Connex® CSK software

CP 100™ and CP 200™
electrocardiographs

CP 50™
electrocardiograph

Spot Vital Signs® LXi™
vital signs device

VSM® 6000 Series
vital signs device

CP 150™
electrocardiograph

Installation guide

Software version 4.1.X

WelchAllyn®

Advancing Frontline Care™

For information about any Welch Allyn product, contact Welch Allyn Technical Support:

http://www.welchallyn.com/about/company/locations.htm

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Contents

1 Overview

About this guide

This guide describes how to install, configure, and troubleshoot the Welch Allyn Connex CSK (Connectivity Solutions Kit) software.

For related procedures — for example, configuring the CP 200 electrocardiograph for connectivity, installing the wireless radio, or installing the CardioPerfect Workstation software — see separate instructions for the specific product.

While this guide mentions HL7 connectivity, installation of the corresponding software module (EIE, enterprise integration engine) is beyond its scope. For details on HL7 connectivity, contact your Welch Allyn service representative.

This guide is written for network administrators and others with a background in information technology.

General warnings and cautions

Throughout this manual, warning statements indicate conditions or practices that could lead to illness, injury, or death. Caution statements indicate conditions or practices that could damage the equipment or other property.

⚠ **WARNING** Reanalyzing imported ECG or spirometry data at a CardioPerfect Workstation might affect measurement values and predicted values due to platform differences, possibly changing the automatic interpretation.

System requirements

Operating systems

Standalone PC	Windows XP SP2 (x86 and x64), Windows Vista Business SP1 (x86 and x64), Windows 7 Professional (x86 and x64), Windows 8 (x86 and x64).
Server	Windows XP SP2 (x86 and x64), Windows 2003 (x86 and x64), Windows 2008 (x86 and x64), Windows 2008 R2, Windows 7 Professional (x86 and x64), Windows 8 (x86 and x64).
Client PC	Windows XP SP2 (x86 and x64), Windows Vista Business SP1 (x86 and x64), Windows 7 Professional (x86 and x64), Windows 8 (x86 and x64).
Computer requirements	Any computer may be used that meets the selected operating system requirements.

Note: The CP 200 (software version 2.6 or lower) requires an upgrade to 2.6 or higher to operate with Connex CSK.

Note: An Internet connection is required for installation.

About Connex CSK software

The Welch Allyn Connex CSK software is a collection of software modules that enable various Welch Allyn devices to communicate with systems such as CardioPerfect Workstations.

Wireless

USB

Removable media
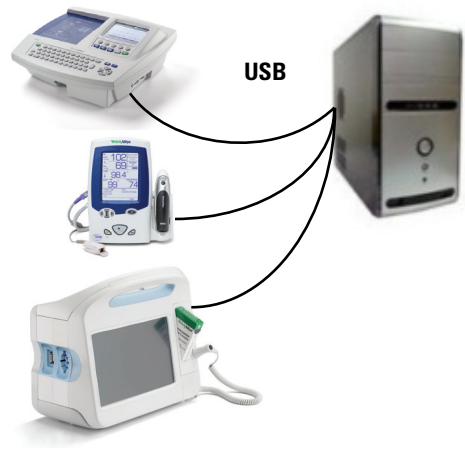
Device	WiFi	Ethernet	USB	Serial	Media
CP 50		✓	✓		✓
CP 100					✓
CP 150		✓	✓		✓
CP 200			✓		
Spot LXi	a, b ✓		✓		
VSM 6000	b ✓	✓	✓		

a. 802.11 b. **Note**: Welch Allyn supports two radio models for Spot LXi.
b. 802.11 a/b/g.

From a connected device, you can do the following:

• Send vitals data to data systems.
• Send ECG and/or spirometry tests to a CardioPerfect database.
• Recall patient information from a CardioPerfect database (CP 50, CP 150, CP 200 only).
• Retrieve patient order lists from an EMR/HIS using the Welch Allyn HL7 interface, sold separately (CP 50, CP 150, CP 200 only).

Even without a connection, users of CP 50, CP 100, CP 150 and CP 200 electrocardiographs can transfer tests to a CardioPerfect database via removable media (SD memory cards or USB storage devices).

Spot LXi and VSM 6000 Series configuration examples

Client-server network configuration, wireless or Ethernet
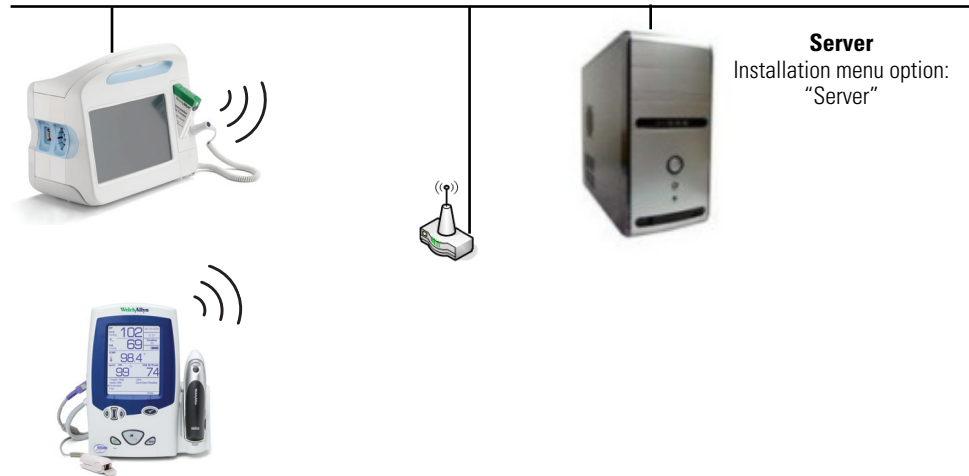
Functional diagram:
"Software modules in a simple network configuration, wireless or Ethernet" on page 36

Client-server configuration
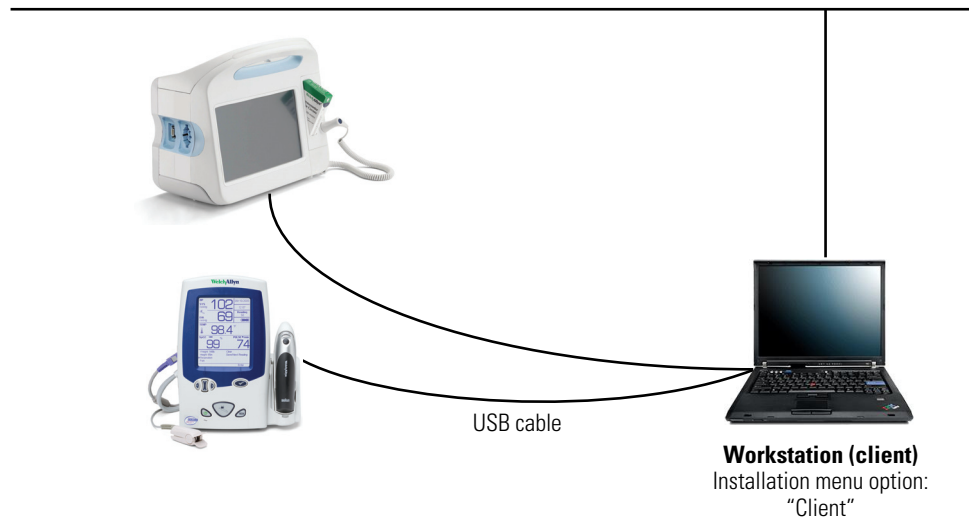
Functional diagram:
"Software modules in a USB configuration" on page 36

Network configuration with multiple subnets

Subnet #1

Server
Installation menu option:
"Server"

Subnet #2

Workstation (client)
Installation menu option:
"Advanced"
(to direct communications to the server)
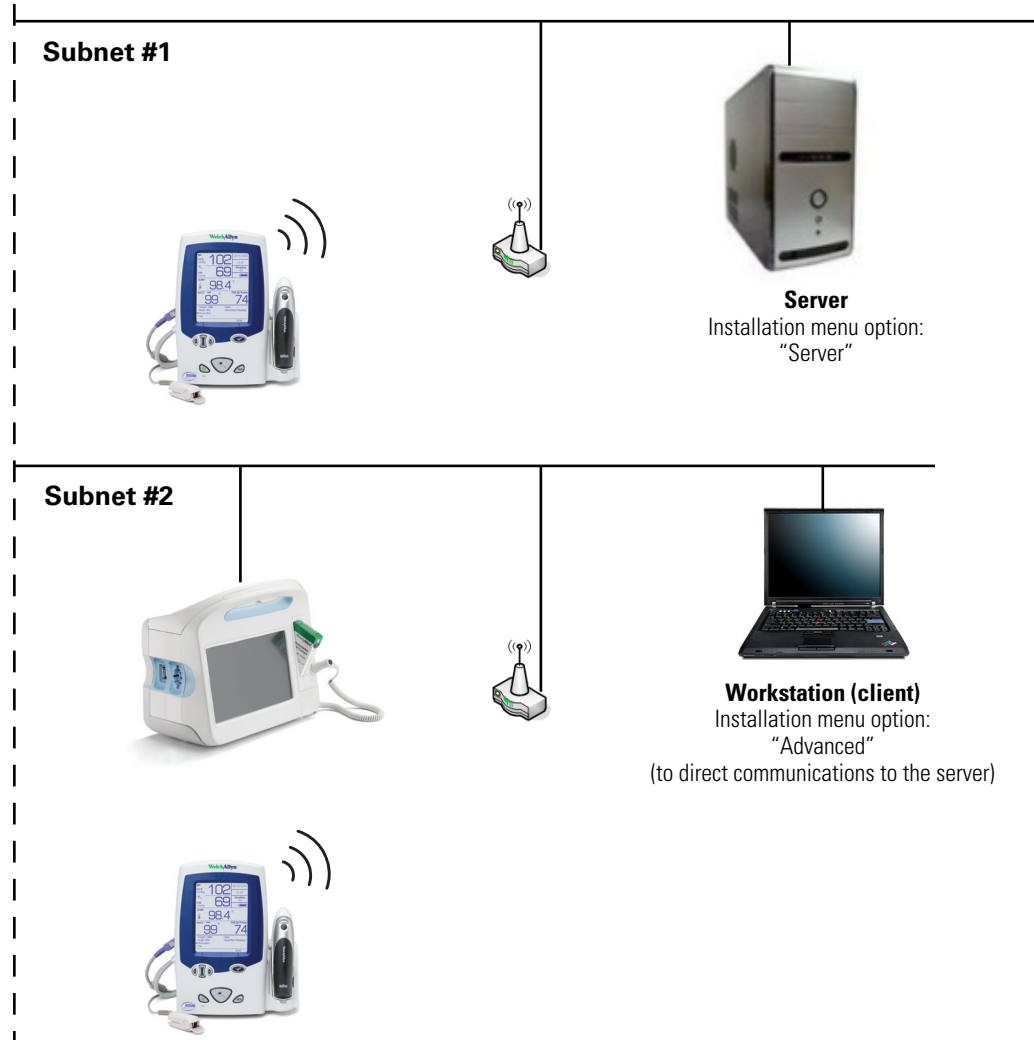
CP 50, CP 100, CP 150 and CP 200 configuration examples

