This document is electronically signed. Approvals can be obtained from the system which displays the selected approvers, their approval roles, and approval dates.

Change Description

DESCRIPTION OF CHANGES:

Updated section 3 on when to download logs
Added section 4.3.2 Intermittent ECG Signals
Added section 4.3.3 VF/VT Alarm Disabled but Still Alarms
Added section 4.3.4 ECG Cable Routing
Added section 4.3.5 ECG Leads Off Noise
Added section 4.3.6 Therapy Cable No Pads or No ECG
Added section 4.6 E2AB Error
Added section 4.7 Unable to Update Software or Sync Configuration
Added section 4.8 Watchdog Reset and Error Code
Added section 4.9 Unable to Perform DCT Download
Added section 4.10 Printer Paper Jam or Shredded Paper
Added section 6.4 Device Manager & Firewall Changes on CyberArk Laptops

RETROSPECTIVE REVIEW:
Retrospective review is not required because this is not a work instruction but instead a reference document used for troubleshooting and reference purposes only.

EFFECTIVITY OF RELEASE:
Effective upon release.

TRAINING ASSESSMENT:

Read and understand training required for SMR-Service LP 35.

Revision History		
CO/Packet	**Revision**	**Reason for Change**
MPKT-2024-0585	AA	Initial release
MPKT-2024-08940	AB	Added software 80.1.23.2 to section 4. Addition of section 5 Parts and section 6 LP35 CAPIP
MPKT-2025-02081	AC	Added information on troubleshooting, error, maintenance, and test failures
MPKT-2025-03901	AD	Added additional troubleshooting sections

Technical Bulletin

Bulletin Name: TB_LP35_Tech Bulletin

Applies to:

Group/s:

☒ Field Service
☒ Depot
☒ Technical Support

Region/s:

☒ Americas
☒ APAC
☒ EMEA
☒ Global (All the above)

Product Family: LIFEPAK 35

1. PURPOSE

The purpose of this technical bulletin is to provide additional troubleshooting, part information, and repair clarification to support the service and maintenance of the LP35 family of products.

2. SCOPE

The scope is limited to the LIFEPAK 35 family of products and does not replace the validated repair process contained in the service manual. This technical bulletin is to be used in conjunction with validated repair processes to provide additional clarity in support of servicing activity.

3. NPE

The LP35 will be subject to a New Product Evaluation (NPE) during the initial launch in the APAC and US markets. This process is further defined in LIFEPAK 35 New Product Evaluation Plan, 3351055. The NPE process allows Engineering to quickly gather potential failure and complaint data from the service team and can last from six months to a year after product launch. This NPE section provides additional instructions for the US field service and Depot team when responding to complaints and performing repairs on the LP35.

- Service is the first tier of support and should follow the servicing process for troubleshooting and repair.
- Create a Repair or Troubleshooting work order in ServiceMax when receiving a complaint for the LP35 device.
- Use the DCT application to pull both the Sys and Prog logs from the device before troubleshooting the failure.
- Use the DCT application to transmit both the Sys and Prog logs to the SMR server after downloading them.
- Follow the troubleshooting steps found in this technical bulletin and the LP35 service manual 3342158 to repair the device.
- Send ALL removed parts from repair to PAC for further investigation.
- If you're unable to identify or resolve an issue and require additional assistance send an email to LIFEPAK35QualityEngineering@stryker.com if you need additional assistance troubleshooting a LP35 issue or if the repair process outlined in the service manual doesn't resolve the complaint.
    - The Engineering team will respond* to your email request with additional instructions.
    - You may be required to ship the LP35 device to the Depot or PAC for further troubleshooting.
      * Response times vary but normally take 1-2 days.
    - Sys and Prog logs are only required for LP35 failures that have an error code present and intermittent complaints that require Engineering analysis.

4. TROUBLESHOOTING

This section is intended to provide additional troubleshooting information to aid the technician in the identification and diagnosis of possible root cause of a device failure. Use the repair process contained in the service manual to perform any component and sub-assembly replacements.

4.1. LP35 Failed Auto Test with QUIK-COMBO Electrodes Pre-Connected

It has been identified that running either the daily auto test, or the user-triggered auto test from the user test menu, while the therapy cable is plugged in and unopened package of QUIK-COMBO (QC) defibrillation electrodes are connected to the therapy cable, can result in a FAIL result for the test and the LP35 device logging codes E06E, E06F, E070, and/or E071.

The impedance values of the QC electrodes vary from part-to-part, so the measured impedance with the electrode package connected may sometimes fall below the minimum impedance thresholds programmed into the software as part of the ECG test. When the impedance result is below the threshold then the device will log E06E, E06F, E070, and/or E071 series service codes.

In this scenario, the device is still operational, and this would be considered a spurious failure. The electrodes should be removed, and the auto test should be re-run manually. If the codes clear, the device can be returned to use. If the codes persist, it may indicate a hardware failure and further troubleshooting is required.

Pre-connection of the QUIK-COMBO electrodes is an optional set-up for device storage/stand-by. There have been no observed issues with just the therapy cable connected during device self-test.

Software version 80.1.23.2 has been released to correct this issue.

4.2. LP35 NIBP Troubleshooting

Reference the NIBP Tip Sheet 3317075 available here LP15 SharePoint Page as needed. Ensure the customer is following the best practices.

4.2.1. General Troubleshooting

- Check hose and cuff being used by the customer for any damage. Have a known good hose and cuff on hand for troubleshooting and isolating the problem.

- Perform NIBP Calibration. If it fails, troubleshoot (check device, hose, cuff etc.) try again (or with another hose and cuff) or repair the device.
- Perform NIBP Leakage Test. If it fails, troubleshoot (check device, hose, cuff, etc.) try again (or with another hose and cuff) or repair the device.
- Try different hose length and size with device.

4.2.2.Neonate Alarm

The LP35 has a neonate alarm that alerts when the device senses that the cuff is inflating too quickly. This can be triggered if the cuff is put on the patient too tightly. There should be space to fit two fingers between the cuff and patient.

The Neonate Alarm can also occur if the NIBP internal hose is partially kinked because of a repair. When installing the PMOD, take care not to pinch the NIBP hose.

4.2.3.XXX at Startup or Calibration

The device performs a calibration/check of the NIBP module during the startup cycle. If the cuff is being moved, or put on a patient during this window, there can be back pressure to the module causing the device to display XXX at startup. The device will need to be restarted to clear this if this occurs at startup. The XXX can clear itself when displayed at other times after 1.5 minutes.

To avoid XXX at startup, it is recommended that the cuff not be installed on the device, or the patient during startup. The device should be started up, then the cuff connected and placed on the patient.

4.2.3.1. Possible Reasons for XXX and ---

- **XXX**
  - NIBP Module failed to calibrate. Restart the device and try again.
  - NIBP Module failed. Replace the module and PIP device.
- **---**
  - Cuff or hose issue. Try another.
  - NIBP time out.
  - NIBP over pressure
  - Leak.
  - Flow error.
  - Weak Pulse.
  - Too much motion.

