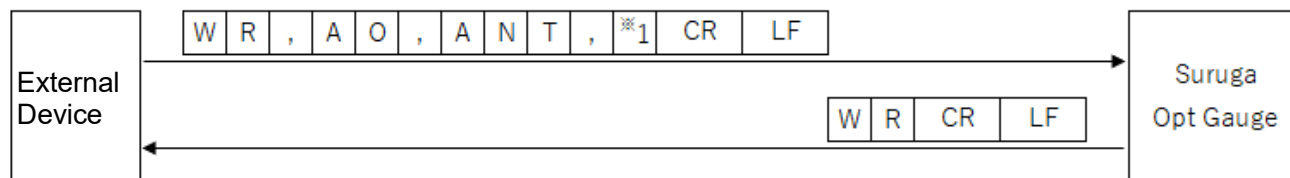
*1: ROI Width (- 3000 to + 3000) or (- 1500 to + 1500) if the Binning is enabled.

[Write: ROI Height Configuration]



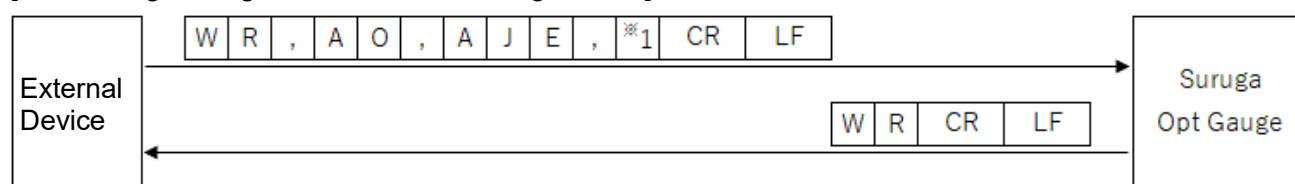
*1 : ROI Height (- 3000 to + 3000) or (- 1500 to + 1500) if the Binning is enabled.

[Write: Angle Type Configuration]



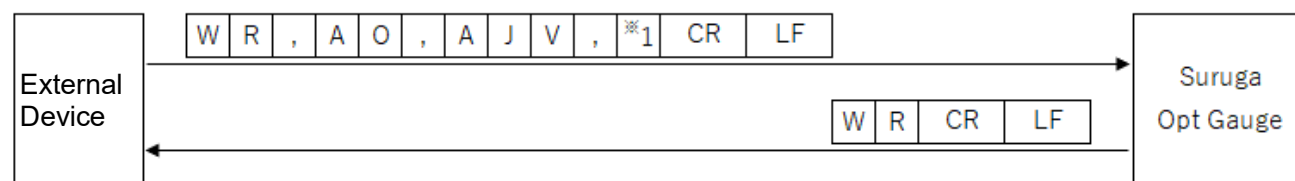
*1: Angle Type ("0" = Tilt angle, "1" = Beam Angle).

[Write: Angle Judgement Enabled Configuration]



*1: Angle judgement ("0" = disabled, "1" = enabled).

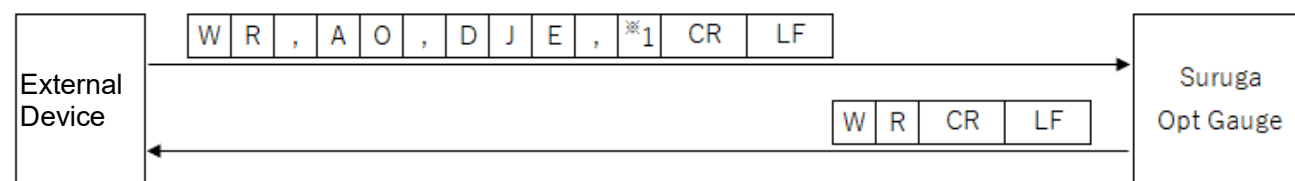
[Write: Divergence Judgement Enabled Configuration]



*1: Angle judgement

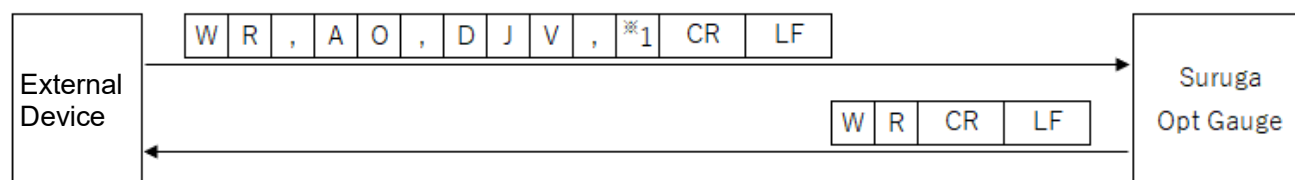
If the Angle Type = Tilt Angle, then (0 to 10) or if the Angle Type = Beam Angle, then (0 to 20).

[Write: Divergence Judgement Enabled Configuration]



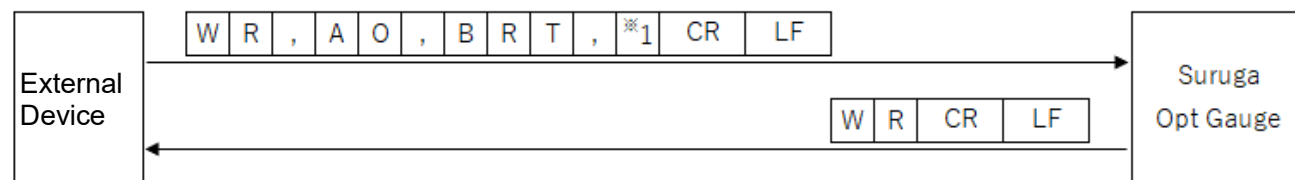
*1: Divergence judgement ("0" = disabled, "1" = enabled).

[Write: Divergence Judgement Value Configuration]



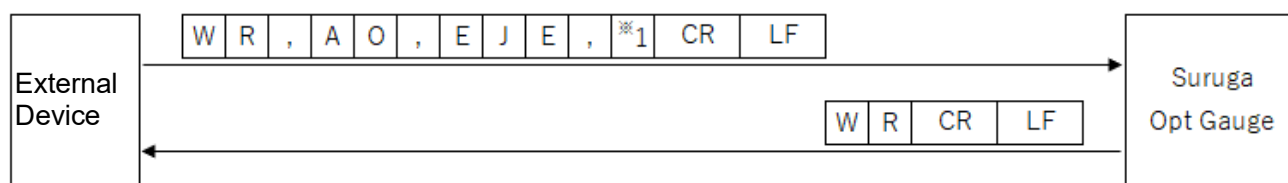
*1: Divergence judgement value (0.0000 to 1000.0000).

[Write: Radius Type Judgement Configuration]



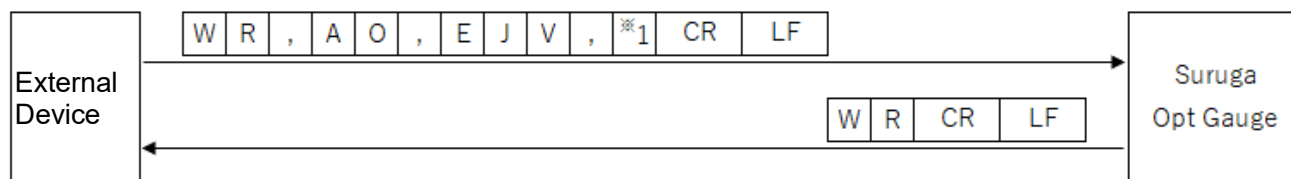
*1: Radius type judgement ("0" = D4Sigma or 1/e², "1" = D86).

[Write: Ellipticity Judgment Enabled Configuration]



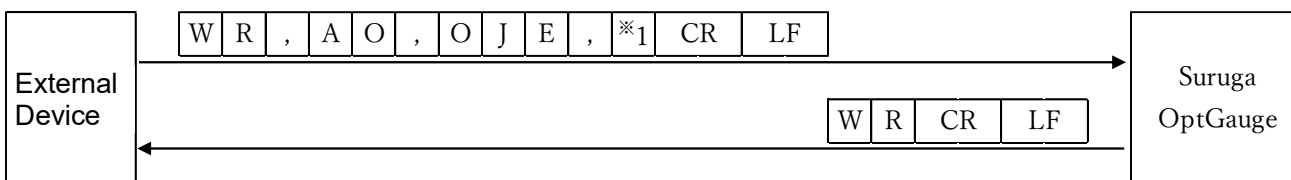
*1: Ellipticity Judgement ("0" = disabled, "1" = enabled).

[Write: Ellipticity Judgement Value Configuration]



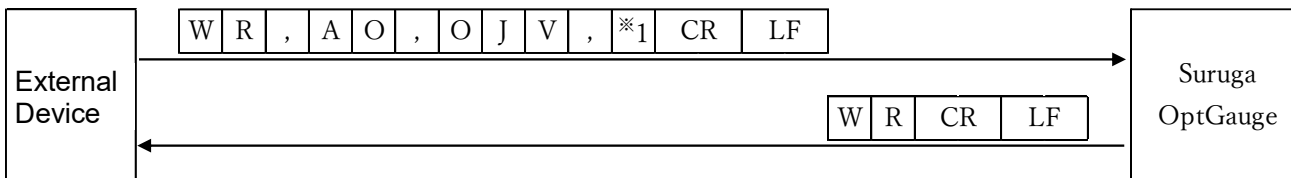
*1: Ellipticity judgement value (0.0000 to 1.0000).

[Writes: Rotation Angle Judgement Enabled Configuration]



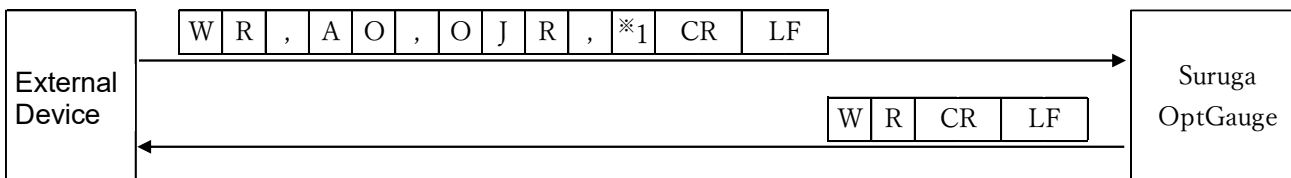
*1: Rotation Angle Judgement ("0" = disabled, "1" = enabled).

[Rotation Angle Judgement criteria Value Configuration]



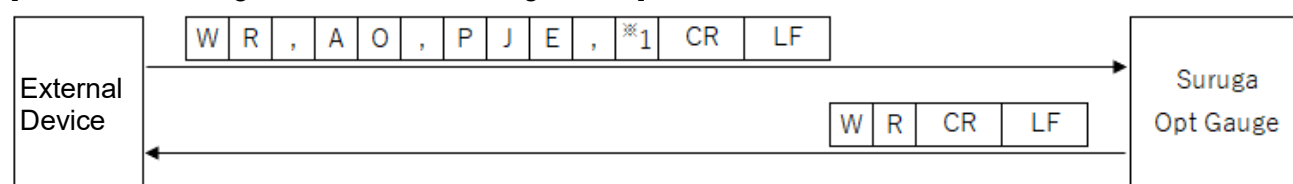
*1: Rotation Angle Judgement criteria Valu (- 90 to + 90).

[Rotation Angle Judgement Range Configuration]



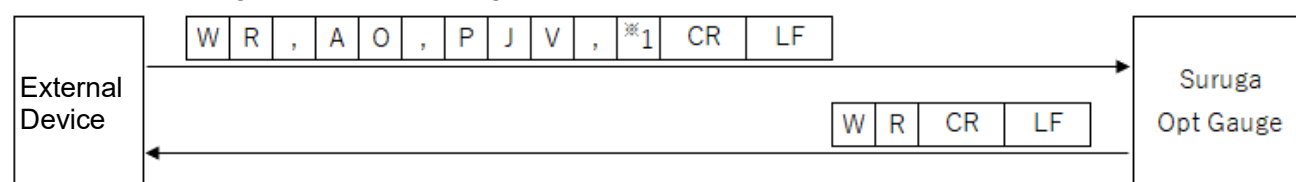
*1: Rotation angle judgement range (- 90 to + 90).

[Write: Peak Judgement Enabled Configuration]



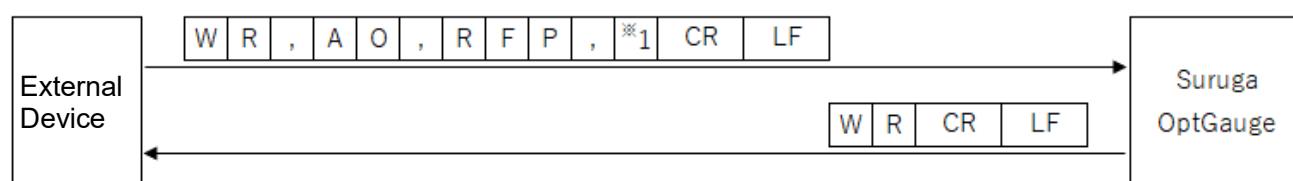
※1: Peak judgement ("0" = disabled, "1" = enabled).

[Write: Peak Judgement Value Configuration]



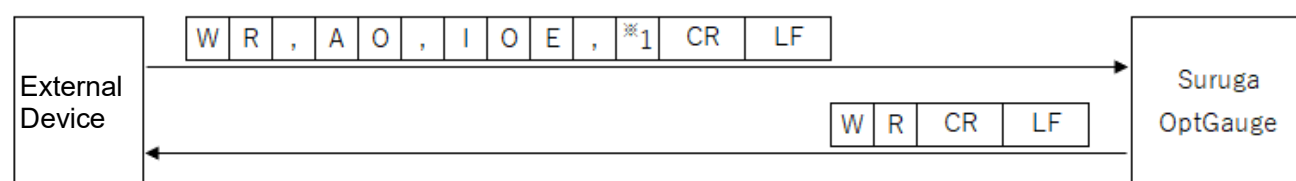
※1: Peak judgement value (0.0 to 4,095.0).

[Write: Log File Output Path Configuration]



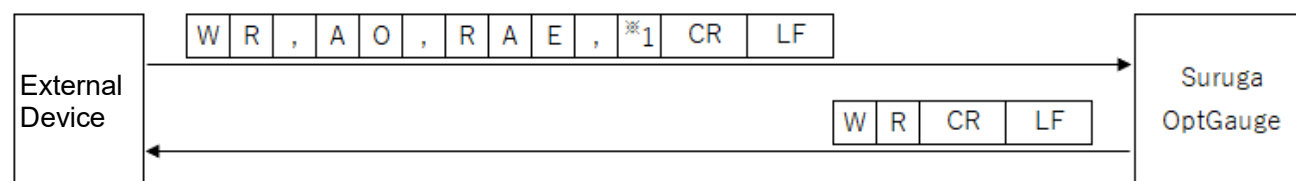
※1: Log file path string.

[Write: Image File Output Enabled Configuration]



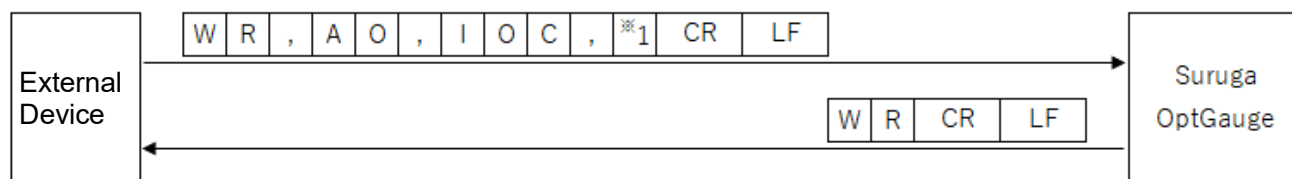
※1 : Image file output ("0" = disabled, "1" = enabled).

[Write: RAW Data Output Enabled Configuration]



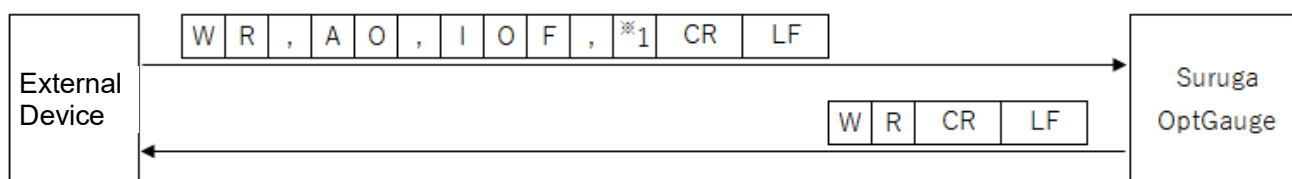
※1 : RAW data output ("0" = disabled, "1" = enabled).

[Write: Image File Output Color Configuration]



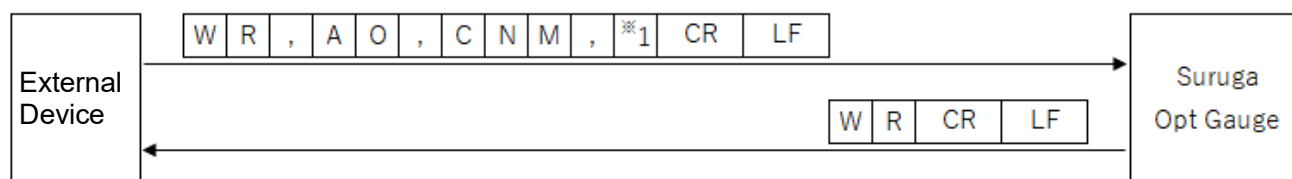
※1 : Image file output color ("0"= Full Color、"1"= Grayscale).

[Write: Image File Output Format Configuration]



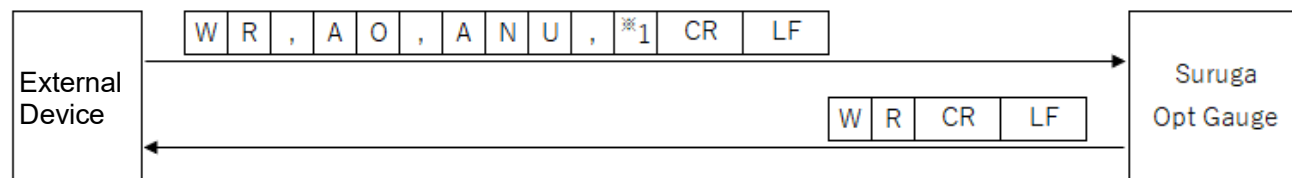
※1 : Image file output format ("0"= png、"1"= bmp、"2"= tiff).

[Write: Beam Centroid Configuration]



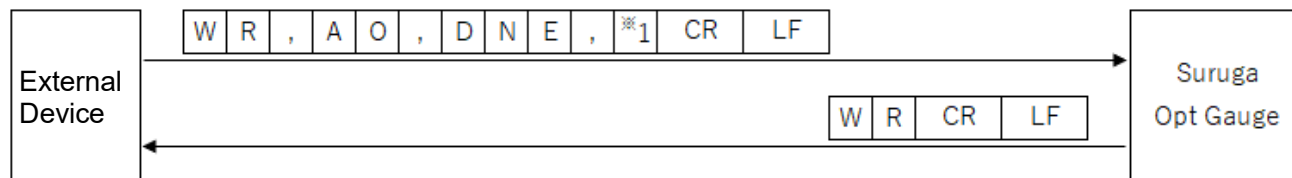
※1: Beam centroid ("0" = area, "1" = Intensity).

[Write: Angle Unit Configuration]



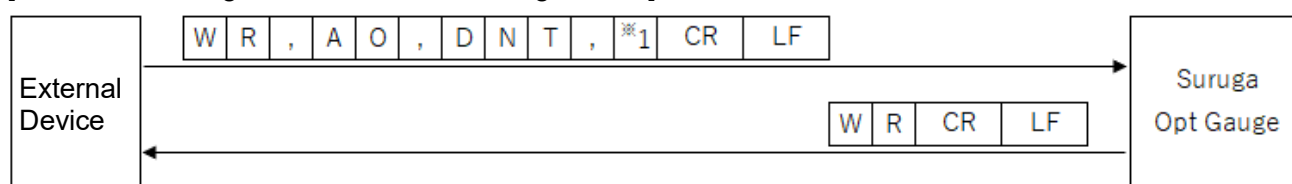
※1: Angle Unit ("0" = degree, "1" = DegMinSec, "2" = milliradian).

[Write: Denoising Enabled Configuration]



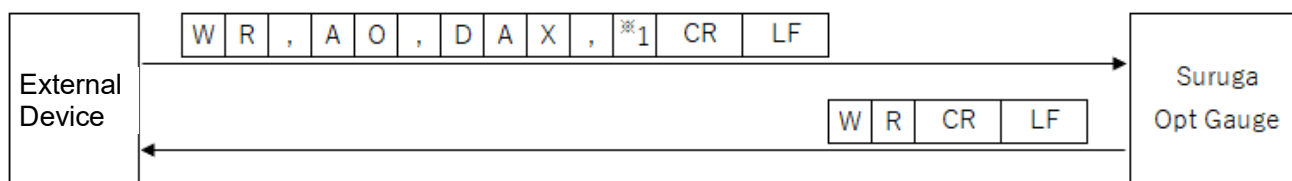
※1: Denoising function ("0" = disabled, "1" = enabled).

[Write: Denoising Threshold Value Configuration]



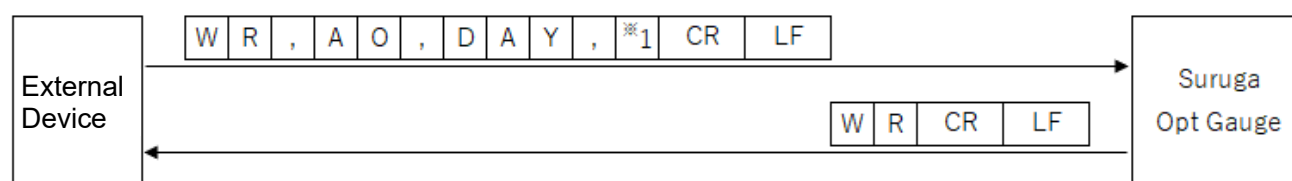
*1: Denoising threshold value (1 to 4095).

