PATHCAST™

Designed Specifically for Pathology and Clinical Consultation

Telepathology
Interface Software

User / Technical Manual

Revision 1.0.005 (December 17, 2019)
PN: PC-MAN   r.1.0.002

SPOT IMAGING
Take a closer look

Table of Contents

Section 1: General Information

Purpose and Scope of Manual

This manual has been written to provide:

- An overview of the operating principles of the software interface design
- Reference diagrams for the setup of the Software in your IT environment
- Brief explanation of each feature with small tutorial on its use
- Common trouble shooting procedures for service technicians performing installations and periodic updates.

Contact Information

Technical Help Inquiries:

Please note that technical assistance from our specialists will only be available in one of three ways:

- Part of the original support period duration listed on the purchase invoice (the subscription per period as applicable)
- Via a pre-purchased service contract (note duration of contract and its coverage)
- Purchased on a time and materials basis at the time of need via approved credit source
- Please note that troubleshooting issues not related to the software may be subject to a charge

Tech Help Contact Information:

Please note that technical assistance from our specialists will only be available in one of two ways:

Telephone: +1 (586) 731 6000 option 2 (Technical Help Desk)

Email: info@spotimaging.com
Subject line: PathCast Technical Help

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Abbreviations and Symbols:

Symbols and Abbreviations:

Symbol	Description
∿	Alternating Current (AC)
⎓	Direct Current (DC)
	Both Direct and Alternating Current
⏚	Earth Ground
	Protective Conductor Terminal
		On (Supply Power)
◯	Off (Supply Power)
⚠	Caution: Your actions can have detrimental impact to you or to associates and customers.
⚡	Caution: Risk of electric shock

Warnings:

⚠️ PathCast transmits the computers desktop to the partners in a session, it does not discriminate PHI (Patient Private Health Information) from non-protected information, therefore it is the responsibility of the Users to ensure that they are communicating with HIPAA Qualified Personnel within their organization or with HIPAA Qualified business partners if PHI is shown on their monitor. Or, in the case of non-HIPAA qualified meeting attendees it is the responsibility of the host and other attendees that have access to PHI to limit presentation of this data to non-HIPAA compliant attendees.

⚠️ PathCast transmits the computers desktop to the partners in a session; it does not discriminate nor hide your personal or corporate sensitive materials from any of the attendees. To this end, it is the responsibility of each attendee to limit anything that they do not want viewed by others in the meeting.

Model and Option Overview:
Software Base Version:

PathCast-S Rev-1.0.002:

PathCast is a software interface that provides virtual meetings between computer workstations across an institutions network and within the firewall domain. It provides video transmission of the presenter's desktop, as well as half duplexed VoIP audio communication using microphones and speakers listed in the operating systems audio settings. PathCast provides the meeting attendee with remote control of the presenter's keyboard and cursor on the presenter's desktop when it is enabled by the Presenter. Meetings are initiated by selecting a colleague's name from the contact list and then clicking Start Meeting. Future releases will expand the number of meeting attendees from the current limit of one (1) to multiple attendees. The installation utilizes individual applications installed on each participants computer as well as a Contact management server within the LAN/WAN network. Current Licensing is based on a per-seat subscription model that is keyed to the computer hardware of each installation. Future releases will leverage the Contact Server to facilitate institutional licensing management models.

PathCast's security benefits from the following architectural and configuration features:

- IT Management control over the addition of new users limiting human spoofing of registrations

- Only operates within organizational firewall

- Does not require any external firewall exceptions

- External access for registered users via VPN connections only (registered and encrypted)

- Utilizes a meeting contact server for participant validation

- PathCast meeting contact server requires a static IP Address - No network discovery services required

- PathCast Clients do not respond to unauthorized requests

- No open meeting resources paths available which blocks access to the client systems

- PathCast™ is a proprietary, hospital targeted application, limiting its access to nefarious actors

Application User Interface Features:

- Launch on startup capability

- Meeting controls dialog - movable, collapsible and dockable

- User contact name customization

- Contact list sort and search

- Available user colleague contact list

- Start meeting and end meeting buttons

- Transfer presenter

- Enable remote keyboard and cursor control (presenter selection)

Microphone controls for:

- Source selection (system resources)
- Trigger and persistence of noise cancellation
- Mute and volume

Speaker controls for:

- Source selection (system resources)
- Trigger and persistence of noise cancellation
- Volume

Preference settings for:

- Starting meeting with screen sharing on or not
- Starting meeting with microphone muted or not
- Starting meeting in full screen mode or not
- Interface color settings
- Choice of meeting requests alert sounds and frequency
- Interface startup collapsed or not
- Window location locked or not
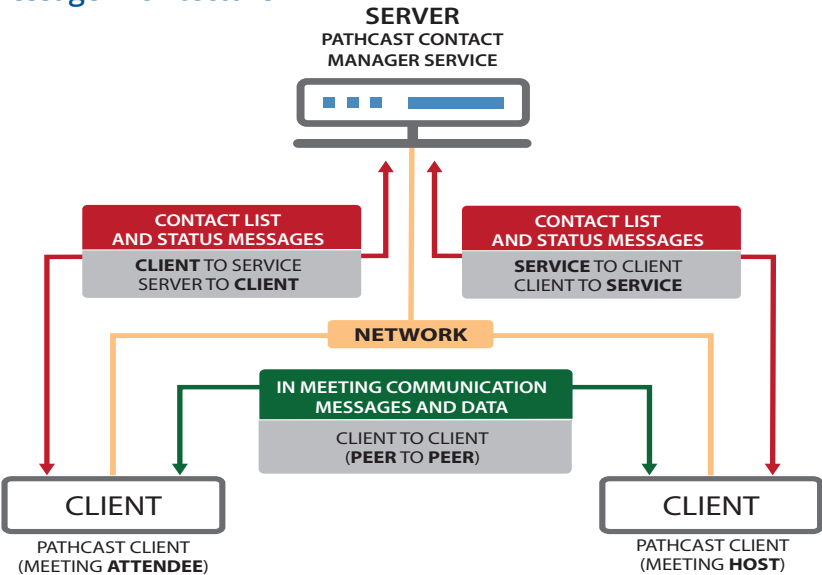
Workstation and Network Requirements

