

# Performing a MM RL1 Self-calibration



# Performing a MM RL1 Self-calibration

This document will show step-by-step instructions on how to perform a MM RL1 self-calibration.

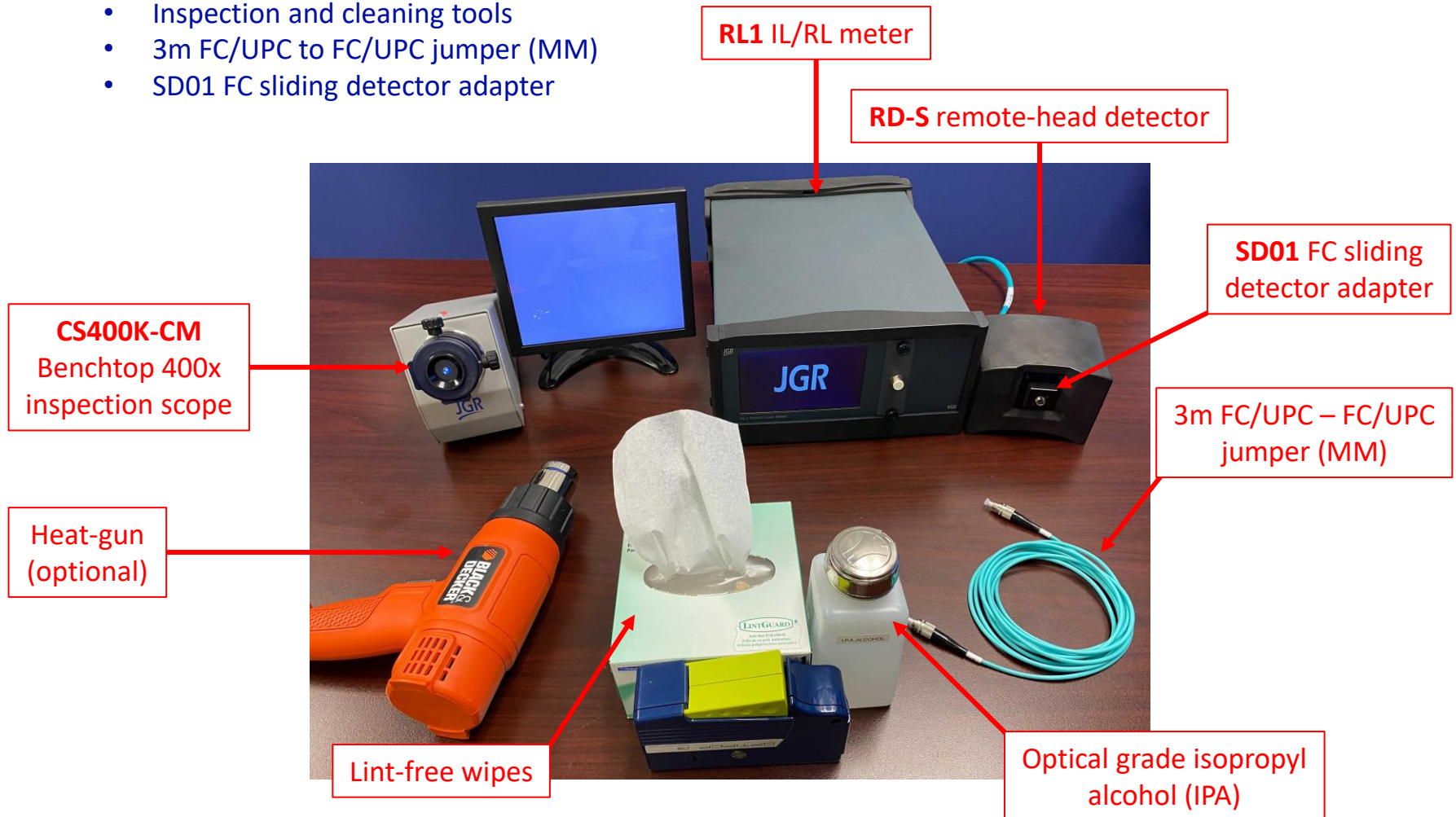
If you have any questions, please email [support@jgroptics.com](mailto:support@jgroptics.com)



