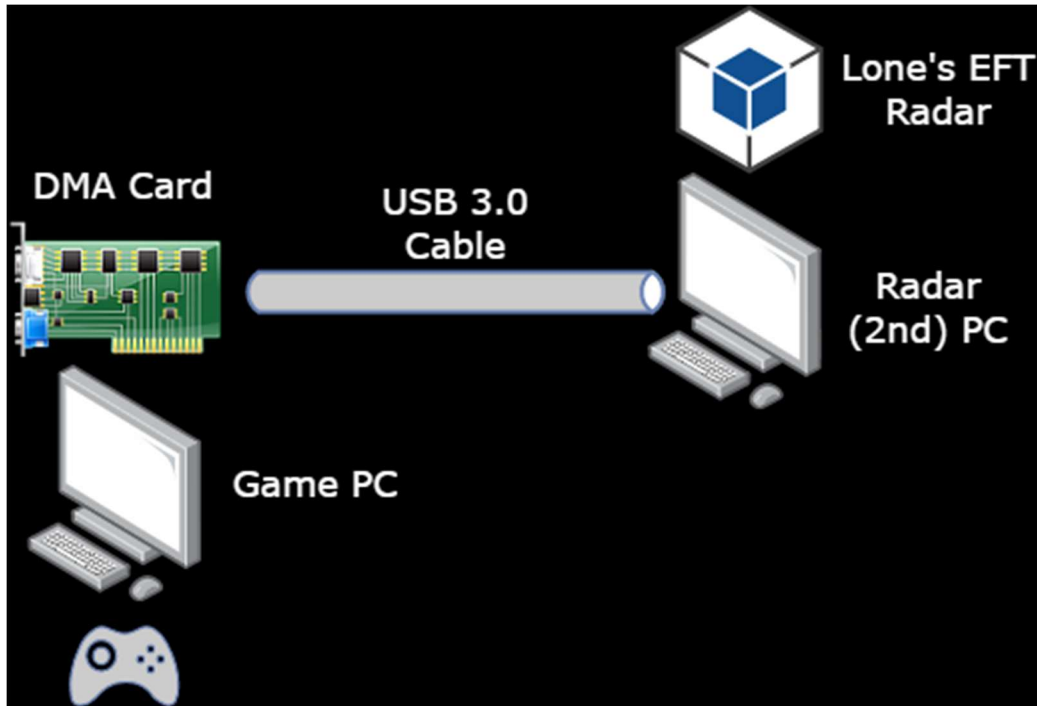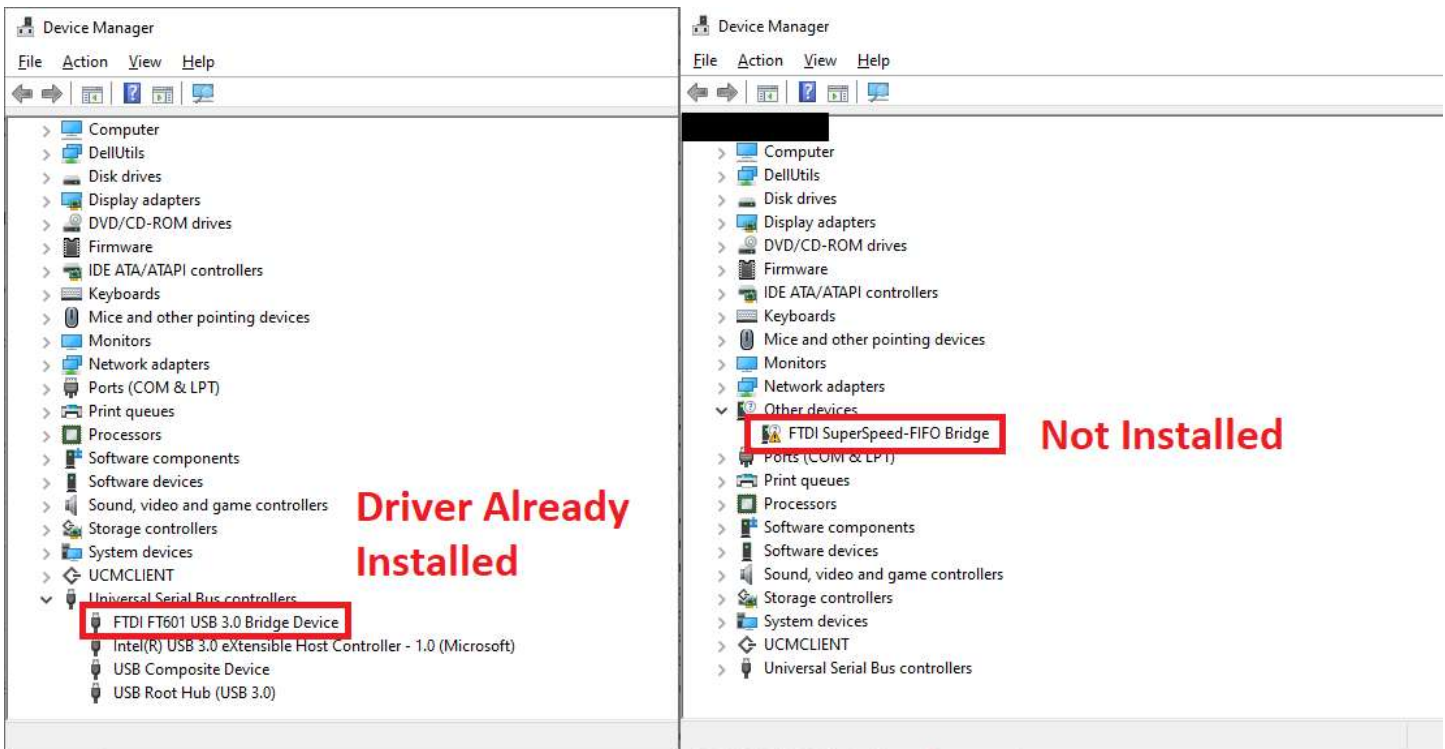# DMA Setup Guide/Testing

