DA-720 Series Windows Software User Manual

Version 3.0, December 2022

www.moxa.com/products

DA-720 Series Windows Software User Manual

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Technical Support Contact Information

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1. Introduction

Thank you for buying Moxa's DA-720 panel computer. This model of the DA-720 comes with the Windows 10 Enterprise LTSB 2016 software platform, which provides a simple and familiar development environment for your various industrial applications needs.

Software Components

The Windows 10 Enterprise LTSB preinstalled on the DA-720 computer consists of the following:

Windows 10 Enterprise LTSB (by CTOS)

Core OS:

- 64-bit support
- Remote Client
- Remote Procedure Call

Applications and Services Development:

- .Net Framework 4.6
- Remote Desktop Protocol 10
- COM OLE Application Support
- COM+ Application Support
- MSMQ (message queuing)
- Work Folders Client

Internet Services:

- Internet Explorer 11
- IIS 10

File Systems and Data Storage:

- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:

- Common Diagnostic Tools
- Problem Reports and Solutions

Graphic and Multimedia Tools:

- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs (MP3)
- MPEG4 Decoders
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Create and play DVDs
- Photo Viewer
- Remote media streaming
- Windows Media Player
- Windows Mail
- Microsoft Print to PDF
- Internet Printing Client

- Windows Fax and Scan
- XPS Viewer
- XPS Services

Management:

- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:

- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:

- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AzMan)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)
- MS Antimalware
- Windows Defender

Embedded Features:

- Unified Write Filter (UWF)
- Message Box Default Reply
- Registry Filter
- The Microsoft Web Services on Devices API (WSDAPI) for .NET

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

2. System Initialization

This chapter covers the initial system settings on the DA-720 computer after you boot up the computer for the first time.

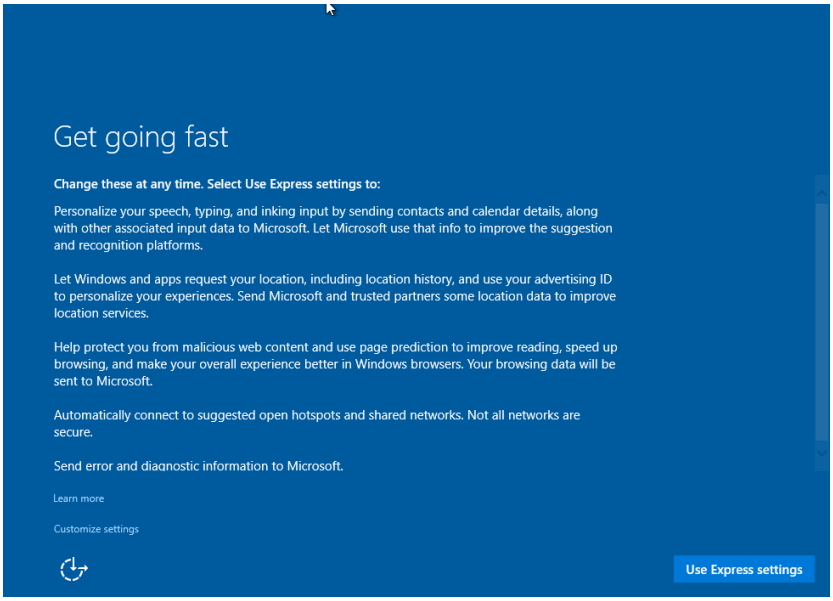
Overview

Like most laptop computers, you must first create a user account and configure the user account settings.

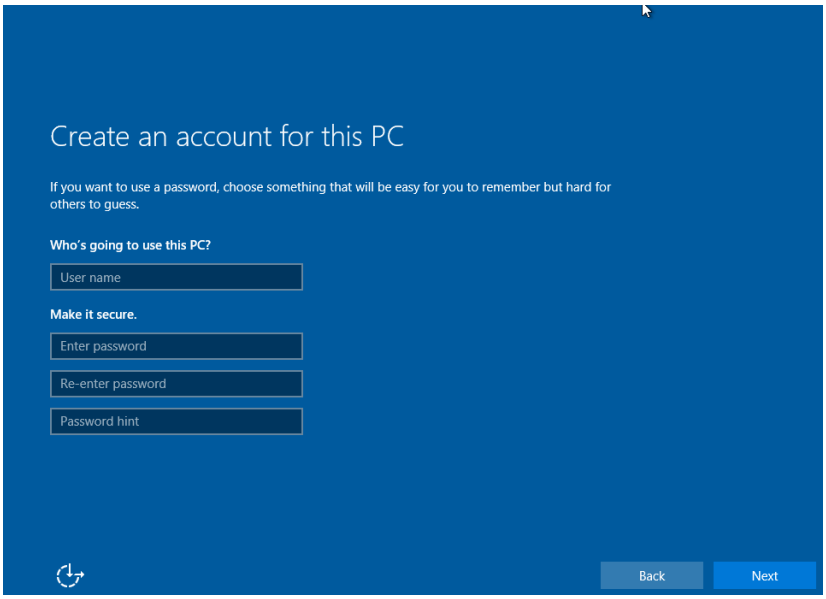
Initializing User Settings

1. When you boot the embedded computer for the first time, you will be asked the following four questions:
   a. What's your home country/region?
   b. What's your preferred app language?
   c. What keyboard layout would you like to use?
   d. What time zone are you in?

   Choose your answers and click **Next**.
2. Click **Use Express settings**.



3. Enter the **username**, **password**, and **password hint**, and click **Next** to create a user account on the computer.



4. You can start using the DA-720 embedded computer once the user account is created.

3. Configuring the Serial Interface

This chapter describes how to configure the serial interface on the DA-720 computer.

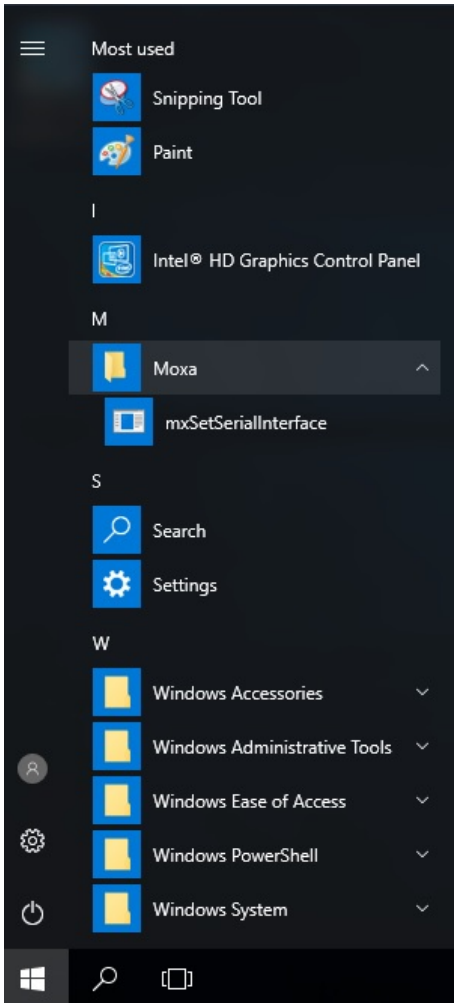
Overview

The DA-720 supports three serial modes: **RS232**, **RS485-2-wire**, and **RS422/RS485-4-wire**. These modes can be configured either on the COM1 or COM2 port.

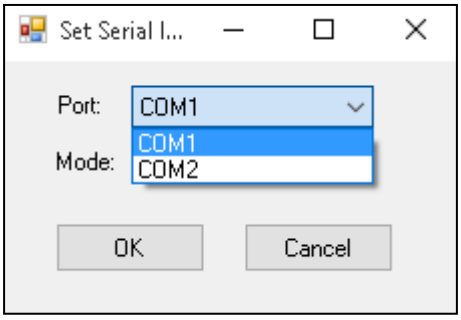
Configuring Serial Interface Mode

To change the serial interface mode settings, do the following:

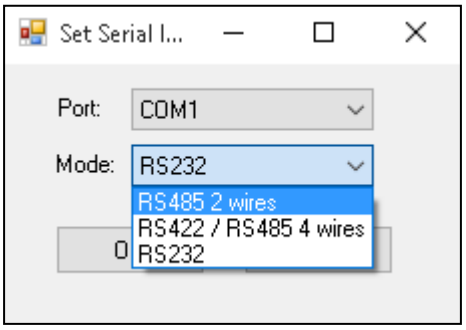
1. In the Start menu select **All apps > Moxa > mxSetSerialInterface**.



2. Select a **Port** for the serial interface.



3. Select the specific **Mode** for the serial interface.



4. Click **OK**.

4. Enabling Embedded Filters

This chapter describes how to operate the embedded features on the DA-720 computer.

Unified Write Filter

Overview

What is UWF?

The Unified Write Filter (UWF) is a feature to protect physical storage media from data writes. UWF intercepts all write attempts to a protected volume and redirects those write attempts to a virtual overlay. This improves the reliability and stability of your device and reduces the wear on write-sensitive media, such as flash memory media like solid-state drives.

About UWF Overlay

UWF intercepts all modifications to any sector on a protected volume. A sector is the smallest unit that can be changed on a storage volume. Any time the file system attempts to modify a protected sector, UWF instead copies the sector from the protected volume to the overlay, and then modifies the overlay instead. If an application attempts to read from that sector, UWF returns the data from the overlay instead, so that the system maintains the appearance of having written to the volume, while the volume remains unchanged.

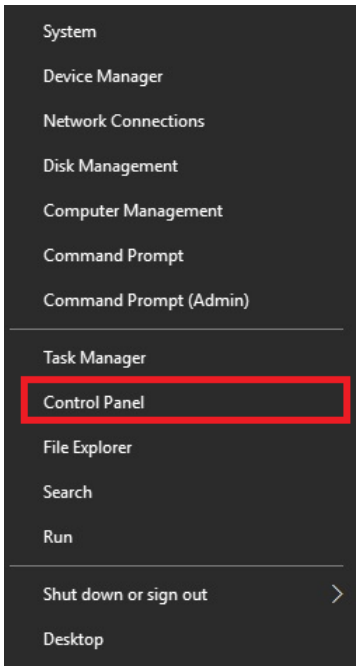
Source: www.microsoft.com

Configuring File-Based Write Filter

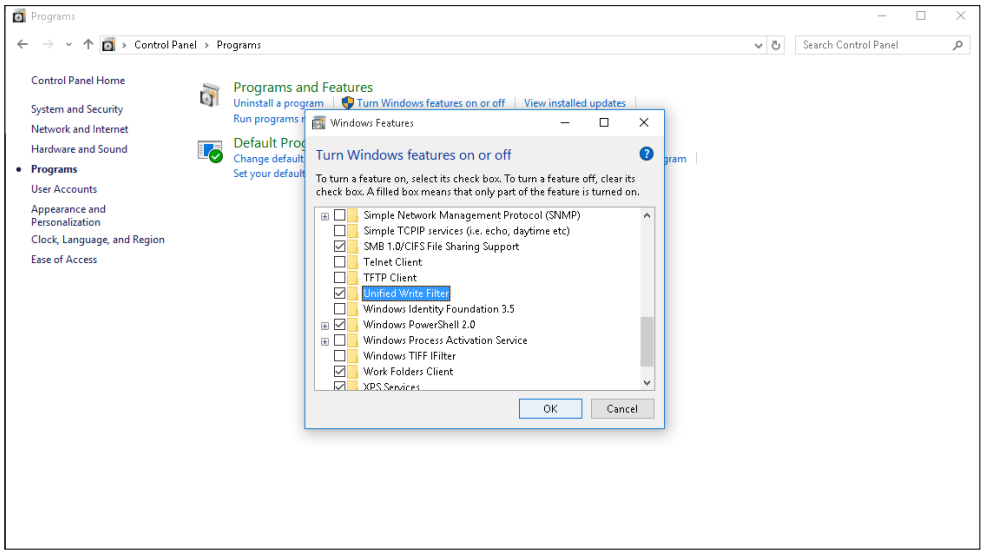
1. Enabling or Disabling the UWF Function

To enable the UWF function, do the following:

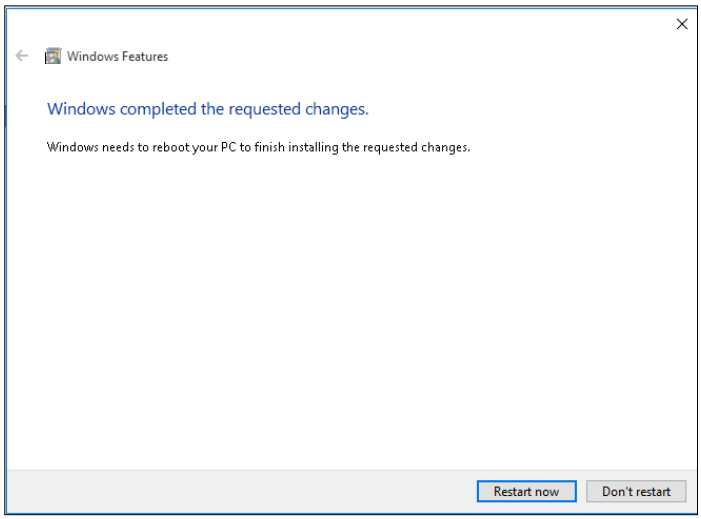
1. Select **Control Panel** in the Windows Start menu.



2. In the left panel, click **Programs.**
3. Click on the **Turn Windows features on or off** link under **Programs and Features**, select **Unified Write Filter** from the list, and click **OK**.



4. Click **Restart now** to apply the changes.



2. Configuring the UWF Overlay Settings

To configure the UWF overlay settings, do the following:

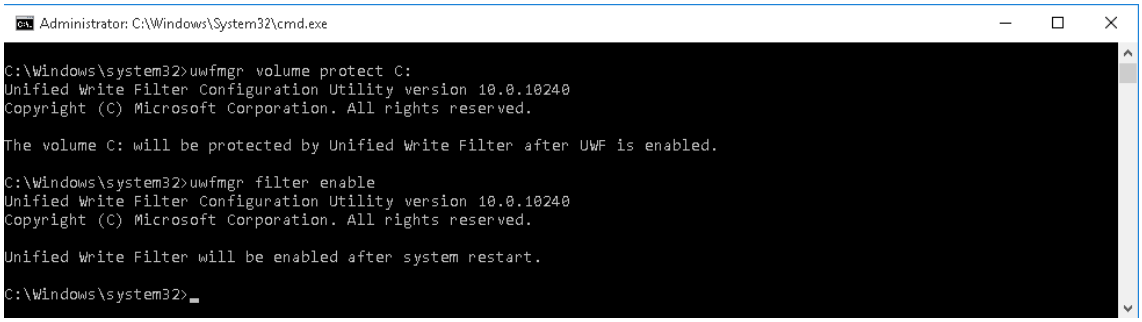
1. Type **cmd** in the Windows Start menu field and press Enter to open a terminal.

2. Run the following command to protect the computer volume C:

   `uwfmgr volume protect C:`

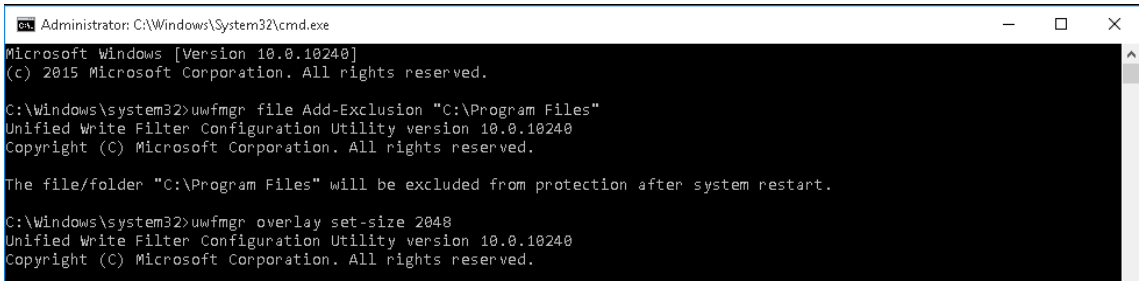
3. Run the following command to enable UWF protection:

   `uwfmgr filter enable`

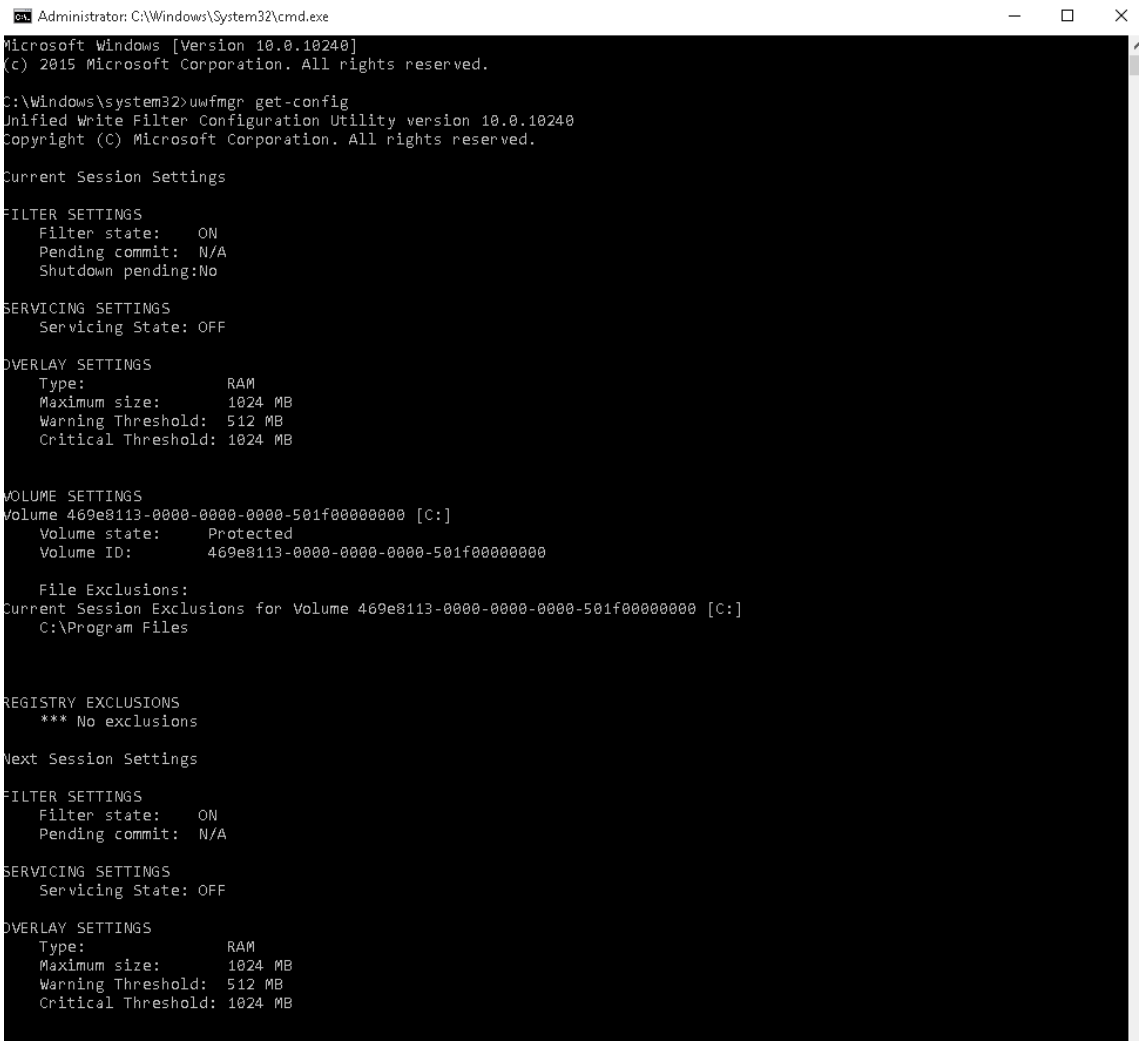


4. Run the following command to exclude files in the **C:\Program Files** folder from UWF protection:

   `uwfmgr file Add-Exclusion C:\Program Files`



5. Exit from the terminal and restart your computer for the changes to take effect.



After restarting your computer, you can check the UWF status by running the **`uwfmgr get-config`** command in a terminal.

