Model PRM2103
Outdoor Microphone Preamplifier

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Larson Davis Model PRM2103-FF

Outdoor Microphone Preamplifier Manual

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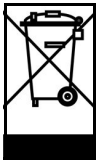

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Table of Contents

CHAPTER

1 Introduction

This chapter summarizes the features of the Larson Davis PRM2103-FF Outdoor Microphone Preamplifier

Description

Important! *Use Model 831 microphone corrections with the PRM2103-FF. See "Setting PRM2103-FF Corrections" on page 2-4 for more information.*

The Larson Davis PRM2103-FF Outdoor Microphone Preamplifier has been designed for use with EPS2106-3 and EPS2108-3 Environmental Protection Shrouds and Model 831 sound level meters. It includes remotely-activated, multi-frequency calibration check functionality and dessicant-free automatic heaters for internal humidity control. The PRM2103 requires only one microphone to get free-field, random or 90 degree response. FIGURE 1-1 shows the PRM2103-FF Outdoor Microphone Preamplifier.

FIGURE 1-1 PRM2103-FF Outdoor Microphone Preamplifier

FIGURE 1-2 shows the PRM2103-FF in an Outdoor Microphone System as part of an EPS2116-3.

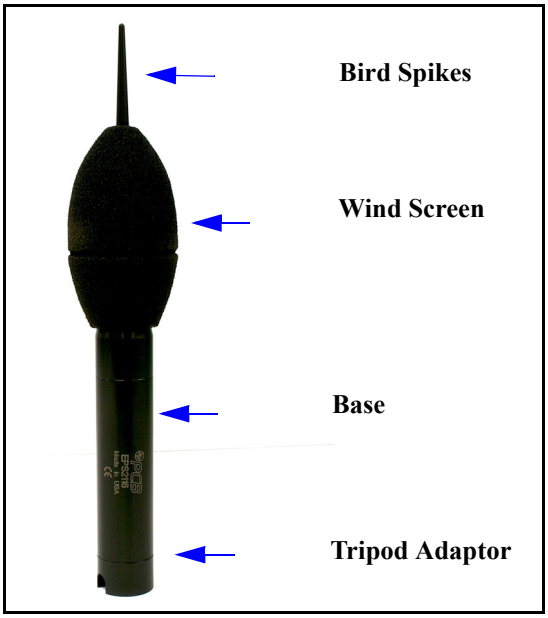


FIGURE 1-2 Outdoor Microphone System

With the supplied 377B02 microphone, the PRM2103-FF provides frequency response characteristics consistent with precision sound level meter requirements for free-field, random incidence measurements when used with the Model 831 sound level meter.

Application

The PRM2103-FF is typically a major component of an outdoor noise monitoring site, as shown in FIGURE 1-3.

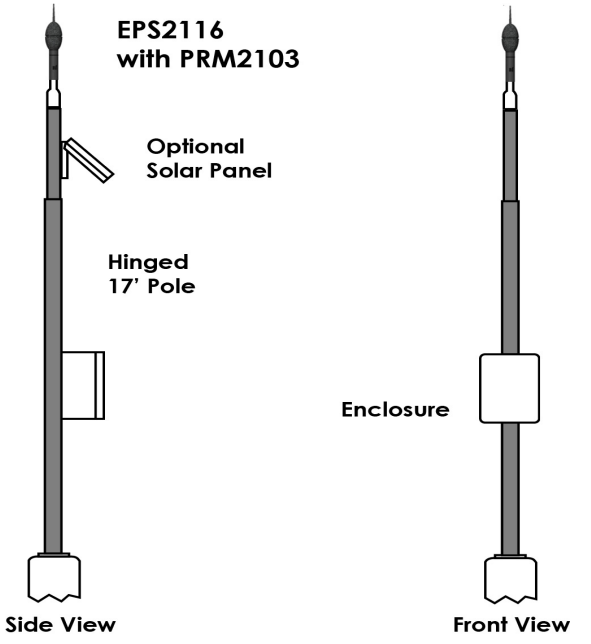


FIGURE 1-3 Remote Noise Monitoring Site

Features

The Larson Davis PRM2103-FF Outdoor Microphone Preamplifier provides the following features:

- Permanent outdoor noise monitoring for IEC 61672 Class 1 measurements (with 377B02 microphone and EPS2116, EPS2106-3 or EPS2108-3). Group Z compliant
- For use with Larson Davis EPS2116, EPS2106-3 or EPS2108-3 environmental protection shroud and Model 831 sound level meter
- Automatic calibration check at five frequencies, including 31.5, 250, 1000, 4000, and 8000 Hz

- Internal humidity and temperature sensor for automatic microphone humidity control
- Free-field, random or 90 degree response with single 377B02 microphone using digital correction in the Model 831 sound level meter
- 50mV/Pa microphone sensitivity for 16 dB to 140 dB typical range
- Protection from rain, wind, and birds when used with EPS2116, EPS2106-3 or EPS2108-3 environmental protection shroud
- Single cable connectivity
- On-screen device monitoring for connection with the 831 sound level meter
- Stainless steel construction

Supplied Accessories

- Prepolarized 377B02 1/2” free-field microphone
- I2103.01 Manual on CD

Other Accessories

Sound Level Meter

- Model 831 Sound Level Meter

Environment Protection

- EPS2116 Outdoor Microphone and Preamplifier Protection, including rain, wind, and bird protection
- EPS2106-3 or EPS2108-3 Environment Protection Shroud, including rain, wind, and bird protection

Power Supplies

- PSA027 DC Power Supply
  Input: 100 to 240 Vac; 47-63 Hz
  Output: 12 Vdc, 1.6 A
  2.5 x 5.5 mm barrel connector

Cables

Used with Model 831-INT or 831-INT-ET

- CBL208-20
- CBL208-XX

Used with Model 831 Only

- CBL203-20
- CBL203-XX

Calibrators

- CAL200: Class 1 Sound Level Calibrator, 94/114 dB @ 1 kHz

CHAPTER

2 Setup

This chapter describes basic setup for the Larson Davis PRM2103-FF.

Mounting the PRM2103-FF

The PRM2103-FF is designed to be mounted to EPS2116, EPS2106-3, or EPS2108-3 environmental protection shrouds.

FIGURE 2-1 shows the steps for assembling and mounting the PRM2103-FF to the EPS2116.

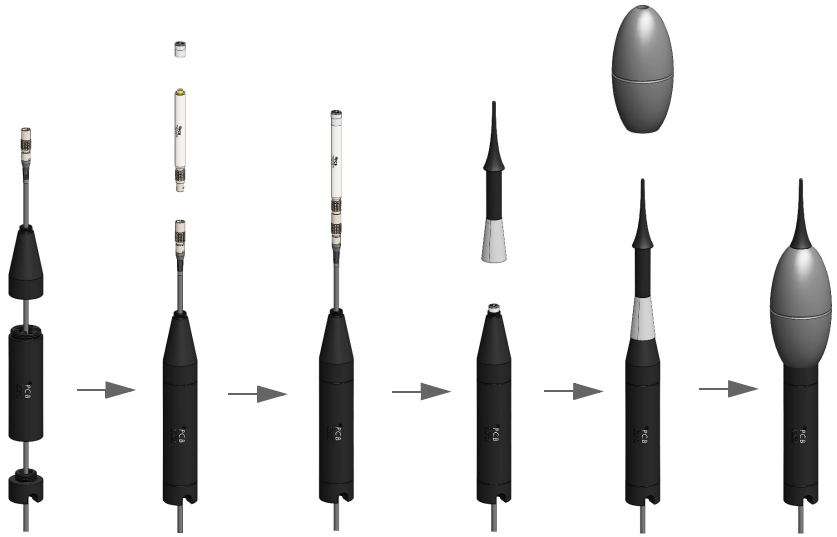


FIGURE 2-1 PRM2103-FF Assembly and Mounting for EPS2116

For complete, step-by-step information on mounting the PRM2103-FF to the EPS2116, EPS2106-3 or EPS2108-3, refer to the following manuals:

- *Larson Davis EPS2116 Outdoor Microphone and Preamplifier Protection Manual*
- *Larson Davis EPS2106 Environmental Shroud Techncial Reference Manual*
- *Larson Davis EPS2108 Environmental Shroud Techncial Reference Manual*

Wiring

The PRM2103 uses a single cable for both signal and control functions, but provides differing connections, depending on whether you are connecting to the Model 831 sound level meter or to the 831-INT, as follows:

CBL203

The CBL203 connects the PRM2103 to the 831 sound level meter, as shown in FIGURE 2-2.

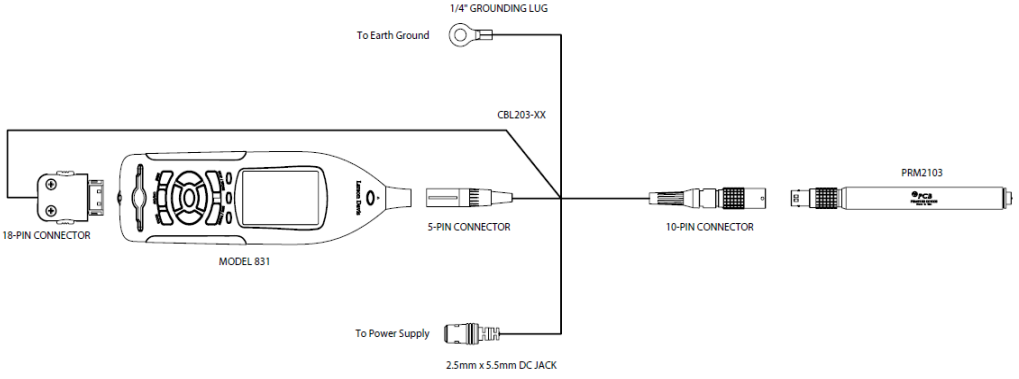


FIGURE 2-2 Connection to 831 Only

NoiseTutor Connections

When connecting the PRM2103 to the NoiseTutor Station, the CBL203 cable should be routed through the cable gland on the NoiseTutor case. For more information, refer to the Larson Davis NoiseTutor System Manual.

If you are connecting the PRM2103 to a NoiseTutor Station, the CBL203 connects as shown in FIGURE 2-3.

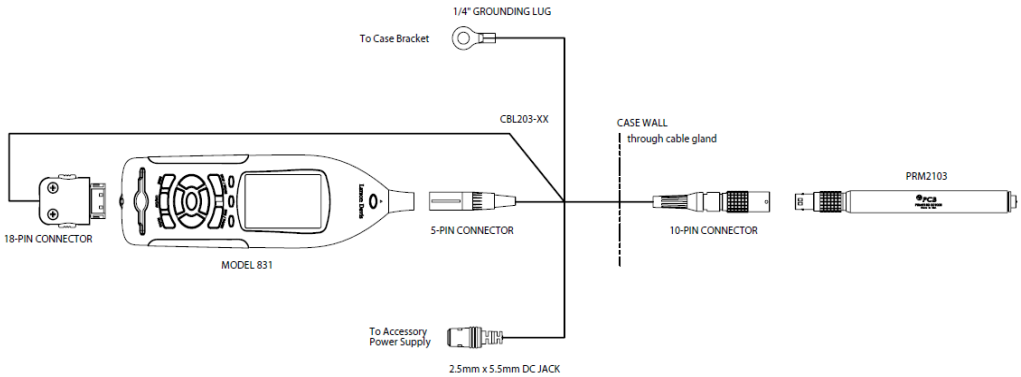


FIGURE 2-3 Connection to NoiseTutor

CBL208

The CBL208 connects the PRM2103 to the 831-INT or 831-INT-ET, as shown in FIGURE 2-4.

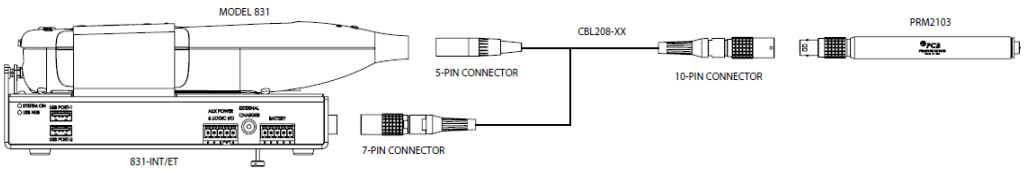


FIGURE 2-4 Connection to 831-INT or 831-INT ET

Both the CBL203 and CBL208 provide 10-pin connections between the PRM2103 and their connecting devices. To setup the PRM2103, put the cable into the EPS and follow these steps:

Step 1 Assemble the EPS with the cable out the top so it rotates freely.

Step 2 Attach the PRM2103-FF.

Step 3 Pull the cable and the PRM2103-FF into the EPS.

FIGURE 2-1 shows the sequence of these steps.

Verifying Preamp Operation with the Model 831

Model 831 firmware version 2.204 or newer is required to support the PRM2103-FF.

When the PRM2103-FF is connected to the Model 831 sound level meter, a message appears, verifying that the connection has been established, as shown in FIGURE 2-5.

FIGURE 2-5 PRM2103-FF Connection Message

Setting PRM2103-FF Corrections

It is important to select the proper correction. Failure to do this will result in a measurement that is not IEC 61672-1 Class 1 compliant.

The Model 831 provides corrections for the PRM2103-FF with EPS2106-3 or EPS2108-3 to produce a response that complies with the requirements of IEC 61672-1. These correction filters correct for the effects of the 377B02 microphone response, windscreen and EPS2106-3 or EPS2108-3. The selected correction is displayed on the Model 831 whenever the preamplifier is connected or disconnected, as shown in FIGURE 2-5.

Of the microphone corrections available in the Model 831, three are applicable to the PRM2103-FF, as follows:

FF:RI 2116 and FF:RI 2106/8

Provides random incidence response.

FF:FF 2116 and FF:FF 2106/8

Provides corrected free-field response. This is usually selected when aiming the microphone for 0° measurements.

FF:90 2116 and FF:90 2106/8

Provides 90° response. This is usually selected when microphone placement is on a vertical pole but 90° measurements are needed.

To set PRM2103-FF microphone corrections, follow these steps:

Step 1 On the Model 831, press the (TOOLS) key and select **System Properties**.

Step 2 On the **Preferences** tab, select the **Mic Corr.** field and then select the needed correction.

FIGURE 2-6 shows the Model 831 microphone corrections for the PRM2103-FF.

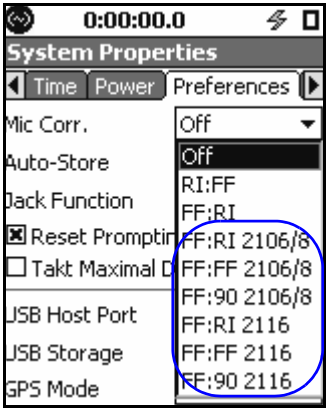


FIGURE 2-6 PRM2103-FF Microphone Corrections

*When using the PRM2103-FF with the EPS2116, select only corrections that include **2116** in the name. When using the PRM2103-FF with the EPS2106 or EPS2108, select only corrections that include 2106/8 in the name.*

Calibration with Model 831

A sound level calibrator is used to apply an acoustical signal of known amplitude and frequency to the microphone. Before using your system you should perform an acoustic

calibration. This section provides information for calibration.

Verifying Calibration Check Using Optional OBA

To verify that the internal calibrator signal in your PRM2103-FF functions properly, follow these steps:

Step 1 On the **Live** tab of the Model 831, navigate to the **Preamp** page, which is the next-to-last page on the tab.

Step 2 Select the **Calibrator On** option by pressing ENTER (ENTER).

FIGURE 2-7 shows the **Preamp** page with the **Calibrator On** option enabled.

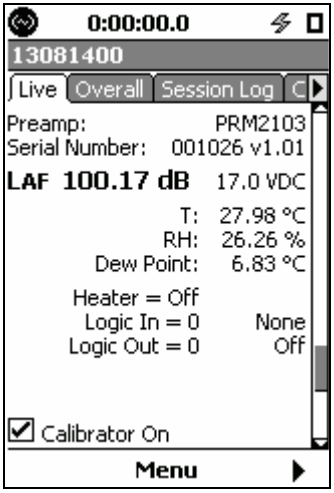


FIGURE 2-7 Calibrator On

*To view the **1/3 Octave** page, the Model 831 must be loaded with the optional 831-OB3 firmware.*

To view the spectrum that the internal, multi-tone calibrator generates, scroll up to the **1/3 Octave** page.

FIGURE 2-8 shows the spectrum generated by the PRM2103-FF internal calibrator.

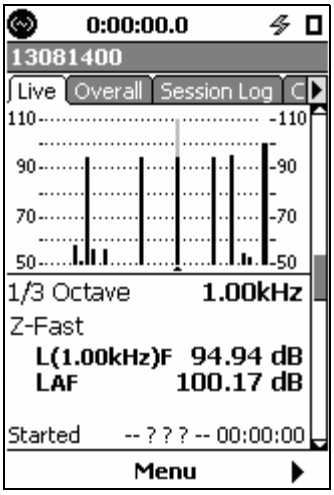


FIGURE 2-8 PRM2103 Calibrator-generated Spectrum

The multi-tone display verifies that the PRM2103-FF is functioning properly.

CHAPTER

3 Operation

This chapter provides information for specifying PRM2103-FF heater controls, viewing data, performing calibration checks, and upgrading firmware.

Performing the Acoustic Calibration

To perform an acoustic calibration, follow these steps:

Step 1 Remove the birdspikes and windscreen.

Step 2 Loosen the thumb screw and lift the assembly from the PRM2103-FF to access the microphone. Do not remove the microphone or the microphone grid cap.