# Performing a MM RL1 Self-calibration

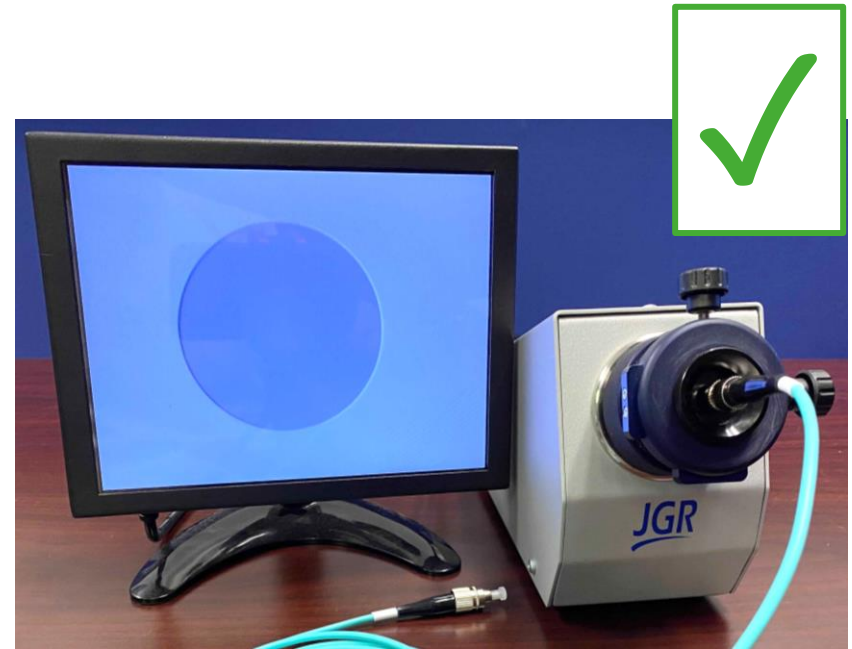
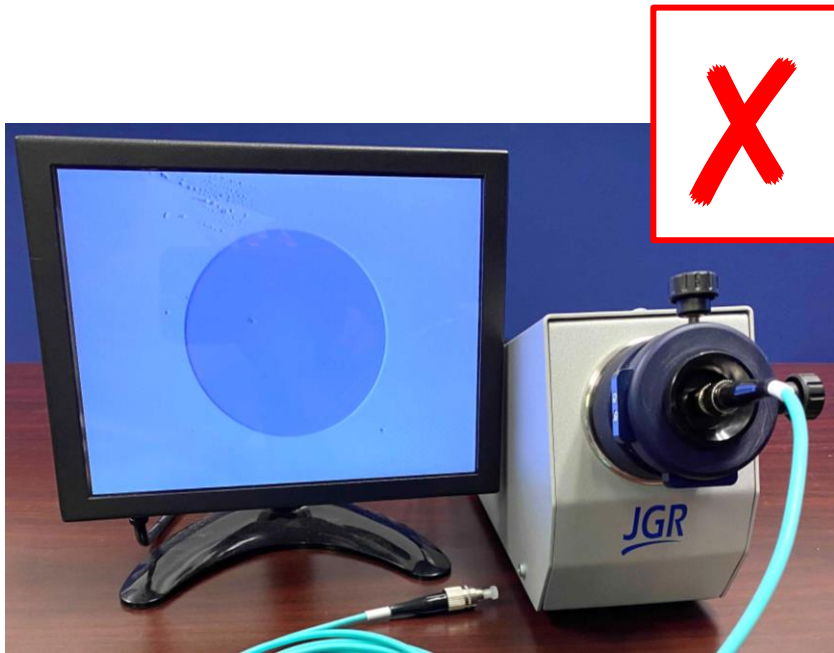
The following items are required:

- Inspection and cleaning tools
- 3m FC/UPC to FC/UPC jumper (MM)
- SD01 FC sliding detector adapter



# Performing a MM RL1 Self-calibration

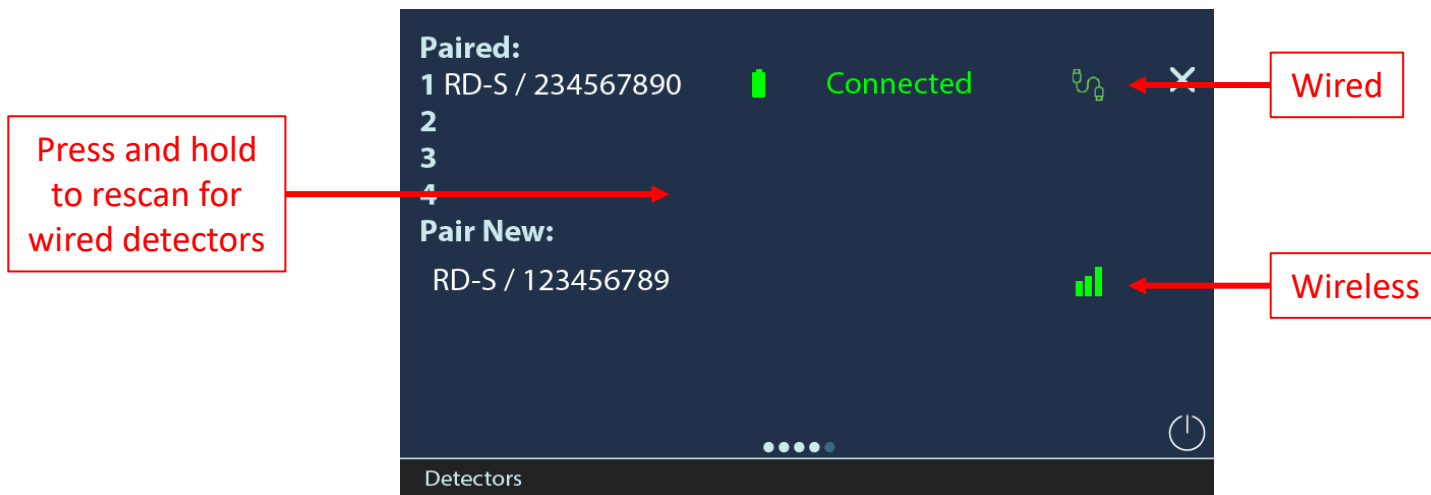
Proper inspection and cleaning is very important.