To test the UWF protection:

1. After you enable UWF protection, create files both in the C:\Program Files and the C:\ folders.
2. Restart the computer.

   Only the file that you created in the **C:\Program Files** should exist. The file that you created in the **C:** folder is erased.
   To disable the UWF protection, open a terminal and run the **`uwfmgr filter disable`** command**.**

5. Examples

This chapter describes how to use the DA-720 functions with examples.

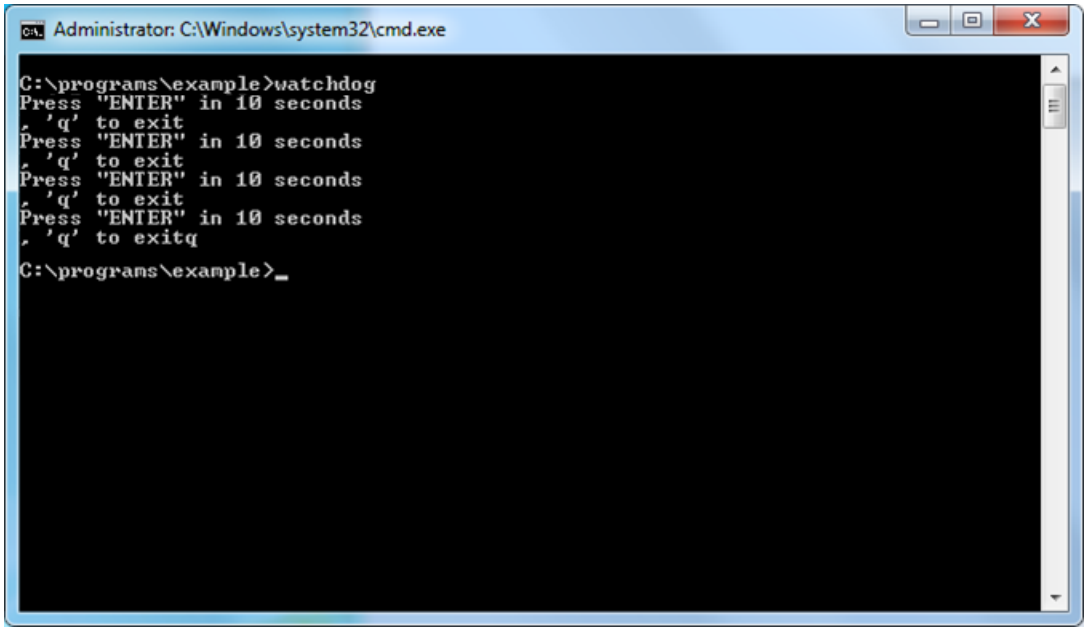
Watchdog Function

An executable file, **watchdog.exe** that enables the watchdog function, is provided in the software DVD that ships with the computer.

Enabling the Watchdog Function

To enable the watchdog function on your computer using the **watchdog.exe** file, do the following:

1. Create **c:\programs\example** folder and copy the following files into the folder:
   mxdwg.dll: <Software DVD>\examples\DA720-W10-example\3.lib\mxwdg
   mxGeneralIo.dll: <Software DVD>\examples\DA720-W10-example\3.lib\MxGeneralIo
   Watchdog.exe: <Software DVD>\examples\DA720-W10-example\Release\x64\
2. Run **Watchdog.exe**.
   You must press **Enter** every 10 seconds to prevent the system from restarting.
   If you want to stop the watchdog function and exit the program, type **q**.



LED Indicators

An executable file, **LED.exe** that displays and controls the status of the LEDs, is provided in the software DVD that ships with the computer.

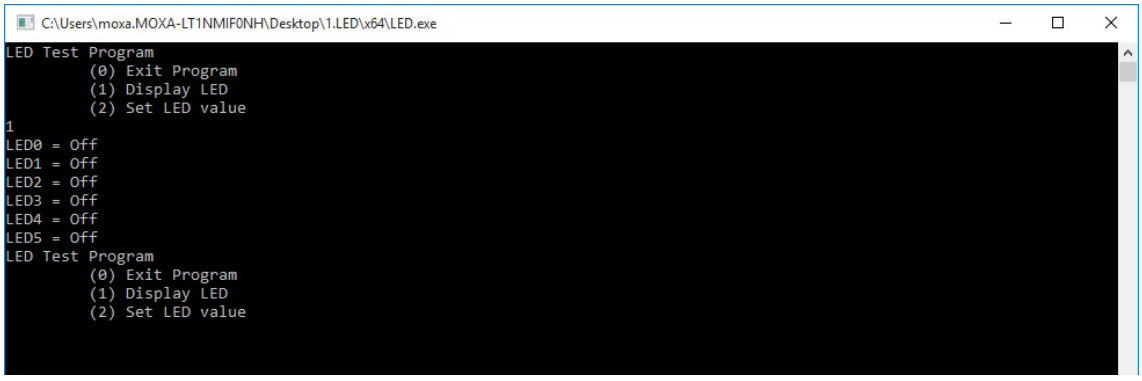
Displaying and Managing the LED On/Off Status

To display the status of the LEDs and to switch the LEDs on or off, do the following:

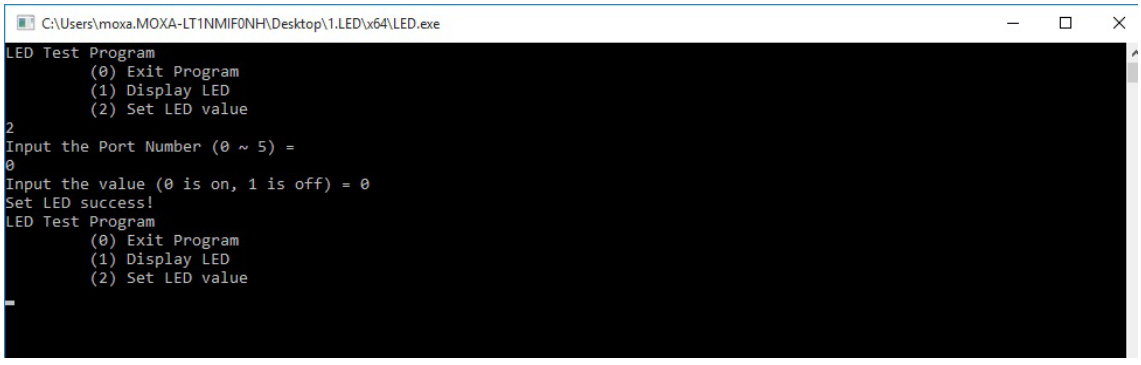
1. Copy the following files from the product software DVD:
   mxgpio.dll: <Software DVD>\examples\DA720-W10-example\3.lib\mxgpio\x64
   mxGeneralIo.dll: <Software DVD>\examples\DA720-W10-example\3.lib\MxGeneralIo
   LED.exe: <Software DVD>\examples\DA720-W10-example\Release\x64\
2. Run **LED.exe**.

3. Select **1** to get the value of the current LED.

> **NOTE**
>
> The LED port numbers 0 to 5 are used to represent the LEDs 1 to 6 on the computer's front panel.



4. Select **2** to change the status (On, Off) of the current LED.



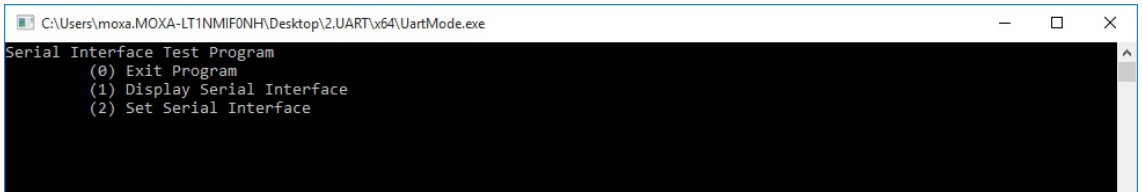
Serial Interface

An executable file, **UartMode.exe** that displays the status and controls the UART mode of the computer is provided in the software DVD that ships with the computer.

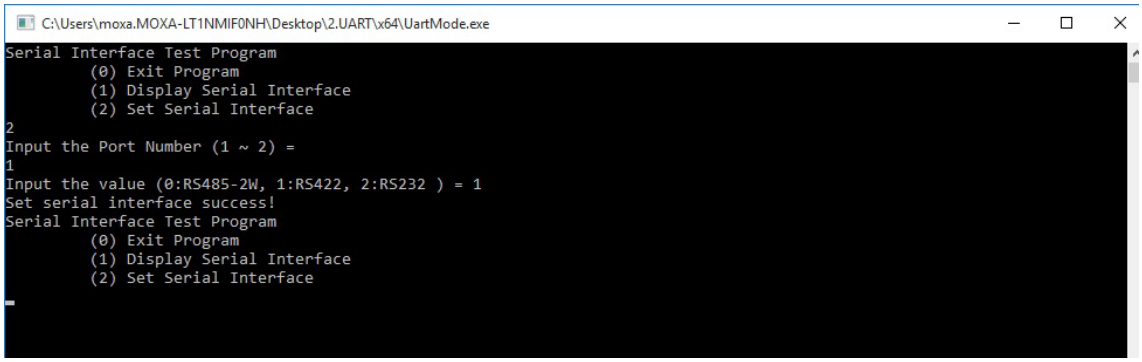
Displaying and Controlling the UART Mode

To display the status of the UART interface and to set the UART mode, do the following:

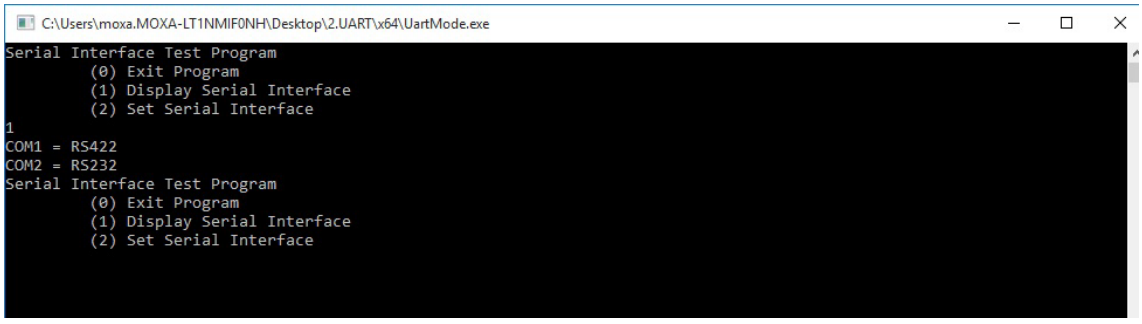
1. Copy the following files from the product software DVD:
   mxsp.dll, SysInfo.dll, SysInfo.sys, SysInfoX64.sys:
   <Software DVD>\examples\DA720-W10-example\3.lib\mxsp\x64
   mxGeneralIo.dll: <Software DVD>\examples\DA720-W10-example\3.lib\MxGeneralIo
   UartMode.exe: <Software DVD>\examples\DA720-W10-example\Release\x64\
2. Run **UartMode.exe**.



3. Type **2** to set the serial interface and follow the onscreen instructions.



4. Type **1** to display the current serial interface settings.



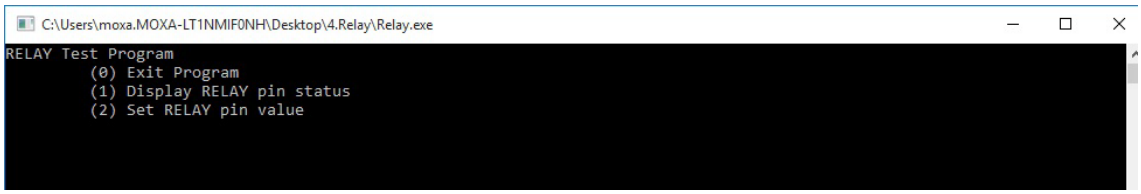
Relay Output

An executable file, **Relay.exe** that displays the relay status and helps you change its status is provided in the software DVD that ships with the computer.

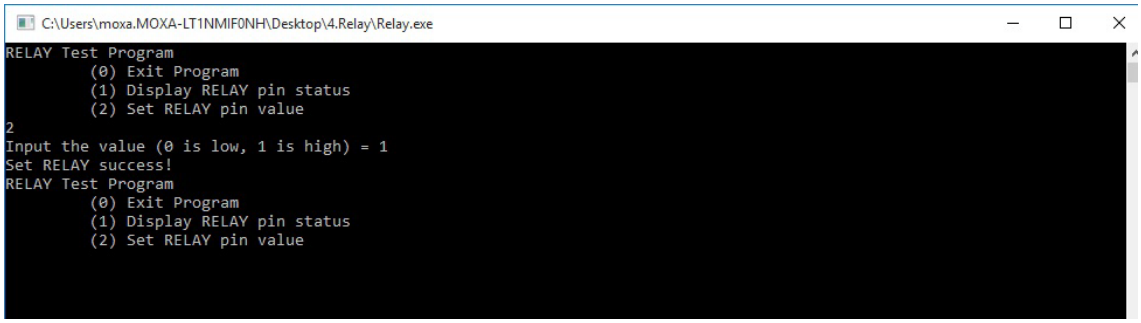
Displaying the Relay Status and Changing the Status to High or Low

To display the relay status and to set the status to high or low, do the following:

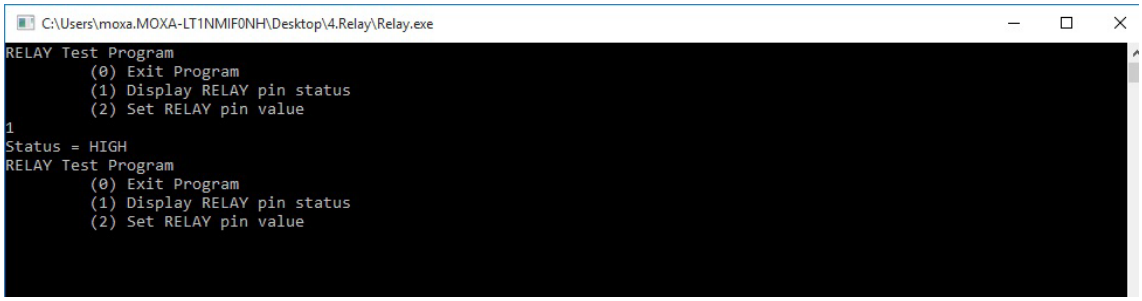
1. Copy the following files from the product software DVD:
   mxgpio.dll: <Software DVD>\examples\DA720-W10-example\3.lib\mxgpio\x64
   mxGeneralIo.dll: <Software DVD>\examples\DA720-W10-example\3.lib\MxGeneralIo
   Relay.exe: <Software DVD>\examples\DA720-W10-example\Release\x64\
2. Run **Relay.exe**.



3. Type **2** to set the serial interface and follow the onscreen instructions.



4. Type **1** to display the current serial interface settings.



6. System Recovery

This chapter describes the Windows 10 Enterprise LTSB platform recovery process in the event of system instability.

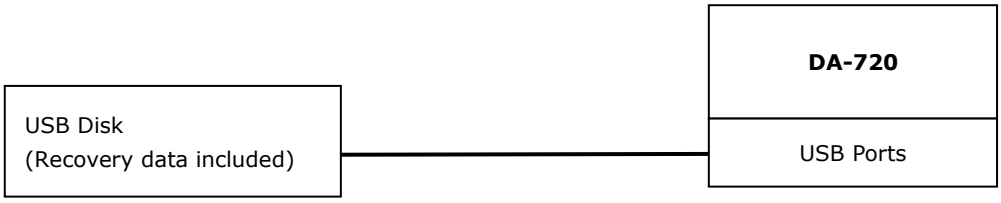
Recovery Environment

The recovery environment consists of the DA-720 panel computer and a bootable USB disk that contains the recovery programs and system image file.

The hardware used includes a PC, a DA-720 computer, and a USB disk with the recovery programs.

NOTE

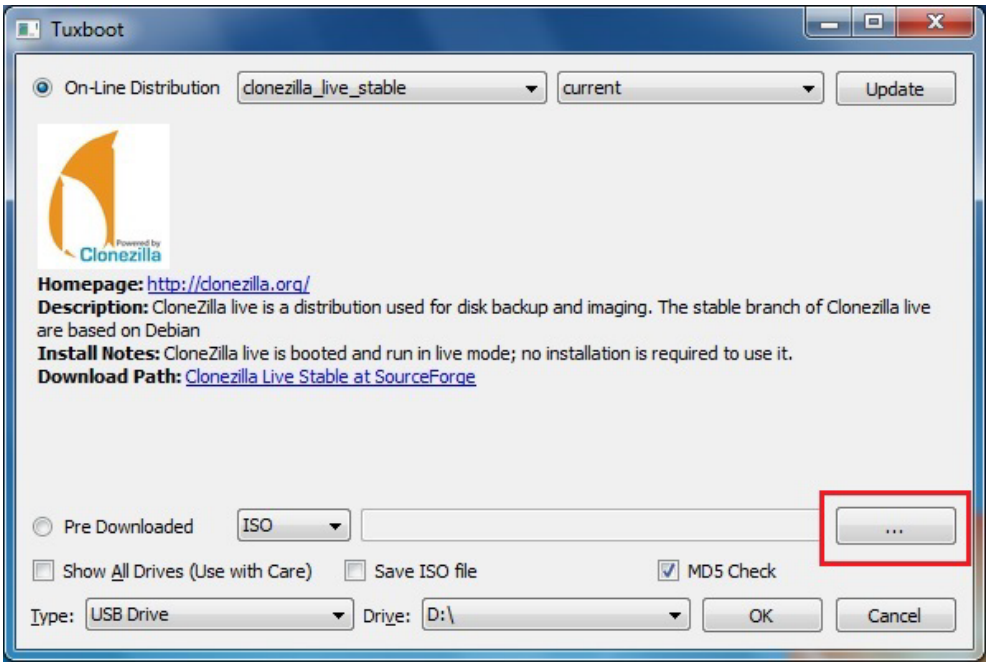
The USB disk should have at least 8 GB of free space.



