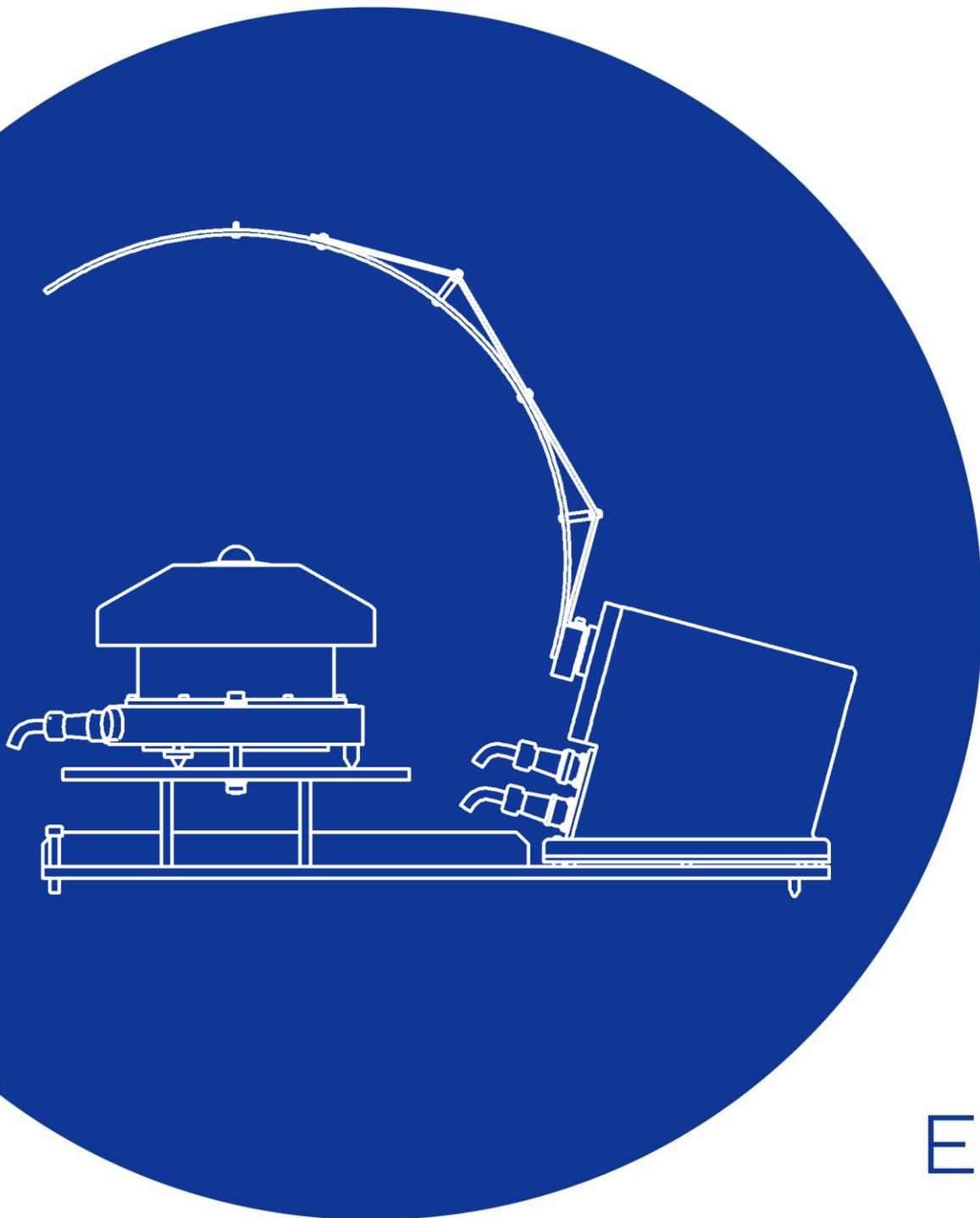


INSTRUCTION MANUAL

Measurement and Data Visualization Software
For EKO Spectroradiometers

Nami



EKO

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2. Introduction

This software, Nami, is exclusively used for measuring and processing the data acquired by MS-711. Nami can be used to control and make measurements of the MS-711 spectroradiometer with or without the RSB-01 and analyze the data.

2-1. Main Functions

By using this software, you can do the following:

1. Single shot measurements and interval measurements using only the MS-711 (Fig. 2-1-1)
2. Single shot measurements and interval measurements using the MS-711 with RSB-01 (Fig. 2-1-2)
3. View measurement data without any devices connected to your PC.