Standalone configuration, removable media or USB
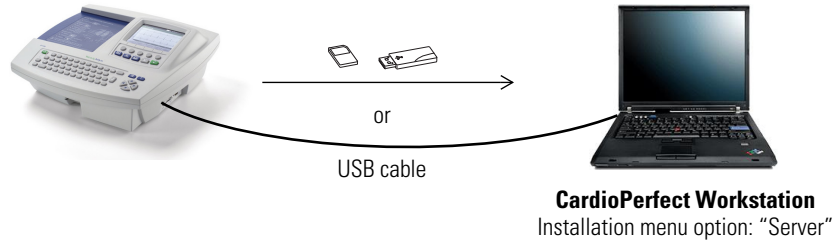
CardioPerfect Workstation
Installation menu option: "Server"

Functional diagram:
"Software modules in a standalone CardioPerfect Workstation, removable media or USB" on page 34

Client-server configuration, removable media or USB
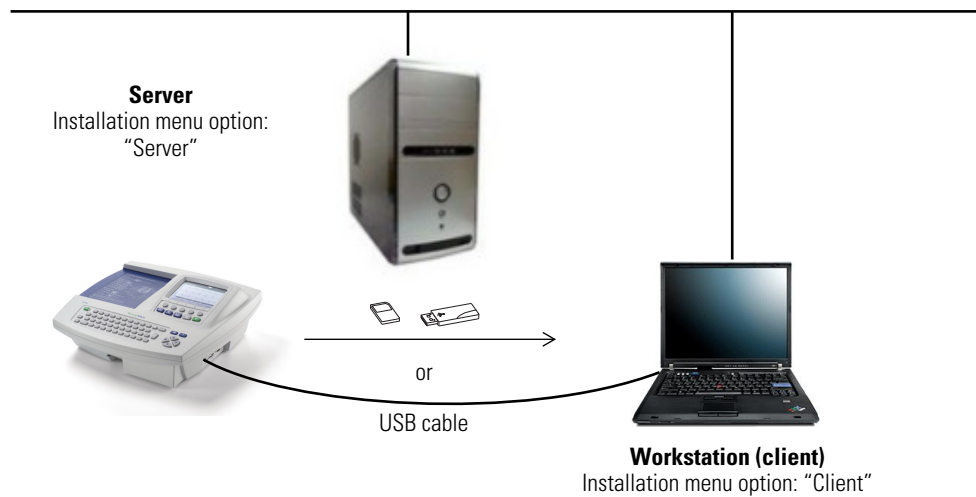
Server
Installation menu option:
"Server"

Workstation (client)
Installation menu option: "Client"

Functional diagram:
"Software modules in a client-server configuration, removable media or USB" on page 35

Network configuration, wireless or Ethernet
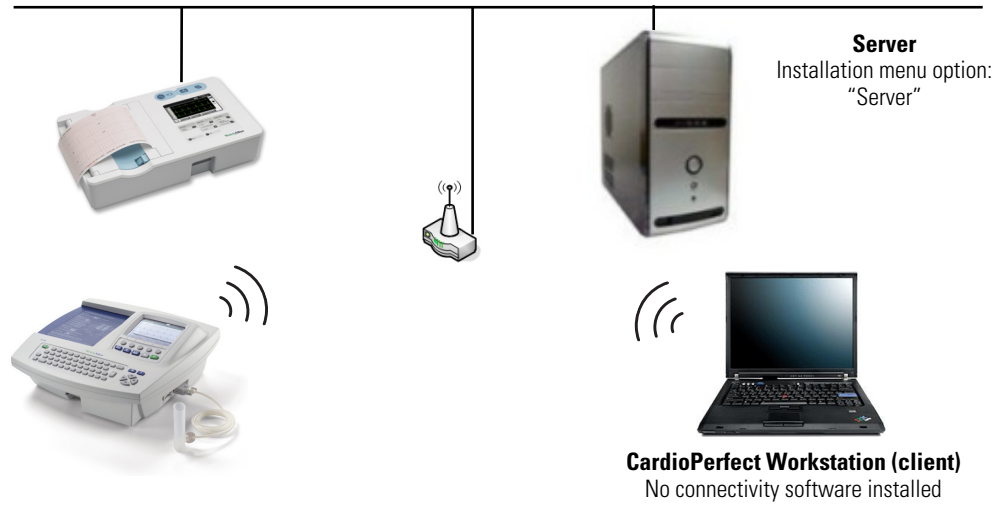
Server
Installation menu option:
"Server"

CardioPerfect Workstation (client)
No connectivity software installed

Functional diagram:

2 Installation

Spot LXi and VSM 6000 Series

Before you install the Welch Allyn Connex CSK software do the following:

- Verify that the connectivity settings in the device software are properly configured. For details, see the device's directions for use.

- When using a client/server configuration, please install the server software on the database server before installing the clients.

- If using wireless communications, check the device's settings. Verify that these settings match the access point settings.

- Verify that you have administrator rights for the PC.

- Close all programs before starting the installation.

- If "Device driver signing" appears, select either "Yes" or "Continue."

To install the Welch Allyn Connex CSK software

1. Insert the Connex CSK CD. This screen appears:
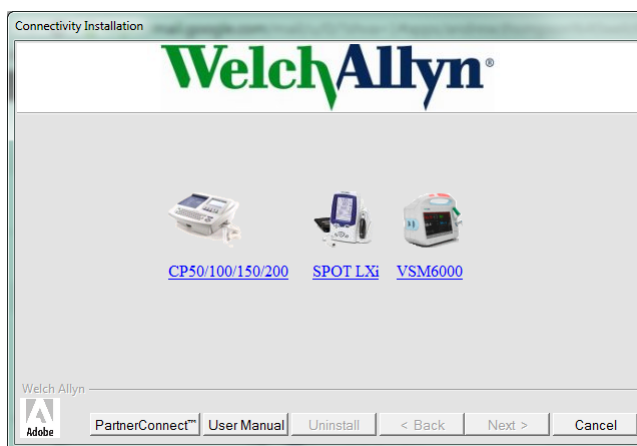
If this screen does not appear, open **Connectivity Install** on the CD.

2. Select **SPOT LXi** or **VSM6000**. This screen appears:
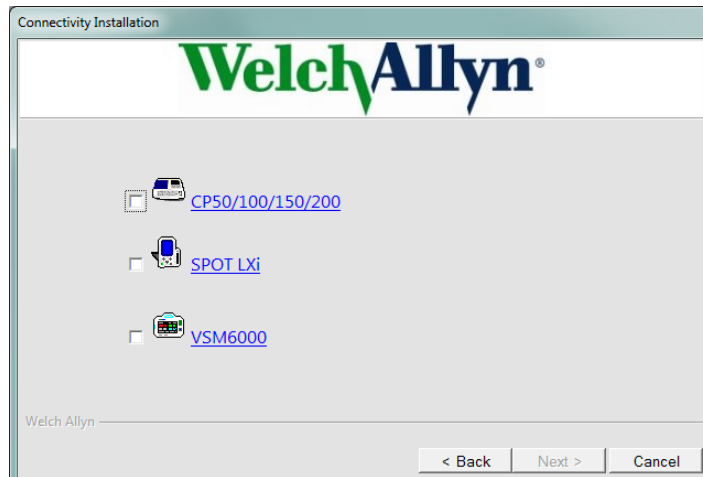
3. Select **SPOT LXi** or **VSM6000.** This screen appears:

4. Choose either **Server** or **Client** based on your configuration.

    For illustrations, see "Spot LXi and VSM 6000 Series configuration examples" on page 4.

5. Follow the instructions on the screen.

Note   If using the removable media transfer option, make sure you transfer at least one complete test record via USB or Network.