Step 3 Place the calibrator over the microphone. Apply the calibrator slowly to avoid applying a sudden large pressure change to the diaphragm.

Step 4 To activate the Calibration function on the Model 831, press the (TOOLS) key and highlight the Calibrate icon.

Alternately, you can perform an acoustic calibration with SLM Utility-G3 or G4 software. Refer to the respective software manuals for more information.

Step 5 Press (ENTER) to open the Calibrate tool. The user may select a calibrator from the list or enter new information about a calibrator. Larson Davis recommends the Larson Davis Model CAL200 calibrator set to 114 dB. The equivalent free-field level of -0.12 dB at 1 kHz should be applied for 1/2" free-field microphones.

Step 6 If using the CAL200 calibrator, ensure the level selection is set to 114 dB SPL. Turn on the calibrator. Select the Calibrate button on the Model 831 and press (ENTER). The Calibrating message box appears. The present sound level (114.0 dB), the difference between the calibration level and the present sound level (Δ), and an indication of stability are displayed in this message box. When the pointer in the stability indicator is vertical, the sound level is stable.

FIGURE 3-1 shows the **Calibrating** message.

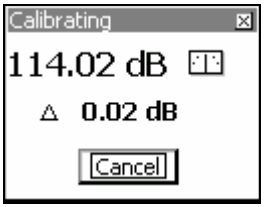


FIGURE 3-1 Calibrating Message

Step 7 After a few seconds, when the calibration is completed, another message box appears that shows the amount of change being made to the calibration. To accept the calibration, press ENTER. To reject this calibration, select **No** and press ENTER.

Step 8 After performing this acoustical calibration, perform a calibration check.

PRM2103-FF Heater Controls

The PRM2103-FF includes a heater to provide protection from condensation to the microphone. The heater state can be specified for one of four settings: **Off**, **Low**, **High**, or **Auto**. The default setting is **Auto**, which is recommended for most applications.

Manual Mode

- **Off**: The heater remains off in all conditions.
- **Low**: The heater remains on continuously at low power.
- **High**: The heater remains on continuously at high power.

Automatic Mode

The **Auto** mode alternates between three states automatically, according to the PRM2103-FF internal temperature and internal relative humidity. The states are as follows:

Off: The heater remains off in all conditions.

Low: The heater turns on at low power when the PRM2103-FF internal relative humidity exceeds 65% or internal temperature drops below 5°C. The heater turns off when the relative humidity decreases below 60% or the temperature rises above 5°C.

High: The heater turns on high when the PRM2103-FF internal relative humidity exceeds 70% or when the internal temperature drops below 3°C. When the relative humidity decreases below 65% or the internal temperature rises above 3°C the heater switches to low.

FIGURE 3-2 shows the PRM2103-FF automatic heater states for internal temperature and relative humidity variations.

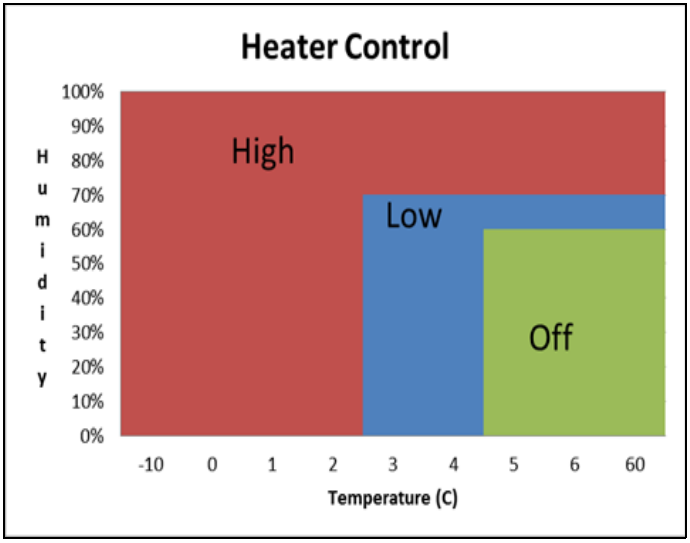


FIGURE 3-2 PRM2103-FF Heater Control Settings

Heater Controls on the Model 831

The heater settings are visible on the Model 831 only when the PRM2103-FF is conneted to the sound level meter.

To specify the heater controls through the Model 831 sound level meter, follow these steps:

Step 1 Press the (TOOLS) key.

Step 2 Select **System Properties** and ENTER.

Step 3 Press the Right Softkey and navigate to the **Other** tab and then navigate to the **PRM2103-FF Heater** field.

Step 4 Select the desired setting and press ENTER.

FIGURE 3-3 shows the PRM2103-FF heater settings on the **Other** tab.

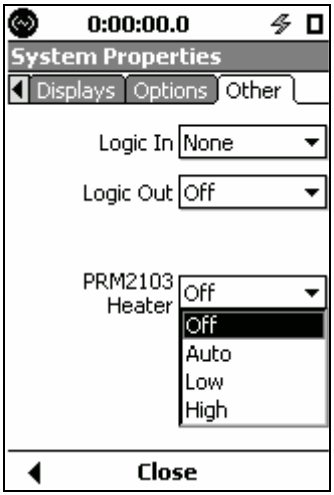


FIGURE 3-3 Heater Settings on the Other Tab

Heater Controls in SLM-G3 Utility Software

To specify heater controls through SLM-G3 Utility software, follow these steps:

*You can also specify heater controls in G4 Software by connecting the instrument, viewing the **System Properties** and then clicking the **Other** tab. The **Heater** options are enabled when the PRM2103 is connected to the instrument.*

Step 5 Open the software and connect to the Model 831 sound level meter by selecting the Connection menu option that best fits your configuration. The **Instrument Manager** dialog box appears.

Step 6 Click the **System** tab and then click the **Other** tab within the **Instrument Settings** preferences.

Step 7 Select the heater setting in the **PRM2103-FF Heater State** drop-down window.

Step 8 Click **Upload Preferences**.

FIGURE 3-4 shows the PRM2103 heater settings on the **System** tab in SLM-G3 Utility software.

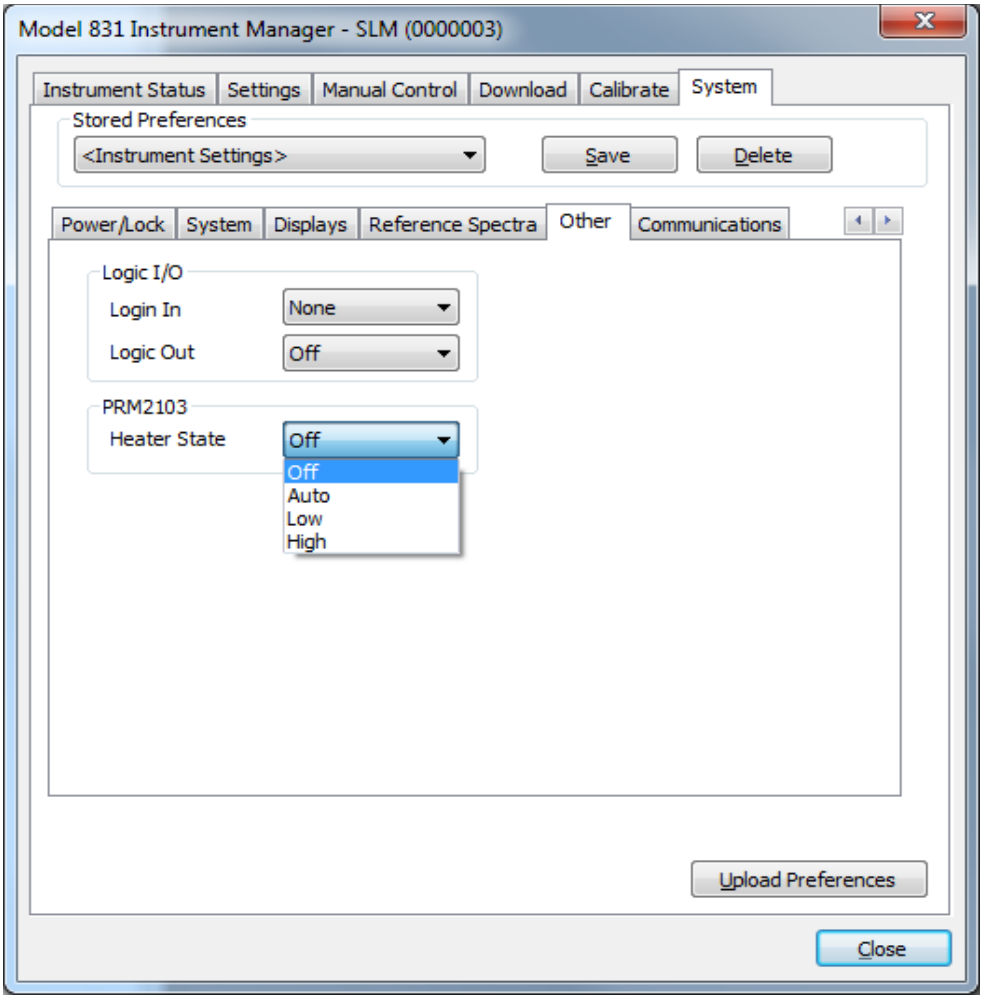


FIGURE 3-4 Heater Settings on System Tab in SLM-G3 Utility Software

Viewing PRM2103-FF Data

The PRM2103-FF provides the following data:

- Preamplifier model
- PRM2103-FF serial number

- Internal PRM2103-FF temperature
- Internal PRM2103-FF relative humidity
- Internal PRM2103-FF dew point
- Heater setting status
- Calibrator check function status
- Preamplifier connection status to 831 sound level meter
- PRM2103-FF firmware version

Data on the Model 831

The 831 sound level meter receives temperature and humidity updates from the PRM2103-FF approximately every fifteen seconds.

The **Preamp** page, or the next-to-last page on the **Live** tab, always displays PRM2103-FF data when the PRM2103-FF is connected to the meter. Temperature, humidity, and dew point is updated every 15 seconds.

FIGURE 3-5 shows the **Preamp** page on the **Live** tab.

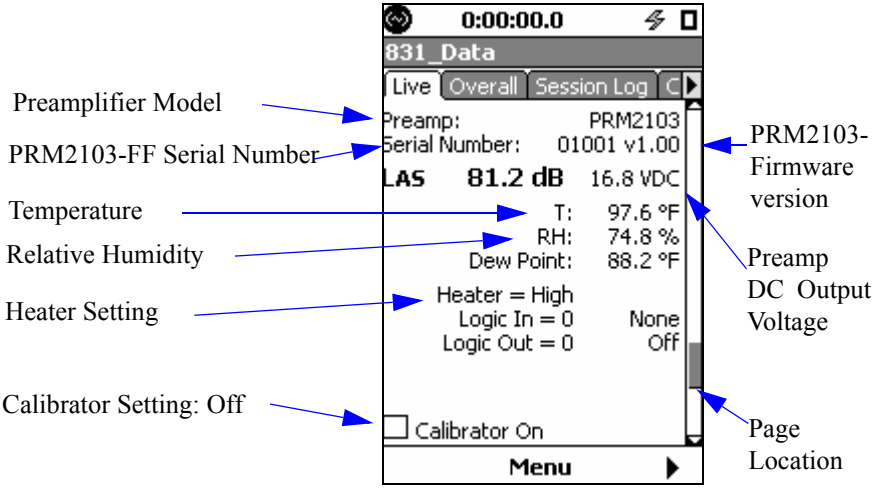


FIGURE 3-5 Live tab: PRM2103-FF Page

If the **Preamp** page displays a **<Comm Error>** message, the Model 831 and PRM2103-FF are not communicating properly. If you see this message, make sure the cables are completely connected and fastened and that power is

supplied to the cable. If the problem persists, call Larson Davis Technical Support.

Humidity and Temperature History

To log internal humidity or temperature history for the PRM2103-FF, follow these steps:

Step 1 In Settings, navigate to the **Time History** tab and select the **Enable Time History** option.

Step 2 Select the **Period** of time for each measurement to be logged.

Step 3 In the **Time History** list, press ENTER and scroll down the list of options. Press the 〉 (RIGHT ARROW) key to enable **Preamp Humidity** or **Preamp Temp.**, as shown in FIGURE 3-6.

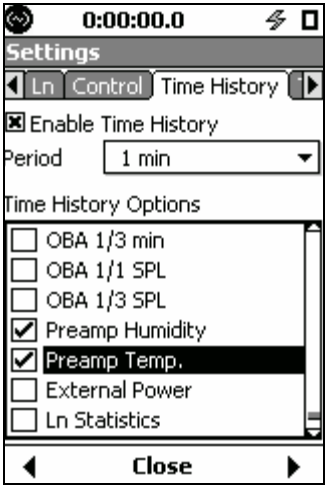


FIGURE 3-6 Preamp Humidity and Temperature History Setup

When viewing measurement records with the 〈 and 〉 keys, you can press ENTER to toggle between displays of ***Preamp Temp.*** *or* ***Preamp Humidity****.*

After exiting the Settings tabs and performing measurements, you can view the PRM2103-FF internal humidity and temperature data by scrolling through the measurement records with the 〈 and 〉 keys on the **Time History** tab. Each time the 〈 or the 〉 key is pressed, the cursor on the graph moves left or right, respectively, and displays the data associated with the record below the graph.

FIGURE 3-7 shows the **Preamp Temp.** data on the **Time History** tab.

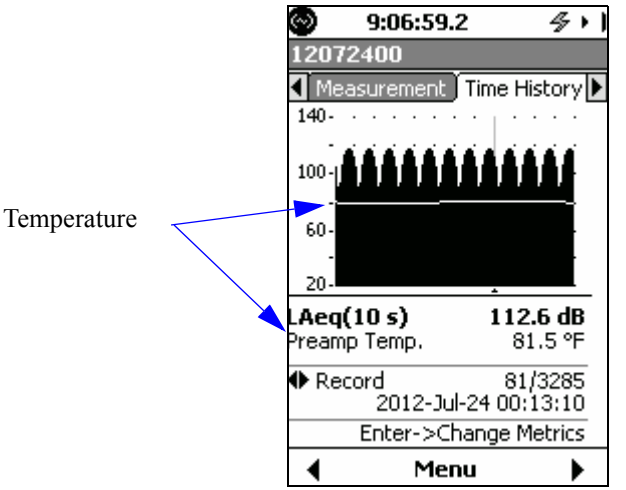


FIGURE 3-7 Time History Preamp Temp. Data

FIGURE 3-8 shows the **Preamp Humidity** data on the **Time History** tab.

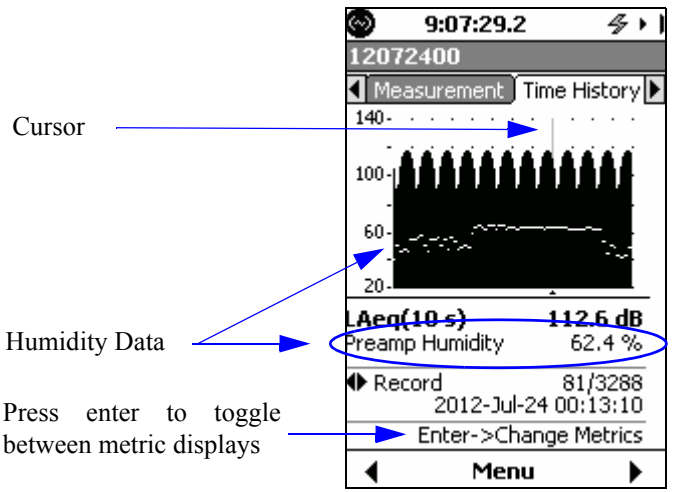


FIGURE 3-8 Time History Preamp Humidity Data

*Click **Refresh** on the **Instrument Status** tab to receive the most recent data from the PRM2103-FF.*

To view PRM2103-FF data in SLM Utility-G3 software, open the software and connect to the Model 831 sound level meter by selecting the **Connection** menu option that best fits your configuration. The **Instrument Manager** dialog box appears. Select the **Instrument Status** tab. The PRM2103-FF data appears in the **Preamplifier** section.

*Similar information can be viewed in the **Status** window of G4 Software, which appears upon connection with an instrument.*

FIGURE 3-9 shows PRM831 information on the **Instrument Status** tab in SLM Utility-G3 software.