4.3. LP35 ECG Troubleshooting

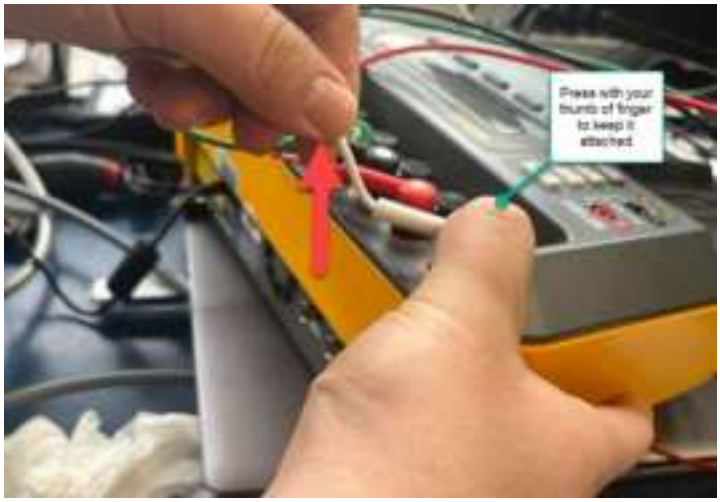
4.3.1.Artifacts

If customers report ECG artifacts, follow the same steps as troubleshooting for the LP15, including:

- When customers report ECG artifacts, refer to the ECG artifact references including ECG Electrode Placement, 3329000 available on Highspot.
- Try another cable.
- Try replicating the issue in the same environment (if the back of an ambulance, try there).
- Look for environmental factors.
- Gather as much detail as possible on when it's happening before requesting assistance.
- If sending the device to Redmond for troubleshooting, include the cables the customer was using.
- If necessary, replace the cables under warranty to send them in.

4.3.2.Intermittent ECG Signals

- Customers report
  - ECG goes blank while in use
  - Screen goes blank while in use (prod customer when they indicate screen went blank. Do they mean it went black, or they lost a signal)
- Check the ECG cable- Connect the ECG cable leads to your simulator or 7000 and gently go through each one and wiggle them to see if you lose signal (note loss of some leads will cause other leads to disappear)
- Send cables back to PAC.



4.3.3.VF/VT Alarm Disabled but Still Alarms

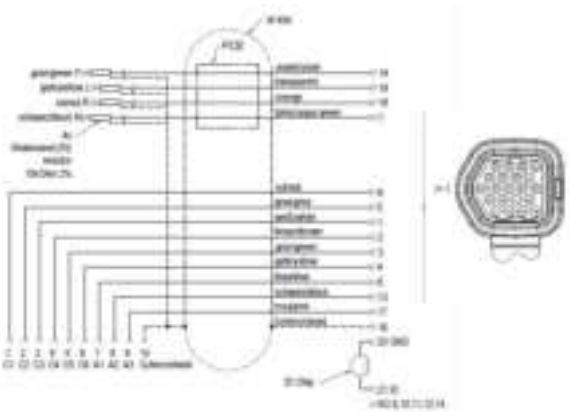
- Customers have reported that the alarm is coming on although they've disabled it.
- If the customer has enabled All Alarms, although VF/VT is disabled it will alarm again.

4.3.4.ECG Cable Routing

- Ensure that the customer is routing the therapy cable properly otherwise it could pull on the ECG cable.

4.3.5.ECG Leads Off and Noise

- For most ECG troubleshooting, remind customers to check their cable connection, not just leads.
  - Can be hard to see with the cable tucked in the bag and behind it's shield so do a physical check.
- ECG Leads Off can be triggered by a partially disconnected cable.
- Multiple leads are on the lower half of the cable.
  - If you lose RL, you get leads off and ----.
  - If you lose more than 2, you get leads off.
- Troubleshooting in manual is incomplete and does not include a check cable connection.
  - Restarting device will clear alarms until connection is reestablished.



4.3.6.Therapy Cable No Pads or No ECG

- Some training challenges
  - Customers expect ECG to come on screen automatically, but they must switch.
    - If you start on 4/12 lead, you must add pads
    - If you start in pads, you must add 4/12 leads
    - No popup
- When reported, try to get the logs asap so they are not overwritten.
- Try to get the pads back.

4.4. Touch Screen Troubleshooting

If a customer reports a touch screen issue, use the following tips to try to isolate the problem:

- Run the touch screen test part of the PIP to try to replicate. If you replicate it, repair as needed.
- Ask the customer what they were specifically doing at the time. The touch screen test part of the PIP does not test every spot, you may need to perform the exact steps the customer was doing to see the

issue (ex. If reported while entering patient information, enter patient information). Ensure you are doing exactly what the customer reports, not just the PIP If able to duplicate, repair as needed.

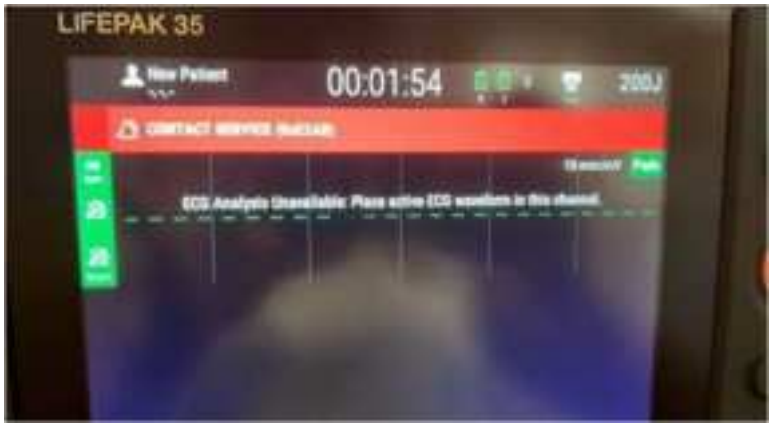
- If unable to duplicate after troubleshooting, the problem may be intermittent. Send the device back to the Redmond Depot for further testing.

4.5. E024 Error After 3AM Check In

The system may fail the software integrity test that is part of the 3AM Check In. The device will clear this at the next 3AM check in or you can push software to the device manually.

4.6. E2AB Error

- Code has been seen during charging in training scenarios primarily.
- Can happen if they are pressing the buttons too quickly, like pressing charge and quickly pressing the energy select. Device sees energy mismatch.
- Should clear itself when they deliver shock.
- If seen in this scenario, no additional service is required.
- If seen in other scenarios, troubleshoot.



4.7. Unable to Update Software or Sync Configuration

A large setup options profile can prevent the device from performing a software update or completing a sync using LDA due to timeout issues. When this occurs, you can attempt to update the software using Repair Mode in LDA.

If you are unable to update the software using Repair Mode, you will need to reset the device using the GCC option in DCT. Once the device is reset to factory settings the software update can now be completed.

After resetting the device to factory settings, the customer can work with the Data Solutions team to have their setup option profile modified in LIFENET to allow it sync with the device.

4.8. Watchdog Reset and Error Code

The watchdog reset is a well-established software safety mechanism. The goal is to serve as an intentional backup system to detect a potential software issue and quickly return the device back to a safe operating condition without additional operator intervention to troubleshoot the issue (i.e., powering the device off then back on, removing and reinstalling power sources, etc.). If a detected software anomaly occurs on the LP35, the watchdog reset automatically initiates a "warm reboot" which will restart the device while preserving the settings and mode that was last being used with the intent of minimizing interruption to the clinical workflow.

As a software mitigation, this is used on all LIFEPAK devices however, it may be more noticeable on the LP35 due to the longer boot up time.

When a Watchdog Reset occurs, it could log an error code in the device. If the error code clears on its own, it is not necessary for service to troubleshoot or repair the device. If the error code persists, it could be an indication of a hardware failure, and the device should be serviced. Use the troubleshooting procedure found in the LP35 service manual to troubleshoot any persistent Service Warning (SW) and Service Error (SE) codes.