[Write: Angle X decimal place Configuration]



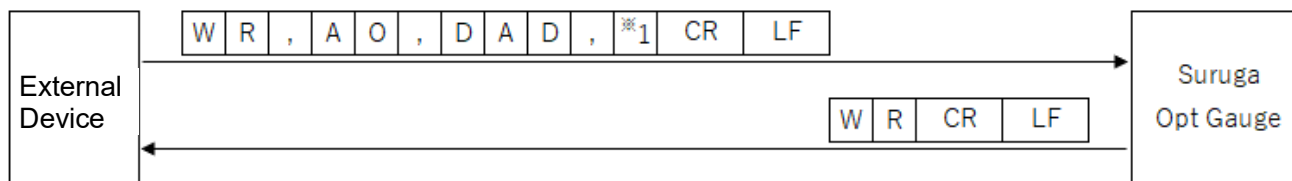
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Angle Y Configuration]



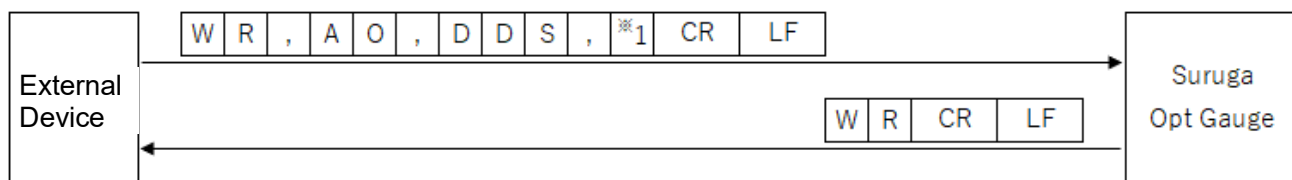
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Angle D Configuration]



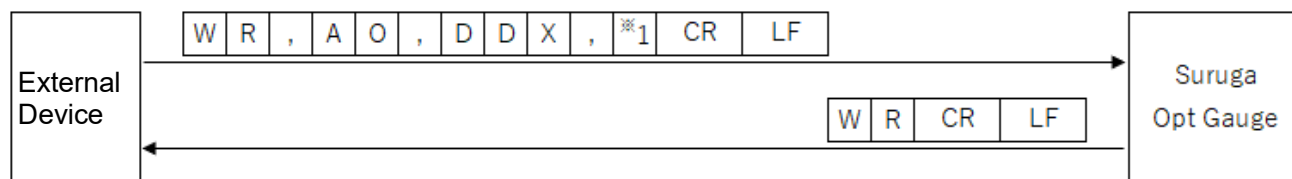
*1: Decimal places (0 to 8).

[Write: (Beam divergence) the Number of Decimal Places for the D4Sigma or the 1/e² Configuration]



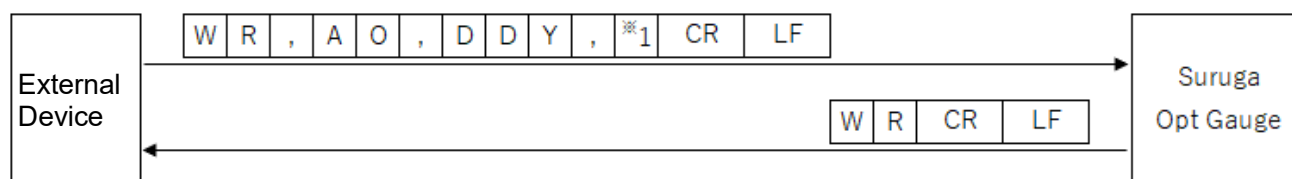
*1: Decimal places (0 to 8).

[Write: (Beam divergence) the Number of Decimal Places for the D4Sigma X(M) or the $1/e^2$ X(M) Configuration]



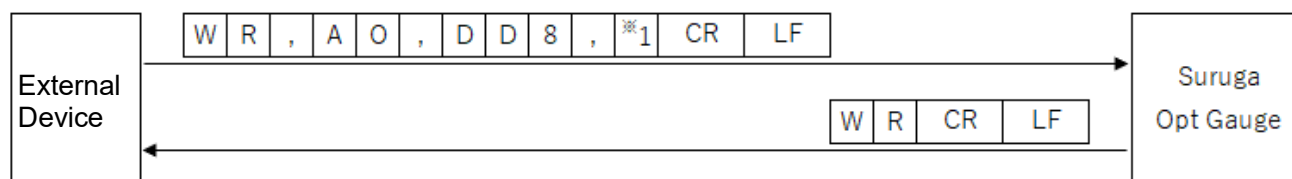
*1: Decimal placed (0 to 8).

[Write: (Beam divergence) the Number of Decimal Places for the D4Sigma Y(m) or the $1/e^2$ X(M) Configuration]



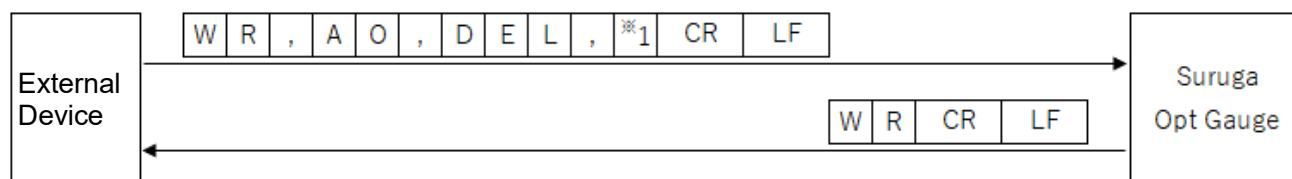
*1: Decimal places (0 to 8).

[Write: (Beam divergence) the Number of Decimal Places for the D86 Configuration]



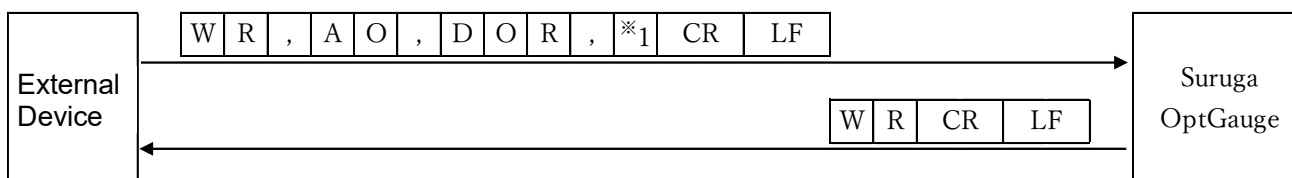
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Ellipticity Configuration]



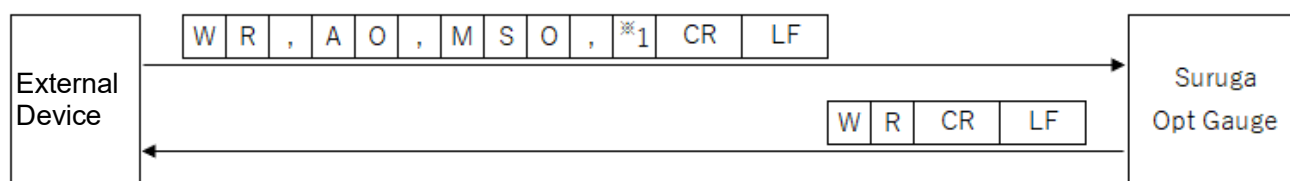
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Rotation Angle Configuration]



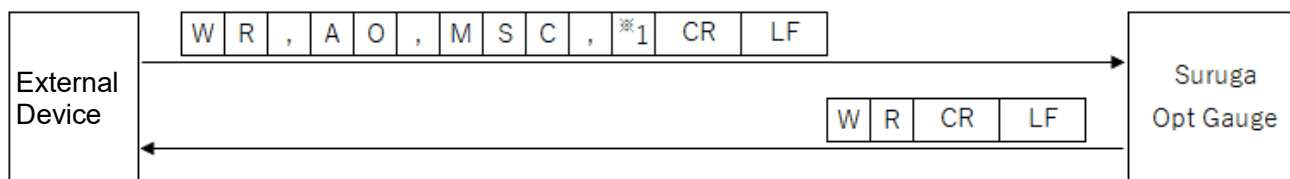
*1: Decimal places (0 to 8).

[Write: (Multi Spot) Write Order Configuration]



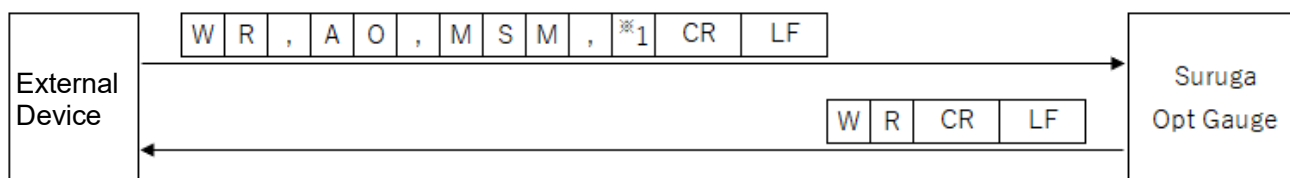
*1: (Multi Spot) list sort type ("0" = Area, "1" = Angle)

[(Multi Spot) Write Spot Count Configuration]



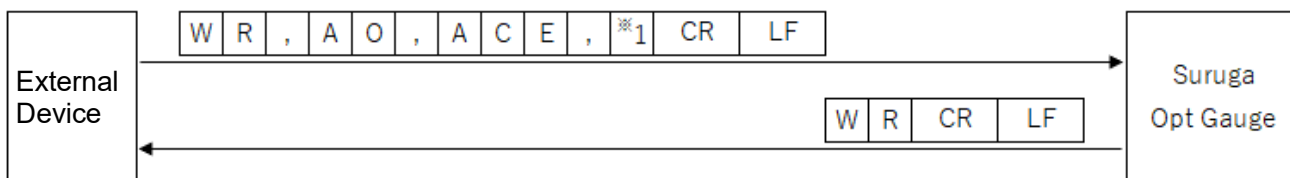
*1: Spot Count (1 to 100)

[Write: (Multi Spot) Minimum Spot Area Configuration]



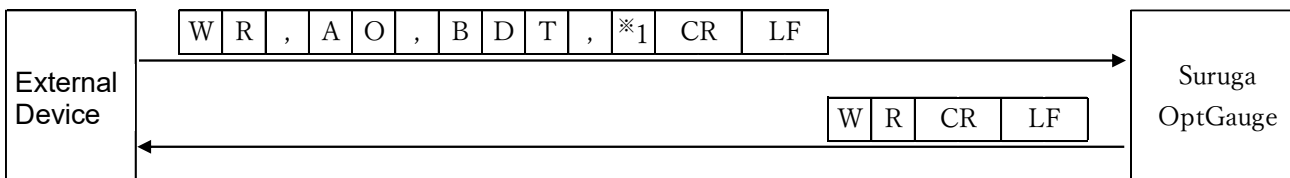
*1: Minimum Spot Area (1 to 1023)

[Write: Adaptive Cal Execution Button Display Enabled Configuration]



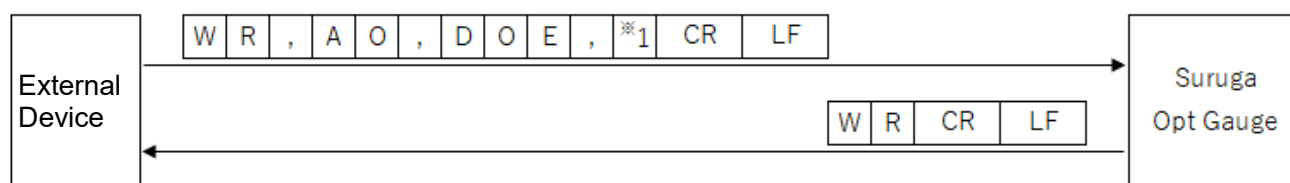
*1: Adaptive Cal execution button display ("0" = disabled, "1" = enabled)

[Write: Beam Diameter Type for Calculation Configuration]



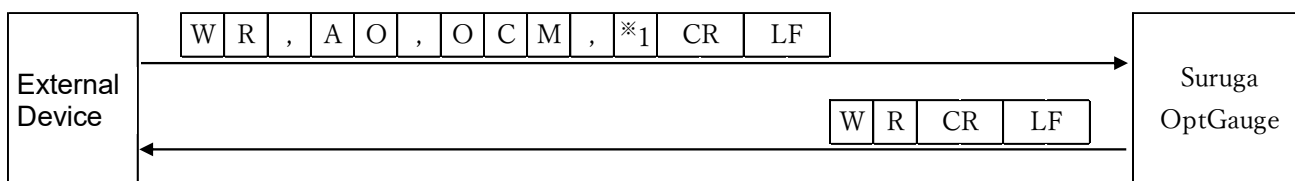
*1: Beam diameter type("0" =D4Sigma, "1" =1/e²)

[Write: Orientation Enabled Configuration]



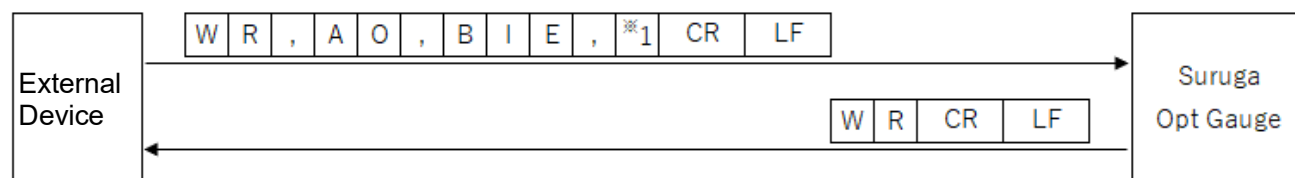
*1: Orientation Enabled ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Measurement Method Configuration]



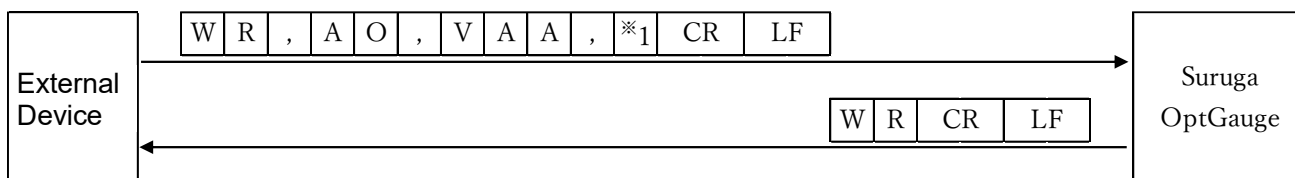
*1: Rotation Angle Measurement Method ("0" = Ellipse Fitting,"1"= Max Distance Search).

[Write: Binning Enabled Configuration]



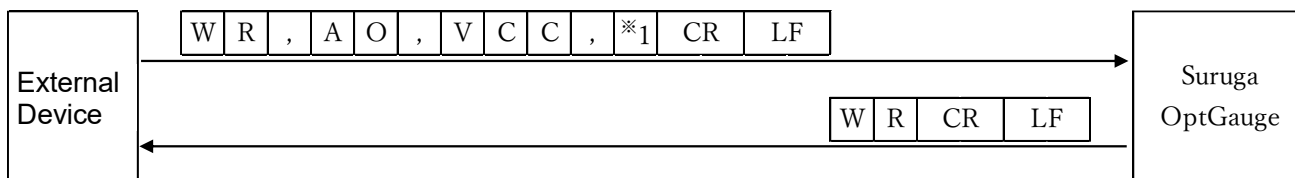
*1: Binning setting ("0" = disabled, "1" = enabled).

[Write: Auto Aperture Display Configuration]



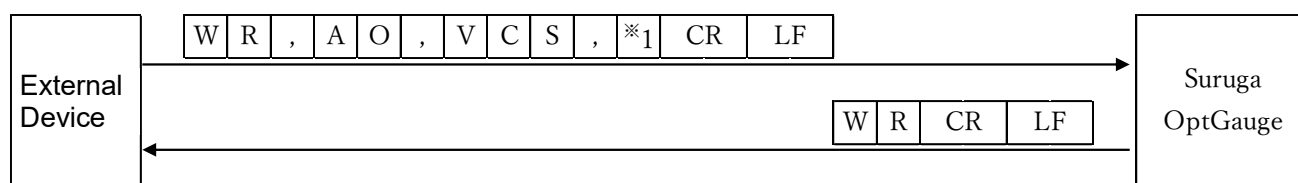
*1: Auto Aperture display ("0" = disabled, "1" = enabled).

[Write: Centroid Cursor display Configuration]



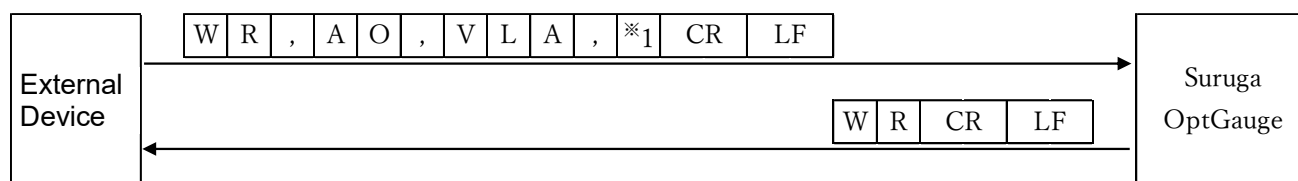
*1: Centroid Cursor display ("0" = disabled, "1" = enabled).

[Write: Cross Section Display Configuration]



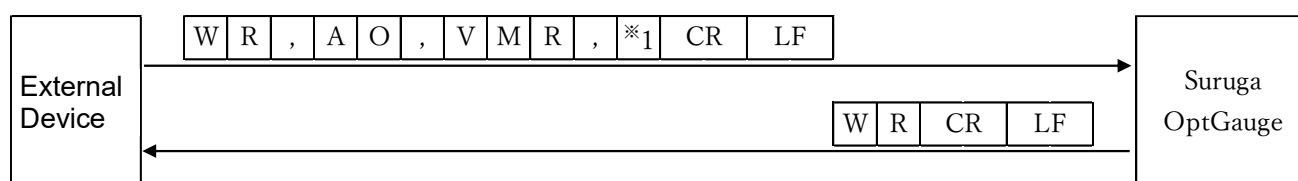
※1: Cross Section display ("0" = disabled, "1" = enabled).

[Write: Labeling Area display Configuration]



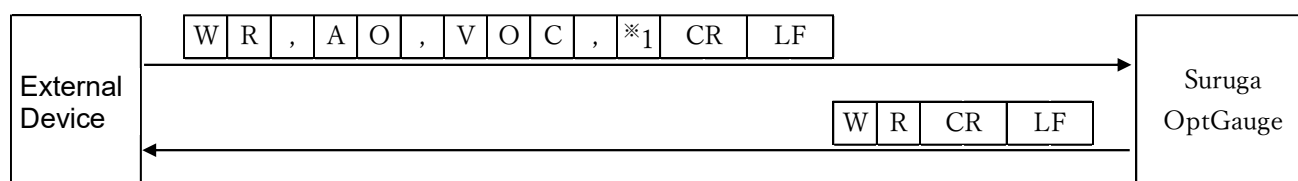
※1: Labeling Area display ("0" = disabled, "1" = enabled).

[Write: Measurement Range Display Configuration]



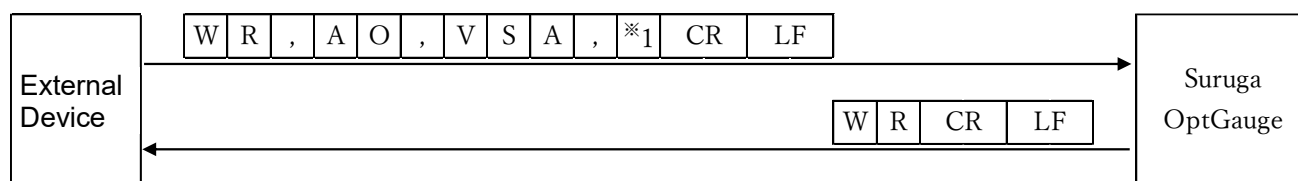
※1: Measurement range display ("0" = disabled, "1" = enabled).

[Write: Origin Cursor display Configuration]



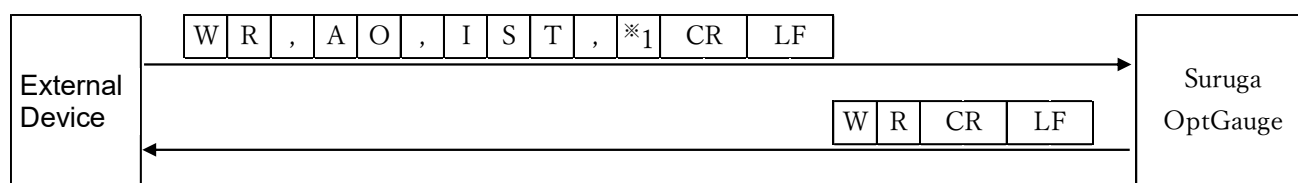
※1: Origin Cursor display ("0" = disabled, "1" = enabled).

[Write: Spot Area Display Configuration]



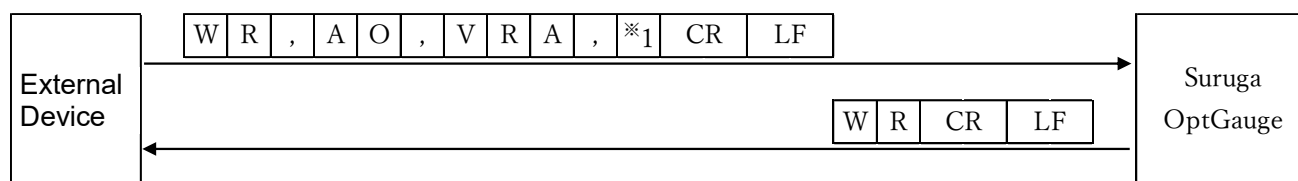
※1: Spot Area display ("0" = disabled, "1" = enabled).

