LATITUDE®–PACEART® INTEGRATION SYSTEM DIAGRAM

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b. LATITUDE environment
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d. Data retrieval from LATITUDE Communicator
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g. Data import to clinic by LATITUDE Integration
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Dial-up telephone connection
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PURPOSE

The purpose of this guide is to provide information technology personnel with a basic understanding of the LATITUDE®–Paceart® Integration software. Personnel that are responsible for administering LATITUDE Integration software at your clinic can use this document to:

• Familiarize themselves with components of the integration software
• Determine how to configure the application
• Understand how to maintain the application

A basic understanding of the system components, processes, and associated terminology can help you and other administrators support the system and troubleshoot problems, should they arise.

NOTE: It is assumed that you are a Windows administrator and are very familiar with Windows administration tasks. It is also assumed that you are proficient in using the Windows operating system and understand how to implement your clinic’s security policies for patient data records.

1. LATITUDE®–PACEART® INTEGRATION PRODUCT DESCRIPTION

LATITUDE Patient Management is a remote monitoring system that gathers follow-up data from patients’ implanted cardiac devices and furnishes it to clinicians. The LATITUDE Communicator is an in-home monitoring system that gathers data from a patient’s implanted device and sends it to the LATITUDE secure server. Using a standard Web browser, authorized clinicians can view this data on a secure website hosted on the LATITUDE server.

The LATITUDE–Paceart Integration (LPI) software is used in conjunction with LATITUDE Integration software to transfer data files from the Boston Scientific LATITUDE Patient Management system to your clinic's Paceart system. The LPI software is compatible with Paceart Get Connected II edition or later.

The system provides data delivery and accuracy through industry standard mechanisms including transmission encryption through Secured Sockets Layer (SSL), data encryption while data is at rest, authentication through the use of certificates, and, where possible, hash validation checks of the data. For detailed information about the LATITUDE Integration software refer to the LATITUDE Integration Guide.

2. APPLICATION OPERATING LOGIC

2.1 Environments

Three physical locations are involved in the integration process:

• Patient Environment. Physical location of the configured LATITUDE Communicator, e.g., the patient’s home.

• LATITUDE Environment. The LATITUDE secure server receives device data from the LATITUDE Communicator and sends it to the LATITUDE Integration application which resides at the clinic. The LATITUDE website is where clinicians first review detailed device and patient data.

• Clinic Environment. The clinic environment is the final destination for the data. The clinic environment includes the LPI components, Paceart, and the physicians and clinicians who monitor their patients’ data.
2.2 Data events

Four major data events take place in the LATITUDE® Integration process:

- Data retrieval – LATITUDE receives implanted device information sent by LATITUDE Communicators using secured Internet connections.
- Patient record dismissal – After an authorized clinician reviews the retrieved data on a secured website, LATITUDE packages a copy for transmission to the clinic.
- LATITUDE data transfer – the data package is transferred to the clinic for integration into CIS/EMR.
- Paceart® data import - the data package is formatted and made available for import into Paceart.

The component model on the inside front cover depicts all four of these processes. The first three processes are described in more detail in the LATITUDE Integration Guide. Only the fourth, the operation of LATITUDE–Paceart Integration (LPI), is described in this guide.

2.3 User input and control

LPI is designed to operate seamlessly in the background. Outside interaction is limited to three areas:

- Initial system configuration during installation
- Clinician review of patient data
- Periodic security certificate renewal

File maintenance operations such as archiving patient data files and system logs are considered ordinary network administration tasks and are outside the operation of the LPI program.

2.4 Paceart® data import

The LPI software (i.e., LPI File Conversion Module) operates after the LATITUDE Integration cycle has completed. LPI transforms LATITUDE HL7 messages into Paceart XML messages and sends them to Paceart Gateway Services to be imported into the Paceart database.

2.5 LPI conversion module

The LPI software scans a secured directory on your network for the HL7 files placed there by the LATITUDE Integration module. The following process is followed each time a file is processed.

1. Decrypt the HL7 file into a readable format.
2. Parse the HL7 file to get each individual data element.
3. Validate the data by checking data elements and CRC hash values.
4. Transform the HL7 data elements into the Paceart XML schema.
5. Establish a secure (HTTPS) connection to the clinic's Paceart server.
6. Transfer the XML data set to Paceart.
7. Wait for a successful return code from Paceart®.
An appropriate message is written to the applications activity log file if any of these steps fails. Key transaction activity messages are written for successful completions. See “Event logging and log files” on page 30 for more information.

LPI can be configured to save all incoming HL7 files and outgoing XML files as needed for troubleshooting.

2.6 Paceart® system

LPI uses existing Paceart functionality to import data from the LATITUDE system. When Paceart receives data from the application, it saves the data elements in its internal database for subsequent viewing and analysis by Paceart users. The Paceart Get Connected II edition or later will integrate with the LATITUDE system. See the Paceart Administrator’s Guide for details.

2.7 Data and information security controls

LPI uses industry standard security controls to ensure data integrity and security throughout the import process. Security controls include:

- Data encryption requires incoming HL7 files to be encrypted to ensure data integrity while the file is at rest on the computer.
- Data signing techniques ensure that the file being processed originated on the LATITUDE system.
- HTTPS is the transport protocol between the application and Paceart that provides data encryption while data is moving between systems.
- CRC and data hashing provide a mechanism to prove that the data received was the data that was sent.

Combining these security controls ensures that data being received by the clinic:

- was sent by LATITUDE
- was not altered during the transmission or import processes, and
- could not be viewed while the files were waiting to be processed.

3. INSTALLATION

Once both the LATITUDE Integration application and the LATITUDE–Paceart Integration software have been successfully installed and tested, your clinic will be able to securely retrieve HL7 data files from the LATITUDE secure server and import them into your Paceart system. Depending on the needs of your own clinic, patient data may also be imported into an EMR or CIS system outside the Paceart environment.

NOTE: The LATITUDE Integration application must already have been installed and tested before attempting to install LPI.

NOTE: The installation assumes that you are a Windows administrator and that are very familiar with Windows administration tasks. It is also assumed that you are proficient in using the Windows operating system and understand how to implement your clinic's security policies for patient data records.

This section describes the step-by-step process of installing the LPI application. The following steps must be completed in sequence.
1. Make sure that all basic requirements are met and the proper hardware and software is available.
2. Login as the LATITUDE UEMRAadmin.
3. Place all the distribution files on the target computer in a directory where the UEMRAadmin user account has read/write security access.
4. Install the LPI software by executing the setup program.
5. Install the security certificate.
6. Configure LPI.
8. Test the application.
9. Verify the installation.

3.1 Basic requirements

LPI adds additional software requirements to the basic hardware, software and environment requirements of the LATITUDE® Integration application.

3.1.1 Hardware and OS

The LATITUDE Integration application runs on a single computer within your clinic's network. It requires one of the following operating systems:

- Windows Server 2000
- Windows Server 2003
- Windows Server 2008
- Windows Server 2012
- Windows XP
- Windows 7
- Windows 8
- Windows 2000 Workstation

The computer must meet the following minimum hardware requirements.