3/20/2025 3:53	3/20/2025 3:56	0xF001	BOOT INFO	RunTest/DailyAutoTest	Information
3/15/2025 3:53	3/15/2025 3:56	0xE026	IMX6 WATCHDOG RESET OCCURRED	IMX6 WATCHDOG RESET OCCURRED	Fault Cleared
3/15/2025 3:53	3/15/2025 3:56	0xE026	IMX6 WATCHDOG RESET OCCURRED	IMX6 WATCHDOG RESET OCCURRED	Service Warning
3/14/2025 20:22	3/14/2025 20:49	0xE026	IMX6 WATCHDOG RESET OCCURRED	IMX6 WATCHDOG RESET OCCURRED	Service Warning

4.9. Unable to Perform DCT Download

If you are unable to perform a DCT download on a LP35 it is usually caused by corrupt data in the device. Perform the steps below if you experience this issue.

- Download the sys and prog logs if required
- Download the PCO files if required
- Use the GCC option in DCT to clear the patient data and reset the device.
- Perform the pre-download in DCT
- Complete the repair and PIP
- Perform the final post download in DCT.
- Sync the device with LDA to assign the customer original configuration.

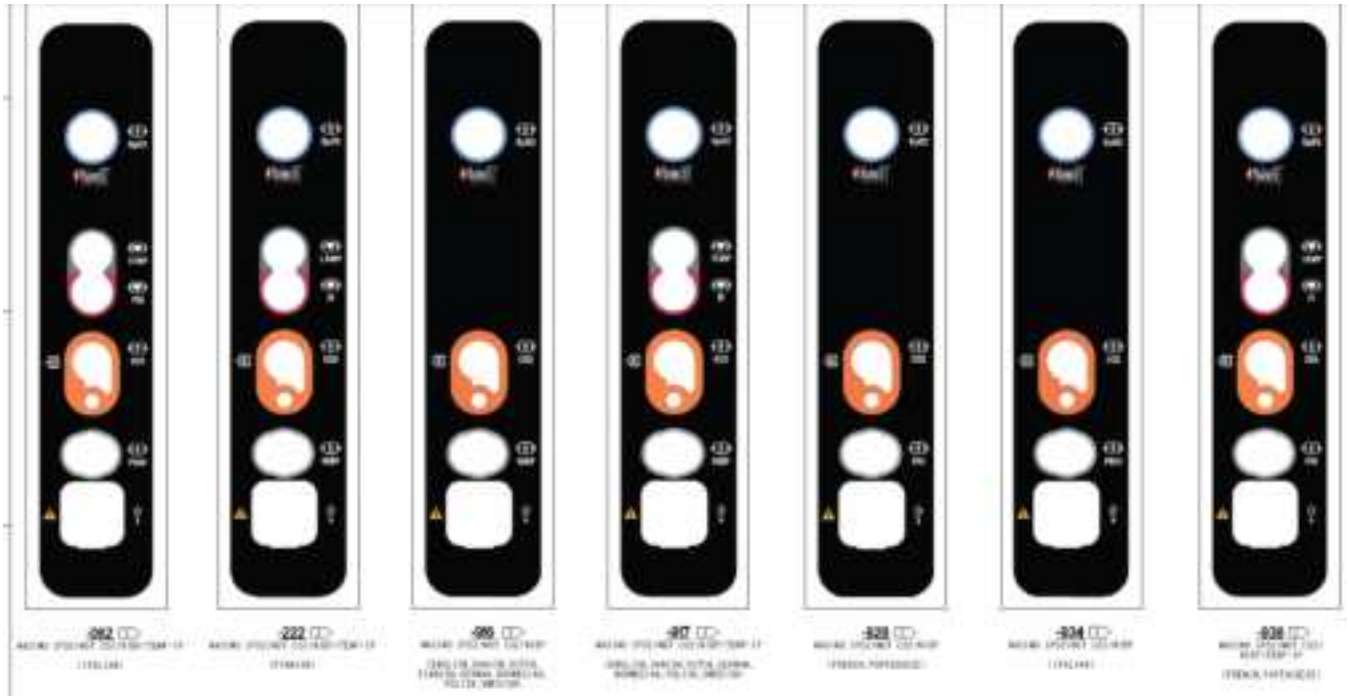
4.10. Printer Paper Jam or Shredded Paper

- Some customers are reporting paper feeding back into itself.
    - Ask customer specific questions about print issues. Do not assume it's a bad printer.
    - Customers can pull about 2 inches of paper out after tearing to avoid jamming.
- Some customers carry their devices on the back of the cot. This puts pressure on the printer, and it will feed back into itself.

5. PARTS

5.1. PMOD Labels

Use the drawing below to help determine the correct PMOD label to order based on the device configuration and language.