# Performing a MM RL1 Self-calibration

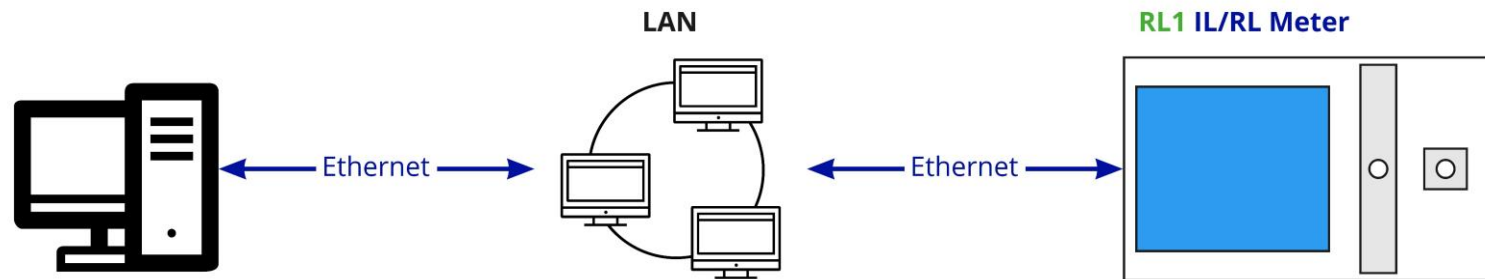
If using a remote-head RD-S detector:

- Connect the RD-S to the RL1 using the blue M12 cable
- Swipe to the *Detectors* page to confirm a wired connection is established



# Performing a MM RL1 Self-calibration

- Connect the RL1 via Ethernet to the same LAN as the controlling PC or tablet



# Performing a MM RL1 Self-calibration

- Swipe to the *Setup* page to get the RL1's IP address
- Enter the IP address into a web browser (recommended: *Google Chrome*)

The image shows two overlapping screenshots. The background screenshot is a web browser window titled 'JGR Interface' with the address bar showing '192.168.12.19'. The page displays 'RL1' and 'Dashboard' options. The foreground screenshot is the 'Setup' page of the RL1 device, showing 'Network Status: Connected', 'Device Name: JGR-RL1-00001932250', 'IP: 192.168.12.19' (highlighted with a red box), and 'XN1 Location: 192.168.12.53:8083'. A red arrow points from the IP address in the foreground to the address bar in the background.

Network Status: **Connected** Touch Auto

Device Name: JGR-RL1-00001932250

IP: 192.168.12.19

XN1 Location: 192.168.12.53:8083

Setup

Calibration: 2020-09-04 11:59(Factory)

Calibration Results: **Pass** Calibration Date: 2020-09-04

RL1-02-8300-50FP: 2034150

Return Loss Accuracy

Wavelength (nm)	Reference (dB)	Specifications ( $\pm$ dB)	Results (dB)	Difference (dB)	Status
1300	14.5	1.4	14.5	0.02	Pass
850	14.4	1.4	14.4	0.02	Pass

Wavelength (nm)	Reference (dB)	Specifications ( $\pm$ dB)	Results (dB)	Difference (dB)	Status
1300	14.5	1.4	14.5	0.02	Pass
850	14.4	1.4	14.4	0.03	Pass

Hardware Validation

Remote Heads	RD-S1-2013453	Pass
Front Panel	Output1	Pass
	Output2	Pass
	Bulkhead1	Pass
	Bulkhead2	Pass
Internal	Firmware	Pass
	Electronics	Pass
	Optics	Pass

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# Performing a MM RL1 Self-calibration

- Click on the *Self Calibration* tab

The screenshot shows the JGR Interface web application. The left sidebar has a dark blue background with the title 'RL1' and several menu items: 'Dashboard', 'Settings', 'Self Calibration' (highlighted with a red circle), 'Help', and 'About'. The main content area is titled 'Self Calibration' and contains two sections: 'Detector Physical Inspection' and 'Power Level'.

**Detector Physical Inspection**

- ☐ Remove FC output panel and disconnect output fibers
- Detected ID: 1, Serial Number: 2034150-1, Connection Type: Wired
- ☐ Verify RD-S diffuser is clean and free of defects

**Power Level**

- ☐ Clean and inspect Output Fiber 1
- ☐ Connect Output Fiber 1 to RD-S

Start

Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
Laser Off	1300	0.000 N/A	N/A	0
Laser Off	850	0.000 N/A	N/A	0

Below the table, the same headers are repeated: Wavelength (nm), RD-S 1 (dBm), Internal Power Meter, Live Reading (dBm).