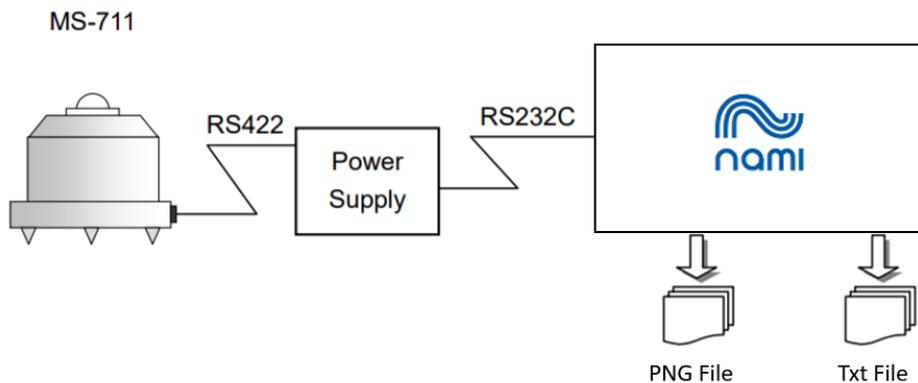


Fig.2-1-1. Connection with MS-711

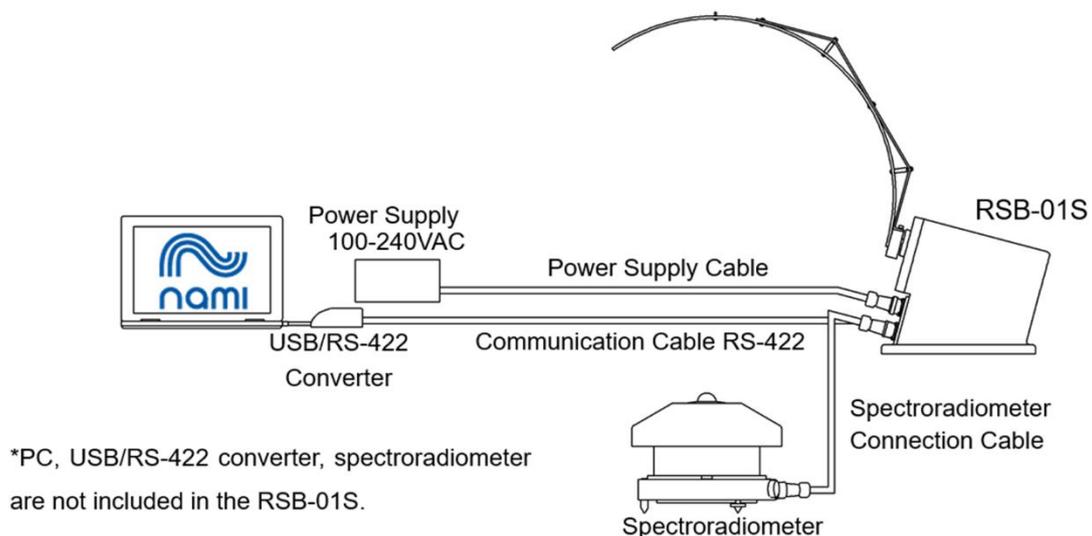


Fig.2-1-2. Connection with RSB-01

3. Software Installation and Uninstallation

3-1. Installation

NOTE: Make sure to install the software on a PC which has administrative and/or installation authority.

- 1) To install software, click [Niji_Software_Ver1.0.0_Installer] → [Setup.exe] and start the installer.
- 2) Installation Wizard window appears. To go to the next step, click [Next].

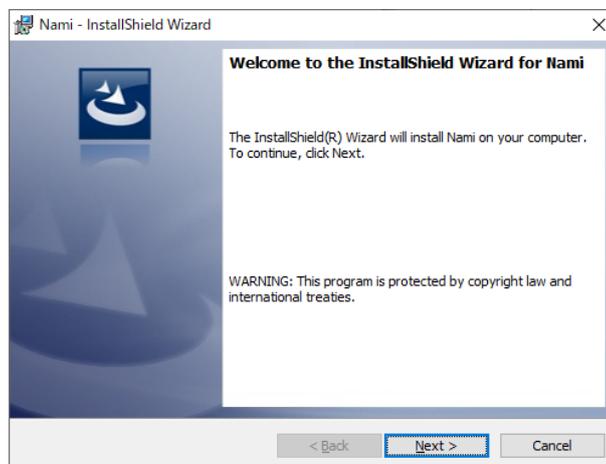


Figure 3-1-1. Installation Wizard Startup Window

- 3) "License Agreement" window appears; select "I accept the terms in the license agreement" then click [Next] button to go to the next step.

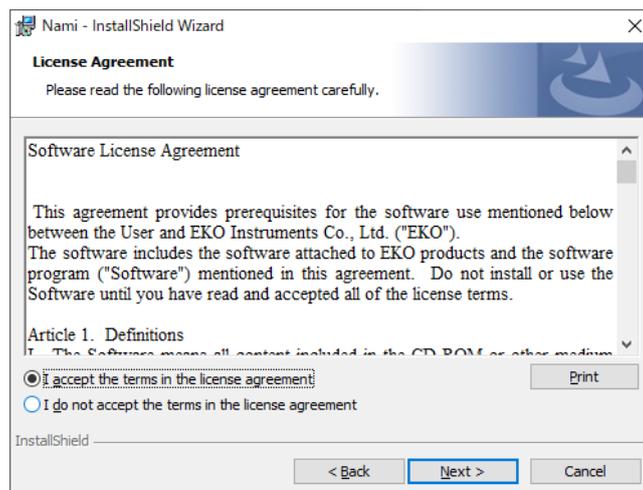


Figure 3-1-2. License Agreement Window

- 4) "Destination Folder" window appears. If the software will be installed in the "C:\EKO" folder, click [Next] button to go to the next step. To change the destination folder, click [Change...] button and select the appropriate folder.

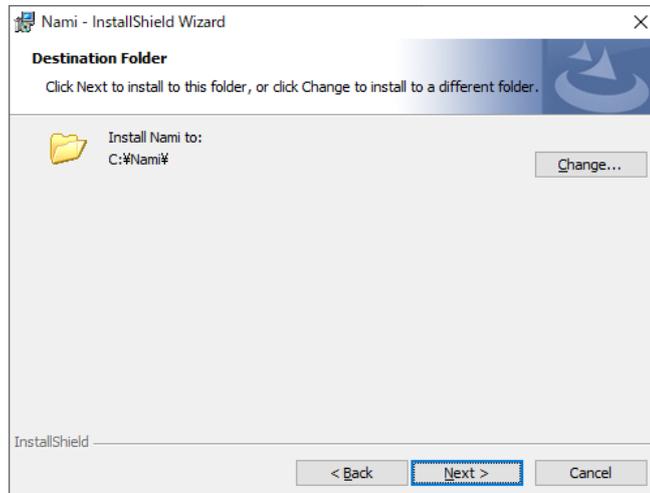


Figure 3-1-3. Destination Folder Window

NOTE: If the Operation System for the installing PC is either one of the Windows Vista, 7, or 8 and to change the destination folder, UAC (User Account Control) function will be effective, and it will need special attention. Installing and/or data uploading in the folder which OS is restricting the access authority may generate problems. There are "C:\Program Files", "C:\ProgramData", "C:\Windows", and system drive route folder "C:\" for such folder with restrictions. Avoid these folders when changing the destination folder.

- 5) "Ready to Install the Program" window appears. Confirm the destination folder and if okay, click [Install] button to go to next step.

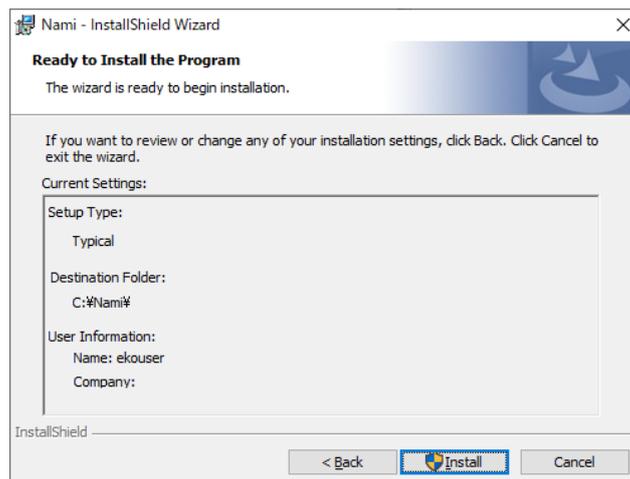


Figure 3-1-4. Install Window

- 6) After a while, the PC display goes dark and “User Account Control” dialog window appears. Click [Yes] button to start the software installation.

