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National Instruments certifies this instrument to be in conformance with the specifications noted herein at time of shipment from the factory.

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Safety Notices

CAUTION
A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING
A WARNING notice defines a hazard. It calls attention to an operating procedure or practice that if not correctly followed or adhered to, could result in either personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.
Introducing the QuickSyn Lite Frequency Synthesizer

Congratulations on purchasing a Phase Matrix QuickSyn Lite Frequency Synthesizer!

To get the most out of your purchase, it is recommended that this user guide be read carefully and completely.

QuickSyn Lite Frequency Synthesizer modules are available in microwave and millimeter-wave frequency ranges. The microwave modules include models FSL-0010, FSL-0020, and FSL-E020; the millimeter-wave modules include models FSL-2740, FSL-5067, and FSL-7682 and are comprised of an FSL-0020 and a frequency multiplier.

In this document . . .

The scope of this document is to describe how to setup the QuickSyn Lite Frequency Synthesizer, install its software on a computer, and control the synthesizer using the software.

“Step 1. Unpack Hardware” on page 4
“Step 2. Perform USB Device Driver Installation” on page 4
“Step 3. Perform Software Installation” on page 19
“Step 4. Setup Synthesizer” on page 22
“Step 5. Review Software Front Panels” on page 23
“Service Information” on page 37
“Declaration of Conformity” on page 39
Step 1. Unpack Hardware

Inspect shipping cartons for any sign of visible or concealed damage. If cartons are damaged, notify the carrier immediately.

CAUTION

The QuickSyn Lite Frequency Synthesizer ships in an antistatic package to prevent damage from electrostatic discharge (ESD). Because ESD can damage the components of a hardware unit, store the unit an antistatic bag when not in use.

Remove the unit from its package and inspect it for loose components or any signs of damage. Notify NI Microwave Components if the unit appears damaged in any way.

Step 2. Perform USB Device Driver Installation

To use a personal computer (PC) to communicate with the synthesizer, a USB device driver must be installed. The device driver can be installed automatically or installed manually if you are not able to run executable files on your PC. The driver supports both 32- and 64-bit versions of Windows XP, Windows Vista, and Windows 7. For automatic installation of the device driver, follow the Step 2-1 instructions. To manually install the device driver on a system using Windows XP or Windows 7, follow the Step 2-2 or Step 2-3 respectively.

Step 2-1 Install Device Driver Using Automatic Installation

1. Download the latest available QuickSyn executable USB device driver from the NI Microwave Components website.

   Device drivers are available online ni-microwavecomponents.com

2. Start the installation process by selecting **Start > Run > Browse**, navigate to the “setup.exe” file, and select **Open** to start the installation wizard.

   A window similar to the one shown in Figure 1 will appear.

3. Select **Next** to continue to the End User License Agreement.

4. Carefully read through the End User License Agreement.
If you agree to the terms of the software license agreement, select “I accept this Agreement” and select Next to continue.

If you do not agree, you will not be able to install the software.

A window similar to the one shown in Figure 3 will appear to show progress of various software components being installed.
5 Select Next once the files have been copied.

**Figure 3** Example of “Installing USB Driver”

![Installing USB Driver](image)

5 Select *Continue Anyway*.

**Figure 4** Example of “Windows Logo Testing”

![Windows Logo Testing](image)

6 Select *Continue Anyway*.

**NOTE**
The QuickSyn device driver uses files that already exist on the computer as part of a standard Windows installation and does not install EXE, DLL, or any other executable files.
7 Select Finish to complete the USB device driver installation.

6 Connect the synthesizer to the PC using a USB Cable and proceed to install software per Step 3 on page 19.

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**Step 2-2 Install Device Driver Using Manual Installation (Windows XP)**

1 Download the latest available QuickSyn USB device driver from the NI Microwave Components website.

Device drivers are available online ni-microwavecomponents.com

2 Connect the synthesizer to the PC using a USB Cable.

The “Found New Hardware Wizard” should start automatically.
3  Select “No, not this time” and Next to continue.

Figure 6 Example of the “Found New Hardware Wizard”

![Found New Hardware Wizard](image)

4  Select “Install from a list or specific location (Advanced)” and Next to continue.

Figure 7 Example of “What Do You Want the Wizard to Do”

![What Do You Want the Wizard to Do](image)
5 Select “Search for the best driver in these locations.”

