



## Send Studies From SHOWCASE® Workstation to a PACS

Your ShowCase Workstation can be configured to automatically forward studies to a PACS. Any study that arrives at the workstation from an imaging device, or is copied into a PACS tab, or edited in a PACS tab will be automatically forwarded to the PACS if you configure this feature.

Most PACS require configuration before they can receive studies from external sources, so you will want to talk to your PACS administrator before starting, and likely get them involved in the configuration of the Workstation.

This guide is in three parts:

**First**, you will set up and configure access to the PACS.

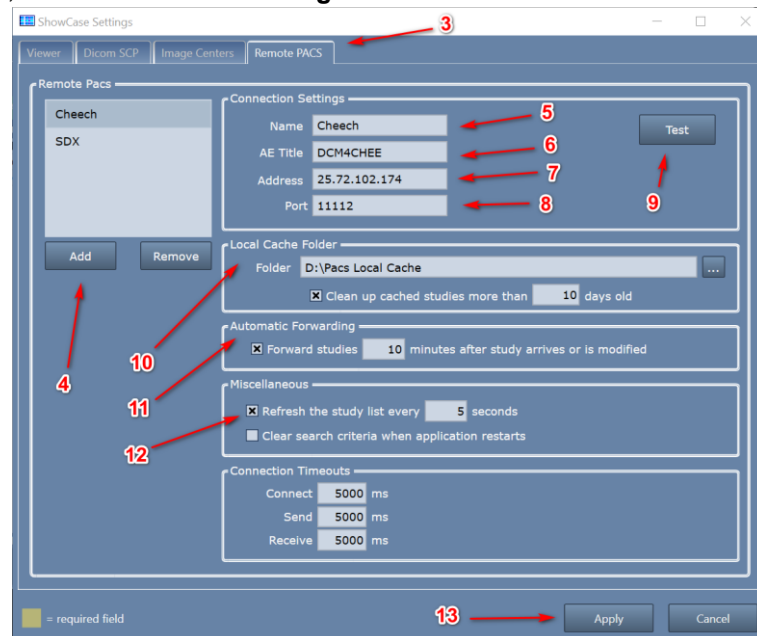
**Second**, you will set up your ultrasound machine or other imaging device to send to the Workstation.

**Third**, you will test and troubleshoot your setup.

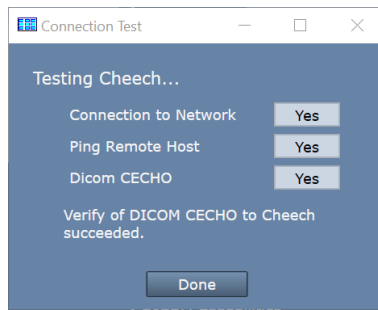
**Before You Start:** Make sure your PACS has been configured to accept DICOM CSTORE events from this workstation. Make sure ShowCase Workstation is installed and licensed on your PC

### Configure Forwarding to the PACS

1. Launch the ShowCase Workstation
2. From the **Edit Menu**, select **ShowCase Settings...**



3. Select the **Remote PACS** tab
4. Click the **Add** button. A new Remote PACS entry will be created named "New PACS 1":
5. Enter a name for your PACS in the **Name** field. It can be any name that is helpful.
6. Enter the PACS's AE Title in the **AE Title** field. You should get this from your PACS administrator.
7. Enter the PACS's IP address in the **Address** field. You should get this from your PACS administrator.
8. Enter the PACS's Dicom **Port**. You should get this from your PACS administrator.
9. Click the **Test** button to see if the Workstation can contact your PACS.



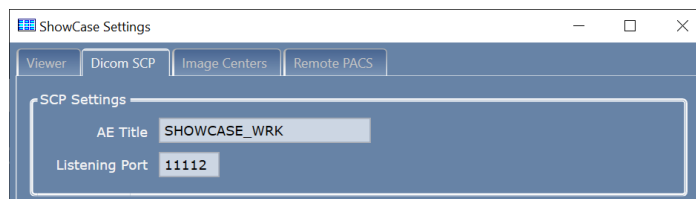
(If the tests do not all say “Yes”, see the Troubleshooting section at the end of this guide.)