[Write: Spot Area Display Type Configuration]



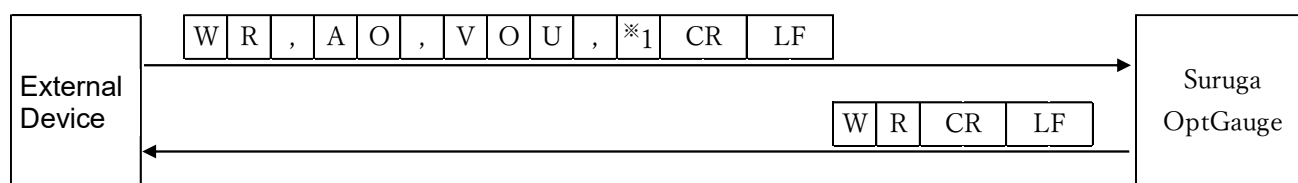
※1: Spot Area display type ("0" = D4Sigma or 1/e², "1" = D86).

[Write: ROI Area Display Configuration]



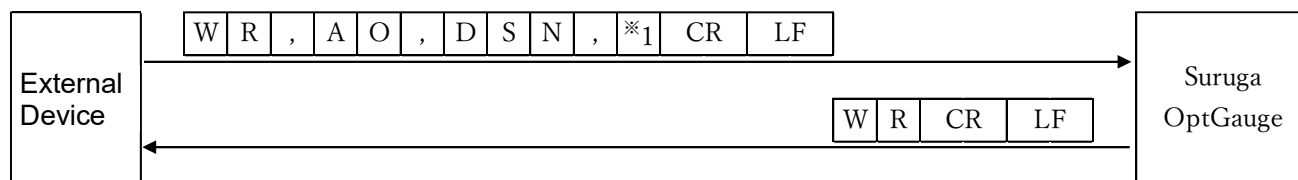
※1: ROI area display ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Cursor Display Configuration]



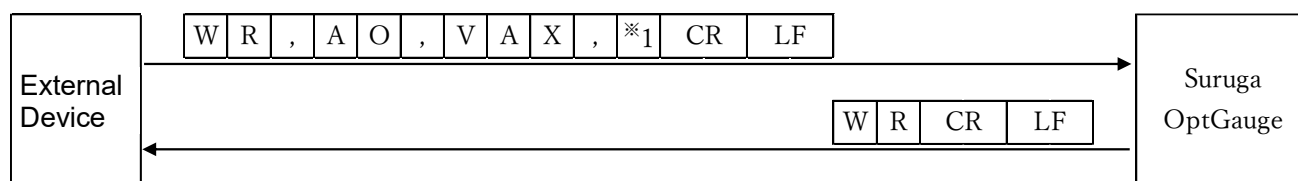
※1 : Rotation Angle Cursor Display ("0" = disabled, "1" = enabled).

[Write: Display Spot Number Configuration]



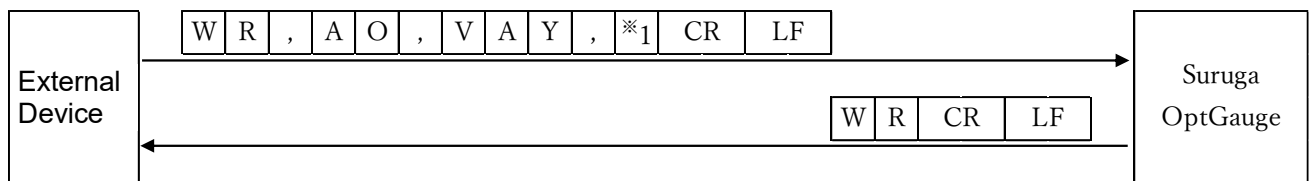
※1: Display spot number (0 to 100).

[Write: Angle X results display Configuration]



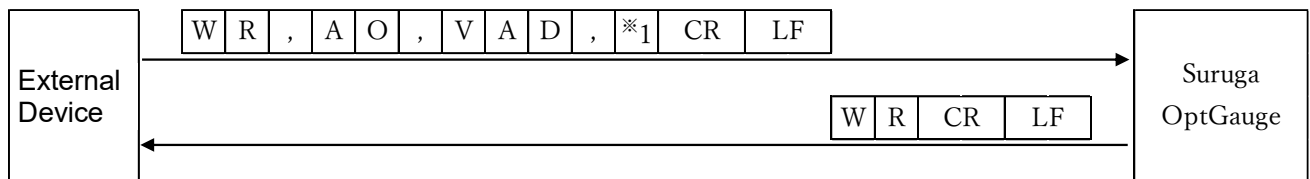
※1: Result display ("0" = disabled, "1" = enabled).

[Write: Angle Y Result Display Configuration]



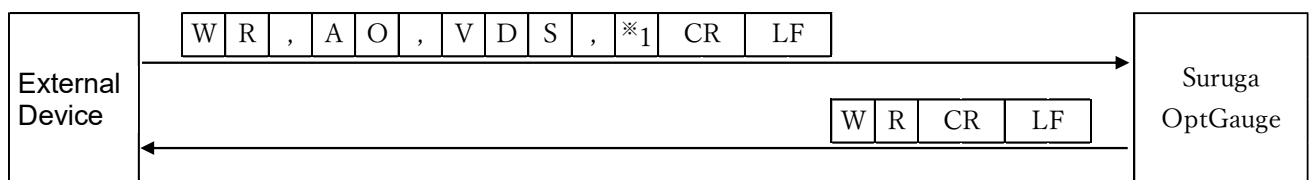
※1: Result display ("0" = disabled, "1" = enabled).

[Write: Angle D Result Display Configuration]



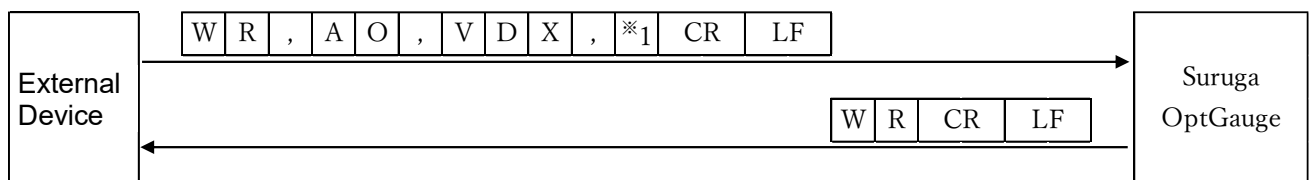
※1: Result display ("0" = disabled, "1" = enabled).

[Write: D4Sigma or 1/e² Result Display Configuration]



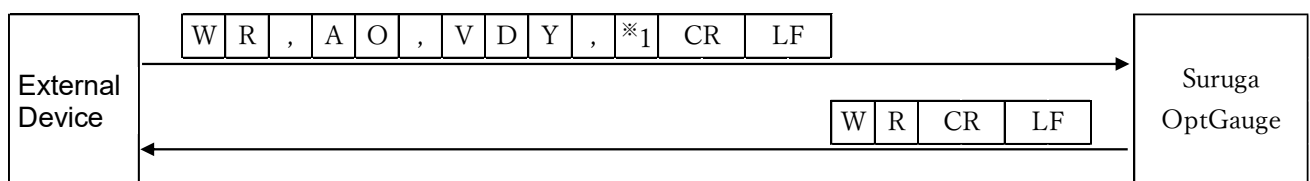
※1: Result display ("0" = disabled, "1" = enabled).

[Write: D4Sigma X(M) or 1/e² X(M) results display Configuration]



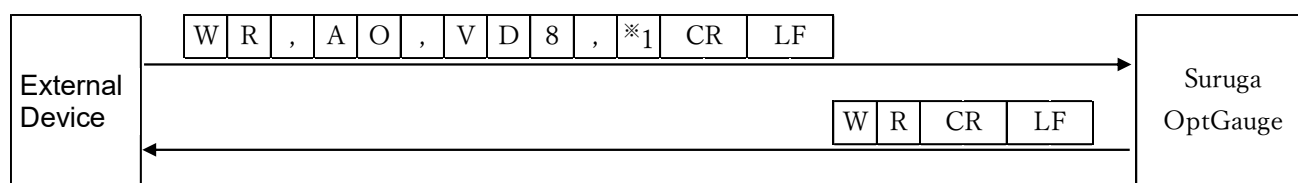
※1: Result display ("0" = disabled, "1" = enabled).

[Write: D4Sigma Y(m) or 1/e² Y(m)result display Configuration]



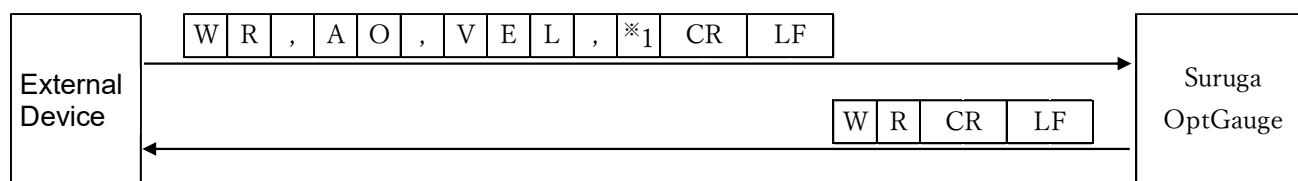
※1: Result display ("0" = disabled, "1" = enabled).

[Write: D86 Result Display Configuration]



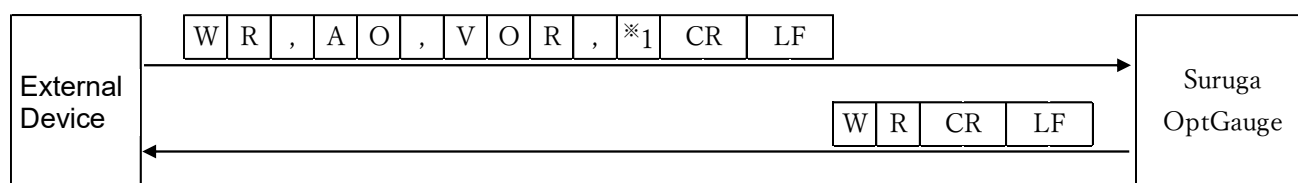
*1: Result display ("0" = disabled, "1" = enabled).

[Write: Ellipticity Result Display Configuration]



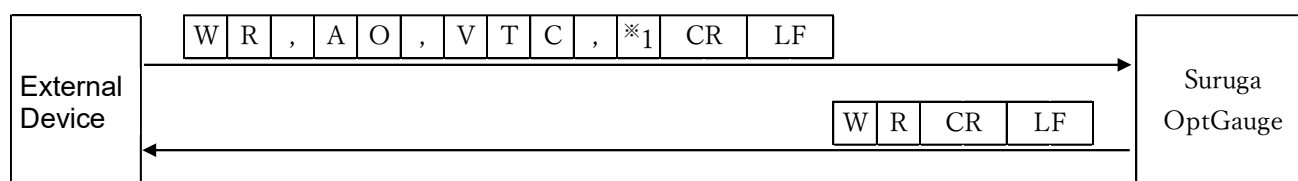
*1: Result display ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Result Display Configuration]



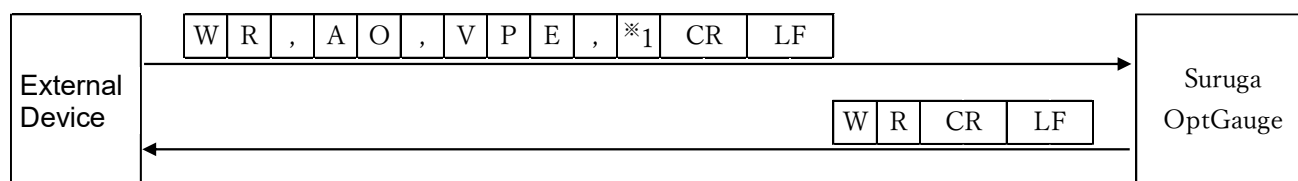
*1 : Result display ("0" = disabled, "1" = enabled).

[Write: Total Count Results Display Configuration]



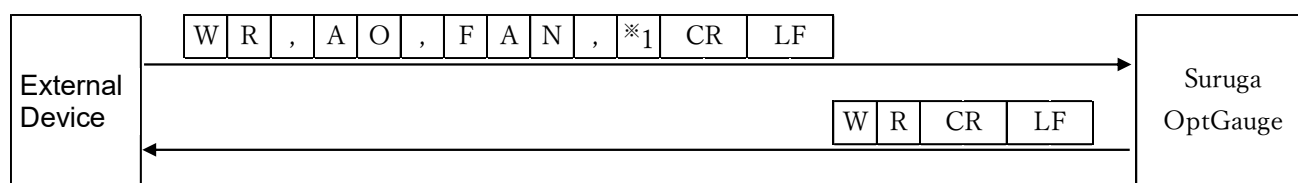
*1: Total Count results display ("0" = disabled, "1" = enabled).

[Write: Peak Result Display Configuration]



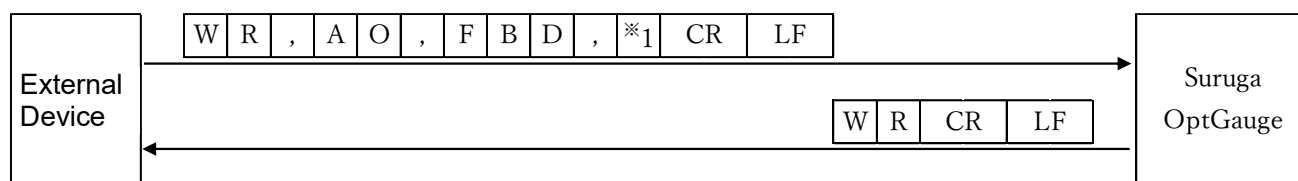
*1: Peak result display ("0" = disabled, "1" = enabled).

[Write: Font Size for the Angle Configuration]



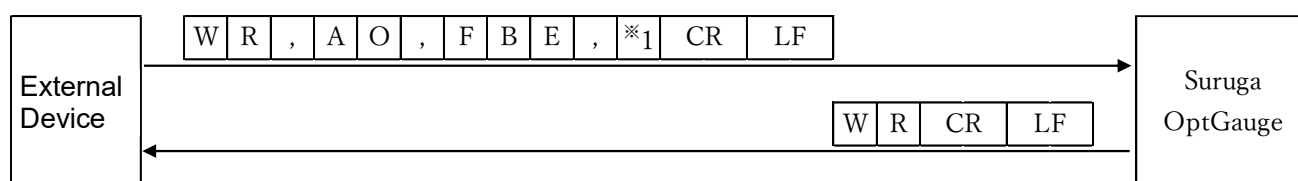
*1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Beam Divergence Configuration]



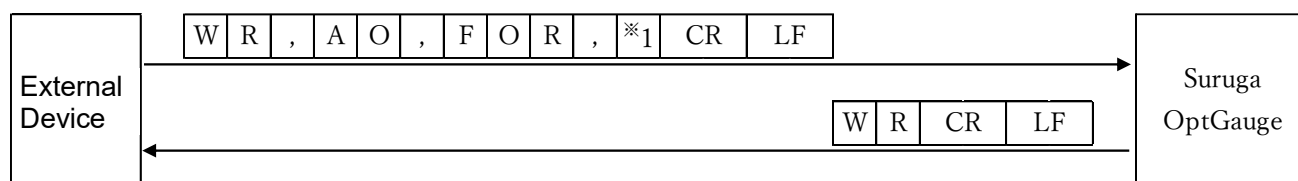
*1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Beam Ellipticity Configuration]



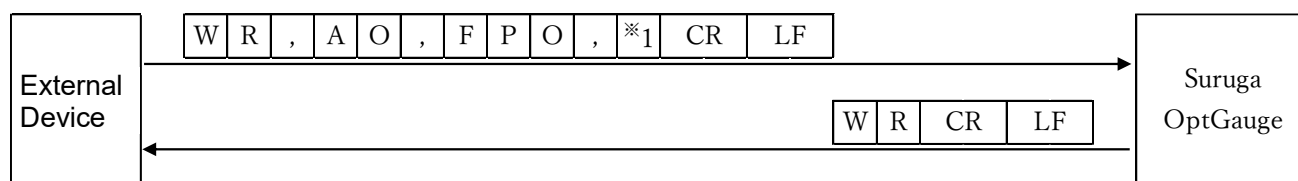
*1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Rotation Angle Configuration]



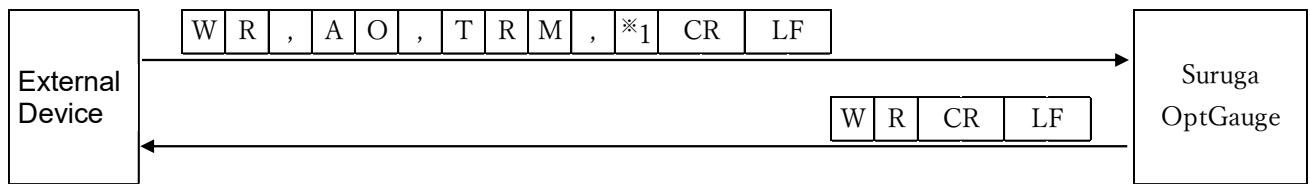
*1 Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Power Configuration]



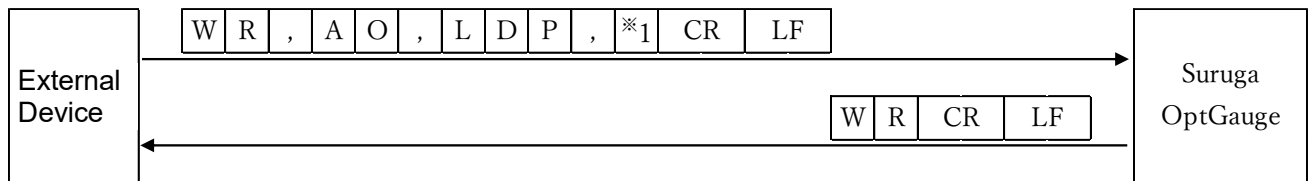
*1: Font Size ("0" = Small, "1" = Medium, "2" = Large).

[Write: External Trigger Mode Enabled Configuration]



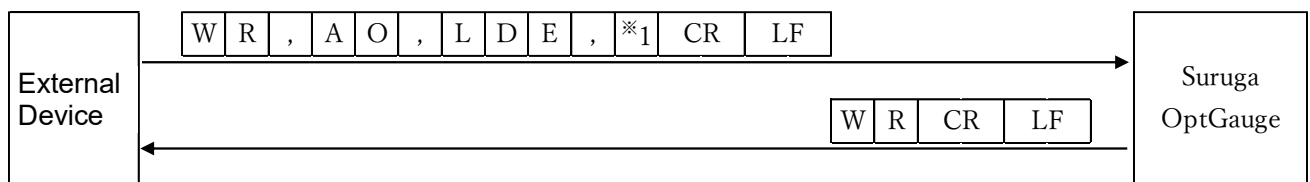
※1: External Trigger Mode ("0" = disabled, "1" = enabled).

[Write: LD Power output value configuration]



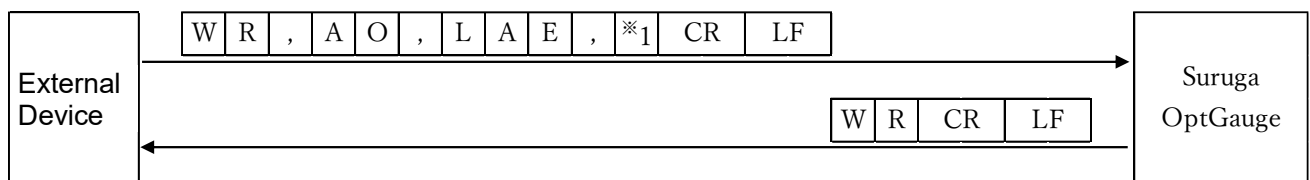
※1: LD Power output value (0 to 4095).

[Write: LD output Enabled configuration]



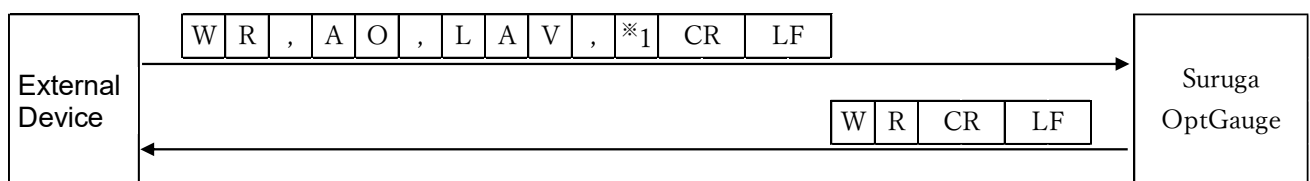
※1: LD Power output ("0" = disabled, "1" = enabled).

[Write: Automatic Brightness Execution Enabling Configuration]



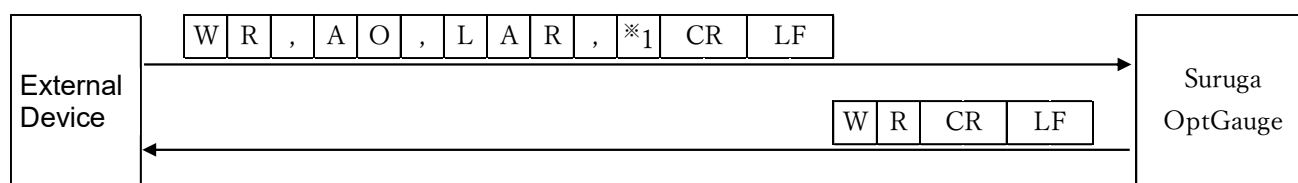
※1: Automatic brightness execution ("0" = disabled, "1" = enabled).