Hardware Setup (Game PC)

1. **Please ensure that your DMA Card has Custom Firmware.** If you have the DMA Card installed in your Game Computer, and launch an Anti-Cheat Protected game *without* Custom Firmware, you **WILL** be banned. Any PCILeech based DMA Card will work with this Software.
2. Install your DMA Card into an open PCI-e slot on your **Game PC**. Most DMA Cards are PCI-e x1, and can fit into x1, x4, x8, x16 slots.
3. Connect your DMA Card via the **Data Port** to your **Radar PC** (2nd PC), using the provided USB Cable (and any USB adapters necessary for different USB Types).

4. Disable/Adjust the following Settings on **Game PC** System BIOS:
   a. We primarily need to disable **Virtualization** on your system, since this *can* interfere with DMA Memory Reading. Disable any Virtualization settings in your System BIOS.
      i. On Intel CPU Motherboards this will usually be listed as:
         1. Virtualization / IOMMU
         2. VT-d
      ii. On AMD CPU Motherboards this will usually be listed as:
         1. Virtualization / IOMMU
         2. SVM
   b. Disable NX-Bit (Only if available. If you can't find it skip this step)
   c. If needed set PCI Slot of DMA Card from Auto to Gen1 (Advanced > PCI Settings)
5. Make sure *Memory Integrity / Core Isolation* is **Off** on your **Game PC.** This may be unavailable/already disabled on some systems, so if you cannot get this page to load, you are likely already good to go. See Device protection in Windows Security - Microsoft Support

FTDI Driver Setup (Radar PC)

1. These steps will install the FTDI Driver on your **Radar PC**. See the screenshot below to see if you have the driver already installed. If already installed you can skip to **Testing.**