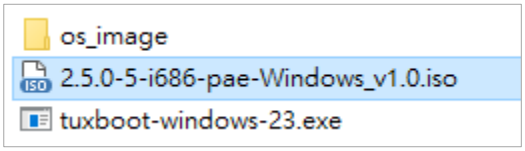
Recovery Procedure

Step 1: Prepare your USB drive

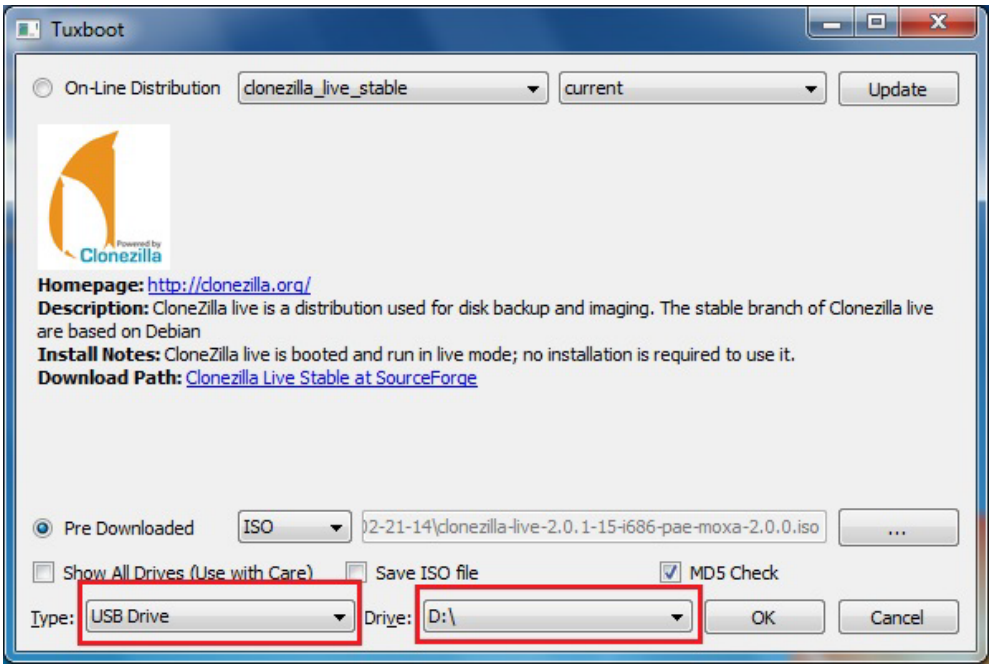
1. Run the **tuxboot-windows-23.exe** program from the <*Software DVD*>**\recovery** folder, select the **Pre Downloaded** option, and then click on the **...** button as shown below:



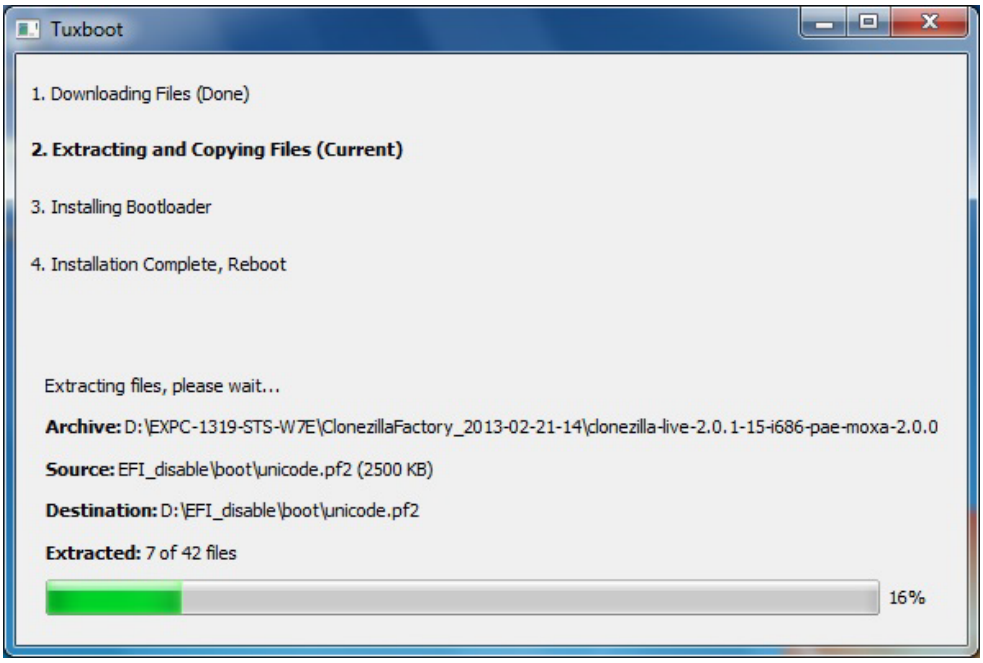
2. Browse to and select the CloneZilla ISO file from the <*Software DVD*>**\recovery** folder.



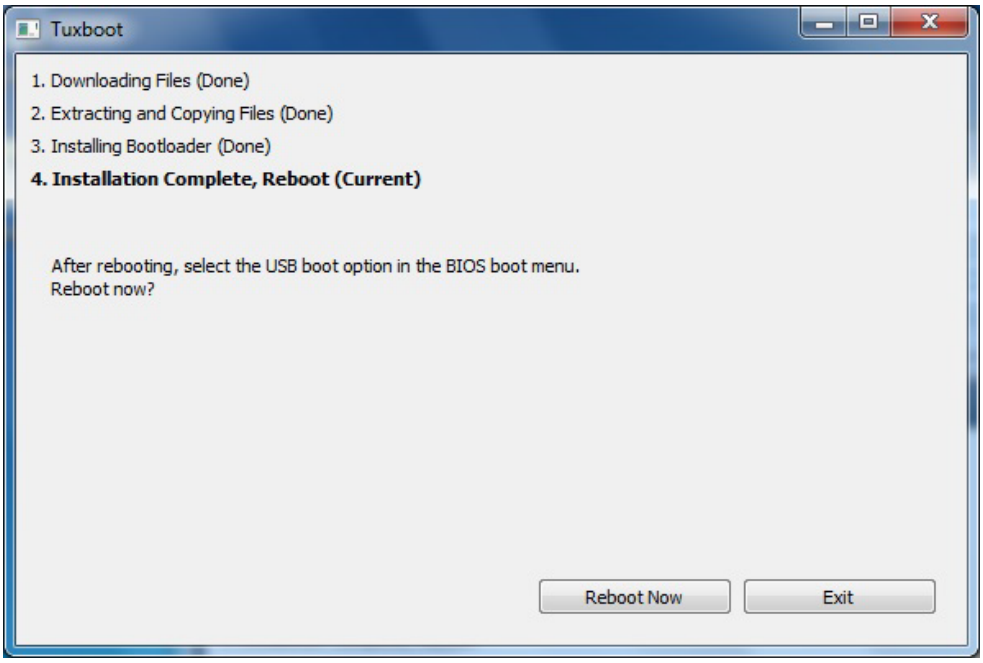
3. Select the **USB Drive** type and the **Drive**, and then click **OK** to continue.



The boot files will be copied to your USB drive.



4. Once the boot files are copied, click **Exit** to stop the program.

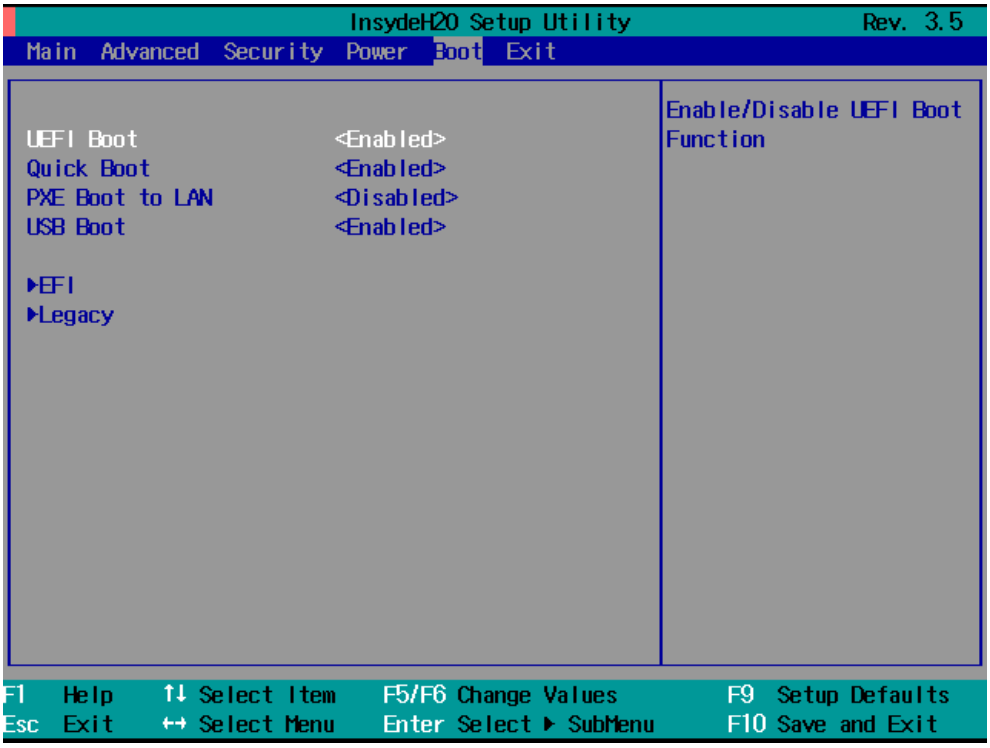


5. Manually copy the **os_image** directory from the <*Software DVD*>**\recovery** folder to the **\home\partimag** folder on the USB drive.

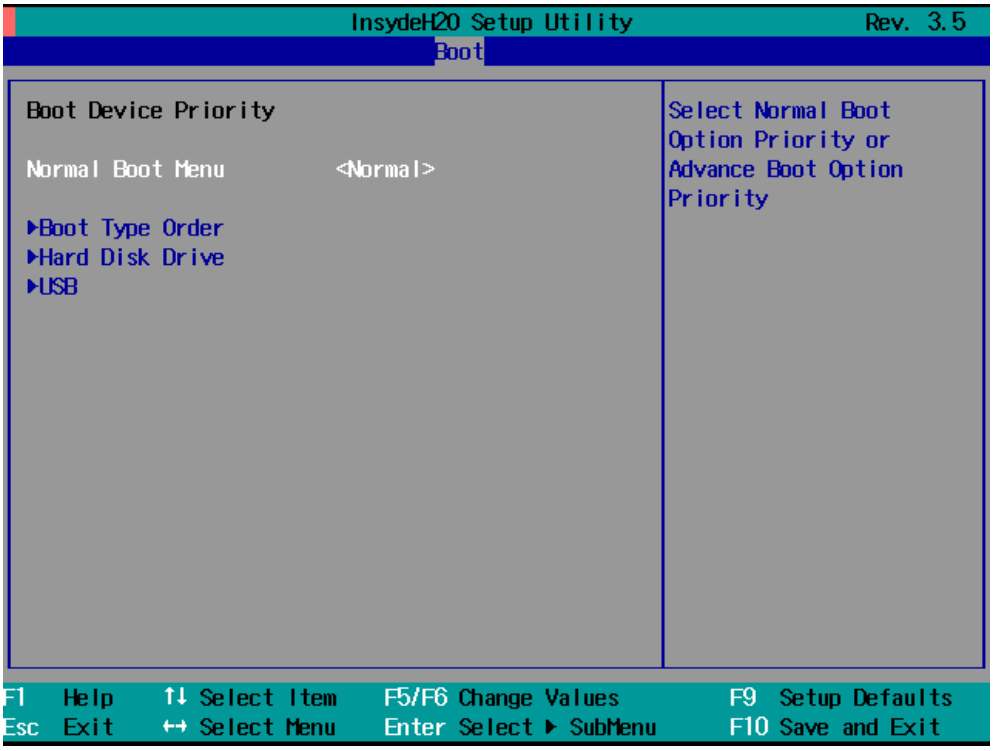
Step 2: Change the BIOS Settings

You will need to change the BIOS settings of your computer to enable it to boot from the USB disk.

1. Turn on the computer and press **F2** till you hear a beep and the BIOS setup menu is displayed.
2. Select the **Boot** tab and then select **Legacy**. Press **Enter** to continue.

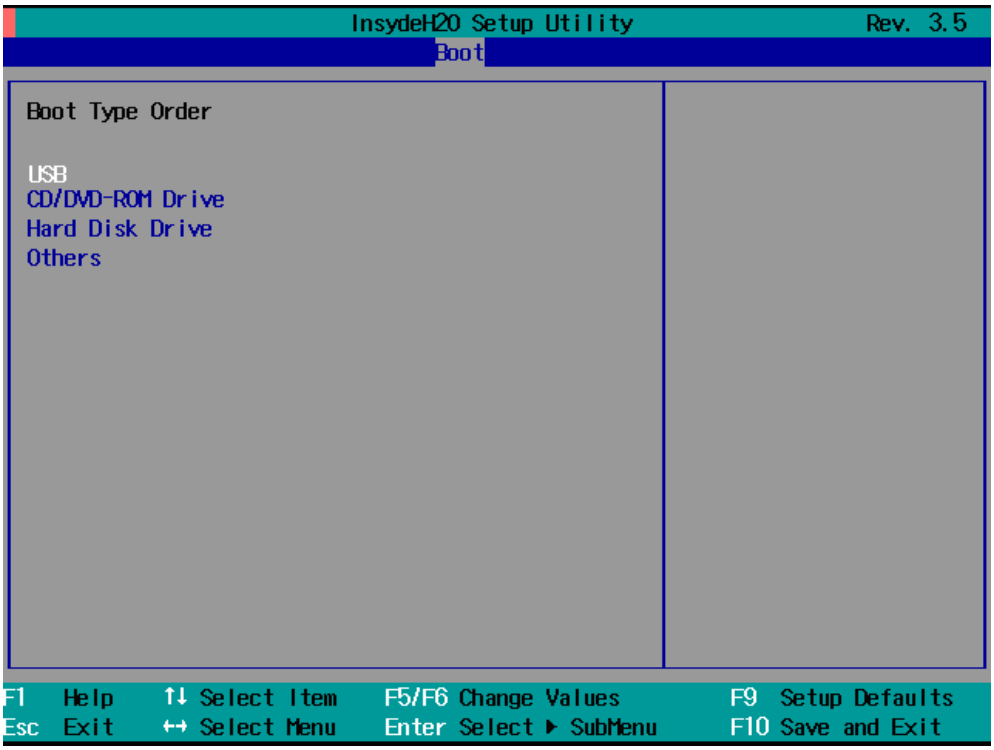


3. Select **Boot Type Order**.



4. Select the USB disk and then press "+" to move it to the first boot device position.

> **WARNING**
>
> An incorrect boot priority will lead to recovery failure.

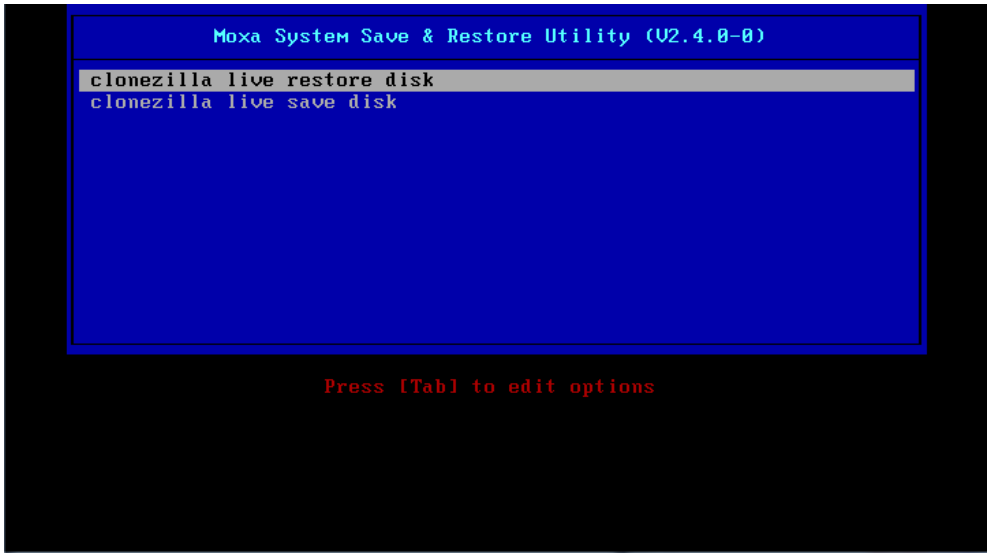


5. Press **F10** and then press **Enter** to save and exit the BIOS setup.

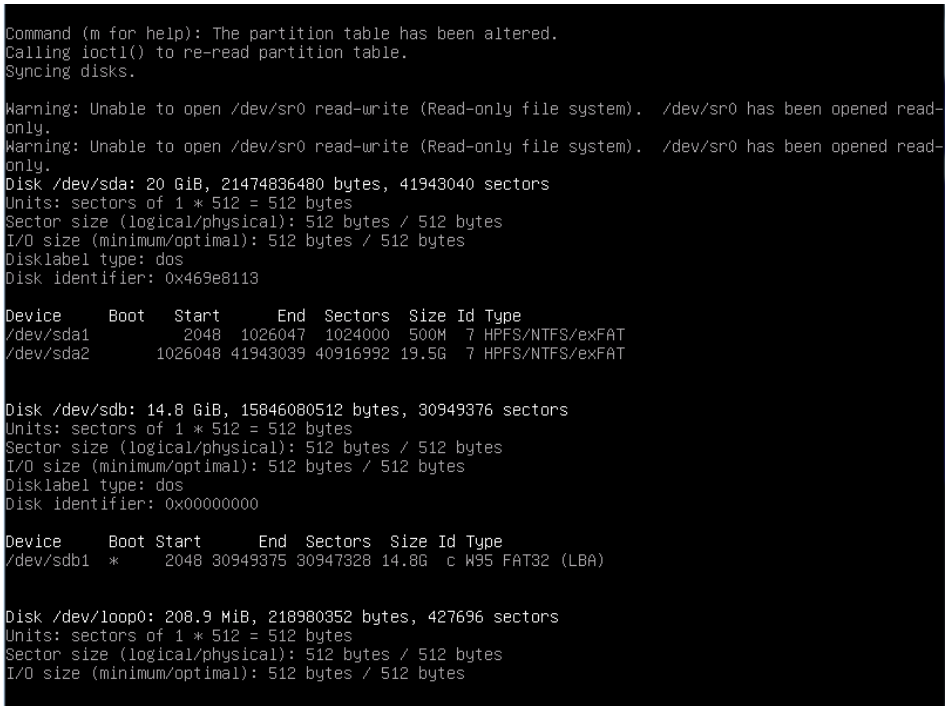
Step 3: Restore the system from USB drive

Connect the USB disk to any of the DA-720's USB ports and then reboot the computer. The system will boot from the USB disk and the **System Save & Restore** utility is displayed.

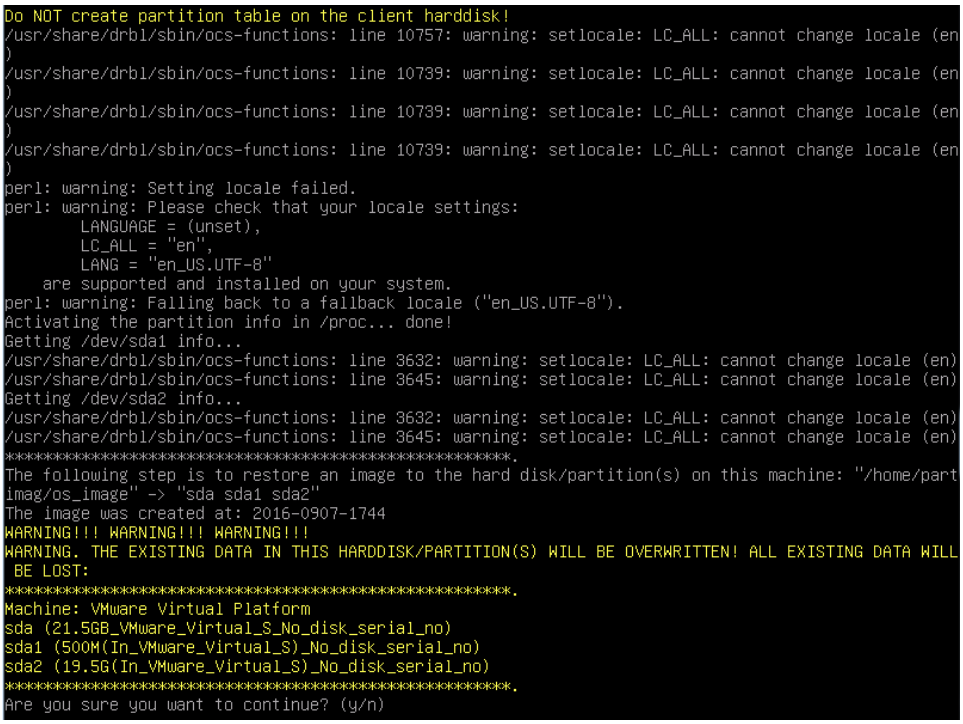
1. In the utility window, select the **clonezilla live restore disk** option.