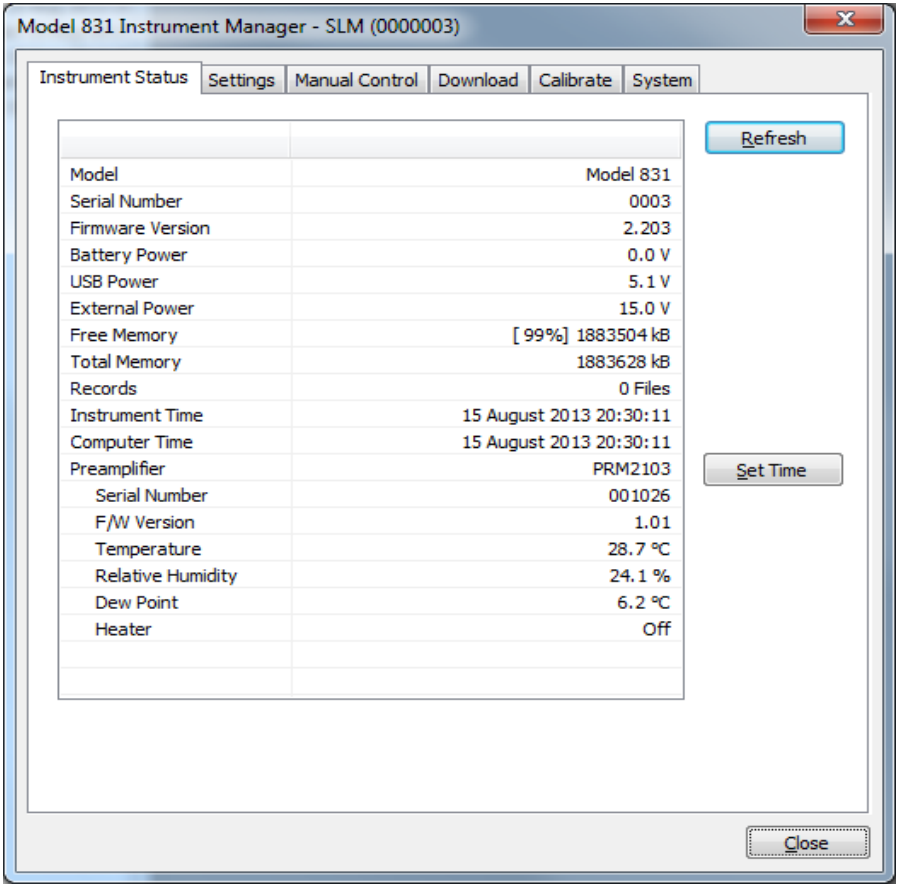


FIGURE 3-9 PRM2103-FF Data on the Instrument Status Tab

Performing Calibration Checks

The calibration check level reported by the Model 831 is the broadband level.

The PRM2103-FF calibration check function produces five discrete tones simultaneously. Calibration checks can be performed automatically at specified times, or at any time manually, either on the Model 831, with SLM Utility-G4, or with SLM Utility-G3 software.

Manual Calibration Checks on the Model 831

To perform manual calibration on the Model 831, follow these steps:

Step 1 Press the (TOOLS) key.

Step 2 Select the Calibration icon and press ENTER.

Step 3 Navigate to the **Cal. Check** tab.

Step 4 Enable the **Cal. Check button** and press ENTER.

FIGURE 3-10 shows the **Cal. Check** tab on the Calibrate Tool.

The standard check level is set by performing a manual Cal. Check directly after performing an acoustic calibration.

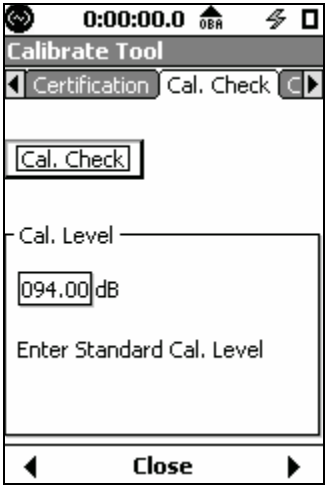


FIGURE 3-10 Cal. Check Tab

The **Standard Cal. Level** field holds the last saved cal check value. The default value is 94.00 dB.

You can manually change the dB level by navigating to the field and changing the number value.

After performing the calibration check, the Model 831 displays a message prompting you to save a new **Standard Cal. Level**, if needed, as shown in FIGURE 3-11.

*Answer **Yes** to save the Standard Cal. Level value. This should be done immediately following the first calibration check. Otherwise, answer **No** to simply record the level (and spectrum) in the Calibraction Check History for trend determination.*

FIGURE 3-11 Save New Standard Cal. Level

Automatic Calibration Checks on the Model 831

Calibration checks can also be scheduled to occur automatically on the **Control** tab by following these steps:

For more information on setting up automatic calibration checks, refer to the Model 831 Sound Level Meter Manual.

Step 1 Set the run mode to **Continuous**.

Step 2 Select and enable the **Cal-Check** option.

Step 3 Set the time of day when the check is to be performed. The default time is 2:30 AM.

FIGURE 3-12 shows the **Control** tab options set for automatic calibration checks.

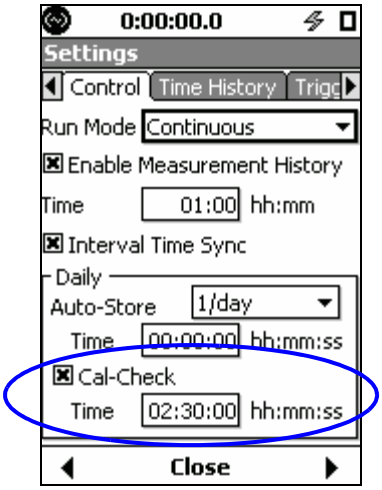


FIGURE 3-12 Scheduled Calibration Checks

Calibration Check History on the Model 831

The calibration **Check History** tab lists the last ten check records, with the date, time, and difference of the measured broadband level from the standard level and the measured level.

FIGURE 3-13 shows the **Check History** tab on the Calibration Tool.

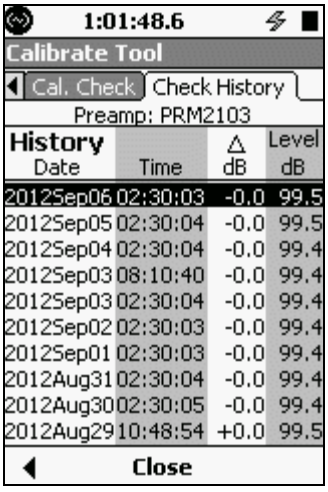


FIGURE 3-13 Check History Tab

To view a calibration check spectrum for a record in the history, select the record and press ENTER. FIGURE 3-14 shows a Cal. Check Spectrum.

Enable 1/1 or 1/3 Octave Band Analysis to display a calibration check spectrum.

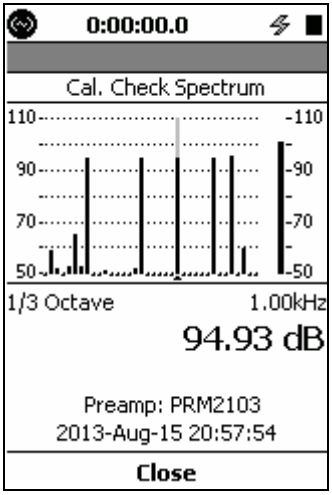


FIGURE 3-14 Cal. Check Spectrum

Manual Calibration Checks in SLM Utility-G3 Software

To perform manual calibration checks in G4 software, refer to the G4 Software Manual.

To perform manual calibration checks on the PRM2103-FF with SLM Utility-G3 software, click the **Calibrate** tab on the **Instrument Manager** dialog box and then click the **Calibration Check** button.

FIGURE 3-15 shows the **Calibrate** tab in SLM Utility-G3 Software.

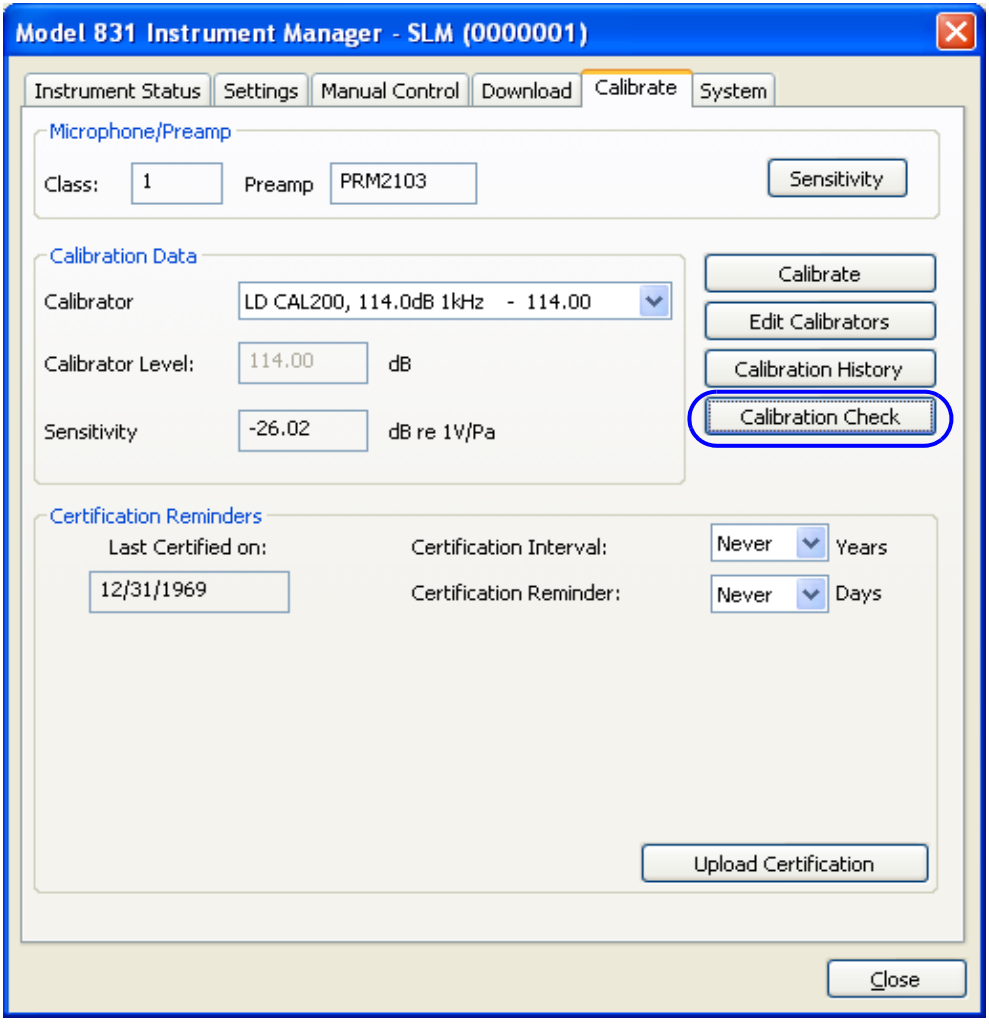
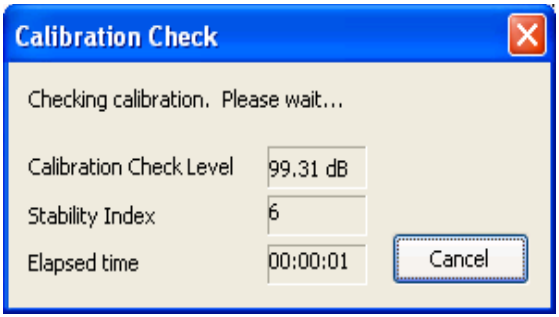


FIGURE 3-15 Calibrate Tab in SLM Utility-G3 Software

FIGURE 3-16 shows the resulting **Calibration Check** message and the prompt to store the Standard Calibration Check Level.

.



*If you click **Yes** to this prompt and store a new Standard Calibration Check Level, all subsequent calibration checks in the Calibration Check History will measure deviations from this check.*

.

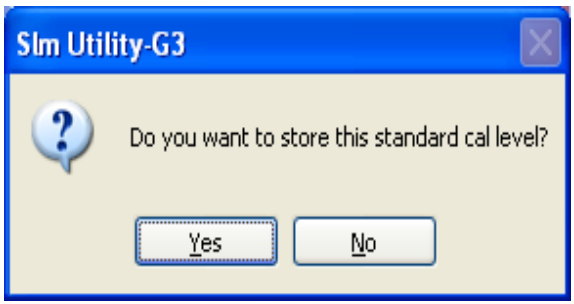


FIGURE 3-16 Calibration Check Message and Prompt

Click **No** to simply check the value and have it stored in the Calibration Check History. Click **Yes** to store a new Standard Calibration Check Level. After clicking either option, the Calibration Check message indicates that the calibration has succeeded, as shown in FIGURE 3-17.

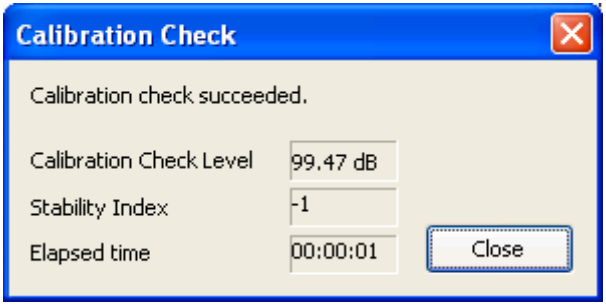


FIGURE 3-17 Calibration Check Succeeded

Automatic Calibration Checks in SLM Utility-G3 Software

To perform automatic calibration checks in G4 software, refer to the G4 Software Manual.

For more information on setting up calibration checks or viewing calibration data in the SLM Utility-G3 software, refer to ***SLM Utility-G3 Software Manual****.*

To schedule automatic calibration checks in SLM Utility-G3 software, follow these steps:

Step 1 Click the **Measurement Control** tab after clicking the **Settings** tab.

Step 2 Select the **Enable Measurement History** option, if desired.

Step 3 Set the run mode to **Continuous**.

Step 4 Specify the **Time** and **Auto-Store** settings, if desired.

Step 5 Enable the **Daily Cal-Check** option and specify the time.

Step 6 Specify the **Daily Cal Check Time**.

Step 7 Click **Upload Settings**.

FIGURE 3-18 shows the **Measurement Control** tab.

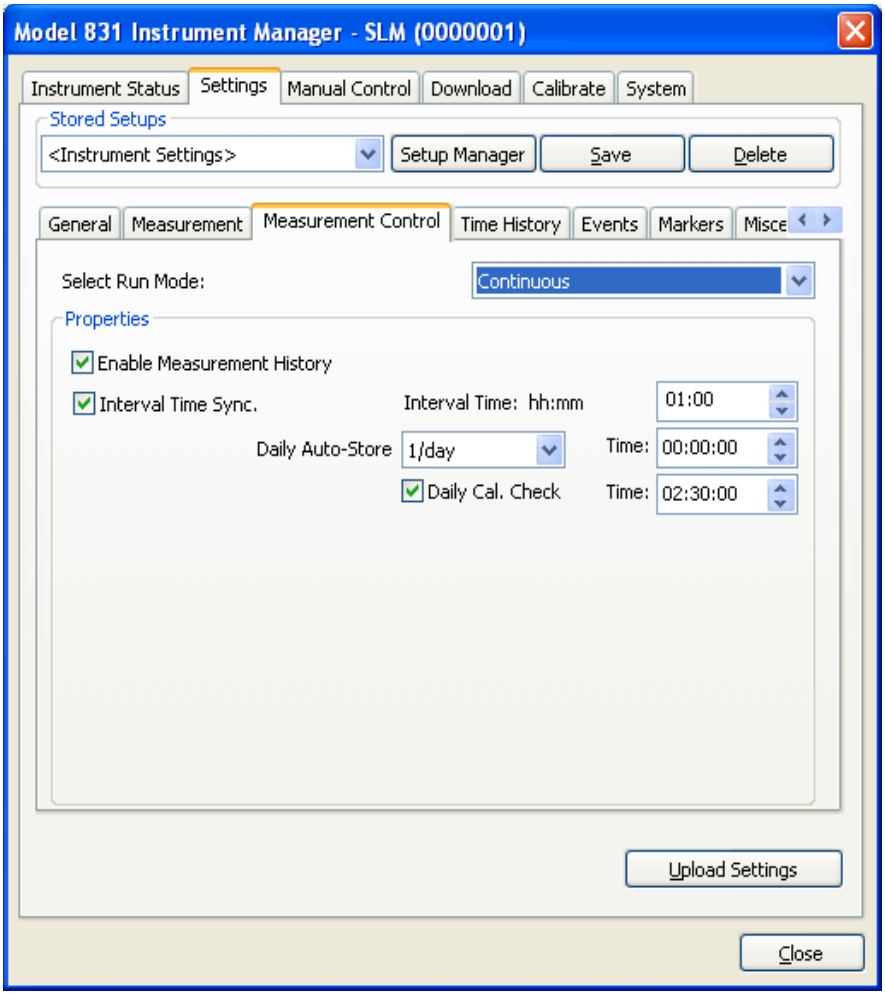


FIGURE 3-18 Measurement Control Tab

Calibration Check History in SLM Utility-G3 Software

To view Calibration Check Histories in G4 Software, refer to the G4 Software Manual.

To view Calibration Check History, click the **Calibration History** button on the **Calibrate** tab. In the **Select data to view** drop down list, select **Calibration Check History**.

FIGURE 3-19 shows the **Calibration History** box with a list of calibration checks.

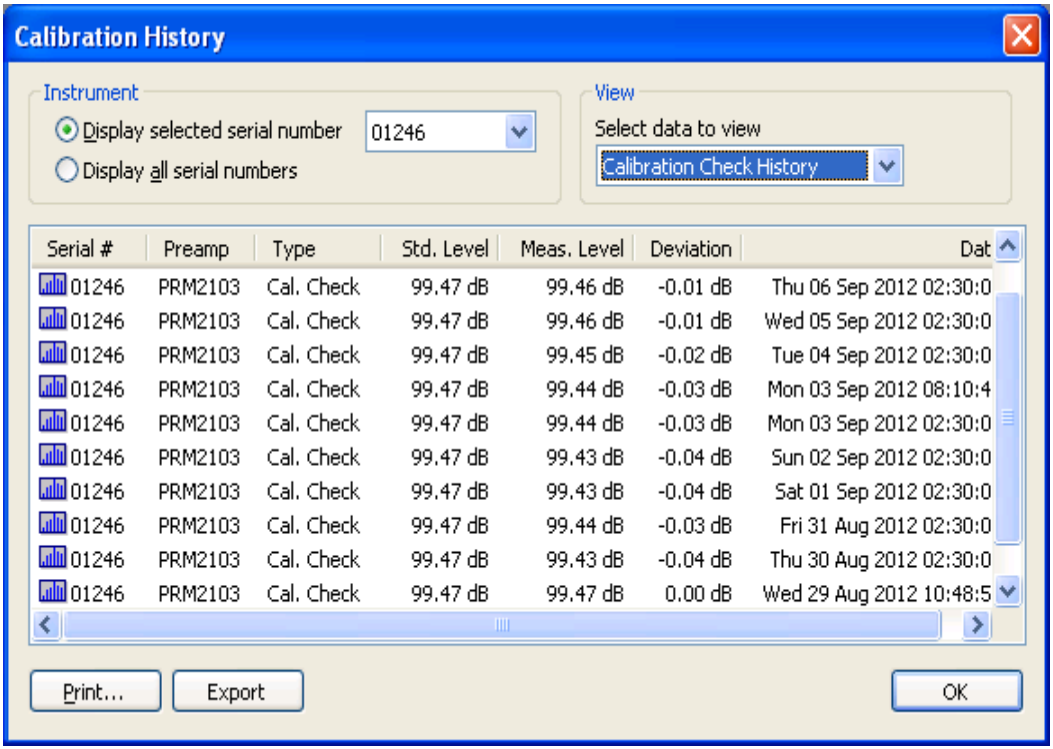


FIGURE 3-19 Calibration History

To view the calibration check spectra, double-click on the Cal. Check record in the **Calibration History** dialog box.