- 512 MB RAM
- 100 MB disk space for application (does not include storage space for incoming HL7 files)
- 1 GB disk space for data storage (see the following section for a more detailed estimate)
- Network card with Internet connectivity through port 443 (SSL) - to retrieve the HL7 files from LATITUDE.
- Network connectivity to the EMR or CIS computer system - to provide the files to the EMR or CIS.
3.1.2 Data storage requirements

Data storage requirements can be determined by using the following formula.

\[ s = \text{Approximate size of each HL7 file, typically 18Kb. (Note that this is a conservative estimate. Files grow larger in proportion to the number of reportable events.)} \]

\[ n = \text{Approximate number of HL7 files to be transferred per day. This figure depends on the number of patients on the LATITUDE® system and how often data is sent from their implanted devices. On average, a clinic with 75 patients will receive 3-5 files per day. However, these estimates are based on how your clinic has configured LATITUDE remote monitoring for each patient.} \]

Estimated data storage (KB) needed per year = \((s \times n) \times 365\)

The `lpi.activity.log` file will expand at a rate of approximately 95 MB per month, assuming a 60 second polling interval and nominal patient activity. Growth of your log file may be different. Log files should be checked on a regular basis for size and errors.

Other considerations when determining disk space requirements include understanding Paceart® storage needs; determining how long HL7 files will be saved before removing them from the LPI computer; and any log file rotation scheme used at your clinic. LPI will not store data unless the “save files” configuration option is set.

These disk space estimates are in addition to the disk space required by the LATITUDE Integration software.

3.1.3 Software and environment requirements

In order to successfully transfer HL7 data files from LATITUDE to Paceart, the following software and system parameters are required:

- The latest version of the LATITUDE Integration software must be installed and functioning correctly
- Paceart Get Connected II (or later) server and client must be installed and functioning correctly
- Paceart Get Connected II (or later) Gateway Services must be installed and configured correctly and have a Paceart–provided unique certificate installed. It must also be configured to receive data from “LATITUDE.” See Paceart Gateway Services in the Paceart System Administrator’s Manual for specific installation and configuration instructions.
- LPI must have access to the local HL7 data file directory
- LPI should not be run on Citrix or a similar server
- LATITUDE clinic language must be set to English
- Your clinic-specific Paceart computer name is needed during system configuration

3.1.4 User requirements

Do not attempt to install LPI unless a LATITUDE UEMRAadmin user account exists with permissions to:

- Install the LATITUDE–Paceart Integration software on the computer
- Manipulate and configure the Java Runtime Engine
- Configure and execute the LATITUDE®–Paceart® Integration service on the computer
- Access local directories and/or network shares where HL7 files will be deposited
Use the UEMRAAdmin account created during the LATITUDE Integration software installation. It is strongly suggested that proper security permissions be set on the HL7 directories. The UEMRAAdmin account must have access to these directories and access by other accounts should be limited.

### 3.2 Install application

LPI must be installed on the same clinic computer that runs the LATITUDE Integration application.

The following steps describe how to install the LPI application.

1. Log on using the UEMRAAdmin account and password.

2. Locate the LATITUDE–Paceart Integration installation files on the program distribution PEN drive. (You may either copy these files to a local directory that has UEMRAAdmin access or you may run the installation directly from the PEN drive.) In either case, begin the installation by running `LATITUDE_Paceart_Integration_6472_Setup-x.xx.exe` where x.xx is the version number.

**NOTE:** When installing LATITUDE Paceart Integration on a 64-bit operating system, the `LATITUDE_Paceart_Integration_6472_Setup-x.xx.exe` file must be run in 32-bit compatibility mode.

![Compatibility mode settings](image-url)
3. Select **Installer Language** and click **OK**.

**NOTE:** Only languages which are installed in the operating system will appear as options. Installation error messages are presented in English with numeric error codes. Translations of these numbered messages appear in a table at the end of this guide.

![Installer Language window](image)

4. Click **Next** on the Welcome Screen.

![Welcome Screen](image)

**LATITUDE™ Paceart Integration - LPI 1.01 Setup Wizard.**

This wizard will guide you through the installation of LATITUDE™ Paceart Integration - LPI 1.01.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.
5. Read the **License Agreement** and accept the terms of the license agreement if you agree. Click the Next button to continue. Note: You must agree to the terms of the license agreement before you can install this product.

6. Although using the default destination folder is strongly advised, you may browse to and select another location. *(The illustrations in this manual refer to the default destination folder.)* Click **Install** to start the installation process.
7. After the installation process has completed, click **Finish** to conclude the installation and close the wizard.

Congratulations! The LATITUDE®–Paceart® (LPI) Integration application is now installed on your machine. Files have been placed in the installation directory and a new LATITUDE–Paceart Integration service has been added to the Windows Services applet. However, further configuration is required before LPI can export patient data to Paceart. The configuration process is explained in the following sections.

### 3.3 Install certificate

Valid security credentials must be installed before LPI can read data that has been transferred from LATITUDE to your clinic. The following steps describe how to install the clinic-specific certificate provided under separate cover by Boston Scientific.

#### 3.3.1 Creating license file

1. Log on using the UEMRAdmin account and password.

   **NOTE:** The LATITUDE–Paceart Integration service must be run on the same computer using the same account that is used to create the license file. The license file must be recreated if the application is ever moved to another machine.

2. Ensure that the LATITUDE Integration application, Java Runtime Engine version 1.6.0 or greater (32-bit version), and Java Unlimited Jurisdiction Pack are installed. If not, go back to those sections and complete those processes before continuing.

3. Locate your clinic–specific certificate (xxxx.P12). This file should have been received under separate cover from Boston Scientific. If you have not received this certificate, please contact LATITUDE Customer Support.
4. Locate your clinic-specific certificate password. You should have received a phone call from Boston Scientific during which you were given this password. Please contact LATITUDE Customer Support if you have not received it.

5. Copy the .P12 certificate file into the LATITUDE–Paceart Integration ./certs directory as shown below. Your actual certificate will have a different name than the one in the example.

![Image of file structure]

6. Open a **Command Prompt** and navigate to the LPI directory (e.g., C:\Program Files\Boston Scientific\LATITUDE Integration\LPI).  

7. Create your computer specific license file by issuing the following command at the command prompt:

   ```
   install_license certs\<cert filename> <cert password>
   ```

   The command does not return messages for successful file creation or incorrect password entry.

   If you receive a “The system cannot find the path specified” error check the JAVA_HOME environment variable to ensure that it is set correctly. See the LATITUDE Integration Guide for more information about the JAVA_HOME environment variable.

A license file with an .lic file extension will be created in the certs directory upon successful completion of this step.

You have now created an encrypted license file that LPI will use to authenticate your clinic when it connects to LATITUDE®. This license file cannot be used on any other computer in your clinic. If you reinstall the LPI application on a different computer, you must create a new license file for that computer by following this process again.