10. Set Up A Local Cache Folder to receive studies
  - a. Click on the “...” button on the right and select a local folder. The folder should be a fresh, empty folder. It should also be on an internal hard drive with about 300G of free space. Do not try to use network shares or external hard drives as these can often cause problems.
  - b. Check the “Clean up cached studies more than XX days old” if you’d like to have this folder automatically clean up studies that have been forwarded to the remote PACS. **Note:** Studies are only automatically cleaned up if they have been successfully sent to the PACS.
11. Enable Forwarding
  - a. Check the box next to “**Forward studies NN minutes after the study arrives**”
  - b. Change **NN** minutes to be the amount of time to wait before forwarding shall begin *after* the last image arrives for the study.
12. Enable Automatic Study List Refresh
  - a. Check the **Refresh the study list every nn seconds** option.
  - b. Set **nn** to be 5 seconds.
13. Click the **Apply** button in the lower right to save these settings. A new tab will appear in your study list, with the name you entered from step 5.

## Setting Up Your Ultrasound Machine to Send to the Workstation

You need to know three things to configure your ultrasound machine to send to the Workstation: the Workstation’s **AE Title** (default is SHOWCASE\_WRK), the Workstation’s DICOM **Port** (default is 11112), and the PC’s **IP Address**.

1. Click on the **Dicom SCP** tab in the ShowCase Settings... dialog:



2. Write down the AE Title and Port. You will need these to configure your ultrasound machine.
3. Determine the IPv4 address of the computer the Workstation is installed on.
  - a. Open a Windows Command Prompt
  - b. Enter the command “ipconfig”.
  - c. You will likely see several network adapters. If you’re using cables to send to the Workstation, use the “Ethernet adapter Ethernet” adapter. If you’re using wireless to send to the Workstation, use the wireless adapter. If you’re unsure which IPv4 address to use, ask your IT support.

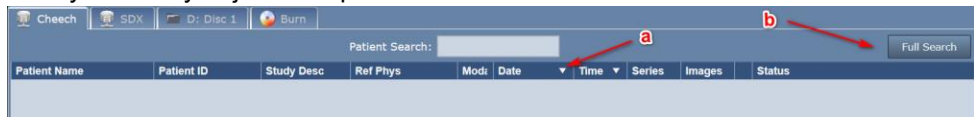
**Tip:** You will want to set your PC up with a ‘fixed’ IP address. Ask your IT support how to do that.

Once you've got these three pieces of information, you will need to consult the user manual for your ultrasound machine for how to configure the machine itself, or work with your ultrasound machine's service technician to get it configured. You can also find some quick guides for common ultrasound models at [web address](#). These are 'quick guides' and not intended as a substitute for your machine's user manual.

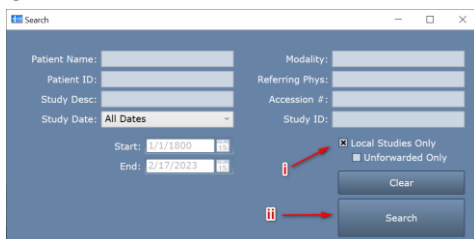
## Testing

### Test Sending Studies to the Workstation

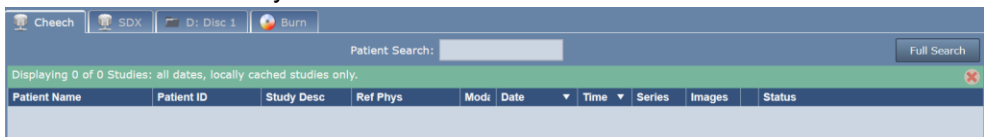
1. Click on the Study List tab you just set up.



- a. Click on the Date column until the arrow is pointing down, which means the newest studies will appear at the top of the study list.
- b. Click the Full Search button.



- i. Check the Local Studies Only option.
- ii. Click Search. The study list will look like this:



2. Go to your ultrasound machine and send a study to the Workstation. Your study should appear in the study list.



If the study does not show up, see the Study Transfer Troubleshooting section below.

3. If the study transfers, double-click on the study to open and view the images.

### Testing Sending Studies to the Remote PACS Manually

1. Select the study you just received in the Study List and press the **Send** button. The study status should change to "send pending" and then immediately start sending the study.
  - a. If you get an error, see if the error message gives any hint as to what is wrong.
  - b. Click the **More...** button at the bottom of the study list and select **Test Connection**.
2. If the study transfers, you are ready to test automatic forwarding. Go to the next test.

### Testing Automatic Forwarding of Incoming Studies

1. Send another study to the Workstation. It should appear in the study list.

Patient Name	Patient ID	Study Desc	Ref Phys	Mod	Date	Time	Series	Images	Status
Davis, Lila E	365-04-1942	Abdomen		US	2/17/2023	3:17 PM	1	49	from CLI_SCP, forward pending
Ngo, Ettie J	506-26-5797	PERIPHERAL VA		US	2/17/2023	3:12 PM	1	48	from CLI_SCP, sent to Cheech

Note that the **Status** will say 'forward pending' for that study.