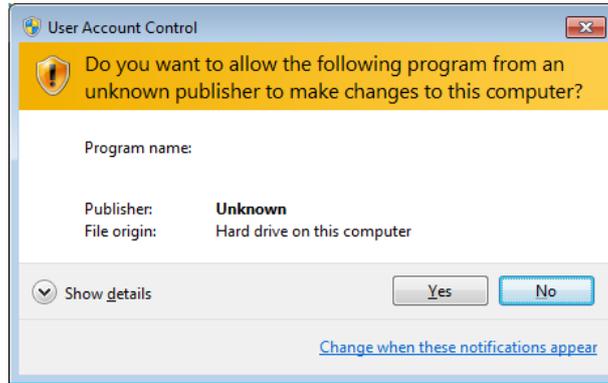


Figure 3-1-5. User Account Control Window

- 7) As the installation is completed, the following window appears. Click [Finish] button to close the installation window.



Figure 3-1-6. Installation Complete Window

- 8) When the installation is completed, a shortcut icon as shown below will be created on the desktop, as well as in the Start Menu, “All Programs” → “EKO” → “Nami”



Figure 3-1-7. “Nami” Shortcut Icon

3-2. Uninstallation

There are 2 ways to uninstall the software.

1) Uninstalling software from the "Programs and Features"

Access by clicking "Control Panel" -> "Program and Features".

Select the program to be uninstalled and right click; the popup menu will appear.

Select "Uninstall".

2) Uninstalling software from the installer

As when the software was installed, startup the software installer.

Proceed according to the messages that appear in the window.

If the software is already installed, there will appear options such as "Modify", "Repair", and "Remove".

Select "Remove" from this window and click [Next] button.

Follow the messages on each step and the software will be uninstalled from your PC.

4. Starting Software

4-1. Launching Nami and the Nami Welcome Screen

As "NAMI" is started, a Welcome screen appears and is below in Fig.4-1-1.

Nami is a larger software package than previous EKO spectroradiometer programs. The first instance of opening Nami takes longer than subsequent instances. Please be patient and allow the program to open. If the software never opens, please contact your local EKO office. Nami is currently available for download from your representative EKO website.

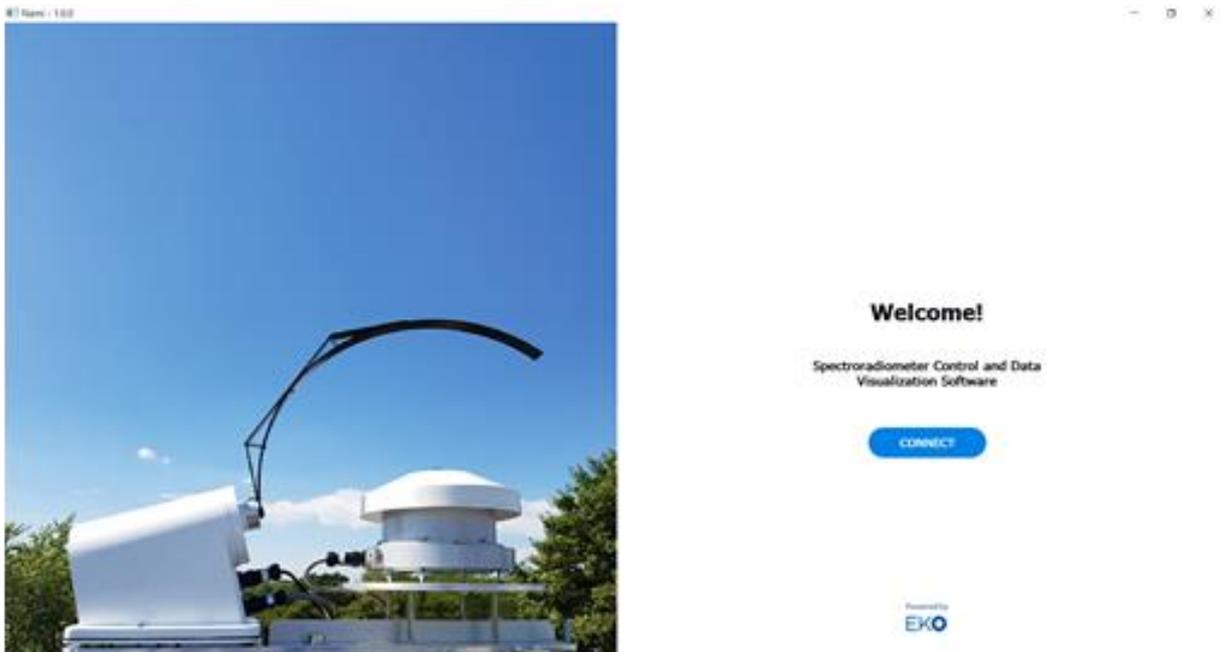


Fig.4-1-1 the Nami Welcome Screen

4-2. Basic Navigation Elements

1. Menu minimization

As with many modern software packages, EKO utilized the familiar dashboard layout. Users can view in detail the screen options or minimize those options. The default setting on the Dashboard displays the EKO logo followed by each screen option. If the user wants to minimize or hide these screens, they should click the “Hide Menu” button at the bottom left. The menu should then look like figure 4-2-1 below.

To return to the larger menu view, simply click the navigation element (three bar symbol).