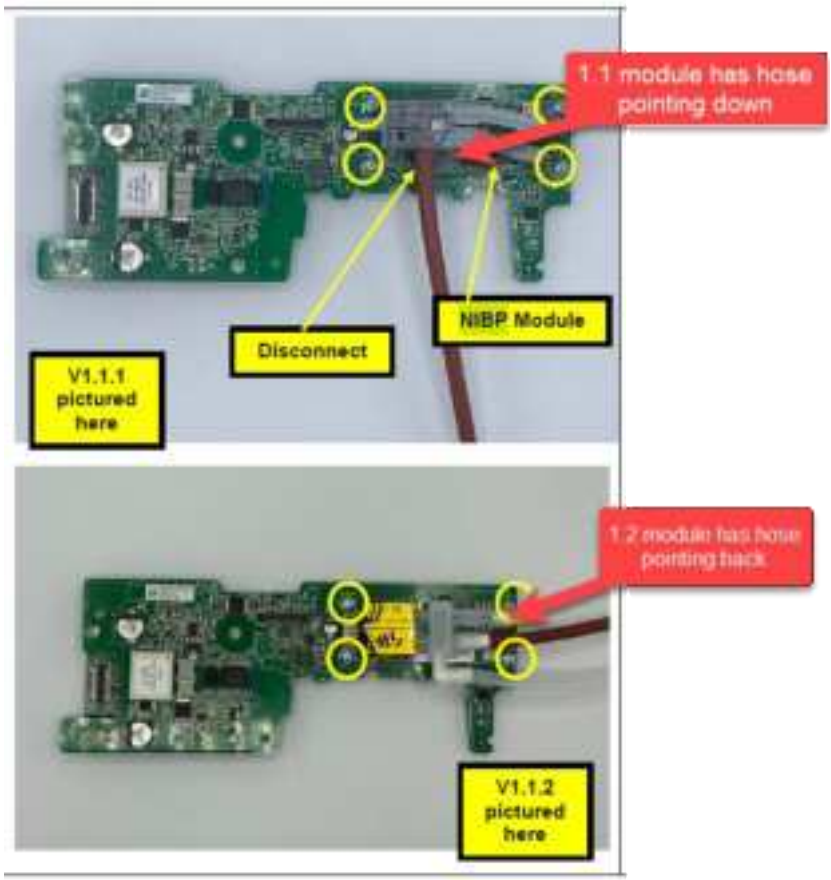


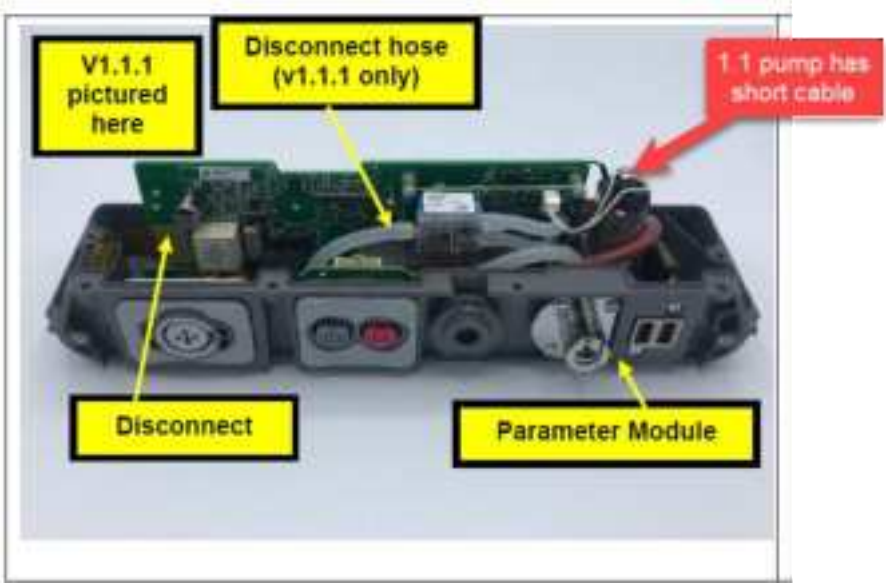
L06	3338800-934	21501-003362	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,G3,LP35	
L06	3338800-938	21501-003363	LABEL,PMOD,MAS SPO2,MDT	

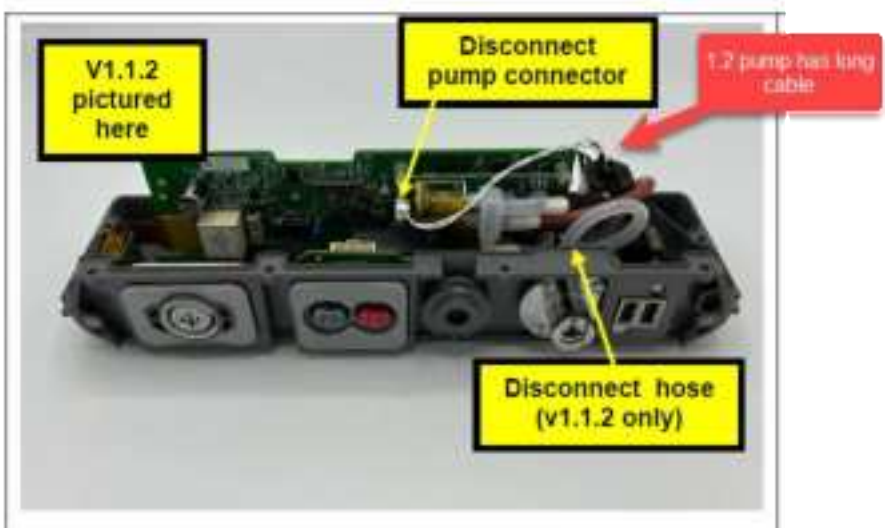
			CO2,NIBP,TEMPIP,G2,LP35	
L06	3338800-917	21501-003364	LABEL,PMOD,MASSPO2,MDTCO2,NIBP,TEMPIP,G1,LP35	
L06	3338800-928	21501-003365	LABEL,PMOD,MASSPO2,MDTCO2,NIBP,G2,LP35	
L06	3338800-222	21501-003368	LABEL,PMOD,MASSPO2,MDTCO2,NIBP,TEMPIP,IT,LP35	
L06	3338800-062	21501-003369	LABEL,PMOD,MASSPO2,MDTCO2,NIBP,TEMPIP,IT,LP35	
L06	3338800-916	21501-003370	LABEL,PMOD,MASSPO2,MDTCO2,NIBP,G1,LP35	

5.2. NIBP Module

In October 2024 LP35 devices started shipping with version 1.2 of the NIBP Module. The pump in the 1.1 version of the NIBP module is not compatible with the 1.2 version and vice versa. When repairing the NIBP module in a LP35 device make sure that both the pump and module are the same version (1.1 or 1.2).


1.1 module has hose pointing down
NIBP Module
Disconnect
V1.1.1 pictured here
1.2 module has hose pointing back
V1.1.2 pictured here


V1.1.1 pictured here
Disconnect hose (v1.1.1 only)
1.1 pump has short cable
Disconnect
Parameter Module



6. LP35 CAPIP

Some technicians are having issues performing the CAPIP on the LP35. The following instructions could help resolve assorted LP35 CAPIP issues.

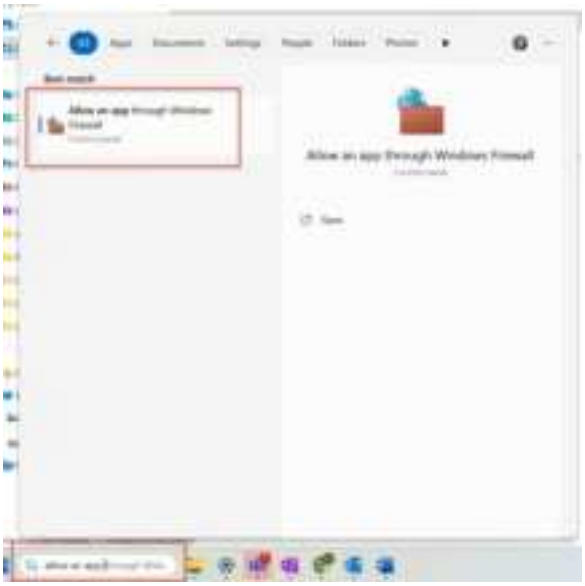
6.1. Bluetooth

Bluetooth must be turned off on the laptop when using the DCT and CAPIP application.

6.2. Firewall

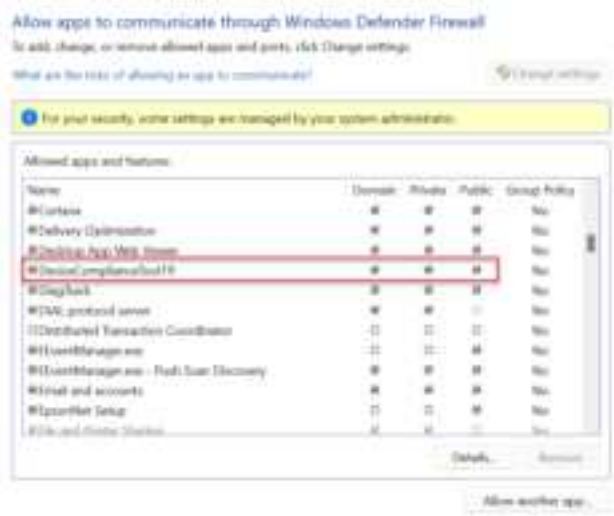
When having issues with LP35 CAPIP application check your firewall settings.