2. Wait for one minute past the wait time you specified in step 11 above, where you set the forwarding delay.
3. You should see the study's **Status** change to 'send pending' and then 'sent to <pacs name>' after the study has automatically been sent to the Remote PACS.

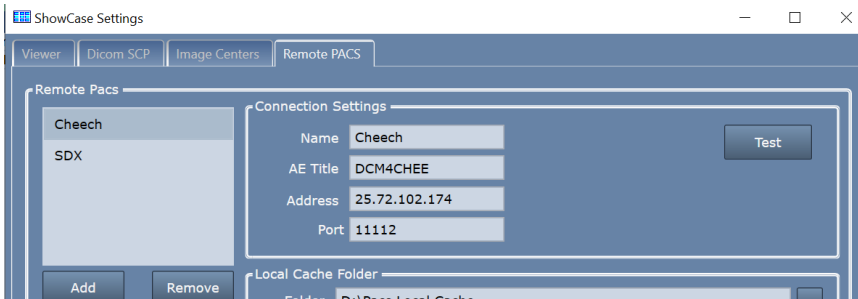
Patient Name	Patient ID	Study Desc	Ref Phys	Mod	Date	Time	Series	Images	Status
Davis, Lila E	365-04-1942	Abdomen		US	2/17/2023	3:17 PM	1	49	from CLI_SCP, sent to Cheech
Ngo, Ettie J	506-26-5797	PERIPHERAL VA		US	2/17/2023	3:12 PM	1	48	from CLI_SCP, sent to Cheech

## Troubleshooting

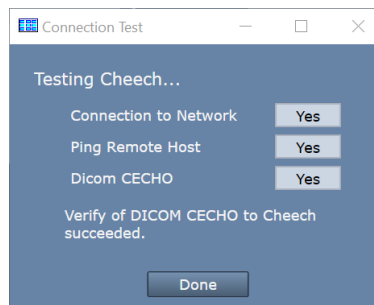
### Trouble Connecting to the PACS

If you're having trouble connecting to your PACS, it would be a good idea to get your PACS administrator involved. PACS often require a PACS administrator to configure the PACS to receive studies from your Workstation. If it looks like your PACS is properly configured, and you are still unable to connect to your PACS follow the steps below to try and ascertain where your problem lies.

1. From the **Edit Menu**, select **ShowCase Settings...**
2. Click on the **Remote PACS** tab and select your PACS



- a. Check that the **AE Title**, **Address**, and **Port** for the PACS are correct
- b. Click the **Test** button. A test dialog will appear.



Look for clues in the messages in this dialog if any of these tests fail. Here is some further insight as to what may cause each test to fail. You may find that you need assistance from your IT group to resolve these issues.

*Connection to Network failed* – Means that the Workstation computer cannot find any networks connected to your computer.

- Can other applications connect to the network, e.g. Chrome?

*Ping Remote Host failed* – Means that the Workstation computer cannot ping the PACS computer with a conventional ethernet ping.

- Is the firewall on the PACS properly configured?
- Is the IP address of the PACS correct?
- Is the PACS computer configured to respond to Ping?

*DICOM CECHO failed* – Means that the Workstation computer was unable to send a DICOM CECHO to the PACS.

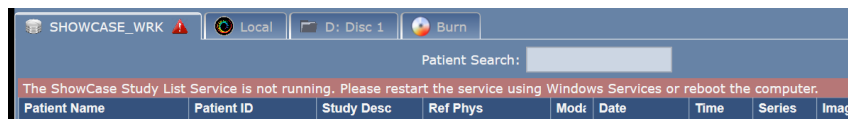
- Is the firewall on the PACS configured to allow DICOM traffic on the specified port?
- Is the port of the PACS correct?
- Is the AE Title of the PACS correct?
- In the PACS: Is the AE Title for the Workstation correct?
- Is the PACS configured to respond to DICOM CECHO from this workstation's AE Title?

## Trouble Receiving Studies from the Imaging Device

So, you sent a study to your workstation but nothing showed up in the study list. Here's how to troubleshoot that.