3.4 Configure Windows services

Since LPI runs as a service inside Windows, you must configure that service within Windows before it will operate properly.

The following steps describe how to accomplish this:

1. Log on with the UEMRAadmin account and password.

2. Open the Services applet in Administrative Tools and scroll down to LATITUDE Paceart Integration.
If the LATITUDE®–Paceart® Integration service is not listed in the services applet, there is a batch file in the LATITUDE–Paceart Integration distribution that can be used to install the service:

a. Navigate to the LPI installation directory (C:\Program Files\Boston Scientific\LATITUDE Integration\LPI is the default location) in My Computer or Windows Explorer.

b. Double-click on install_service.bat to install the LATITUDE–Paceart Integration service. Upon completion LPI will be added to the Services applet. Note that the windows services may need to be refreshed for LATITUDE–Paceart Integration to appear on the services list.
3. **Double-click** on the **LATITUDE–Paceart Integration** service to open the properties pane.

![LATITUDE-Paceart Integration Properties](image)

**NOTE:** *Startup type should be set to Automatic. This causes the LPI service to be started when the computer is started.*

4. Click the **Log On** tab to open the log on information.

5. Click the **This account** radio button and fill in the information as shown in the following example.

![LATITUDE-Paceart Integration Properties (Local Computer)](image)

This allows the LPI service to run under the UEMRAadmin account as required. LPR will not run under the “Local System account.”

**NOTE:** *The password will need to be entered even though the dots indicate that it is already there.*

6. Click **OK** to close the Properties pane.
7. Close the Services window.

You have now configured the LATITUDE®–Paceart® Integration service to use a specific user account and password. If the user account ever gets deleted or if the password ever expires, the LPI service will fail to start and data will not be exported to Paceart.

The LPI service is now configured. The next step is to configure the application itself. Continue to “UEMR.XML Configuration” to properly configure LATITUDE Integration.

3.5 UEMR.XML configuration

Your existing LATITUDE Integration installation must be modified to work with the LATITUDE–Paceart Integration software. Changes must be made to the UEMR.XML configuration file in the LATITUDE Integration installation ./certs directory (C:\Program Files\Boston Scientific\LATITUDE Integration\UEMR by default).

Follow the steps below to configure the uemr.xml file to work with LPI. Log on with the UEMRAdmin account.

1. Locate the uemr.xml file in the <install dir>\config directory. Note there may be other configuration files in the config directory. These files are used by LATITUDE Integration and should not be changed unless instructed by Boston Scientific.

2. Edit the uemr.xml file using your favorite text editor. (Notepad or WordPad will work fine.) Below is an example uemr.xml file before any modifications.

3. Find the end of the global section by searching for the </global> tag.

4. Insert the following line above the </global> tag.

   <crc-mode>downstream</crc-mode>

This entry will cause the application to create a CRC file for the LPI software to process.
5. Search for the <drop-zone-paths> section. There is a line that defines where the application places files it retrieves from LATITUDE®. In the example above the line is:

   <local-path uri="c:\UEMROutbox" />

LPI requires that all incoming files are encrypted. Therefore, the UEMR software must encrypt the files before writing them to the drop-zone-paths specified.

To encrypt files, add the certificate attribute to the local-path entry as shown below.

   <local-path uri="c:\UEMROutbox" certificate="certificate name"/>

Use the same license file name that was used in the pickup-zone-paths certificate entry (do not include the .LIC extension). Make note of the license file name used in this step; it will be needed later in the system configuration process.

6. An example of the final uemr.xml file is shown below. Inspect your uemr.xml file to insure proper configuration.

```xml
<?xml version="1.0"?>
<config xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="config/uemr.xsd">
  <!-- Global configurations -->
  <global>
    <verbose>false</verbose>
    <polling-interval>60</polling-interval>
    <retry-count>4</retry-count>
    <crc-mode>downstream</crc-mode>
  </global>
  <!-- LATITUDE Pickup Zone -->
  <pickup-zone name="LATITUDE">
    <pickup-zone-paths>
      <webdav-path certificate="sc_12345" url="https://www.latitude.com/clinic/files" />
    </pickup-zone-paths>
    <drop-zone-paths>
      <local-path uri="c:\UEMROutbox" certificate="sc_12345" />
    </drop-zone-paths>
  </pickup-zone>
</config>
```

Parameter added in Step 4  Certificate name added in Step 5

7. Save the uemr.xml file and exit the editor.

8. Reset the UEMR service by first running `stop_service.bat` and then `start_service.bat`.

These files are located in the UEMR installation directory (default is C:\Program Files\Boston Scientific\LATITUDE Integration\UEMR). See the “Starting and Stopping the Service” section in LATITUDE Integration Guide for more information.

### 3.6 LPI.XML configuration

The example lpi.xml file contains the configuration parameters for the LATITUDE®–Paceart® Integration software. This section does not explain all of the optional settings in the lpi.xml file. Only those required to run LPI are described here. Refer to the “LATITUDE–Paceart Integration Configuration Detail” section later in this document for more detailed information.
Perform the following steps to configure LPI to process incoming HL7 files and export them to Paceart. These steps assume that LPI has been installed and the appropriate license file has been created.

1. Login to the machine using the UEMRAdmin account and password created earlier.

2. Locate the example-lpi.xml file on the distribution media in the \LATITUDE_Paceart_Integration directory.

3. Copy the example-lpi.xml file and rename it lpi.xml in the <install dir>\config directory.

4. Locate the directory where LPI will read incoming HL7 files. This must be the drop zone directory configured during LATITUDE EMR Integration. It may be on the local machine or a network share. Ensure that the UEMRAdmin account has read/write privileges to this directory.

   For this example, we'll assume the directory is c:\UEMROutbox.

5. Locate the name of the license file created earlier. For this example we'll use SC_12345.lic as the example license file name.
6. Edit the lpi.xml in a text editor. (Notepad or WordPad will work fine.) Below is an example lpi.xml file before any modifications:

```xml
<?xml version="1.0" encoding="utf-8"?>
<config xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="config/lpi.xsd">
    <global>
        <verbose>false</verbose>
        <crc-input-mode>or</crc-input-mode>
        <delete-input-files>true</delete-input-files>
        <!-- Paceart https address, username and password -->
        <https-interface paceart-uri="https://ADD PACEART MACHINE:443/"
            trusted-certificate-path="certs\PACEART_ROOT.cert.jks"
            auth-id="cxHkCVZzP1UUJ2T/svwyqtzd4yBo2urKwG4Uk4o61sdBFPSQ="
            auth="Pj7t90+ehhm4/S/21mOAX1Knza76LdTHG32wPqECmHRRtiC55Q="/>
    </global>
    <!--- EACH PICKUP-ZONE CAN OVER RIDE THE VALUES OF GLOBAL SECTION. -->
    <pickup-zone name="Pickup1">
        <pickup-zone-paths>
            <pickup-zone-path path="ADD PICKUP PATH"
                certificate-path="certs\ADD CERT NAME"/>
        </pickup-zone-paths>
    </pickup-zone>
</config>
```