To uninstall the Welch Allyn Connex CSK software

1. Insert the Welch Allyn Connex CSK CD. This screen appears:
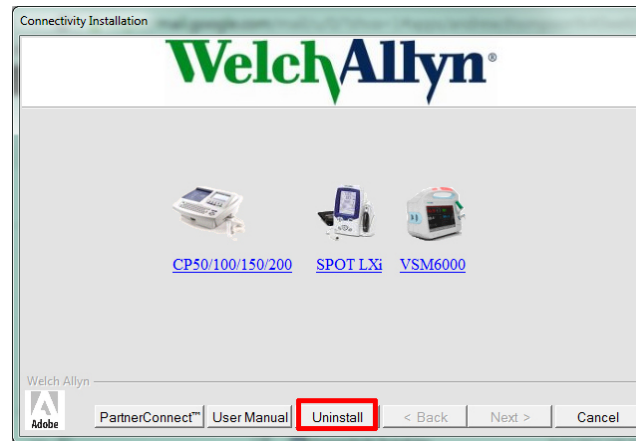
2. Select the Uninstall button.
3. Follow the prompts.

CP 50, CP 100, CP 150, or CP 200

Before you install the Welch Allyn Connex CSK software do the following:

- If connecting to a CardioPerfect Workstation, do the following:

  - Verify that the CardioPerfect Workstation software and database have both been upgraded to version 1.6.0 or higher. If necessary, upgrade the software and database now.

  - When using a stand-alone CardioPerfect Workstation system, please install the server software on the stand-alone CardioPerfect Workstation system

  - When using a client/server configuration, please install the server software on the CardioPerfect Workstation database server before installing the clients.

- Verify that the connectivity settings in the software are properly configured. For details, see the electrocardiograph directions for use.

- If using a CP 200 electrocardiograph in a wireless configuration, do the following.

  - Verify that the electrocardiograph software product version is 2.4.0 or later.

  - Verify that the Wireless Settings item is available on the Connectivity Settings menu. If not, a hardware upgrade is needed. Contact your Welch Allyn service representative.

  - Check the electrocardiograph's network and wireless settings. Verify that these settings match the access point settings.

  For details, see the electrocardiograph directions for use.

- Verify that you have administrator rights for the CardioPerfect Workstation software and for the PC.

- Close all programs before starting the installation.

- If "Device driver signing" appears, select either "Yes" or "Continue."

To install the Welch Allyn Connex CSK software

1.   Insert the Connex CSK CD. This screen appears:
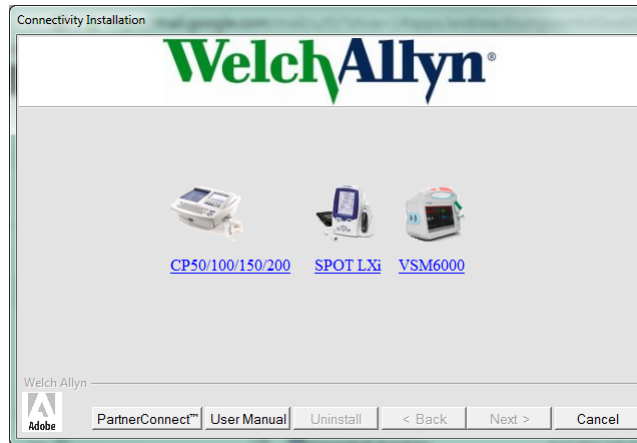
   If this screen does not appear, open **Connectivity Install** on the CD.

2.   Select **CP50/100/150/200**. This screen appears:
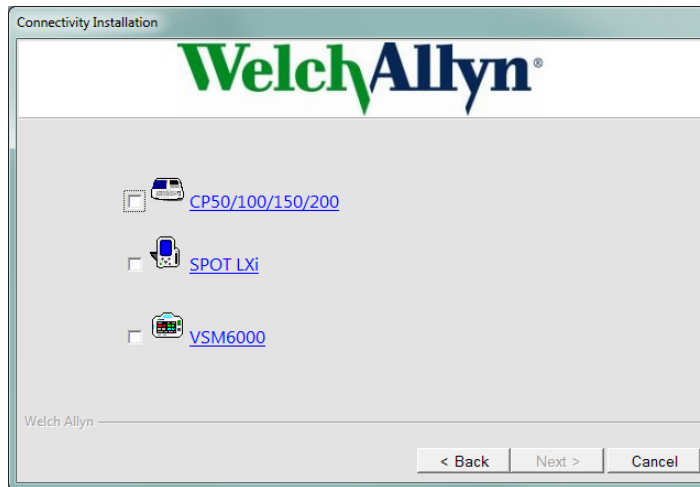
3. Select **CP50/100/150/200.** This screen appears:

4. Choose either **Server** or **Client** based on your configuration.

For illustrations, see "CP 50, CP 100, CP 150 and CP 200 configuration examples" on page 6.

5. Follow the instructions on the screen.

Note If using the removable media transfer option, make sure you transfer at least one complete test record via USB or Network.

To uninstall the Welch Allyn Connex CSK software

1. Insert the Welch Allyn Connex CSK CD. This screen appears:
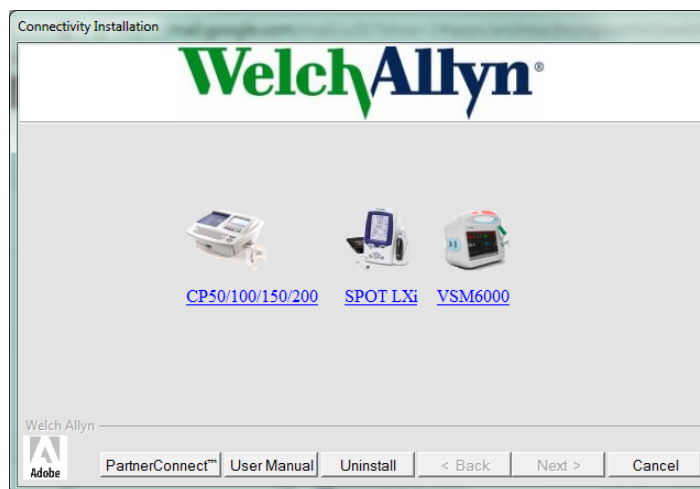
2. Select the Uninstall button.

3. Follow the prompts.

3 Configuration

Configuring the CP 50, CP 150, and CP 200 patient-match criteria (resolving patients)

When a test is imported into the CardioPerfect database, the patient data submitted with the test may or may not match patient data already stored in the database. The software tries to match, or resolve, the incoming data against the stored data. Tests are entered either for an existing patient or for a new patient, depending on the patient-match criteria.

MRN (medical record number) is a unique piece of text that identifies a patient. It is usually a number, but it sometimes includes other information, such as social security number or last name.

If the criteria are only partially satisfied, a suspect record may be created (.*SUSPECT* is appended to the MRN).

The file named *CPWS.Operations.CPWSImportTest* provides a method of inserting a test into the database. If the test already exists, it is replaced with the new test. Either the patient indicated in the test is matched to a patient already in the database, or a new patient is created. The criteria are controlled by the PatientMatchCriteria appSetting in *App.config* (which compiles into *CPWS.Service.exe.config*).

To configure the patient-match criteria

1. Open this file: C:\Program Files\Welch Allyn\CPSAPI*CPWS.Service.exe.config*.

Note On 64-bit systems, the file path is C:\Program Files (x86)\Welch Allyn\CPSAPI\CPWS.Service.exe.config.

Windows Vista and Windows 7 users: Open this file as an administrator, as follows.

a. Click the **Start** button. Select **All Programs** > **Accessories**.

b. Right-click **Notepad**. Select **Run as Administrator**. Notepad opens.

c. Click **File** > **Open**. Open *CPWS.Service.exe.config.*

2. Replace the key attribute with the desired PatientMatchCriteria value in this line:

<add key="PatientMatchCriteria" value="**MATCH_MRN**"/>

PatientMatchCriteria	Description
MATCH_MRN	This is the default setting. The MRN must match exactly. If the MRN is empty, the record is marked suspect.
MATCH_MRN_DOB_GENDER	The MRN, date of birth and gender must match exactly. If this fails but the MRN matches or is empty, the record is marked suspect.
MATCH_MRN_DOB_GENDER_LASTNAME	The MRN, date of birth, gender and last name must match exactly (case-insensitive). If this fails but the MRN matches or is empty, the record is marked suspect.
MATCH_DOB_LASTNAME_FIRSTNAME	The first name and last name must match exactly, and the date of birth must be on the same day. • If there is no match, but the MRN conflicts with another entry, the record is marked suspect. • If there is no match and the MRN is blank, the MRN is set to a period, the patient's last name, a period, and a unique number. This is the only setting that allows a blank MRN, which gets automatically generated.

3. Save the file.

4. Restart the CPSAPI service. (Go to **Control Panel** > **Administrative Tools** > **Services**. Right-click **CardioPerfect Services**. Select **Restart**.)

Configuring the CardioPerfect Workstation for non-Welch Allyn devices

CardioPerfect Workstation uses the SCP-ECG plug-in, which is a standard communications protocol for computer-assisted electrocardiography (EC71 or EN1064). This plug-in, which works with the CPSAPI software module, enables you to configure the CardioPerfect Workstation software to import resting ECG tests from non-Welch Allyn devices and to export ECG tests to non-Welch Allyn record management systems using a format translator, for example Datamed (sold separately).

To configure CPSAPI plug-ins, you modify an XML configuration file, and then restart the CardioPerfect Services service.

The plug-in file, named *CPSAPI.config*, is stored in the local folder with the CPSAPI service executable. By default, this folder is C:\Program Files\Welch Allyn\CPSAPI. On 64-bit operating systems, the path is C:\Program Files (x86)\Welch Allyn\CPSAPI.