FIGURE 3-20 shows the Calibration Check Spectra.

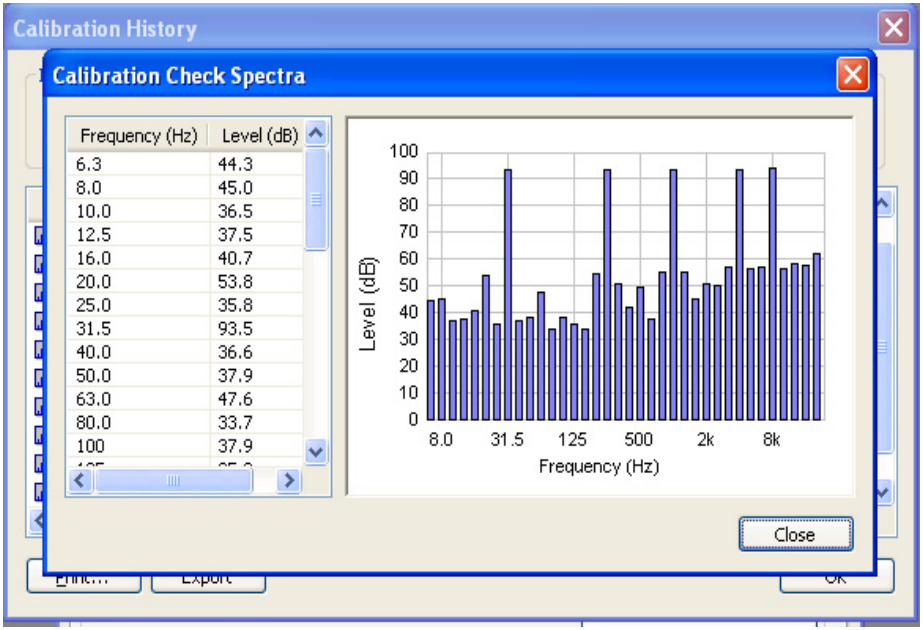


FIGURE 3-20 Calibration Check Spectra

Upgrading the PRM2103-FF Firmware

Although this procedure describes the steps for upgrading firmware in Slm Utility-G3, you can also upgrade firmware in G4 Software. Refer to the G4 Software Manual for more information.

Keep the PRM2103-FF and Model 831 connected and properly powered until after firmware upgrades are complete.

The PRM2103-FF firmware is distributed with the Model 831 firmware. The PRM2103-FF is upgraded automatically when connected to the Model 831. Firmware is not upgraded if the Model 831 is making a measurement.

To upgrade the Model 831 sound level meter and PRM2103-FF firmware, follow these steps:

Step 1 Download and install the SLM Utility-G3 software.

Step 2 Upgrade the Model 831 firmware. If not already connected, connect the Model 831 to the PRM2103-FF with CBL203 or CBL205. See FIGURE 2-2 or FIGURE 2-4 for examples of these connections.

Step 3 On the Model 831, navigate to the **Preamp** page on the **Live** tab. The **Preamp** page displays a "programming" message when the firmware is updating, as shown in FIGURE 3-21.

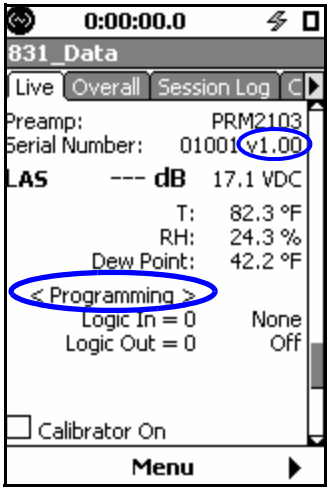


FIGURE 3-21 PRM2103-FF Firmware Upgrade

Firmware in the PRM2103-FF is upgraded only when the version stored in the Model 831 is newer than the version in the preamplifier.

The **Preamp** page displays the new firmware version number after programming is complete, as shown in the top highlighted area in FIGURE 3-21.

If the upgrade does not complete properly after multiple programming attempts, the **Preamp** Page displays the message "Fault 101."

APPENDIX

A Technical Specifications

The technical specifications in this chapter are subject to change without notice. Please refer to calibration and test results for data on a specific unit. Unless otherwise noted, specifications are applicable to the following conditions: 20°C, 50% RH, 12 V, when using PSA027 power supply, CBL203-20 or CBL208-20, 377B02 microphone, and Model 831.

Values specified are typical unless tolerances are provided.

Standards Met by PRM2103-FF

Sound Level Meter Standards

IEC 61672-1 Ed. 1.0 (2002-05) Class 1, Group Z

ANSI S1.4-1983 Type 1

Octave Filter Standards (Option 831- OB3)

IEC 61260 Ed. 1.0 (1995-08) plus Amendment 1 (2001-09), 1/1 and 1/3-octave Bands, Class 1, Group X, all filters

ANSI S1.11-2004 (R2009) Class 1

Safety Requirements

Electrical Equipment for Measurement, Control, and Laboratory Use:

IEC 61010-1 (2010)

Electrical

Tested with ADP090 adaptor (12 pF), equivalent to capacitance of 377B02 microphone.

Microphone Bias	0 V
Input Impedance	10 GΩ // 0.1 pF (typical)
Gain (unweighted)	-0.1 dB at 1 kHz (typical)
Max Input Level (for THD < -30 dB)	± 18 V peak (142 dB re. 20 μPa)

Max Output Level (typical)	± 14 V peak (143 dB peak using 50 mV/Pa mic)
Max Output Current	10 mA
Output Impedance	50 Ω (typical)
Total Harmonic Distortion +N	< -60 dBc at 8V rms and 1 kHz
Power Supply	10 V to 15.5 V (12 V Nominal) Isolated from preamp circuitry for ground loop protection.
Output Slew Rate	> 3 V/μS
Phase Linearity	10 Hz to 32 Hz: -3° to 10° 32 Hz to 100 kHz: < ± 3° The output is in phase with the input electrical signal. A positive change in acoustic pressure will give a positive output.
Calibration Check Level at 1 kHz	94 dB ± 2 dB
Calibration Check Level - Other Frequencies	+/- 1.0 dB relative to 1 kHz
Calibration Check Frequencies	31.25, 250, 1000, 4000, & 8000 Hz
Calibration Check Sensitivity	± 0.005 dB/°C (typical)
Dynamic Range	124 dB; 16 dB noise floor to 140 dB re. 20 μPa with input electrically tested through an ADP090 adaptor (12 pF)

Self-Generated Noise (with 377B02 Microphone)

Self-generated noise levels are time-averaged sound levels.

	A Weight	C Weight	Z Weight
0 dB Gain (typical)	18 dB re. 20 μPa	19 dB re. 20 μPa	28 dB re. 20 μPa
0 dB Gain (max.)	19 dB re. 20 μPa	24 dB re. 20 μPa	31 dB re. 20 μPa
+20 dB Gain (typical)	16 dB re. 20 μPa	18 dB re. 20 μPa	28 dB re. 20 μPa
+20 dB Gain (max.)	17 dB re. 20 μPa	20 dB re. 20 μPa	33 dB re. 20 μPa

Electrical Noise

Tested with ADP090 adaptor (12 pF), equivalent to capacitance of 377B02 microphone.

	A Weight	C Weight	Z Weight
0 dB Gain	5.0 μV 14 dBμV	6.3 μV 16 dBμV	22.4 μV 27 dBμV
+20 dB Gain	2.5 μV 8 dBμV	5 μV 14 dBμV	22.4 μV 27 dBμV

Note that a typical 50 mV/Pa microphone has a 15 dB A-weighted noise in addition to the electrical noise of the preamplifier.

Cable Drive

Control Cable (CBL203 and CBL208)

Tested with ADP090 adaptor (12 pF), equivalent to capacitance of 377B02 microphone.

Length, ft	14 Vpeak	4.2 Vpeak	1.4 Vpeak
100	27 kHz	120 kHz	300 kHz

The standard control cable length is 20 feet, but is also available in custom lengths up to 100 feet.

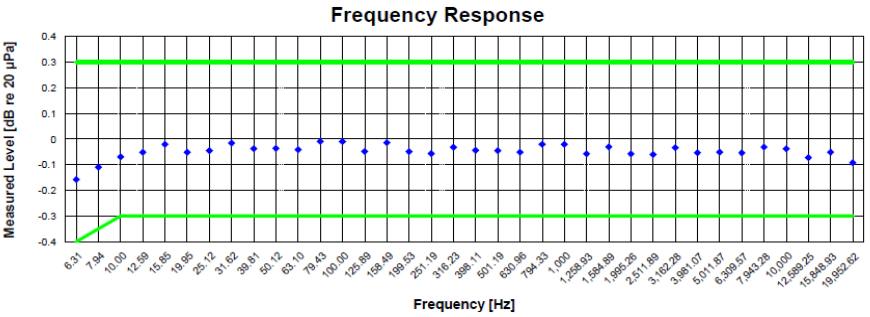
Internal Sensor Accuracy

Relative Humidity	±5% RH
Temperature	±2 °C

Power

Power Consumption (at 12 V for PRM2103 only)

	Calibration Check Status	
Heater Option	**On**	**Off**
Off	2.2 mA	0.2 mA
Low	22.2 mA	20.2 mA
High	42 mA	40 mA



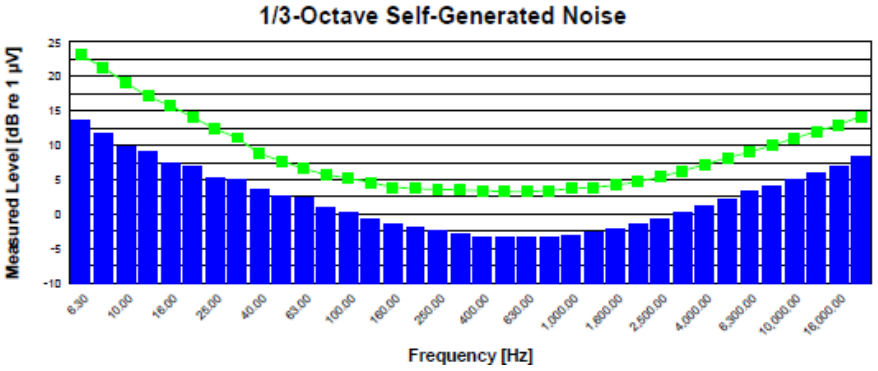
Frequency response electrically tested at 114.0 dB µV

Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
6.31	-0.16	-0.40	0.30	0.10	Pass
7.94	-0.11	-0.35	0.30	0.10	Pass
10.00	-0.07	-0.30	0.30	0.10	Pass
12.59	-0.05	-0.30	0.30	0.10	Pass
15.85	-0.02	-0.30	0.30	0.10	Pass
19.95	-0.05	-0.30	0.30	0.10	Pass
25.12	-0.05	-0.30	0.30	0.10	Pass
31.62	-0.02	-0.30	0.30	0.10	Pass
39.81	-0.04	-0.30	0.30	0.10	Pass
50.12	-0.04	-0.30	0.30	0.10	Pass
63.10	-0.04	-0.30	0.30	0.10	Pass
79.43	-0.01	-0.30	0.30	0.10	Pass
100.00	-0.01	-0.30	0.30	0.10	Pass
125.89	-0.05	-0.30	0.30	0.10	Pass
158.49	-0.01	-0.30	0.30	0.10	Pass
199.53	-0.05	-0.30	0.30	0.10	Pass
251.19	-0.06	-0.30	0.30	0.10	Pass
316.23	-0.03	-0.30	0.30	0.10	Pass
398.11	-0.04	-0.30	0.30	0.10	Pass
501.19	-0.05	-0.30	0.30	0.10	Pass
630.96	-0.05	-0.30	0.30	0.10	Pass
794.33	-0.02	-0.30	0.30	0.10	Pass
1,000.00	-0.02	-0.30	0.30	0.10	Pass
1,258.93	-0.06	-0.30	0.30	0.10	Pass
1,584.89	-0.03	-0.30	0.30	0.10	Pass
1,995.26	-0.06	-0.30	0.30	0.10	Pass
2,511.89	-0.06	-0.30	0.30	0.10	Pass
3,162.28	-0.03	-0.30	0.30	0.10	Pass
3,981.07	-0.05	-0.30	0.30	0.10	Pass
5,011.87	-0.05	-0.30	0.30	0.10	Pass
6,309.57	-0.05	-0.30	0.30	0.10	Pass
7,943.28	-0.03	-0.30	0.30	0.10	Pass
10,000.00	-0.04	-0.30	0.30	0.10	Pass
12,589.25	-0.07	-0.30	0.30	0.10	Pass
15,848.93	-0.05	-0.30	0.30	0.10	Pass
19,952.62	-0.09	-0.30	0.30	0.10	Pass

Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz Reference Measurement	113.67	113.40	114.00	0.13	Pass

Tested electrically using a 12pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 50 mV/Pa.
Temperature: 22.99 °C ± 0.01 °C Humidity: 26.1 %RH ± 0.5 %RH Static Pressure: 87.36 kPa ± 0.03 kPa Technician: Eric Olson
Calibration Date: 17 Jan 2014

FIGURE A-1 Frequency Response Test Report



Frequency [Hz]	Test Result [dB]	Upper limit [dB]	Result
6.30	13.52	23.10	Pass
8.00	11.68	21.30	Pass
10.00	9.75	19.10	Pass
12.50	9.17	17.10	Pass
16.00	7.48	15.80	Pass
20.00	6.85	14.10	Pass
25.00	5.19	12.40	Pass
31.50	4.93	11.10	Pass
40.00	3.61	8.80	Pass
50.00	2.70	7.70	Pass
63.00	2.50	6.60	Pass
80.00	0.91	5.70	Pass
100.00	0.25	5.20	Pass
125.00	-0.67	4.60	Pass
160.00	-1.43	3.90	Pass
200.00	-1.89	3.70	Pass
250.00	-2.49	3.60	Pass
315.00	-2.83	3.50	Pass
400.00	-3.28	3.40	Pass
500.00	-3.35	3.30	Pass
630.00	-3.43	3.30	Pass
800.00	-3.29	3.40	Pass
1,000.00	-3.05	3.70	Pass
1,250.00	-2.75	3.90	Pass
1,600.00	-2.10	4.20	Pass
2,000.00	-1.40	4.70	Pass
2,500.00	-0.64	5.40	Pass
3,150.00	0.23	6.30	Pass
4,000.00	1.16	7.20	Pass
5,000.00	2.13	8.20	Pass
6,300.00	3.30	9.00	Pass
8,000.00	4.12	10.00	Pass
10,000.00	4.90	11.00	Pass
12,500.00	6.03	12.00	Pass
16,000.00	7.02	13.00	Pass
20,000.00	8.41	14.20	Pass

Frequency [Hz]	Test Result [dB]	Upper limit [dB]	Result
A-weighted Sum	13.53	16.00	Pass

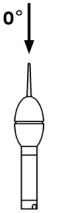
FIGURE A-2 1/3-Octave Self-Generated Noise

Physical

Microphone Thread	11.7 mm - 60 UNS (.4606 - 60 UNS)
Diameter	12.7 mm (0.5 in)
Height	132.4 mm (5.25 in)
Weight	64.4 g (2.27 oz.)
Output Connector	10-pin male (FGA. 1B.310)
Venting	377B02 microphone is rear-vented and sealed to the PRM2103 using an O-ring. The PRM2103 is vented through the 10-pin connector for pressure equalization.
Microphone Reference Point	The center of the diaphragm of the 377B02 microphone.
Reference Frequency	1000 Hz
Reference Level	114 dB re. 20 μPa
Reference Calibrator	CAL200
Environmental	
Operating Temperature Range	- 40 °C to 70 °C (- 40 °F to 158 °F)
Operating Humidity Range	0 to 100% relative humidity, excluding internal condensing
Temperature Sensitivity	<±1.0 dB at 1 kHz from -40 °C to -10 °C (-40 °F to 14 °F) <±0.5 dB at 1 kHz from -10 °C to 50 °C (14 °F to 122 °F) <±0.9 dB at 1 kHz from 50 °C to 70 °C (122 °F to 158 °F)
Humidity Sensitivity	< ± 0.2 dB @ 1 kHz from 0 to 100% relative humidity, at 40 °C (104 °F)

Reference Direction

0° is perpendicular to plane of microphone diagram, as shown below.