7. Edit the paceart-uri entry by searching for “ADD PACEART MACHINE” and replace it with the name of your Paceart server, including the quotes. For example, if LPI is installed on the Paceart computer, the final Paceart-uri entry would be:

```
paceart-uri="https://localhost:443"
```

8. Edit the pickup-zone-path entry searching for “ADD PICKUP PATH” and replace it with the path to the location of the incoming HL7 files - including the quotes. An example of the entry would be:

```
pickup-zone-path path="C:UEMROutbox".
```

9. Edit the pickup-zone-path certificate-path entry by searching for “ADD CERT NAME” and replace it with the name of the .LIC file you created earlier- including the quotes and .lic extension. In this example it would be: pickup-zone-path certificate-path="certs\sc_12345.lic". The license file name must be an exact match (with the addition of the .lic) of the name used in the UEMR.XML config file in order for decryption to be successful. Ensure that the names match by reviewing the UEMR.XML configuration file.

10. The final lpi.xml file is shown below. Inspect your lpi.xml file to ensure proper configuration.
11. Save the lpi.xml file and exit the editor.

3.7 Paceart® Gateway Services configuration

Check the Paceart® Gateway Services application under the Local Acquisition Service tab. Verify that LATITUDE® is listed in the “Enabled for Import” field. For additional information on the Gateway services configuration refer to the Paceart System Administrator’s Manual or contact Paceart support.

You have completed the configuration steps and are ready to start the LATITUDE–Paceart Integration service.

3.8 Starting and stopping the service

Windows provides a number of ways to start and stop a service. All of those ways will work for LATITUDE–Paceart Integration. In the Services pane of the Windows Administrative Tools the LPI service will be listed as LATITUDE Paceart Integration. The service is set to start automatically, but you can use the Services pane to start and stop the it as needed.

There are two batch files in the LATITUDE Integration installation directories that can be used to start and stop the service.

Start_service.bat will start the LATITUDE Integration service.

Stop_service.bat will stop the LATITUDE Integration service.
4. TESTING

4.1 Test protocol

Testing the LPI installation involves logging into the LATITUDE website, dismissing a patient record, and comparing that data with the data that appears in Paceart after the LATITUDE processes have completed. Please follow the steps below to verify the operation of your LPI installation.

1. Open a web browser and log in to LATITUDE as a user who has privileges to dismiss patients.
2. Find a patient entry on the Patients for Review page that shows Ready for Review or Review Started in the Disposition column (far right). Any of the patients in the following screen shot could be used for testing.

![Screen Shot of LATITUDE® Patient Management](image)

NOTE: You are working with actual patient data. Patients should not be dismissed without the consent of the clinician. All normal LATITUDE® review procedures should be followed.

3. Place a check in the box to left of the patient's name to be dismissed and then click the Dismiss Patient button. This action will remove the patient from the Patients for Review page and begin the LPI process.

4. Open the ALL PATIENTS tab on the LATITUDE website and find the patient whom you dismissed in the previous step. Make note of the following information to compare with the data that Paceart® will import:
   a. Patient name
   b. Patient date of birth
   c. Device model number
   d. Device serial number

5. Open the Paceart client and find the most recent data for the patient you dismissed from LATITUDE in step 3 above. Verify that the content of the four data points shown on the LATITUDE ALL PATIENTS tab is the same as that shown in Paceart.
4.2 Expected results

The content of the four data points shown on the LATITUDE® ALL PATIENTS tab will be the same as that shown in Paceart®.

NOTE: During the test an Error 6 message might be written to the Paceart log. This occurs when no patients are found with a matching device model or serial number. Refer to Paceart System Administrator’s Manual for additional information about the Paceart log.

4.3 Verification of installation

Once you have completed the installation and configuration, we ask that you send copies of the lpi.service.log, lpi.activity.log, and lpi.xml files to Boston Scientific for our records. Please contact LATITUDE Customer Support for instructions on sending these files.

5. MAINTENANCE

5.1 Certificate renewal

Each certificate used for LPI authentication and authorization has an expiration date. When the certificate expires, it will be necessary to replace the expired certificate with a new certificate provided by Boston Scientific. Once the new certificate is received, the following steps will be used to replace the expired certificate with a new, valid certificate.

1. Stop the LPI and LATITUDE Integration Windows services.

2. Copy the new certificate (.p12 file extension) provided by Boston Scientific to the LPI/Certs folder. (The default location is C:/Program Files/Boston Scientific/Latitude Integration/LPI/Certs). If you receive a “file exists” message, allow the new file to overwrite the old file.
3. Delete the existing .lic file.
4. Extract the .lic file from the new .p12 file using the method described in "Creating license file" on page 9 of this guide.
5. If the new certificate name is different from the old certificate (i.e., you were not prompted to allow a file overwrite in step 2 above), update the LPI.xml with the new certificate name following the procedure in "Creating license file" on page 9 of this manual.
6. Start the LPI and LATITUDE® Integration Windows services.
7. Check the *.activity.log files in the UEMR/Log/ and LPI/Log/ folders to ensure that the two programs are running correctly. (The default locations are C:/Program Files/Boston Scientific/Latitude Integration/UEMR/Log/ and C:/Program Files/Boston Scientific/Latitude Integration/LPI/Log/. See Section 4.1, steps 9–13 in the LATITUDE Integration Guide.)

5.2 Upgrade the LATITUDE®–Paceart® Integration software

To perform a software upgrade for LPI, first uninstall the current LPI software as explained in Section 5.3 below and then follow the initial installation instructions in Section 3.2 to complete the upgrade.

5.3 Uninstall the LATITUDE®–Paceart® Integration software

The following steps will uninstall the LPI application. Make sure to backup any configuration and certificates before proceeding.

1. Log on using the LATITUDE Integration Admin account and password.
2. Open a Command Prompt and navigate to the LATITUDE Integration Installation directory (C:\Program Files\Boston Scientific\LATITUDE Integration\LPI is the default location).
3. From the installation directory, run the command uninstall_service.bat which will stop the service and remove it from the Services list.
4. Copy any important files from the install directory. These may include:

<table>
<thead>
<tr>
<th>Certificates</th>
<th>.\certs*.p12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configurations</td>
<td>.\config\lpi.xml</td>
</tr>
<tr>
<td>Log Files</td>
<td>.\log\lpi.activity.log and .\log\lpi.service.log</td>
</tr>
</tbody>
</table>

5. Delete the install directory. The default directory is C:\Program Files\Boston Scientific\LATITUDE Integration\LPI.
6. Navigate to the location where LATITUDE Integration was depositing HL7 files. Assuming the directory is empty and is no longer going to be used, delete the directory.

LATITUDE–Paceart Integration has now been removed from the computer.