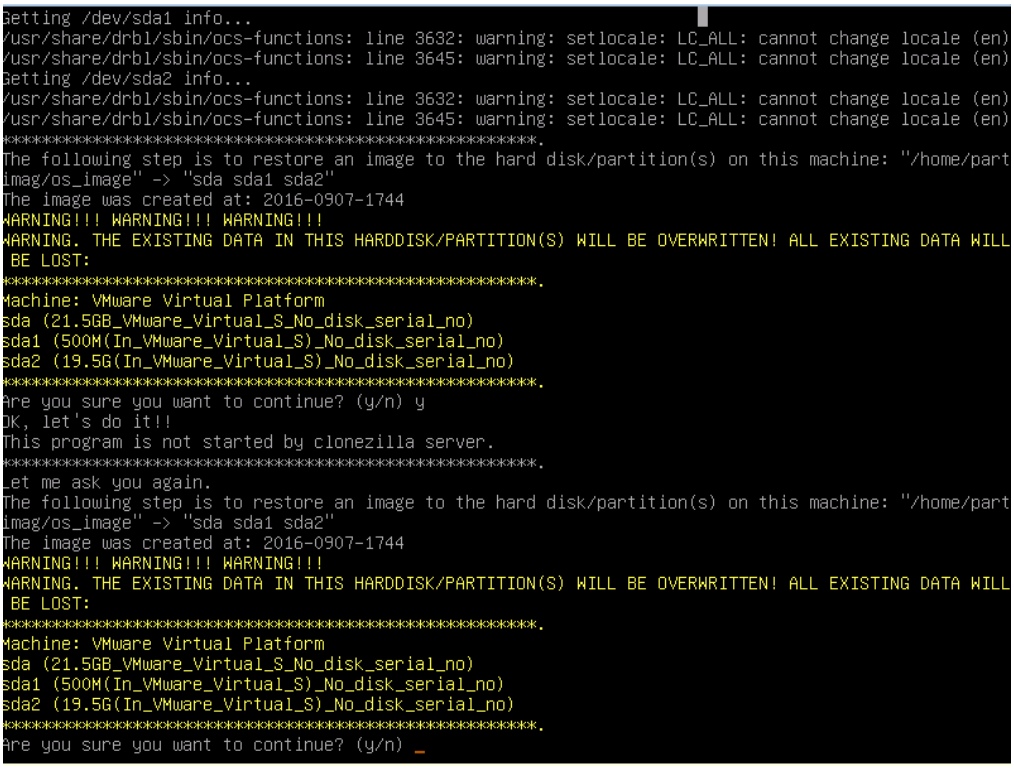
2. Wait for the USB drive boot process to finish.



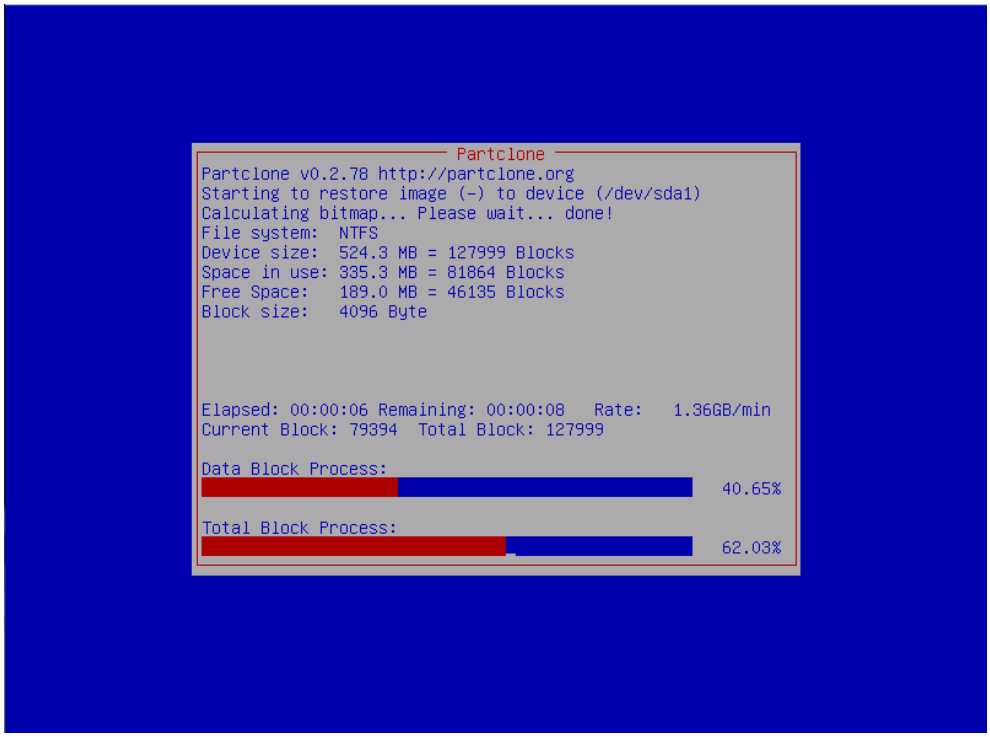
3. Enter **y** to continue the restore process.



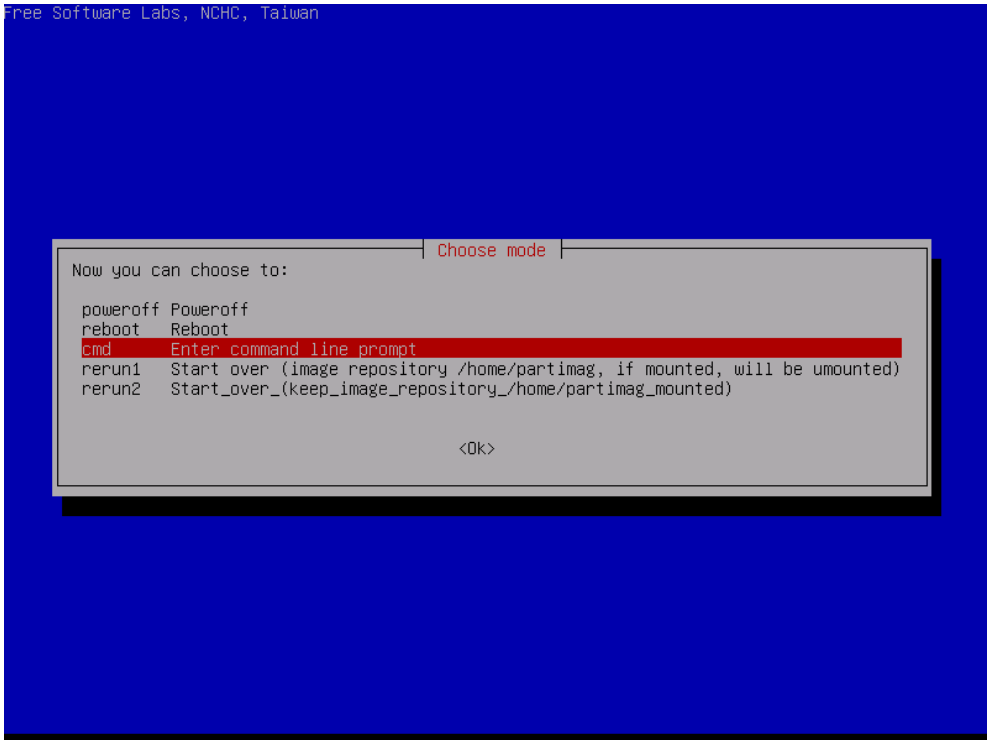
4. Enter **y** to confirm again.



5. Wait for the process to finish.



6. Select **(0) Poweroff** to power off the computer.



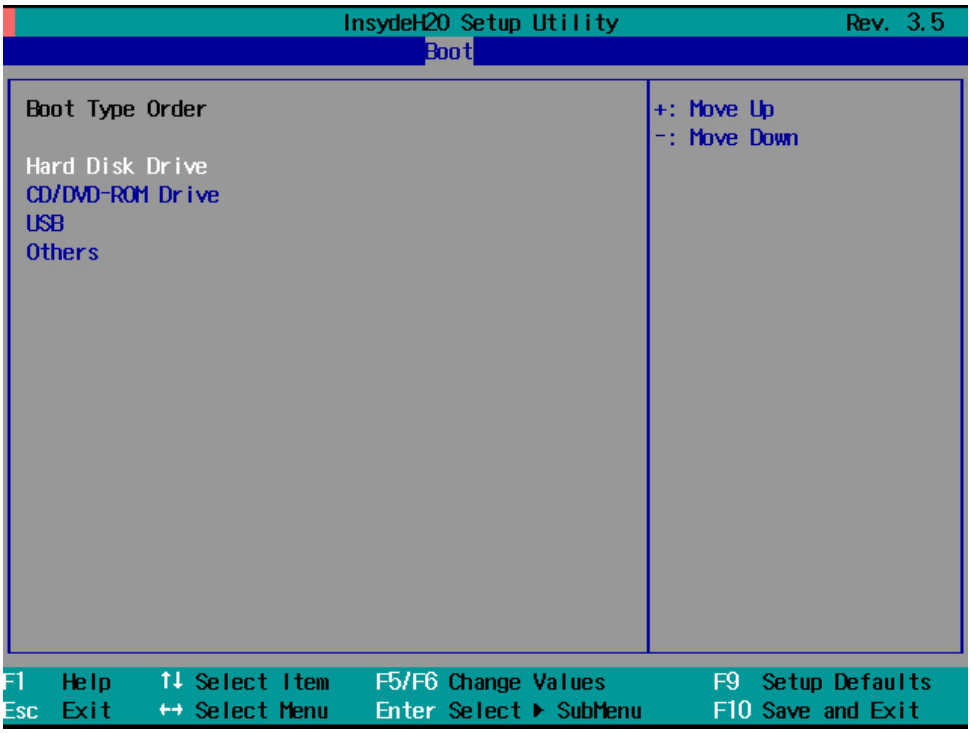
7. Remove the USB drive after the computer has been powered off.

Step 4: Change the BIOS Settings to Boot from the Original Disk

Now you will need to change the boot priority so that the computer can boot from the original disk.

As the system reboots, press **F2** to enter the BIOS setup menu.

1. Select **Hard Disk Boot Priority** and then press + to move to the first boot device position, and then press **Enter**. Make sure the hard disk has first boot priority.



2. Press **F10** and then press **Enter** to save and exit BIOS settings.

Step 5: Reboot the Computer

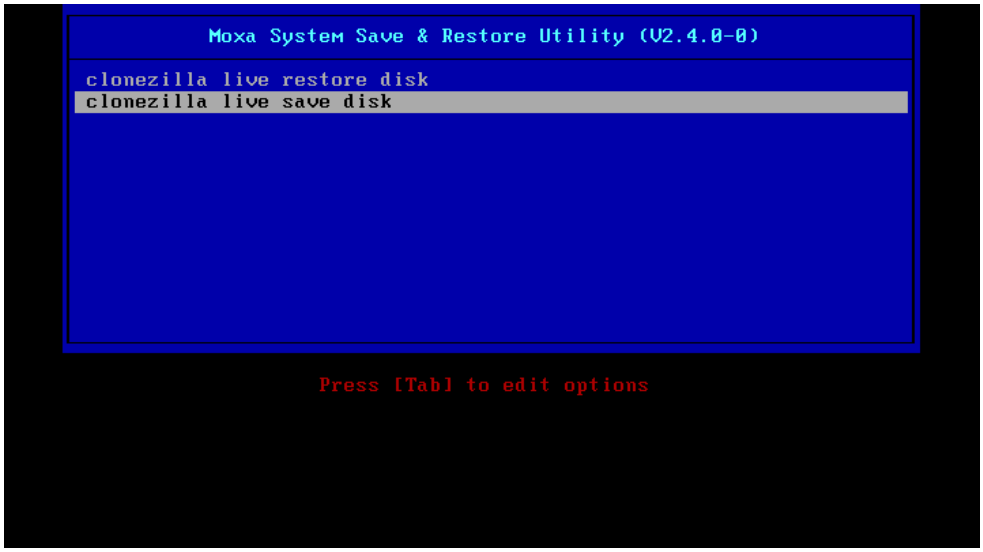
You need to wait about 10 to 15 minutes for the system to restart two times automatically, since the system configuration files will be initiated while booting up for the first time. **Do not turn off the computer or shut down the computer** while the system is restarting; otherwise, the IIS service will be terminated. When the operating system has successfully launched, you will need to restart your computer so that the new settings can be activated.

Saving the System Image to the USB Drive

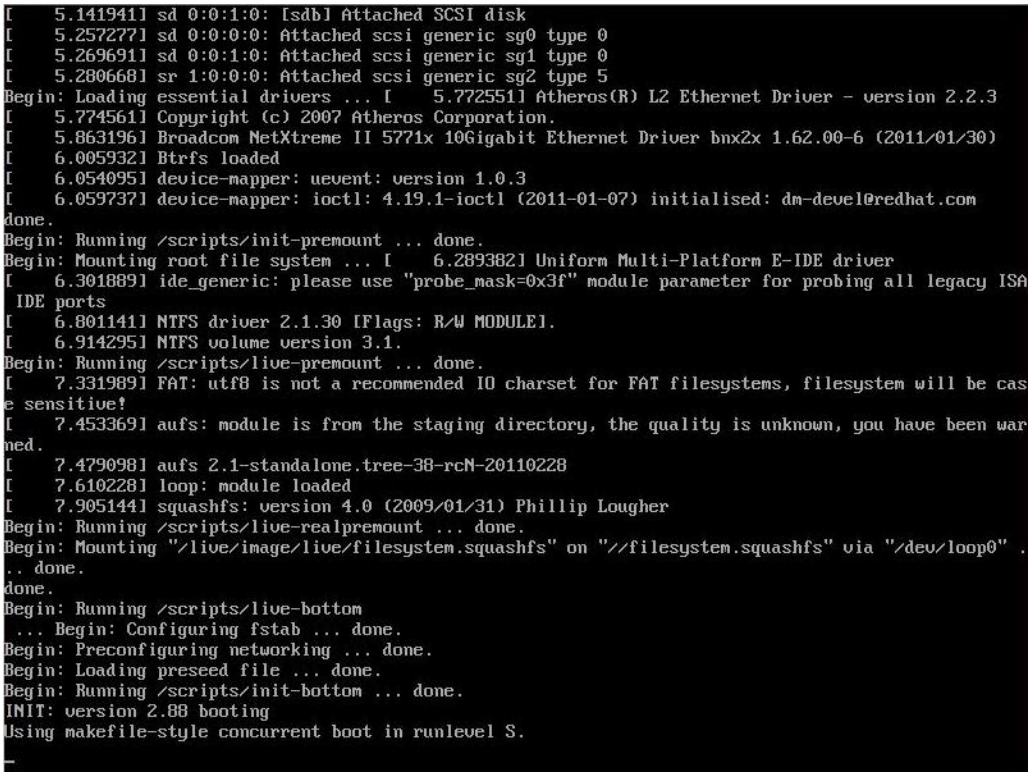
You may also save the current system image to the USB drive for system recovery in case the system crashes. Before saving the system image to the USB drive, we suggest you remove all files under **\home\partimag** on the USB drive. In addition, change the BIOS settings to make the USB drive the first boot priority.

When the system boots up, do the following:

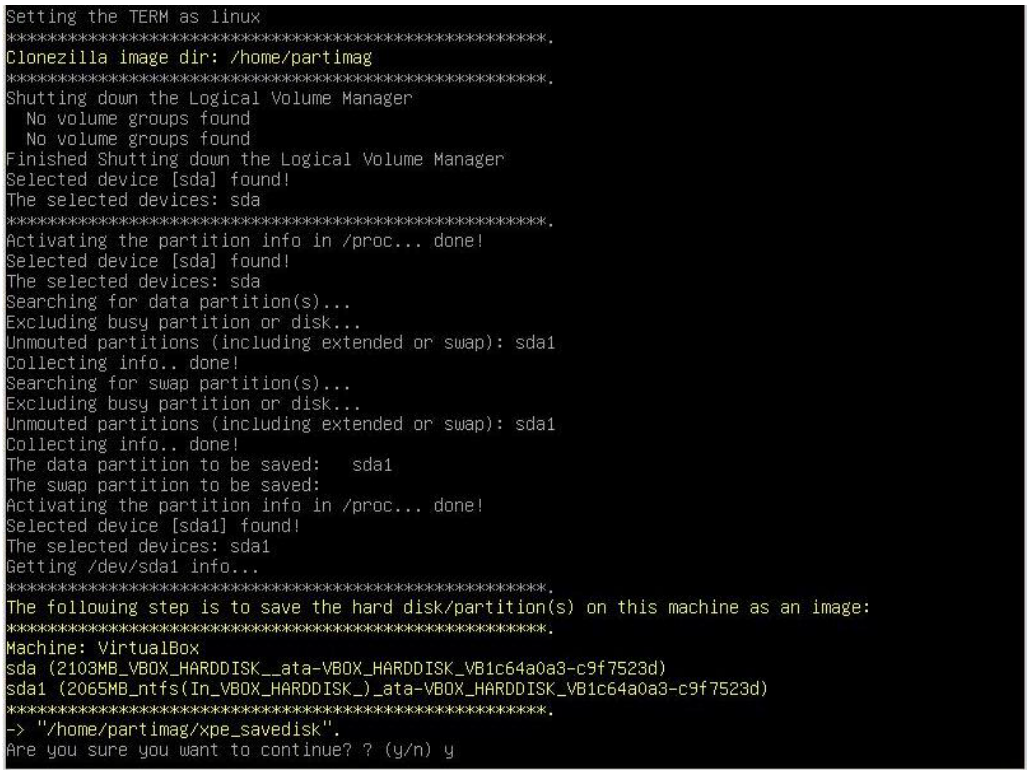
1. Select **clonezilla live save disk**.



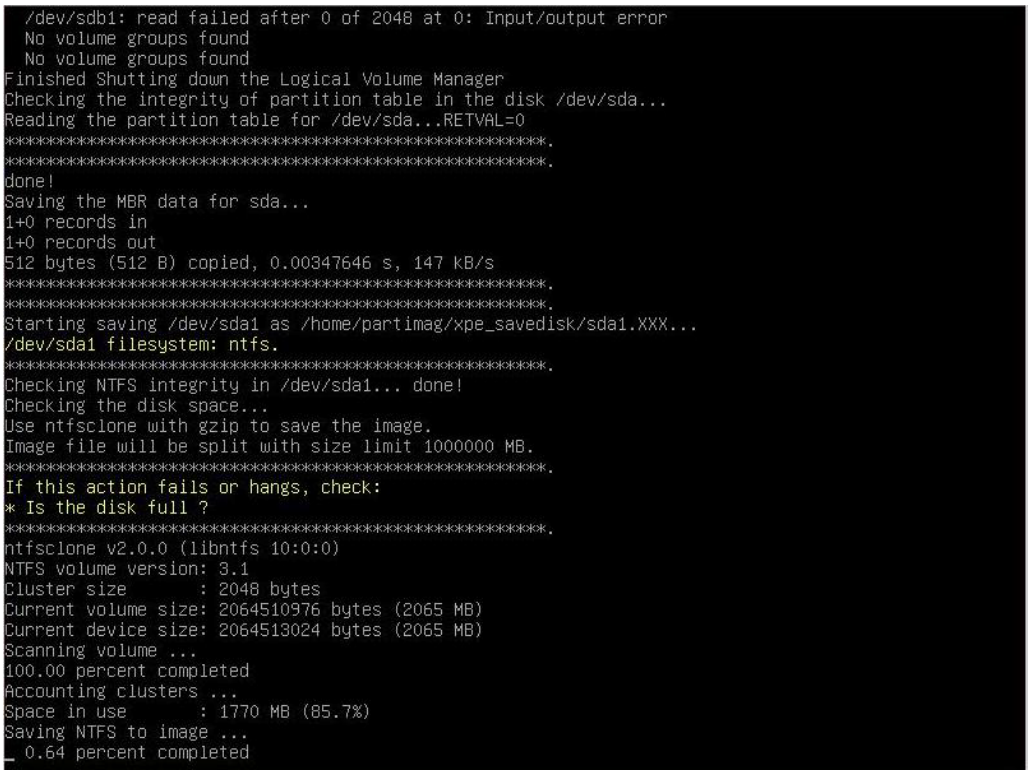
2. Wait for the USB drive boot process to finish.