Effect of Temperature Variation

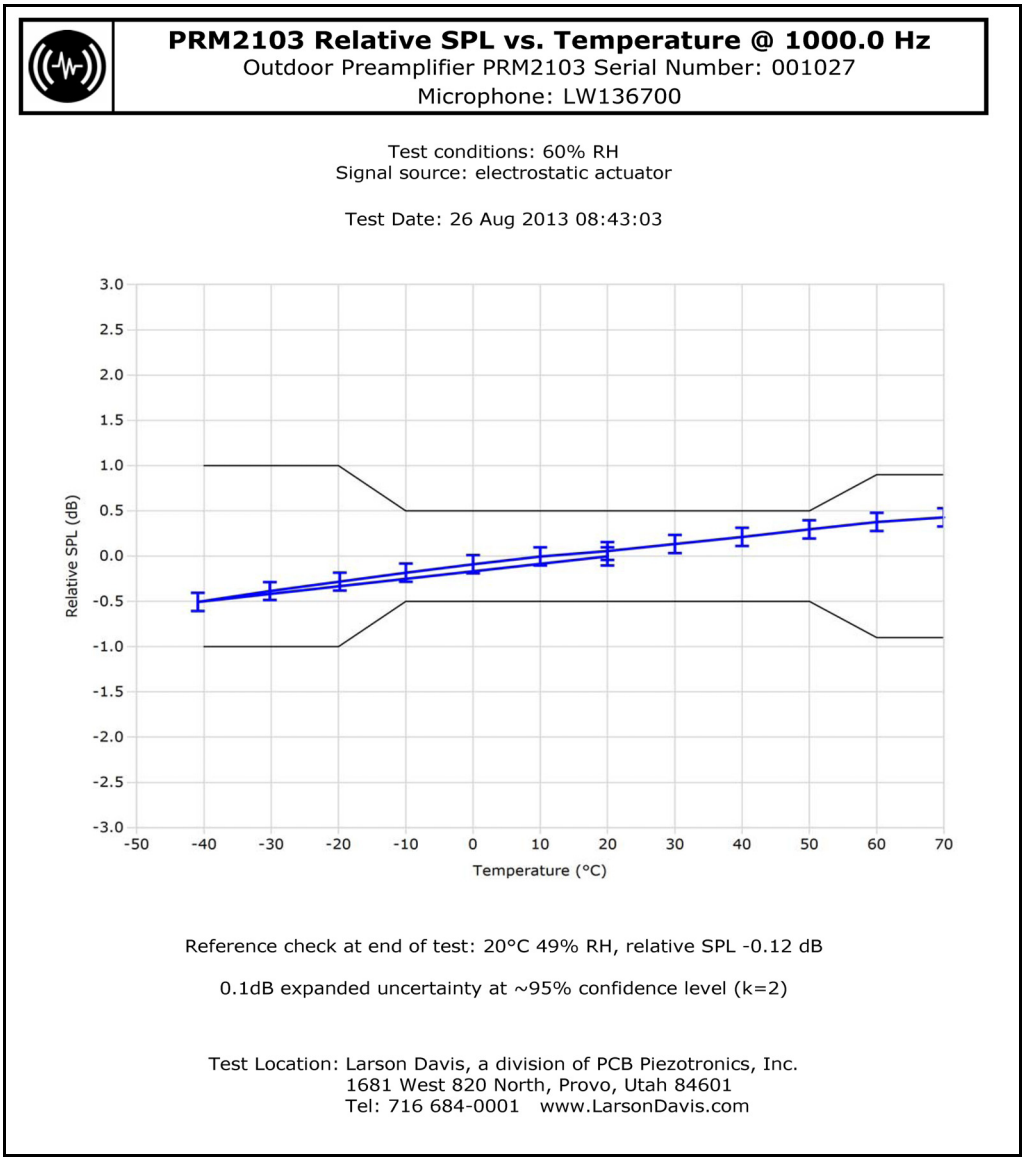


FIGURE A-3 Relative SPL versus Temperature

Effect of Humidity

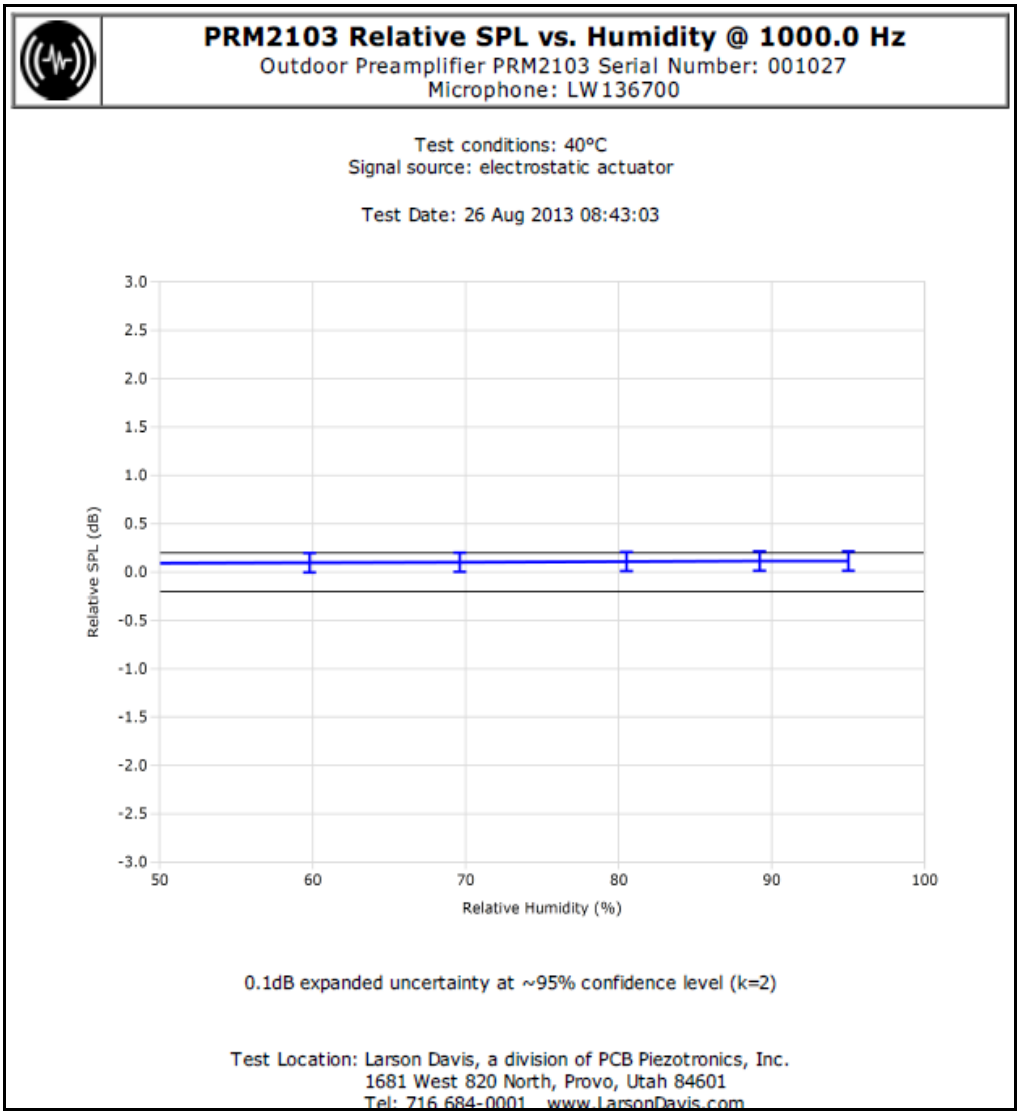


FIGURE A-4 Relative SPL versus Humidity

Humidity Endurance

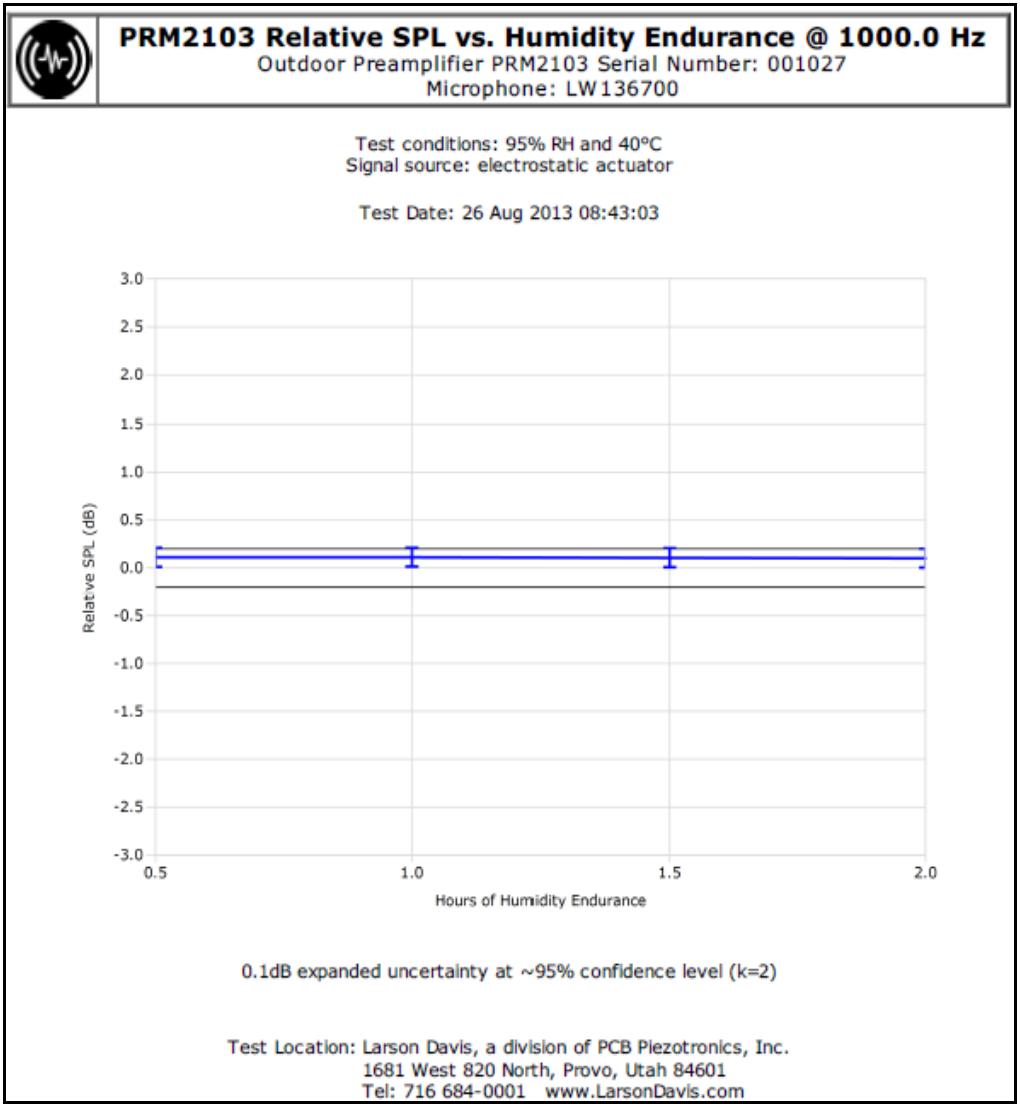


FIGURE A-5 Relative SPL versus Humidity Endurance

PRM2103-FF Corrections

FIGURE A-6 shows a graph of microphone corrections for the Model 831 and the correction values at different frequencies.

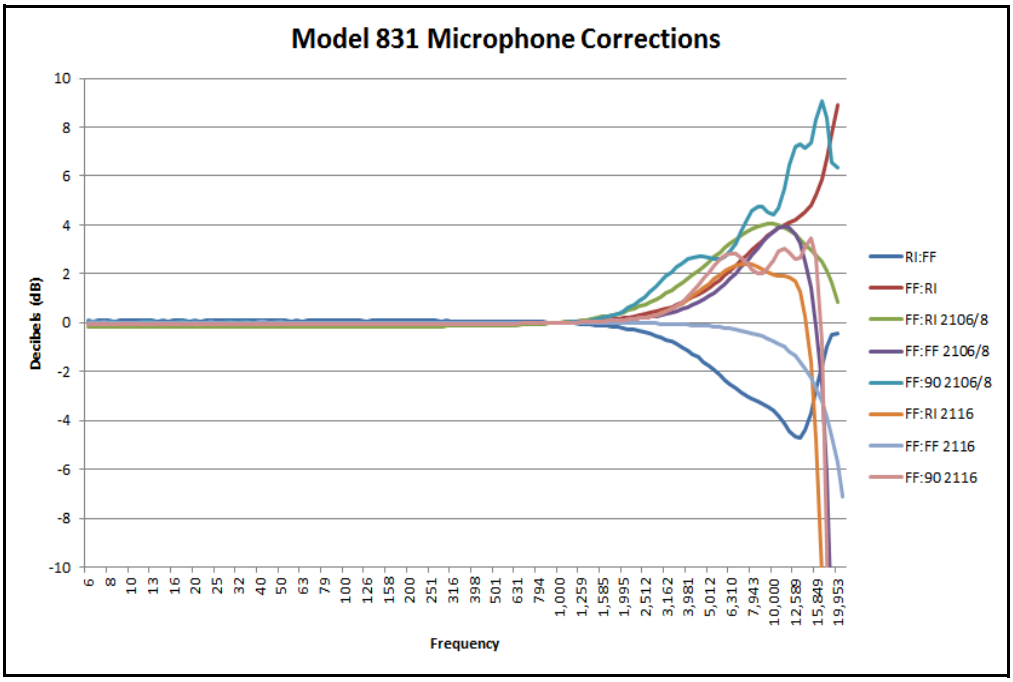


FIGURE A-6 Model 831 Microphone Corrections Graph

Model 831 Microphone Corrections

The following tables list the microphone corrections that can be applied through the Model 831 and the correction values at different frequencies .

EPS2116

Frequency	FF:FF 2116	FF:RI 2116	FF:90 2116
251.19	0.01	-0.01	-0.06
266.07	0.01	-0.01	-0.06
281.84	0.00	-0.01	-0.06
298.54	0.00	-0.01	-0.06
316.23	0.01	-0.01	-0.06
334.97	0.01	-0.01	-0.06
354.81	0.01	-0.01	-0.05
375.84	0.01	-0.01	-0.05
398.11	0.00	-0.01	-0.05
421.70	0.00	-0.01	-0.05
446.68	0.00	-0.01	-0.05
473.15	0.01	-0.01	-0.05
501.19	0.01	-0.01	-0.05
530.88	0.01	-0.01	-0.04
562.34	0.00	-0.01	-0.04
595.66	0.00	-0.01	-0.04
630.96	0.00	-0.01	-0.04
668.34	0.00	-0.01	-0.03
707.95	0.00	-0.01	-0.03
749.89	0.00	-0.01	-0.03
794.33	0.00	-0.01	-0.02
841.40	0.00	0.00	-0.02
891.25	0.00	0.00	-0.01
944.06	0.00	0.00	-0.01
1000.00	0.00	0.00	0.00
1059.25	0.00	0.00	0.01
1122.02	0.00	0.01	0.01
1188.50	0.00	0.01	0.02
1258.93	0.00	0.01	0.03
1333.52	0.00	0.02	0.04
1412.54	-0.01	0.03	0.05
1496.24	-0.01	0.04	0.06
1584.89	-0.01	0.05	0.07
1678.80	-0.01	0.06	0.09
1778.28	-0.01	0.08	0.10
1883.65	-0.02	0.09	0.12
1995.26	-0.02	0.12	0.14
2113.49	-0.02	0.15	0.16
2238.72	-0.02	0.18	0.19

Frequency	FF:FF 2116	FF:RI 2116	FF:90 2116
2371.37	-0.03	0.22	0.22
2511.89	-0.03	0.27	0.26
2660.73	-0.04	0.33	0.31
2818.38	-0.04	0.39	0.38
2985.38	-0.05	0.47	0.46
3162.28	-0.06	0.57	0.57
3349.65	-0.06	0.68	0.70
3548.13	-0.07	0.80	0.86
3758.37	-0.08	0.93	1.06
3981.07	-0.10	1.08	1.28
4216.97	-0.11	1.25	1.54
4466.84	-0.12	1.42	1.81
4731.51	-0.14	1.60	2.09
5011.87	-0.16	1.78	2.36
5308.84	-0.18	1.95	2.59
5623.41	-0.21	2.11	2.76
5956.62	-0.24	2.24	2.83
6309.57	-0.28	2.34	2.80
6683.44	-0.32	2.40	2.66
7079.46	-0.36	2.41	2.43
7498.94	-0.42	2.37	2.18
7943.28	-0.48	2.29	2.00
8413.95	-0.55	2.18	2.00
8912.51	-0.64	2.07	2.22
9440.61	-0.74	1.98	2.58
10000.00	-0.86	1.93	2.91
10592.54	-1.00	1.91	3.02
11220.18	-1.17	1.88	2.87
11885.02	-1.37	1.71	2.61
12589.25	-1.61	1.25	2.63
13335.21	-1.90	0.26	3.10
14125.38	-2.25	-1.59	3.47
14962.36	-2.68	-4.79	2.65
15848.93	-3.20	-10.35	-0.81
16788.04	-3.86	-21.75	-9.26
17782.79	-4.68	-29.47	-23.91
18836.49	-5.73	-29.21	-14.89
19952.62	-7.10	-33.73	-12.57

FIGURE A-7 Model 831 Corrections with EPS2116

EPS2106/8.