NOTE: The execution of all the uninstall steps previously described is essential for a correct re-installation of LPI.
6. REFERENCE

6.1 LATITUDE®–Paceart® Integration configuration detail

The LATITUDE–Paceart configuration file is the only means of user input into the LPI service. At its most basic level (as seen in the default example) this configuration file controls what data files to retrieve, where to retrieve them from, and how to export them to Paceart. However, LPI allows further flexibility in its configuration. This section describes the configuration parameters available in the LATITUDE–Paceart Integration software.

The configuration file is found in the \config directory of the installation directory and is named lpi.xml. Assuming the default installation directory was used, the configuration file can be found here:

C:\Program Files\Boston Scientific\LATITUDE Integration\LPI\config\lpi.xml

The LATITUDE Integration configuration is an XML file which contains the complete configuration parameters for LATITUDE–Paceart Integration. There are three major sections of the file:

1. Header (not user configured)
2. Global (user configured)
3. Pickup zone (user configured)

Each of those sections is described below.

As is customary with XML files, each section and parameter within a section is started by a start tag and ended with an end tag (i.e., <global>…</global> or <log-path>…</log-path>).

Certain LATITUDE–Paceart Integration configuration parameters must be correct in order for the LPI service to launch. Those parameters have suggested settings set as default values in the supplied uemr.xml file.

The following paragraphs identify the parameters and explain their suggested settings.

6.1.1 Header section parameters

The heading section simply points to the XML schema documentation so the parameters used in the following sections can be validated by the LPI XML parser. No changes are required to this section and there are no parameters contained in this section.

6.1.1.1 Header section example

The following is an example of the header section. The configuration file you received from Boston Scientific may be different from this example. You should not modify the header section in the file you received from Boston Scientific.

<?xml version="1.0"?>
<config xmlns='http://bostonscientific.com/uemr'
   xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance'
   xsi:schemaLocation='http://bostonscientific.com/lpi
   http://bostonscientific.com/lpi.xsd'>
6.1.2 Global section parameters

The global section of the lpi.xml file contains those configuration parameters that apply to all of the pickup zone sections. The global section is opened by the <global> tag and closed with the </global> tag. Certain LATITUDE–Paceart Integration parameters are limited to the global section, while others may be used in either the global or the pickup-zone sections.

For example, LPI has only one log file and that log file is limited to one location. Therefore, the configuration parameter log-path may only be used in the global section. Adding it to a pickup zone section will cause an error and prevent the LPI service from starting.

When considering a global parameter you should take into account the parameter hierarchy:

1. The system parses and sets the global parameters first.
2. If the same parameter exists in both the global and a pickup zone section, the pickup zone instance will override the global instance, but only for that particular pickup zone and only if the parameter is allowed outside the global zone.
3. If only a pickup zone parameter exists, use the pickup zone parameter.

The following parameters must only be used in the global section of the configuration file. Using them elsewhere will cause an error and prevent the LPI service from starting.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>https-interface</td>
<td>Required</td>
<td>Complex XML element with the following attributes.</td>
<td></td>
</tr>
<tr>
<td>paceart-uri</td>
<td>Required</td>
<td>String</td>
<td></td>
</tr>
<tr>
<td>trusted-certificate</td>
<td>Required</td>
<td>Filename as String. All certificates will be stored in \certs folder which will be created during system installation.</td>
<td></td>
</tr>
<tr>
<td>trusted-certificate-path</td>
<td>Required</td>
<td>Path as a String</td>
<td></td>
</tr>
<tr>
<td>auth-userid</td>
<td>Required</td>
<td>Encrypted String</td>
<td></td>
</tr>
</tbody>
</table>
### Parameters restricted to global configuration section

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>auth:</strong> Part two of the encrypted credentials used to authenticate the Paceart® HTTPS session. This value should not be changed unless told to do so by Boston Scientific.</td>
<td>Required</td>
<td>Encrypted String</td>
<td></td>
</tr>
<tr>
<td><strong>transfer-timeout:</strong> Defines the number of seconds to wait for a response code from Paceart after sending an XML interface file.</td>
<td>Optional</td>
<td>Time in sec. Value ranging from 10 to 300 but less than polling-interval minus 5.</td>
<td>50</td>
</tr>
<tr>
<td><strong>verbose:</strong> The level of verbosity when logging LPI events. If set to true additional detail will be logged. Due to log file size, it is recommended that verbose be set to false except when troubleshooting.</td>
<td>Optional</td>
<td>Boolean string – true or false</td>
<td>false</td>
</tr>
<tr>
<td><strong>log-path:</strong> The path where the activity log file will be written. (the name of the file will always be &quot;lpi.activity.log&quot;)</td>
<td>Optional</td>
<td>Path String</td>
<td>./log</td>
</tr>
<tr>
<td><strong>polling-interval:</strong> The number of seconds to wait between checking for input files.</td>
<td>Optional</td>
<td>Integers between 10 and 86400 (24 hours)</td>
<td>60</td>
</tr>
<tr>
<td><strong>error-path:</strong> The path where files that were not successfully imported into Paceart will be written to. This path must exist at startup or the directory will be created.</td>
<td>Optional</td>
<td>Path String</td>
<td>./error</td>
</tr>
<tr>
<td><strong>retry-per-interval:</strong> Defines the number of times per polling-interval that the application will retry a failed transfer attempt</td>
<td>Optional</td>
<td>Number between 0 and 256. Must always be less than polling-interval - 1</td>
<td>4</td>
</tr>
</tbody>
</table>

The following parameters may be included in the global section of the configuration file. They may also be used in other sections which may override the global parameter setting. See the description of the parameter hierarchy above.

### Parameters available in global and pickup zone configuration sections

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>input-file-suffix:</strong> The input file extension used by LATITUDE–Paceart Integration when searching for HL7 files. This parameter is NOT case sensitive.</td>
<td>Change optional</td>
<td>String</td>
<td>hl7</td>
</tr>
<tr>
<td><strong>crc-suffix:</strong> The file extension of the checksum files to be received.</td>
<td>Change optional</td>
<td>String</td>
<td>“crc”</td>
</tr>
</tbody>
</table>
### Parameters available in global and pickup zone configuration sections