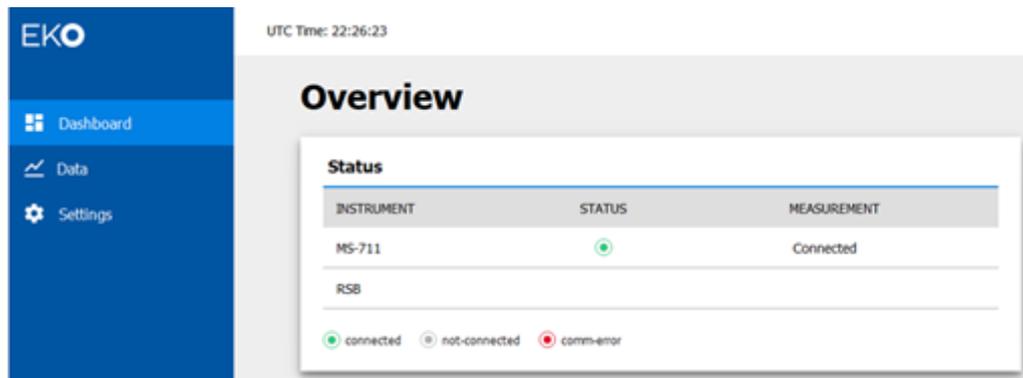


Fig.4-2-1(a) Default

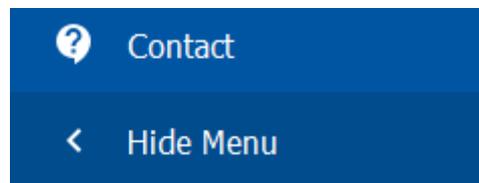


Fig.4-2-1(b) “Hide Menu” button at the bottom left

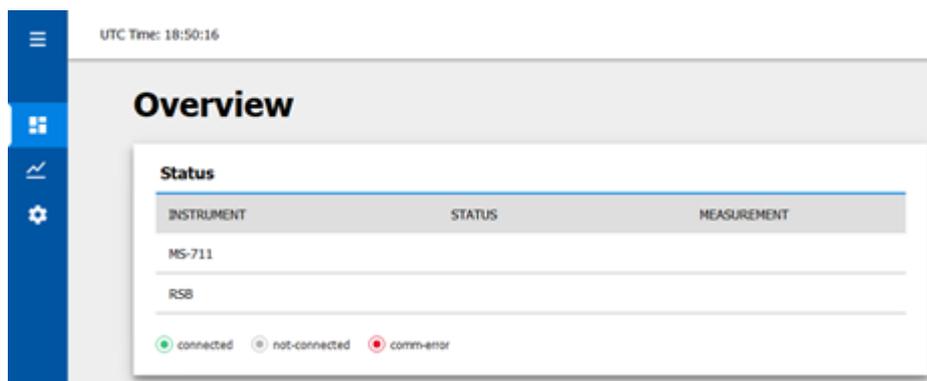


Fig.4-2-1(c) Minimized display

2. Dashboard (Home)

The Dashboard is your starting point in operating Nami and it is also the screen the operator or user will spend most of their time. Instrument communications, measurements, and data can all be monitored from this screen. Whether you are using the MS-711 or the combination of MS-711 and RSB-01, the dashboard will function the same. Nami was designed with MS-711 users as priority. If a user requires Global Horizontal Irradiance (GHI), Direct Normal Irradiance (DNI), Diffuse Horizontal Irradiance (GDI), or Plane of Array (POA) measurements without a Shadowband, Nami remains the only piece of software needed. Nami will pass the appropriate messages to a single MS711 or transparently through a RSB-01S to a MS-711. No need in changing any communication settings.

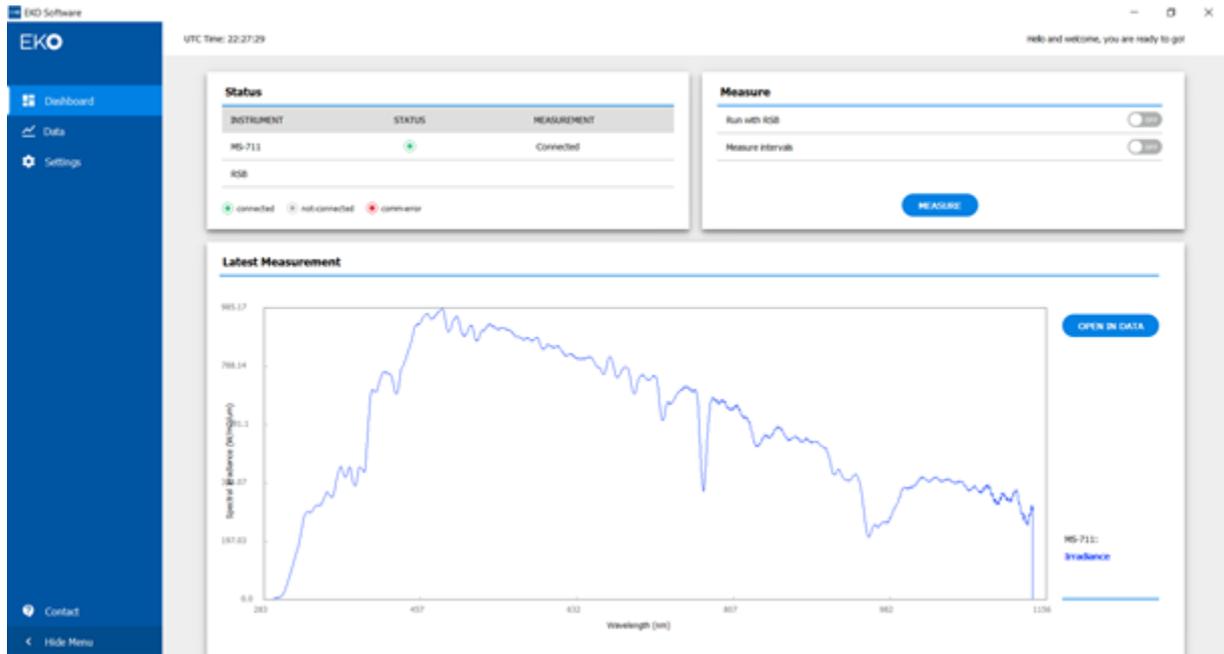


Fig.4-2-2 Basic Dashboard display with a MS-711 providing a single measurement.

3. Status

From the Status area, users can see what instruments are connected and communicating with the PC. Green colors represent successful connections and communications while grey and red colors represent no connections or connection problems respectively. If you are expecting a connection but not seeing a successfully connected instrument, check the cable connections on the instruments and the PC. If you are using USB-to-Serial converters, check your Windows Device Manager settings to ensure the drivers are loaded properly for the converters. In Fig.4-2-2 above, the user only has a MS-711 connected. The MS-711 is communicating with the spectroradiometer and the latest measurement was displayed in the lower half of the Dashboard screen.

4. Measure

A user can perform a single measurement (Single-Shot) or perform multiple measurements based on intervals. These measurement settings are modified here. When the Measure button is BLUE, you are ready to measure. If the Measure button is grey, you should check your instrument communications on the Status menu. The user can select whether to use a RSB and if they want to enable measurements based on an interval. Please see figure 4-2-3 below.