6 Check the box to “Include this location in the Search” and enter the file path in the combo-box or select Browse and search for the device driver file (QuickSyn.inf) that was downloaded in step 1.

The screen shown in Figure 9 is displayed as Windows copies the required file. Once copying is finished, the Next button becomes available.

**Figure 8** Example of “choose search and installation options”

**Figure 9** Example of files being copied

7 Select Next to continue once the files have been copied.
8 Select **“Continue Anyway”**

**NOTE**
The QuickSyn device driver uses files that already exist on the computer as part of a standard Windows installation and does not install EXE, DLL, or any other executable files.

Windows should display a message indicating that the installation was successful.

9 Select **Finish** to complete the device driver installation.
Step 2-3 Install Device Driver Using Manual Installation (Windows 7)

1. Download the latest available QuickSyn device driver from the NI Microwave Components website.
   
   Device drivers are available online ni-microwavecomponents.com

2. Connect the synthesizer to the PC using a USB cable.

The “Installing Device Driver Software” message will pop up in the lower-right portion of the screen (see Figure 12).

**Figure 12** Example of “Installing device driver software”

The QuickSyn device driver requires manual installation; therefore, two other messages will appear (see Figure 13 and 14).

**Figure 13** Example of driver software installation warning

**Figure 14** Example of driver software installation warning

3. Select Close (see Figure 14).
4 Click on the Windows logo in the lower-left corner of the screen, and select Drivers and Printers as shown in Figure 15.

Figure 15 Example of How to Start Manual Installation of Driver

![Windows logo with Drivers and Printers selected]

5 Find the device labeled “FSW_USBSerial” and right-click on it. Choose Properties from the menu (see Figure 16).

Figure 16 Example of Finding a Device

![Image of device selection process]
Figure 17 Example of FSW_USBSerial Properties

6 Click on the **Hardware** tab (see figure 17).
7 Select the **Properties** button to display the properties dialog box (see Figure 18).

**Figure 18** Example of FSW_USBSerial Properties
8 Select **Change settings** (see Figure 19) to enable the **Update Driver** button and click on the **Update Driver** button.

**Figure 19** Example of FSW_USBSerial Properties

8 Select **Change settings** (see Figure 19) to enable the **Update Driver** button and click on the **Update Driver** button.

**Figure 20** Example of Update Driver Software

9 Select the browse option as shown in Figure 20.
Figure 21 Example of Update Driver Software

Figure 22 Example of Browse for Folder

10 Browse to the location of the location of the QuickSyn.inf. file and choose Ok (see Figure 22).
11 Click **Next** to begin installing the driver (see Figure 23).

A Windows security dialog box will appear asking to approve the installation. The driver has been signed by NI Microwave Components (formerly Phase Matrix, Inc.).

![Figure 23 Example of Update Driver Software](image)

12 Choose **Install** to start the installation (see figure 24).

After the driver installs, a dialog box (similar to the one shown in Figure 25) will appear confirming that the installation was successful. The com port number will show in the title bar.

![Figure 24 Example of Windows Security Message](image)
Figure 25 Example of Windows Security Message

In the Control Panel under Devices and Printers, the QuickSyn USB interface should now be listed along with its com port number as shown in Figure 26. Keep the com port number handy as it will be needed in order to communicate with the synthesizer.

Figure 26 Device and Printers Window
Step 3. Perform Software Installation

1. Download the latest available QuickSyn Soft Front Panel software from the NI Microwave Components website and unzip it to a location on the computer.

   Software is available online ni-microwavecomponents.com

2. Start the installation process by selecting Start > Run > Browse, navigate to the “setup.exe” file, and select Open to start the installation wizard.

   A screen similar to the one shown in Figure 27 is displayed.

   **Figure 27** Example of Starting the Soft Front Panel Installation Wizard

3. Continue to the next screen.
Figure 28 Example of Selecting Destination Directory for Executables

Figure 29 Example of Software License Agreement

4 Enter the destination directory for the soft front panel executables or browse to a destination directory by selecting the Browse button.

5 Once the file path has been entered, select Next to continue to the Software License Agreement.
6 Carefully read through the Software License Agreement.
   • If you agree to the terms of the software license agreement, select “I accept the License Agreement” and select Next to continue.
   • If you do not agree, you will not be able to install the software.