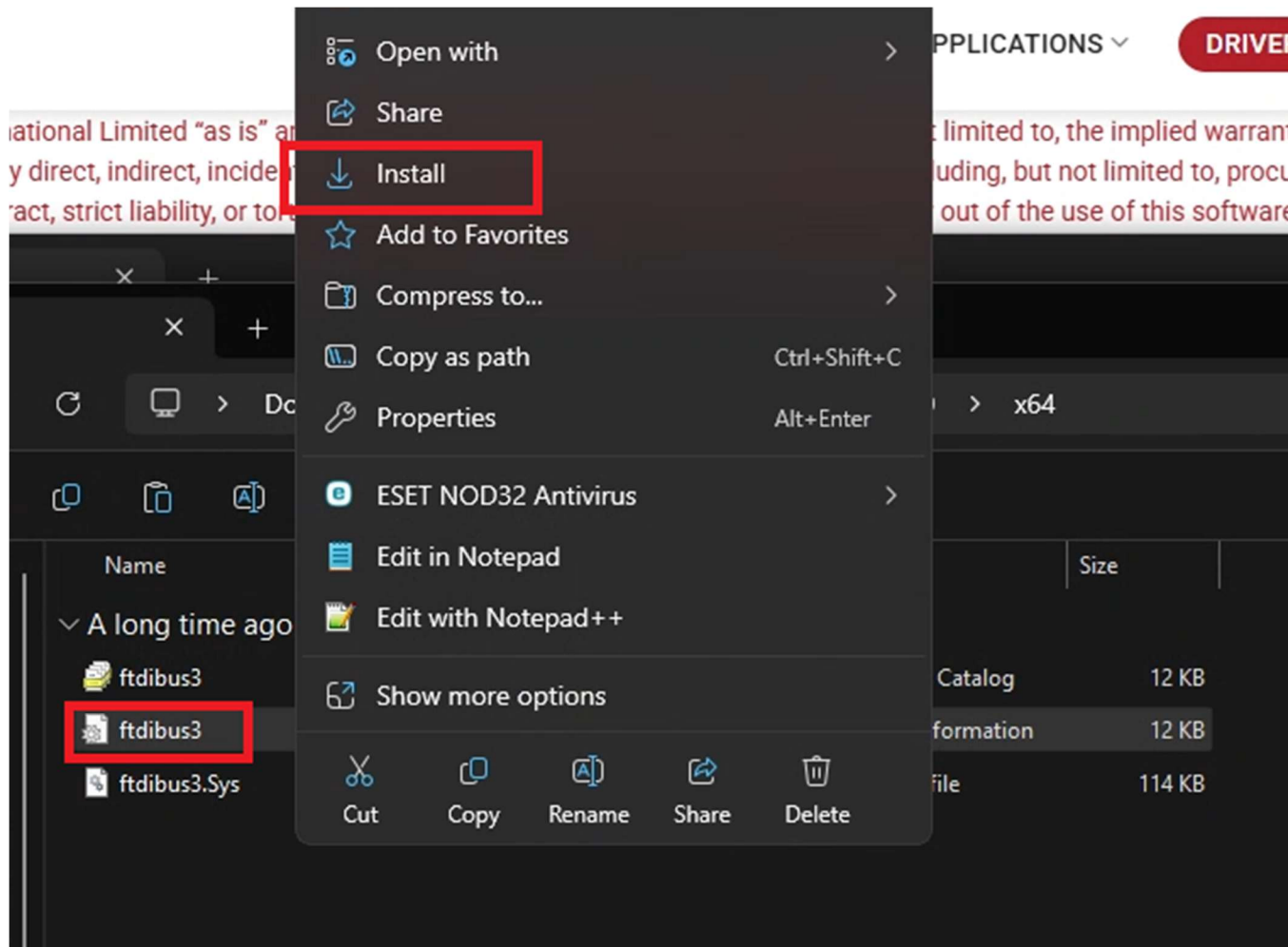a. You can launch Device Manager from the Search Box in the Start Menu.

2. Download the **Windows x64 FTDI Driver** from https://ftdichip.com/drivers/d3xx-drivers/ , and unzip it. See screenshot below:

a.

3. Open the unzipped FTDI Driver Download, and navigate to the **X64** folder. **Right-Click** on *ftdibus3.inf* and click **INSTALL**. See screenshot below:

a.

4. The FTDI Driver should now be installed on your Radar PC (See Step 1 to verify).
    a. If the device is not registering, try to reseat the USB Cable and/or reboot your Radar PC.

Testing (Radar PC)

1. Download and Unzip the **lone-dma-test.zip** package from Discord (if you do not already have it).
    a. Read the README.txt instructions.
2. Run the test tool on your **2nd (Radar) PC**.
3. Run the Full Test.
4. If successful, you should get a message saying that the test **PASSED.**
    a. Latency Test Results:
        i. <4000 = Fail
        ii. 4000+ = Acceptable
        iii. 5000+ = Good
        iv. 6000+ = Excellent
    b. Throughput Test Results:
        i. <100 = Fail
        ii. 100+ = Acceptable
        iii. 150+ = Good
        iv. 200+ = Excellent

     c.   **Passing Test Example:**

5. If there are issues, please see the **Common DMA Troubleshooting** section below *before* messaging support.

DMA Troubleshooting Guide

1. **ERROR - [FAIL] VMM INIT FAILED.**
   a. The most common cause of this error is that your DMA Card/Connection is 'hung'. This most commonly occurs after your Game PC does a fast reboot, or if your Game PC was previously in sleep mode.
      i. Reboot **BOTH** your Game PC and Radar PC.
      ii. This should resolve this issue 99% of the time.
   b. **DOUBLE CHECK THAT YOU COMPLETED <u>ALL STEPS</u> IN THE SETUP GUIDE ABOVE!! THIS IS ONE OF THE BIGGEST REASONS PEOPLE GET THIS ERROR.**