# Performing a MM RL1 Self-calibration

- Remove the output panel and disconnect the lead



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## Self Calibration

### Detector Physical Inspection

☒ Remove FC output panel and disconnect output fibers

Detected ID	Serial Number	Connection Type
1	2034150-1	Wired

☐ Verify RD-S diffuser is clean and free of defects

### Power Level

☐ Clean and inspect Output Fiber 1  
☐ Connect Output Fiber 1 to RD-S

Start

Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
Laser Off	1300	0.000 N/A	N/A	0
Laser Off	850	0.000 N/A	N/A	0
	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)

# Performing a MM RL1 Self-calibration

- Verify the detector diffuser glass is clean and free of defects
  - If the diffuser is dirty, gently use a lint free wipe or swab
  - IPA and low pressure compressed air can be used on the diffuser plate
  - If it is scratched and cannot be cleaned, please contact [support@jgroptics.com](mailto:support@jgroptics.com)



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## Self Calibration

### Detector Physical Inspection

- ☒ Remove FC output panel and disconnect output fibers

Detected ID	Serial Number	Connection Type
1	2034150-1	Wired

- ☒ Verify RD-S diffuser is clean and free of defects

### Power Level

- ☐ Clean and inspect Output Fiber 1
- ☐ Connect Output Fiber 1 to RD-S

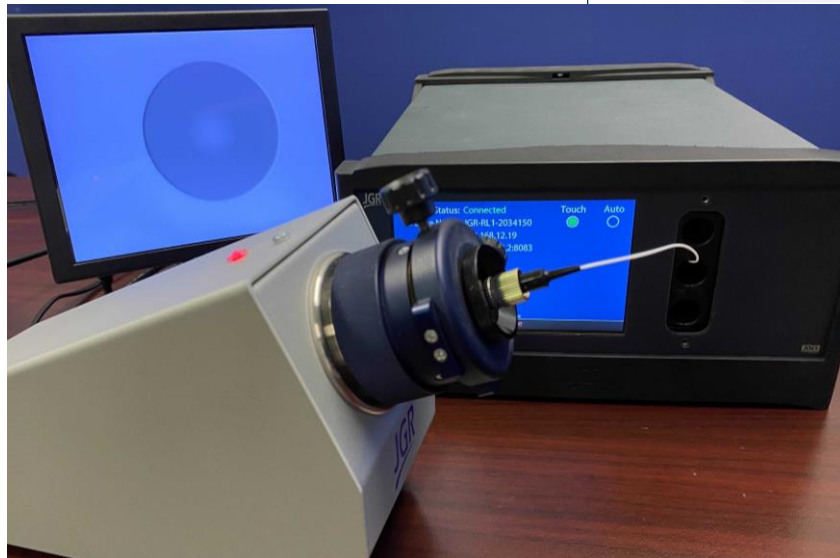
Start

Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
Laser Off	1300	0.000 N/A	N/A	0
Laser Off	850	0.000 N/A	N/A	0
	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)

# Performing a MM RL1 Self-calibration

- Clean and inspect the output lead connector
  - Position the scope so that the fiber is not under tension and there are no sharp bends



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## Self Calibration

### Detector Physical Inspection

- ☒ Remove FC output panel and disconnect output fibers
- ☒ Verify RD-S diffuser is clean and free of defects

	Detected ID	Serial Number	Connection Type
<input checked="" type="radio"/>	1	2034150-1	Wired

### Power Level

- ☒ Clean and inspect Output Fiber 1
- ☐ Connect Output Fiber 1 to RD-S

Start

Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 N/A	N/A	0
<input type="radio"/> Laser Off	850	0.000 N/A	N/A	0
	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)

# Performing a MM RL1 Self-calibration

- Connect the output lead to the detector
  - Make sure that the fiber is not under tension and there are no sharp bends



**RL1**

## Self Calibration

**Detector Physical Inspection**

- ☒ Remove FC output panel and disconnect output fibers
- ☒ Verify RD-S diffuser is clean and free of defects

Detected ID	Serial Number	Connection Type
1	2034150-1	Wired

**Power Level**

- ☒ Clean and inspect Output Fiber 1
- ☒ Connect Output Fiber 1 to RD-S

**Start**

Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 N/A	N/A	0
<input type="radio"/> Laser Off	850	0.000 N/A	N/A	0
	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)

# Performing a MM RL1 Self-calibration

- Start the power level

The screenshot shows the JGR Interface in a web browser. The left sidebar contains 'Settings', 'Self Calibration' (highlighted), 'Help', and 'About'. The main content area is titled 'Self Calibration' and includes several checkboxes: 'Remove FC output panel and disconnect output fibers' (checked), 'Verify RD-S diffuser is clean and free of defects' (checked), 'Clean and inspect Output Fiber 1' (checked), and 'Connect Output Fiber 1 to RD-S' (checked). A table displays detected fiber information:

	Detected ID	Serial Number	Connection Type
<input checked="" type="radio"/>	1	2034150-1	Wired

Below this is the 'Power Level' section with a 'Start' button circled in red. A note says 'Click Start to read the power level of RD-S 1 on Output 1'. Two tables follow, showing power readings for 1300 nm and 850 nm wavelengths. The first table shows 'Pass' for both RD-S 1 and Internal Power Meter. The second table shows 'N/A' for both.