Frequency	FF:RI 2106/8	FF:FF 2106/8	FF:90 2106/8	RI:FF	FF:RI
251.19	-0.15	-0.03	0.01	0.07	-0.06
266.07	-0.15	-0.03	0.01	0.07	-0.06
281.84	-0.15	-0.03	0.01	0.07	-0.06
298.54	-0.15	-0.03	0.00	0.07	-0.06
316.23	-0.15	-0.03	0.00	0.07	-0.06
334.97	-0.14	-0.03	0.00	0.07	-0.06
354.81	-0.14	-0.03	0.00	0.06	-0.06
375.84	-0.14	-0.03	0.00	0.06	-0.06
398.11	-0.14	-0.03	0.00	0.06	-0.06
421.70	-0.13	-0.03	0.00	0.06	-0.05
446.68	-0.13	-0.03	0.00	0.06	-0.05
473.15	-0.12	-0.03	0.00	0.06	-0.05
501.19	-0.12	-0.03	0.00	0.06	-0.05
530.88	-0.12	-0.03	-0.01	0.05	-0.05
562.34	-0.11	-0.03	-0.01	0.05	-0.05
595.66	-0.10	-0.02	-0.01	0.05	-0.04
630.96	-0.10	-0.02	-0.01	0.04	-0.04
668.34	-0.09	-0.02	-0.01	0.04	-0.04
707.95	-0.08	-0.02	-0.01	0.04	-0.03
749.89	-0.07	-0.02	-0.01	0.03	-0.03
794.33	-0.06	-0.01	-0.01	0.03	-0.02
841.40	-0.05	-0.01	-0.01	0.02	-0.02
891.25	-0.03	-0.01	-0.01	0.02	-0.01
944.06	-0.02	0.00	0.00	0.01	-0.01
1000.00	0.00	0.00	0.00	0.00	0.00
1059.25	0.02	0.00	0.01	-0.01	0.01
1122.02	0.04	0.01	0.02	-0.02	0.02
1188.50	0.06	0.01	0.03	-0.03	0.03
1258.93	0.09	0.02	0.05	-0.04	0.04
1333.52	0.12	0.03	0.07	-0.06	0.05
1412.54	0.15	0.04	0.10	-0.08	0.07
1496.24	0.19	0.05	0.13	-0.09	0.08
1584.89	0.23	0.06	0.18	-0.11	0.10
1678.80	0.28	0.07	0.23	-0.14	0.12
1778.28	0.33	0.08	0.30	-0.16	0.14
1883.65	0.38	0.10	0.38	-0.19	0.17
1995.26	0.44	0.11	0.48	-0.23	0.19
2113.49	0.51	0.13	0.60	-0.26	0.23
2238.72	0.58	0.15	0.74	-0.30	0.26

2371.37	0.66	0.18	0.89	-0.35	0.30
2511.89	0.75	0.21	1.06	-0.40	0.34
2660.73	0.85	0.24	1.25	-0.46	0.39
2818.38	0.96	0.28	1.46	-0.53	0.45
2985.38	1.07	0.32	1.67	-0.61	0.51
3162.28	1.19	0.37	1.88	-0.69	0.58
3349.65	1.33	0.42	2.09	-0.78	0.65
3548.13	1.47	0.48	2.28	-0.89	0.73
3758.37	1.62	0.55	2.45	-1.00	0.83
3981.07	1.78	0.64	2.58	-1.13	0.93
4216.97	1.95	0.73	2.66	-1.27	1.04
4466.84	2.13	0.83	2.70	-1.42	1.16
4731.51	2.31	0.95	2.69	-1.59	1.29
5011.87	2.50	1.09	2.65	-1.77	1.44
5308.84	2.69	1.24	2.61	-1.95	1.60
5623.41	2.88	1.41	2.60	-2.14	1.77
5956.62	3.07	1.60	2.69	-2.34	1.95
6309.57	3.25	1.80	2.90	-2.53	2.14
6683.44	3.43	2.03	3.26	-2.70	2.34
7079.46	3.59	2.27	3.72	-2.86	2.54
7498.94	3.73	2.52	4.19	-3.00	2.76
7943.28	3.86	2.78	4.57	-3.12	2.97
8413.95	3.95	3.05	4.76	-3.22	3.18
8912.51	4.02	3.30	4.72	-3.33	3.38
9440.61	4.05	3.53	4.53	-3.44	3.56
10000.00	4.04	3.73	4.43	-3.60	3.73
10592.54	3.99	3.87	4.71	-3.82	3.88
11220.18	3.90	3.92	5.48	-4.10	4.01
11885.02	3.78	3.86	6.47	-4.42	4.13
12589.25	3.61	3.65	7.17	-4.68	4.23
13335.21	3.42	3.22	7.32	-4.74	4.36
14125.38	3.22	2.52	7.12	-4.42	4.54
14962.36	2.99	1.44	7.35	-3.70	4.82
15848.93	2.75	-0.16	8.32	-2.73	5.25
16788.04	2.48	-2.54	9.07	-1.76	5.88
17782.79	2.13	-6.20	8.39	-0.98	6.73
18836.49	1.63	-12.60	6.57	-0.52	7.75
19952.62	0.84	-39.14	6.35	-0.45	8.89

FIGURE A-8 Model 831 Corrections with EPS2106/8

Acoustical Response

Acoustical response data for PRM2103-FF mounted inside an EPS2116 is included in the "Technical Specifications" of the *EPS2116 Outdoor Microphone and Preamplifier Protection Manual*.

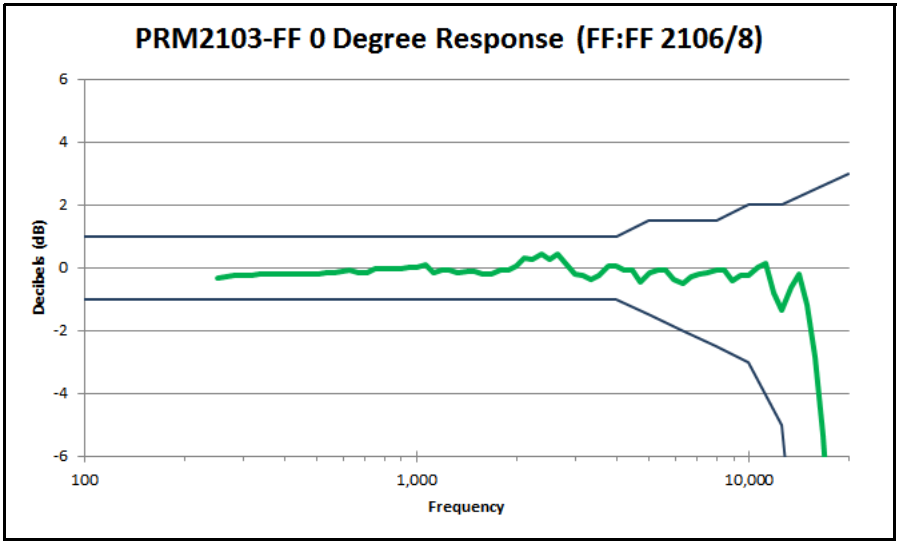
The following data for PRM2103-FF mounted inside an EPS2106-3 or EPS2108-3 includes the effects of the windscreen. Data also corresponds to proper selection of Model 831 microphone corrections.

Acoustical Frequency Response Limits						
Frequency (Hz)	0 degree Free-field		90 degree Free-field		Random	
10.0	3.0	-4.0	3.0	-4.0	3.0	-4.0
12.5	2.5	-3.5	2.5	-3.5	2.5	-3.5
16.0	2.0	-3.0	2.0	-3.0	2.0	-3.0
20.0	2.0	-2.0	2.0	-2.0	2.0	-2.0
25.0	2.0	-1.5	2.0	-1.5	2.0	-1.5
31.5	1.5	-1.5	1.5	-1.5	1.5	-1.5
40 to 4000	1.0	-1.0	1.0	-1.0	1.0	-1.0
5000	1.5	-1.5	1.5	-1.5	1.5	-1.5
6300	1.5	-2.0	1.5	-2.0	1.5	-2.0
8000	1.5	-2.5	1.5	-2.5	1.5	-2.5
10000	2.0	-3.0	2.0	-3.0	2.0	-3.0
12500	2.0	-5.0	2.0	-5.0	2.0	-5.0
16000	2.5	-16.0	2.5	-16.0	2.5	-16.0
20000	3.0	-∞	3.0	-∞	3.0	-∞
	with respect to level at 1 kHz					

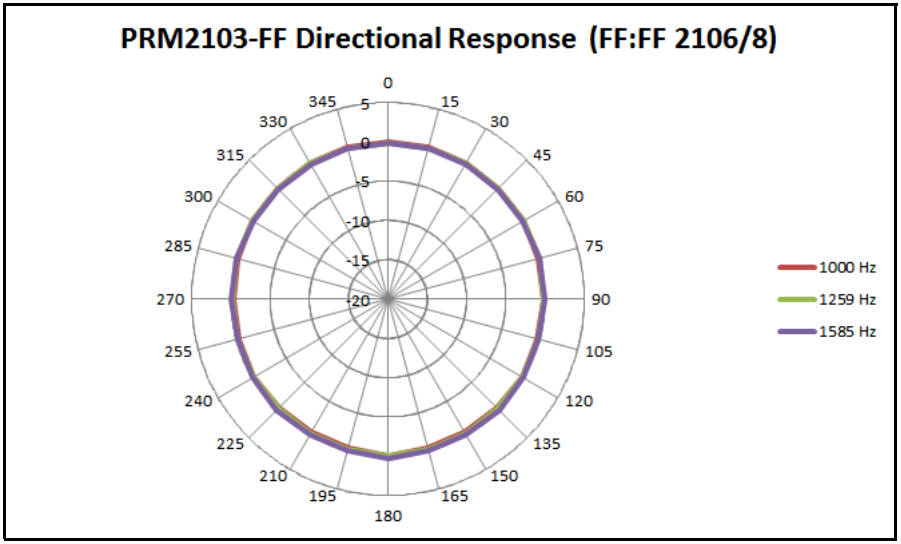
FIGURE A-9 Acoustical Frequency Response Limits

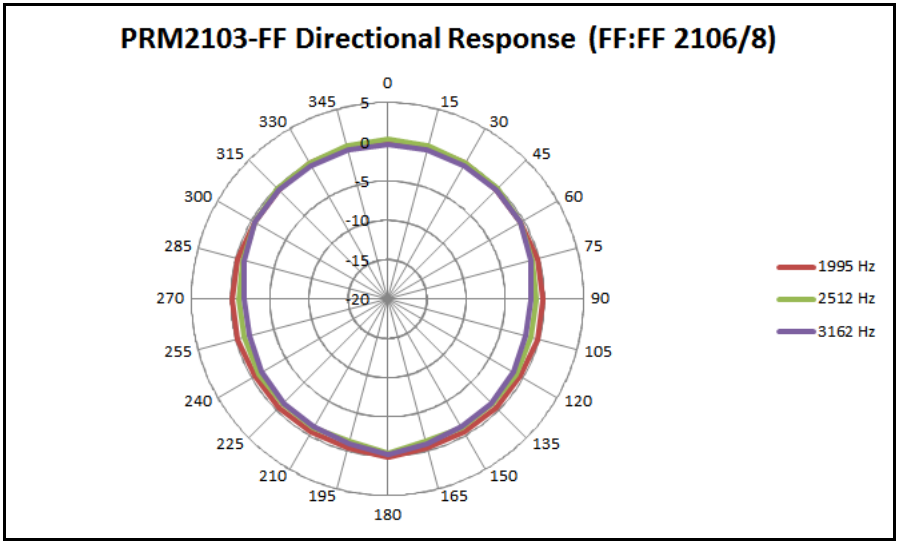
Free Field Response (0°) with Corrections

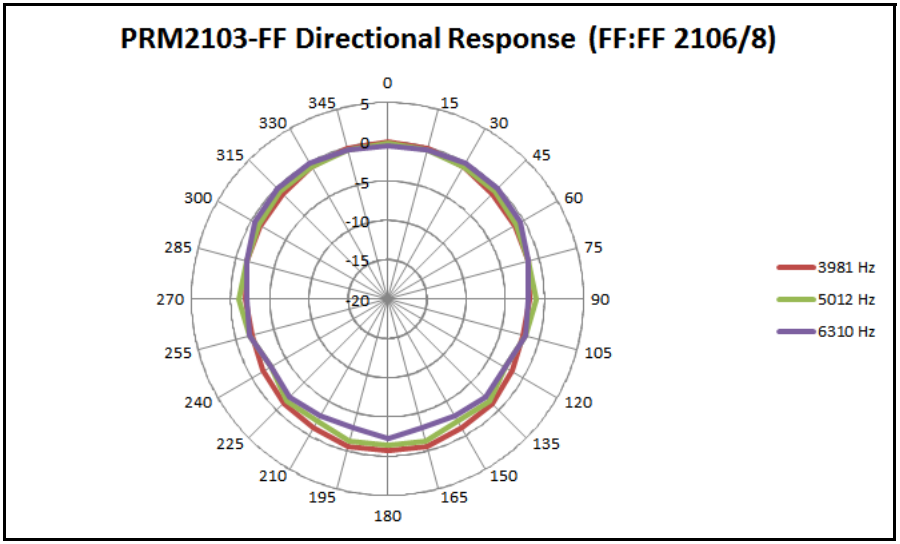
For the following graphs, the applied correction is indicated in parentheses, e.g. (FF:FF2106/8).

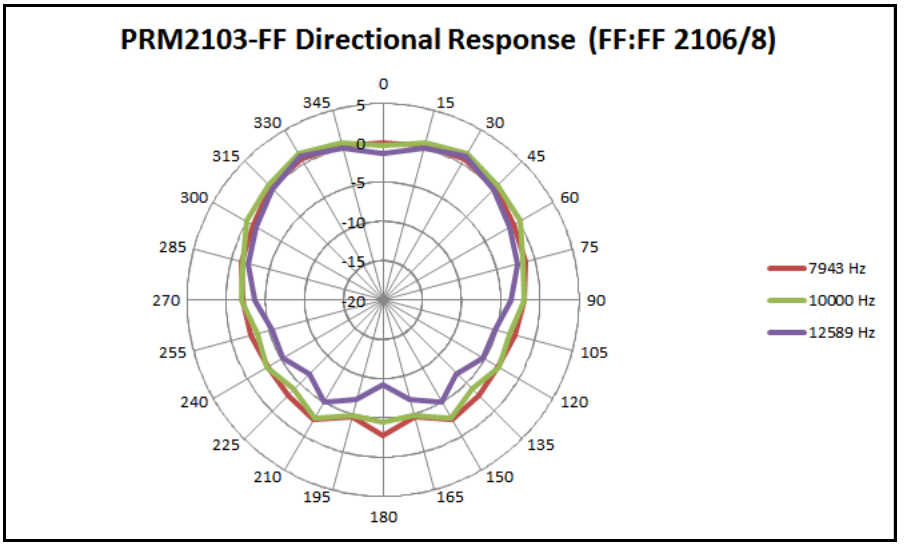


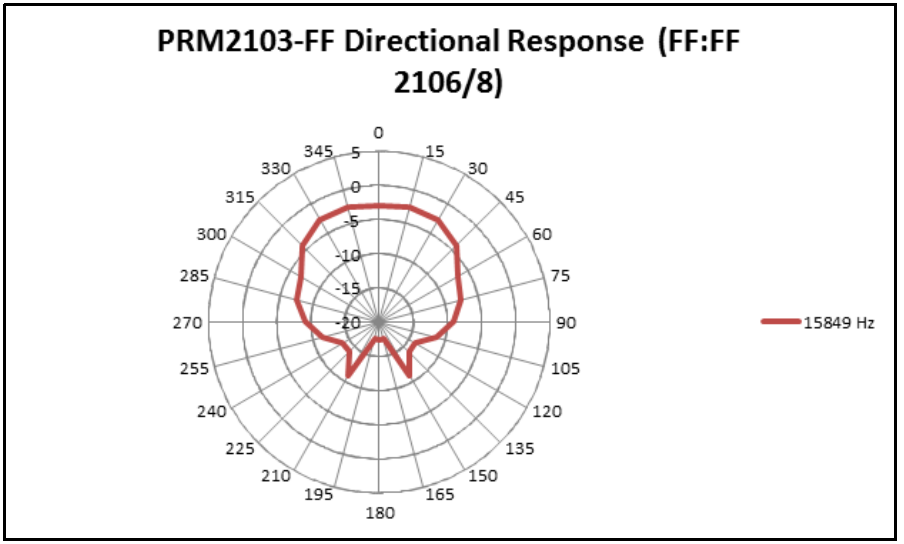
Directional Characteristics



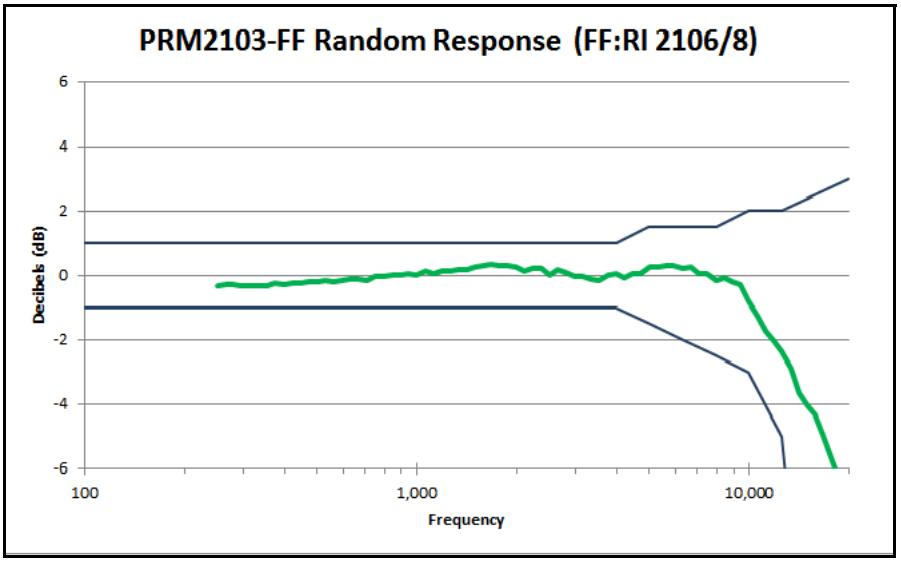

PRM2103-FF Directional Response (FF:FF 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
1995 Hz
2512 Hz
3162 Hz