[Write: Automatic Brightness Peak Target Value Configuration]



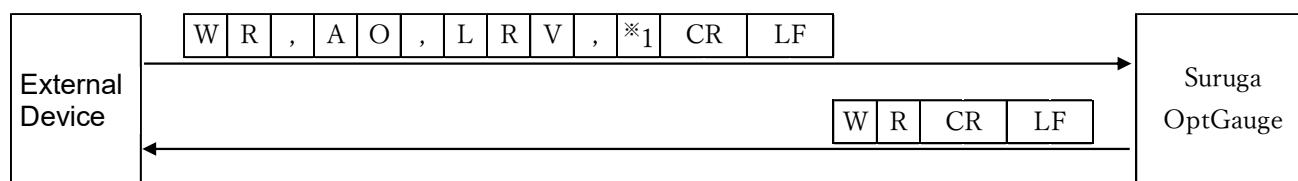
※1: Automatic brightness peak target value (1000 to 3500).

[Write: Automatic Brightness Peak Target Range Configuration]



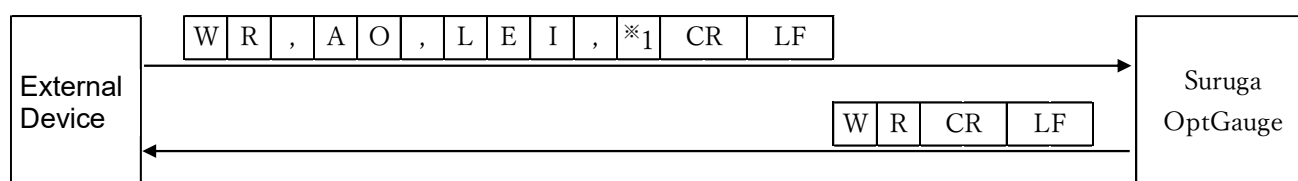
*1: Automatic brightness peak target range (100 to 1000).

[Write: Automatic Brightness Target Reflectance Configuration]



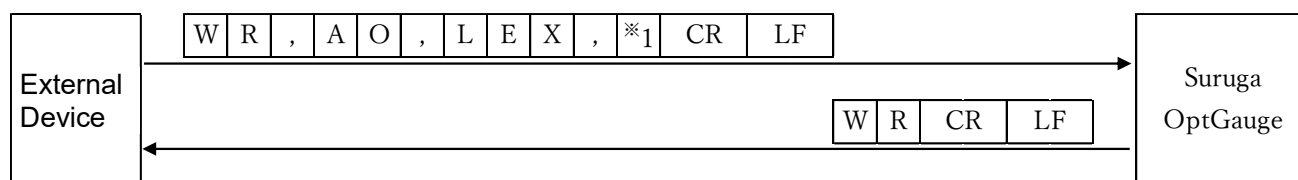
*1: Automatic brightness target object reflectance (0.05 to 100).

[Write: Exposure Time Initial Value Applied in the Automatic Brightness Configuration]



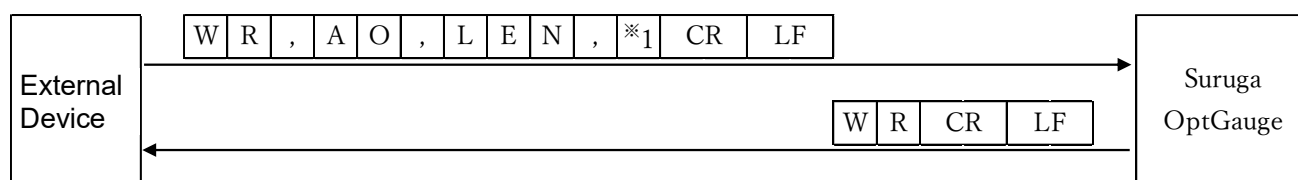
*1: Initial exposure time value used in automatic brightness (0.027 to 20).

[Write: Maximum Exposure Time Applied in the Automatic Brightness Configuration]



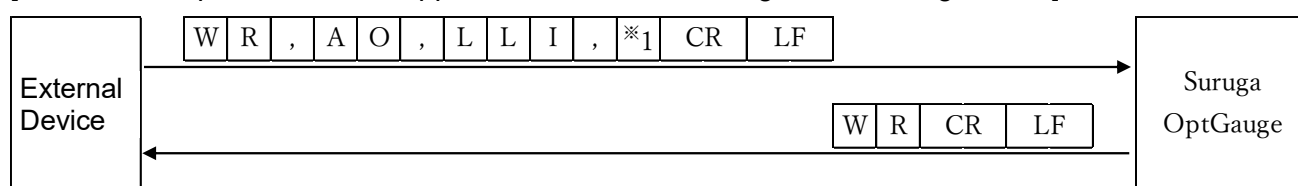
*1: Maximum exposure time value (0.027 to 20).

[Write: Minimum Exposure Time Applied in the Automatic Brightness Configuration]



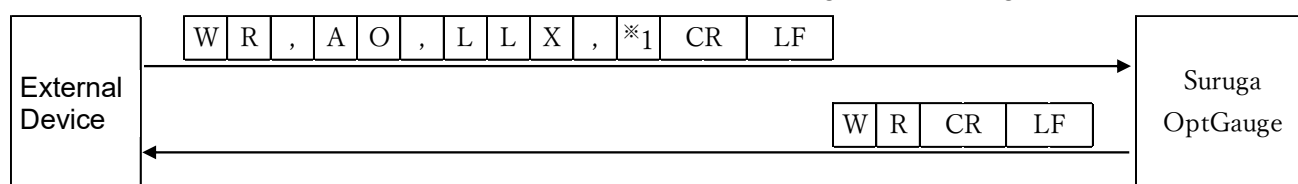
*1: Minimum exposure time value (0.027 to 20).

[Write: LD output Initial value Applied in the Automatic Brightness Configuration]



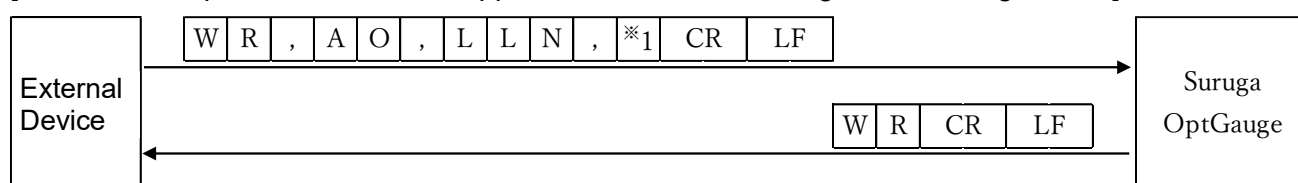
※1: LD output Initial value (0 to 4095).

[Write: LD Output Maximum Value Applied in the Automatic Brightness Configuration]



*1: LD Output Maximum Value (0 to 4095).

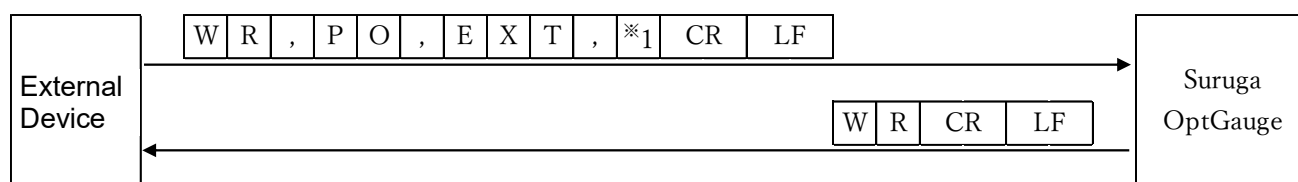
[Write: LD Output Minimum Value Applied in the Automatic Brightness Configuration]



※1: LD Output Minimum Value (0 to 4095).

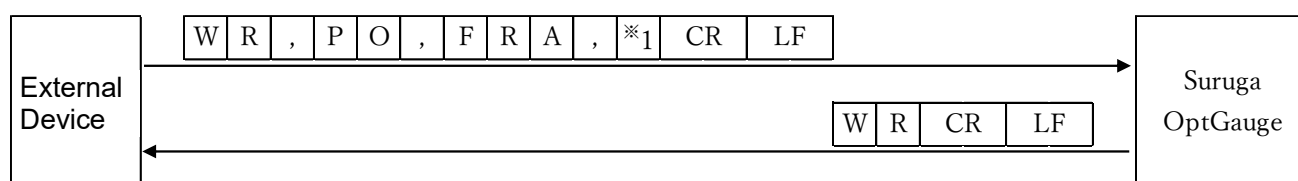
3.5.1.3 Profile

[Write: sensor camera Exposure Time]



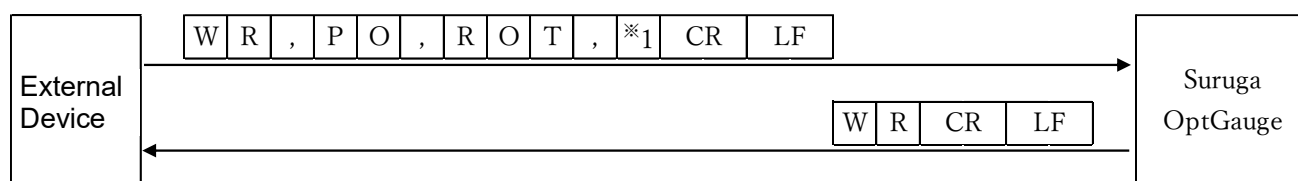
*1: Exposure time (0.027 to 2000).

[Write: sensor camera Frame Rate]



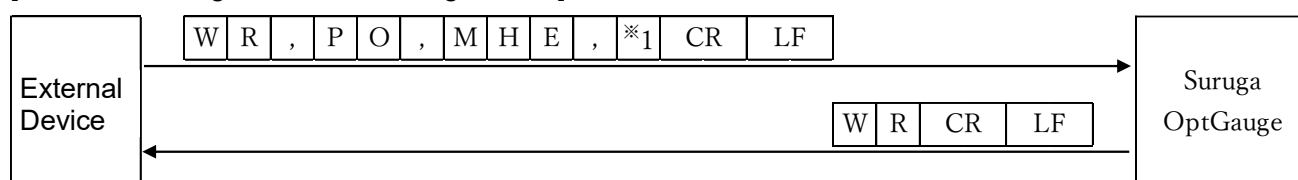
*1: Frame Rate (0.1 to 100).

[Write: sensor camera Frame Rate]



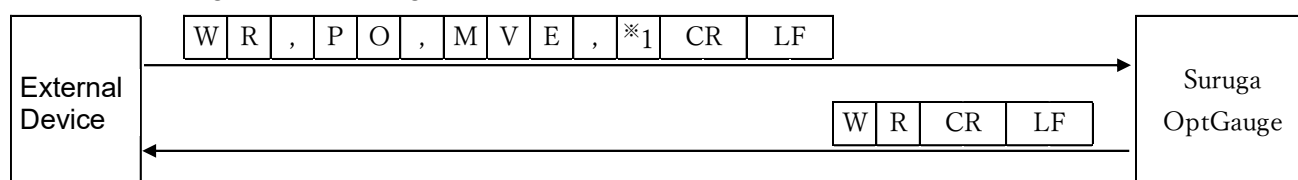
*1: Rotation ("0" = OFF, "1" = Rotation right 90°, "2" = Rotation right 180°, "3" = Rotation right 270°).

[Write: Mirroring Horizontal Configuration]



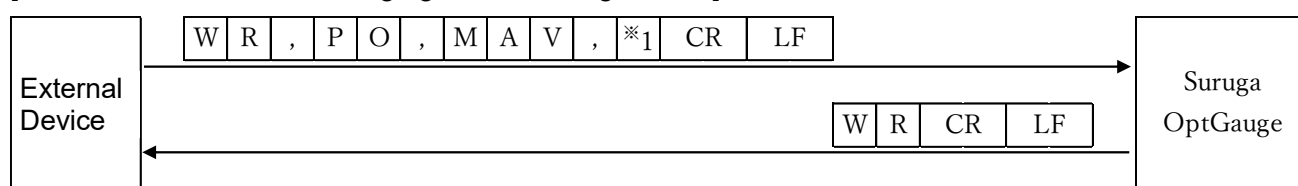
*1: Mirroring ("0" = OFF, "1" = horizontal mirroring).

[Write: Mirroring Vertical Configuration]



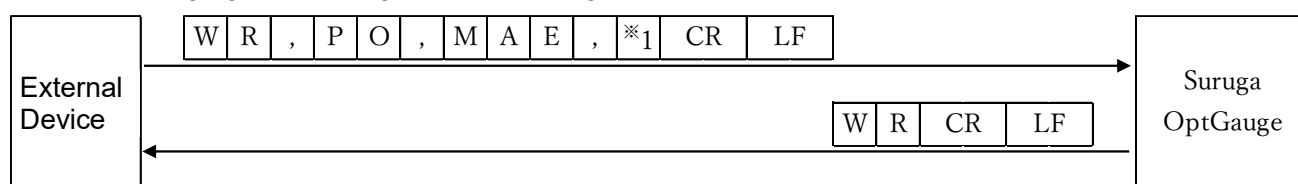
*1: Mirroring ("0" = OFF, "1" = vertical mirroring).

[Write: the Number of Averaging Times Configuration]



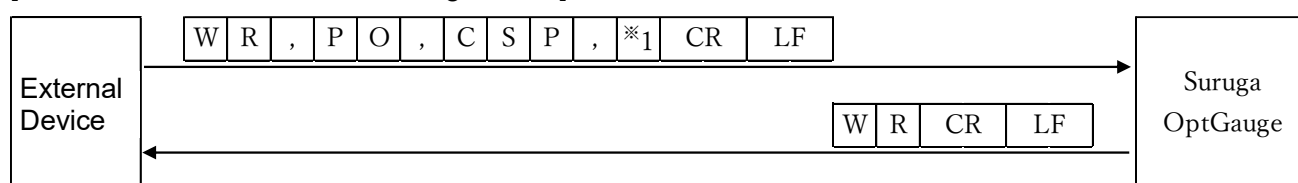
*1: the Number of Averaging Times (2 to 262,144)

[Write: Averaging Processing enabled Configuration]



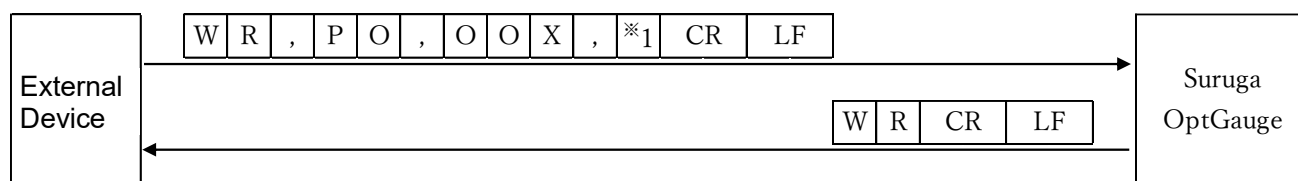
*1: Averaging Processing ("0" = disabled, "1" = enabled)

[Write: Cross Section Point Configuration]



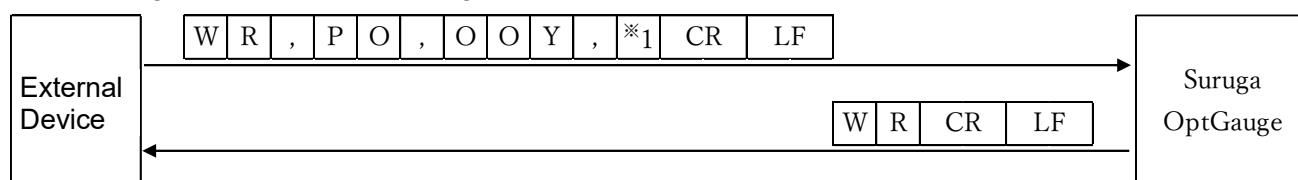
*1: Cross Section Point ("0"=Origin Cursor, "1"=Beam Cursor).

[Write: OriginOffset X value Configuration]



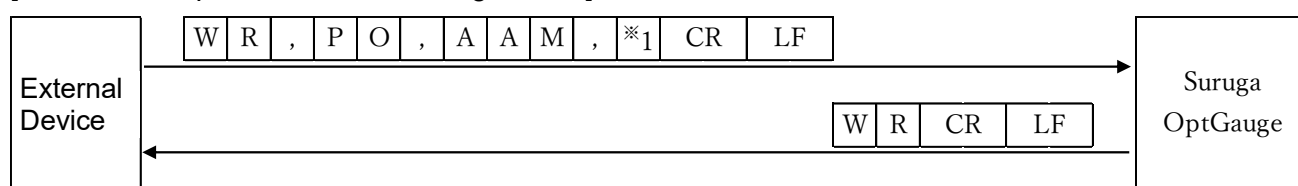
*1: Origin Offset X (- 20 to + 20)

[Write: Origin Offset Y Value Configuration]



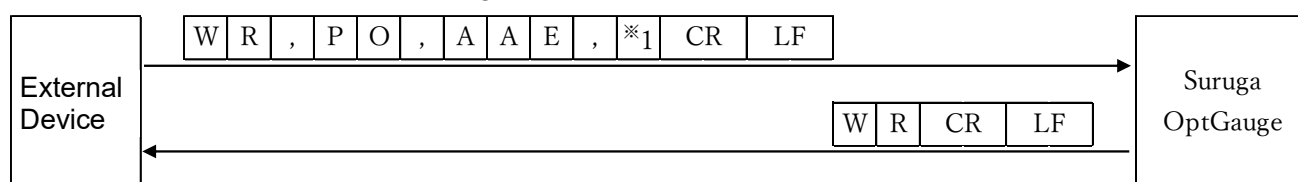
*1: Origin Offset Y (- 20 to + 20)

[Write: Auto Aperture Method Configuration]



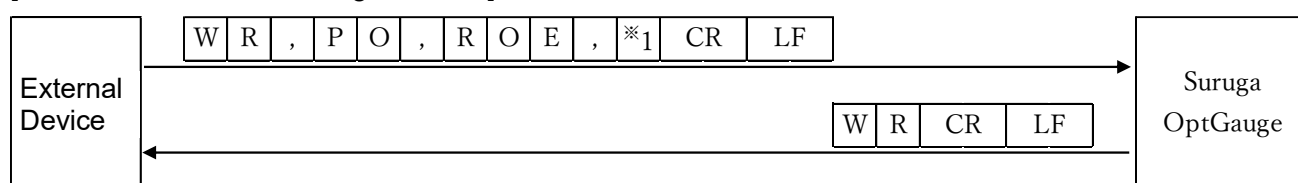
※1: Auto Aperture Method (“0” = area, “1” = luminance).

[Write: Auto Aperture enabled Configuration]



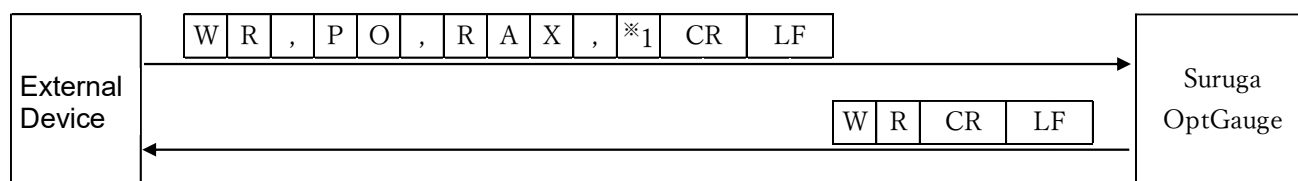
※1: Auto Aperture (“0” = disabled, “1” = enabled)

[Write: ROI enabled Configuration]



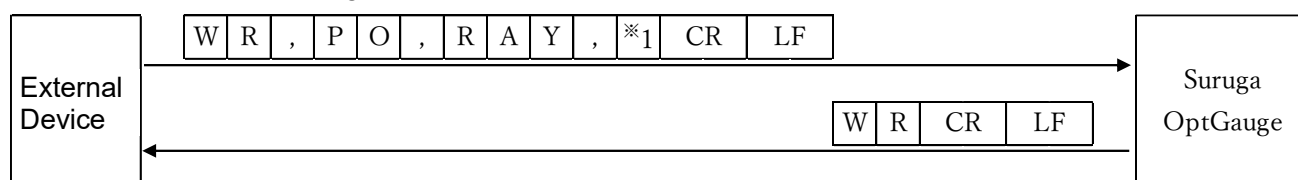
※1: ROI (“0” = disabled, “1” = enabled)

[Write: ROI X value Configuration]



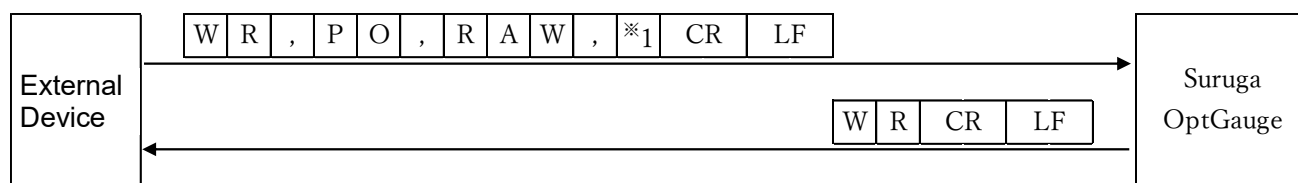
※1: ROI X value (- 3000 to + 3000) or (-1500 to + 1500) if the binning is enabled.

[Write: ROI Y value Configuration]



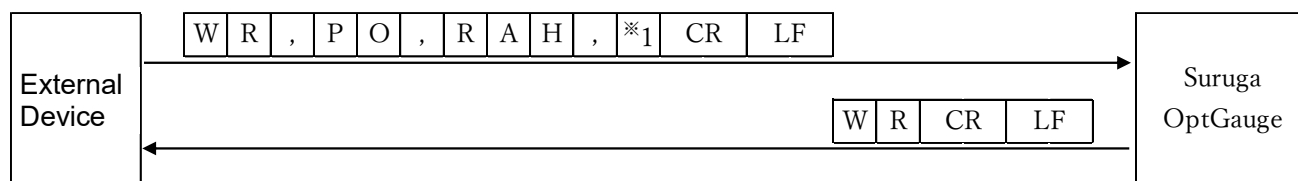
※1: ROI Y value (- 3000 to + 3000) or (- 1500 to + 1500) if the binning is enabled.