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	-7.580 Pass	Pass	0
<input type="radio"/> Laser Off	850	-7.083 Pass	Pass	0

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 N/A	N/A	0
<input type="radio"/> Laser Off	850	0.000 N/A	N/A	0

At the bottom, there is a checkbox 'Reconnect the Output to the FC output panel' which is unchecked.

# Performing a MM RL1 Self-calibration

- Reconnect the output lead to the output panel



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Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	-7.580 <span>Pass</span>	<span>Pass</span>	0
<input type="radio"/> Laser Off	850	-7.083 <span>Pass</span>	<span>Pass</span>	0

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 <span>N/A</span>	<span>N/A</span>	0
<input type="radio"/> Laser Off	850	0.000 <span>N/A</span>	<span>N/A</span>	0

☒ Reconnect the Output to the FC output panel

☐ Carefully attach the output panel to the RL1

**Hardware Validation**

Click Start to begin

Electronics	<span>N/A</span>
Firmware	<span>N/A</span>

**Return Loss Accuracy**

☐ Connect a 3m UPC-UPC jumper to the MM Output



# Performing a MM RL1 Self-calibration

- Carefully reattach the output panel to the RL1
  - Use your free hand to help guide the fiber back in, avoiding any twists or bends
  - If you feel any resistance, stop, pull out slowly then try again



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Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	-7.580 <span>Pass</span>	<span>Pass</span>	0
<input type="radio"/> Laser Off	850	-7.083 <span>Pass</span>	<span>Pass</span>	0

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 <span>N/A</span>	<span>N/A</span>	0
<input type="radio"/> Laser Off	850	0.000 <span>N/A</span>	<span>N/A</span>	0

☒ Reconnect the Output to the FC output panel

☒ Carefully attach the output panel to the RL1

**Hardware Validation**

Click Start to begin

**Electronics** N/A

**Firmware** N/A

**Return Loss Accuracy**

☐ Connect a 3m UPC-UPC jumper to the MM Output

# Performing a MM RL1 Self-calibration

- Start the hardware validation
  - If the electronics fail, it's possible the APD is not sufficiently warmed up. Leave the unit on then try again. Depending on the environment, this could take up to 30 min.



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Click Start to read the power level of RD-S 1 on Output 1

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	-7.580 <span>Pass</span>	<span>Pass</span>	0
<input type="radio"/> Laser Off	850	-7.083 <span>Pass</span>	<span>Pass</span>	0

	Wavelength (nm)	RD-S 1 (dBm)	Internal Power Meter	Live Reading (dBm)
<input type="radio"/> Laser Off	1300	0.000 <span>N/A</span>	<span>N/A</span>	0
<input type="radio"/> Laser Off	850	0.000 <span>N/A</span>	<span>N/A</span>	0

☒ Reconnect the Output to the FC output panel

☒ Carefully attach the output panel to the RL1

**Hardware Validation**

Start Click Start to begin

**Electronics** Pass

**Firmware** Pass

**Return Loss Accuracy**

☐ Connect a 3m UPC-UPC jumper to the MM Output



# Performing a MM RL1 Self-calibration

- Inspect and connect a 3m FC/UPC to FC/UPC (MM) jumper to the RL1 output

Network Status: Connected  
Device Name: JGR-RL1-2034150  
IP: 192.168.12.19  
XMI Location: 192.168.12.2/8083