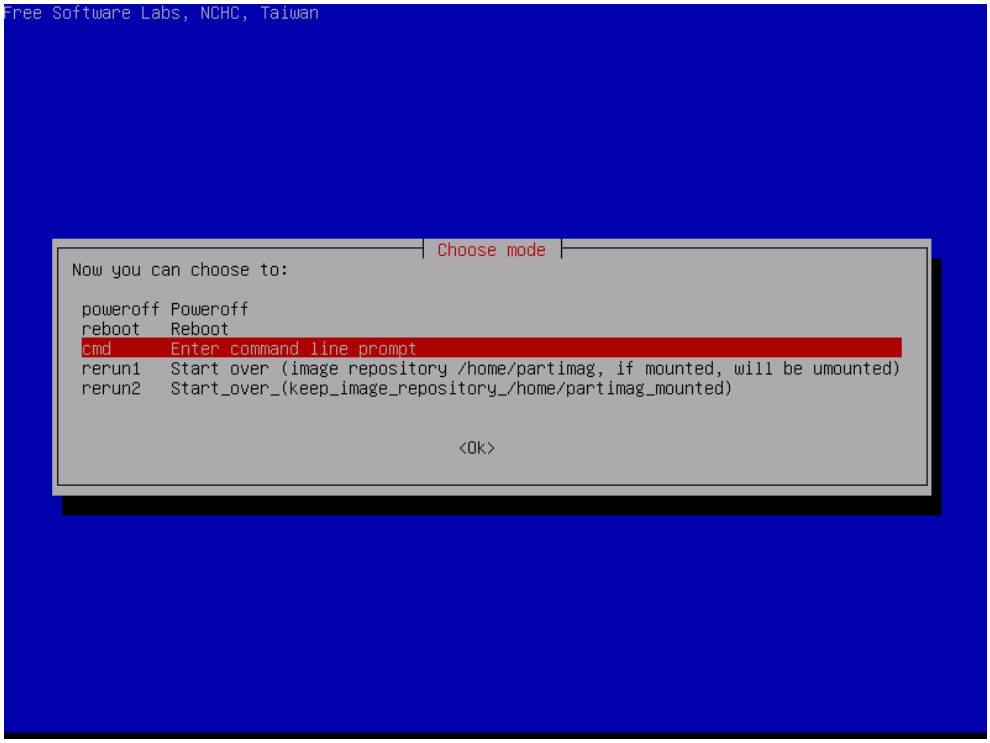
3. Enter **y** to continue.



4. Wait for the process to finish.



5. Select **(0) Poweroff** so that the computer will power off when the process is finished.



7. DE-PRP-HSR-EF Expansion Module

Overview

The DE-PRP-HSR-EF Ethernet Redundancy expansion module is compliant with the latest standardized redundancy protocols for industrial automation networks, such as IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High availability Seamless Redundancy, HSR). PRP/HSR ensures high-availability of the system and data integrity for mission- critical applications in electrical substation and/or process automation systems that require zero- recovery-time redundancy. The DE-PRP-HSR-EF comes with two 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports for PRP/HSR redundant protocol communications.

Moxa's DA-720 Series industrial computer coupled with the DE-PRP-HSR-EF module is the ideal solution for power substation automation and for deploying in process automation systems.

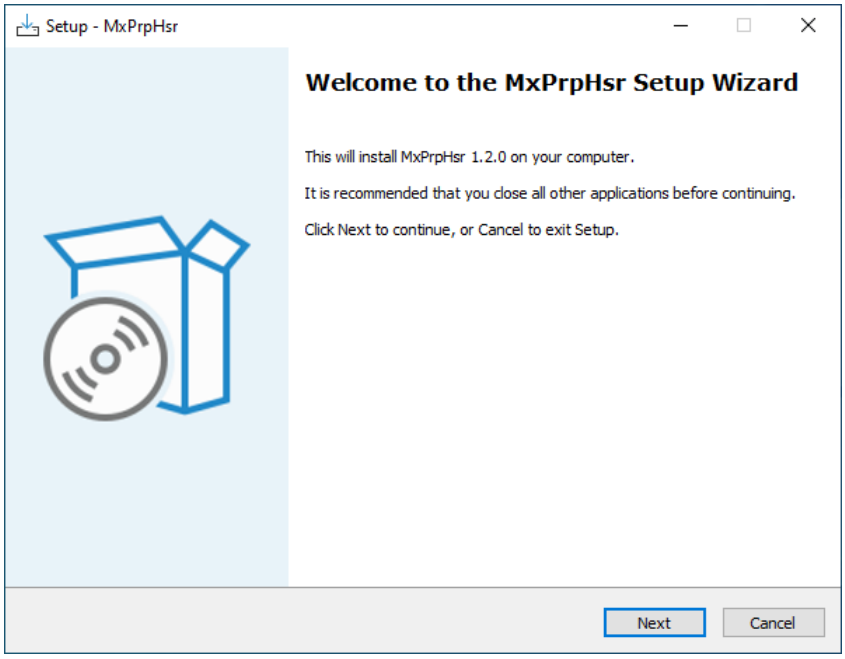
Installing the DE-PRP-HSR-EF Utility

NOTE

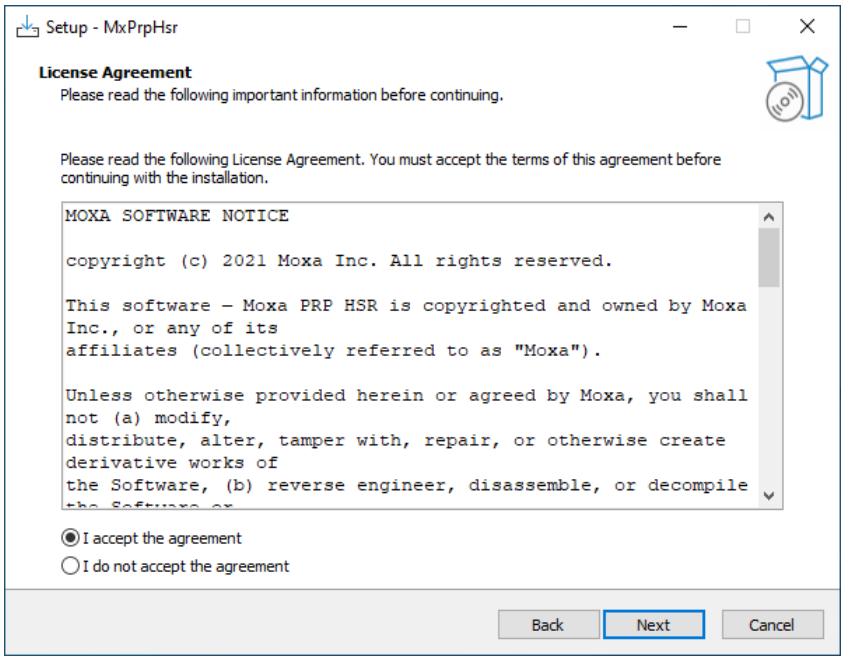
The DE-PRP-HSR-EF utility are supported on Windows 10.

1. Connect a monitor, keyboard, and a mouse to the target computer.
   For more information, see the DA-720 Series Embedded Computer Hardware Manual.
2. Turn on the computer.
3. Download the DE-PRP-HSR-EF driver from Moxa's support website at https://www.moxa.com/en/support to the DA-720 computer.
4. Double-click **MxPrpHsrSetup-1.2.0.exe** to start the installation process.

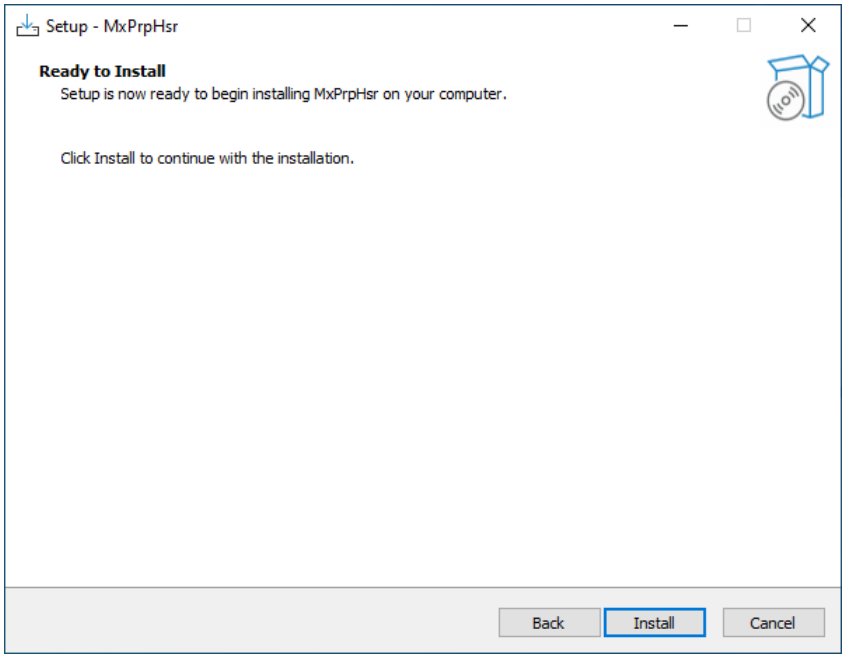
5. Installation process will show the welcome page. Click **Next**.



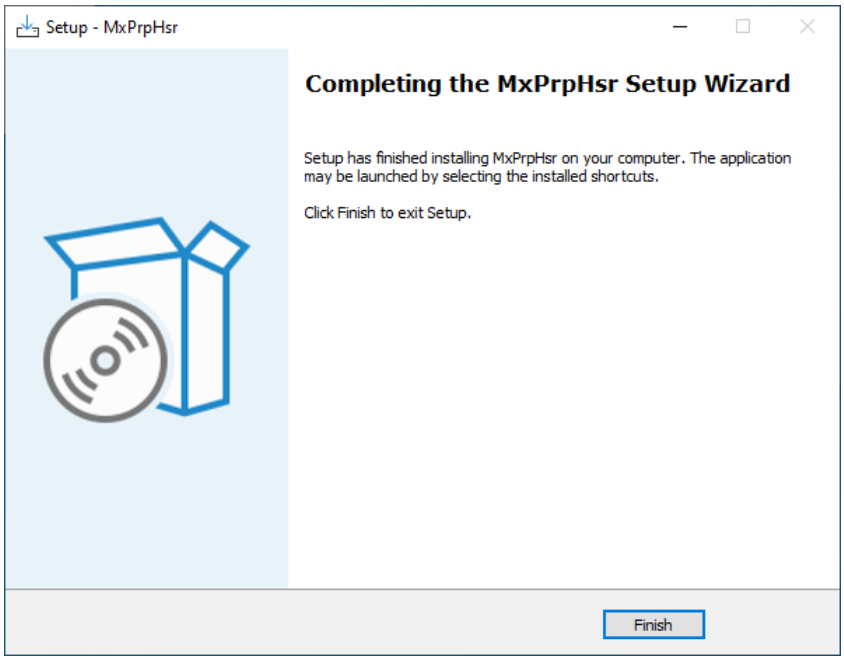
6. Accept the license agreement. Click **Next**.



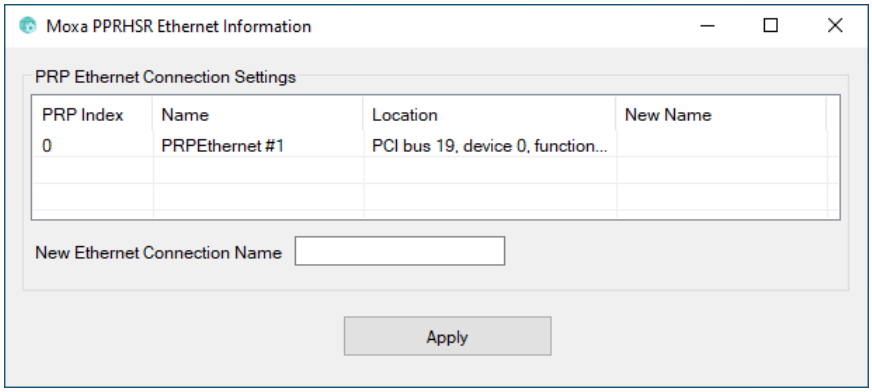
7. Click **Install** to continue.



8. Click **Finish** to complete the installation. The Moxa PRP Service is installed on the computer.



9. After finishing the installation, the **Moxa PRP Ethernet Information** utility will run automatically.

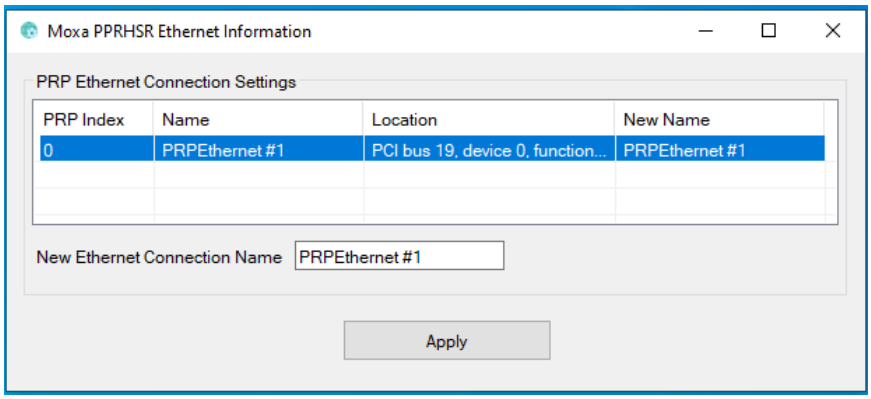


NOTE

If a new PRP card in installed on the computer or removed from the computer, the **Moxa PRP Ethernet Information utility** will run automatically when the computer reboots. Use the utility to configure the new card.

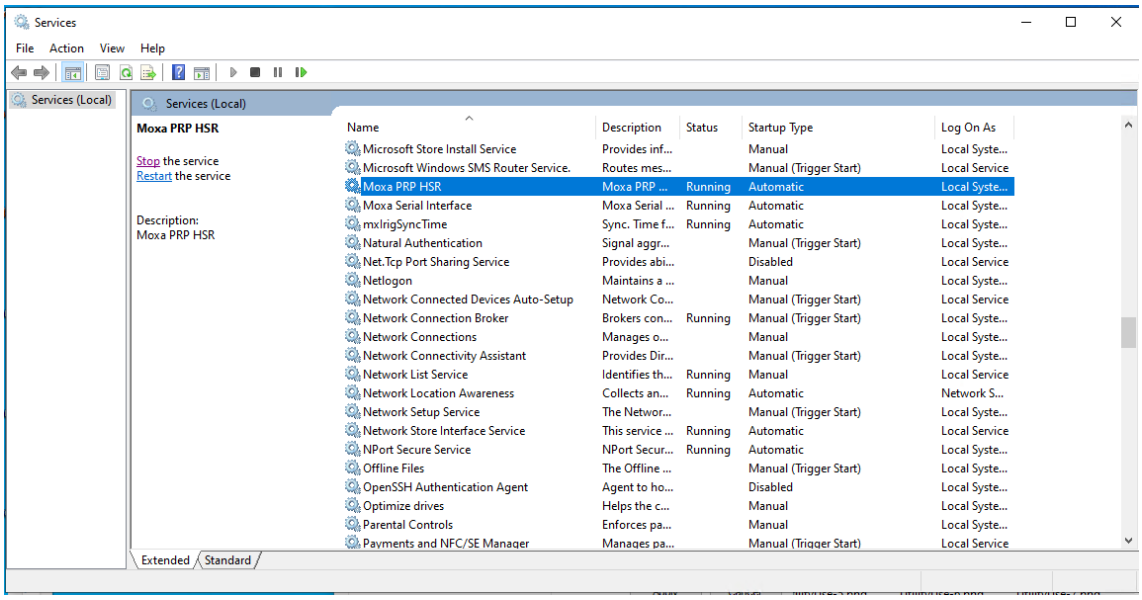
10. The utility sets a default name for each card, which can be changed. In the example below, the PRP Index represents the PRP index switch selection and the location of the PRP expansion card, which can be obtained from the device manager.

    To change the default name for an expansion card, click on the entry for the card in the utility window, change the default name, and click **Apply**.

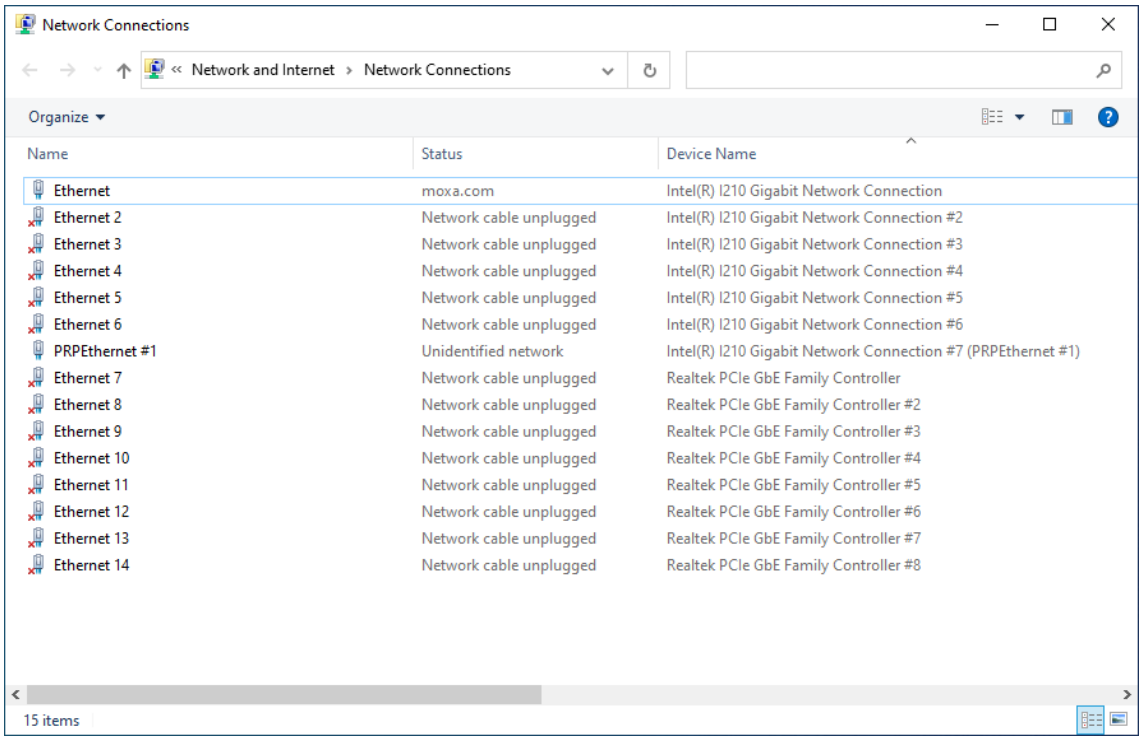


11. You will be prompted to restart the computer.

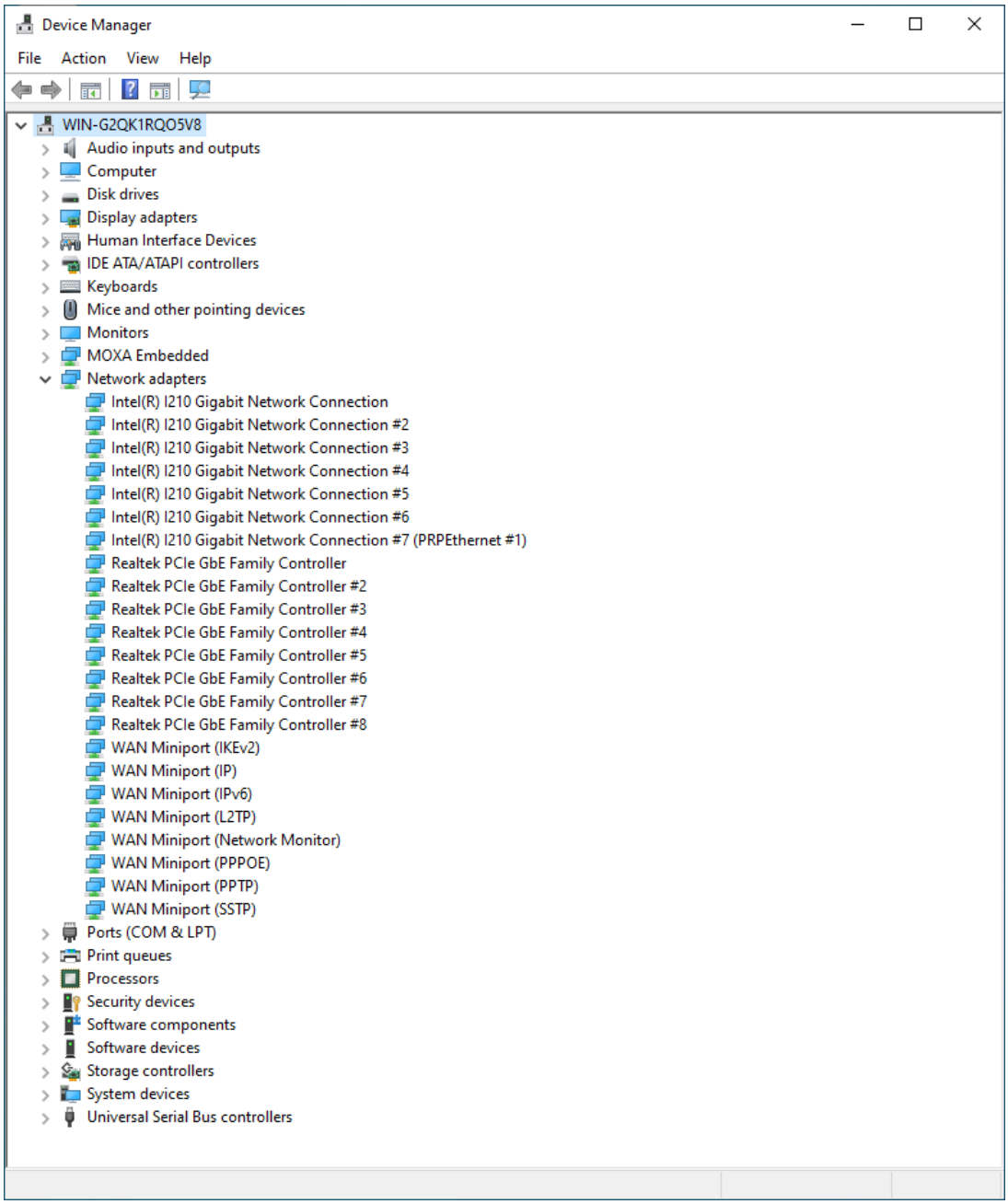
12. After the computer is restarted, the Moxa PRP Service will run.