[Write: ROI Width Configuration]



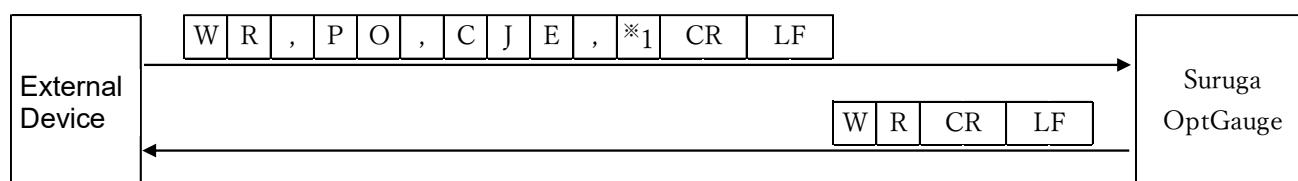
※1: ROI Width (- 3000 to + 3000) or (- 1500 to + 1500) if the binning is enabled.

[Write: ROI Height Configuration]



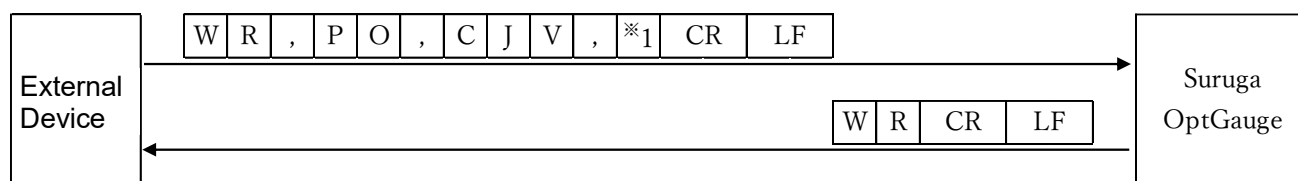
※1: ROI Height (- 3000 to + 3000) or (- 1500 to + 1500) if the binning is enabled.

[Write: Centroid Judgement Value Configuration]



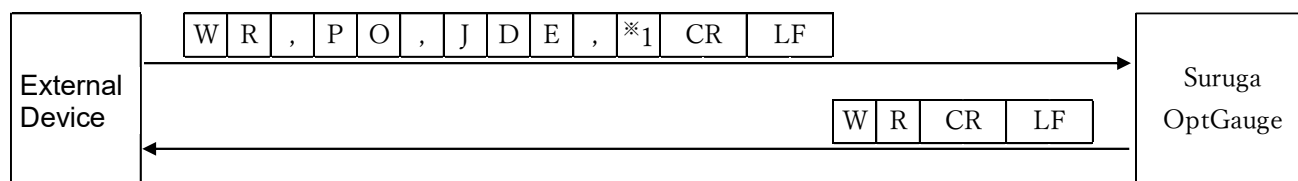
※1: Centroid judgement ("0" = disabled, "1" = enabled).

[Write: Centroid Judgement Value Configuration]



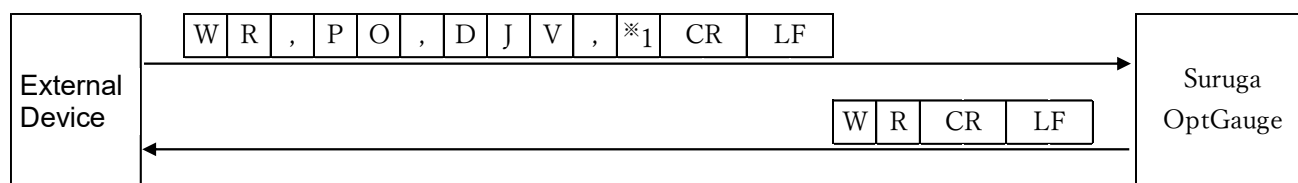
※1: Centroid judgement value (0 to 20).

[Write: Diameter Judgement Enabled Configuration]



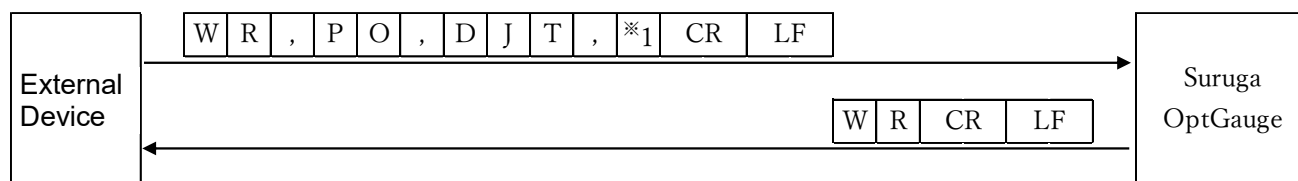
※1: Diameter judgement ("0" = disabled, "1" = enabled).

[Write: Diameter Judgement Value Configuration]



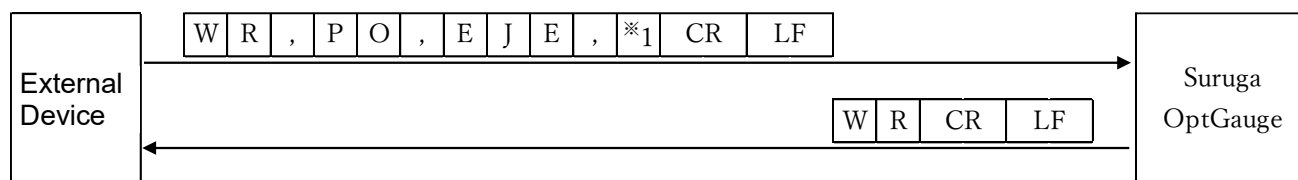
※1: Diameter judgement value (0 to 20).

[Write: Diameter Judgement Value Configuration]



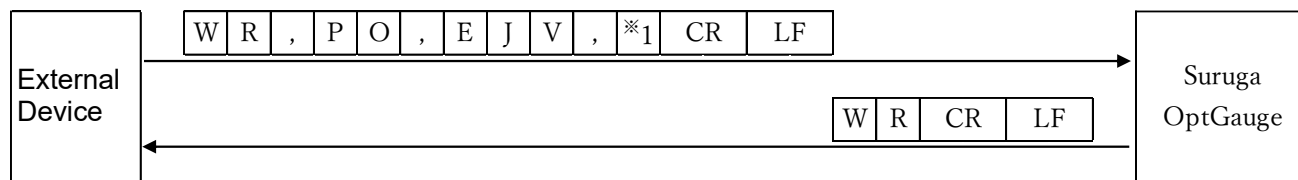
※1: Diameter judgement value ("0" = D4Sigma or 1/e², "1" = D86).

[Write: Ellipticity Judgement Enabled Configuration]



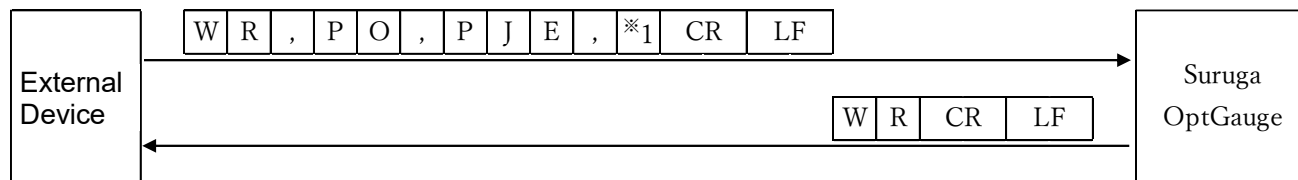
※1: Ellipticity judgement ("0" = disabled, "1" = enabled).

[Write: Ellipticity Judgement Value Configuration]



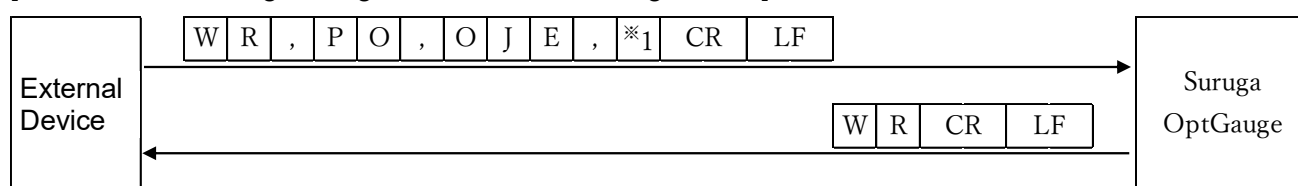
※1: Ellipticity judgement value (0.0000 to 1.0000).

[Write: Peak Judgement Enabled Configuration]



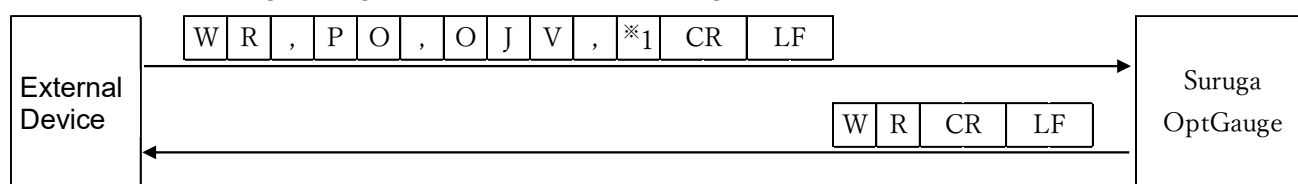
※1: Peak judgement ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Judgement Enabled Configuration]



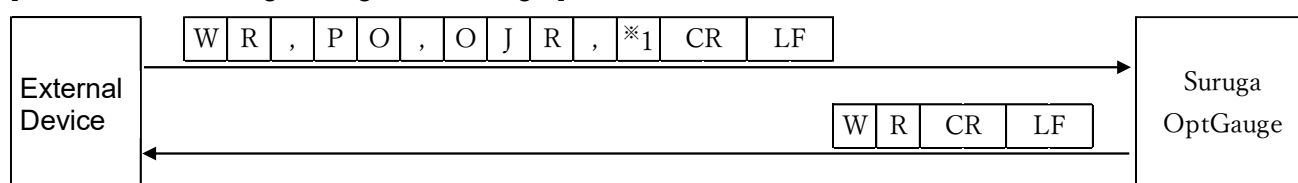
※1: Rotation Angle Judgement ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Judgement criteria Value Configuration]



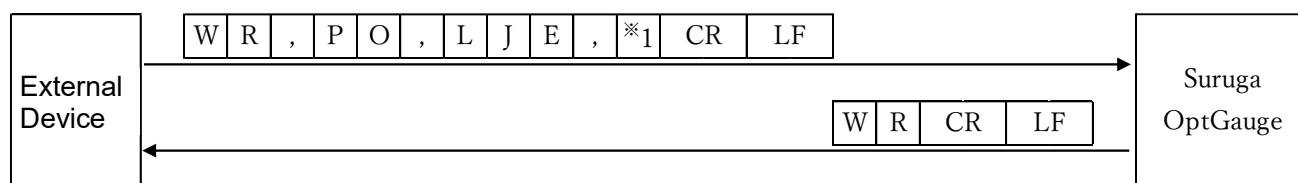
※1: Rotation Angle Judgement criteria value (- 90 to + 90).

[Write: Rotation Angle Judgement Range]



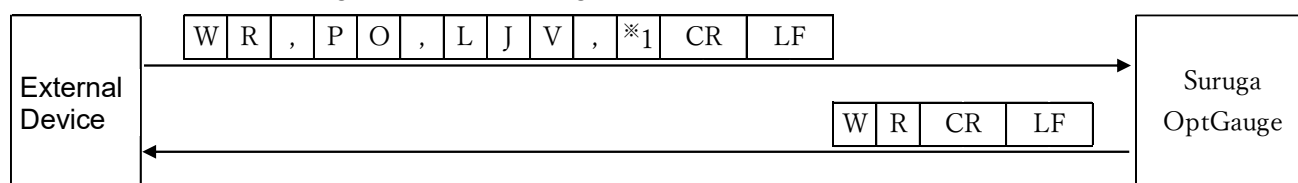
※1: Rotation angle judgement range (- 90 to + 90).

[Write: Line Position Judgment Enabled Configuration]



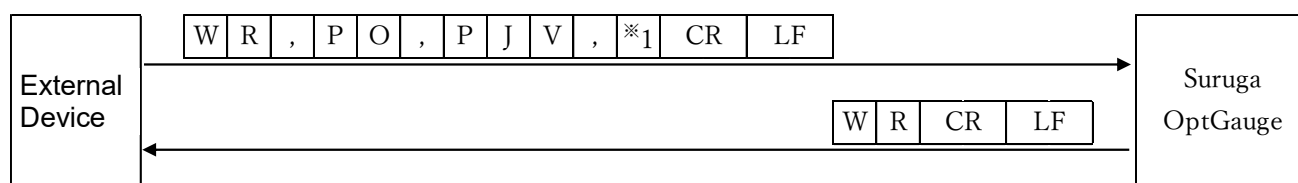
※1: Line position judgment ("0" = disabled, "1" = enabled).

[Write: Line Position Judgment Value Configuration]



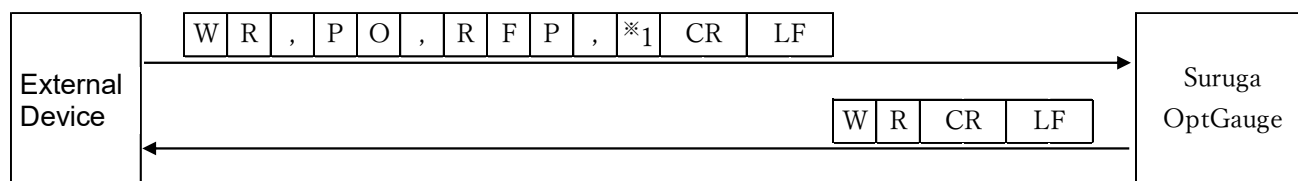
※1: Line Position Judgment Value (- 20 to + 20).

[Write: Peak Judgement Value Configuration]



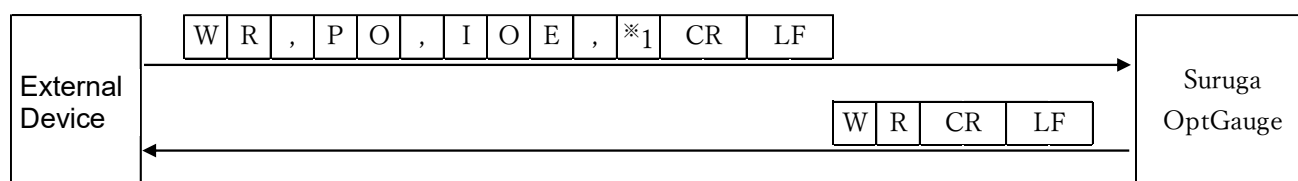
※1: Peak judgement value (0.0 to 4095.0).

[Write: Log File output path Configuration]



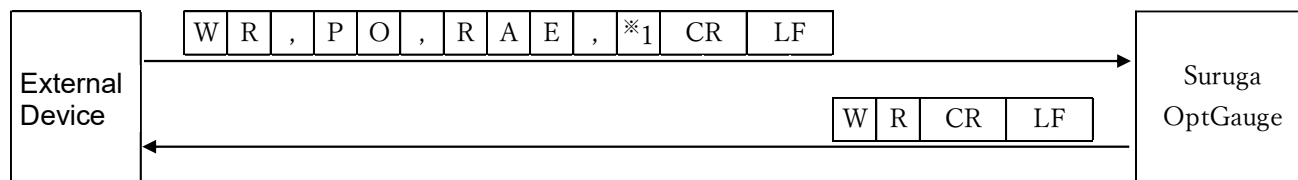
※1: Log file path string.

[Write: Image File output Enabled Configuration]



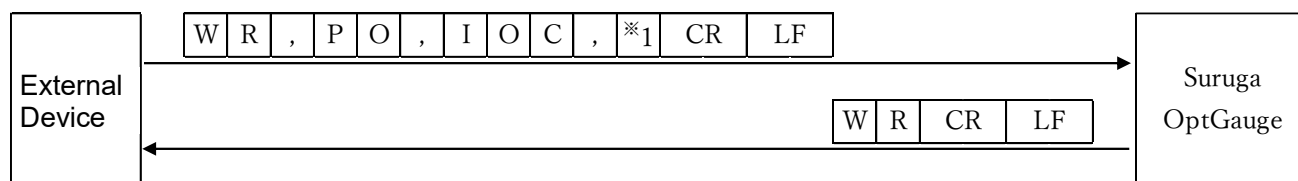
※1: Image file output ("0" = disabled, "1" = enabled).

[Write: RAW Data output enabled Configuration]



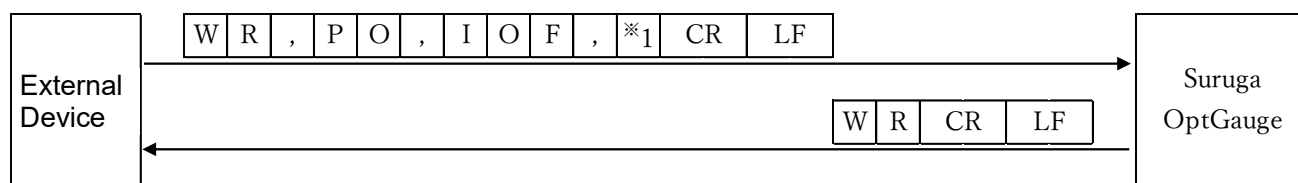
※1: RAW data output ("0" = disabled, "1" = enabled).

[Write: Image File output color Configuration]



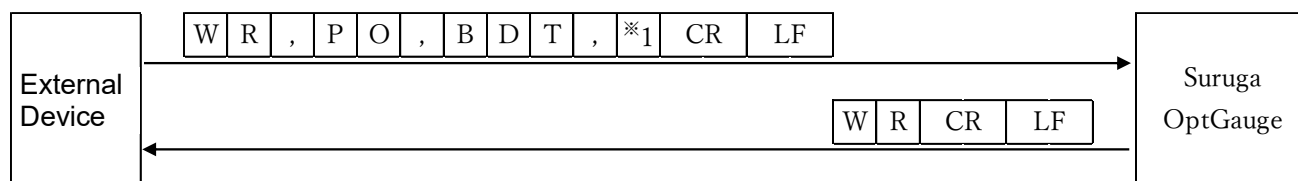
※1: Image file output color ("0"= Full Color, "1"= Grayscale).

[Write: Image File Output Format Configuration]



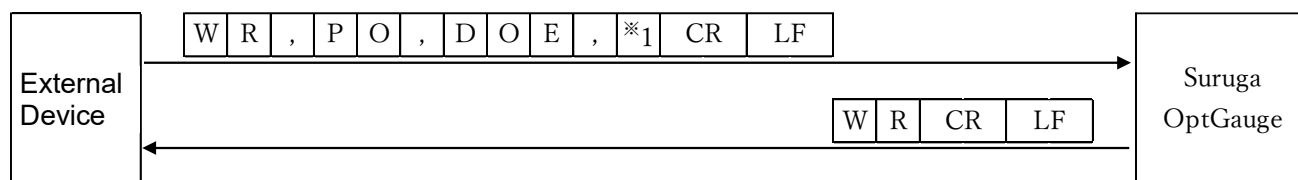
※1: Image file output format ("0"= png, "1"= bmp, "2"= tiff).

[Write: Beam Diameter Type for Calculation Configuration]



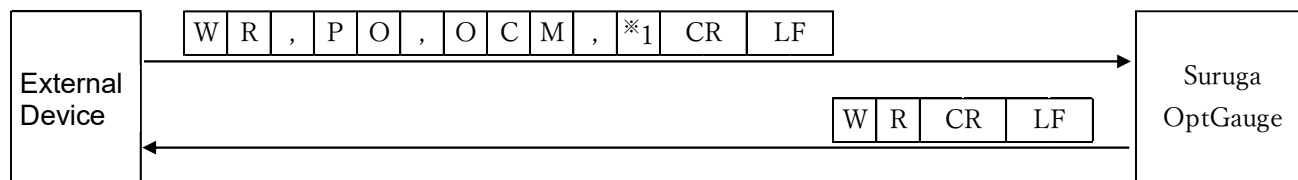
※1: Beam Diameter Type ("0"= D4Sigma, "1"= 1/e²).

[Write: Orientation Enabled Configuration]



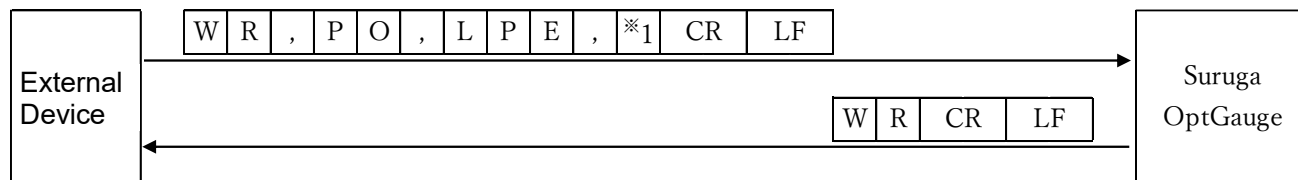
※1: Orientation Enable ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Measurement Method Configuration]



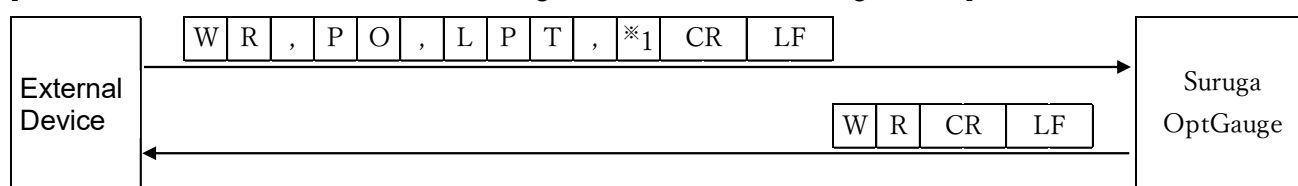
※1: Rotation Angle Measurement method ("0"=Ellipse Fitting, "1"=Max Distance Search).