For a description of the CPSAPI module, see "Configuring the CP 50, CP 150, and CP 200 patient-match criteria (resolving patients)" on page 15.

To configure the plug-in for automatic ECG exporting

This procedure configures the CardioPerfect program to export ECG tests from the CardioPerfect database automatically when they are captured and saved in the specified folder.

1. Find the SCP-ECG Collector entry in *CPSAPI.config*.

    Example:

    ```
    <ResultCollector name="SCP-ECG Collector" enabled="1" standalone="1"
    type="CPWS.Plugins.ResultCollector.SCPECGCollector,CPWS.Plugins" values="" destinationfolder="specify export
    folder here" />
    ```

2. Modify the **enabled** and **destinationfolder** attributes as desired.

Attribute	Description	Possible Values
enabled	Specifies whether CPSAPI should load and execute the plug-in.	0 (Off), 1 (On)
destinationfolder	Specifies the output folder where SCP-ECG files will be created. Caution: The destination and source (export and import) folder names must be unique. If these folder names are identical, the system will not operate properly.	Any valid Windows path

3. Restart the CPSAPI service.

    a. Go to **Control Panel** > **Administrative Tools** > **Services**.

    b. Right-click **CardioPerfect Services**.

    c. Select **Restart**.

To configure the plug-in for automatic ECG importing

This procedure configures the CardioPerfect program to import ECG tests into the CardioPerfect database automatically when new SCP files appear in the specified folder.

1. Find the TestFileImporter entry in *CPSAPI.config*.

    Example:

```
<TestFileImporter name="SCP-ECG Test Importer" enabled="1"
type="CPWS.Plugins.TestFileImporter.SCPECGTestFileImporter,CPWS.Plugins" sourcefolder="specify import folder here"
/>
```

2. Modify the **enabled** and **sourcefolder** attributes as desired.

Attribute	Description	Possible Values
enabled	Specifies whether CPSAPI should load and execute the plug-in.	0 (Off), 1 (On)
sourcefolder	Specifies the import folder for incoming SCP-ECG files. Caution: The destination and source (export and import) folder names must be unique. If these folder names are identical, the system will not operate properly.	Any valid Windows path

3. Restart the CPSAPI service.

    a. Go to **Control Panel** > **Administrative Tools** > **Services**.

    b. Right-click **CardioPerfect Services**.

    c. Select **Restart**.

Data Catcher configuration

The Data Catcher application acts as a gateway between devices and external information hosts. The configuration interface is described in the following section.

Note   This interface is for advanced users only. The software installation configures Data Catcher for the configuration selected during the installation. Only use this when an advanced, non-standard configuration is required.

Configuration interface

As part of the configuration interface, a system tray icon is included.

The following sections show and describe elements of the configuration interface.

Opening panel
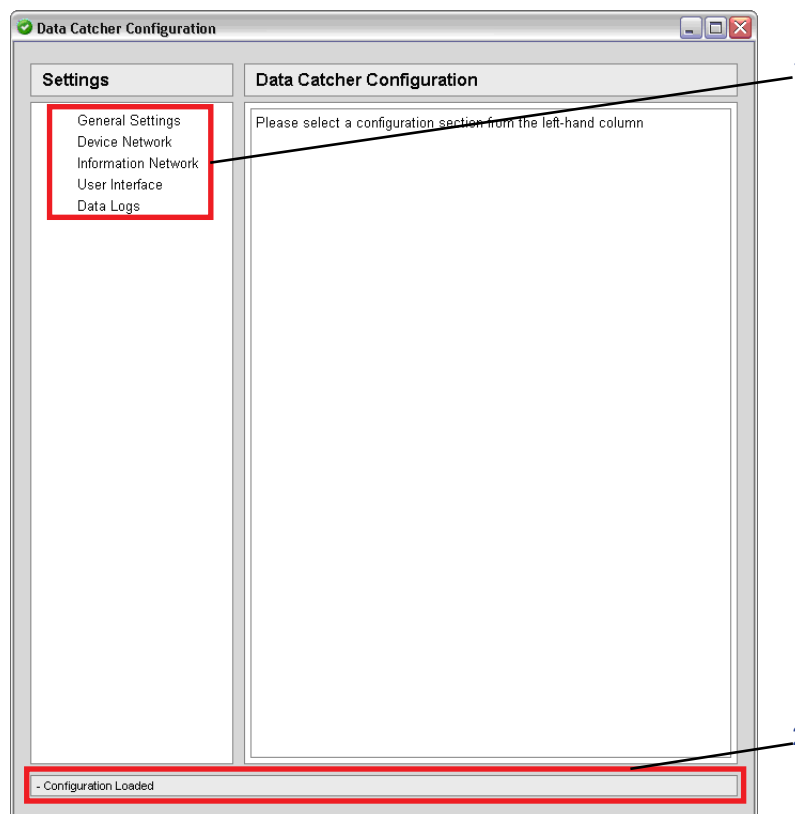
| 1 | Settings categories | Lists the configuration sub-categories for Data Catcher. By clicking on an option, the panel on the right will be populated with the related settings. |
| 2 | Status bar | Describes the last action performed during configuration to provide feedback about your actions. |

General settings

1	Start button	Selecting this starts the device server portion of Data Catcher.
2	Stop button	Selecting this stops the device server portion of Data Catcher. All state information pertaining to currently pending information host messages will also be reset.
3	Automatic configuration	This option allows you to fully configure Data Catcher using an existing configuration file. This will copy the specified file to the Data Catcher directory, rename the file to "DataCatcherConfig.xml,"and force the application to restart to reload the new configuration. **Note:** This will disconnect any current devices in the same way the Stop button works. This will also restart the Web interface portion of the application to employ any user interface changes.
4	Local Data Cache directory	Data Catcher provides the option to save all device data sent through the system to a local directory. This data is the unaltered data, directly from the device. This configuration option specifies the directory where the cached device data files should be stored, relative to the application directory.
5	Local Data Cache file types	This option allows you to specify what types of data files should be cached locally. You can choose to save the pure binary data from the device, an XML form of the data, or both. Each file is uniquely named using a combination of the device source ID, the current system time, and a randomly generated number.
6	Local Failed Data Cache directory	This option only applies to messages that have failed to respond to the device. If there is an error that cannot complete its round trip, a copy of the original message will be stored here.

7   Local Failed Data   This option allows you to specify what types of failed message data files should be cached
    Cache file types   locally. You can choose to save the pure binary data from the device, an XML form of the
                        data, or both. Each file is named using a combination of the device source ID, the current
                        system time, and a randomly generated number.

8   Save settings   Selecting this commits any changes made to the configuration settings. This will update
                        the application settings on the fly, and save the changes to the "DataCatcherConfig.xml"
                        file.

Device network settings
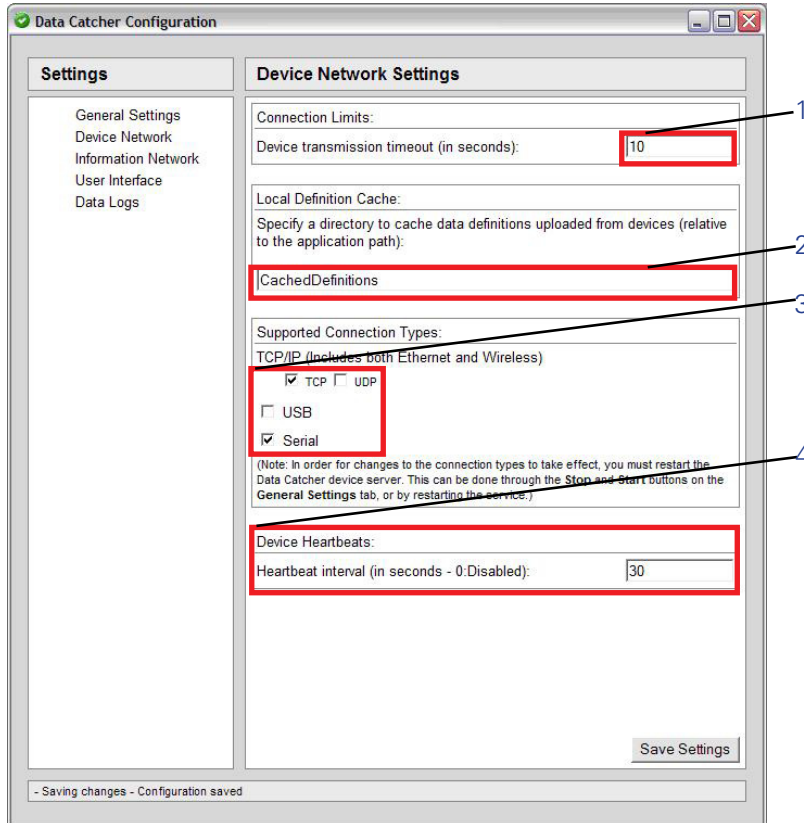
1	Device transmission timeout	This value represents the maximum time, in seconds, that a device can be connected to Data Catcher with no communication before the device is disconnected.
2	Definition cache	This value represents the local or path to the directory where cached definitions are stored. **Note:** Cached definitions are only loaded when Data Catcher starts, so any additions or updates to these files will not be recognized until the application restarts.
3	Connection types	These checkboxes represent the supported connection types for the device server portion of Data Catcher. **Note:** The "Serial" option available applies to both normal serial connections, and USB Serial Host Driver connections (for example CP 200 USB). **Note:** Changes to this option will not be reflected by Data Catcher until the application is restarted.
4	Device heartbeats	This value represents the interval (in seconds) at which heartbeat pings will be sent to known client devices. This is a standard ICMP ping echo request, sent to a networking client.
		When set to "0," heartbeat pings are disabled.
		When a client device connects, it will be marked as a known client and flagged as active. Once the interval has elapsed, a ping request will be sent to each known client in parallel. Once a client responds to the request with an echo response, the client will be flagged as active. If any clients have not responded after one second, a retry request will be sent to those clients. Up to four retries will be attempted, and any clients that have not responded after the fourth attempt will be flagged as inactive.
		Once the retries have completed, the list of active and inactive device clients will be forwarded to the host system. Once the list is sent, all inactive clients are removed from the device list.