13. The DE-PRP-HSR-EF card uses the same Intel® Ethernet driver as the onboard Ethernet adapters. All expansion cards installed on the computer are shown as individual Ethernet adapters.



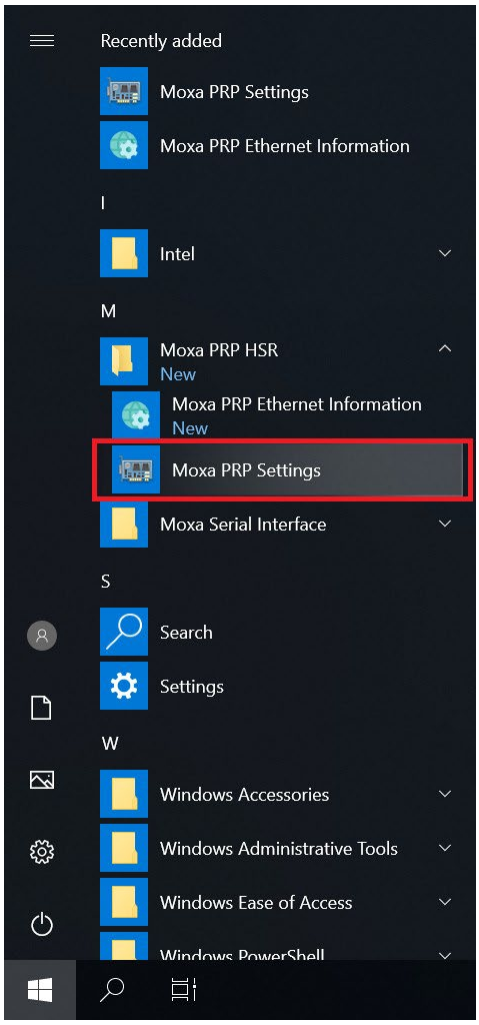
14. You can also confirm the name change of the expansion card by checking the Ethernet adapter names in the **Device Manager**.



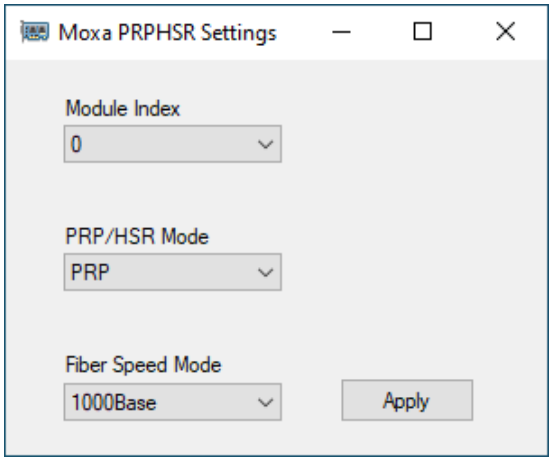
Configuring the Operation Mode

You can use the **Moxa PRP Settings utility** to set the operating mode (PRP or HSR) for a DE-PRPHSR-EF expansion card.

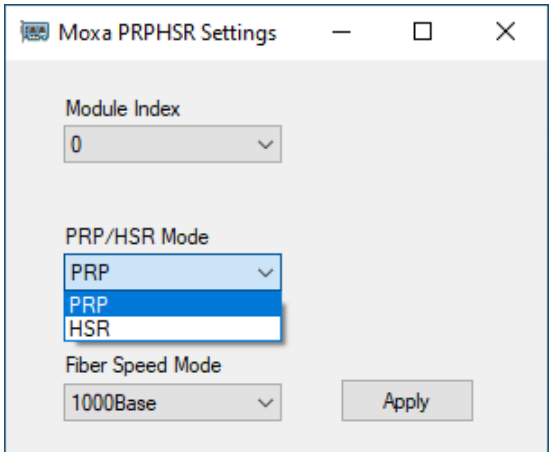
1. Run the **Moxa PRP Settings utility** from the Start menu.



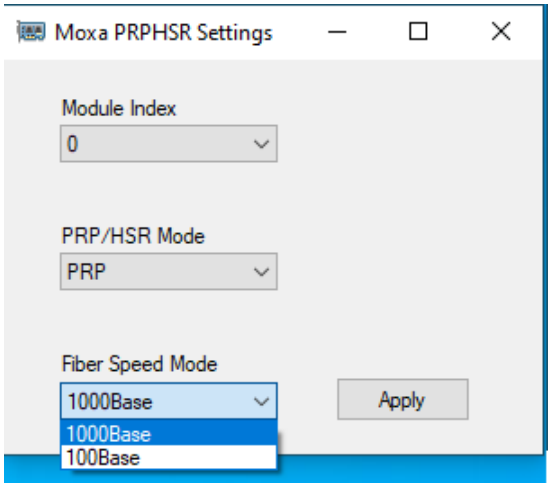
2. Select the expansion card. If more than one DE-PRP-HSR expansion cards are installed on the computer, use the **Module Index** (0 to 1) drop-down menu to select the card that you want to configure.



3. From the **PRP/HSR Mode** drop-down list, select an option.



4. From the **Speed Mode** drop-down list, select an SFP module judge speed option.
   - **1000Base:** the service force SFP module speed for 1000 BASE-X, it can only detect 1000BASE-X SFP module.
   - **100Base:** the service force SFP module speed for 100 BASE-FX, it can only detect 100BASE-FX SFP module.

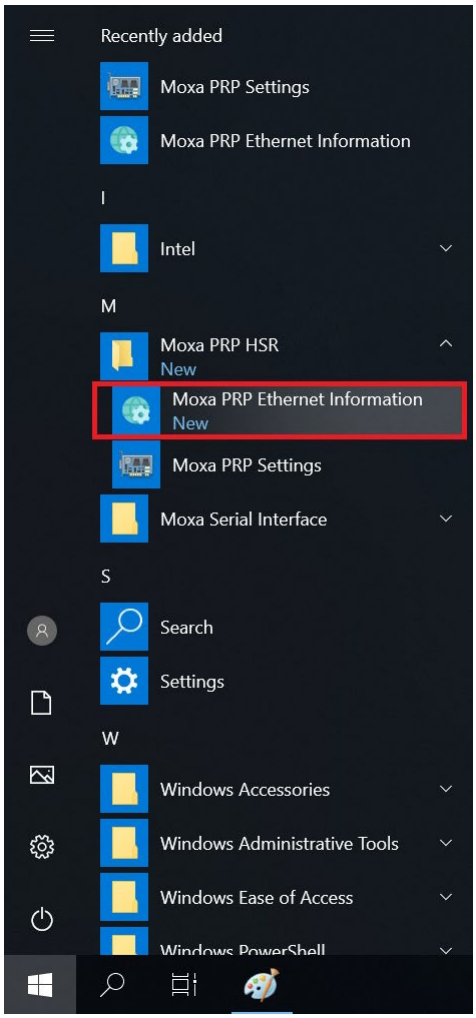


5. click **Apply**.

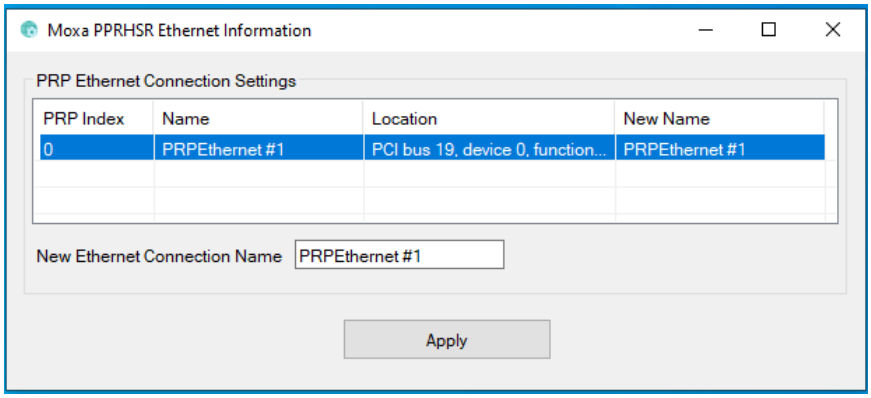
Redefining DE-PRP-HSR-EF Ethernet Information

The **Moxa PRP Ethernet Information utility** can be used to redefine the DE-PRP-HSR-EF Ethernet information in the system.

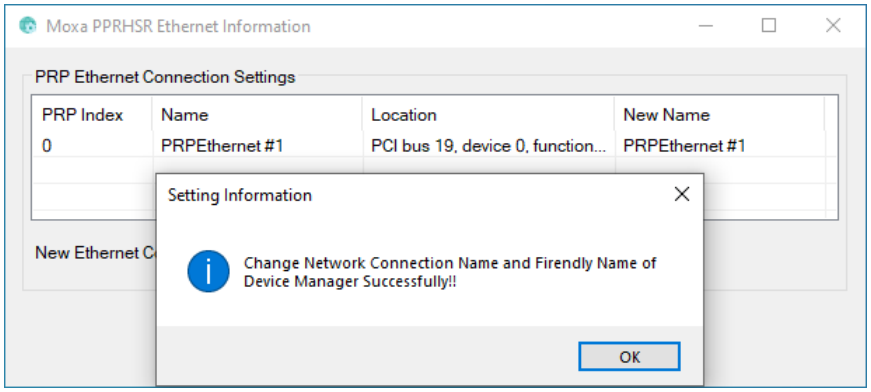
1. Run **Moxa PRP Ethernet Information utility** from the Start Menu.



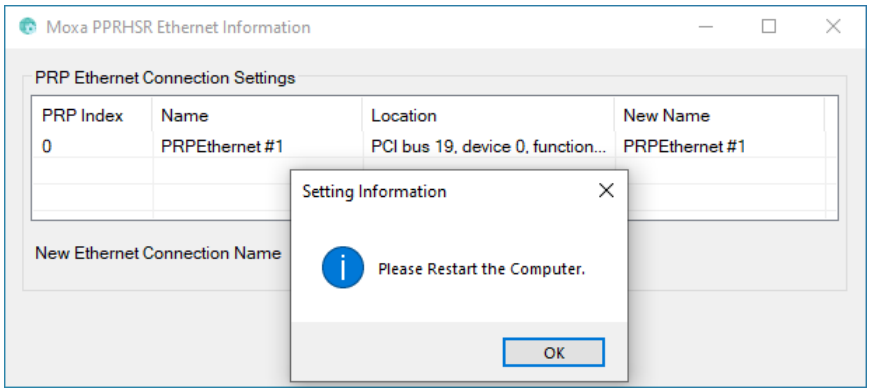
2. In the utility screen, select the expansion card.
   - **PRP Index:** Select the target PRP card index (the index set by the switch in the expansion card).
   - **Location:** PCI bus location of the target PRP card.
   - **Name:** Type the network connection name of target PRP card. In this example, we are redefining the name of the card.
   - **New Name:** The new name to set.



After the Ethernet information has been successfully redefined, a message is shown. Click **OK**.



3. Restart the computer.

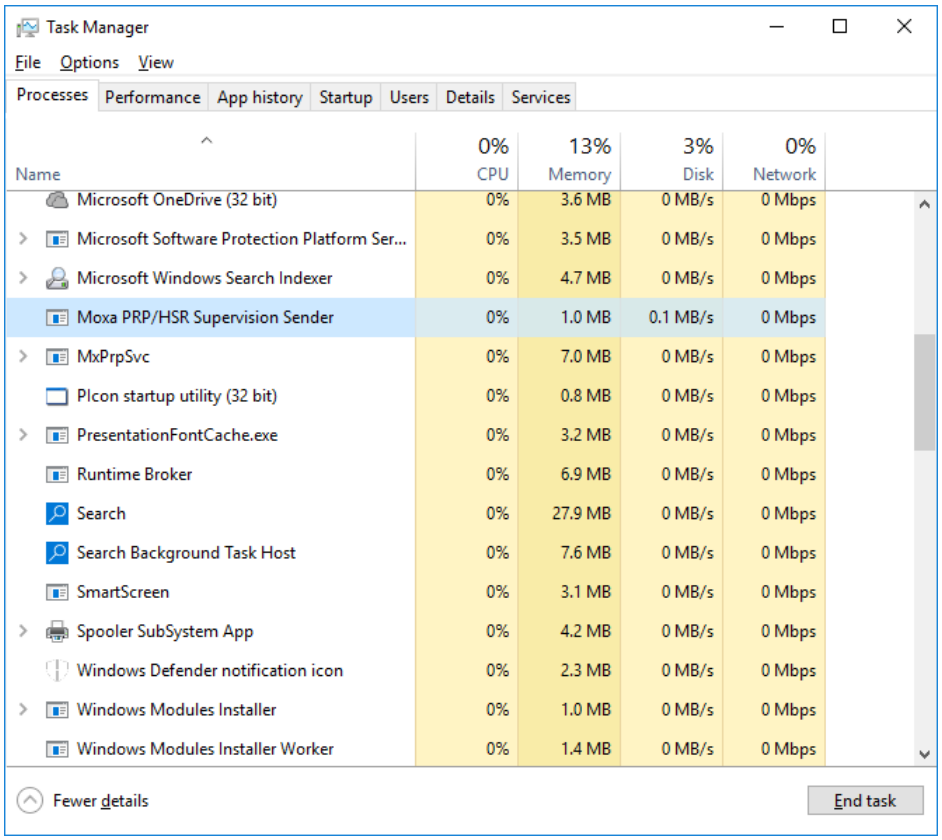


PRP/HSR Supervision Frame

The supervision frame of DE-PRP-HSR-EF expansion card is based on WinPcap. Before you start sending the PRP/HSR supervision frame, you must download and install the WinPcap tool from https://www.winpcap.org/ and check the supervision frame.

To check the PRP/HSR supervision frame, do the following:

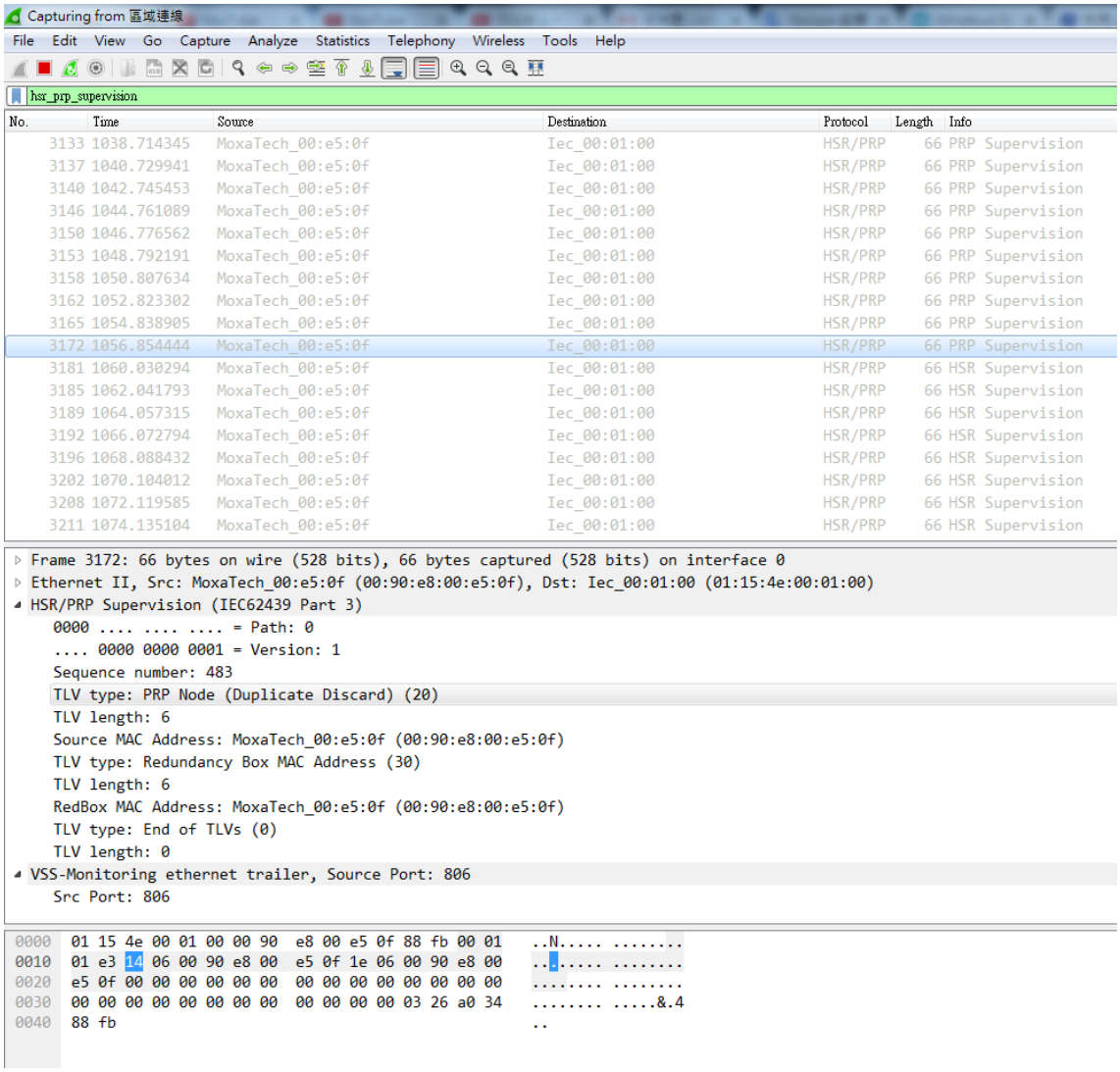
1. Install WinPcap on DA-720.
2. Install MxPrpHsrSetup-1.2.0.exe.
3. Wait for the Moxa PRP Service to initialize.
4. The Moxa PRP/HSR Supervision Sender service will start running.