[Write: Line Position Measurement Enabled Configuration]



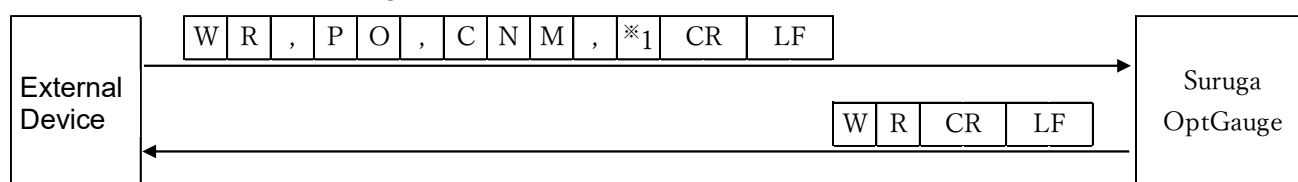
※1: Line Position Measurement ("0" = disabled, "1" = enabled).

[Write: Line Position measurement Straightness Threshold Configuration]



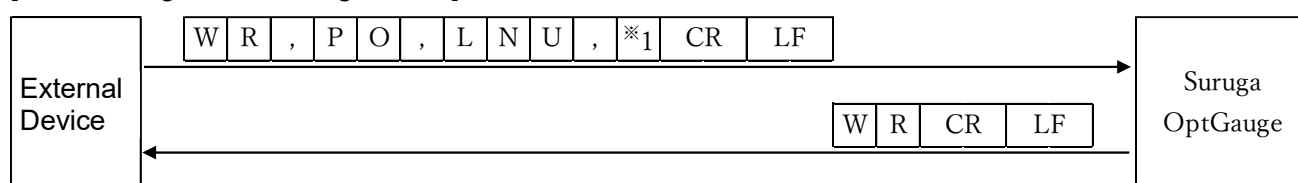
*1: Line Position Measurement Straightness Threshold (- 30 to + 300).

[Write: Beam Centroid Configuration]



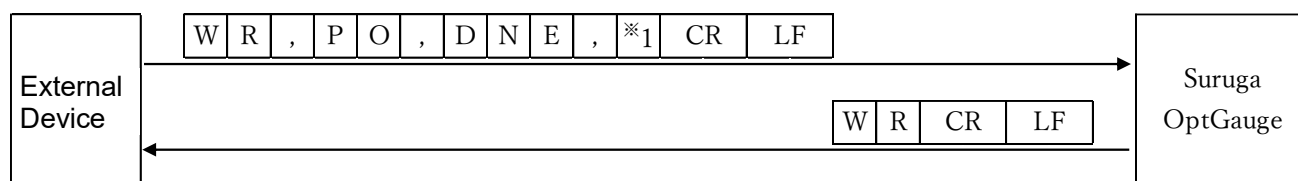
*1: Beam centroid ("0" = Area, "1" = Intensity).

[Write: Length Unit Configuration]



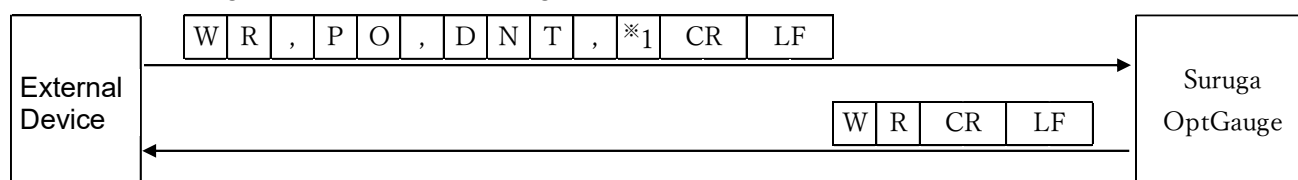
*1: Length unit ("0" = Millimeter, "1" = Micrometer).

[Write: Denoising Enabled Configuration]



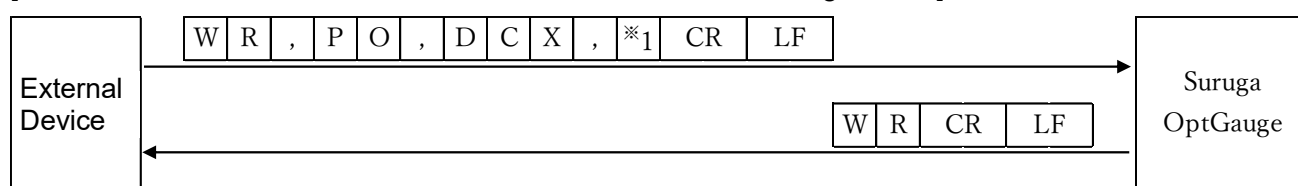
*1: Denoising function ("0" = disabled, "1" = enabled).

[Write: Denoising Threshold Value Configuration]



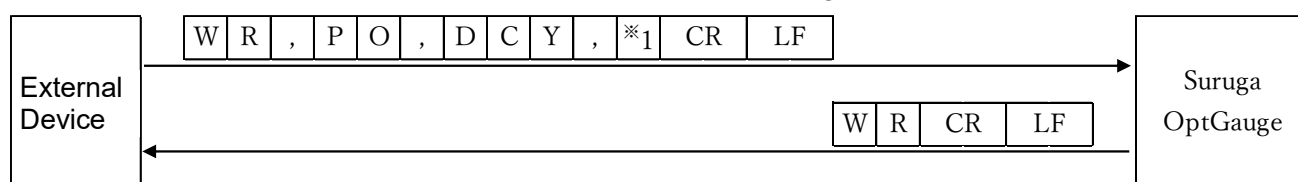
*1: Denoising threshold value (1 to 4095).

[Write: the Number of Decimal Places for the Centroid X Configuration]



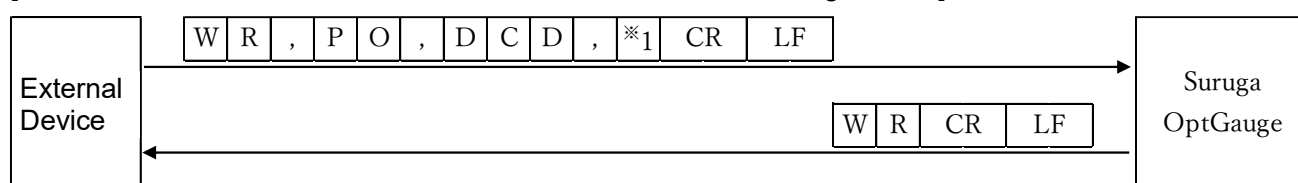
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Centroid Y Configuration]



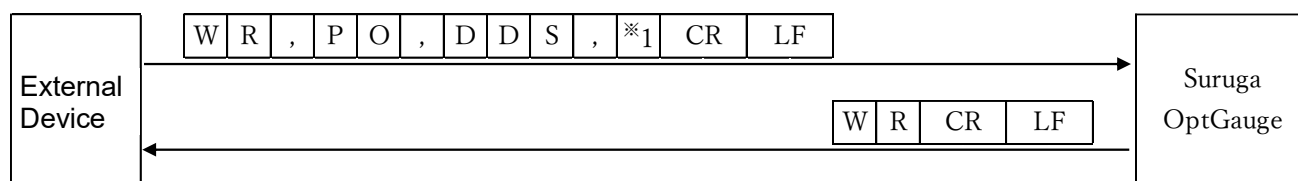
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Centroid D Configuration]



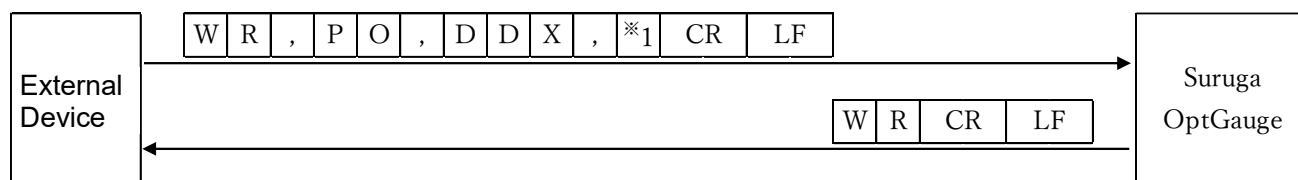
*1: Decimal places (0 to 8).

[Write: (Beam Diameter) the Number of Decimal Places for the D4Sigma or the 1/e² Configuration]



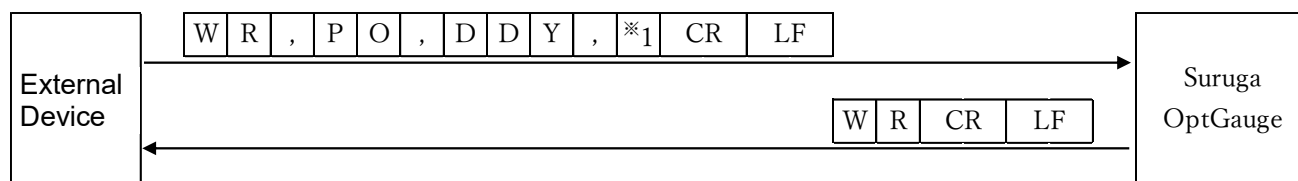
*1: Decimal places (0 to 8).

[Write: (Beam Diameter) the Number of Decimal Places for the D4Sigma or the 1/e² X(M) Configuration]



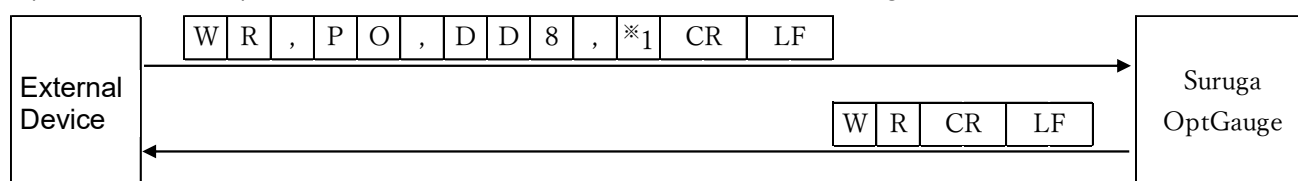
*1: Decimal places (0 to 8).

[Write: (Beam Diameter) the Number of Decimal Places for the D4Sigma Y(m) or $1/e^2$ Y(m) Configuration]



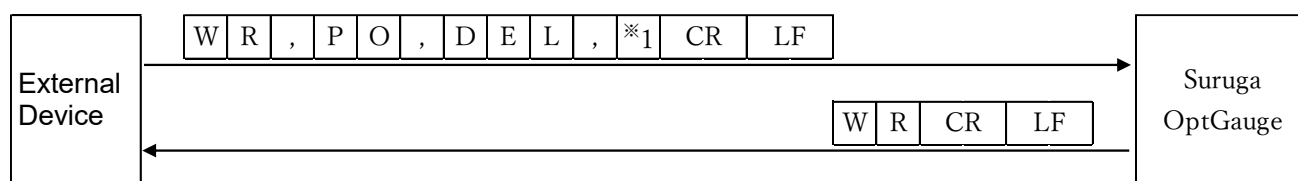
*1: Decimal places (0 to 8).

[(Beam Diameter) the Number of Decimal Places for the D86 Configuration]



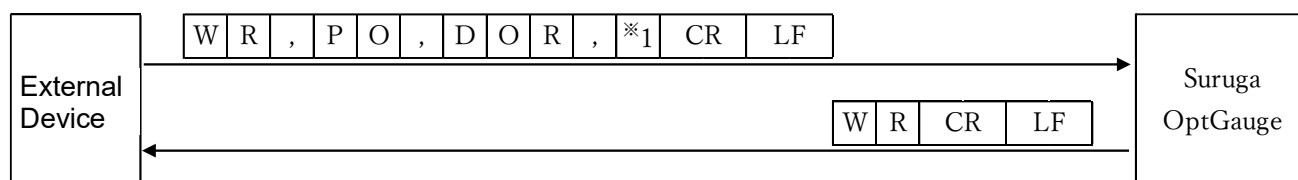
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Ellipticity Configuration]



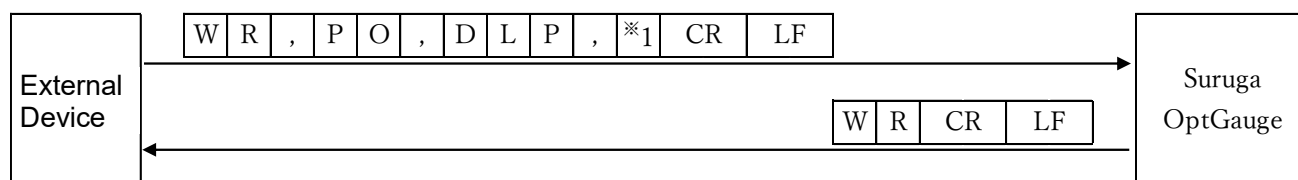
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Angle Rotation Configuration]



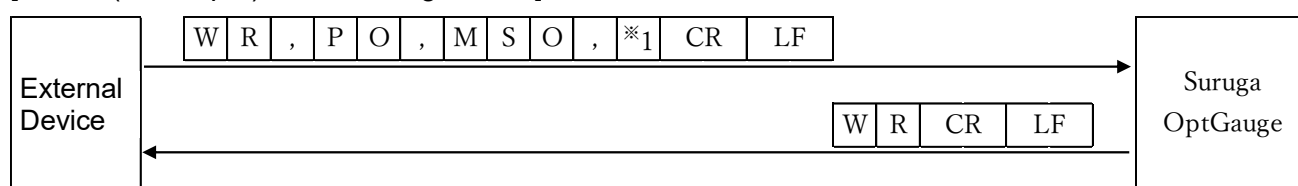
*1: Decimal places (0 to 8).

[Write: the Number of Decimal Places for the Line Position Configuration]



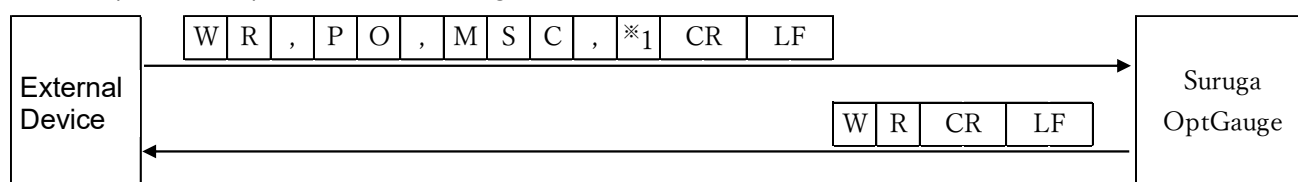
*1: Decimal places (0 to 8).

[Write: (Multi Spot) Order Configuration]



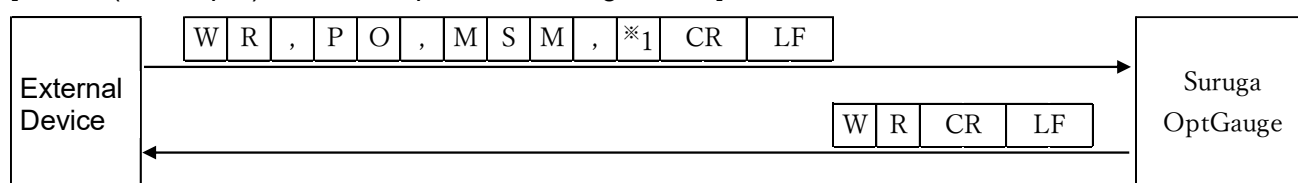
※1: (Multi Spot) list sort type (“0” = Area, “1” = Centroid).

[Write: (Multi Spot) Spot Count Configuration]



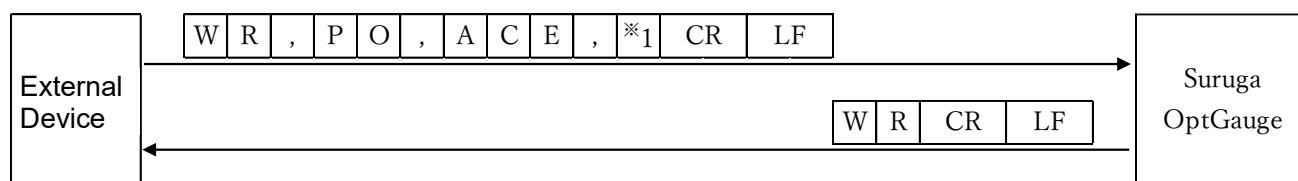
※1: Spot Count (1 to 100).

[Write: (Multi Spot) Minimum Spot Area Configuration]



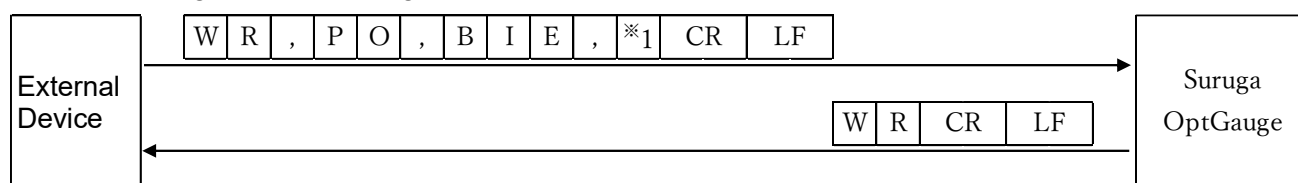
※1: Minimum spot area (1 to 1023).

[Write: Adaptive Cal Execution Button Display Enabled Configuration]



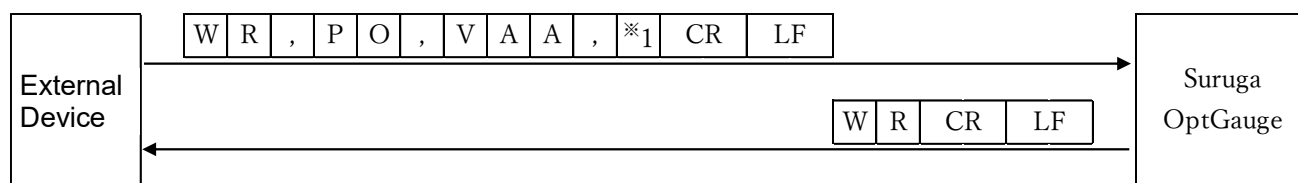
※1: Adaptive Cal execution button display (“0” = disabled, “1” = enabled).

[Write: Binning Enabled Configuration]



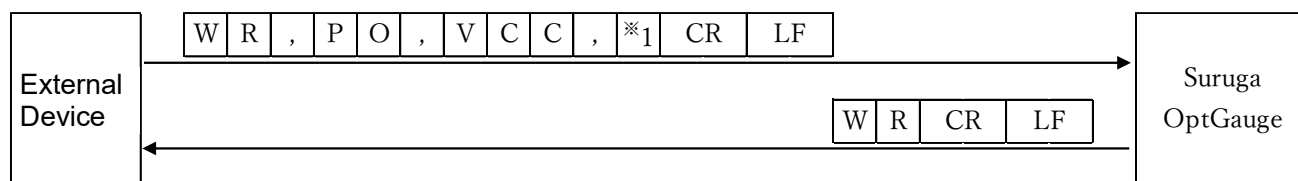
※1: Binning setting (“0” = disabled, “1” = enabled).

[Write: Auto Aperture Display Configuration]



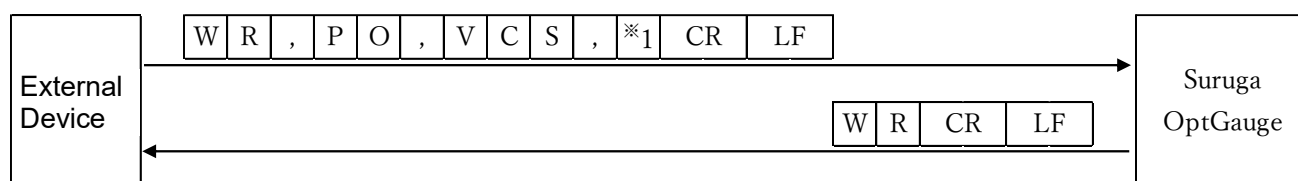
*1: Auto Aperture display ("0" = disabled, "1" = enabled).

[Write: Centroid Cursor Display Configuration]



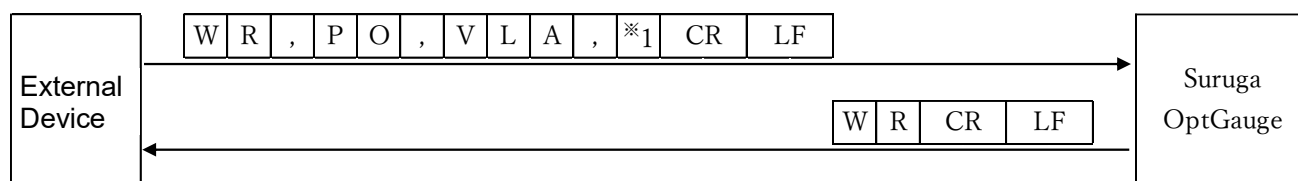
*1: Centroid Cursor display ("0" = disabled, "1" = enabled).

[Write: Centroid Cursor Display Configuration]



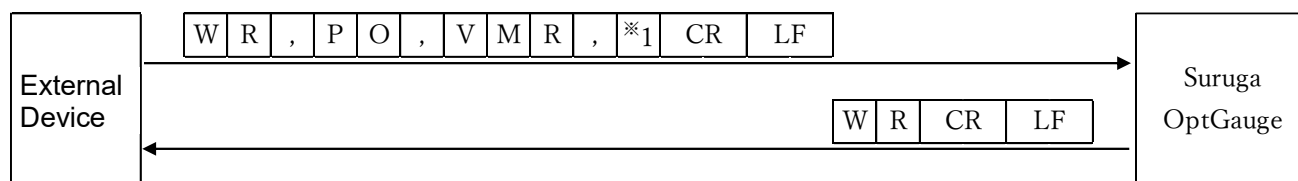
*1: Cross Section display ("0" = disabled, "1" = enabled).