	Minimum	Recommended	Best Performance
Operating System	Windows 7- SP1 (64 bit)	Windows 10 (64 bit)	Windows 10 (64 bit)
Hard Disk Space	50 MB	50 MB	50 MB
CPU	Intel/AMD 1.5 GHz	Intel i5 2+ Core 2+ GHz	Intel i7 2+ Core 3+ GHz
GPU	Integrated GPU with Open GL Support	Integrated GPU with Open GL Support	Integrated GPU with Open GL Support
GFLOPS*	>400 GFLOPS	>600 GFLOPS	>800 GFLOPS
Monitor**	1280 x 720	1920 x 1080	2560 x 1600
Mouse	2 Button	2 Button with Scroll Wheel	2 Button with Scroll Wheel
Microphone	Win OS System Supported Devices- Application Selectable	Win OS System Supported Devices- Application Selectable	Win OS System Supported Devices- Application Selectable
Speakers	Win OS System Supported Devices- Application Selectable	Win OS System Supported Devices- Application Selectable	Win OS System Supported Devices- Application Selectable
Server Support	Within LAN/WAN Contact Server	Within LAN/WAN Contact Server	Within LAN/WAN Contact Server
Network Port Speed	100 Mbps- 100 Base-T	1000 Mbps- Gigabit Full Duplex	1000 Mbps- GigaBit Full Duplex
Network Ports	TCP: 2223, 2224, 2225; UDP:2221, 2222		
	*-Computer Speed Ratings:	**=Note that high resolution displays will tax both the computing and LAN capacity	

Performance (Note that actual speeds will depend on network speed and loading, CPU/GPU performance, monitor resolution, and amount of image change)

	Minimum	Recommended	Best Performance
Connection Time	2-4 s	2-4 s	2-4 s
Typical Frame Rate	>10 FPS	>15 fps	>20 fps
Transmission Resolution	Full Res. Quality Optimized	Full Res. Quality Optimized	Full Res. Quality Optimized
Video Delay	<1 s	< 0.75 s	<0.5 s
Remote Cursor Delay	<1.5 s	< 1.5 s	<1.0 s

PathCast Workflow Diagrams

Message Architecture

SERVER
PATHCAST CONTACT MANAGER SERVICE

CONTACT LIST AND STATUS MESSAGES
CLIENT TO SERVICE SERVER TO **CLIENT**

CONTACT LIST AND STATUS MESSAGES
SERVICE TO CLIENT CLIENT TO **SERVICE**

NETWORK

IN MEETING COMMUNICATION MESSAGES AND DATA
CLIENT TO CLIENT (**PEER** TO **PEER**)

CLIENT
PATHCAST CLIENT
(MEETING **ATTENDEE**)

CLIENT
PATHCAST CLIENT
(MEETING **HOST**)

Typical Workflow

SELECT CONTACT → SEND INVITATION

CONTACT ACCEPTS INVITATION — **No** → MEETING REFUSED

Yes

MEETING RUNNING

Audio Channel and Meeting Management Channel Established.

Meeting is running at this point and the Host or Attendee can terminate it or choose to share their screen, change presenter, etc...

END MEETING? — **No**

END MEETING MESSAGES SENT AND ENDED

Active Meeting Screen Sharing

HOST SHARING SCREEN? — **No** → DISPLAY MEETING INFORMATION

Yes

SCREEN SHARED

Speaker Phone: Suggested

Jabra Speak 410 USB Speakerphone Wired Speaker Phone

Compact size

- **Conferencing Speakerphone**
- **True Wide band Sound**
- **360-degree Microphone**
- **Compact Design**
- **Intuitive On-Device Call Controls**
- **External Ringer**
- **Headset Port**
- **Includes USB Cable**

USB Cable

Headset port

360-degree microphone

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Section 2: Software Installation and Setup

Network Architecture:
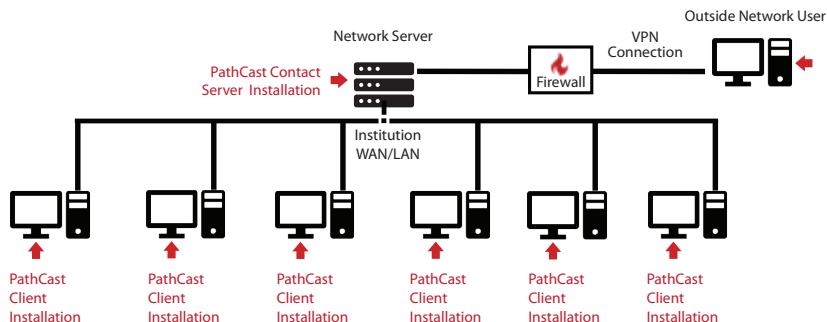
PathCast Server Computer Minimum Requirements:
- Server Grade Windows 10 OS (64 Bit) computer with Static IP address
- WAN/LAN Network with 100 Mbit/s Port

PathCast Client Computer Minimum Requirements:
- 50 MB Free Space, Windows 10 (64 Bit) OS computer
- WAN/LAN Network 100 Mbit/s Port

PathCast Software Installers Download Links:

PathCast Contact Server:
http://www.spotimaging.com/downloads/pathcast/server

PathCast Client:
http://www.spotimaging.com/downloads/pathcast

Please Note :
- *Non-Internet connected computers will require additional time for hard copy registration and license activation. Plan accordingly for this.*
- *If you need to purchase a physical copy (DVD or thumb drive) of the Path-Cast Installers please contact a SPOT representative at +1-586-731-6000 or info@spotimaging.com*
- *Ensure you have administrative privileges with the ability install software and edit firewall rules on the target computer. Contact your IT department as needed to perform these services.*

PathCast Contact Server Network Server Installation:

- Preparation Notes:
    - o The Standard PathCast Contact Server installation requires a Static IP address.
    - o For dynamic server addressing please contact SPOT Imaging Tech Help Desk.
- Run the PathCast Server Setup installer on your network Server
- Upon completion of the PathCast Contact Server Installation:
    - o Record the static IP Address of the Server Network Port. This IP address will be entered into settings of each of the PathCast Client installations.
    - o Open the UDP 2221 and 2222 Firewall ports for communication.
    - o Start the PathCast Contact Service using one of the following methods:
        - Go to the **Services** folder and start the **PathCast Server**
        - Restart the server computer

PathCast Client Installation:

- Preparation Notes:
    - o In fulfillment of your purchase, you will receive a letter containing your PathCast Subscription Product Keys. These keys are your seat licenses.
    - o One product key is required for each active computer station that will participate in teleconferencing meetings.
- Run the **PathCast_Setup** installer on each of your user's computers
- Upon completion of the PathCast Client Installer you will be prompted to register and activate each license. This can be done:
    - o **On-line**, which provides instant, automatic activation of your license (This is the preferred method-See the following page)
    - o **Off-line**, which will require sending forms to SPOT Imaging via a hardcopy mailing or an electronic PDF file emailed from an online computer. Once your registration is received you will be sent an activation code via the same method your registration was sent.
    - o **NOTE:** Your PathCast software will be nonfunctional until it is activated, plan accordingly.
    - o **NOTE:** If you plan to move your licensed copy of PathCast to a new computer you will need to contact SPOT Imaging to update your registration and activation codes.