2. **ERROR - DEVICE: FPGA: ERROR: Unable to connect to USB/FT601 device [0,v0.0,0000]**
   a. Make sure you installed the FTDI Driver on your **Radar PC** (See the setup guide above for details).
   b. Make sure you are plugged into the **DATA PORT** on your DMA Card.

3. **Other Common Errors:**
   a. *Failed to retrieve Physical Memory Map!*
      i. Troubleshoot your USB Connection (See #4).
      ii. If all else fails, re-install windows on your Game PC.
   b. *[SYMBOL] Offline symbols unavailable - file 'info.db' not found.*
      i. This means that PCILeech was unable to download symbols from the Microsoft Symbol Server. This assists PCILeech in reading memory from your Game PC System.

  ii. Make sure you unzipped the folder and all files.

  iii. Make sure **symsrv.dll** and **dbghelp.dll** are present in the folder.

  iv. Make sure you have internet connectivity and your firewall(s) are not blocking any connections.

  v. If all else fails, you can download the latest **info.db** file from the MemProcFS repository (https://github.com/ufrisk/MemProcFS/releases win-x64), and include it in the folder. This is an 'offline' symbols dump.

c. *FPGA: TINY PCIe TLP Algorithm auto-selected!*

  i. This indicates that your DMA Card is operating at lower speeds. This can sometimes be due to a firmware issue, or more commonly a poor usb connection.

  ii. Make sure your USB Cable is seated securely on both ends. Try different USB Port(s).

d. *[CORE] Initialization Failed. Unable to locate valid DTB / Unable to auto-identify operating system.*

  i. Make sure you made the BIOS Adjustments on Game PC per the setup steps.

  ii. Troubleshoot your USB Connection.

  iii. **Last resort:** Re-install windows on Game PC.

4. **DMA Test Tool - Test Result: FAIL / General Failures**

a. If the DMA Test is giving you a failure message, it is most commonly due to your latency/throughput being too low.

  i. Latency under 4000 Mem/Sec.

  ii. Throughput under 100 MB/s.

b. This is most commonly due to a poor USB Connection:

  i. Make sure your USB Cable is a data-rated (not charging-only!) USB 3.0 Cable, and is securely seated on both ends (DMA Card / Radar PC).

  ii. On your **Radar PC** go into Power Plans and set your Power Plan to **High Performance**. This can improve CPU / USB speeds.

  iii. Try different USB Ports / USB Cables.

  iv. Keep playing with it! Most people resolve slow latency/low throughput by re-seating their DMA Card, reseating the USB Cable, and/or sometimes the DMA Card bracket may get in the way of the USB Cable fitting securely.

  v. **If your Radar PC is significantly below recommended specs, this can diminish DMA Latency/Throughput.**

c. This can be less commonly caused by the Firmware on your DMA Card.

  i. Some Vanguard / Faceit 'bypass' firmwares will reduce the latency/throughput of your card.

d. In some cases DMA Software may still run fine with higher latency/lower throughputs (particularly if you are close to the cutoffs).

      i. We recommend running a Stress Test, and looking for any 'drop outs'. If the connection is stable you may be fine even if you have slow latency.

5. **DMA Software – Not loading up, entities disappearing or not showing, other anomalous behavior:**

    a. This is most commonly caused by **Paged Out Memory.**

        i. When your system / target process are under High Memory Pressure, assets in memory may get shifted to your Page File.

        ii. The Page File is a file located on your hard drive that contains low priority / less commonly accessed items.

        iii. Since the Page File is located on your hard drive, your DMA Card cannot read from it.

        iv. This can cause undefined behavior in many DMA Software(s), and lead to a lot of frustration.

    b. This is most commonly resolved by installing additional System Memory (RAM) in your **Game PC**.

    c. You can also disable the System Page File in Windows on your **Game PC** (**Not Recommended:** Your system can BSOD if Memory Commits exceed available memory).

If you have any issues after following this guide, please contact the Support Team for your DMA Card Hardware/Firmware.