Touch Auto

RL1 Platform Loss Meter

JGR Interface

192.168.12.19/self-calibration

Firmware Pass

**Return Loss Accuracy**

☒ Connect a 3m UPC-UPC jumper to the MM Output

☐ Leave the UPC endface open to air

Start Click to start RL Reference of Output

Wavelength (nm)	Results
1300	N/A
850	N/A

**Optical Performance Validation**

☐ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output

☐ Connect the test jumper to RD-S 1

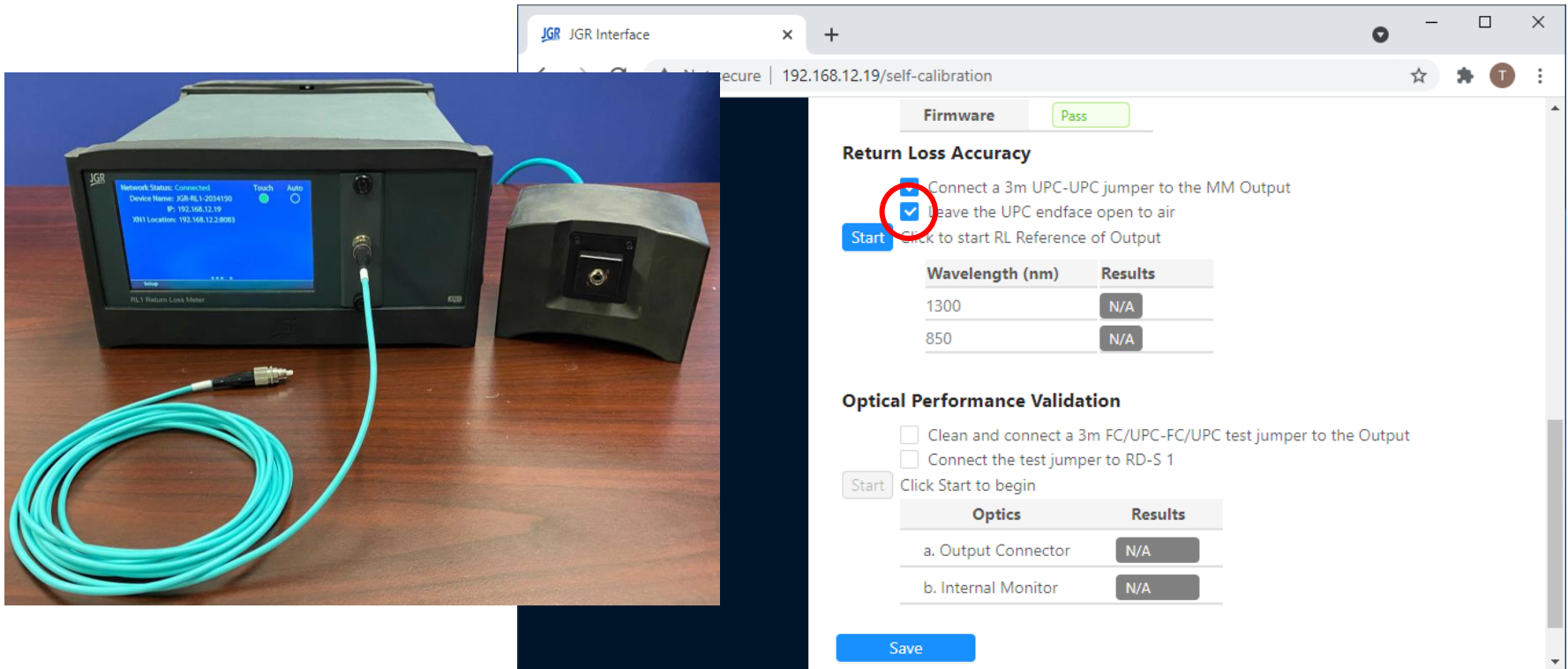
Start Click Start to begin

Optics	Results
a. Output Connector	N/A
b. Internal Monitor	N/A

Save

# Performing a MM RL1 Self-calibration

- Leave the jumper open to air



The image shows a JGR RL1 Return Loss Meter on the left, connected to a JGR Interface web application on the right. The meter's screen displays network status and IP address. The web application is at the URL 192.168.12.19/self-calibration. It features a 'Firmware' section with a 'Pass' status. The 'Return Loss Accuracy' section has two checked checkboxes: 'Connect a 3m UPC-UPC jumper to the MM Output' and 'Leave the UPC endface open to air'. Below this is a table for 'Return Loss Accuracy' with columns 'Wavelength (nm)' and 'Results'. The 'Optical Performance Validation' section has two unchecked checkboxes: 'Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output' and 'Connect the test jumper to RD-S 1'. Below this is a table for 'Optical Performance Validation' with columns 'Optics' and 'Results'. A 'Save' button is at the bottom.

**Return Loss Accuracy**

☒ Connect a 3m UPC-UPC jumper to the MM Output  
☒ Leave the UPC endface open to air

Start Click to start RL Reference of Output

Wavelength (nm)	Results
1300	N/A
850	N/A

**Optical Performance Validation**

☐ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output  
☐ Connect the test jumper to RD-S 1

Start Click Start to begin

Optics	Results
a. Output Connector	N/A
b. Internal Monitor	N/A

Save

# Performing a MM RL1 Self-calibration

- Start the return loss calibration

The screenshot shows the JGR Interface web application in a browser window. The address bar indicates the URL is 192.168.12.19/self-calibration. The page has a dark blue sidebar on the left. The main content area is white and contains the following sections:

- Firmware**: A green 'Pass' button.
- Return Loss Accuracy**:
  - Two checked checkboxes: 'Connect a 3m UPC-UPC jumper to the MM Output' and 'Leave the UPC endface open to air'.
  - A blue 'Start' button, which is circled in red. Below it is the text 'Click to start RL Reference of Output'.
  - A table with two columns: 'Wavelength (nm)' and 'Results'.