7 Select Finish to complete the soft front panel installation. Reboot the computer if prompted to do so.

Figure 30 Example of files being copied

![Figure 30 Example of files being copied](image)

Figure 31 Example of Completing Soft Front Panel Installation Wizard

![Figure 31 Example of Completing Soft Front Panel Installation Wizard](image)
Step 4. Setup Synthesizer

1 Insert one end of an SMA cable to the synthesizer’s RF OUT SMA connector and the other end of the cable to the applicable microwave test equipment as shown in Figure 32 (for microwave synthesizer modules) or Figure 33 (for millimeter-wave synthesizer modules).

NOTE Model FSL-7682’s RF OUT connector is a WR15 waveguide connector, which is not depicted in any of the illustrations in this guide.

2 Insert the Mini-B end of a USB cable into the Synthesizer’s USB connector and the A-Type end into the computer’s USB receptacle.

WARNING Voltage less than +11.4 V at the synthesizer connector may result in malfunction, and voltage in excess of +15 V may damage the synthesizer.

3 Ensure that the power supply is turned off before connecting DC cables. Verify that the voltage of the power supply is set between +12 V and +12.5 V.

4 Connect the black (ground) wire of the DC bias power cable to the power supply.

5 Connect the red (+12 V) wire to the power supply.

6 Insert a 30-pin SPI connector into the synthesizer’s SPI connector receptacle.

7 Turn on the power supply. The power-on indicator on the millimeter-wave synthesizer modules will illuminate blue light. The indicator appears on the small printed-circuit board on the front panel. The microwave synthesizer modules do not have power-on indicators.

CAUTION The QuickSyn Lite Frequency Synthesizer generates heat; therefore, use a heatsink or ensure adequate (i.e., ≥ 1 cfm) airflow is present to prevent the synthesizer’s internal temperature from exceeding +75° C.
**Figure 32** Connection diagram for FSL-0010, FSL-0020, FSL-E020

**Figure 33** Connection diagram for FSL-2740, FSL-5067, FSL-7682
Step 5. Review Software Front Panels

Step 5-1 Launch QuickSyn Soft Front Panel Software

1. Use the shortcut icon that was placed on the computer’s desktop during installation to launch the QuickSyn Soft Front Panel software.

The “Locate QuickSyn Device” dialog box will appear (see Figure 34).

Figure 34 Example of “Locate QuickSyn Device” dialog box

2. Enter a name for the QuickSyn Lite Frequency Synthesizer. The default name is “USBComPort.” The name that is entered here will appear at the top of the Main Control panel, which will help the user differentiate between multiple QuickSyn units attached to the computer.

3. Select the com port to which the QuickSyn Lite Frequency Synthesizer is connected and choose OK.
Step 5-2 Review the Main Control Panel

The QuickSyn Lite Frequency Synthesizer Soft Front Panel is a graphical user interface (GUI) that provides a quick and easy way to exercise the synthesizer’s extensive functionality (see Figure 35). The GUI contains three tabs in the upper-left corner. These tabs represent the three logical groups of functionality—main control, sweep mode, and list mode.

**Figure 35 QuickSyn Lite Frequency Synthesizer Main Control Panel**

**Stop Button** This button is used to stop the soft front panel from reading and writing to the synthesizer; it halts the program and is the preferred way to exit the program.

**Model, Serial Number, Firmware Ver, Calibration Date** The information area, located in the upper-left corner of the Main Control panel, reveals the synthesizer’s model number, serial number, firmware version, and the date when the unit was last calibrated. This information cannot be changed with the soft front panel.

**NOTE** Please have the information from the main control panel readily available when contacting NI Microwave Components regarding questions about your synthesizer.
**Start Ref Cal** This button, when selected, will initiate the calibration of the synthesizer’s TCXO internal reference. The process will take approximately six minutes to complete and while in process, the indicator to the right of the button will blink. After the reference calibration is completed, the indicator will remain on.

When the reference calibration is successful, the calibration data will automatically be stored in the synthesizer’s permanent memory and the date of calibration will be updated. If the reference calibration fails, the previous calibration data is retained and no changes are made to the calibration date.