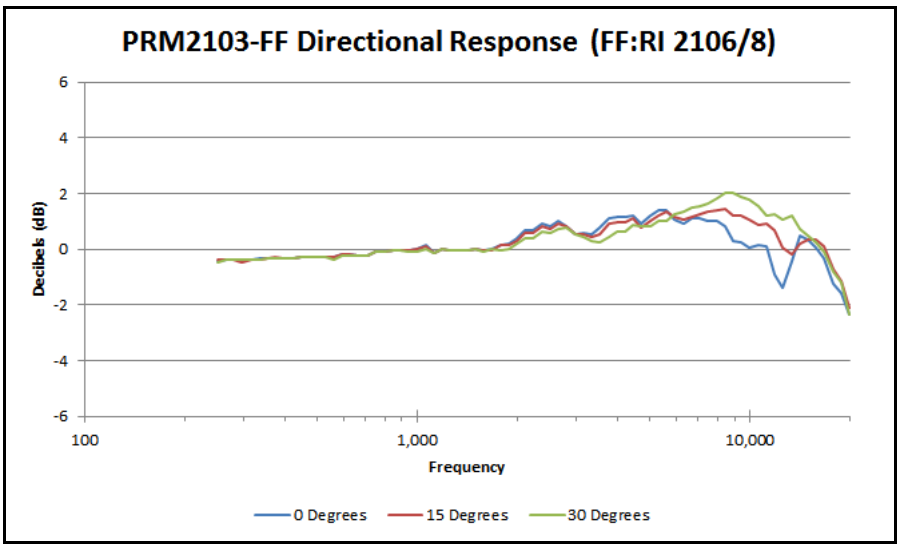

PRM2103-FF Directional Response (FF:FF 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
3981 Hz
5012 Hz
6310 Hz

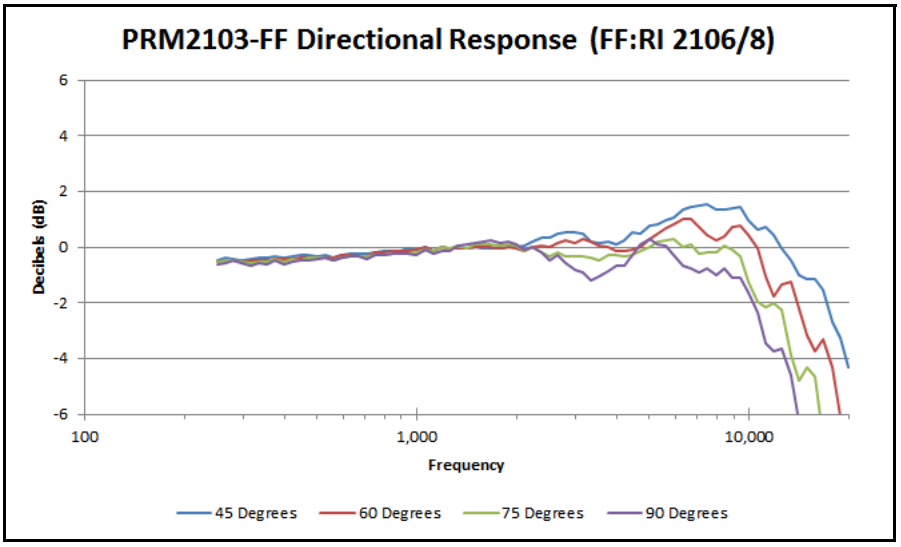

PRM2103-FF Directional Response (FF:FF 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
7943 Hz
10000 Hz
12589 Hz

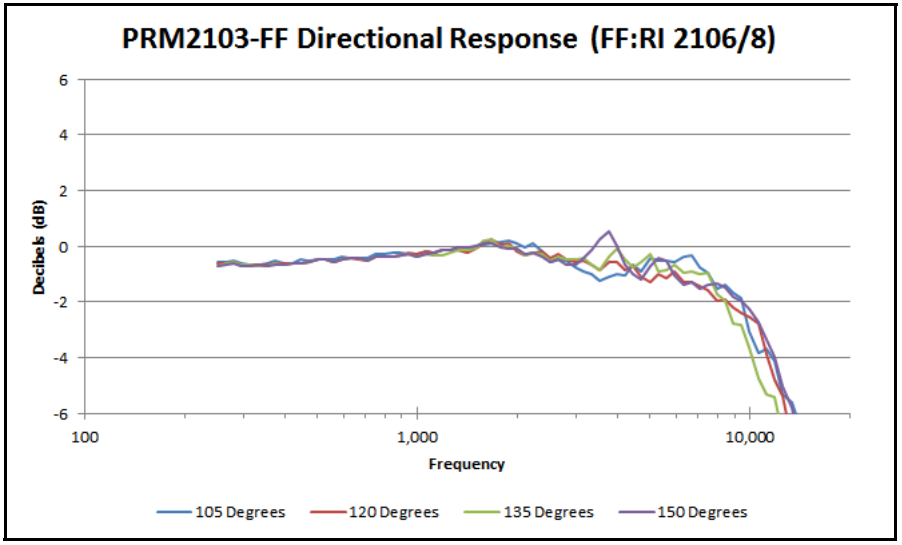

PRM2103-FF Directional Response (FF:FF 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
15849 Hz

Random Response (diffuse) with Corrections

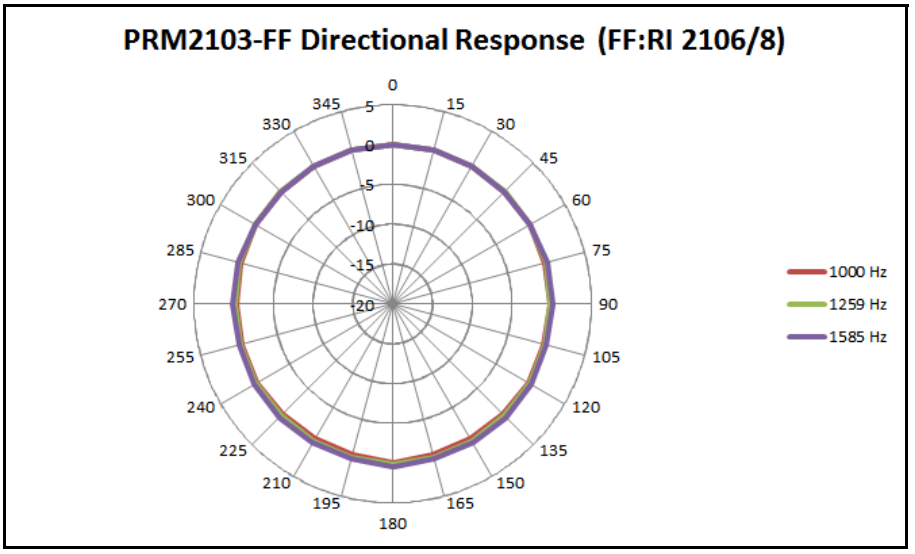


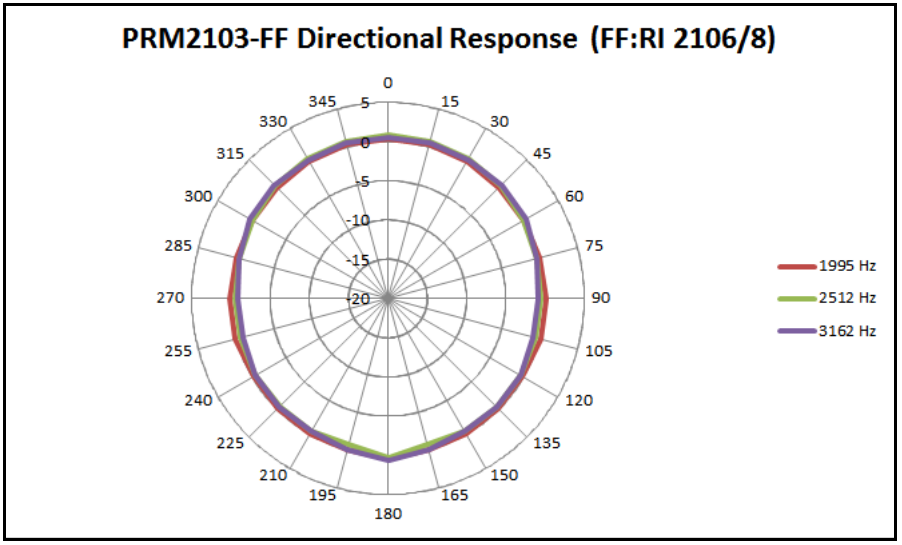


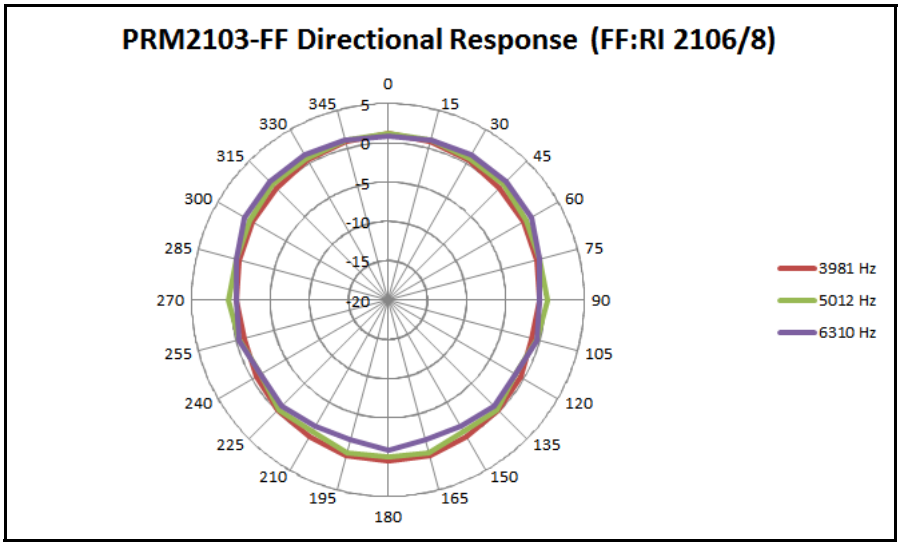

PRM2103-FF Directional Response (FF:RI 2106/8)
Decibels (dB)
6
4
2
0
-2
-4
-6
100
1,000
10,000
Frequency
45 Degrees
60 Degrees
75 Degrees
90 Degrees

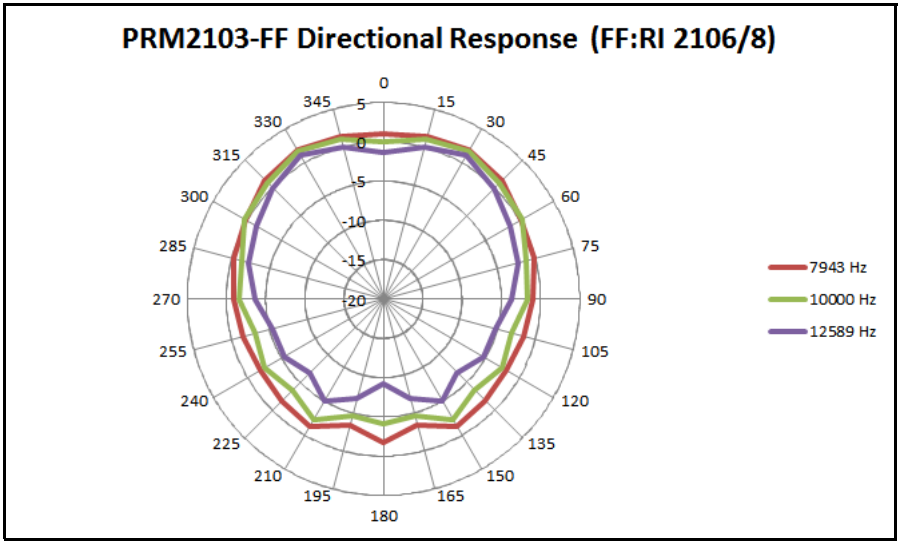

PRM2103-FF Directional Response (FF:RI 2106/8)
Decibels (dB)
6
4
2
0
-2
-4
-6
100
1,000
10,000
Frequency
105 Degrees
120 Degrees
135 Degrees
150 Degrees

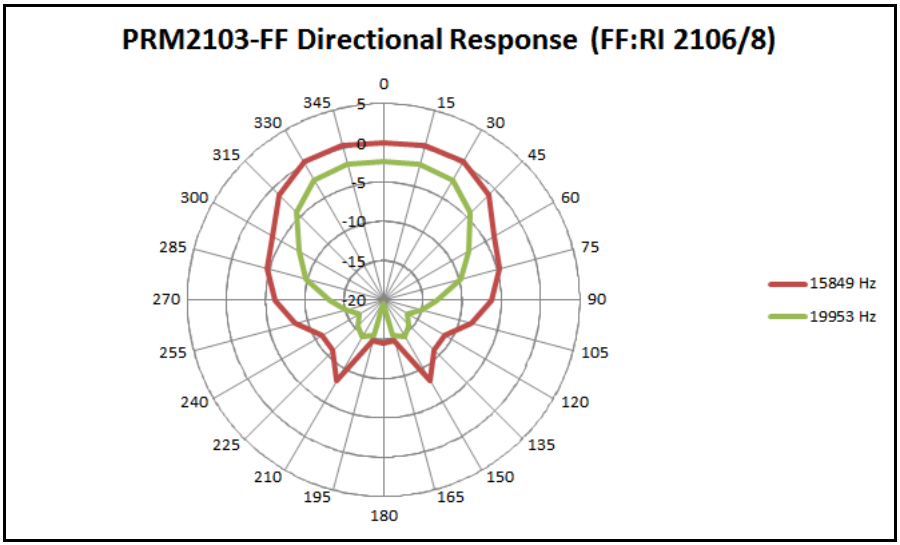
Directional Characteristics



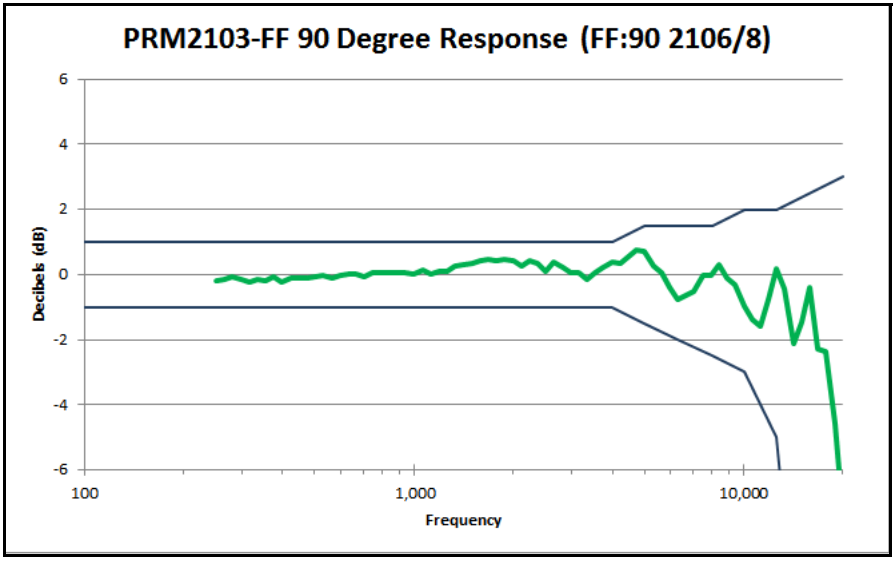


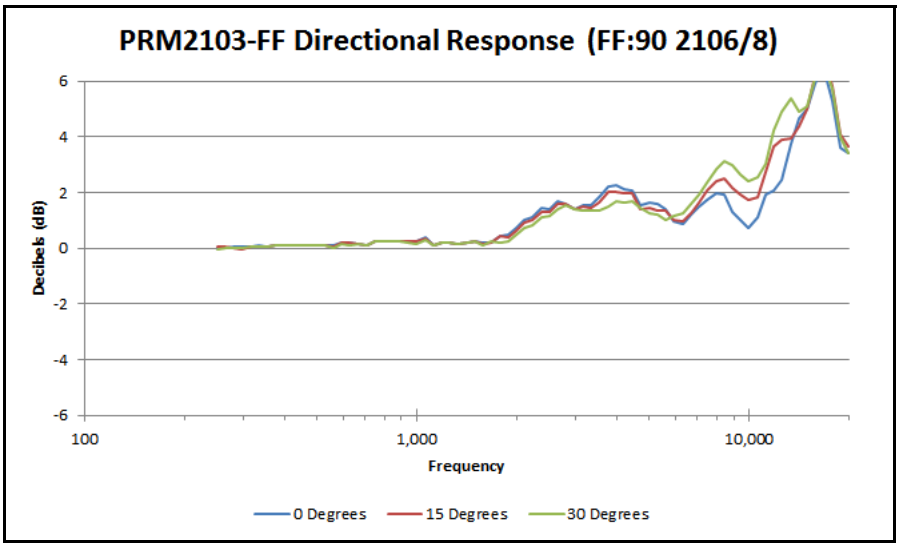

PRM2103-FF Directional Response (FF:RI 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
3981 Hz
5012 Hz
6310 Hz