### 1. Is there a red bar at the top of the study list with an error message?

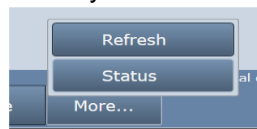
If there is, it will look like this:



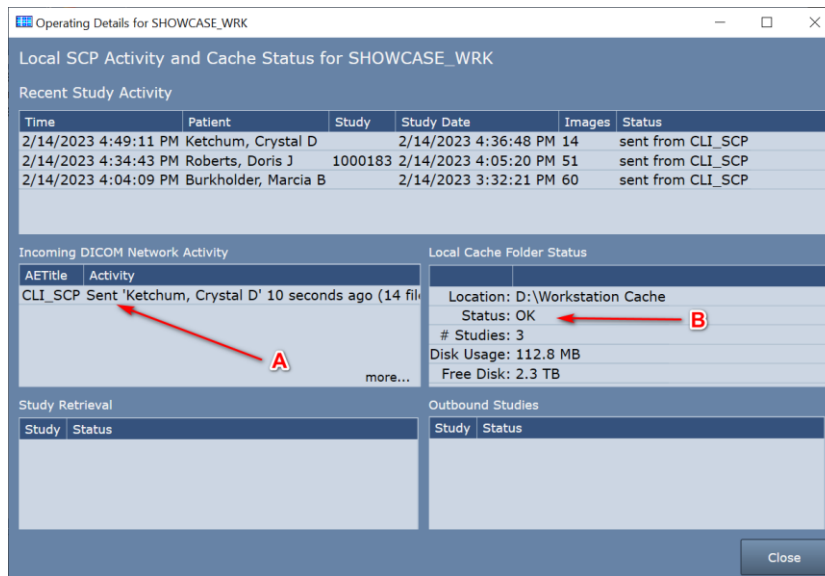
To resolve this, read the error message and follow the instructions there. There might be a *[click here for help]* option, which you can click to read more about resolving the error shown.

### 2. No Red Bar?

Click the **More...** button at the bottom of the study list and select **Status**.



An Operating Details screen will appear:



- A. The first thing to check is the **Incoming DICOM Network Activity** window. It lists incoming DICOM activity from imaging machines sending studies to the Workstation.
- Try sending a study to the Workstation
  - If you don't see any activity for AE Title of the machine that sent the study, then no DICOM network messages are making it to the Workstation. Try the following:
    - Turn off the firewall on the Workstation computer. Try sending a study. If that doesn't fix the problem, leave the firewall off and continue.
    - Check that the ultrasound machine is configured with the correct IP address for the Workstation computer. In ShowCase, go to the **Edit menu**, select **ShowCase Settings** and click on the **Dicom SCP tab**. Do the settings in there match the AE title and port configured at the ultrasound machine?
    - Check the imaging machine's DICOM logs for errors.
    - Clear the DICOM queues on the imaging machine.
    - Reboot the imaging machine.
    - Reboot the Workstation computer.
    - Do a DICOM CECHO on the imaging machine and see what it tells you.
    - Turn the firewall back on if it was turned off earlier.
  - If you do see activity from the imaging machine, but some studies are not coming across, click **more...** and the DICOM messaging log will appear. Look for errors in this log (highlighted in red). If you need help interpreting the errors, go to the **Help menu** in ShowCase, select **Submit A Support Request...** and fill out the form so our support engineers can help you diagnose the problem.
- B. The second thing to check is the **Local Cache Folder Status**.
- Does the Status: field say anything but OK? If it does, you have problems with your local cache and the Workstation will be unable to receive studies until the problem is resolved. Here are some possible local cache problems:
    - Cache full, limit is 1000 studies** – When this happens you will need to clean up studies in your cache. If these are real patient studies, see the section on “Freeing Up Cache Space”
    - Out of Disk Space** – This happens when your disk is full. Free up space on your disk or migrate your cache to a new location.

- iii. **Cache almost full, limit is 1000 studies** – This will not prevent studies from transferring but is alerting you to the fact that you're about to hit the 1000 study limit of your cache.
- iv. **Low Disk Space** – This will not prevent studies from transferring but it is alerting you to the fact that pretty soon you won't have enough disk space available to receive studies.
- v. **Cache Folder Missing** – Your cache folder was removed and you will need to set up a new folder in the settings screen. Or, if you can, restore the original cache folder.

#### Other Things to Check

- If Storage Commitment and/or MPPS are being proposed by the imaging machine, turn it off.
- Check for conflicts on the IP Address and/or Workstation listening port (default 11112), change the port number to a number above 1000; the port number must be changed in both Workstation and imaging machines.
- Check for hardware problems by replacing network cables, using different ports on the network switch and replacing network cards
- Check to make sure multi-frame images (clips) are being compressed. Transferring huge uncompressed clips can aggravate network problems.

#### Trouble Sending Studies to the PACS

If you test your PACS connection and all of the tests come back "Yes" but when you try to send a study you get errors, you will definitely want to get your PACS administrator involved.

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