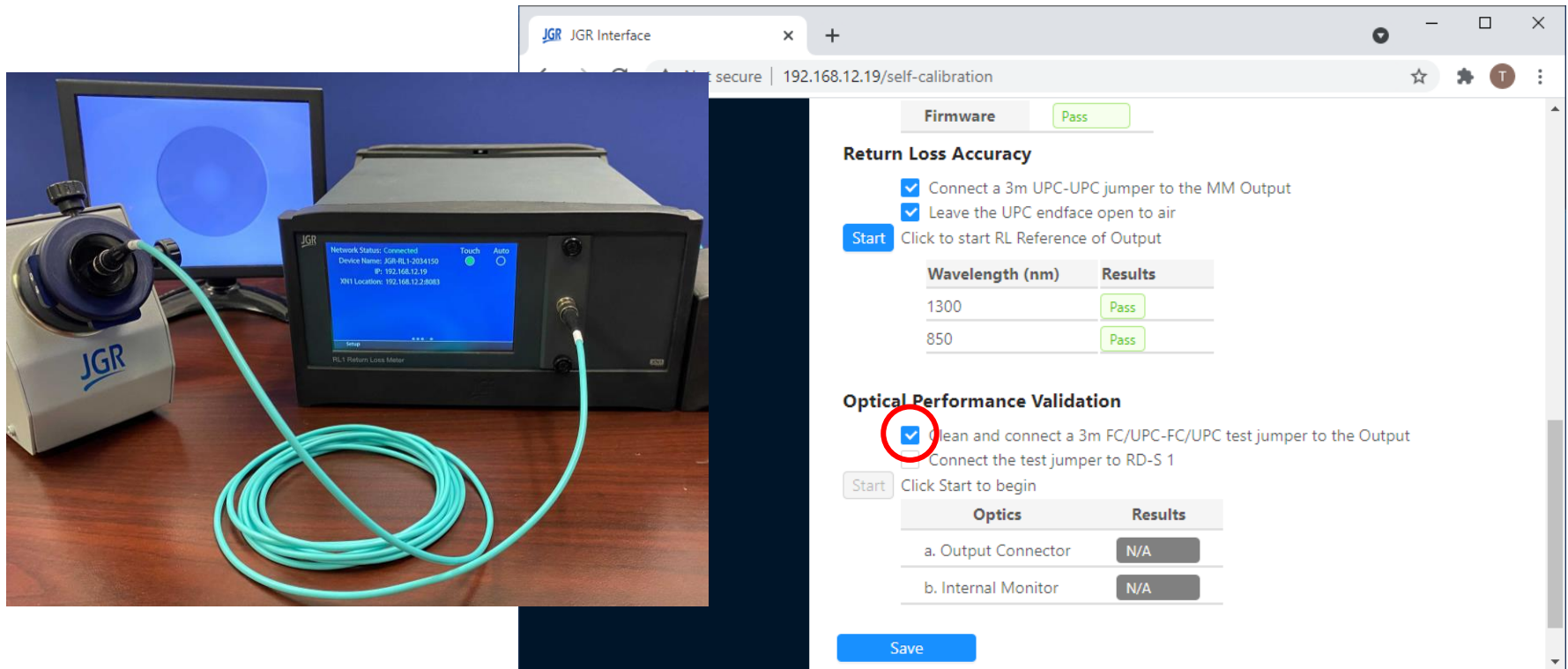
Wavelength (nm)	Results
1300	Pass
850	Pass
- Optical Performance Validation**:
  - Two unchecked checkboxes: 'Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output' and 'Connect the test jumper to RD-S 1'.
  - A grey 'Start' button with the text 'Click Start to begin' below it.
  - A table with two columns: 'Optics' and 'Results'.

Optics	Results
a. Output Connector	N/A
b. Internal Monitor	N/A

At the bottom of the page is a blue 'Save' button.

# Performing a MM RL1 Self-calibration

- Inspect the jumper end-face



The image shows a JGR RL1 Platform Loss Meter connected to a computer. The meter's screen displays network status: Connected, Device Name: JGR-RL1-2034150, IP: 192.168.12.19, and XMI Location: 192.168.12.20083. A blue fiber optic cable is plugged into the meter's output. The background shows a computer monitor displaying a blue circle. Overlaid on the right is the JGR Interface web application, which is used for self-calibration. The application shows the 'Firmware' status as 'Pass'. Under 'Return Loss Accuracy', there are two checked items: 'Connect a 3m UPC-UPC jumper to the MM Output' and 'Leave the UPC endface open to air'. A 'Start' button is available to begin the reference output. Below this is a table showing results for 1300 nm and 850 nm wavelengths, both marked as 'Pass'. The 'Optical Performance Validation' section has a checked item: 'Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output'. Below this, another 'Start' button is present. A table shows 'Optics' results: 'a. Output Connector' and 'b. Internal Monitor', both marked as 'N/A'. A 'Save' button is at the bottom.