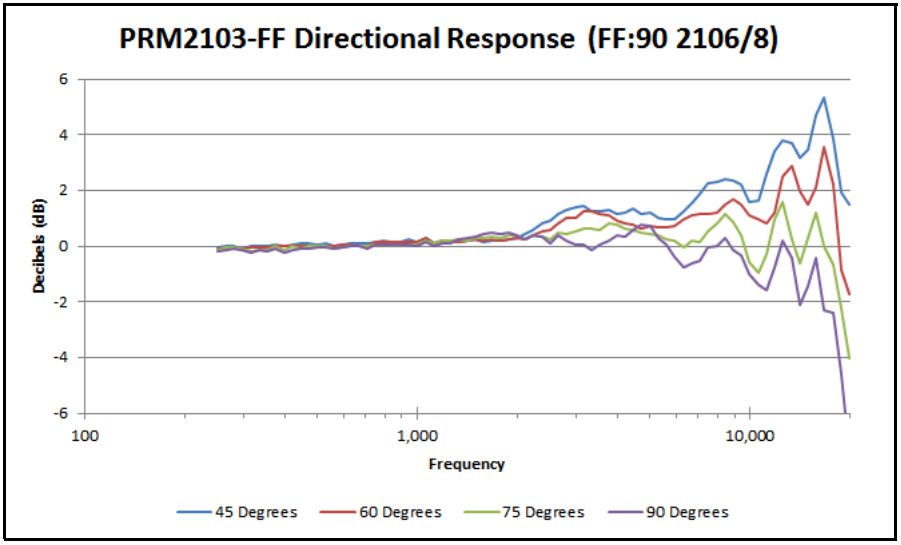

PRM2103-FF Directional Response (FF:RI 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
7943 Hz
10000 Hz
12589 Hz

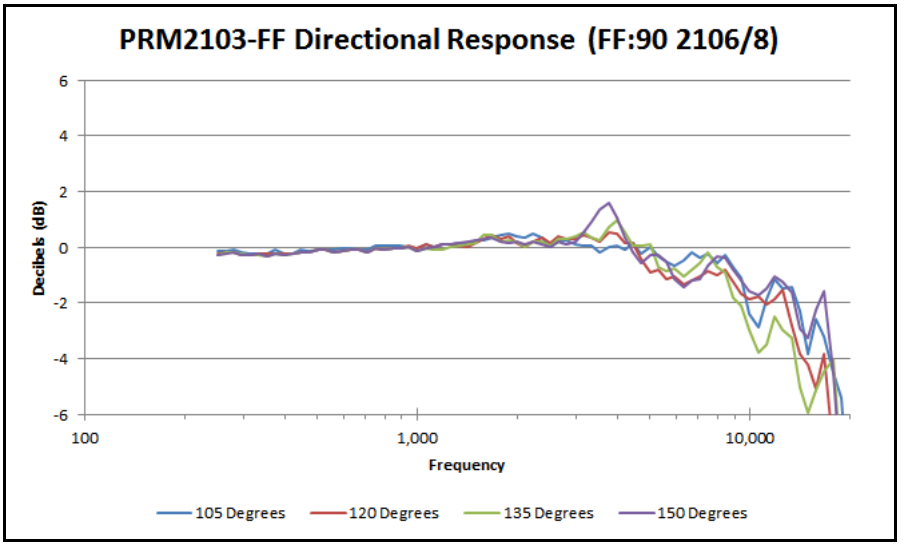


90° Response with Correction



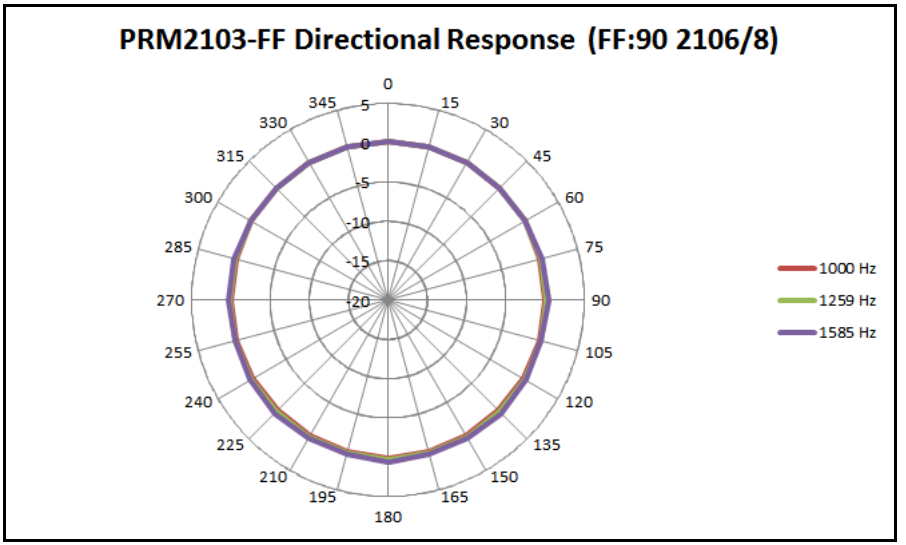

PRM2103-FF Directional Response (FF:90 2106/8)
6
4
2
0
-2
-4
-6
Decibels (dB)
100
1,000
10,000
Frequency
0 Degrees
15 Degrees
30 Degrees

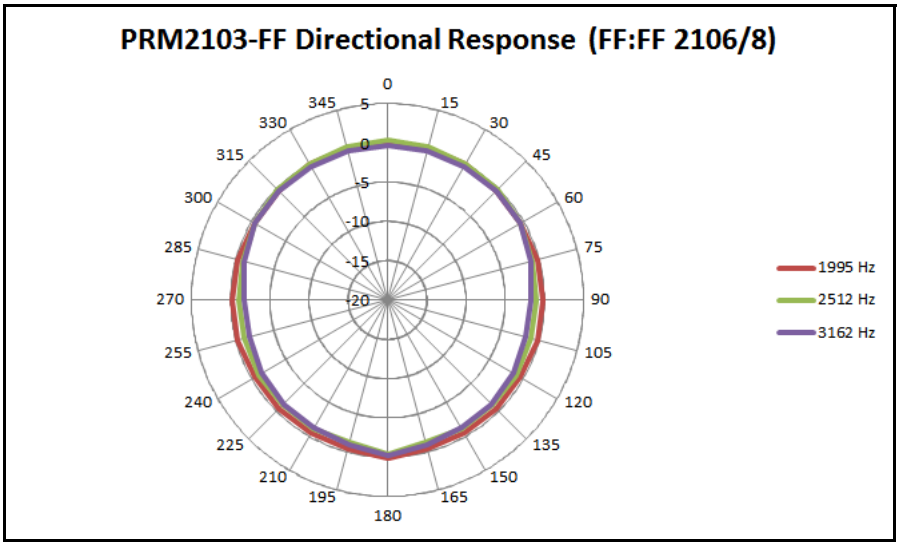

PRM2103-FF Directional Response (FF:90 2106/8)
6
4
2
0
-2
-4
-6
Decibels (dB)
100
1,000
10,000
Frequency
45 Degrees
60 Degrees
75 Degrees
90 Degrees

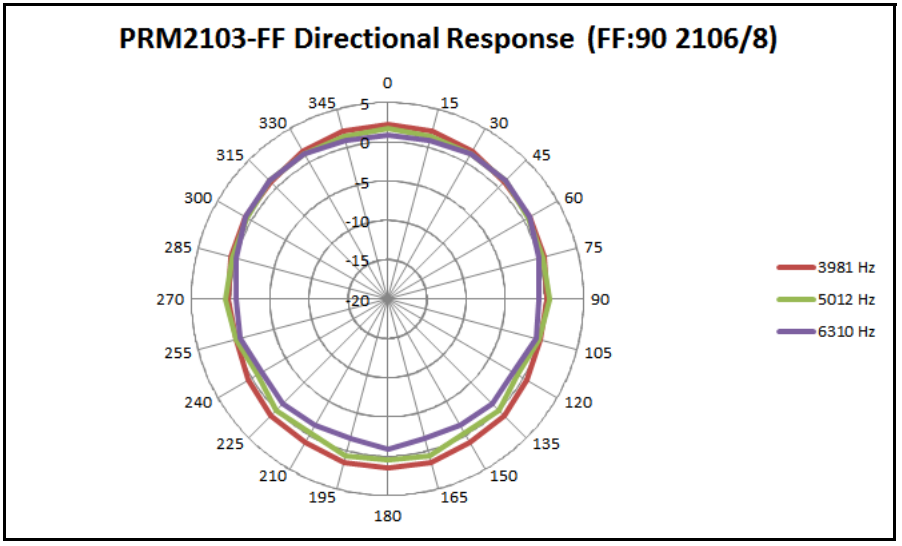


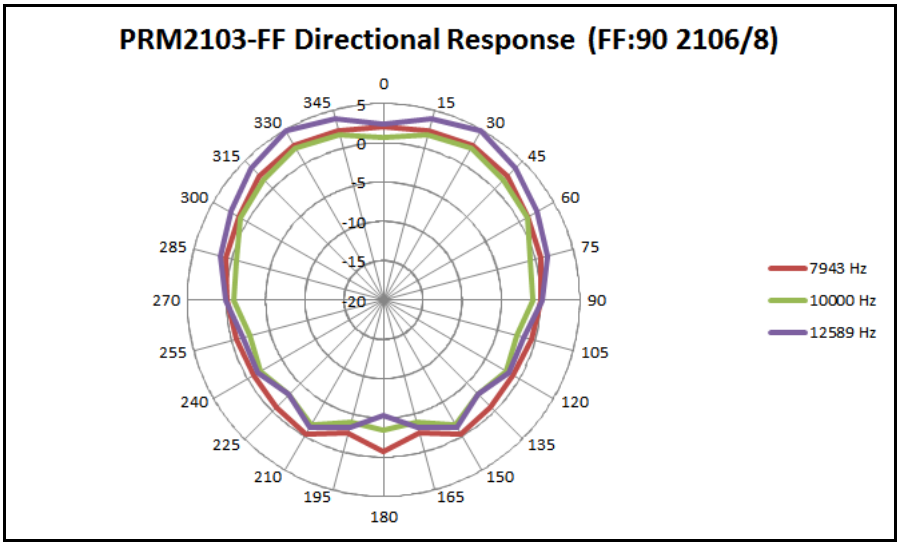
Directional Characteristics

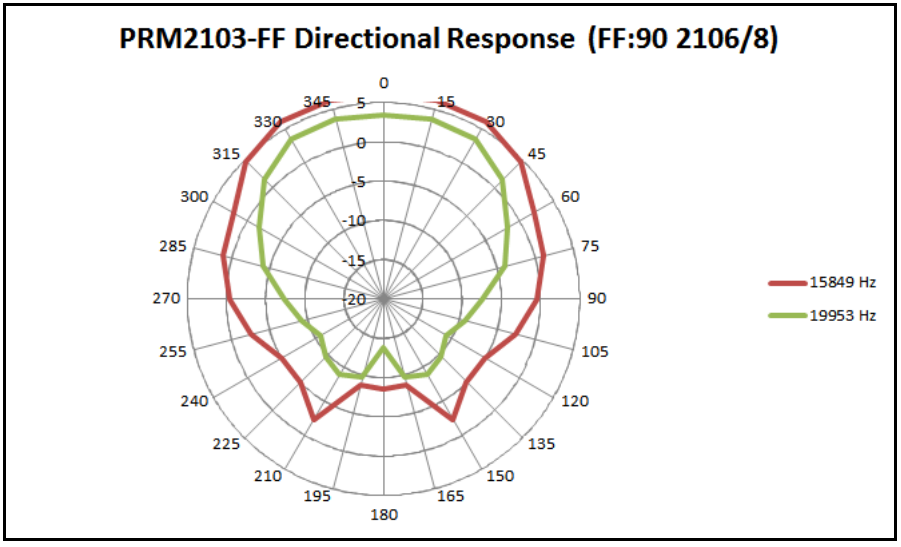
For the following graphs, the applied correction is indicated in parentheses, e.g. (FF:90 2106/8).




PRM2103-FF Directional Response (FF:FF 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
1995 Hz
2512 Hz
3162 Hz


PRM2103-FF Directional Response (FF:90 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
3981 Hz
5012 Hz
6310 Hz


PRM2103-FF Directional Response (FF:90 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
7943 Hz
10000 Hz
12589 Hz


PRM2103-FF Directional Response (FF:90 2106/8)
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15
-20
15849 Hz
19953 Hz

Cables

The PRM2103-FF connects with either the CBL203 or the CBL208. The CBL203 connects directly into the Model 831 with an external power supply. The CBL208 connects into the Model 831 and Model 831-INT-ET.

The standard lengths for the CBL203 and CBL208 are 20', but are available up to 100'.

FIGURE A-10 shows the view looking directly into the CBL 203 or CBL208 10-pin connector (connecting to the PRM2103-FF).

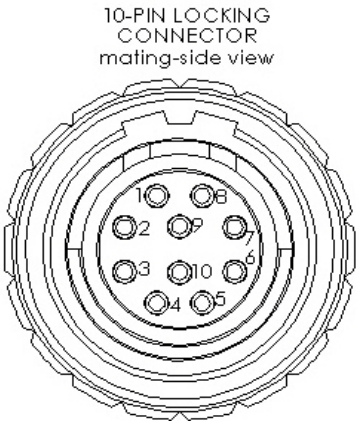


FIGURE A-10 View Looking Directly into CBL203 or CBL208 10-pin Connector

FIGURE A-11 shows the view looking directly into the CBL203 or CBL208 5-pin connector (connecting to the Model 831).

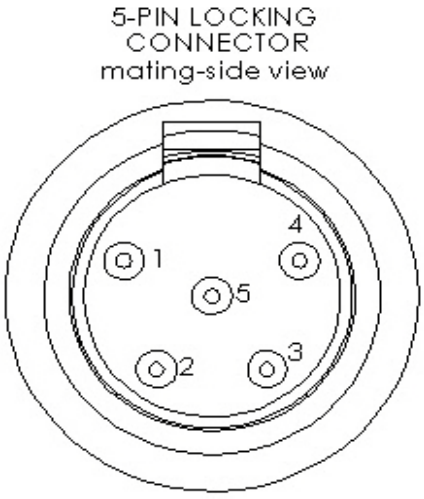


FIGURE A-11 View Looking Directly into CBL203 or CBL208 5- pin Connector

CBL203

Output

10-pin female connector with dual-keyed locking

Control Connector

10-pin female (PHA.1B.310)

Table A-1 shows the CBL203 pinout.

Signal	10-pin Connector	5-pin Connector	18-pin Connector	Power Jack	Ground Lug
Not Used	1	Not Used			
Digital Communications Clock	2	N/C	8	N/C	N/C
Preamp Ground	3	1	N/C	N/C	N/C
Data I/O	4	N/C	9	N/C	N/C
Preamp Signal Output	5	2	N/C	N/C	N/C
Digital Power	6	N/C	6 & 7	Center	N/C
Preamplifier Power	7	3	N/C	N/C	N/C
Not Used	8	Not Used			
Preamp Self-identification	9	4	N/C	N/C	N/C
Digital Ground	10	N/C	1 & 5	Outside	N/C
Inner Shield	N/C	N/C	Shell	N/C	N/C
Outer Shield	Shell	Shell	N/C	N/C	Lug

Table A-1 CBL203 Pinout

CBL208

Output

10-pin female connector with dual-keyed locking

Control Connector

10-pin female (PHA.1B.310)

Table A-2 shows the CBL208 pinout.

Signal Name	10-pin Connecter	5-pin Connector	7-pin Connector
Digital Communications Clock	2	N/C	5
Preamp Ground	3	1	N/C
Data I/O	4	N/C	6
Preamp Signal Output	5	2	N/C
Digital Power	6	N/C	7
Preamplifier Power	7	3	N/C
Preamp Self-identification	9	4	N/C
Digital Ground	10	N/C	1 & 2
Inner Shield	N/C	N/C	Shell
Outer Shield	Shell	Shell	N/C

Table A-2 CBL208 Pinout

CE Declaration of Conformity Information

Declaration of Conformity

PCB Piezotronics, Inc. declares that the following instrument:

Model PRM2103-FF Outdoor Microphone Preamplifier

CE

complies with the European Community EMC Directive (2004/108/EC) and also the Low Voltage Safety Directive (2006/95/EC) by meeting the following standards:

Safety	**IEC 61010-1:2010** - Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
Electromagnetic Compliance	**IEC 61326-1:2012** - Electrical equipment for measurement, control and laboratory use - EMC requirements-Part 1: General requirements. **CISPR 11:2010** - Industrial, scientific and medical equipment-Radio-frequency disturbance characteristics- Lists and methods of measurements. Group 1, Class B. CISPR 22:2008 - Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement. Group 1, Class B. **IEC 61672-1: 2002** - Electroacoustics –Sound Level Meters – Part 1:Specifications (Group Z Compliant). **FCC:** Complies with 47 CFR Part 15, Group 1, Class B device.

Complies to above EMC requirements when using PRM2103-FF, Model 831, 831-INT (if applicable), and either CBL203 or CBL208 cable (20 to 100 feet).

Worst case operation mode for RF emissions and susceptibility will be with PRM2103-FF, 831 (10 ms time history), 831-INT-ET, with CBL208-100 cable.