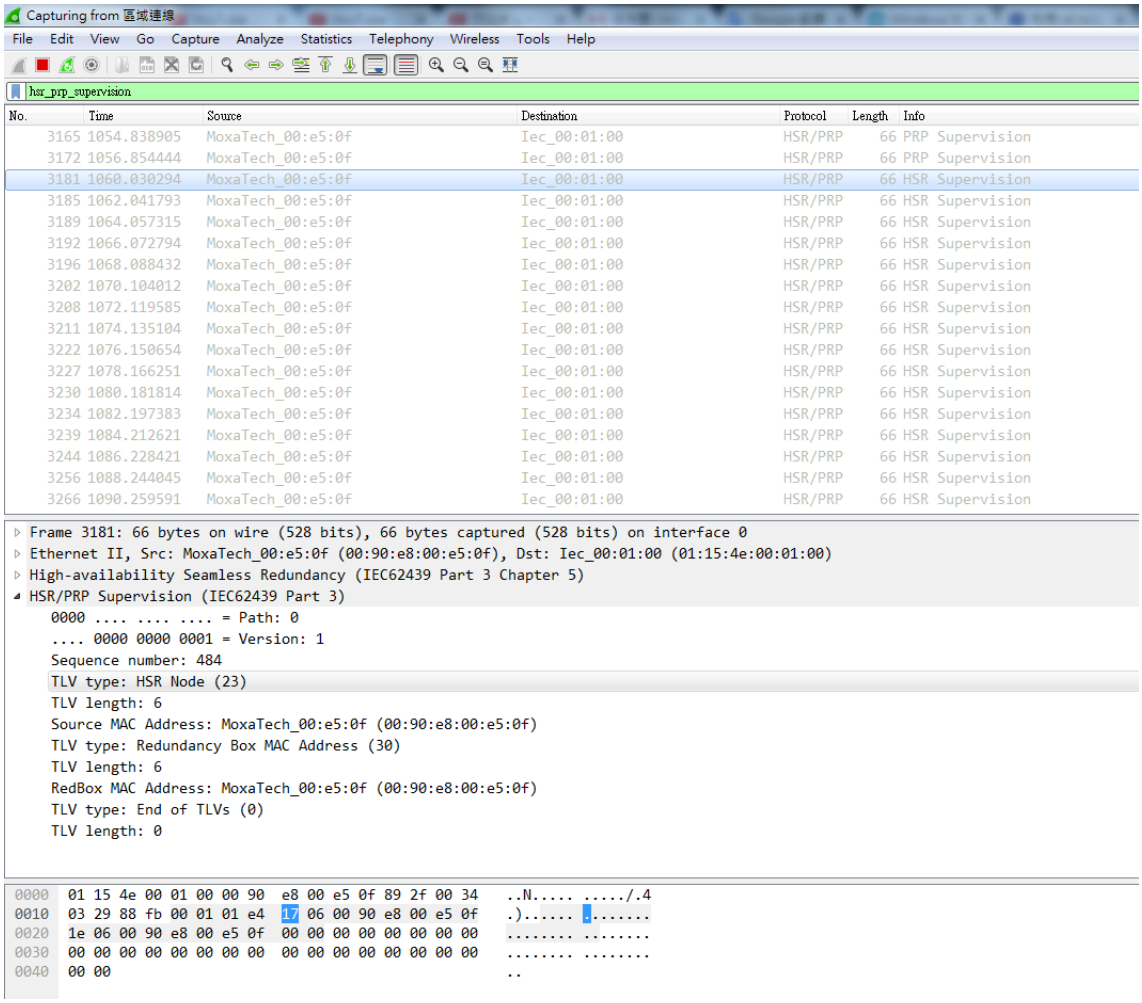
5. Install the Wireshark tool on a PC and run the tool with the "hsr_prp_supervision" filter to wait for the PRP supervision frames.
6. Connect port A or port B of the DE-PRP-HSR-EF to the Ethernet port of the PC.
7. Use the Moxa PRP Settings utility to set the PRP/HSR mode.

8. Check the supervision frame using the Wireshark tool.

PRP Supervision Frame



HSR Supervision Frame



8. DE-2-IRIGB-4-DIDO Expansion Module

Overview

The DE-2-IRIGB-4-DIDO expansion card for the DA-720 Series industrial computer features 4 digital inputs and 4 digital outputs and provides precision timing information using IRIG-B input signals.

Software Installation and Configuration

This section describes how to install driver and utility for the DE-2-IRIGB-4-DIDO on an embedded computer running Windows 10 (64-bit), and how to configure the software settings. The following topic are covered:

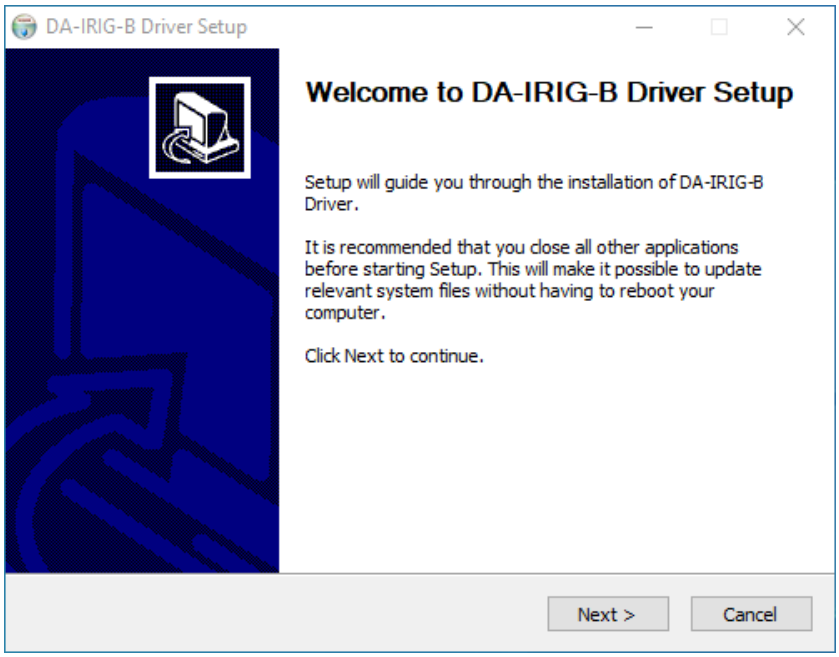
- System requirements
- Installing the IRIG-B Driver
- Installing the IRIG-B Utility
- Using the IRIG-B Utility
- Using the mxIrigUtil Command

System Requirements

- OS: Windows 10
- .Net framework 3.5
- Microsoft Visual C++ Redistributable x64

Installing the IRIG-B Driver

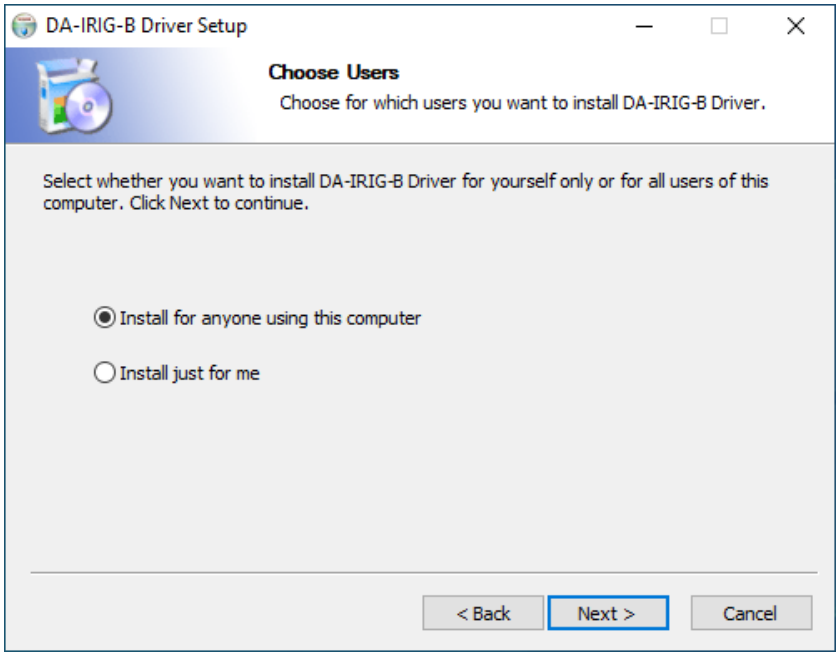
1. Download the DE-2-IRIGB-4-DIDO driver from Moxa's support website at https://www.moxa.com/en/support to the DA-720 computer.
2. Double-click **DA-IRIG-B Driver_1.0_2014121916_Setup.exe** to start the installation process.
3. Installation process will show the welcome page. Click **Next**.



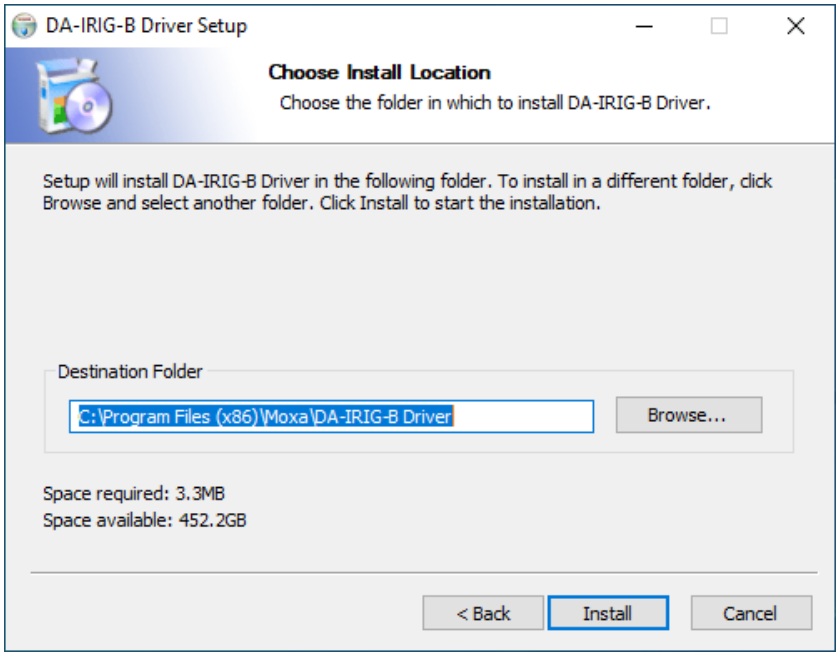
4. Select Install for anyone using this computer and click **Next**.

NOTE

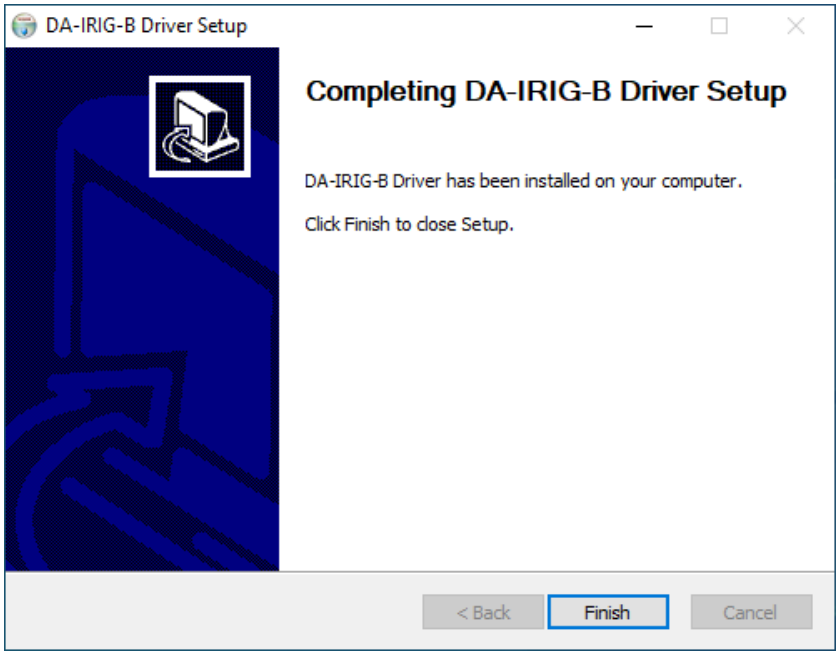
Before you select **Install just for me**, make sure that you understand how this option might affect the operation for other users on the embedded computer.



5. Accept the default destination folder or click **Browse** to select one; then, click **Install**.



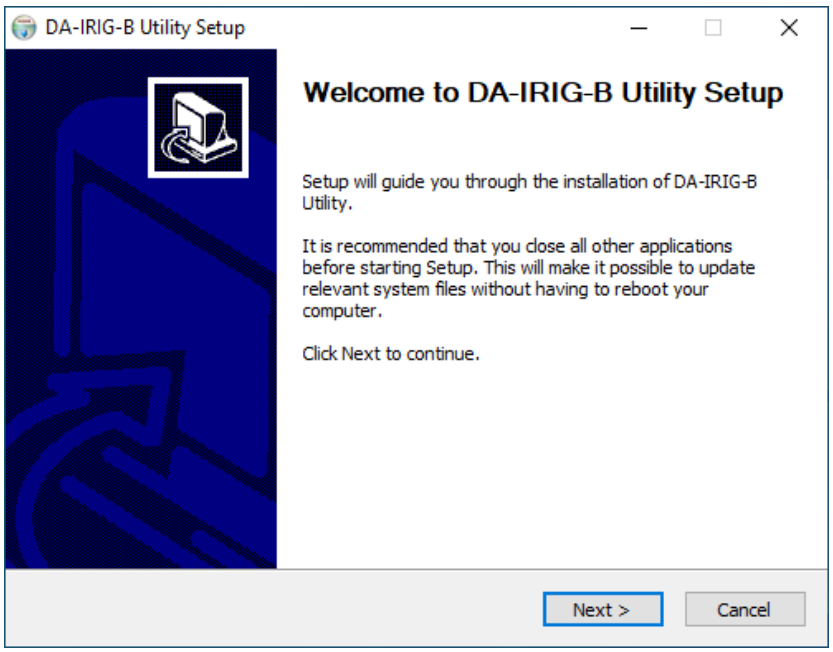
6. When the installation process is complete, click **Finish**.



Installing the IRIG-B Utility

You can use the IRIG-B utility to view the status information and configure the signal type for the DE-2-IRIGB-4-DIDO module.

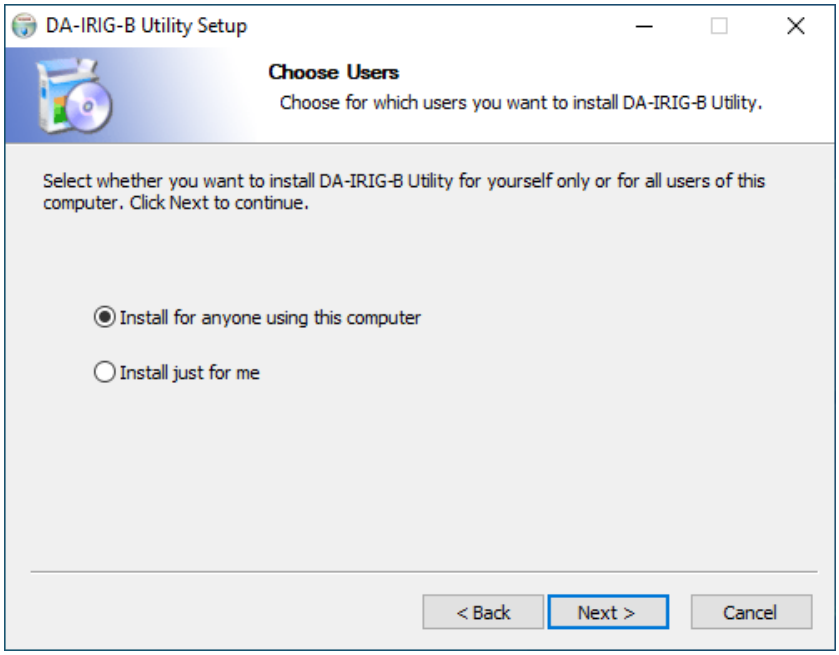
1. Download the DE-2-IRIGB-4-DIDO utility from Moxa's support website at https://www.moxa.com/en/support to the DA-720 computer.
2. Double-click **DA-IRIG-B Utility_1.2_2018062211_Setup.exe** to start the installation process.
3. Installation process will show the welcome page. Click **Next**.



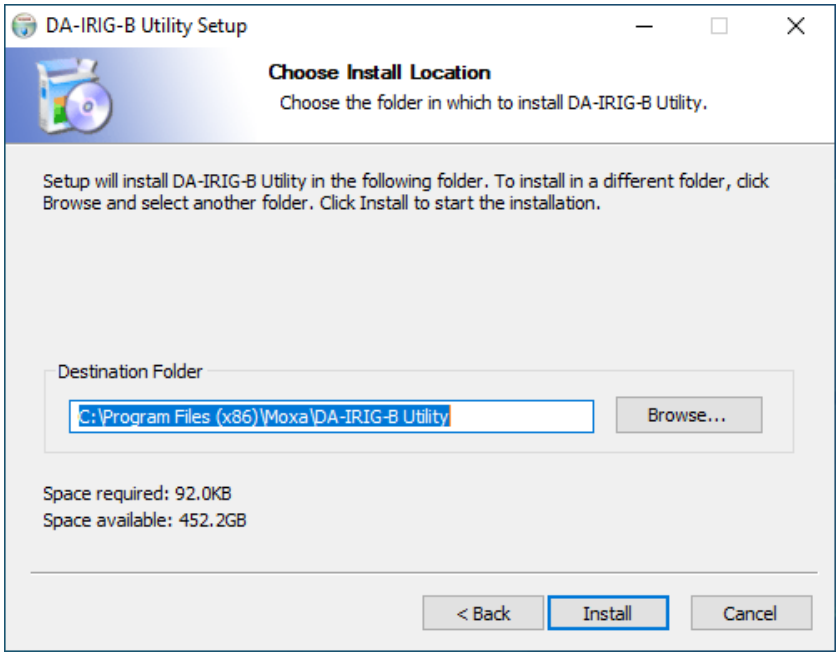
4. Select Install for anyone using this computer and click **Next**.

NOTE

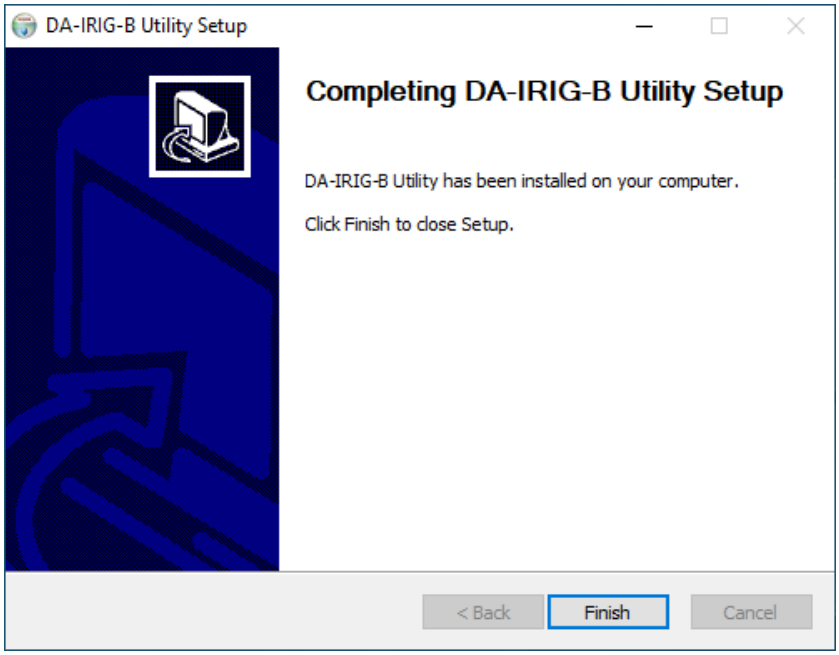
Before you select **Install just for me**, make sure that you understand how this option might affect the operation for other users on the embedded computer.