**JGR Interface**

Network Status: Connected  
Device Name: JGR-RL1-2034150  
IP: 192.168.12.19  
XMI Location: 192.168.12.20083

**Firmware** Pass

**Return Loss Accuracy**

- ☒ Connect a 3m UPC-UPC jumper to the MM Output
- ☒ Leave the UPC endface open to air

**Start** Click to start RL Reference of Output

Wavelength (nm)	Results
1300	Pass
850	Pass

**Optical Performance Validation**

- ☒ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output
- ☐ Connect the test jumper to RD-S 1

**Start** Click Start to begin

Optics	Results
a. Output Connector	N/A
b. Internal Monitor	N/A

**Save**

# Performing a MM RL1 Self-calibration

- Connect the jumper to the detector
  - Make sure the jumper is well managed on the table without any twists or sharp bends



JGR JGR Interface

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Firmware Pass

### Return Loss Accuracy

- ☒ Connect a 3m UPC-UPC jumper to the MM Output
- ☒ Leave the UPC endface open to air

Start Click to start RL Reference of Output

Wavelength (nm)	Results
1300	<span>Pass</span>
850	<span>Pass</span>

### Optical Performance Validation

- ☒ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output
- ☒ Connect the test jumper to RD-S 1

Start Click Start to begin

Optics	Results
a. Output Connector	<span>N/A</span>
b. Internal Monitor	<span>N/A</span>

Save

# Performing a MM RL1 Self-calibration

- Start the optical performance validation
  - This step may take several minutes

JGR Interface

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☒ Connect a 3m FC/UPC-FC/UPC test jumper to the Output

☒ Leave the UPC endface open to air

**Start** Click to start RL Reference of Output

Wavelength (nm)	Results
1300	Pass
850	Pass

**Optical Performance Validation**

☒ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output

☒ Connect the test jumper to RD-S 1

**Start** Click Start to begin

Optics	Results
a. Output Connector	Pass
b. Internal Monitor	Pass

**Save**

English

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# Performing a MM RL1 Self-calibration

- If all steps passed, save the report

The screenshot shows the JGR Interface in a web browser. The address bar indicates the URL is 192.168.12.19/self-calibration. The interface displays a list of steps with checkboxes, a 'Start' button, and a table of results. A red arrow points to the 'User Calibration Saved' message, and a red circle highlights the 'Save' button.

**Wavelength (nm) Results**

Wavelength (nm)	Results
1300	Pass
850	Pass

**Optical Performance Validation**

☒ Clean and connect a 3m FC/UPC-FC/UPC test jumper to the Output

☒ Connect the test jumper to RD-S 1

**Start** Click Start to begin

Optics	Results
a. Output Connector	Pass
b. Internal Monitor	Pass

**Save**

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# Performing a MM RL1 Self-calibration

- The report is saved on the meter and is accessible via the webpage dashboard
- Click on the dropdown menu: up to 3 self-calibration reports can be stored on the RL1

The screenshot displays the JGR Interface for the RL1 device. The browser address bar shows '192.168.12.19'. The left sidebar contains navigation links: Dashboard, Settings, Self Calibration, Help, and About. The main content area shows the following information:

Calibration: 2020-09-09 15:29

Calibration Results: Pass Calibration Date: 2020-09-09

RL1-02-8300-50FP: 2034150

**Return Loss Accuracy**

Wavelength (nm)	Reference (dB)	Specifications ( $\pm$ dB)	Results (dB)	Difference (dB)	Status
1300	14.5	1.4	14.5	0.02	Pass
850	14.4	1.4	14.4	0.02	Pass

Wavelength (nm)	Reference (dB)	Specifications ( $\pm$ dB)	Results (dB)	Difference (dB)	Status
1300	14.5	1.4	14.5	0.02	Pass
850	14.4	1.4	14.4	0.03	Pass

**Hardware Validation**

Remote Heads	RD-S1-2013453	Pass
Front Panel	Output1	Pass
	Output2	Pass
	Bulkhead1	Pass
	Bulkhead2	Pass
Internal	Firmware	Pass
	Electronics	Pass
	Optics	Pass

English

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# Performing a MM RL1 Self-calibration

Common issues which can result in a failed step of the self-calibration:

- **Connector contamination**
  - microscopic airborne dust, chemical residuals or contact with surfaces are common sources of connector end-face contamination
  - inspect and clean **both ends** before **every mating**
  - if using a lint free wipe is not sufficient, try using IPA and remember to use a dry lint free wipe after applying the IPA to remove any residue
- **Poor fiber management**
  - bends and twists of the output lead or test jumper can affect the stability of the unit
  - use a heat-gun to relax the fiber's plastic jacket and smooth out any kinks
- **Microcracks**
  - fiber mishandling can cause microcracks in fiber causing instability
  - if there is no connector contamination and the fiber management is good but you still have issues, try replacing the test jumper
  - poor handling of the output lead can cause microcracks – if this happens, the unit will need to be shipped back to JGR or one of its approved service centers, please email [support@jgroptics.com](mailto:support@jgroptics.com) for additional instructions