Section 3: Client Registration and Activation
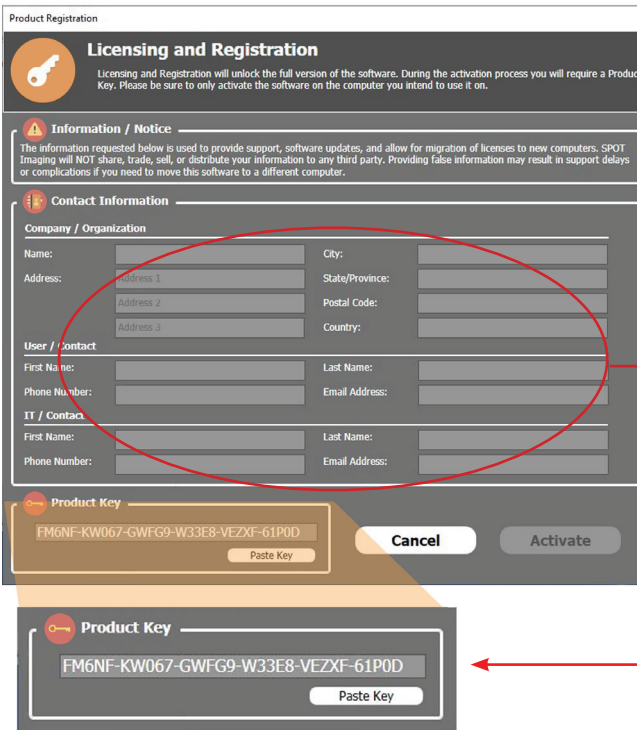
To maintain security, only registered PathCast licenses are activated and functional.

(This information ensures that your organization is a secure, verified account)

- Un-activated PathCast software provides a license registration dialog on startup.
- Click the **<Enter License>** button.
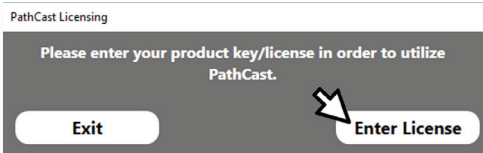
- In the **[Product Registration]** form enter your Institution, User and IT Department contact information.

Fill in all sections

- Enter the PathCast Product Key for the computer.
  (The product key is found on the PathCast Subscription Product Keys Letter sent in fulfillment of your purchase.)

Continued...

PathCast Client Registration and Activation:

- Once all the registration fields are completed, the **<Activate>** and **<Print>** buttons will become available to press.

Automatic Activation

- Users with internet connected computers should press the **<Activate>** button. This will initiate the automatic registration, activation and startup of your PathCast Software. This typically occurs in less than 30 seconds.

Manual Activation

- Users with computers that are not connected to the internet should press the **<Print>** button.

    Note: This manual registration process will incur a delay related to the transmission and manual processing of the request, **plan accordingly.**

In the print dialog you can:

- **Select <Microsoft print to PDF>** to create a file which you can transfer to an internet connected computer and email it to:

    Subject: PathCast Registration-Activation

    Email: info@spotimaging.com

OR:

- **Select a printer**, make a hard copy and mail it to:

    SPOT Imaging
    Attention: PathCast Registration-Activation
    6540 Burroughs Ave
    Sterling Heights, MI 48314-2133

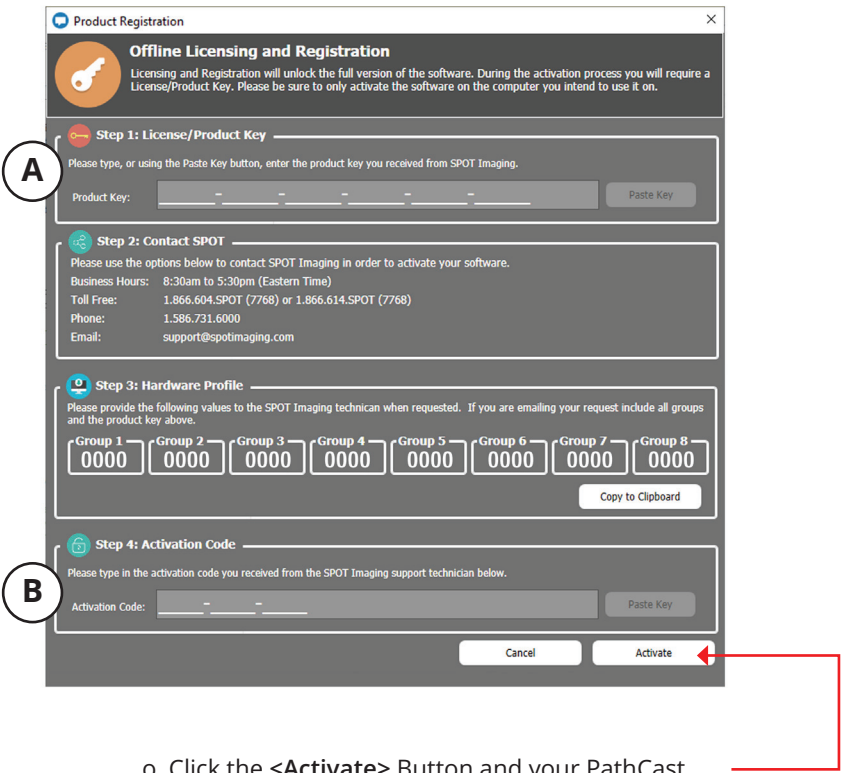*You will receive Activation Codes in the same manner that you sent the registration form.*

PathCast Client Registration and Activation:

   o Upon receiving your activation codes, start the PathSuite software

   o Click the **<Enter License>** button
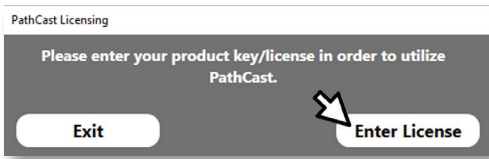
   o Fill in the **Product Key** (A) and **Activation Code** (B) fields from the information provided.

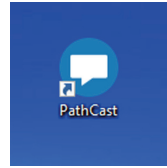   o Click the **<Activate>** Button and your PathCast software will start.
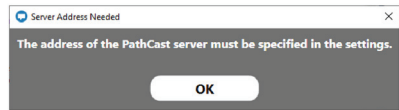
Section 4: Client Initial Settings

On Startup certain essential setting are required for proper PathCast operation...

PathCast Contact Server IP Address:

- Double Click on the PathCast icon if it is not already started.