[Write: Labeling Area Display Configuration]



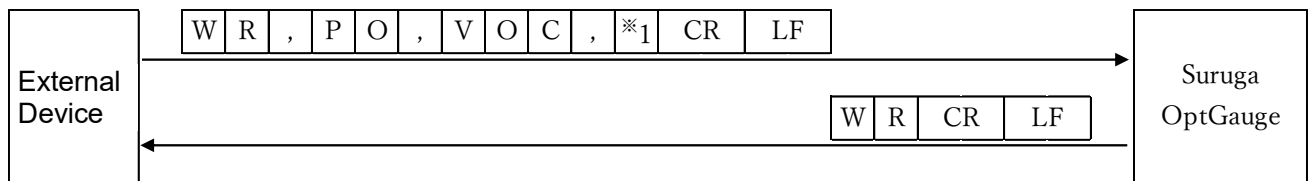
*1: Labeling Area display ("0" = disabled, "1" = enabled).

[Write: Measurement Range Display Configuration]



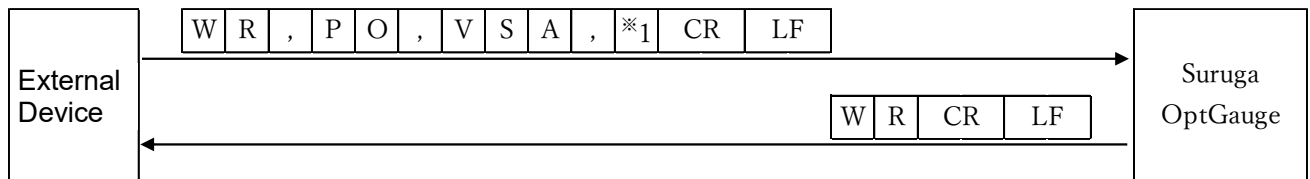
*1: Measurement range display ("0" = disabled, "1" = enabled).

[Write: Origin Cursor Display Configuration]



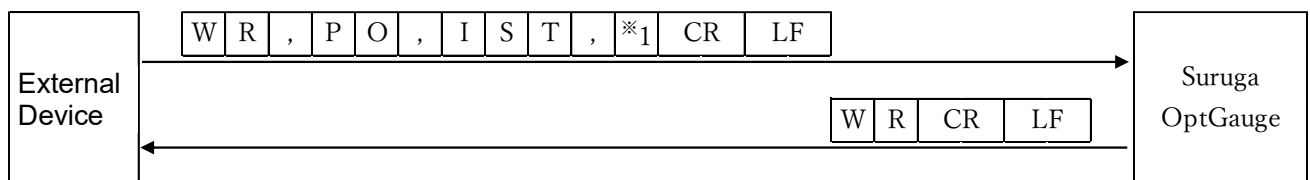
※1: Origin Cursor Display ("0" = disabled, "1" = enabled).

[Write: Spot Area display Configuration]



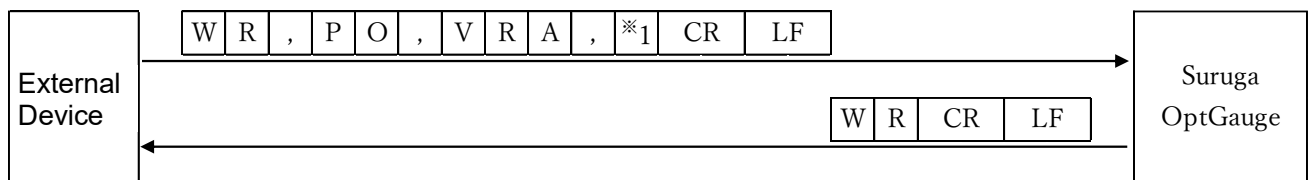
※1: Spot Area display ("0" = disabled, "1" = enabled).

[Write: Spot Area Display type Configuration]



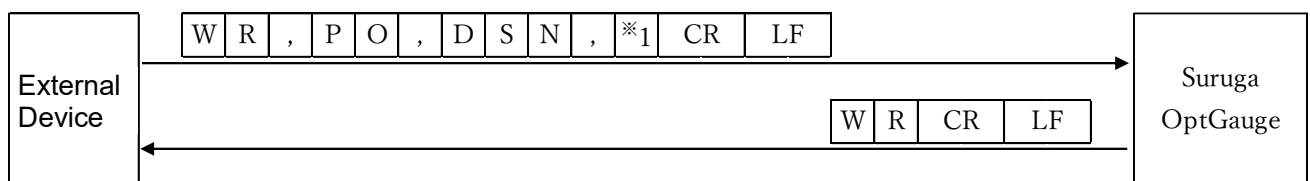
※1: Spot Area display type ("0" = D4Sigma or $1/e^2$, "1" = D86).

[Write: ROI Area Display Configuration]



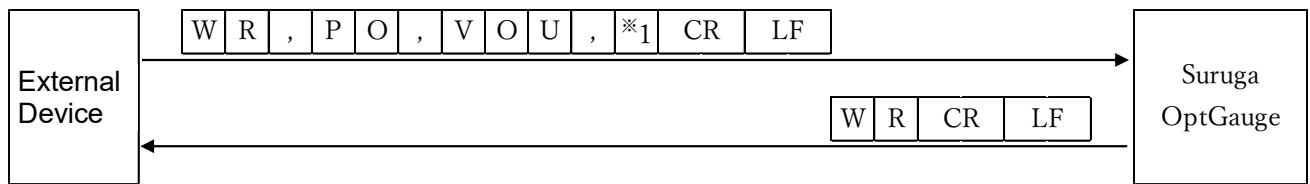
※1: ROI area display ("0" = disabled, "1" = enabled).

[Write: Display Spot Number Configuration]



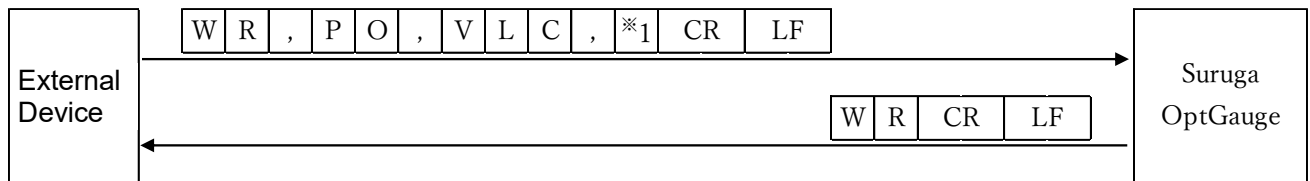
※1: Display spot number (0 to 100).

[Write: Rotation Angle Cursor Display Configuration]



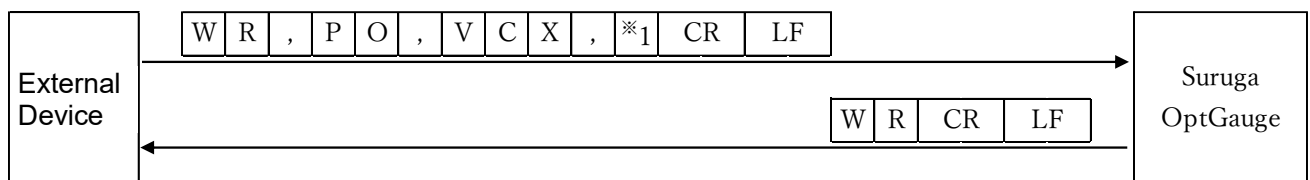
※1: Rotation Angle Cursor Display ("0" = disabled, "1" = enabled).

[Write: Line Position Cursor Display Configuration]



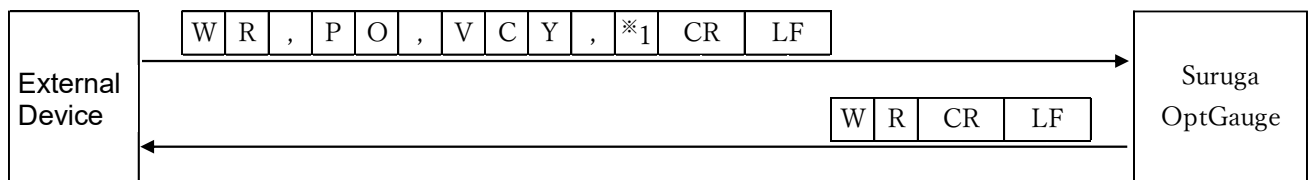
※1: Line Position Cursor Display ("0" = disabled, "1" = enabled).

[Write: Centroid X Result Display Configuration]



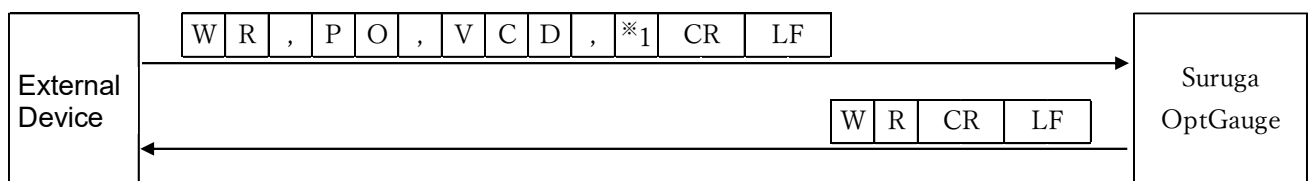
※1: Results display ("0" = disabled, "1" = enabled).

[Write: Centroid Y Result Display Configuration]



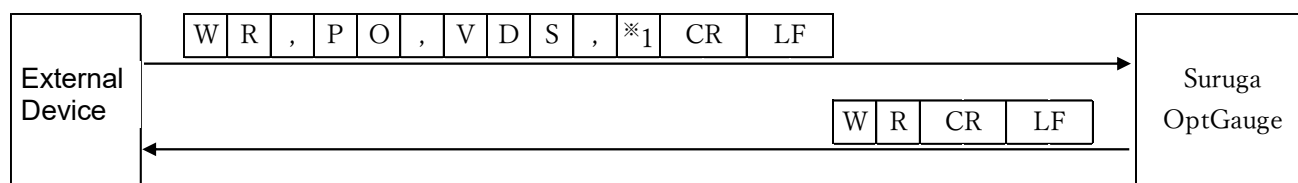
※1: Results display ("0" = disabled, "1" = enabled).

[Write: Centroid D Result Display Configuration]



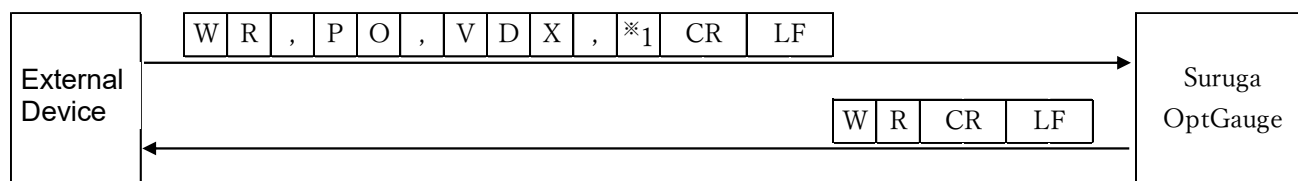
※1: Result display ("0" = disabled, "1" = enabled).

[Write: D4Sigma or $1/e^2$ Result Display Configuration]



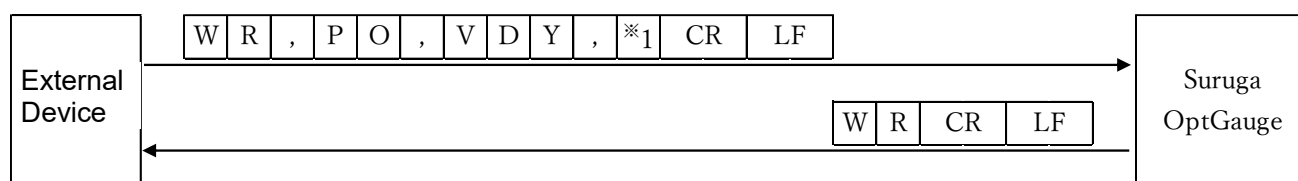
*1: Result ("0" = disabled, "1" = enabled).

[Write: D4Sigma X or $1/e^2$ X(M) Result Display Configuration]



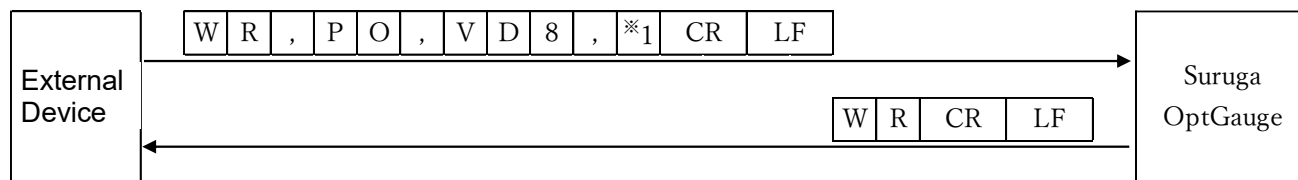
*1: Result ("0" = disabled, "1" = enabled).

[Write: D4Sigma Y(m) or $1/e^2$ Y(m) Result Display Configuration]



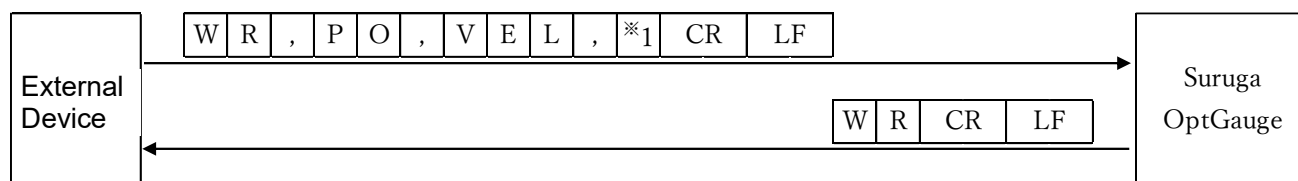
*1: Result ("0" = disabled, "1" = enabled).

[Write: D86 Result Display Configuration]



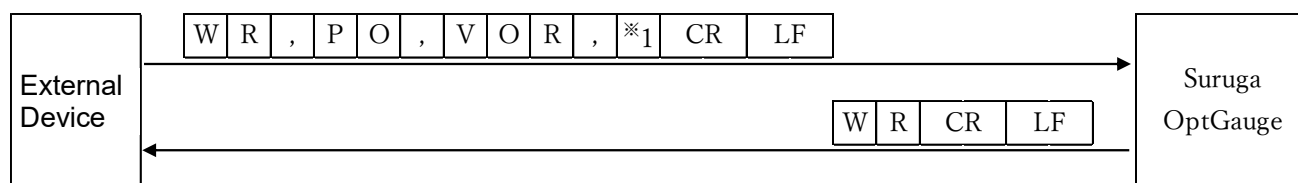
*1: Result ("0" = disabled, "1" = enabled).

[Write: Ellipticity Results Display Configuration]



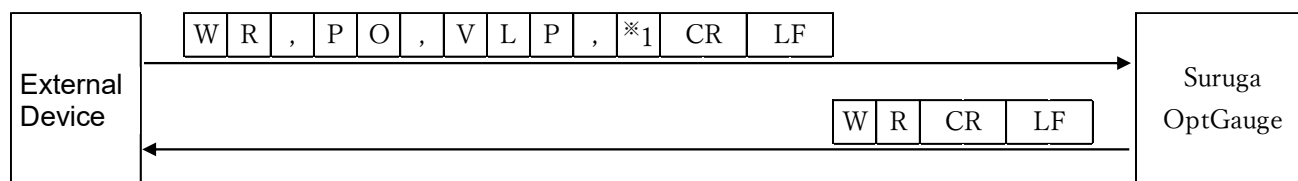
*1: Result ("0" = disabled, "1" = enabled).

[Write: Rotation Angle Result Display Configuration]



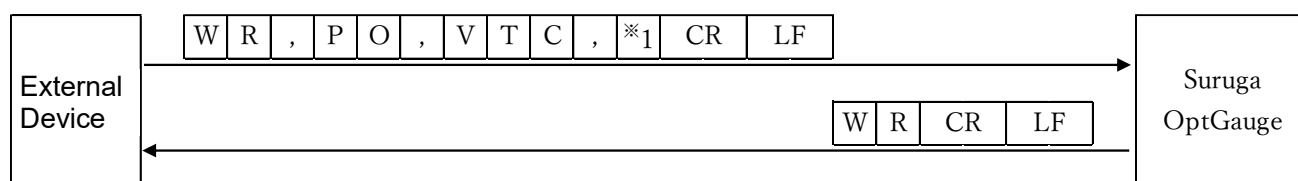
※1: Result ("0" = disabled, "1" = enabled).

[Write: Line Position Result Display configuration]



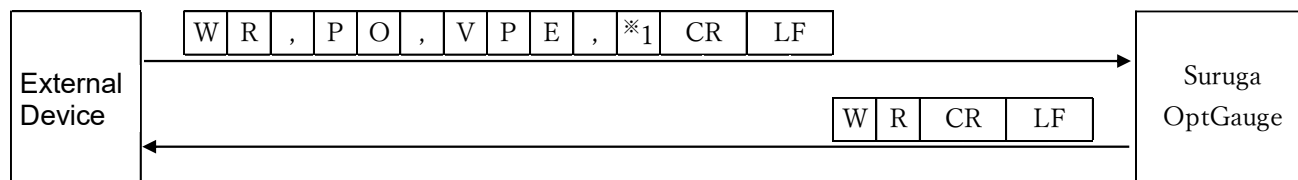
※1: Result ("0" = disabled, "1" = enabled).

[Write: Total Count Result Display Configuration]



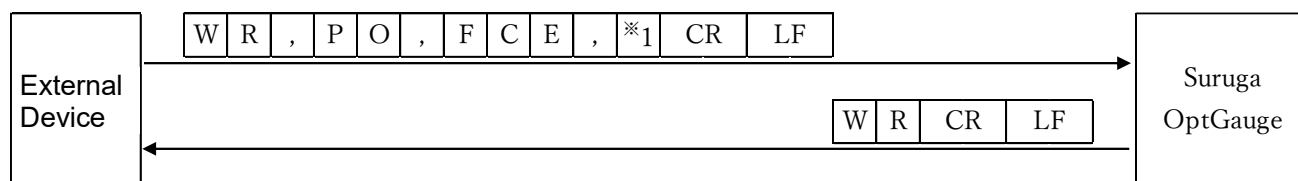
※1: Result ("0" = disabled, "1" = enabled).

[Write: Peak Result Display Configuration]



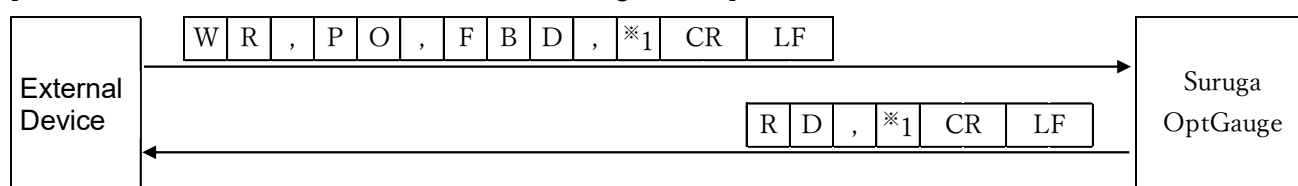
※1: Result ("0" = disabled, "1" = enabled).