1. Type “allow an app through Windows firewall” in the search box.
2. Click on the result.

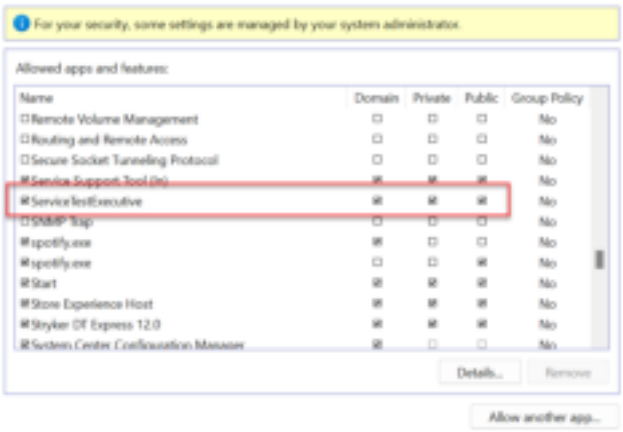


3. Click Change Settings.

4. Make sure that all boxes are checked for DCT.



5. Make sure all boxes are checked for Service Test Executive.



6.3. LP35 Ghost Port Maintenance

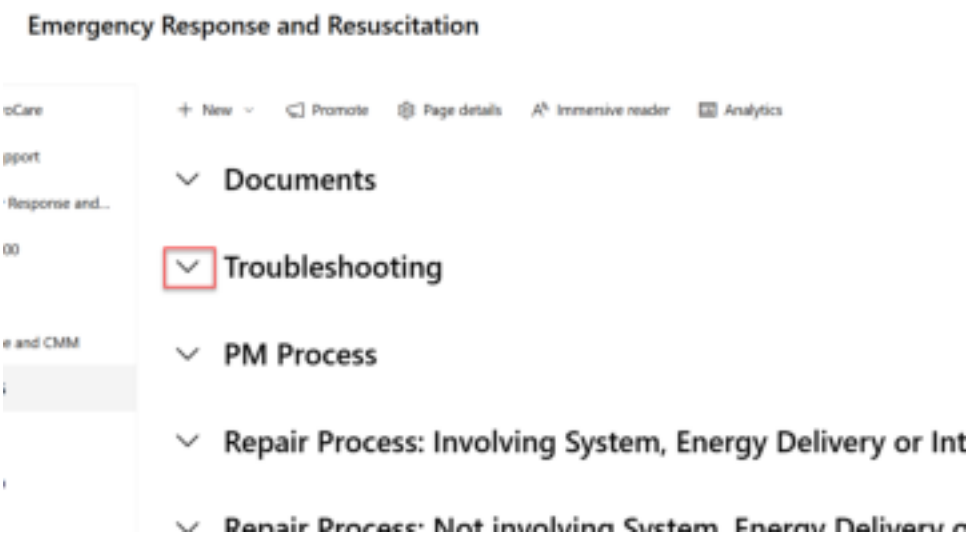
The following information can help resolve connection issues with the LP35 that could potentially affect the performance of the LP35 CAPIP.

1. Connect laptop to LP35 using the access port cable. Make sure that the LP35 is powered off.
2. Open Device Manager, select View, and then make sure that Show hidden devices is checked.

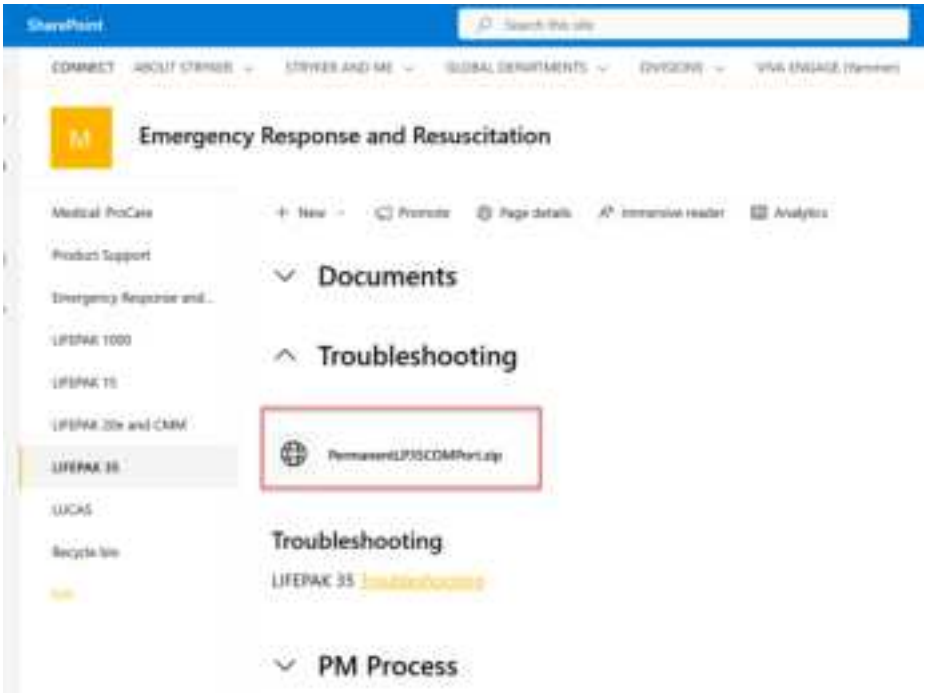
3. Scroll to the Ports section and uninstall all ghost ports not currently being used. You will have to uninstall them one at a time. Do not uninstall the driver.

4. After all the ghost ports are uninstalled, you should only see the 2 ports currently connected to the LP35.

5. Navigate to https://stryker.sharepoint.com/sites/medical_home/customercare/fieldservice/product_support/err/SitePages/LIFEPAK-35.aspx
6. Click the arrow for Troubleshooting