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>crc-input-mode</strong>: The input mode for CRC processing.</td>
<td>Change optional</td>
<td>&quot;On&quot; or &quot;Off&quot;</td>
<td>&quot;Off&quot;</td>
</tr>
<tr>
<td>Off - no processing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On - expect to receive a CRC file. If it does not exist, assume the HL7 file is in error and do not process it. Check the CRC file against the HL7 file. If any differences occur do not process the HL7 file. If no differences then process the HL7 file normally.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>crc-input-algorithm</strong>: The CRC algorithm to use when computing and comparing checksums for the incoming HL7 file.</td>
<td>Do not change</td>
<td>MD5</td>
<td></td>
</tr>
<tr>
<td><strong>crc-output-mode</strong>: The output mode for CRC processing.</td>
<td>Optional</td>
<td>&quot;On&quot; or &quot;Off&quot;</td>
<td>&quot;Off&quot;</td>
</tr>
<tr>
<td>Off - no processing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On - create a CRC file for the output XML file.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>crc-output-algorithm</strong>: The CRC algorithm to use when computing and comparing checksums for the XML output file.</td>
<td>Do not change</td>
<td>MD5</td>
<td></td>
</tr>
<tr>
<td><strong>delete-input-files</strong>: Flag indicating whether or not input files should be deleted from the pickup-zone-path once they have been transferred.</td>
<td>Optional</td>
<td>Boolean string – true or false</td>
<td>true</td>
</tr>
<tr>
<td><strong>save-xml-files</strong>: Defines whether or not to save XML files in the save-xml-files-paths once they have been successfully transferred to Paceart®.</td>
<td>Optional</td>
<td>Boolean string – true or false</td>
<td>true</td>
</tr>
<tr>
<td><strong>save-xml-files-path</strong>: Defines where saved XML files will be written once they have been successfully transferred to Paceart. The parameter <strong>save-xml-files</strong> must be “true” to save XML files.</td>
<td>Optional</td>
<td>String</td>
<td>/save</td>
</tr>
</tbody>
</table>

#### 6.1.3 Pickup zone section parameters

A pickup zone is a logical grouping of parameters that define the location the program will retrieve data (pickup zone path) and where it will put it (drop zone path). As with the other sections of the configuration file, some parameters are required and others are optional. While only one pickup zone can be defined in the lpi.xml configuration file, multiple pickup zone paths may be configured.
The pickup zone starts with the `<pickup-zone name=xxxxx>` tag and ends with the `</pickup-zone>` tag. Note that the logical name of this pickup zone (*pickup-zone name*) must be identified by the name attribute (*xxxxx*) in the start tag. The following table outlines the required components of a pickup zone.

**Required pickup zone parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pickup-zone</code></td>
<td>Required</td>
<td>Complex XML element</td>
<td></td>
</tr>
<tr>
<td><code>name</code></td>
<td>Required</td>
<td>String</td>
<td></td>
</tr>
<tr>
<td><code>pickup-zone-paths</code></td>
<td>Required</td>
<td>Complex XML element</td>
<td></td>
</tr>
</tbody>
</table>

In addition, there are a number of optional parameters available for a pickup zone. Many of these optional parameters may also be defined in the global section described earlier. Any optional parameters defined for a pickup zone will override the same parameter defined in the global section.

**Optional pickup zone parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>polling-interval</code></td>
<td>Change</td>
<td>Integers</td>
<td>60</td>
</tr>
<tr>
<td><code>input-file-suffix</code></td>
<td>Change</td>
<td>String</td>
<td>“hl7”</td>
</tr>
<tr>
<td><code>crc-suffix</code></td>
<td>Change</td>
<td>String</td>
<td>“crc”</td>
</tr>
<tr>
<td><code>crc-input-mode</code></td>
<td>Change</td>
<td>“Off” or “On”</td>
<td>“Off”</td>
</tr>
</tbody>
</table>

- **polling-interval**: The number of seconds the application will wait between checking for input files.
- **input-file-suffix**: The input file extension used by the LATITUDE Integration software when searching for HL7 files. This parameter is NOT case sensitive.
- **crc-suffix**: The file extension of the checksum files to be received.
- **crc-input-mode**: The mode for checksum/CRC processing.
  - Off – no CRC processing.
  - On - expect to receive a CRC file. If it does not exist, assume the HL7 file is in error and do not process it. Check the CRC file against the HL7 file. If any differences occur do not process the HL7 file. If no differences then process the HL7 file normally.
### Optional pickup zone parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>crc-input-algorithm:</strong></td>
<td>Do not change</td>
<td></td>
<td>MD5</td>
</tr>
<tr>
<td>The CRC algorithm to use when computing and comparing checksums for the incoming HL7 file.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>crc-output-mode:</strong></td>
<td>Change optional</td>
<td>“Off” or “On”</td>
<td>“Off”</td>
</tr>
<tr>
<td>The output mode for CRC processing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>crc-output-algorithm:</strong></td>
<td>Do not change</td>
<td></td>
<td>MD5</td>
</tr>
<tr>
<td>The CRC algorithm to use when computing and comparing checksums for the incoming HL7 file.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>delete-input-files:</strong></td>
<td>Change optional</td>
<td>Boolean string – true or false</td>
<td>true</td>
</tr>
<tr>
<td>Flag indicating whether or not input files should be deleted from the pickup-zone-path once they have been transferred.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>save-xml-files:</strong></td>
<td>Change optional</td>
<td>Boolean string – true or false</td>
<td>false</td>
</tr>
<tr>
<td>Defines whether or not to save XML files in the save-xml-files-paths once they have been successfully transferred to Paceart.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>save-xml-files-path:</strong></td>
<td>Change optional</td>
<td>String</td>
<td>/save</td>
</tr>
<tr>
<td>Defines where saved XML files will be written once they have been successfully transferred to Paceart. The parameter <strong>save-xml-files</strong> must be “true” to save XML files.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each pickup zone has two complex tags that define the pickup zone paths and the drop zone paths. The following paragraphs define those tags in more detail.

### 6.1.4 Pickup zone paths tag

The pickup zone paths tag defines specifically where to retrieve the files from. It may point to a local or a network path. A pickup zone path tag must have at least one network path or one local path or LPI will not start.

A local path is a directory on the local machine or clinic network. The LATITUDE®–Paceart® Integration admin user must have read/write access to this directory.

The local path and network path are complex XML tags with multiple elements in each. The following table describes the elements.
### Pickup zone path tag parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pickup-zone-paths</strong>: The path where the input file(s) are located.</td>
<td>Required</td>
<td>Complex XML element</td>
<td></td>
</tr>
<tr>
<td><strong>local-path</strong>: Defines a path on a local file system or clinic network where LPI software should retrieve the files.</td>
<td>Required</td>
<td>Complex XML element</td>
<td></td>
</tr>
<tr>
<td><strong>path</strong>: The path to the files enclosed in quotes.</td>
<td>Required</td>
<td>String–file system path</td>
<td></td>
</tr>
<tr>
<td><strong>certificate-path</strong>: The path and filename of the license to use for decrypting the incoming HL7 file.</td>
<td>Required</td>
<td>String–file system path</td>
<td></td>
</tr>
</tbody>
</table>

---

### 6.2 Example LPI.XML configuration

The following example configuration file shows many of the optional parameters. The example shows how the parameters would be used even though it may not make sense to use such a configuration for your installation.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<config xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="config/lpi.xsd">
  <global>
    <verbose>false</verbose>
    <crc-input-mode>on</crc-input-mode>
    <delete-input-files>true</delete-input-files>

    <!-- Paceart https address, username and password-->
    <https-paceart-url>"https://ADD PACEART MACHINE:443/"
    trusted-certificate-path="/certs"
    auth-id="cXhMCZ2pZpUUj2T/svvyqtZ4yBO2uRkqvP9MeGPUk4o613gFBPSQ=="
    auth="pPjt90+ewh4/5/21mKOAx1kJnaajBQ5mWfG6EcmHRd55SQ=="/>