- PathCast will request the fixed IP address of the PathCast server recorded earlier. Click **<OK>** on the prompt.
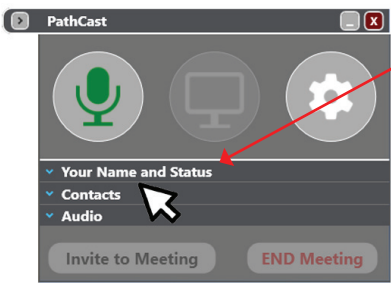
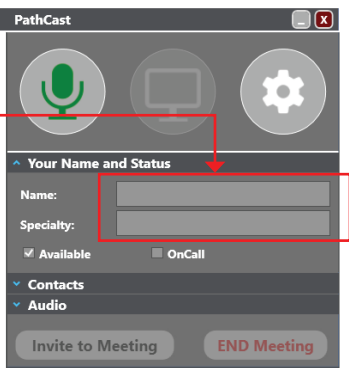Click the **Unlock Button** to enter or update the IP Address
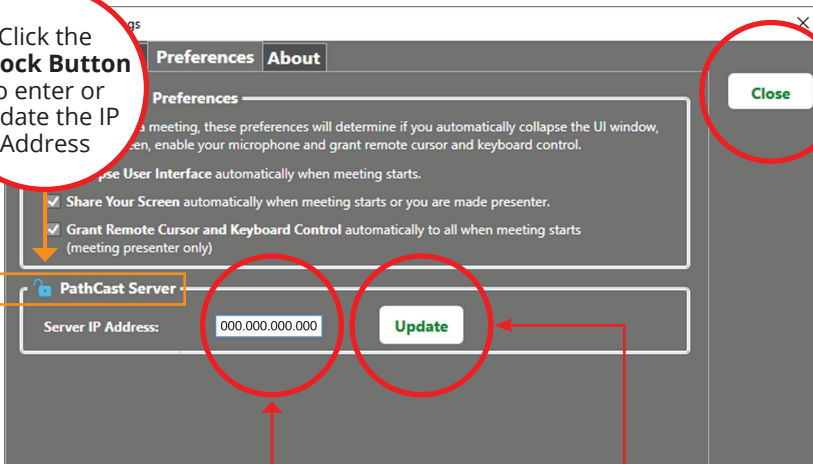
- Enter the **IP-Address** in the field provided and click the **<Update>** button

- Click the **<Close>** button to exit the **[PathCast Settings]** dialog

- *NOTE: Any time the PathCast Contact Server IP address changes it will need to be updated in the [PathCast Settings] dialog at the bottom of the [Preferences] tab.*
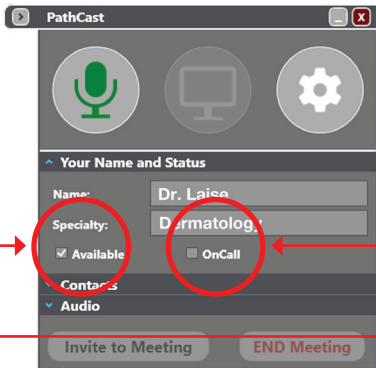
User Contact Name, Department and Status:

• Expand the PathCast Control Center dialog

1 Click on the **[Your Name and Status]** pane
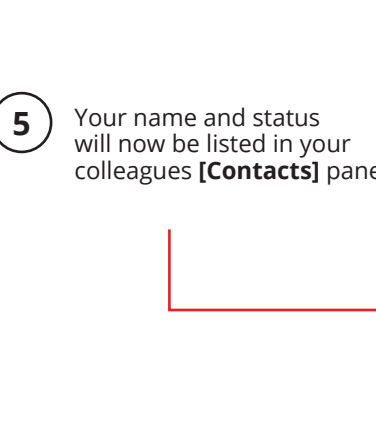
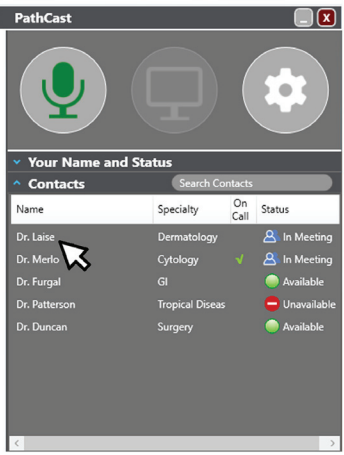**2** Enter your Name and Specialty to allow colleagues to readily identify you

3 Use the **[On Call]** check box to flag when you are covering support services for ROSE and Intraoperative consults.

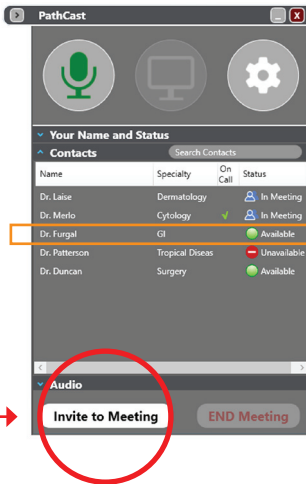**4** Set the **[Available]** check box to let colleagues know when they can connect to you.

**5** Your name and status will now be listed in your colleagues **[Contacts]** pane.

Start a Meeting:

- Expand the PathCast Control Center dialog if it is minimized
- Click on the **[Contacts]** pane
- Select the name of an available colleague
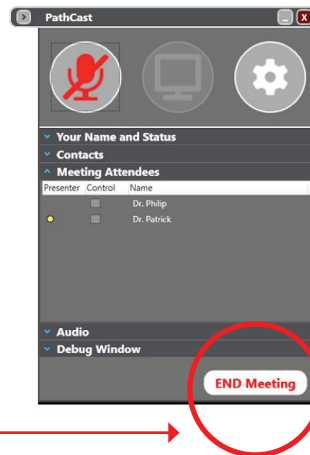- Click the **<Invite to Meeting>** button

← Select a Colleague

- The colleague selected will receive a visual and audio meeting request prompt. Clicking the **<Accept>** button in the dialog will start the meeting connection and show your screen and provide an interactive audio connection.
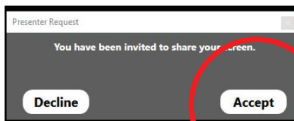
- To end the meeting press the **<End Meeting>** button

See the **PathCast User Manual** for full details and specification on all the settings and features

## Renewal and Maintenance of Your PathCast License:

- PathCast is licensed on a **Per Seat Per Year** basis
- To help you manage your subscription, PathCast will provide you with renewal reminders at 90, 60, 30 and every day within the last two weeks of the subscription.
- The catalog number for a 1 year subscription renewal per seat is:
    - o PATHCAST-1YRNL

Renewal Purchases Can Be Made:

- **On-Line:**
    - o Electronic Purchase Dialog:
      www.spotimaging.com/pathcast/renewal
    - o Requires:
        - Internet Connection
        - Credit Card
        - Seat License Number
          (Found in the Help/About PathCast Menu)

- **Off-Line/Manual/PO Process:**
    - o Contact your SPOT Sales Representative at:
        - Email: info@spotimaging.com
        - Toll Free +1 (866) 604-SPOT
        - Main Phone: +1 (586) 731-6000
    - o Requires:
        - Seat License Number
          (Found in Help/About PathCast Menu)

Section 5: PathCast Sound Settings

Expand the Audio Pane:
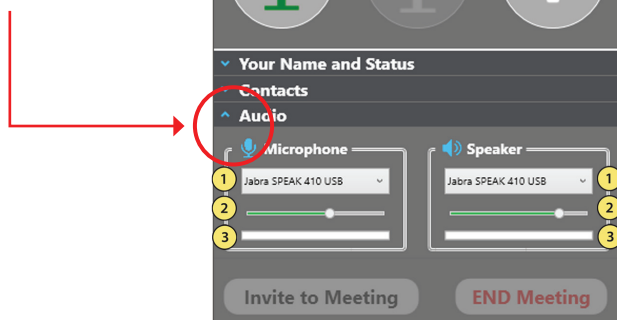
In each of the **Microphone** and the **Speakers** sections there are three controls:

    1. **Microphone/Speaker** Hardware Selectors

        > This allows you to designate what Audio Device is used
          by PathCast.