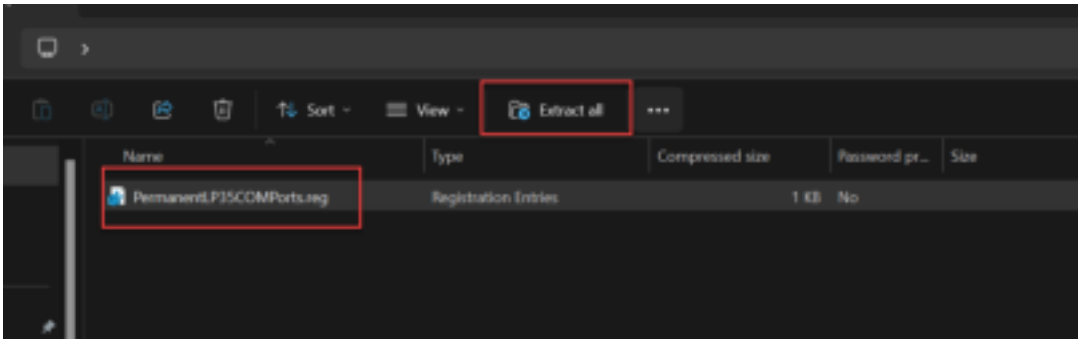


7. Click on the PermanentLP35COMPort.zip link

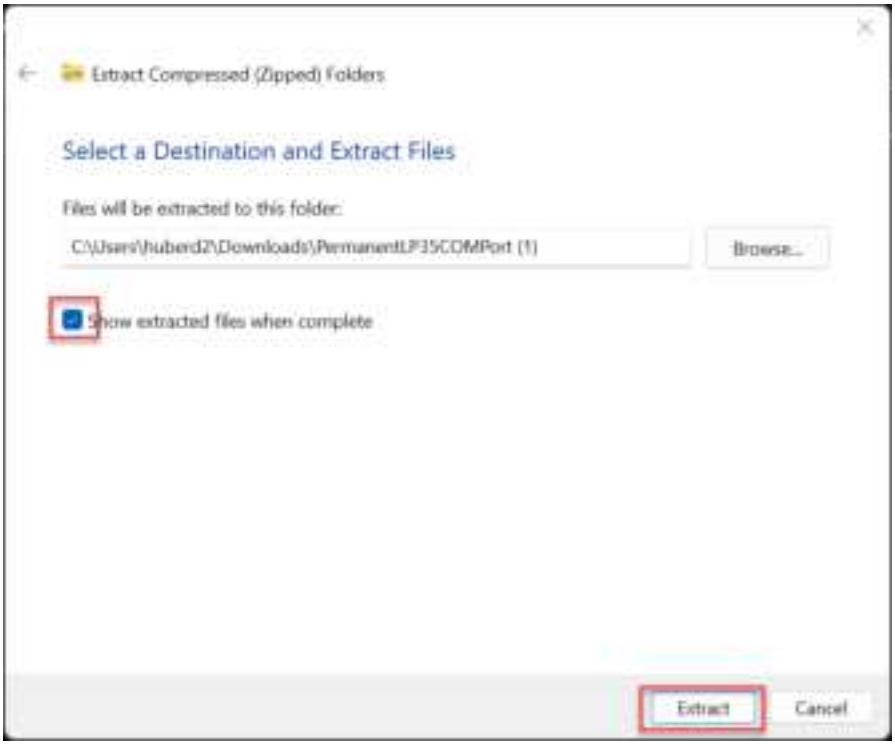


8. Check the box and download the zipped file.

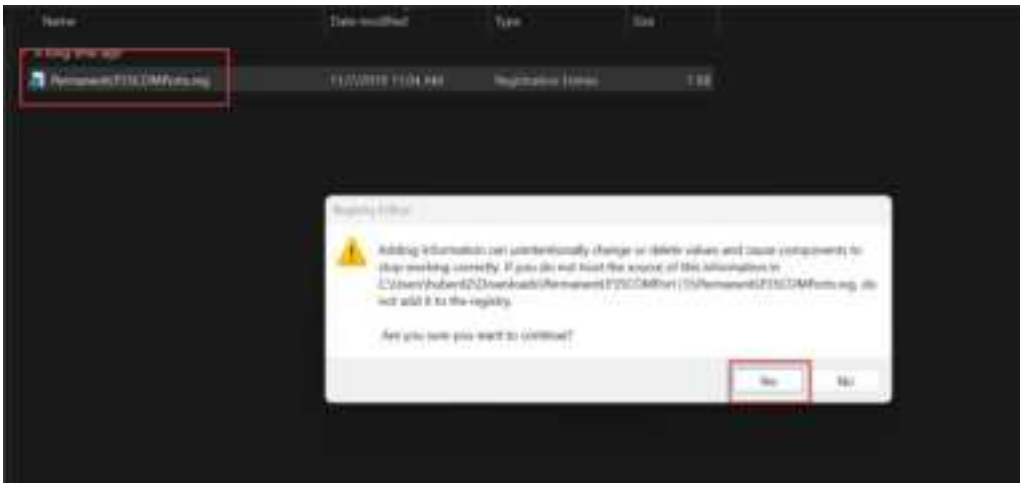
9. Go to your Downloads folder, click on the file, and then click the Extract all button.



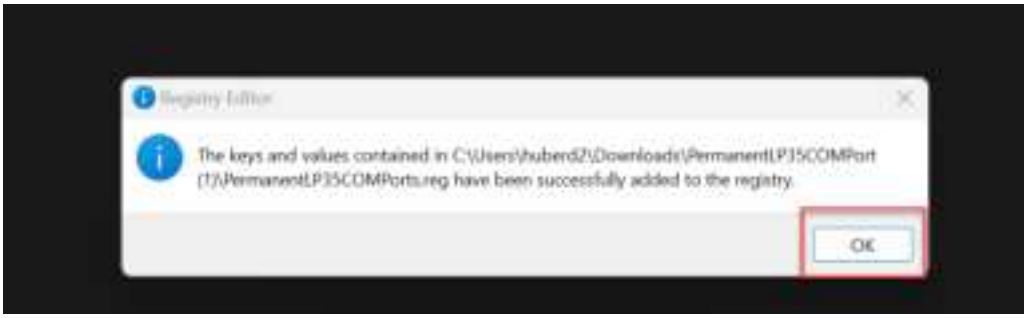
10. Check the box then click the Extract button.



11. After the file is extracted double click to run it. Click the Yes button.



12. Click the Ok button.

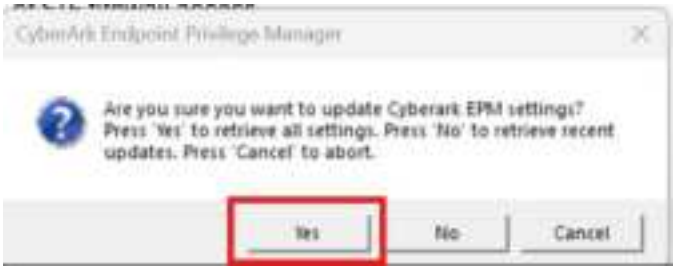


6.4. Device Manager & Firewall Changes on CyberArk Laptops

Accessing Device Manager and Firewall setting will take additional steps on newer laptops with CyberArk installed.

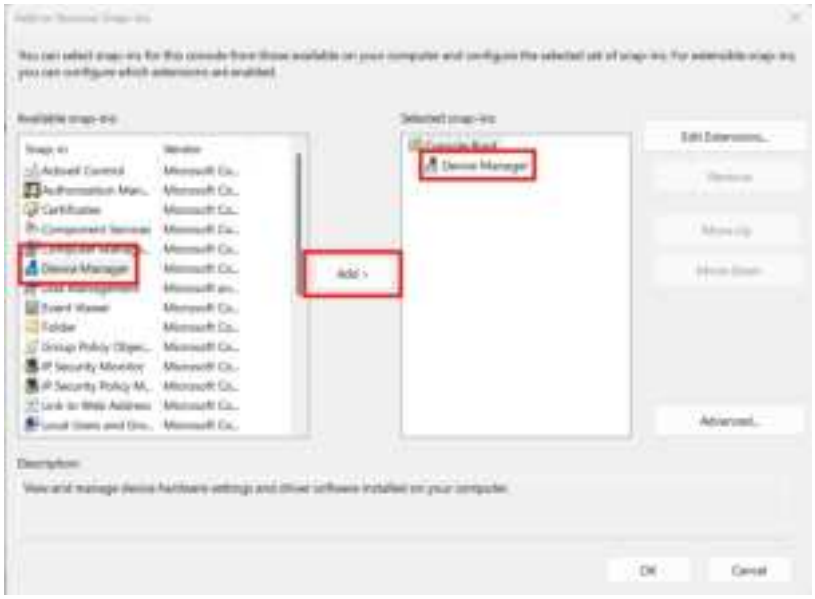
1. Open Task Bar and right click the CyberArk application