Information network settings
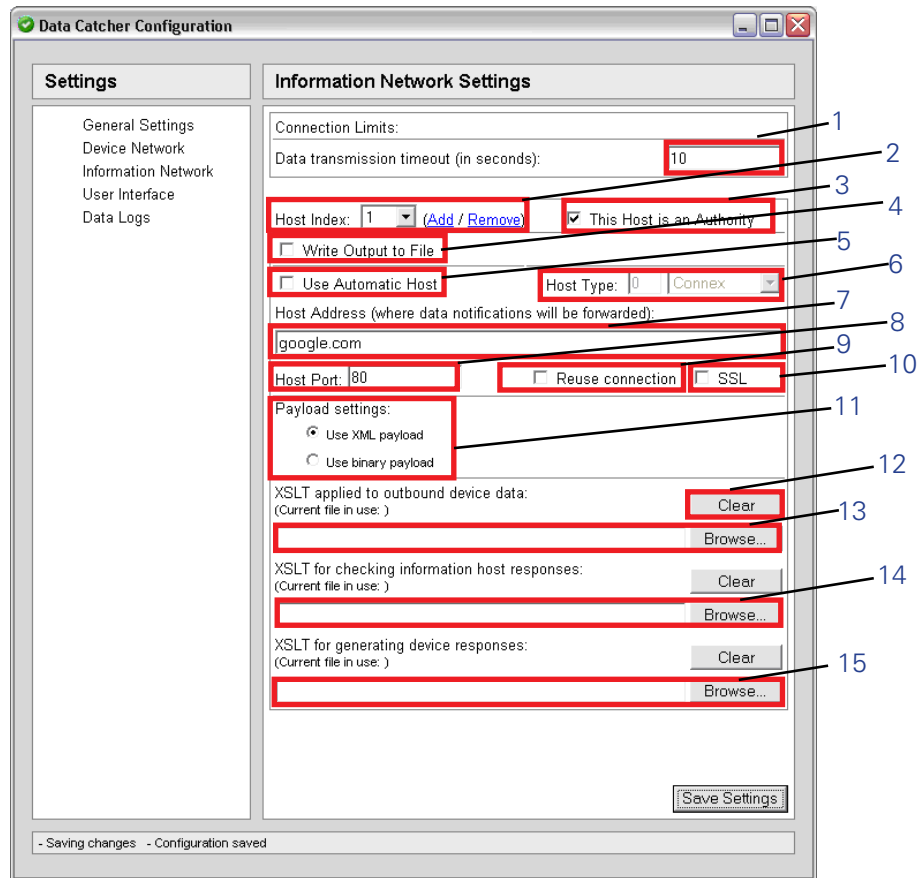
1   Data transmission timeout   This value represents the maximum time, in seconds, that a connection will be maintained with an external information host. If no response is received from an information host within this time interval, for a specific message context from a device, Data Catcher will send a NACK to the relative device and close the connection to the information host.

2   Multiple external host management   This option allows Data Catcher to act as a message branch, and forward device messages to multiple external host systems. Each message received from a device will be duplicated and sent to each host specified in this list. Each host has its own related configuration page and information, and can specify separate IP addresses, payload options, and transform sheets. The Add/Remove buttons are used to add new, blank host information pages, and remove currently selected host information pages based on the displayed index.
Since a single device message can be branched to multiple host information systems, the "Host Authority" option (XREF) allows you to specify how the responses from these hosts should be used to determine the success state of the transmission.

3   Host authority   This option identifies whether the currently selected external host should be used to determine the success state of a data transmission or not. This is primarily used when multiple external hosts are configured for Data Catcher.

4   File output   This option specifies whether the output should be written to file instead of forwarded to an external host, and to what directory the output file should be written.

5	Automatic host resolution	In certain system configurations, the IP address of the external host is either not known at configuration time, or not static. In these cases, the IP address of the host cannot be determined ahead of time, and must be resolved at the time that connections to the host are attempted. This feature uses an integrated DCP client to find hosts automatically when devices send messages to Data Catcher. When this option is enabled, the "Host IP Address" and "Host Port" fields are disabled, as this setting overrides those options. Also, the "Host Type" option becomes enabled, and lets you choose which hosts they would like to find automatically when messages are routed through the system.
6	Host type	When the "Automatic Host Resolution" option is enabled, this option becomes available. It lets you choose which external host types to look for when finding automatic hosts. There are two fields associated with this option – a manually edited numeric field, and a dropdown box of predefined selections. If no host types are known that match the index, a value of "Unknown" is displayed.
7	Host address	This is the IPv4, dot-separated address, or DNS lookup name for the external information host where device data will be forwarded. **Note:** The connection established with the information host is a standard TCP connection.
8	Host port	This is the application port value available on the external information host where Data Catcher will connect.
9	Reuse connections	This option enables of disables the connection reuse algorithm. When this option is enabled, messages from all devices to a single information host will be routed through a single, established connection, synchronously. If no connection is available, a new connection is established. When this option is disabled, a new asynchronous TCP connection is established every time a new data message is forwarded to an information host.
10	SSL option	This option enables or disables the use of SSL (Secure Sockets Layer) encryption when communicating with an information host. When this option is enabled, an SSL session is established whenever a connection is made to the configured information host. All messages that are transmitted to the information host are then encrypted with the SSL algorithms. When this option is disabled, a standard, un-encrypted TCP connection is used.
11	Payload type	This option determines if Data Catcher will forward WACP-formatted XML data, or binary data to external information hosts. **Note:** If an outbound XSLT file is specified, the WACP-formatted XML is translated using that file and then sent. If no file is specified, the XML is sent directly without translation.
12	XSLT Clear	These buttons will clear the selected XSLT file for the associated field. This will not delete the XSLT files from the related directory. It will only remove the assignment of that XSLT file for message processing in Data Catcher.
13	Outbound XSLT	The outbound XSLT field is used to specify the location of an .xsl file that will be used to translate data from a device to the format accepted by the information host. You can browse for an .xsl file, which will be copied and saved to Data Catcher's own local storage directory. All data collected from devices is translated from the native binary format from the device to the XML format. At that point, the XML data is then transformed using the provided outbound XSLT sheet, and forwarded to the specified external information host. This allows an administrator to provide a specialized transformation sheet designed for the information host that will format the data to fit the needs of the information host's interface.

14 Host response
    XSLT

The Host Response XSLT field is used to specify the location of an .xsl file that will be used
to verify responses from an external information host. Whenever XML data, or translated
data, is sent to an information host, the data message is saved as part of the message
context. If a Host Response XSLT file is specified, it is used to translate that original
outbound message into an expected response. This expected response is then compared
against the actual response from an information host.
If no Host Response XSLT is specified, then any response from an information host,
regardless of content, will result in an ACK back to the device.

15 Device
    response XSLT

If an appropriate, matching host response is received from an external information host, and
a Device Response XSLT is present, then Data Catcher generates a specific response for the
device using this XSLT. This response can include elements saved from the Host Response
comparison (using set-variable and get-variable), it can use custom generated binary data
(using binary-stream), and it can conditionally decide whether an ACK, NACK, or custom
message id should be sent to the original device. This allows the XSLT developer a large
amount of flexibility in controlling the response to the device, above and beyond the generic
ACK/NACK responses.

User interface settings
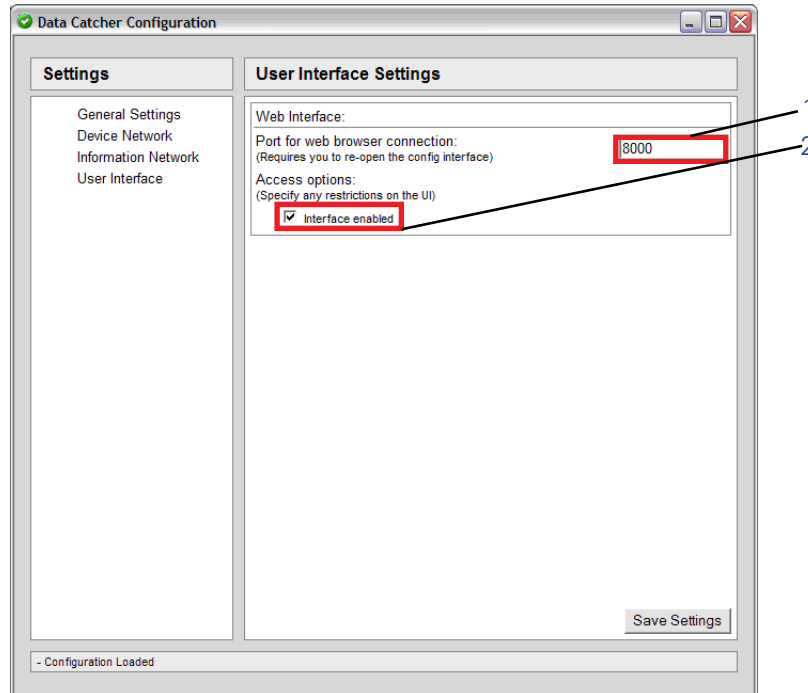
1   Web port   The port value that will host the Web interface for Data Catcher.
                     Note: Any changes to the web port value will force the web-interface portion of Data
                     Catcher to restart. This means you must close the interface and re-open it to continue
                     configuration.