    2. **Microphone/Speaker** Volume Control Sliders

        > Adjust this until comfortable

    3. **Microphone/Speaker** Audio Signal Indicators

        > This shows the amount of signal going into the microphone
          or out of the speakers.

If the green bar is repeatedly at the full scale it would be best to move the volume controls to the left.
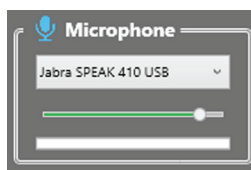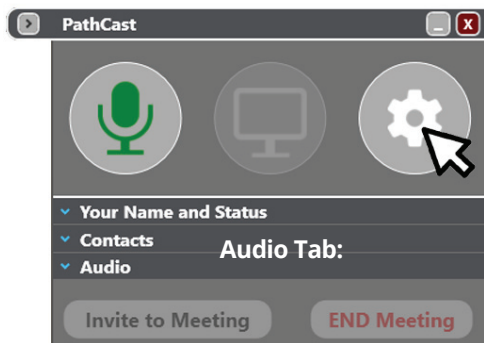

If the green bar is barely moving out of the left side it would be best to increase the volume by moving the volume control to the right.

Section 6: PathCast Settings

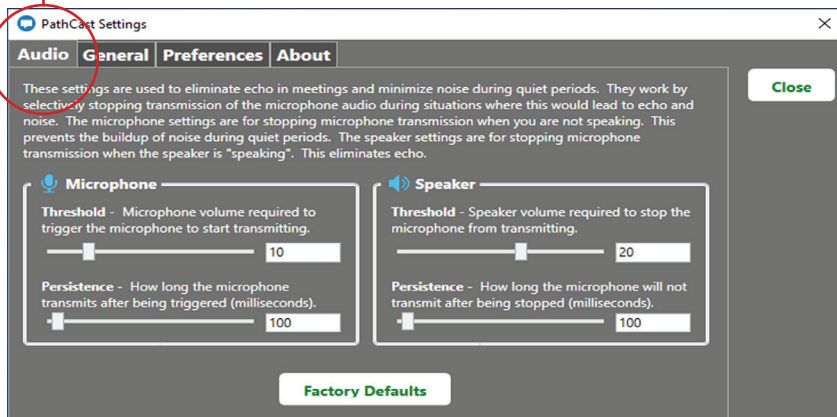To enter the PathCast Settings, click on the **Gear** button

This will open the **PathCast Settings Control** in which you will see 4 tabs...
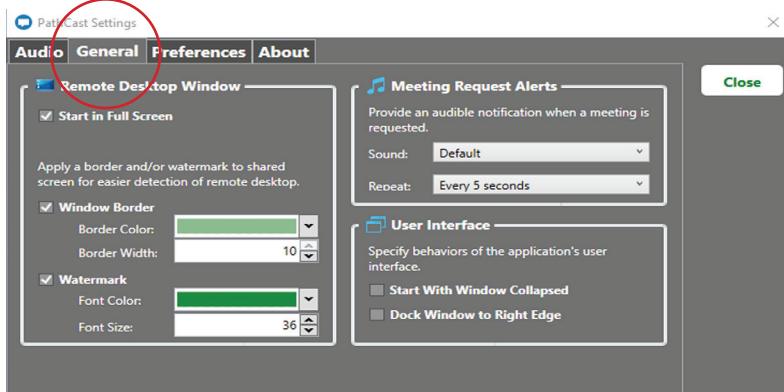
- **Audio Tab**
- **General**
- **Preferences**
- **About**

Audio Tab:

> Adjust the echo suppression settings

> Store audio echo suppression settings

> Restore of factory default echo suppression settings

Remote Desktop Window:

- **Start In Full Screen** Check box:
    - > This sets the starting state of the PathCast Remote Desktop Presentation Window
    - > When checked the Presentation window will fill your screen
    - > When unchecked the presentation window will assume the size and location that was last used.
- **Window Border** Check box:
    - > If checked the PathCast Remote Desktop Presentation Window will have a border around it
    - > The border provides the user a visual indicator that you are viewing the presenter's window and not your own desktop, avoiding an otherwise common mistake of perception.
    - > **Border Color:** Allows user to set their Color preference
    - > **Border Width:** Allows user to set their preference in pixels
- **Watermark** Check box:
    - > Checking the Watermark puts the presenter's name at the top of the PathCast Remote Desktop Presentation Window. This clarifies who's window is being presented during the meeting. This is especially helpful during Multi-attendee meetings.
    - > **Font Color:** Allows user to set their font color preference
    - > **Font Size:** Allows user to set their type size preference

Meeting Request Alerts:

These are the settings for the "Ringer" sounds to alert you of an incoming meeting request.

- **Sound:**
  - > Allows user to select the audio alert snippet of their preference
- **Repeat:**
  - > Sets the period between each audio notification

User Interface:

Sets the preferences for the PathCast Control Center Window

- **Start With Window Collapsed** Check box:
  - > When checked the PathCast Control Center Window is collapsed to the side to save Desktop space.
 - > The Expand arrow will need to be clicked to open it and allow the settings to be changed or a meeting to be started.
- **Dock Window to Right Edge** Check box:
  - > When checked, the PathCast Control Center Window will be collapsed and docked to right edge of the screen
  - > When unchecked, the PathCast Control Center Window is locked to the last location it was positioned.

Preferences Tab
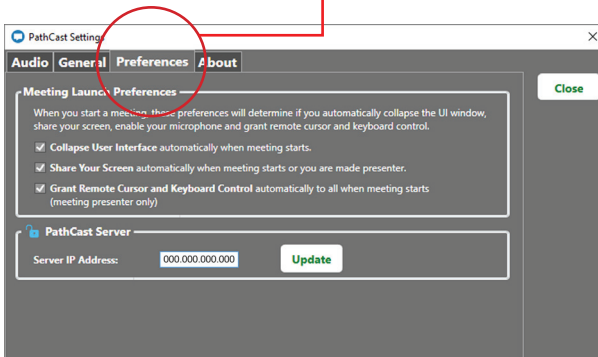
Meeting Launch Preferences:

Settings to determine if presentation video and audio are automatically running when a Meeting is initiated

- **Collapse User Interface**:
  - > If checked, automatically collapses the **PathCast Control Center** Window to right screen edge on meeting start, ensuring your screen is unobscured

- **Share your screen**:
  - > When **checked**: Video streaming starts as soon as the meeting starts, eliminates forgetting to start Screen Sharing
  - > When **UnChecked**: Requires user to click the presentation button