2. Select Request Settings
3. Click the Yes button

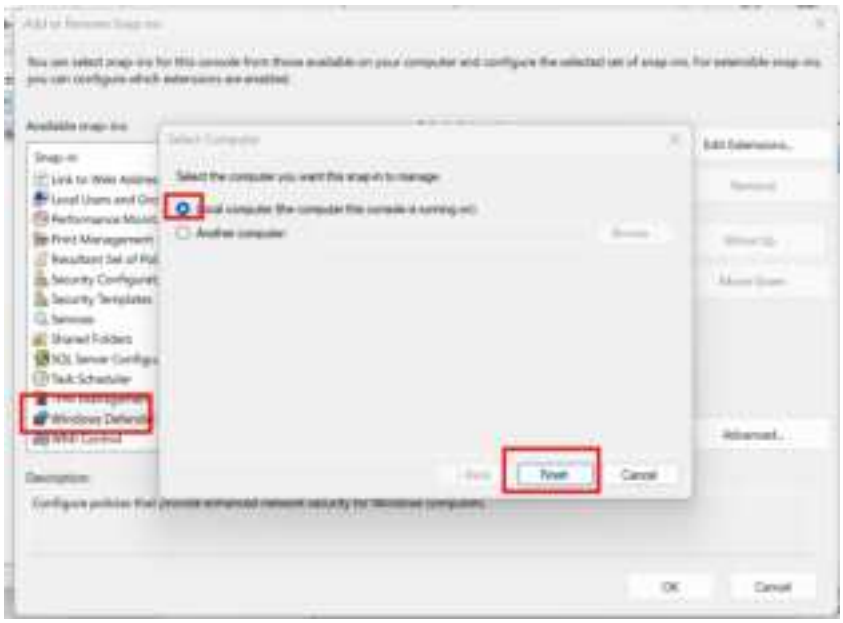


4. Wait at least 30 minutes for updated settings to download
5. Type MMC in the search box
6. Click Open for MMC Run Command
7. Select File then Add/Remove Snap-in

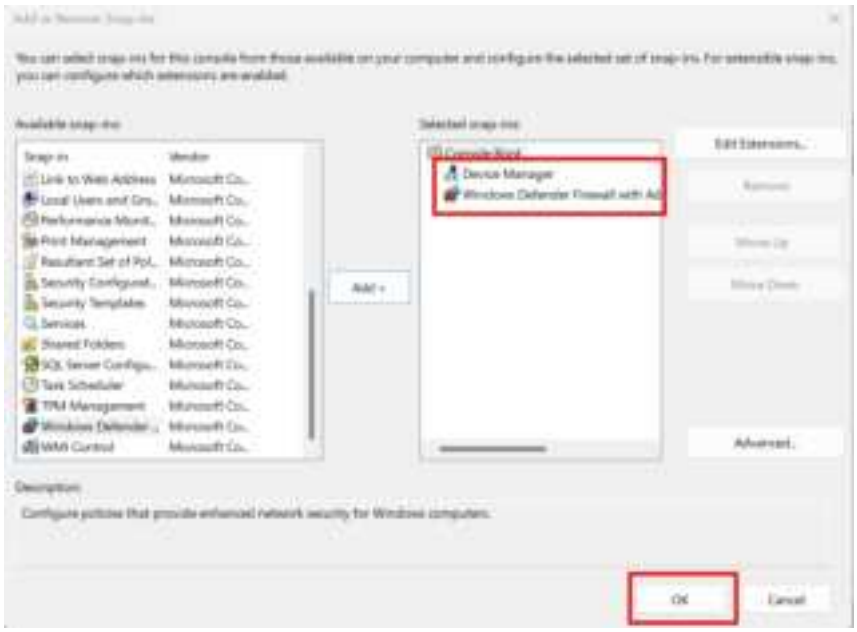
8. Select Device Manager and click the Add button to move it to the right



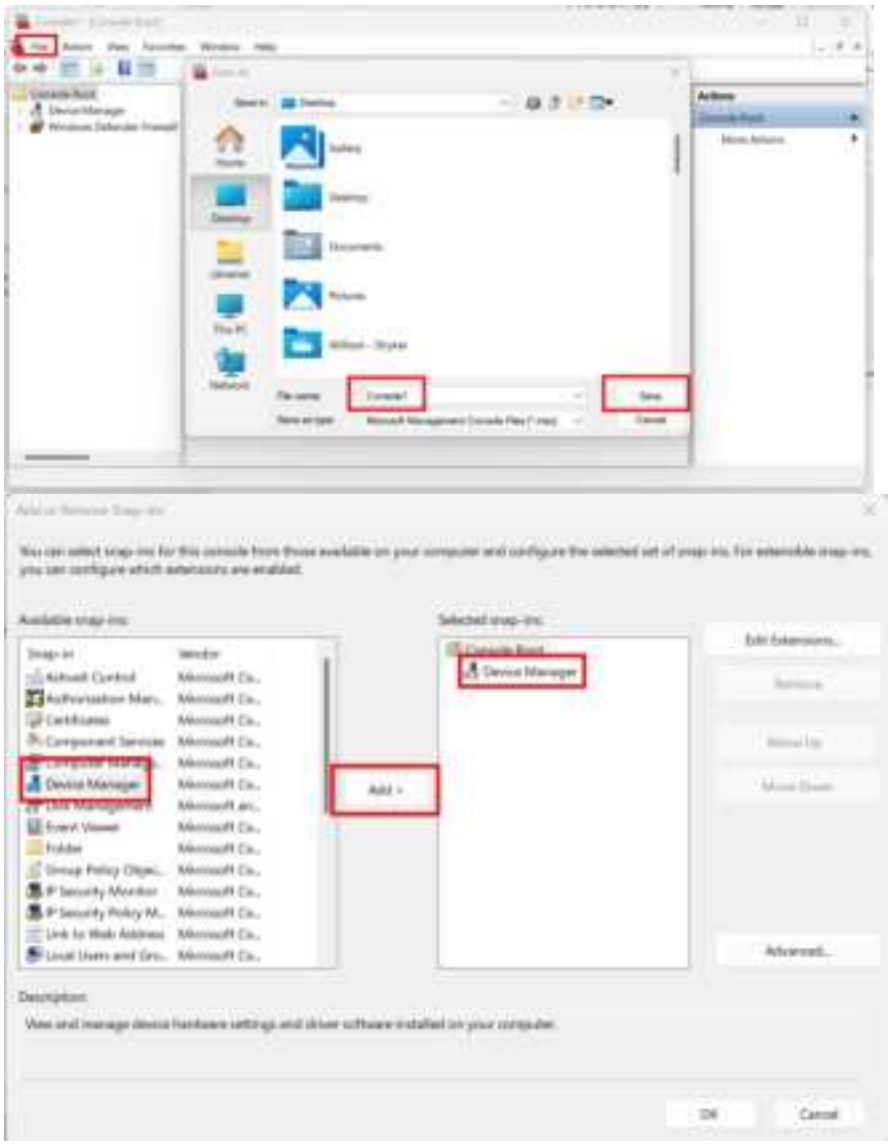
9. Select Windows Defender, select Local Computer, then Finish