**NOTE** Connect a 10 MHz reference standard to the REF IN connector on the front panel of the synthesizer before starting the reference calibration process.

**Synthesizer Frequency** This rotary control (along with an entry box) is used to select a fixed frequency. A frequency value may be selected by pointing the rotary control and dragging it around to the left or right until the desired frequency is reached. The Locked indicator will illuminate when the synthesizer settles on the target frequency. The value is displayed in the entry box below the rotary control. The entry box value may be changed by highlighting the number and entering in the desired value or by using the up/down arrows to the left of the entry box. The default frequency is 10,000 MHz. Refer to the synthesizer’s data sheet for applicable frequency range. Data sheets are located on the Ni Microwave Components website (www.ni-microwavecomponents.com).

**Lock Recovery** When this check box is selected, the synthesizer will automatically attempt to recover a lost or unestablished frequency lock. Three attempts will be made to recover the lock. The Locked indicator will no longer illuminate if the synthesizer cannot recover the frequency lock. The lock recovery function is on by default.

**Locked** This indicator illuminates when the synthesizer settles on the target frequency.

**RF Output** This button enables the user to choose between RF power output on or off. By default the RF Output button is off. The button will illuminate when on.
**Reference Indicators** The Ext. Detect indicator will illuminate to indicate when the synthesizer has detected an external reference source. The Int. Detect indicator will illuminate to indicate the internal reference source is selected. The Lock indicator will illuminate to indicate the synthesizer has locked to the source.

**Reference Source** These radio buttons are used to select between External and Internal reference sources. Internal is the default selection.

- When External is selected, the synthesizer will detect and lock to the user-supplied 10 MHz external signal.

- When Internal is selected, the synthesizer will lock to its temperature-controlled crystal oscillator.

To lock to an external reference, connect an external reference source to the REF IN connector located on the synthesizer’s front panel and select the External button.

**NOTE** External reference frequency input must be within 10 MHz ±2 ppm.

**Internal Reference** The Output button enables the user to choose between reference power output on or off. The button is illuminated when on and is on by default. When the Output button is off, the signal is muted and the button is no longer illuminated.

**Temperature, Frequency, Reference** These settings and status indicators (see Figure 36) located near the bottom of the Main Control panel indicate the synthesizer’s internal temperature and provide the currently selected frequency value and reference type. The values in these indicators will update as settings and temperature change.

**Figure 36** Settings and status indicators

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Frequency</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.8°C</td>
<td>10000.000000000 MHz</td>
<td>INT</td>
</tr>
</tbody>
</table>
**Command Window**  Located in the lower-left corner of the Main Control panel is a command window (see Figure 37) that displays all the commands used during a session and is intended to aid in the development of programs to control the synthesizer.

**Figure 37 Command Window**

![Command Window](image)

**Self Test**  The Start Test button will initiate the synthesizer’s self-test routine, which will check frequency lock, bias voltage, and temperature. The indicator above the Start Test button will show Passed or Failed based on the results of the test. Failed parameters will be listed in a separate popup screen.

**Instrument State**  The buttons in the lower-right corner of the Main Control panel enable the user to save, recall, and reset settings.

- When Save as Default is selected, the current reference and frequency settings are stored as the new default settings.

- When Recall Default is selected, the settings previously saved as default settings are recalled.

- When Set to Factory Default is selected, the synthesizer’s factory-defined default settings (see Table 1) are restored, replacing previously user-defined settings.

**Table 1 Factory Default Settings**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Output</td>
<td>on</td>
</tr>
<tr>
<td>Frequency</td>
<td>10 GHz</td>
</tr>
<tr>
<td>Output Power</td>
<td>on</td>
</tr>
<tr>
<td>Reference Source</td>
<td>Internal</td>
</tr>
<tr>
<td>Reference Output</td>
<td>on</td>
</tr>
</tbody>
</table>

The Sweep Mode panel, as shown in Figure 38, is accessible by

**NOTE**  When the synthesizer is turned on, the instrument state returns to the last saved state; thus, if no user-defined settings are saved, the factory default settings are used.
Step 5-3 Review the Sweep Mode Panel

selecting the Sweep Mode tab located in the upper-left corner of the Main Control panel. The Sweep Mode panel allows the user to set triggering, sweep direction, frequency range, and step size.