Measure

Run with RSB

Measure intervals

Measure from sunrise to sunset

Starts at: UTC Intervals:

Ends at: UTC

MEASURE

Fig.4-2-3 Measurement settings

Intervals are specified with a start and stopping time as well as the interval between measurements. The fastest a RSB-01 can perform a minimum of 2 measurements (no band correction measurements), one for GHI and another for Diffuse Horizontal irradiance is 10 seconds. Band Correction measurements will be covered in the settings section. Lastly, for this portion of the dashboard, a user can set their start and stop based on the sunrise and sunset of their location. Position information is also entered in the Settings menu, either using the GPS receiver sold with the RSB-01 or manually.

5. Latest Measurement

The lowest section of the Dashboard is for latest measurement viewing. Here, the data from the last measurement will be displayed. In the case of a single MS-711, the software will simply display the data as a single spectral irradiance measurement. This allows users to orient the spectroradiometer into different positions as well as use the EKO collimation tubes without causing any confusion as to what they were measuring. When the RSB is enabled and used, the data appears in all three components (DNI, GHI, and DHI). Please see figure below.

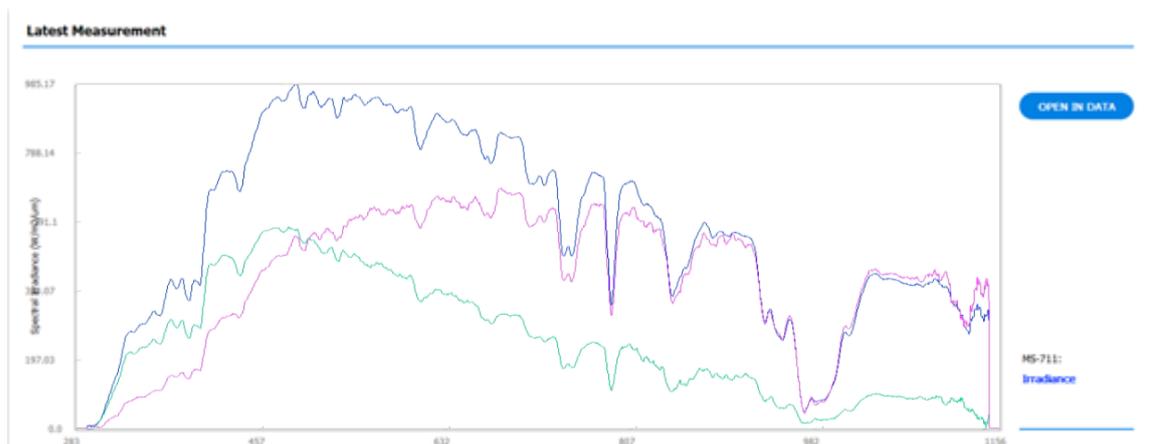


Fig.4-2-4 Latest Measurement Data

6. DATA Visualization

In the past, EKO used one software program for controlling spectroradiometers and another program for analyzing and visualizing the spectra from the instrument. Nami combines these two programs into one elegant software solution.

Loading Spectra

Unlike the last measurement, the default Data screen (Figure 4-2-5) does not display the latest measurement allowing for a clean canvas for the user.

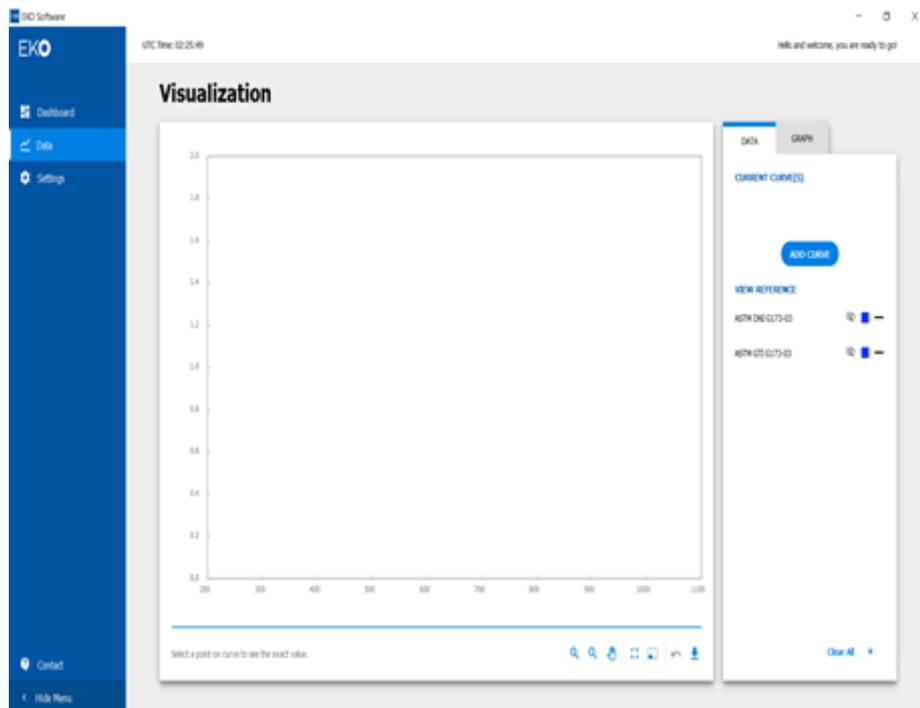


Fig.4-2-5 Default Data Screen

To add a spectrum for viewing, click the “Add Curve” button. Users can select to import spectra from files on their file system or from a saved library created in Nami. Figure 4-2-6 displays this option.