  </global>

  <!-- EACH PICKUP-ZONE CAN OVER RIDE THE VALUES OF GLOBAL SECTION. -->
  <pickup-zone name="Pickup1">
    <pickup-zone-paths>
      <pickup-zone-path>"ADD PICKUP PATH"
      certificate-path="certs\ADD CERT NAME"/>
    </pickup-zone-paths>
  </pickup-zone>
</config>
```
6.3 Event logging and log files

The LATITUDE® Integration software will log its actions to log files. Actions are classified into four categories:

- **Startup**
- **Exception**
- **Transmission**
- **Information**

**Startup** actions are those actions that are executed while the LATITUDE–Paceart Integration service is starting. They include such things as reading the configuration file and verifying configuration parameters.

**Exception** actions might also be classified as errors. When things go wrong within LATITUDE–Paceart Integration software an exception error will be logged.

**Transmission** actions are all other actions that may occur. Checking for files, transferring files, or writing files into Paceart are all examples of transmission actions.

**Information** messages are only logged when verbose logging is turned on by setting the `verbose` configuration parameter to “true.”

As actions occur a log entry is made in the log file. Log entries will include a date/time stamp, a location id, an action category, and the message. An example log entry might be:

```
```

Although this log entry is more than one line, it is a single action log. The log entry can be broken down into its components.

<table>
<thead>
<tr>
<th>Date/time stamp</th>
<th>2007-12-21 12:51:58</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message id</td>
<td>T200</td>
</tr>
<tr>
<td>Action Class</td>
<td>TRANSMISSION</td>
</tr>
<tr>
<td>Message</td>
<td>T200:HL7 file read and validated successfully. File name and zone: myfile.hl7</td>
</tr>
</tbody>
</table>

Date/time stamp is the date and time this particular log entry occurred. It is taken from the date and time of the computer.

Message id is an identifier for the location in the program where this error occurred. This information will only be useful when debugging problems with Boston Scientific.

Action class is the type of log entry as described above.

Message is the action message. It always starts with an identifier which will most commonly be the pickup zone name from the configuration file.
6.3.1 Log file configuration

LPI uses two log files: **lpi.service.log** and **lpi.activity.log**. The following two optional parameters may be used in the configuration file to define the logging function. See "Global section parameters" on page 24 for more detail.

**Log-path** – the path were the log files will be written to. The default is ./log.

**Verbose** - Sets the level of verbosity when logging actions. Can be set to “true” or “false.” False is the default configuration.

6.3.2 lpi.service.log file

The lpi.service.log file is the log file where startup actions are written while the application is starting up. The path and filename for this log file are static and non-configurable.

The lpi.service.log file is used for all action messages that need to be logged during the program startup process - during the time the uemr.xml configuration is still being read and validated. Once the LPI service is running, the application copies the action messages from the **lpi.service.log** file to the **lpi.activity.log** file and continues recording log information there.

The following example is a lpi.service.log file showing a successful startup.

```plaintext
--> wrapper started as Service
Java Service wrapper Community Edition 32-bit 3.3.5
Copyright (C) 1999–2009 Tanuki Software, Ltd. All Rights Reserved.
http://wrapper.tanukisoftware.org

Launching a JVM...
WrapperManager: Initializing...
Wrapping: Starting up, Version: 1.01
Launching a JVM...
http://wrapper.tanukisoftware.org
```

file and continues recording log information there.
6.3.3 lpi.activity.log file

As noted previously, the activity log file is the main log file for LPI. Upon successful startup, all activities are logged to this log file - including the startup activities from the service log file.

LPI creates a new \textit{lpi.activity\_log} file every night at midnight. The previous day's log file will be renamed and saved with a date tag in yyyymmdd format, e.g., \textit{lpi.activity.20101011.log} is the log file from October 11, 2010.

The following is an example activity log file.

```
2010-10-11 10:34:19,667 STARTUP [wrapperstartstopappmain] - Configuration complete, starting thread
2010-10-11 10:34:19,667 STARTUP [wrapperlistener_stop_runner] - About to shutdown