Figure 38 Sweep Mode Panel
**Set Trigger**  The radio buttons in the Sweep Settings (Common) area of the Sweep Mode panel allow the user to set parameters that are common to frequency sweeps.

- When No Trigger is selected, sweeps begin immediately after selecting the Start Sweep button.
- When Enable List Trigger is selected and the Start Sweep button is pressed, a full sweep of all list points begins when a hardware trigger is detected.
- When Enable List Point Trigger is selected and the Start Sweep button is pressed, one sweep point is output for each hardware trigger received.

**NOTE**  A hardware trigger is a 0/3.3 V pulse signal applied to pin 14 (trigger) of the SPI interface connector. A trigger is initiated on a low-to-high transition.

**Dwell Time (usec)**  The Dwell Time entry box is used to enter the dwell time, which is the time each point in the sweep will remain static before moving to the next point. The dwell time is not used when Enable List Point Trigger is selected. To enter a dwell time, highlight the entry box and enter a value. Use the up/down arrow on the left side to raise or lower the value.

**NOTE**  Switching speed (from one frequency point to another) in Normal Mode is 200 μs. Sweeps can be as fast as 100 μs per point in Fast Mode. However, the number of points allowed is limited to 32,000. Therefore, use Normal Mode for sweeps that require a number of points over 32,000.

**Sweep Direction**  The buttons under Sweep Direction allow the user to set sweep direction.

- When Up is selected, sweeps occur from start frequency to stop frequency.
- When Down is selected, sweeps occur from stop frequency to start frequency.
- When Up and Down is selected, the synthesizer sweeps in both ascending and descending order.

**Number of Sweeps**  This entry box is used to define the number of times a sweep is executed. To enter a number of sweeps, highlight the entry box and enter the desired value. The up/down arrow on the left side of the entry box can be used to increase or decrease the value.
Continuous On/Off When this button is selected, the indicator will illuminate, and sweeps will continue until the Stop Sweep button is selected.

Sweep Mode The buttons in the Frequency Sweep Settings area of the Sweep Mode panel allow the user to set the parameters necessary for frequency sweeps.

• When Normal Mode is selected, the Start Freq, Stop Freq, and Step Freq entry boxes are available for the user to enter values.

• When Fast Mode is selected, the Start Freq, Stop Freq, and Number of Points entry boxes are available for the user to enter values. The Step Freq entry box is disabled as the synthesizer will pre-calculate the step frequency based on the number of points specified in the Number of Points entry box located above the Start Sweep button.

Start Freq, Stop Freq These entry boxes are used to select the frequencies that the sweep will start and end with. To enter a value, highlight the number in the box and enter the desired value or use the up/down arrows to the left of the entry box.

Step Freq (MHz) This entry box is used to select the frequency step between sweep points. To enter a value, highlight the number in the box and enter the desired value or use the up/down arrows to the left of the entry box. This box is only available when Normal Mode is selected.

Number of Points This entry box is used to select the maximum number of points to sweep. To enter a value, highlight the number in the box and enter the desired value or use the up/down arrows to the left of the entry box. Values above 32,000 are not allowed when Fast Mode is selected. This box is only available when Fast Mode is selected.

Start Sweep The Start Sweep button under the Frequency Sweep Settings area of the Sweep Mode panel is used to execute frequency sweeps after parameters are set.

Stop Sweep The red Stop Sweep button under the Frequency Sweep Settings area of the Sweep Mode panel is used to halt frequency sweeps.

NOTE When exiting the Sweep Mode panel, a reset command is issued and the synthesizer returns to its last saved state.
Step 5-4 Review the List Mode Panel

The List Mode panel, as shown in Figure 39, is accessible by selecting the List Mode tab located in the upper-left corner of the Main Control panel. The List Mode panel allows the user to setup and execute a list of triggered sequences of synthesizer states.

Figure 39 List Mode Panel

**Set Trigger** The buttons in the Set Trigger area of the List Mode panel allow the user to select trigger mode.

- When No Trigger is selected and the Run List button is pressed, sweeps begin immediately upon execution.
- When Enable List Trigger is selected, a full sweep begins when a hardware trigger is detected.
- When Enable List Point Trigger is selected, one list point is output for each hardware trigger is received.