2   Interface enabled   This option enables or disables the Web interface. If this is enabled, the application can be
                          configured as normal through the configuration interface. If this is disabled, you will not be
                          able to access the configuration interface.
                          Note: The only way the interface can be re-enabled after being disabled is to stop the
                          application, manually edit the "DataCatcherConfig.xml" file to enable the interface, and
                          restart the application.

Data logs

To provide assistance in monitoring messages that are processed by Data Catcher, specifically ones that fail to complete their round-trip delivery, a Data Log option is available on the left side of the configuration interface. This option will open a new window and display a list of data messages that have been received from devices by Data Catcher, but for some reason have not completed their process successfully.

This log displays information contained within the data messages themselves (for example Patient ID, Date/Time, Serial Number of the device, etc) to help determine if the error was a result of improper device data, or if it was from an internal processing error.

For the Data Log option to work, Data Catcher must have the Failed Data Cache option enabled (see "Local Failed Data Cache directory" on page 20), and must have XML formatted data enabled for this option (see "Local Failed Data Cache file types" on page 21). If either of these options are missing or not enabled, the Data Logs will not be available.

Debug logs

The Data Catcher application generates a running log with debug information as it executes. It maintains two logs ("DebugLog1.txt" and "DebugLog2.txt") that store this information, and writes to the two files in a circular manner. When the application starts, it opens "DebugLog1.txt" to write first, and continues to write information to this file until it reaches the specified capacity (10 Megabytes). Once this limit has been reached, the application opens "DebugLog2.txt" and continues writing until once again the capacity limit has been reached. Then, the application reopens "DebugLog1.txt", clears all data from the file, and continues writing.

Adding CVSM to a Connex CSK installation

The Connex VSM is only supported on CSK installations of version 4.0 and higher, so you must verify that your Connex CSK installation is valid before proceeding.

To verify if your Connex CSK installation is valid

1. Navigate to the Welch Allyn installation directory (by default C:\Program Files\Welch Allyn\").

2. Open **versions.txt** and search for the term "Full Connectivity Package." Verify that the version listed here is greater than or equal to 4.0 (4.0.0.x).

3. If the version is less than 4.0, follow the instructions listed in the readme.txt file on the CD for "Updating from Connex CSK Version 3.0 to Version 4.0."

Note   During the installation process of CSK 4.0, make sure that the existing devices are selected along with the CVSM.

Once you have either confirmed you are using CSK 4.0, or have upgraded to it, you may need to add custom XSLT configurations to handle data from your CVSM device.

To add custom XSLT configurations to handle data from a CVSM device

1. Open the Data Catcher configuration page through the system tray icon. Click on **Information Network** on the left.

2. To add a new data path for the device, click **Add** next to **Host Index**. This will add a new, empty host configuration and the Host Index field will update to represent the index of the new entry.

3. If you wish to communicate with a information host that will receive device data, enter the Host address and port information in the appropriate fields. Check the **Reuse Connection** and **SSL** options if needed.

4. If you wish to write device data to a file on the local PC, select the **Write Output to File** option. Fill in an appropriate directory where you would like the output data to be stored.

5. Check the **Use XML payload** option under the **Payload settings** field.

Note   In some very specific cases, the "Use binary payload" option can be used if no XML transformation is desired. However, this option requires an intimate knowledge of the WACP binary protocol formats, and should only be selected if you have worked with a Welch Allyn engineer to develop your interface.

6. Select any custom XSLT sheets that will be used to transform device data to the format compatible with the host system's interface.

Note   The XSLTs used for custom interfaces are ones you develop. Welch Allyn can provide support and consultation in developing these XSLTs, but maintenance and verification of them is your facility's responsibility.

Connecting Connex CSK to multiple device models

If you wish to connect multiple devices models to CSK, you will need to edit your XSLT sheets to handle each device model. If you have an LXi device and CVSM device, there are two options. Pick the option that suits your needs.

1. If there are two separate host systems installed, one for handling data from LXi devices and one for handling data from CVSM devices, then you should follow Step 2 on page 28 to configure two Host Index entries. There should be one entry with custom XSLT sheets specifically for handling LXi data, and a second entry with different XSLT sheets specifically for handling CVSM data. Inside these XSLT sheets, the script should filter data based on GUIDs, so that only data from the associated device model is handled by the respective XSLT.

2. If there is a single host system installed that handles all data from both device models, then you should follow Step 2 on page 28 to configure one Host Index entry. This entry should have a XSLT sheet for handling both LXi data and CVSM data. Inside the XSLT sheet there should be sections for handling each device model's data based on GUID filtering. One section would handle all data from LXi devices, while the other section would handle all data from CVSM devices.

Replacing a Spot LXi with a CVSM

If you are replacing one device model with another, instead of using both simultaneously, then the steps to configure Data Catcher are very similar to what has already been described.

To replace a Spot LXi with a CVSM

1. Open the Data Catcher configuration page through the system tray icon. Click **Information Network** on the left.

2. To remove an existing data path for a device, select the appropriate Host Index entry with the drop-down box, and click **Remove** located next to the Host Index field. Click **Save Settings** to confirm the removal.

3. See "Adding CVSM to a Connex CSK installation" on page 28 to add a new Host Index entry for the CVSM device.

Adding a CVSM to a system already using a Spot LXi

No global settings should need to change when adding a CVSM device to the system. The only change would be to Step 2 on page 28, where additional Host Index entries may need to be added on the Information Network page.

File Importer configuration

File Importer is a software program that allows you to transfer patient vitals from an external media drive into CardioPerfect.

Options tab

The options tab allows you to change your configuration settings.
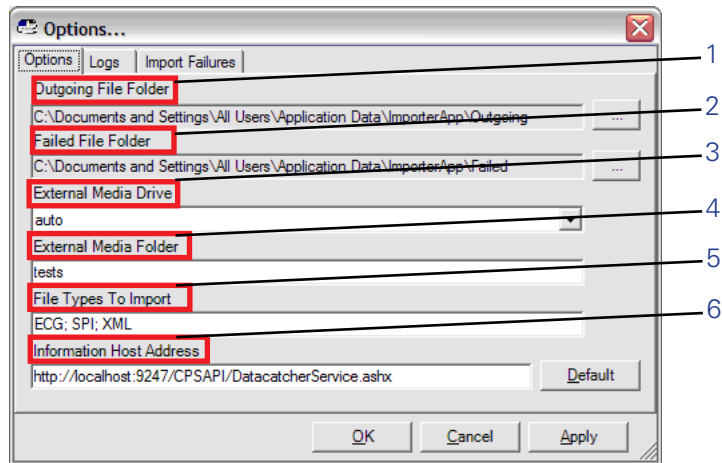
| 1	Outgoing file folder	This is the folder containing a copy of the files sent to the Information Host.
2	Failed file folder	Folder containing a copy of the files that failed to send to the Information Host.
3	External media drive	Disk drive representing the removable media where the tests are stored.
4	External media folder	Folder on the removable media containing the tests to be imported.
5	File types to import	File types (extensions) that the software will look for in the External Media Folder on the External Media Drive to import.
6	Information host address	Web address of the web service where the files are to be sent. The only part that could be configured is the "localhost:9247."

Logs tab

The Logs tab allows you to read logged messages to either confirm a test was imported correctly or determine why an import failed.
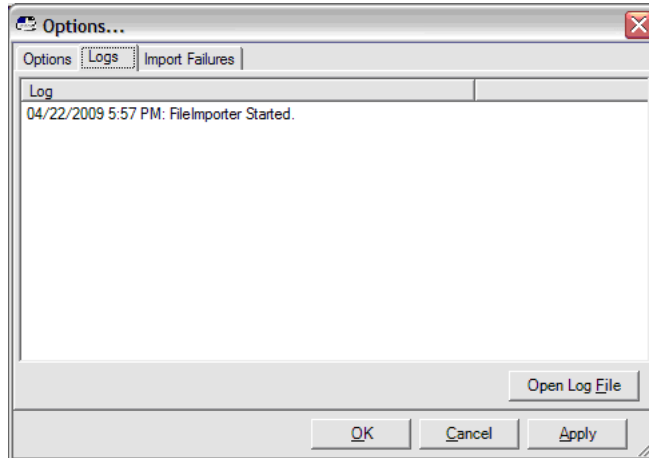
Import failures tab

This tab shows a list of files (tests) that were not able to be imported.
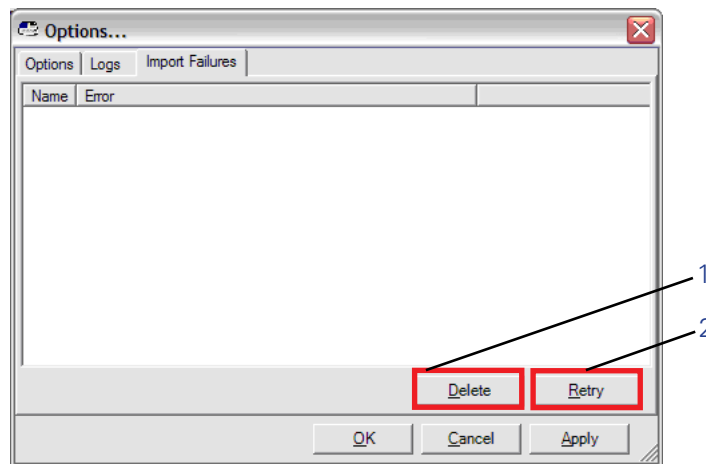
| 1 | Delete | Allows you to remove this file from the system. |
| 2 | Retry | Allow you to correct the problem and retry to send the file. |