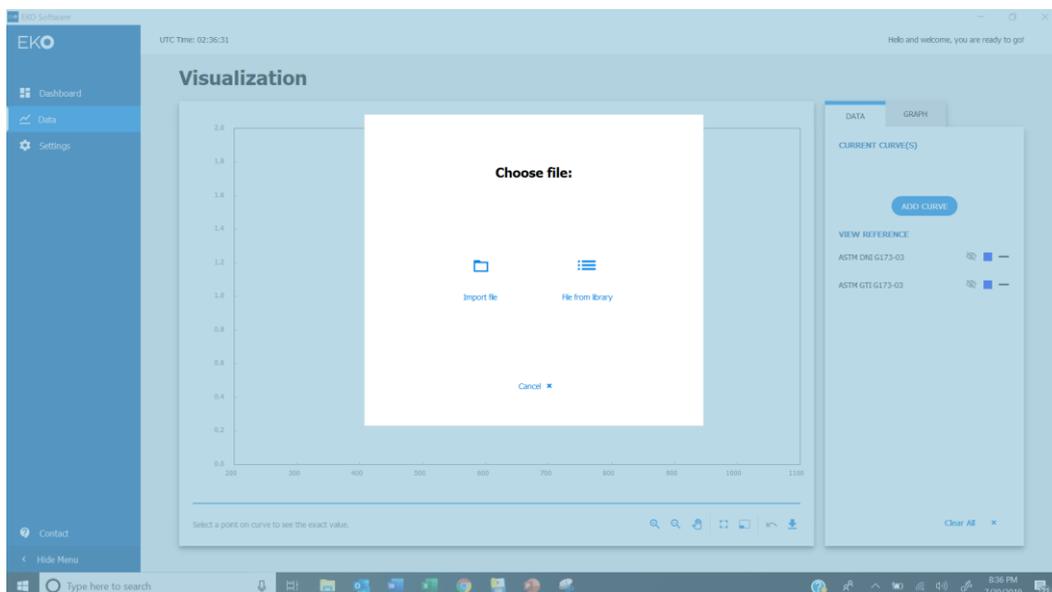


Figure 4-2-6 Adding spectrum from imported file or Nami library

In the case of importing, a Windows browser will launch allowing the user to choose which spectrum they

want to view. If the user creates a library by saving spectra within Nami, they can select from a provided list. An example list is in Figure.4-2-7 below.

Choose Data File:

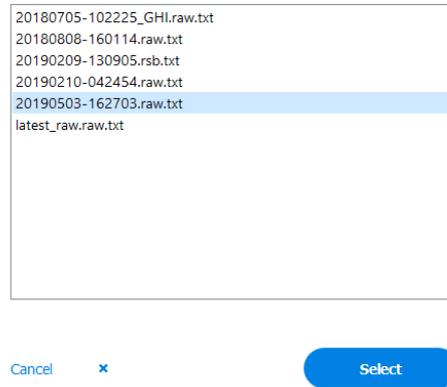


Figure 4-2-7 Example Nami Data Library

When the spectrum file is selected, the user can then select what colors and lines the spectra can be viewed in. For example, if a file from created from the RSB-01 and MS-711 is chosen, the user can select which irradiance components they want viewed, what colors, and what line styles. These choices and results are displayed in Figures 4-2-8 and 4-2-9 respectively.

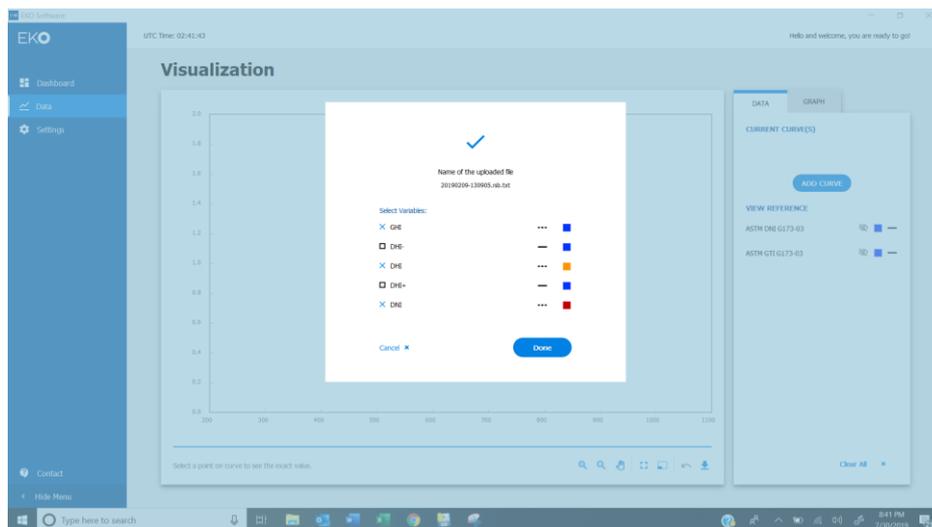


Figure 4-2-7 RSB file with three components to be displayed with different colors

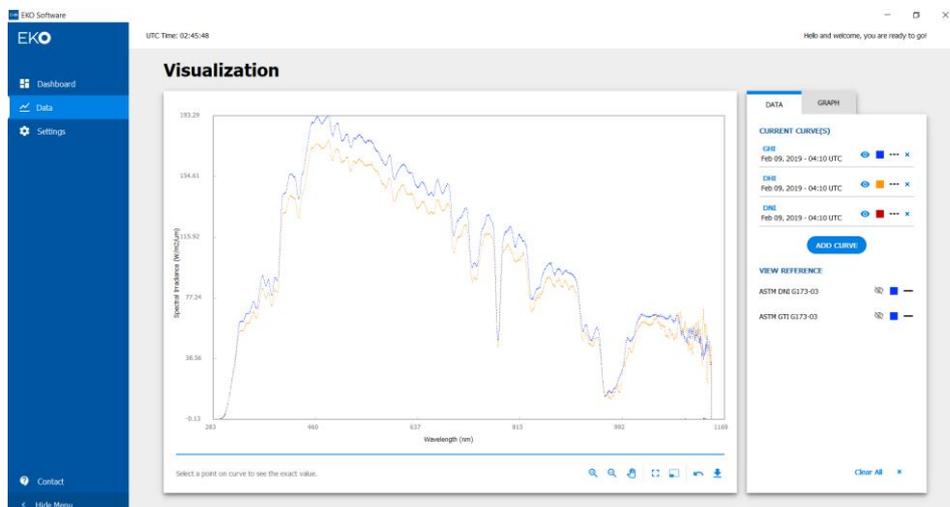


Figure 4-2-8 Three component spectral irradiance data

Viewing Individual Irradiance Values

After loading a spectrum, the user can click on individual points on the display providing information about the wavelength and associated irradiance. This can be helpful when studying subtle features in the spectrum.

Manipulating the Graph/Plot

At the bottom of the Data screen is a tool bar. These features will help the user investigate features of the spectra more closely. Figure 4-2-9 shows an enlarged image of those tool bar buttons.



Fig.4-2-9 Data Toolbar

Zoom In, Zoom Out, Drag/Move, Autoscale, Lasso, Undo, and Save Image buttons respectively displayed

If you want to Zoom around or away from a specific section of a spectrum, these buttons combined with the drag button will help. Autoscale is used to automatically scale the graph based on the spectrum or spectra presented on the graph. Lasso is used to focus on a specific portion of a spectrum or spectra. Undo will revert the graph back to the original visualization state. Once a user is satisfied with how a graph is presented, clicking the save button will create a PNG file which can be used in presentations or reports.