JVM exited unexpectedly while stopping the application.
```

---\textit{wrapper} Stopped

JVM exited unexpectedly while stopping the application.
In the LATITUDE® HL7 file, the zone elements GDT-00058, Afib Zone; GDT-00066, SvT Zone; GDT-00074, VF Zone; and GDT-00079, VT Zone display in beats per minute (bpm). The detection rate (bpm) cannot be directly imported into Paceart® via the XML interface. However, Paceart does import the detection interval (ms). Since the detection rate cannot be directly imported, a conversion formula is used to convert from beats per minute (bpm) in the HL7 file to milliseconds in the XML file. The conversion formula is 

\[ \text{ms} = \frac{60000}{\text{bpm}} \]

Both the detection rate (bpm) and detection interval (ms) will appear in Paceart on the ICD Summary tab and the individual therapy tab (e.g., VF tab). Due to these multiple calculations, there may be rounding errors when viewing the detection rate (bpm).
6.5 LPI error code messages

<table>
<thead>
<tr>
<th>Error code number</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LPI Installer error (install directory). Please, close all applications and try installing LPI again.</td>
</tr>
<tr>
<td>2</td>
<td>Unable to obtain Windows version. Unable to install LPI.</td>
</tr>
<tr>
<td>3</td>
<td>LATITUDE–Paceart Integration not compatible with Windows version (version number). Unable to install LPI.</td>
</tr>
<tr>
<td>4</td>
<td>Unable to obtain installed JRE version. Please, install JRE version 1.6 or higher prior to installing LPI.</td>
</tr>
<tr>
<td>5</td>
<td>Unable to obtain installed JRE version. Please, install JRE version 1.6 or higher prior to installing LPI.</td>
</tr>
<tr>
<td>6</td>
<td>Unable to obtain installed JRE version. Please, install JRE version 1.6 or higher prior to installing LPI.</td>
</tr>
<tr>
<td>7</td>
<td>Installed JRE version (Java Version) not compatible. Please, install JRE version 1.6 or higher prior to installing LPI.</td>
</tr>
<tr>
<td>8</td>
<td>Error while writing and/or reading the Windows Registry. Please, close all applications and try the installation again.</td>
</tr>
<tr>
<td>9</td>
<td>Incorrect LPI install directory on the Windows Registry. Please, close all applications and try the installation again.</td>
</tr>
<tr>
<td>10</td>
<td>Error while installing LPI files. Please, close all applications and try installing LPI again.</td>
</tr>
<tr>
<td>11</td>
<td>Error detected while installing LPI as a Windows service. Please, close all applications and try the installation again.</td>
</tr>
<tr>
<td>12</td>
<td>Unable to install LPI as a Windows service. Please, close all applications and try the installation again.</td>
</tr>
</tbody>
</table>

7. TERMS AND DEFINITIONS USED IN THIS MANUAL

<table>
<thead>
<tr>
<th>Component or Actor Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Information System (CIS)</td>
<td>Software package used at clinics and hospitals to electronically store patient data.</td>
</tr>
<tr>
<td>Clinic Environment</td>
<td>Site where the EMR/CIS applications are installed and used.</td>
</tr>
<tr>
<td>Clinician</td>
<td>Person with the role of caring for patients who have implanted devices. Could be a physician or an allied health professional.</td>
</tr>
<tr>
<td>Component or Actor Name</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Electronic Medical Record (EMR)</td>
<td>Software package used at clinics and hospitals to electronically store patient data.</td>
</tr>
<tr>
<td>EMR/CIS Client</td>
<td>Software component that provides a user interface for clinicians to access EMR information.</td>
</tr>
<tr>
<td>EMR/CIS Database</td>
<td>Relational database that contains and manages the EMR/CIS data.</td>
</tr>
<tr>
<td>HL7 (Health Level 7)</td>
<td>International medical IT group which manages the HL7 messaging standard. LATITUDE®–Paceart® Integration software uses HL7 messaging structure to transfer data to EMR/CIS.</td>
</tr>
<tr>
<td>Patient Environment</td>
<td>Patient's home (or location) where LATITUDE Communicator gathers data from implanted cardiac device.</td>
</tr>
<tr>
<td>Implant Cardiac Device</td>
<td>Implanted Cardiac Devices operate within the human body in both monitoring and therapy delivery capacities. These devices are categorized as pacemakers, implantable cardioverter defibrillators (ICDs), and cardiac resynchronization therapy (CRT) devices.</td>
</tr>
<tr>
<td>Internet</td>
<td>Public data framework used to transfer data. NOTE: All data flows in this system are secured and encrypted using standard encryption and data transfer techniques.</td>
</tr>
<tr>
<td>Integration Engine</td>
<td>Software component responsible for transferring data from external systems into EMR/CIS database. Many EMR packages include an Integration Engine. LATITUDE Integration software does not include an Integration Engine.</td>
</tr>
<tr>
<td>LATITUDE Communicator</td>
<td>Communications device that interrogates the implanted cardiac device and transfers data to LATITUDE server over the Internet.</td>
</tr>
<tr>
<td>LATITUDE Integration File Delivery Module</td>
<td>The Universal EMR component responsible for securely retrieving a LATITUDE HL7 file and transferring it to the clinic.</td>
</tr>
<tr>
<td>LATITUDE®–Paceart® Integration</td>
<td>LATITUDE–Paceart Integration (LPI) is the software used to securely transfer LATITUDE data to Paceart.</td>
</tr>
<tr>
<td>LATITUDE Secure Server</td>
<td>Centralized computer system that stores from LATITUDE Communicator. Provides data content for LATITUDE website and transfer to clinic.</td>
</tr>
<tr>
<td>LPI File Conversion Module</td>
<td>See LATITUDE–Paceart Integration (LPI).</td>
</tr>
<tr>
<td>Paceart</td>
<td>Clinic patient data management tool, similar to EMR/CIS.</td>
</tr>
<tr>
<td>Component or Actor Name</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Paceart Database</td>
<td>The relational database that contains and manages Paceart data.</td>
</tr>
<tr>
<td>Paceart Client</td>
<td>Software component that provides a user interface to access Paceart information.</td>
</tr>
<tr>
<td>Patient</td>
<td>The person that has the implanted cardiac device that is being followed by your clinic.</td>
</tr>
<tr>
<td>PHI</td>
<td>Protected Health Information.</td>
</tr>
<tr>
<td>Web Browser</td>
<td>The Internet browser used by the clinician to access the LATITUDE system.</td>
</tr>
</tbody>
</table>

**8. SOFTWARE AND RELATED FILES**

The following files and documents are provided by Boston Scientific in the LATITUDE–Paceart software installation package:

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LATITUDE_Paceart_Integration_6472_Setup-x.xx.exe</td>
<td>The executable program that contains all software required to run the LATITUDE–Paceart Integration service.</td>
</tr>
<tr>
<td>Example-lpi.xml</td>
<td>An example LPI.XML configuration file which uses the most common configuration options.</td>
</tr>
<tr>
<td>Expanded-lpi.xml</td>
<td>An example LPI.XML configuration file that shows all configuration parameters and their options.</td>
</tr>
<tr>
<td>file_checksum.md5</td>
<td>Hex key listing of all the LATITUDE Integration files.</td>
</tr>
</tbody>
</table>
Once the LATITUDE®–Paceart® Integration package is installed, the following files and directories are available in the installation directory (default is C:\Program Files\Boston Scientific\LATITUDE Integration\LPI).

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>./certs</td>
<td>Directory for all .p12 certificates and license files.</td>
</tr>
<tr>
<td>./config</td>
<td>Directory where the lpi.xml configuration file is located.</td>
</tr>
<tr>
<td>./lib</td>
<td>Contains the JAVA code and libraries for LATITUDE Integration.</td>
</tr>
<tr>
<td>./log</td>
<td>Directory where the lpi.service.log will be written. Also the default location of the lpi.activity.log file.</td>
</tr>
<tr>
<td>./tmp</td>
<td>Temporary space for LATITUDE–Paceart Integration</td>
</tr>
<tr>
<td>Classpath.bat</td>
<td>Sets appropriate environment variables for JAVA.</td>
</tr>
<tr>
<td>Install_license.bat</td>
<td>Used to create a machine specific license file from a .p12 certificate provided by Boston Scientific.</td>
</tr>
<tr>
<td>Install_service.bat</td>
<td>Installs LATITUDE–Paceart Integration as a Windows service. This is normally done automatically during the installation process.</td>
</tr>
<tr>
<td>Run_from_cmd_line.bat</td>
<td>Allows LATITUDE–Paceart Integration to run from the command line and not as a Windows service. This should be used for testing purposes only.</td>
</tr>
<tr>
<td>Start_service.bat</td>
<td>Starts the LATITUDE–Paceart Integration service.</td>
</tr>
<tr>
<td>Stop_service.bat</td>
<td>Stops the LATITUDE–Paceart Integration service.</td>
</tr>
<tr>
<td>Uninstall_service.bat</td>
<td>Removes the LATITUDE–Paceart Integration service from the Windows Services.</td>
</tr>
<tr>
<td>Wrapper.exe</td>
<td>The executable that allows the LATITUDE–Paceart Integration JAVA application to run as a Windows service.</td>
</tr>
</tbody>
</table>

Additional default directories may be created when the LPI service is started for the first time.

9. LATITUDE®–PACEART® CUSTOMER SUPPORT

LATITUDE–Paceart Customer Support is available by calling 1.800.CARDIAC (227.3422).
Boston Scientific
4100 Hamline Avenue North
St. Paul, MN 55112-5798 USA

1.800.CARDIAC (227.3422)
+1.651.582.4000

www.bostonscientific.com

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