4 Troubleshooting

About the connectivity software modules

The Connex CSK software comprises a set of modules that are installed separately as needed. The connectivity modules are listed here:

Module	Full name	Description	Installation location
CPSAPI	CardioPerfect Server Application Programming Interface	This is the database connectivity module. It plays a central role, directing communications between various software modules and the server software.	One CPSAPI per site
DC	Data Catcher	This module receives data from the device(s).	One DC per CPSAPI installation and per Workstation that supports wired-USB
DCP	Device Communication Protocol	This module listens for device(s) that are connected wirelessly, and it tells them which IP address to communicate with.	One DCP per subnet
FI	File Importer	This module receives tests from removable media (SD memory cards or USB storage devices).	One FI per Workstation receiving tests via removable media

Firewall settings

If you are using a firewall between any PCs in your configuration, the following ports or application files are required to gain access through the firewall. Software installation automatically opens these ports.

Software module	Port	Type	Application file
CPSAPI	9247	TCP	CPWS.Service.exe
DCP	44435	UDP	DCPd.exe
DCP	7711	UDP	DCPd.exe
DC	281	TCP	DataCatcher.exe
CP 200		ICMP	Allow incoming echo requests	Ping test

Functional diagrams

Software modules in a standalone CardioPerfect Workstation, removable media or USB
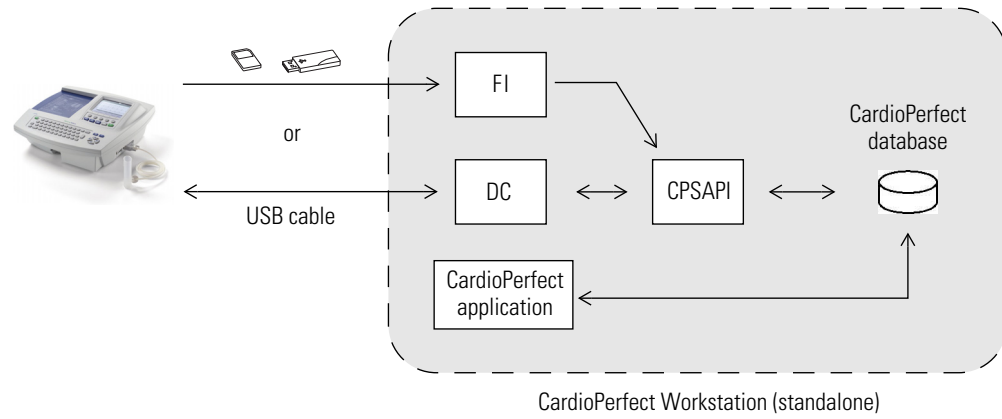
Related illustration:
"Standalone configuration, removable media or USB" on page 6

Software modules in a network configuration, wireless or Ethernet
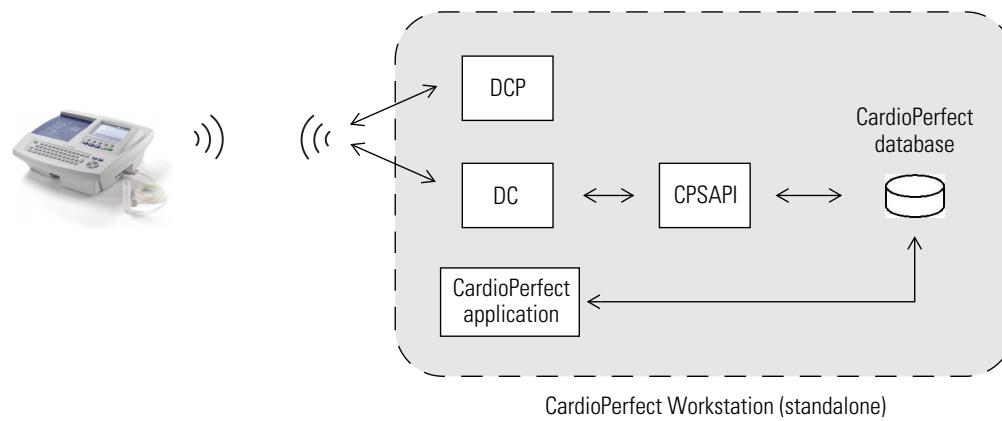
Software modules in a client-server configuration, removable media or USB
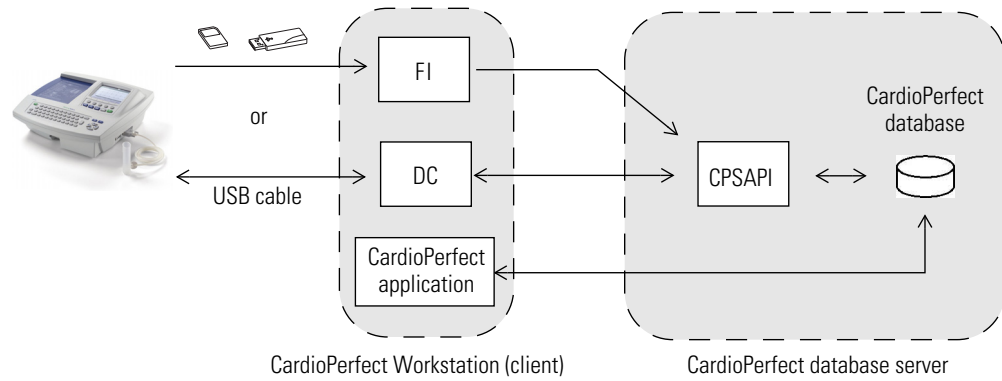
Related illustration:
"Client-server configuration, removable media or USB" on page 6

Software modules in a client-server network configuration, wireless or Ethernet
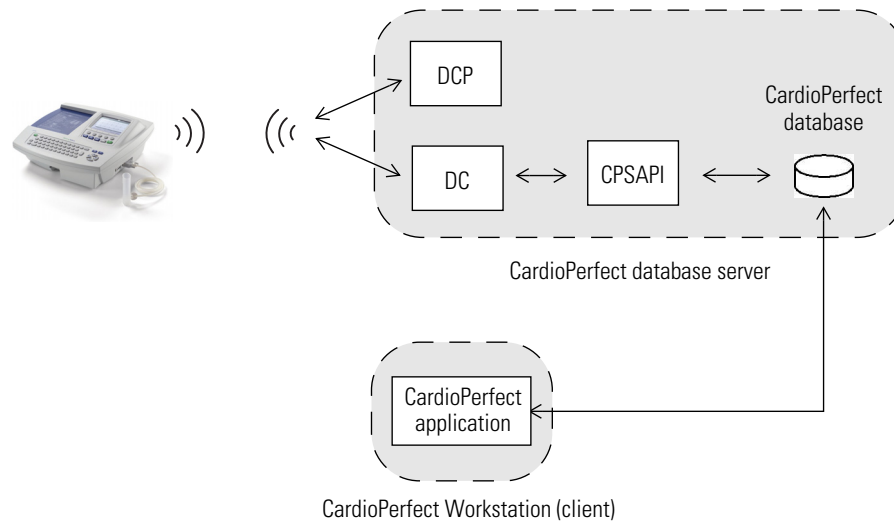
Related illustration:
"Client-server network configuration, wireless or Ethernet" on page 4

Software modules in a simple network configuration, wireless or Ethernet
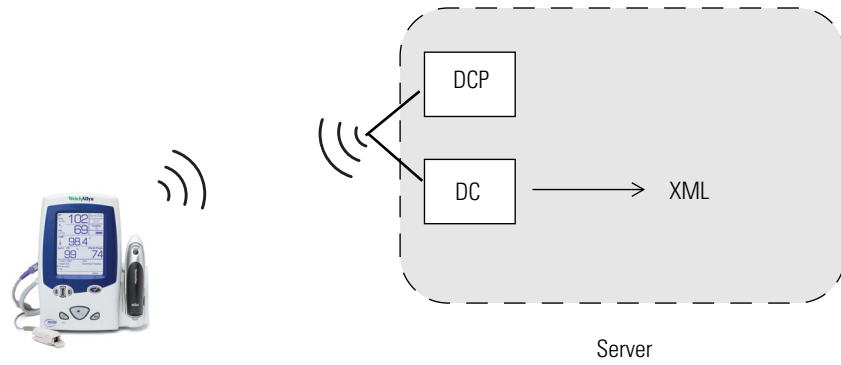
Related illustration:
"Client-server network configuration, wireless or Ethernet" on page 4

Software modules in a USB configuration
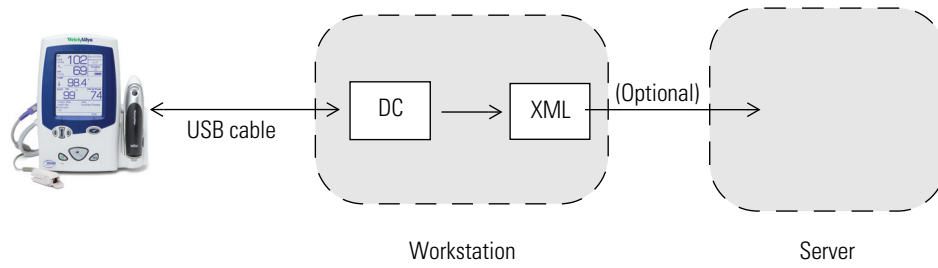
Related illustration:
"Client-server configuration" on page 4

Reassigning a server IP address

Who needs this procedure?
Users with a client-server configuration wired to the client PC(s) or communicating via removable media.