If a comparison to a reference spectrum is desired, EKO has loaded the reference spectra of ASTM Standard G173-03(2012) for comparison purposes. G173-03(2012) is Standard Tables for Reference Solar Spectral Irradiances: Direct Normal and Hemispherical on 37° Tilted Surface. Direct Normal reference spectra is designated as DNI while the tilted surface spectra is designated as GTI. If a user would like a copy of this standard, please contact ASTM and purchase the standard from ASTM.

7. Settings

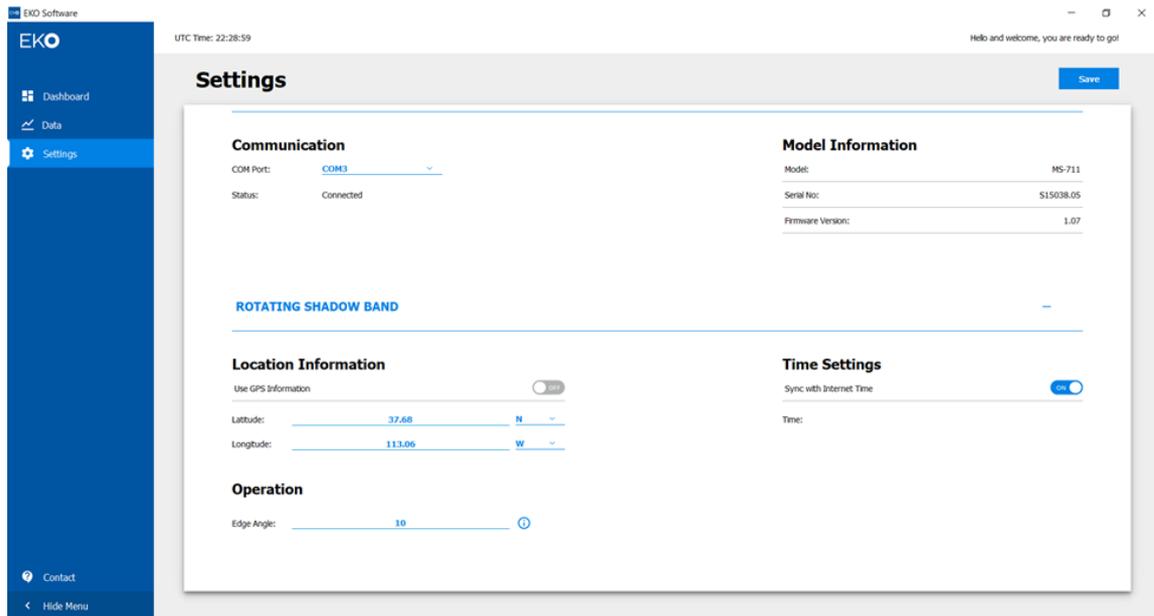


Fig.4-2-10 Example Settings menu

The final screen in Nami is the setting screen. If a user needs to modify communication, time synchronization, location information, or RSB operation settings, this is the screen to make those changes. Many of these settings are self-explanatory. However, in the event that a user has difficulties or confusions, please contact your local EKO representative.

Clicking the small blue minus/plus signs (-/+) will minimize/maximize each section allowing the user to hide or see the instrument specific settings in more detail.

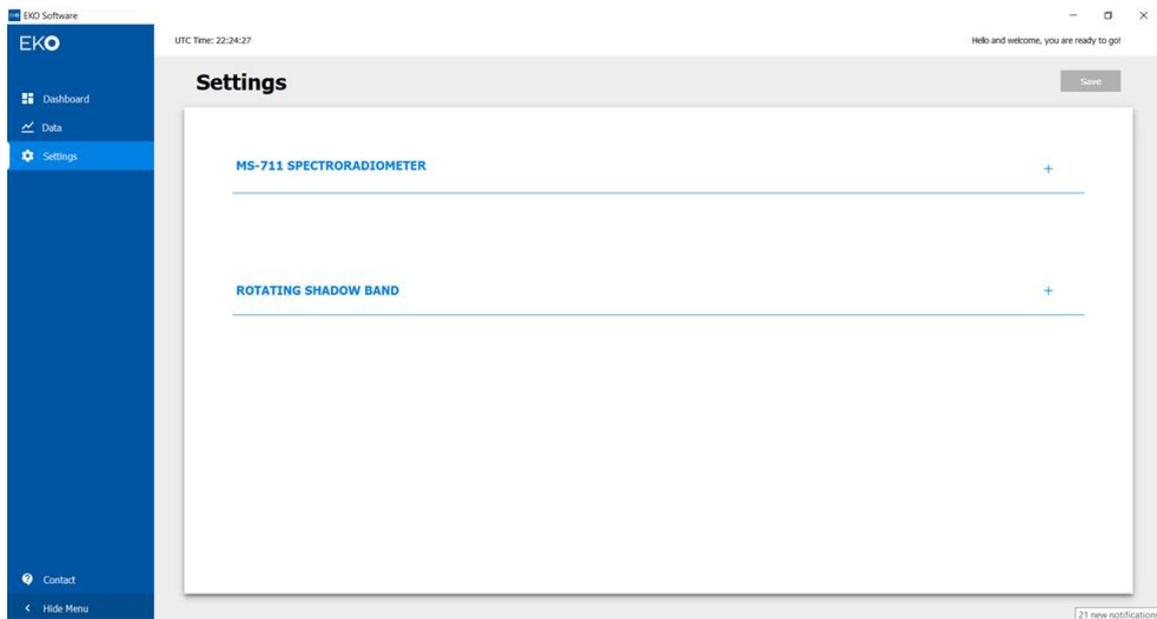


Fig.4-2-11 Minimize / Maximize each section

Rotating Shadow Band Edge Angle

The edge angle is used for a band correction calculation. Figure 4-2-12 shows the edge angle settings with the help box visible.

Operation

Edge Angle: _____ 10 _____ ⓘ

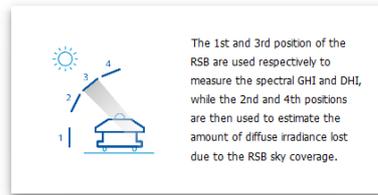


Figure 4-2-12 RSB Edge Angle setting

The available edge angles are 0 (no band correction) through 15 degrees. If an incorrect or not suitable edge angle is selected, the setting will appear red as to show there is an error. The band correction calculation is performed automatically by the software to improve the diffuse irradiance measurement. All measurements including the additional band edge measurements (two additional measurements) can be viewed at any point.