- **Grant remote and keyboard control:**
  - > When checked, allows attendee control of the cursor and keyboard on the presenter's screen
  - > Note this is controlled by presenter only
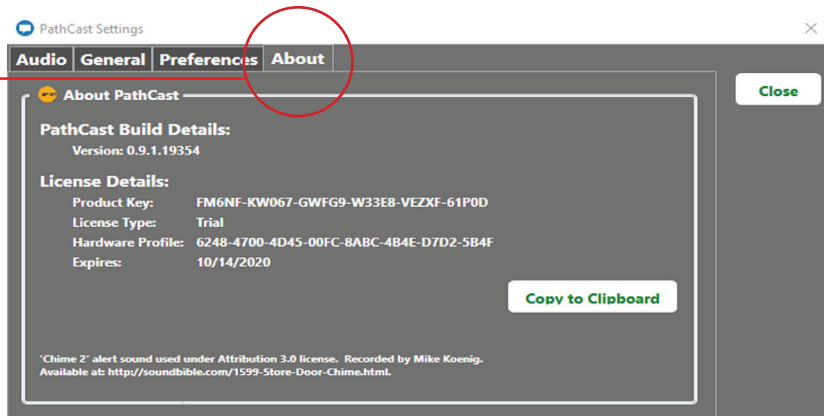
- **PathCast Server:**
  - > This is the server address setting for the **PathCast Contact Manager**
  - > It must be set to the location of the **PathCast Contact Manager**. If it is not set correctly, the contact list will not populate.

About Tab:

- **Provides Contact information for SPOT Imaging**
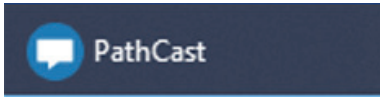
- **Provides PathCast:**
  - > Revision numbers
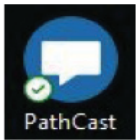 - > License number
  - > Subscription expiration date

Section 7: Typical Meeting Workflow

Start PathCast by clicking on:

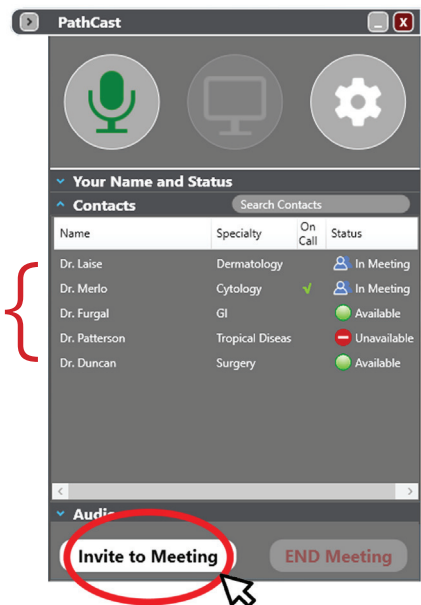• **PathCast Task Bar Icon**

• **Or PathCast Desktop Icon**

• **Open the PathCast Control Center Window if it is collapsed by clicking on the Expand Arrow…**

• **This will open the PathCast Control Center Window**

• **Click on the Contacts pane to see the Available Contacts**

- **Select the contact you would like to meet with and then click the Invite to Meeting button**

- **The Contact you selected will receive a Pending Meeting Request Prompt and the Audio Alert at their computer**

    (Note: If your contact has their speakers muted or turned off they will not hear the audio alert they will only get the Visual Pending Meeting Request Prompt)
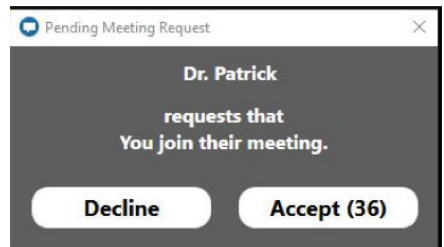
- **Your Contact Can:**
    - **Let the Pending Meeting Request expire (after 60s)**
        - > **You will be notified that your request timed out**
    - **Decline the Meeting**
        - > **You will be notified that the meeting was declined on your screen**
    - **Accept the Meeting**
        - > **The meeting will start**

- If you do not have the Auto-Show Screen setting on, (located in the Preference Tab) you will receive a **Presenter Request** to show your screen.
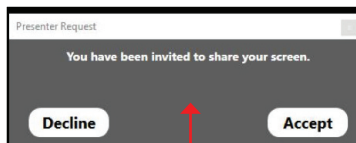
- You can Decline:
  - > Let the Pending Meeting Request expire (after 60s)
    - > You will be notified that your request timed out
- You can Accept:
    - > The invitee will then see your screen...
   - > Notice the Border and the Watermark with the Presenter's name
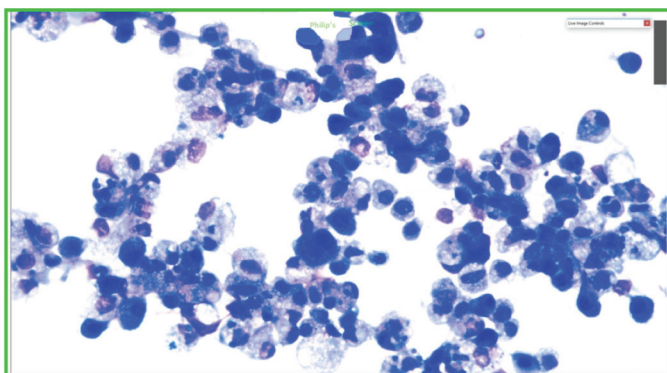
- Your audio connection will be made between the two computers:
    - > Note that each attendee will be responsible for un-muting their microphone and setting their speaker volume
    - > See the Microphone Mute/Unmute controls below...
- "In Meeting" Privacy:
    - > During a meeting your audio can be muted by clicking on the **Microphone** Icon, clicking again unmutes the microphone.
    - > Note: PathCast also supports speaker-phone push-button controls.
    - > Additionally, If the presenter would like to hide their desktop, they can click the **Monitor** Icon to stop presenting their desktop. Clicking again resumes desktop presentation.