When do you need this procedure?
Anytime your server IP address changes.

What does this procedure accomplish?
It enables the software to pick up a newly assigned server IP address.

How do you do this procedure?
Restart the computer's DCP daemon Windows service.

     a.   Go to **Control Panel** > **Administrative Tools** > **Services**.

     b.   Right-click **DCP Daemon**.

     c.   Select **Restart**.

No action is required at the client PC(s).

Troubleshooting chart

Conditions	Causes	Actions
1. View Available Networks screen does not return any available networks (CP 200).	Outside range of all wireless networks.	Move within the wireless network.
	There are no wireless networks available.	Verify that the wireless network router(s) are powered up and properly configured.
	Device radio is not connected.	Connect CP 200 radio. Verify that the CP 200 radio lights are blinking or solid to indicate action.
	Device configuration.	Check the CP 200 network settings and connectivity mode. Verify that these settings match the access point settings.
	The device cannot connect to the network.	Check wireless settings and ensure that they match the access point settings.
2. Ping operation failed.	Wrong IP address entered.	Check other computer's IP address.
	The device cannot properly connect to the network.	**Wireless:** Check wireless settings and ensure that they match the access point settings. **Ethernet:** 1. Connect the network cable. 2. Wait a few seconds. 3. Navigate to the network setting screen and verify that the device has a valid IP address.
	Firewall settings.	The firewall needs to be set to "Allow echo requests." (See "Firewall settings" on page 33.)
	Device configuration.	Check the device network settings and connectivity mode. Verify that these settings match the access point settings.
3. Server test operation failed.	The device cannot properly connect to the network.	**Wireless:** Check wireless settings and ensure that they match the access point settings. **Ethernet:** 1. Connect the network cable. 2. Wait a few seconds. 3. Navigate to the network setting screen and verify that the device has a valid IP address.
	Connectivity software not installed on a computer on the network.	Install Connex CSK on the same computer as CardioPerfect database.
	DCP module is not running.	Check the services to verify that the DCP daemon service is running.
	Firewall settings.	Check firewall to ensure that exceptions are set. (See "Firewall settings" on page 33.)
	Device configuration	Check the device network settings and connectivity mode. Verify that these settings match the access point settings.
	The server IP address has changed.	See "Reassigning a server IP address" on page 37.
	Multiple subnets.	Check your network router settings; enable multicasting across subnets.
	Unknown	1. Determine the IP address of the PC running Data Catcher. 2. Perform a ping test to this IP address. If the ping test passes, the network connection is OK. 3. Perform a server test, if the server test fails then either DCP or Data Catcher is not running or in error state. 4. Restart the DCP or Data Catcher, and try the server test again.

Conditions (continued)	Causes (continued)	Actions (continued)
4. Test send (or patient search) failed — wireless or ethernet.	No patient order found or patient search contained no results	Server does not contain any patients that match the search criteria.
	The device cannot properly connect to the network.	**Wireless:** Check wireless settings and ensure that they match the access point settings. **Ethernet:** 1. Connect the network cable. 2. Wait a few seconds. 3. Navigate to the network setting screen and verify that the device has a valid IP address.
	Outside range of all wireless networks.	Move within the wireless network.
	There are no wireless networks available.	Verify that the wireless network router is powered up and properly configured.
	Device radio is not connected (CP 200 only).	Connect CP 200 radio. Verify that the radio lights are blinking or solid to indicate action.
	Connectivity software not installed on a computer on the network.	Install Connex CSK on the same computer as CardioPerfect database.
	DCP module is not running.	Check the services to verify that the DCP daemon service is running.
	Data Catcher is not running.	Check the services to verify that the Data Catcher service is running.
	Data Catcher is not receiving files.	Verify that the C:\Program Files\Welch Allyn\DataCatcher\SavedCopies folder has new files with a date/time stamp about when you sent it and that the folder updates as you send more tests. • If yes, Data Catcher is getting files. Check CPSAPI. • If no, Data Catcher is not working. Reinstall server software or check firewall.
	CardioPerfect services (CPSAPI) is not running.	Verify that the CardioPerfect Services service is running.
	CP 200 configuration.	Ensure that Connectivity Mode is set to Wireless.
	The server IP address has changed.	See "Reassigning a server IP address" on page 37.
	Firewall settings.	Check firewall to ensure that exceptions are set. (See "Firewall settings" on page 33.)
	Unknown	1. Determine the IP address of the PC running Data Catcher. 2. Perform a ping test to this IP address. If the ping test passes, the network connection is OK. 3. Perform a server test, if the server test fails then either DCP or Data Catcher is not running or in error state. 4. Restart the DCP or Data Catcher, and try the server test again.
	Data Catcher is not receiving files	Check to make sure the proper device connection type is enabled: 1. Open the Data Catcher configuration page through the system tray icon. Click on **Device Network** on the left. 2. Check **Supported Connection Types** to make sure the proper channels are enabled. **Note:** WiFi connections from devices require TCP to be enabled. USB connections from the CP200 require Serial to be enabled. 3. Click **Save Settings** to save your changes 4. If using WiFi wireless connectivity, verify that the device wireless settings (SSID, etc.) matches the network settings.

Conditions (continued)	Causes (continued)	Actions (continued)
5. Test send (or search) failed — USB cable.	Cables not connected.	Make sure USB cable is connected on both ends (device and PC).
	Connectivity software not installed.	Install Server Connectivity option on the computer containing the database, and install the Client option on the USB computer. Ensure that the device is connected and the PC driver is loaded.
	CP 200 configuration.	Ensure that Configuration Mode is set to Wired.
	Data Catcher is not running.	Check the services to verify that the Data Catcher service is running.
	Data Catcher is not receiving files.	Verify that the C:\Program Files\Welch Allyn\SavedCopies folder has new files. • If yes, Data Catcher is getting files. Check CPSAPI. • If no, Data Catcher is not working. Reinstall Client software or check firewall.
	CardioPerfect services (CPSAPI) is not running.	Verify that the CardioPerfect Services service is running on the computer containing the database.
	The server IP address has changed.	See "Reassigning a server IP address" on page 37.
	Firewall settings.	Check firewall to ensure that exceptions are set. (See "Firewall settings" on page 33.)
	Incorrect cable.	CP 50 and CP 150: Verify that you are using an A-to-mini-B USB cable. CP 200: Verify that you are using an A-to-A USB cable.
	Data Catcher is not receiving files	Check to make sure the proper device connection type is enabled: 1. Open the Data Catcher configuration page through the system tray icon. Click on **Device Network** on the left. 2. Check **Supported Connection Types** to make sure the proper channels are enabled. **Note:** WiFi connections from devices require TCP to be enabled. USB connections from the CP200 require Serial to be enabled. 3. Click **Save Settings** to save your changes 4. If using WiFi wireless connectivity, verify that the device wireless settings (SSID, etc.) matches the network settings.
6. Test send failed - removable media	Connectivity software not installed.	Install Server Connectivity option on the server containing the database, and install the Client option on the USB computer. Ensure that the device is connected and the PC driver is loaded.
	Client software is not installed on the computer intended to be the transfer station.	Install the Client software option on the computer intended to be the transfer station.
	Tests not on removable media.	Refer to the device's directions for use for details on sending tests to memory card.
	File Importer is configured for "Auto," but it ignores drives A and B.	Set File Importer to select the proper external media drive.
	File Importer reports a failure.	Verify that client and server have connectivity and that CPSAPI is running, then retry: Right-click the File Importer tray icon, select "Import Failures," select the failed file(s), and press Retry.
	File Importer has been manually disabled.	Right-click the File Importer tray icon, and uncheck the "Disable" menu.
	The server IP address has changed.	See "Reassigning a server IP address" on page 37.

Conditions (continued)	Causes (continued)	Actions (continued)
7. Data Catcher configuration page is inaccessible	The configuration web-interface has been disabled	1. Open **DataCatcherConfig.xml** (located in the Data Catcher installation directory) with a text editor. 2. Search for "InterfaceEnabled." On the line following this term, find the section that reads "<![CDATA[0]]>". 3. Edit the file and replace the 0 with a 1, so the entry reads: "<![CDATA[1]]>". **Note:** If the entry already reads "<![CDATA[1]]>", then the web-interface is enabled and something else is causing the access issue.
	There is another application already running on the PC which is using the port the web-interface would normally use.	1. Open **DataCatcherConfig.xml** (located in the Data Catcher installation directory) with a text editor. 2. Search for "ListenPort." On the line following this term, find the section that reads "<![CDATA[8000]]>." The 8000 may be another numerical value, if the web-interface port was changed in the past. 3. Edit the file to replace the 8000 with a new port value, one that you know no other application is currently using.
8. CPWS patient number has .SUSPECT appended to the patient number	The CP 200 patient-match criteria is only partially satisfied.	See "Configuring the CP 50, CP 150, and CP 200 patient-match criteria (resolving patients)" on page 15.
9. Datamed interface is not working	The plug-in is not enabled.	See "Configuring the CardioPerfect Workstation for non-Welch Allyn devices" on page 17.