[Write: Font size for the Centroid Configuration]



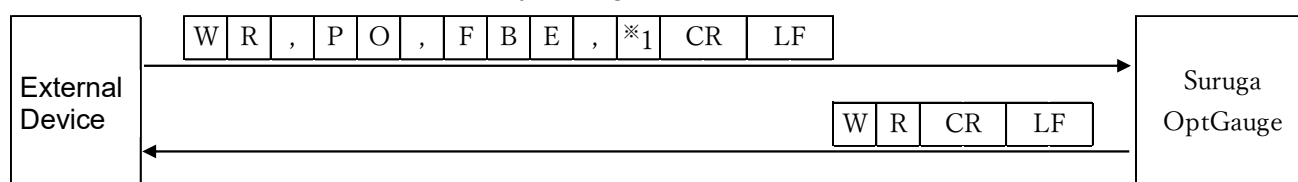
※1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Beam Diameter Configuration]



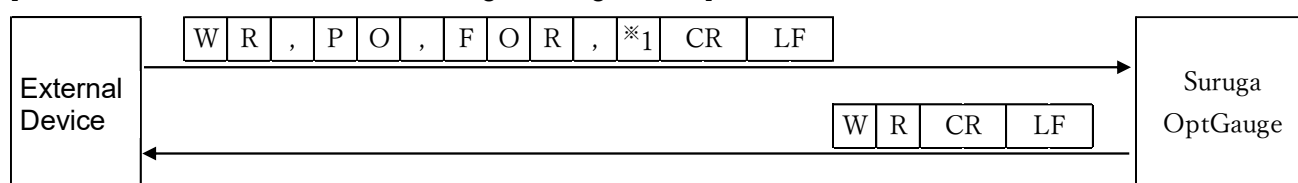
*1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Beam Ellipticity Configuration]



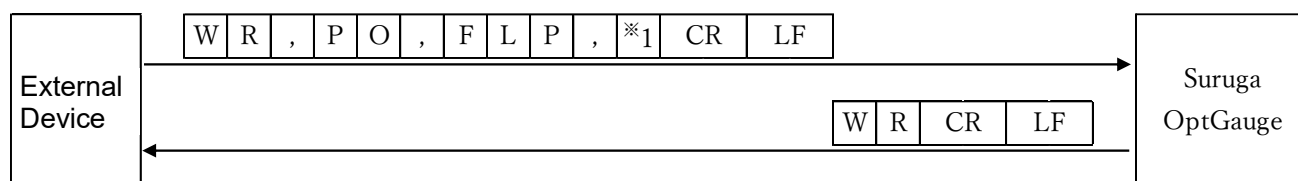
*1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font size for the Rotation Angle configuration]



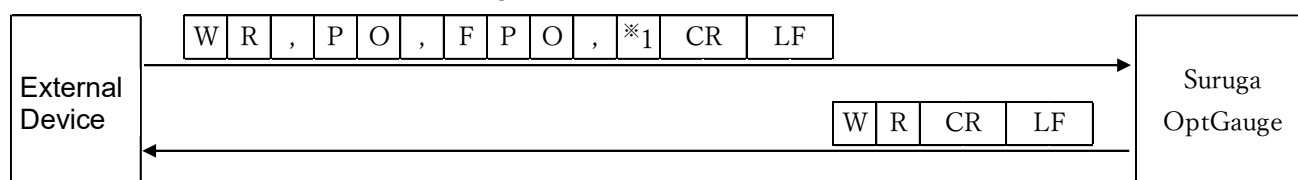
*1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font size for the Line Position configuration]



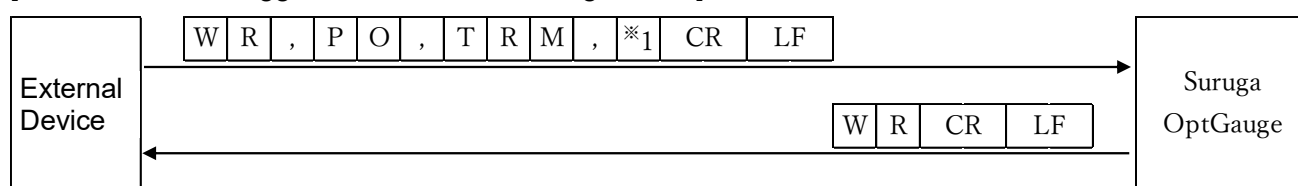
*1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: Font Size for the Power Configuration]



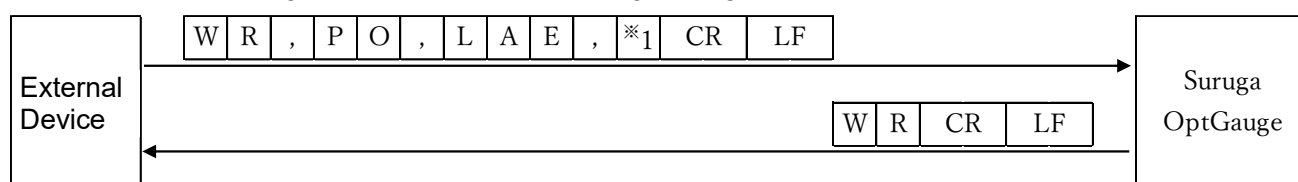
*1: Font size ("0" = Small, "1" = Medium, "2" = Large).

[Write: External Trigger Mode enabled configuration]



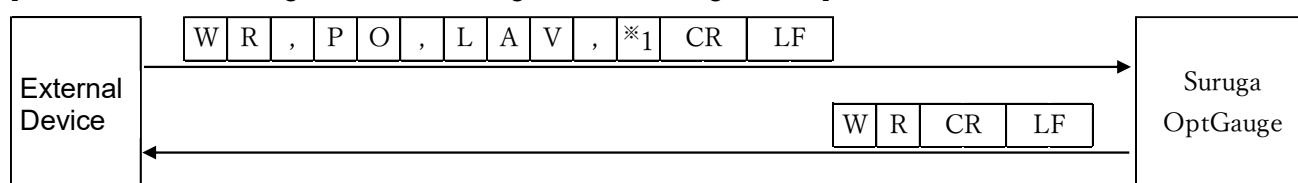
*1: External Trigger Mode ("0" = disabled, "1" = enabled).

[Write: Automatic Brightness Execution Enabling Configuration]



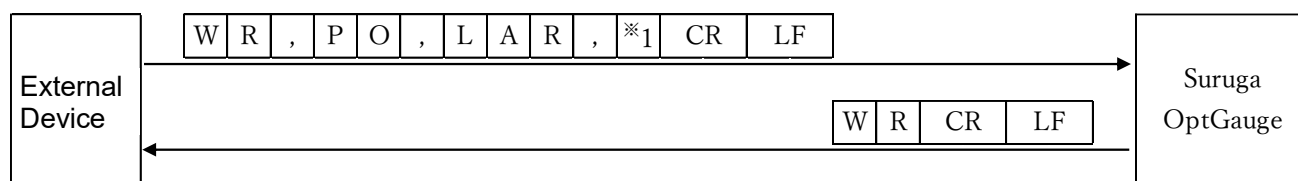
*1: Automatic brightness execution ("0" = disabled, "1" = enabled).

[Write: Automatic Brightness Peak Target Value Configuration]



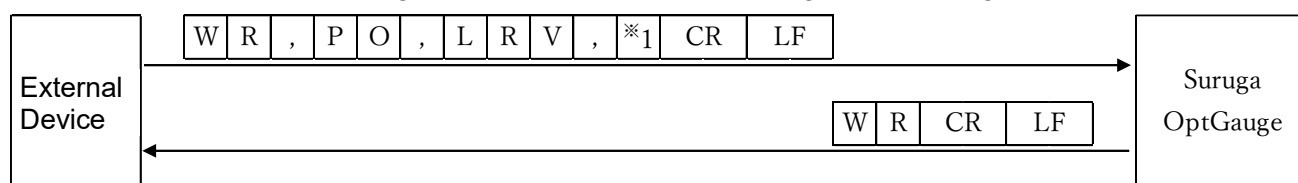
*1: Automatic brightness peak target value (1000 to 3500).

[Write: Automatic Brightness Peak Target Range Configuration]



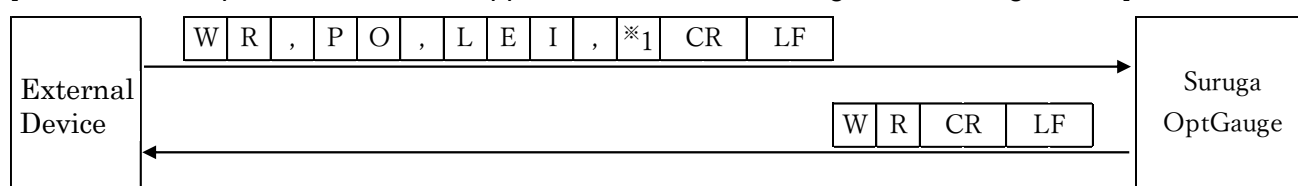
*1: Automatic brightness peak target range (100 to 1000).

[Write: Reflectance of the Target Applied in the Automatic Brightness Configuration]



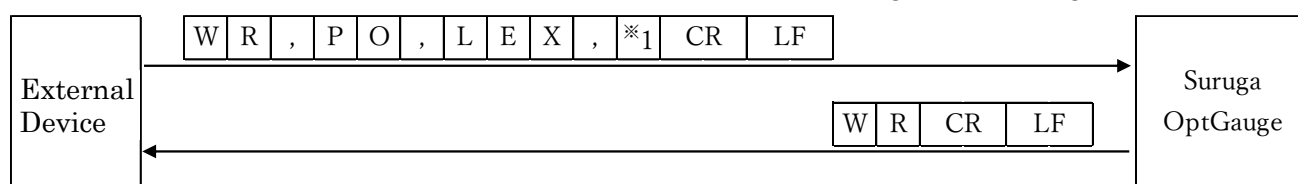
*1: Reflectance of the Target (0.05 to 100).

[Write: Initial Exposure Time Value Applied in the Automatic Brightness Configuration]



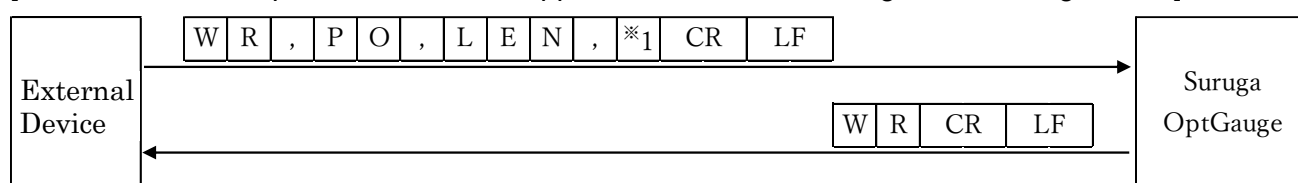
※1: Initial exposure time value (0.027 to 100).

[Write: Maximum Exposure Time Value Applied in the Automatic Brightness Configuration]



※1: Maximum value of exposure time (0.027 to 100)

[Write: Minimum Exposure Time Value Applied in the Automatic Brightness Configuration]

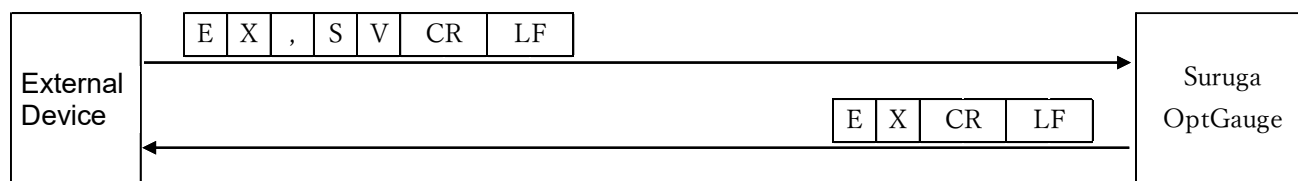


※1: Minimum value of exposure time (0.027 to 100).

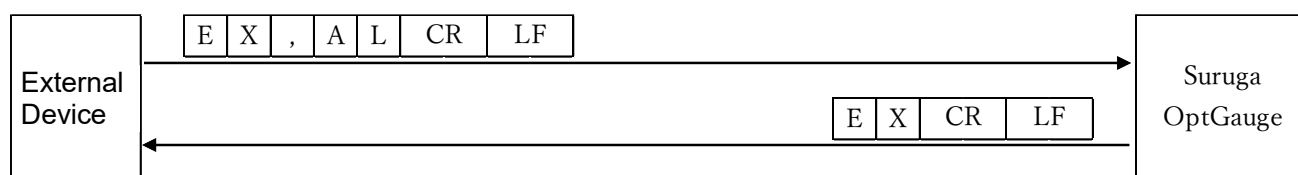
3.6 Execute Commands

3.6.1 Command Format

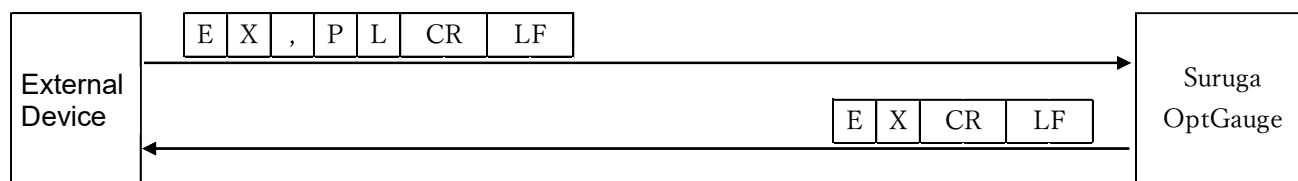
[Execute: Save Options]



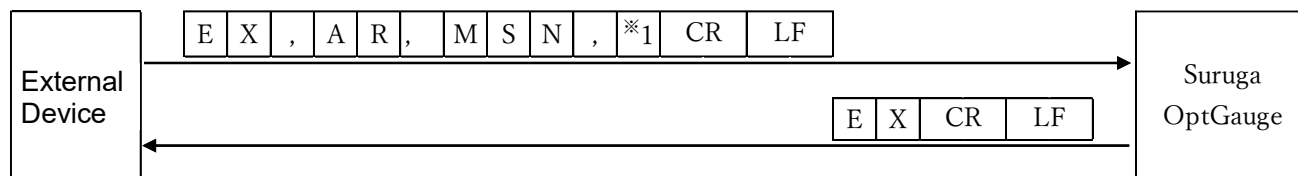
[Execute: Automatic Brightness for Angle Measurements]



[Execute: Automatic Brightness for Profile Measurements]

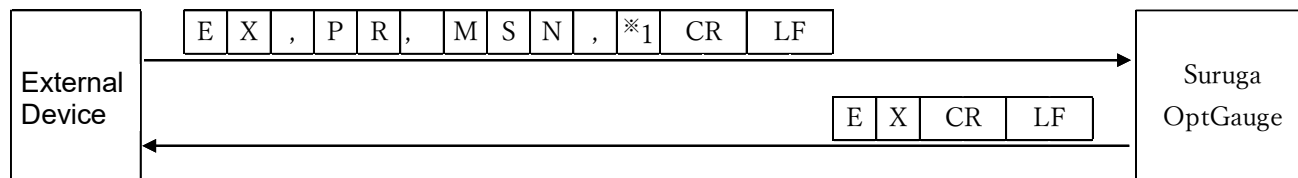


[Execute: Angle Main Spot Number Switching]



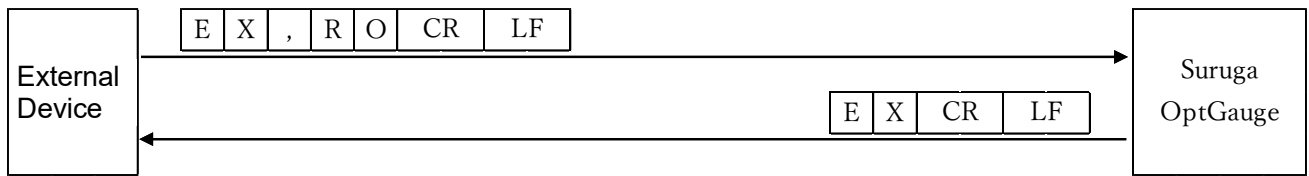
*1: Main Spot Number(1 to 100).

[Execute: Profile Main Spot Number Switching]

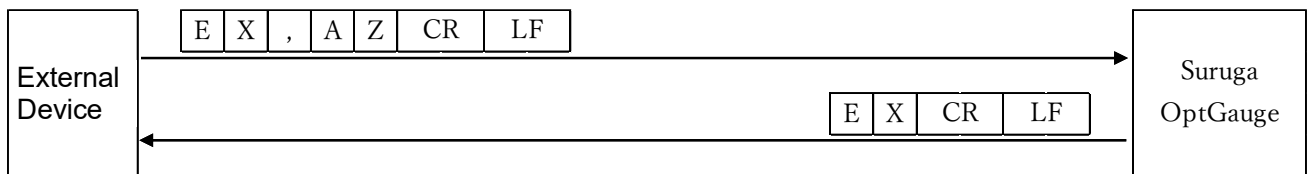


*1: Main Spot Number(1 to 100).

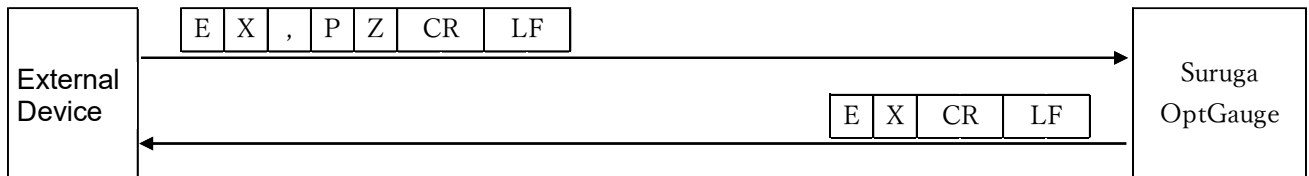
[Execute: Measurement Result Log Output]



[Execute: Angle zero set]

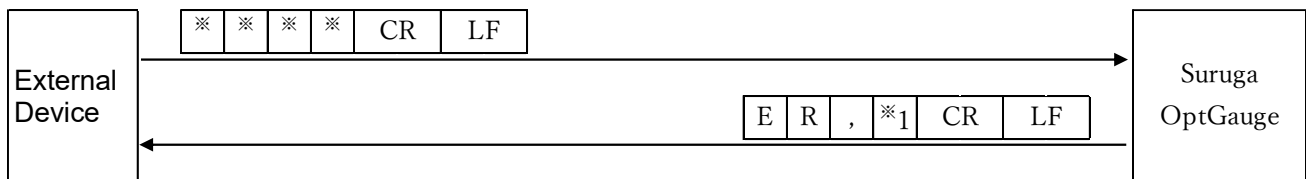


[Execute: Profile Zero Set]



3.7 Communication Error

When a command was not successfully received or could not be executed, the Products will return error information in the following format.



※1The error codes appear in ※1 as below.

"2": Setting Data Error

- Value outside setting range was set.

"3": Command Format Error

- The number of commas from header to [CRLF] does not match.
- Command not in command list, or non-alphanumeric characters.
- Text after header includes characters not in list above.

"5": Condition Error

- Value outside setting range was set.

4 System Log

4.1 System Log List

System Log	Details
Angle view initialize succeeded.	Angle screen initialization was successful. Measurement starts normally.
Profile view initialize succeeded.	Profile screen initialization was successful. Measurement starts normally.
Angle view initialize failed. Please check the connection with the Suruga OptGauge.	Angle screen initialization failed. Check the sensor head and computer connection.
Profile view initialize failed. Please check the connection with the Suruga OptGauge.	Profile screen initialization failed. Check the sensor head and computer connection.
Angle result output succeeded.	By pressing the [Output Once] button icon, it executes the output of the Angle measurement results, successfully.
Profile result output succeeded.	By pressing the [Output Once] button icon, it executes the output of the Profile measurement results, successfully.
Angle result output failed.	Measurement results output with [Output Once] button failed.
Profile result output failed.	Measurement results output with [Output Once] button failed.
Adaptive Cal succeeded.	Adaptive calibration with [Adaptive Cal] button was successful.
Adaptive Cal failed.	Adaptive Cal with [Adaptive Cal] button failed.
It is necessary to block the light.	Adaptive Cal failure: Block the light.

4.2 Error Messages and Countermeasures

Error Message	Cause	Counter Measure
Angle view initialize failed. Please check the connection with the Suruga OptGauge.	The Products and computer are not connected.	Check that the Products and computer are connected and restart the Suruga OptGauge. If this error is repeatedly generated, the Products interior camera may not be working properly. Contact the Suruga Seiki Optical Device Business Division Sales Section.
Profile view initialize failed. Please check the connection with the Suruga OptGauge.		
Angle result output failed.	Measurement results output file (.csv) is open.	Please close the measurement results output file (.csv) if opened and execute outputting measurement results.
Profile result output failed.		
Adaptive Cal failed. It is necessary to block the light.	Because the light is not blocked, the Adaptive Cal cannot be executed.	Check that the beam is not incoming to the Products. Also, make sure before measurement that there is no unwanted exterior light or other laser light source interfering with the sensor.

5 Failures? Frequently Asked Questions

5.1 Symptoms and Countermeasures

Useful information for troubleshooting is listed below.

Check if the table below shows your trouble.

Symptom	Cause	Counter Measure
Internal light source power is NOT turned on.	AC adapter or power cable is not correctly connected.	DC12V is not supplied.
	DC12V is not supplied.	Correctly connect the DC12V power source.
The Software does not start.	USB cable is not correctly connected.	Connect the USB cable to the USB3.0 port.
	Device authentication file is not being read.	Read the device authentication file (.suruga) corresponding to the purchased the Products.
The Software stops during startup	With Windows 11 Version 23H2, due to differences in some system components and specifications, this software may not function properly.	Please update to the latest Windows version (24H2 or later).
	USB cable disconnected.	Close the application, connect the USB cable correctly, and restart the application.
Beam is not displayed on screen	Exposure Time is too short.	Adjust the Exposure Time to the optimal speed.
	Large tilt on the target.	Adjust the tilt angle of the target so that the reflected light beam enters within a viewing range.
Measurement target centroid is unstable	Noise is causing serious effects	Enable the Threshold in the Denoising settings and adjust the threshold.
RS232C communication is not working	RS232C cable is not correctly connected	Correctly connect RS232C cable.
	Computer communication conditions are not set correctly.	Set the communication settings correctly on the PC.
TCP/IP communication is not working	Ethernet cable is not correctly connected.	Correctly connect the Ethernet cable.
	Computer communication	Set the communication settings correctly

	conditions are not met correctly.	on the PC.
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6 Warranty - After-Sales Service

6.1 Warranty Terms, Conditions and Coverage

- Before contacting us, please confirm the serial number for the individual Product.
- The warranty period is one year after delivery.
- However, the following cases are not covered by the warranty and will be repaired for a fee.
 - Failure or damage caused by misuse, modification or repair by someone other than the company's designated persons from us.
 - Failure or damage caused by improper handling, such as dropping the Products during transportation or moving.
 - Failure or damage caused by fire, salt damage, gas damage, abnormal voltage, earthquake, lightning, wind, flood, or other natural disasters
 - In the event of a malfunction or damage caused by improper handling contrary to the methods and precautions described in the instruction manual.

We reserve the right to revise, modify, or amend these Warranty Terms and Conditions (hereinafter referred to as "Revisions, etc."), and in the event of such revisions, etc., we shall promptly post the revised Warranty Terms and Conditions in this catalog or on our website (<http://jpn.surugaseiki.com/>). If you place an order for the Products after such revision, you shall be deemed to have accepted the revision.

6.2 After-Sales Service

Before requesting repair, please check the items in "[Failures? Frequently Asked Questions](#)". If you have any questions, please contact our Optical Instruments Division Sales Department.

<During the Warranty Period>

When damage occurs under a normal use state following the cautions/warnings/notes written in this manual, Suruga conducts a repair service for free. For any damages out of warranty period mentioned above, Suruga charges a fee for any repair service.

<After the Warranty Period>

A repair service is available with a fee to maintain the functionalities of the Products up on your requests.

<If repair is required>

For repair and calibration inquiries, please contact to the following address.

info@suruga-g.co.jp

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