**NOTE** A hardware trigger is a 0/3.3 V pulse signal applied to pin 14 (trigger) of the SPI interface connector. A trigger is initiated on a low-to-high transition.
**Dwell Time**  The buttons in the Dwell Time area of the List Mode panel allow the user to choose between List Point Dwell Time and Global Dwell Time. Dwell time is the time that each point in the sweep will remain static before moving to the next point

- When Use List Point Dwell Time is selected, the synthesizer uses the user-specified time value for each list point.
- When Global Dwell Time is selected, the Global Dwell Time entry box becomes available, and a value in microseconds can be entered.

**Global Dwell Time**  This entry box is used to specify the time in microseconds that each point will remain static before moving to the next point. To enter a value, select the option button next to Global Dwell Time, highlight the number in the box, and enter a value or use the up/down arrows.

**Sweep Direction**  The buttons under Sweep Direction allow the user to set sweep direction.

- When Up is selected, sweeps occur in ascending order.
- When Down is selected, sweeps occur in descending order.
- When Up and Down is selected, the synthesizer sweeps in both ascending and descending order.

**Number of Sweeps**  This entry box is used to define the number of times a sweep is executed. To enter a number of sweeps, highlight the entry box and enter the desired value. The up/down arrow on the left side of the entry box can be used to increase or decrease the value.

**Continuous On/Off**  When this button is selected, the indicator will illuminate, and sweeps will continue until the red Stop List button is selected.

**Erase List**  When the Erase List button is selected, an erase-list command is sent and prepares the synthesizer for a new list.

**Create/Edit List**  This button is used to enable the Edit List dialog box (see Figure 39).

**Run List**  The Run List button is used to execute a sweep per a list that has been created in the Edit List dialog box.

**Stop List**  The Stop List button is used to halt a sweep running in list mode.
**List Load Progress**  The List Load Progress indicator displays the progress of the list loading after the Load Current List button in the Edit List dialog box is selected. The Ready indicator will illuminate when the list is loaded and ready to be executed.

**Run List Point**  This button is used to run the point number specified in the Point Number entry box located next to the Run List Point button.

**Point Number**  The Point Number entry box is used to specify the point number in the list to run when the Run List Point button is selected. To specify a value, highlight the number in the box and enter a new value or use the up/down arrows on the left side of the entry box.

**NOTE**  When exiting the List Mode panel, a reset command is issued and the synthesizer returns to its last saved state.
Step 5-5 Review the Edit List Dialog Box

The Edit List dialog box, shown in Figure 40, is accessible by selecting the Create/Edit List button on the List Mode panel.

**Figure 40** Edit List Dialog Box

![Edit List Dialog Box](image)

**Point Number, Frequency, Dwell Time** These entry boxes enable the user to specify point number, frequency, and dwell time values for creating sweep lists. To specify a value in these entry boxes, highlight the number in the box of the parameter you wish to set and enter a new value or use the up/down arrows on the left side of the entry box.

**Output ON/OFF** The Output ON/OFF buttons located next to the Dwell Time entry boxes in the Edit List dialog box are used to control the RF output signal at the specified point. When selected the indicator on the button will illuminate and RF output will be enabled.

**Clear Current List** This button is used to clear data in all entry boxes in the Edit List dialog box.
Create New List  When the Create New List button is selected, the Create List dialog box (see Figure 42) appears.

Get List From File  This button is used to locate and retrieve a previously defined and saved list. Selecting the Get List From File button launches a browsing window that will enable the user to find the file.

Save List to File  This button enables the user to save a list to a file. Selecting the Save List to File button launches a browsing window (similar to the one shown in Figure 41) that will enable the user to save a file on the computer.

Load Current List  This button is used to load a list into the synthesizer from the the Edit List dialog box.

Cancel  The Cancel button in the Edit List dialog box closes the dialog box and does not save the values entered in the entry boxes.
Step 5-6 Review the Create List Dialog Box

The Create List dialog box, shown in Figure 42, is accessible by selecting the Create New List button in the Edit List dialog box. The entry boxes on the Edit List dialog box are automatically populated when the entry boxes within the Create List dialog box are filled and the Create List button is selected.