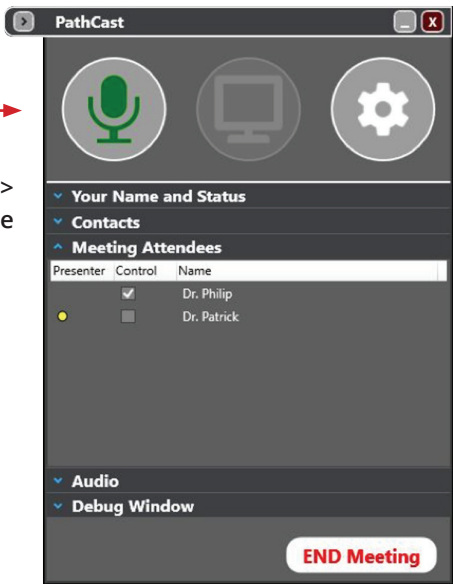## Collapsed and Expanded Main Control Box

Collapsed Mode
> Muted Microphone

Expanded Mode
> Muted Microphone
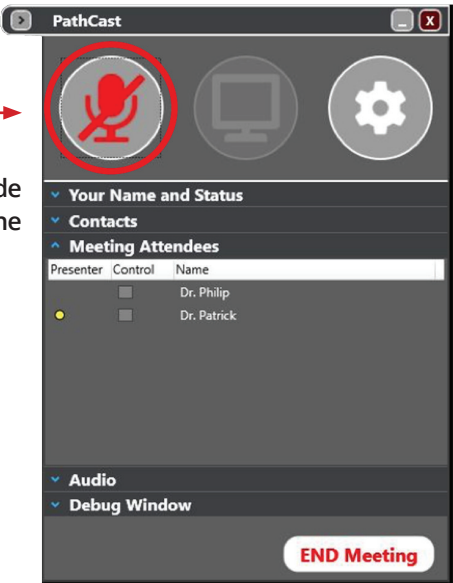
Collapsed Mode
> Unmuted Microphone

Expanded Mode >
Unmuted Microphone

- Meeting Attendees Pane:

    > Notice in the Expanded PathCast Control Center Window that the Meeting Attendees Pane is open...

    > There is a yellow dot placed in the Presenter column to indicate current presenter

    > Checking the Control column check box provides the attendee the ability to use the Remote Cursor and Keyboard Control on the Presenter's Desktop.
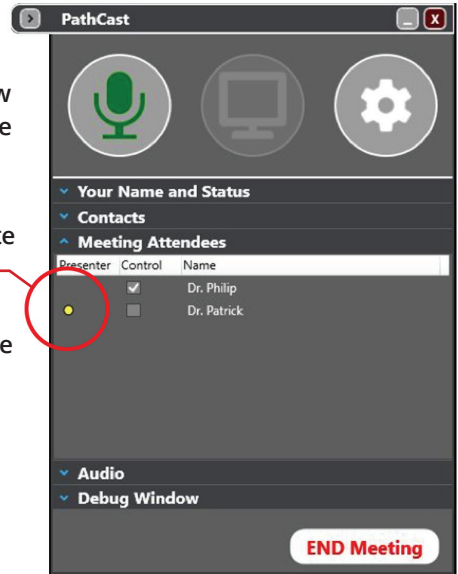

- The Remote Cursor is a composite cursor that has two components:

    > **Circle Cursor**: The circle provides immediate feedback to the remote attendee of their mouse movements to the intended location of action on the presenter's desktop

    > **Arrow Cursor**: The arrow cursor shows the actual cursor location on the presenter's desktop. The arrow cursor lags the circle due to the data travel times across the network.

- **End Meeting:**
  - > **When either party to a meeting would like to leave a meeting, simply push the end meeting button in either the collapsed or expanded PathCast Control Center Window**

Collapsed PathCast Control Center Window

Expanded PathCast Control Center Window
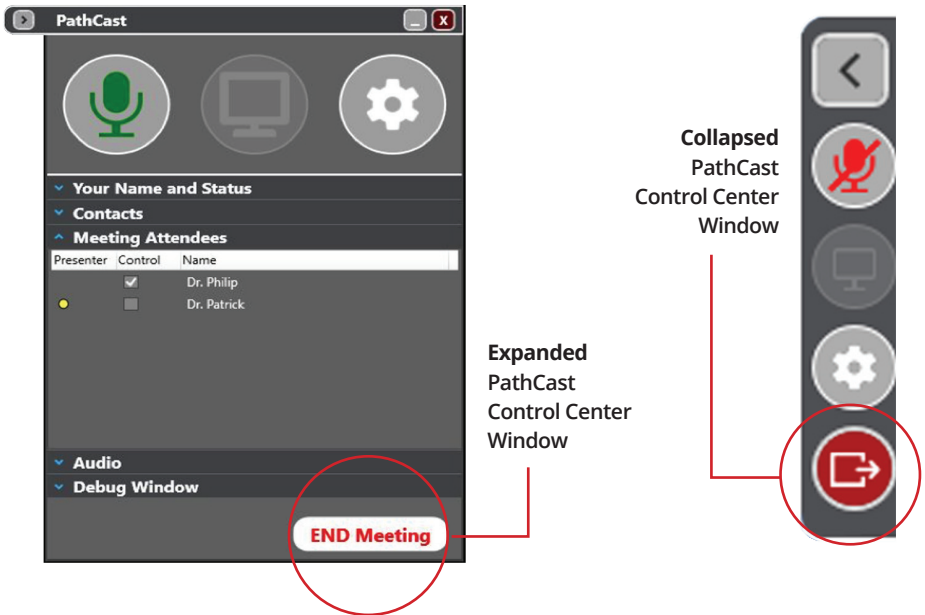
**The party ending the meeting will be presented with a confirmation dialog:**
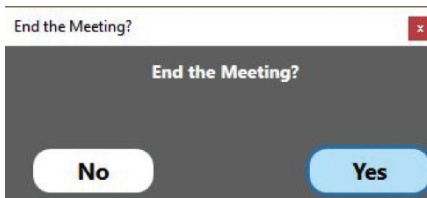
The other party will be provided with a notification that the meeting has ended:
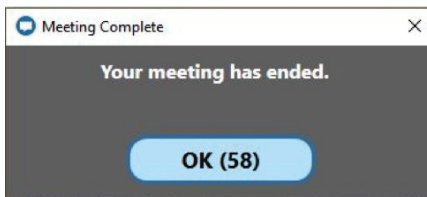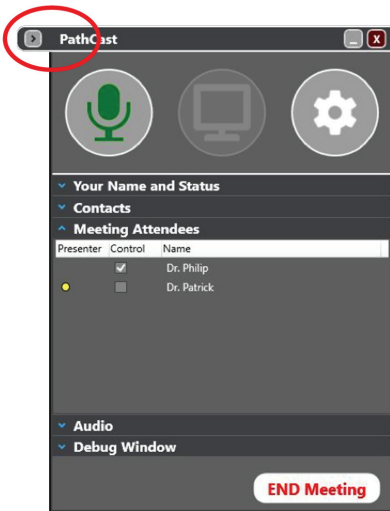
Section 8: PathCast FAQ and Solutions