10. With Device Manager and Windows Defender on the right click OK

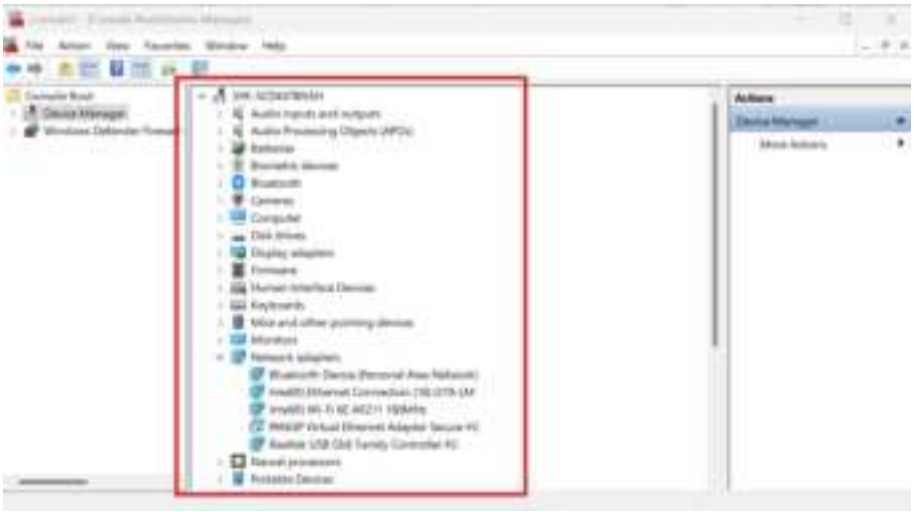


11. Select File then Save As to save this session on your desktop for future use

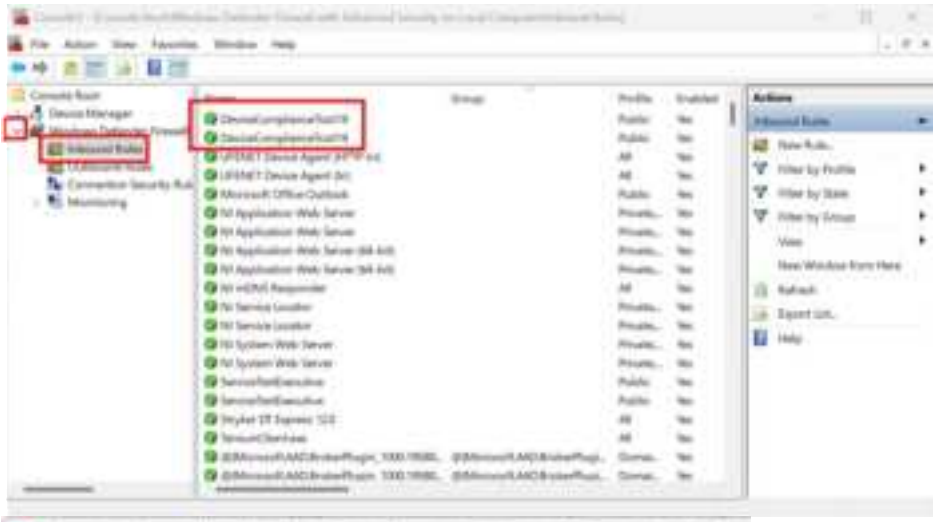


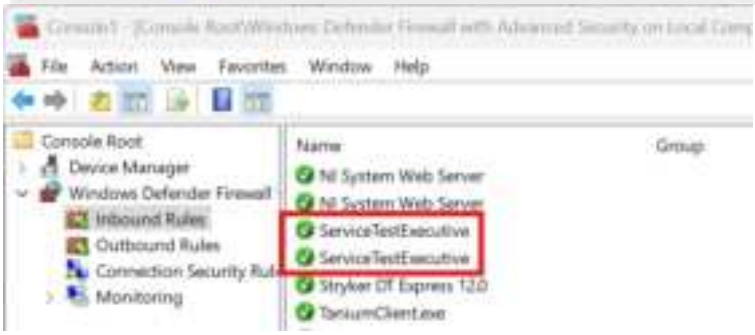
12. Double click Device Manager to open it

13. Use this screen to update drivers as needed

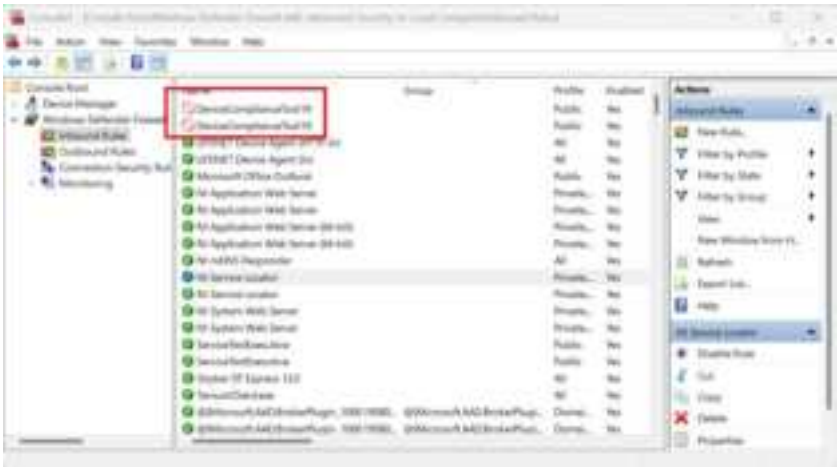


14. Click the arrow next to Windows Defender and select Inbound Rules
15. Confirm that DCT and STE have a green checkmark. You won't see DCT or STE until after you attempt a pre-download on a LP35 and start a CAPIP.

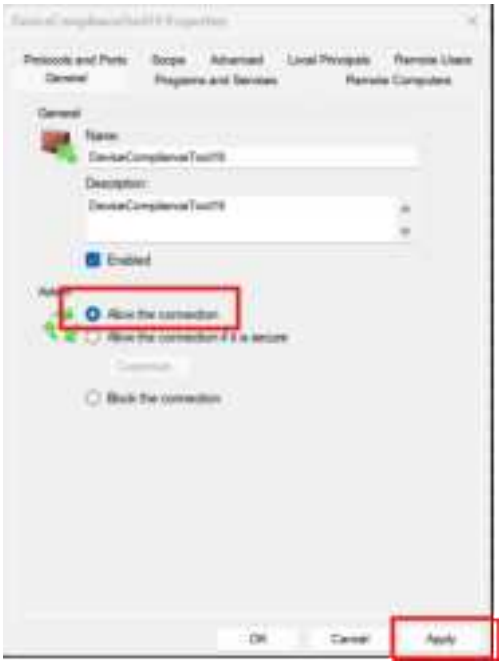




16. If DCT or STE have a red circle with a line through it Windows Firewall is blocking the connection, and it will need to be fixed.



17. Double click the blocked application to open it
18. Select Allow the Connection and click Apply



19. Do the same for all DCT and STE applications that are blocked
20. In the future you can use the shortcut created to make future changes to Device Manager or Windows Firewall

6.5. Ambient Light Sensor Test Failures

Some technicians are experiencing false failures when performing the Ambient Light Sensor test during the LP35 CAPIP. This can happen if the environment you are working in doesn't have sufficient lighting and the light sensor is not able to achieve and adequate baseline reading.

If you are working in an environment that has poor lighting it might help to shine a flashlight at the sensor at the beginning of the Ambient Light Sensor test to allow the application to register an adequate baseline reading.

6.6. Temperature Test Failures

Some technicians are experiencing Temperature Test failures while performing the LP35 CAPIP. If you are experiencing this failure, it might be a good idea to verify your test setup in patient mode. Put the device in patient mode and connect the temperature simulator to the cable. Confirm that the simulator value matches the display within 0.2C. If your reading falls outside of this range check to make sure you have a good connection from the test adapter to the cable and see if the reading changes.

If the reading is still out of range, try testing on a different device or using a different temp cable. If it is determined that the device is the issue you can try replacing the temp connector or the system PCB.