**Figure 42 Create List Dialog Box**

![Create List Dialog Box](image)

**Begin Frequency, End Frequency** These entry boxes are used to specify the initial and final frequency values the list will start and end with. To enter values, highlight the number in the entry box and enter a value or use the up/down arrow on the left side of the box.

**Dwell Time** This entry box is used to specify the dwell time for all points on the list. To enter values, highlight the number in the entry box and enter a value or use the up/down arrow on the left side of the box.

**Number of Points** The number of points to be included in the list is entered in the Number of Points entry box. To enter values, highlight the number in the entry box and enter a value or use the up/down arrow on the left side of the box.

**RF Output** The RF Output button, when pressed, disables RF output at each point on the list. The button is illuminated when on.

**Create List** Selecting the Create List button executes the action of populating the entry boxes in the Edit List dialog box.

**Cancel** The Cancel button in the Create List dialog box, closes the dialog box and does not save the values entered in the entry boxes.
Service Information

Periodic Maintenance

There are no hardware adjustments within QuickSyn Frequency Synthesizers. We recommend the QuickSyn Lite Frequency Synthesizer is calibrated every 24 months or whenever a problem is suspected. The specific calibration interval depends upon the accuracy required. No periodic preventive maintenance is required.

NOTE Calibration software is available from the NI Microwave Components website (ni-microwavecomponents.com)

Synthesizer Identification

Each QuickSyn Lite Frequency Synthesizer is identified by a model number and a serial number that appear on a label affixed to the synthesizer itself. The model number and serial number must be included in correspondence regarding your QuickSyn Lite Frequency Synthesizer.

Millimeter-wave synthesizer modules contain multiple identification labels since they are comprised of separate components that have model and serial numbers. Figure 43 shows an example label.

Figure 43 Example Identification Label

![Identification Label](image)

Factory Service

If you are returning a QuickSyn Lite Frequency Synthesizer for service or repair, be sure to include the following information with the shipment:
• Name and address of owner

• Model, complete serial number, and firmware version.

• A complete description of the problem. Be sure to provide enough information so that the problem can be verified:
  • Under what conditions did the problem occur?
  • Did the unit work then fail?
  • What other equipment was connected to the synthesizer when the problem occurred?

• The name and telephone number of someone familiar with the problem who can be contacted by NI Microwave Components if any further information is needed.

• The shipping address to which the synthesizer is to be returned. Include any special shipping instructions.

**Shipping Instructions**

1. Place the synthesizer in an antistatic bag or enclosure.

2. Wrap the synthesizer in heavy plastic or kraft paper.

3. Repack the synthesizer in the original container, if available.
   
   If the original container cannot be used, pack the synthesizer in a heavy (275 pound test) double-walled carton with approximately four inches of packing material between the synthesizer and the inner carton.

4. Seal the carton with strong filament tape or strapping.

5. Mark the carton to indicate that it contains a fragile electronic instrument.

6. Ship the synthesizer to Phase Matrix at the following address:

   NI Microwave Components
   4600 Patrick Henry Drive
   Santa Clara CA 95054
   Tel: 1-408-610-6810
   ni-microwavecomponents.com
DECLARATION OF CONFORMITY

Manufacturer's Name: Phase Matrix, Inc.
Manufacturer's Address: 4600 Patrick Henry Drive
                     Santa Clara CA 95054
Product Name: QuickSyn® Synthesizer
Model Number: FSW-0010, FSW-0020

Statement: Phase Matrix, Inc. declares that the aforementioned product(s) conform(s) to the following Council Directives of the European Union:

Rohs Directive 2011/65/EU
Low Voltage Directive 2006/95/EC

Test method(s) used¹:
  EN/IEC 61010-1:2001—Safety requirements for electrical equipment for measurement, control, and laboratory use.
  EN 55011:2007—Industrial, scientific, and medical (ISM) radio-frequency Equipment. Electromagnetic disturbance characteristics. Limits and methods of measurement

Related data²:
  MIL-STD-461F (RE102 & RS103)—DoD Interface Standard: Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment (10 kHz to 40 GHz).
  FCC 15B/ICES-003 CLASS A—Conducted and radiated emissions.

* Independently audited by BACL Labs. Test reports on file for review. Contact the sales department of Phase Matrix, Inc. for more information.

Authorized Signature:

Mark Espinosa
Quality Assurance Manager

10-02-2017

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