Issue: Big gray box in the Remote Users Field of View

PathCast grays out the presenter's PathCast Control Center Window in the presentation screen to keep attendee from seeing the host's PathCast Control Center Window.
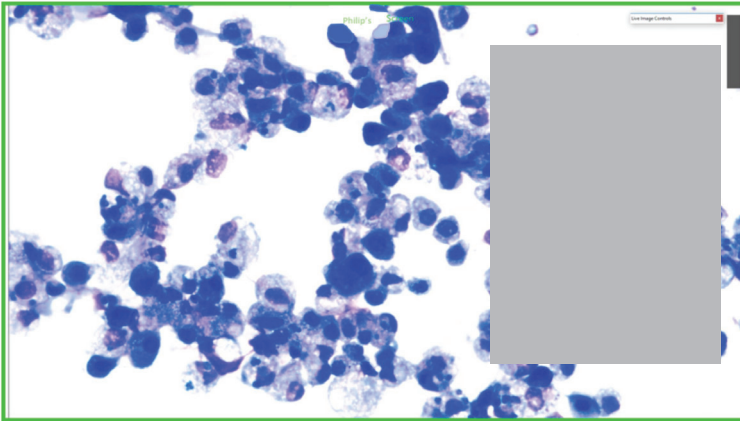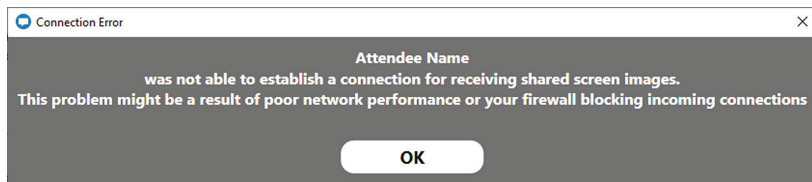

To get rid of it, the presenter should click the Collapse button on the PathCast Control Center Window.

Issue: Cannot connect due to Firewall

If this happens, a dialog box will appear saying to contact your IT department.

Issue: Don't see the Meeting Attendees list

If you experience a meeting that works but you can't see who's attending the meeting, you should contact your IT department.

Issue: Contact list is not showing up... it means the PathCast server could not be setup and running correctly...

1) Check to make sure the network is setup correctly.

    a. Make sure that you are using either a WiFi connection or a Ethernet connection NOT both since the Windows Network manager automatically selects your connection and may switch connections causing your meeting to drop.

2) Check to make sure the IP Address for the PathCast Server is correctly set

    a. On the computer that the PathCast server is installed on browse to:

    Setting>> Network & Internet>> Change connection properties

        i. Scroll down to the IPv4 Address and record this

b. In each of the connected PathCast Clients Select:

    i. Settings [Gear icon] >> Preferences Tab>>

    ii. Verify the IP address matches the IP address recorded above if it does not update it by:

        1. Clicking on the lock icon

        2. Select OK in the warning dialog

        3. Enter the corrected IP address

        4. Then Click the Update button

3) Check to see if the PathCast Service is installed and running properly...

    a. Type "Services" into Explorer search and then select the Services App

    b. Then scroll to see if PathCast is installed and running

    c. If you don't see it, reinstall the PathCast Server from the link below:

    d. If PathCast is installed check to make sure it's Startup Type setting is set to "Automatic"

    e. If not reinstall the PathCast Server from the link:

    http://www.spotimaging.com/downloads/pathcast/server

    f. If PathCast is installed and running, try highlighting it and clicking restart- this can clear program and settings anomalies with in the service.

4) Check if the Computer Firewall settings are correct:

    a. Type "Security: into the Windows Explorer then browse to:

    Windows Security >> **Firewall & network protection** >> **Allow an app through firewall**

    b. Scroll down to the PathCast apps and make sure they are allowed through the firewall in both public and private checkboxes- if not click the Change settings button and check the boxes.

    (Note: You will need Administration privileges to accomplish this)

Tech Support:

- The purchase of a PathCast software subscription (Cat. No. PATHCAST-1YRNL) is for the Software only.

- Installation and ongoing support to your IT Department will only be provided by:

  o A quoted line item on your Original Purchase order

  o An IT Department Software Support Contract purchase

  o A per hour IT Support Purchase made at the time of need

- End User Support will only be provided by:

  o An End user Help Desk Support Contract

  o A per hour End User purchase made at the time of need

Telephone: +1 (586) 731-6000 option 2 (Technical Help Desk)

Email: info@spotimaging.com

Manual Revision History:

Revision	Date	Changes
1.0.003	6/24/2019	Pre-Production Release
1.0.004	10/24/2019	Production Release

PathCast™ Software Revision History:

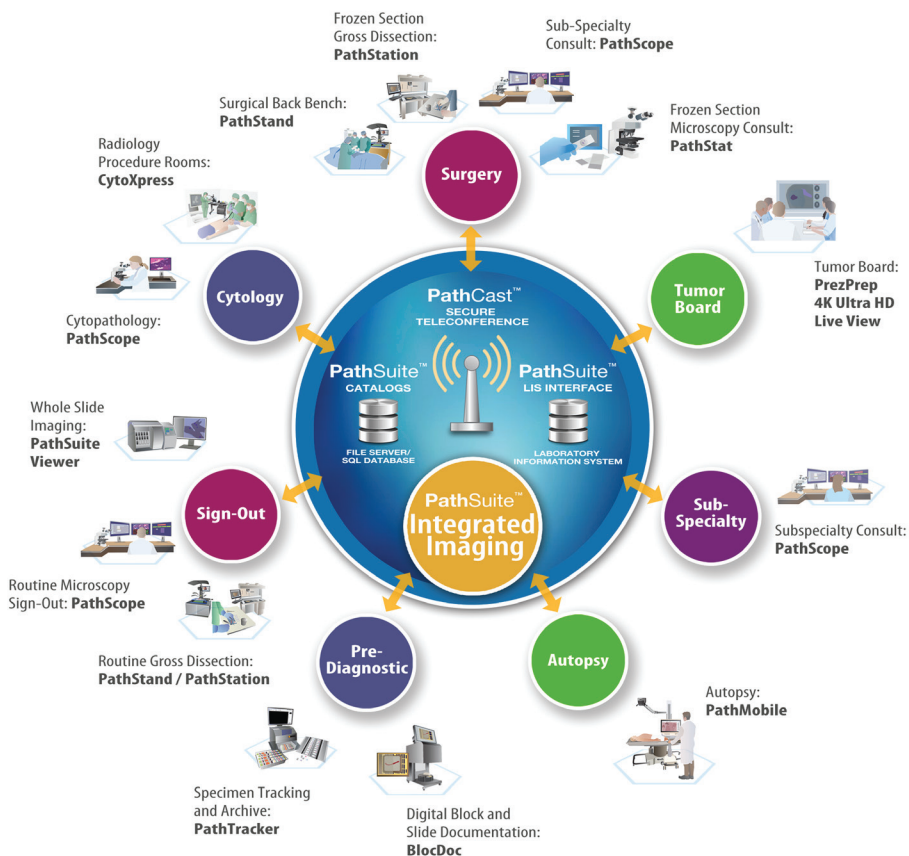| Revision	Date	Changes
1.0.0.19400	12/16/2019	Pre-Production Release

PathSuite™

Integrated Imaging Environment

The Vision of the Future

Building a vision of the future is essential to ensuring that each step supports the final integrated solution. PathSuite™ provides an over arching vision that supports streamlined workflows for the task at hand built into a connected environment that supports collaboration.