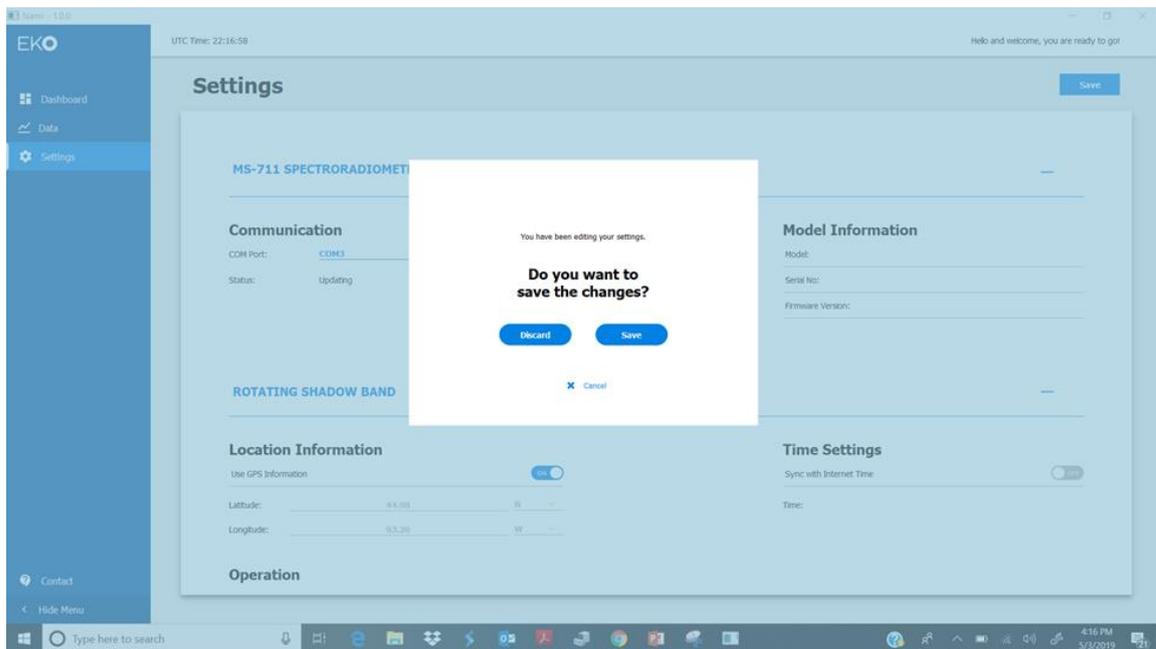


Fig.4-2-12 Saving changes

Since many EKO users are deploying instruments around the world, EKO recommends saving this settings information with specific details regarding your location or campaign.

8. Contact

Clicking the contact button launches your internet browser and navigates you to your EKO Instruments webpage. If you have additional questions or issues, please follow the webpage to contact your local EKO office.



Fig.4-2-13 Contact

5. Troubleshooting

5-1. Troubleshooting

Check the following items in case of troubles with the instrument. If any questions should remain, contact EKO for further technical support.

Table 5-1. Troubleshooting

Failure	Action
<ul style="list-style-type: none">• Cannot operate by PC• Cannot take measurements	Communication between the PC and Spectroradiometer may be disconnected. <ol style="list-style-type: none">1) Check the communication cable between PC and Main Unit, connection cable between Main Unit and Spectroradiometer if they are properly connected.2) Check the PC and Main Unit power is turned ON.3) Check the COM Port on PC which the communication cable is connected.4) Reboot the software and make sure successfully communicate and operate by PC.5) If there are any cause of noise on power supply cable and communication cable, take measures to remove/reduce the noise.
<ul style="list-style-type: none">• Abnormal measurement value• Bad repeatability of measurement value• Measurement value is too small	Spectroradiometer glass dome may be significantly dirty. Clean the glass dome. <ol style="list-style-type: none">1) Shadow Band may not be blocking the Spectroradiometer properly. Check the Shadow Band for band alignment (see section 1.) or any loose screws and so on.2) Shutter, spectrometer, and/or circuit board may be broken. If so, contact EKO.
Software behaves abnormally	PC and/or software may have malfunction, restart application or reboot the PC then run the software.

6. Specification

6-1. Software

Table 6-1. Main Unit Specification

Characteristics	Details
Supported OS	Windows 7/10 (64bit)
Compatible models	MS-711, RSB-01
Measurement function	<ul style="list-style-type: none">- Single-shot measurement- Interval measurement (Any time zone or from sunrise to sunset)- Text file output of data
Graph drawing function	<ul style="list-style-type: none">- GHI, DHI, DNI graph drawing- Change graph title, axis title- Zooming the graph- Save graph as image
Setting items	<ul style="list-style-type: none">- Select COM port- GPS ON / OFF- Input of latitude and longitude- ON / OFF of time acquisition from time server- Input of edge angle (5 through 15 ° or 0°)

APPENDIX

A-1. Understanding the Version of your software

As updates to the software are made, new versions will be available for download. Please check the version of your software in the top left corner of the Dashboard screen. You may then reference this number with the latest version of the software on the EKO software download page. An example version is shown in Figure 6-1-1. Nami software updates are free of charge. Nami+ versions require an update fee for each leading integer versions. For example, updating from Version 2.0.0 to Version 3.0.0 of Nami+ will require an update fee. Updating from Version 2.1.1 to 2.1.2 will not require any additional fees or purchases. The same would apply for an update similar to 2.2.1 to 2.3.1. Please contact your local EKO office for information about updates and updating your software to take advantage of the latest and greatest features.



Figure 6-1-1 Nami Software Version

Other EKO Software

Nami is the first of a new platform for EKO software. As new instrumentation is created, so will new software be made to control and help the user maximize their data acquisitions and storage. The welcome message will aid in helping the users quickly see what software package they are using and what application the software is serving.

Hello and welcome, you are ready to go!

Figure 6-1-2 Example EKO Software Welcome Message

UTC Time

Many international calibrations/intercomparisons require the data be timestamped and relative to Coordinate Universal Time or UTC. Nami will maintain this UTC timestamp based on your PC clock. Later in the settings section, you can see how GPS as well as Network Time Protocols (NTP) can be used to guarantee accurate timestamps for your measurements.

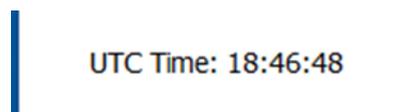


Figure 6-1-3 Example UTC Time



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