5. Accept the default destination folder or click **Browse** to select one; then, click **Install**.

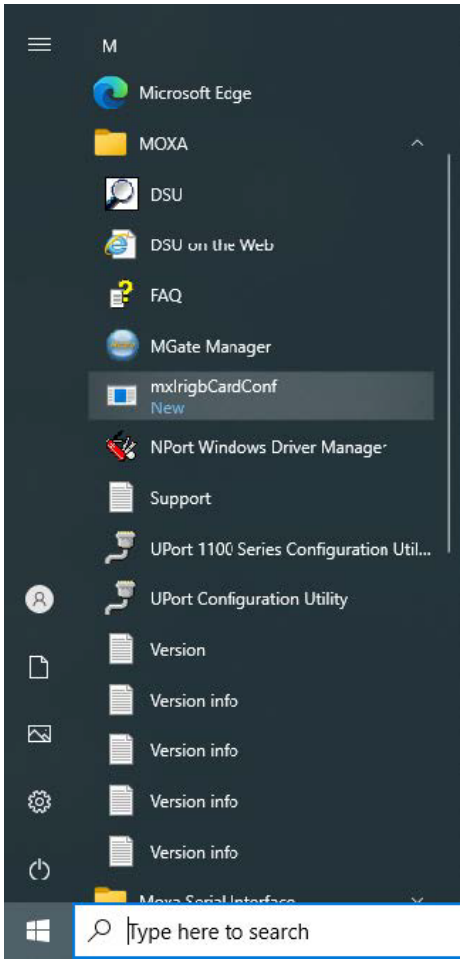


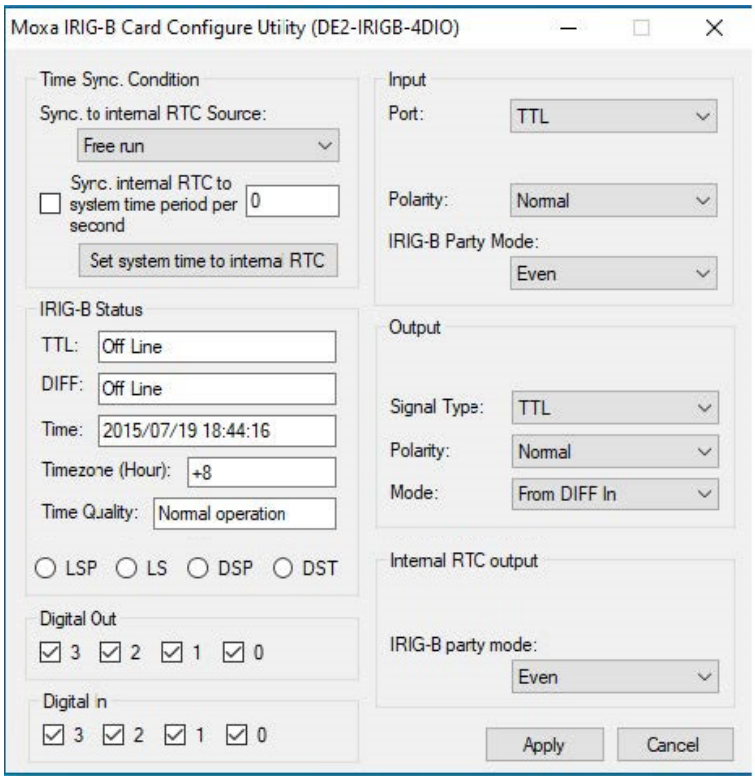
6. When the installation process is complete, click **Finish**.



Using the IRIG-B Utility

After you install the IRIG-B utility on your embedded computer running Windows 10, you start the IRIG-B utility from the start menu (click **Moxa > mxIrigbCardConf**) to configure the DE-2-IRIGB-4-DIDO.




Moxa IRIG-B Card Configure Utility (DE2-IRIGB-4DIO)
Time Sync. Condition
Sync. to internal RTC Source:
Free run
Sync. internal RTC to system time period per second
0
Set system time to interna RTC
IRIG-B Status
TTL:
Off Line
DIFF:
Off Line
Time:
2015/07/19 18:44:16
Timezone (Hour):
+8
Time Quality:
Normal operation
LSP
LS
DSP
DST
Digital Out
3
2
1
0
Digital In
3
2
1
0
Input
Port:
TTL
Polarity:
Normal
IRIG-B Party Mode:
Even
Output
Signal Type:
TTL
Polarity:
Normal
Mode:
From DIFF In
Internal RTC output
IRIG-B party mode:
Even
Apply
Cancel

Configuring Time Synchronization Settings

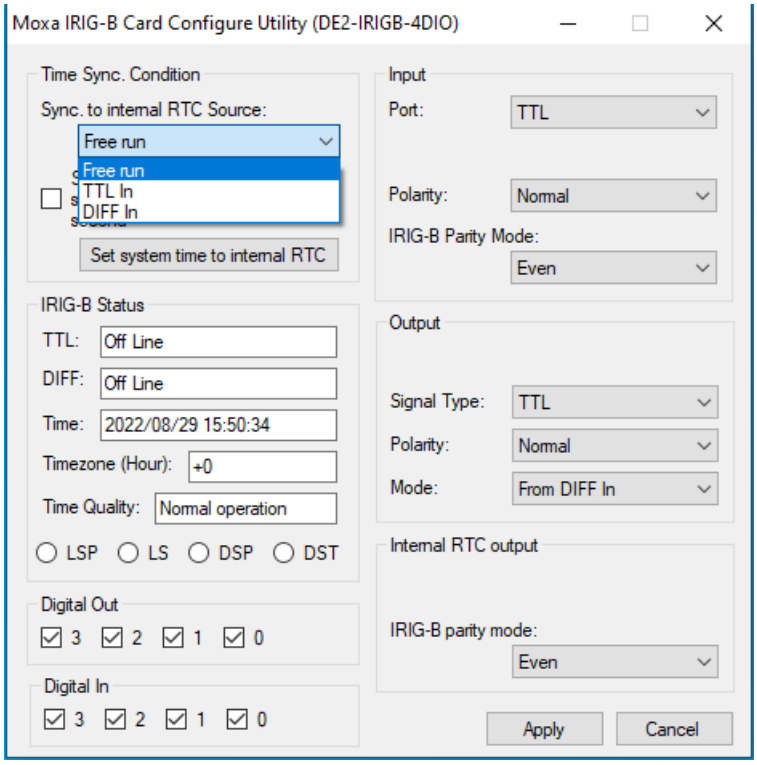
In the IRIG-B utility, you can set the DE-2-IRIGB-4-DIDO module to synchronize the RTC using one of the following time input sources:

- External IRIG-B signal
- Internal independent 25 MHz reference clock

Time Input Source

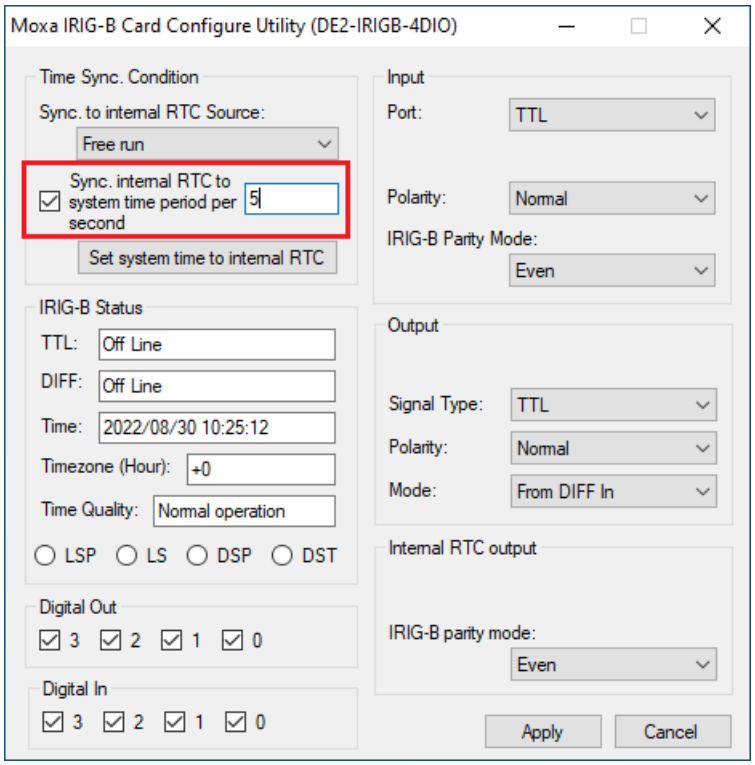
Depending on the input port that you want to use, select **Free run, TTL In** or **DIFF In** (Differential In).

From the **Sync. to internal RTC Source** drop-down list, select a time input source that you want to use.



Synchronizing with System Time

You can synchronize the RTC time with the system time. In the IRIG-B utility, select the **Sync. internal RTC to system time** check box and enter the number of seconds to synchronize the time.



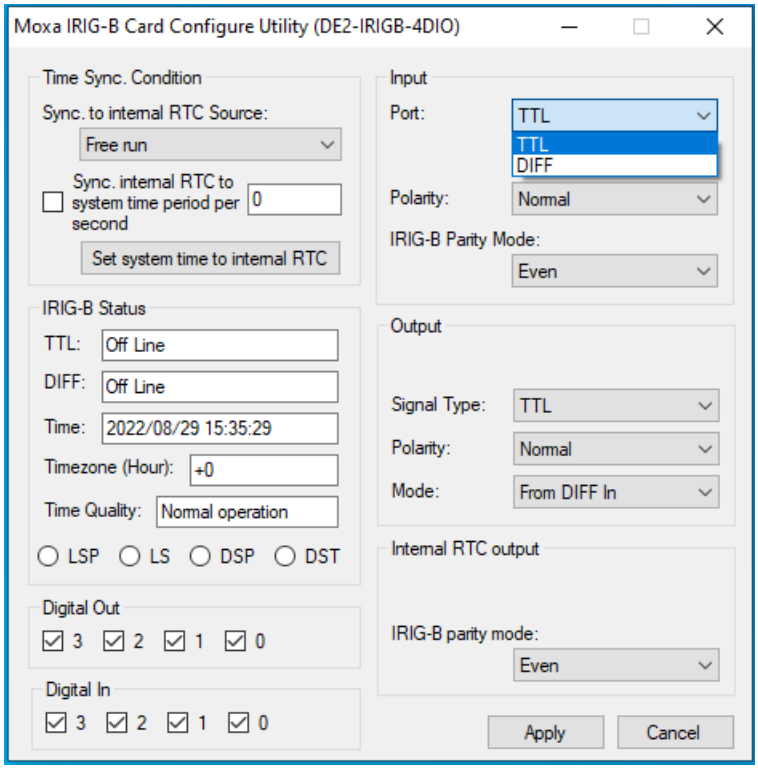
Configuring IRIG-B Input/Output Parameters

You can use the IRIG-B utility to configure the IRIG-B parameters that the DE-2-IRIGB-4-DIDO module supports.

Input Signal Type

Depending on the input port that you want to use, select **TTL** or **DIFF** (Differential).

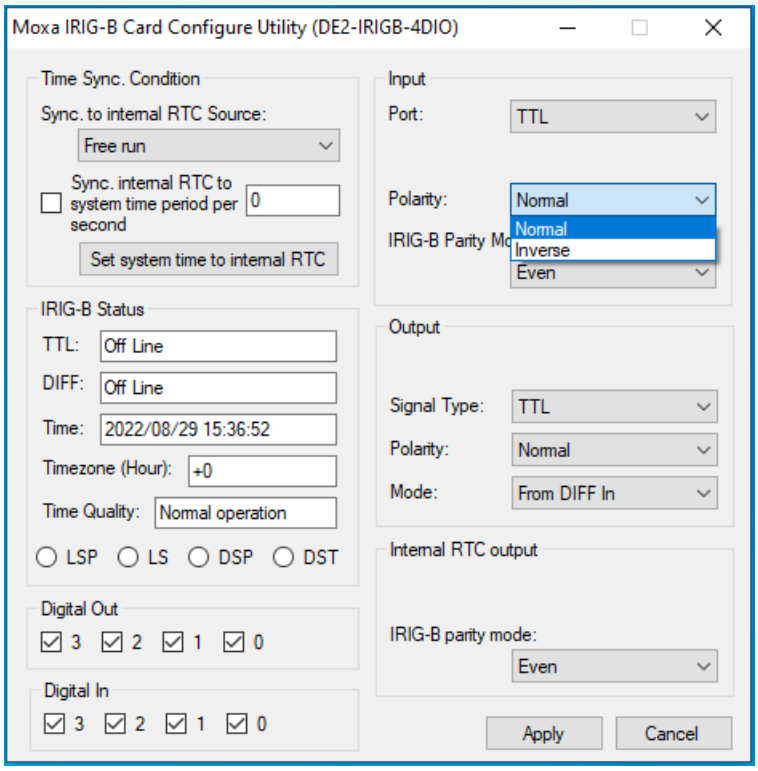
From the **Port** drop-down list select an option and click **Apply** to make the changes take effect.



Input Polarity Mode

Depending on the input signal, you may need to configure the polarity mode to **Normal** or **Inverse**.

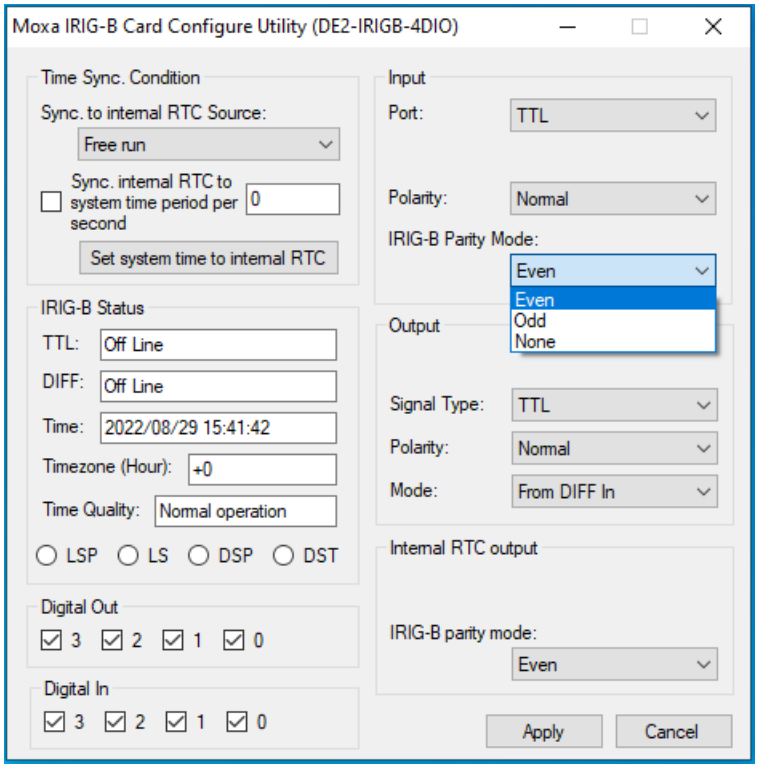
From the **Polarity** drop-down list select an option and click **Apply** to make the changes take effect.



Input Parity Mode

Depending on your country, you may need to configure the parity mode. For example, in China, select the **Odd** parity mode.

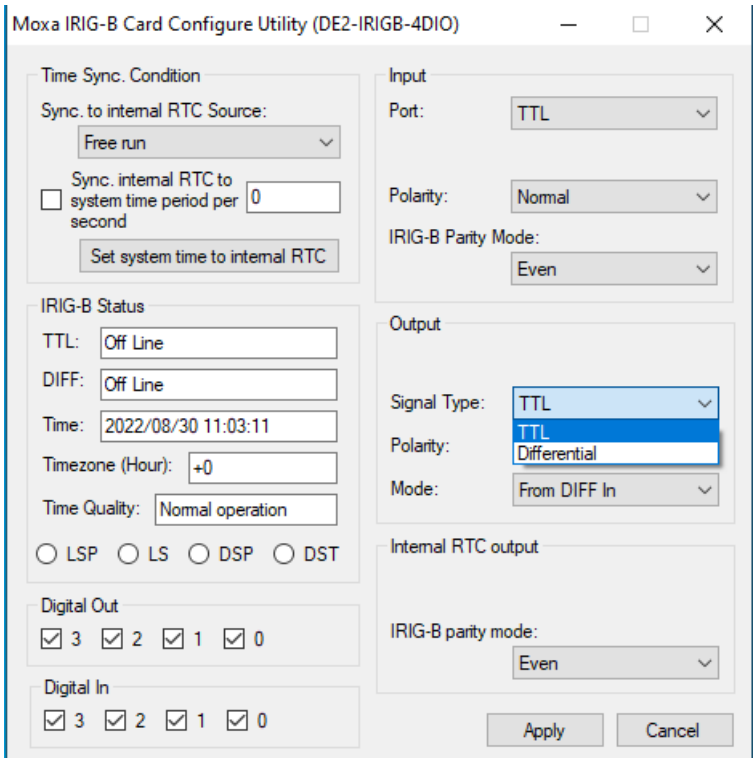
From the **IRIG-B Parity Mode** drop-down list box select an option and click **Apply** to make the changes take effect.



Output Signal Type

Depending on the output port that you want to use, select **TTL** or **Differential** (DIFF).

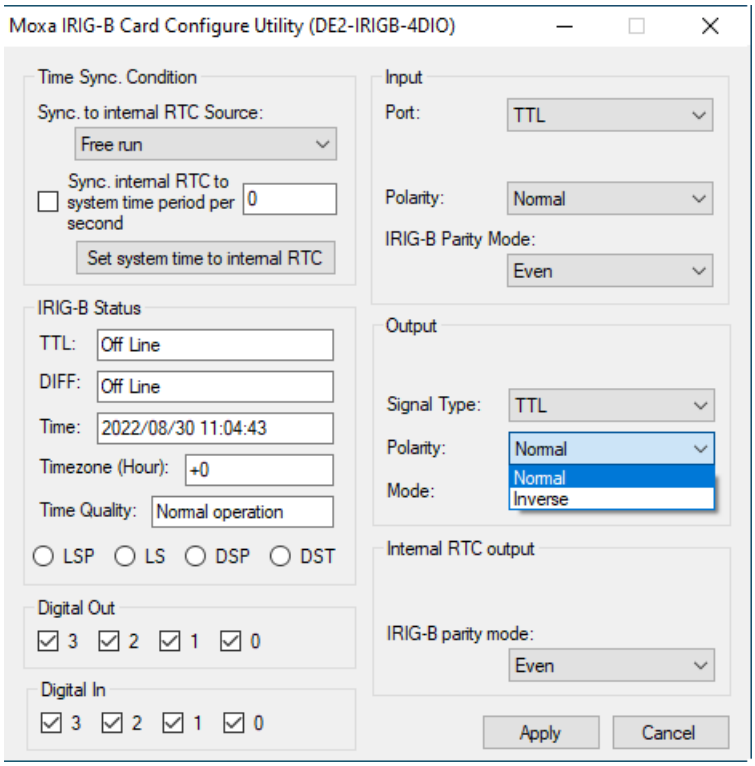
From the **Signal Type** drop-down list box select an option and click **Apply** to make the changes take effect.



Output Polarity Mode

Depending on the output signal, you may need to configure the polarity mode to **Normal** or **Inverse**.

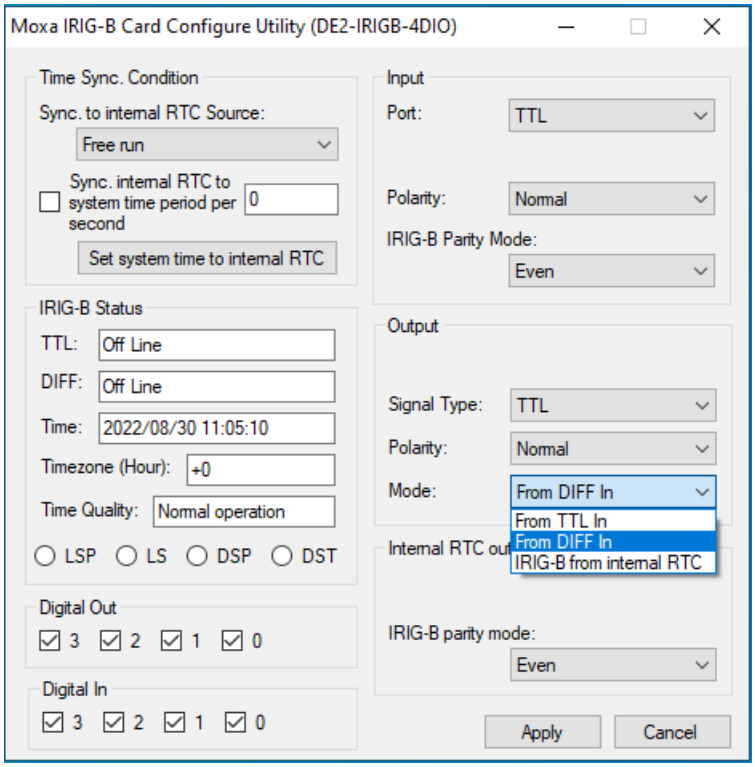
From the **Output Polarity** Mode drop-down list box select an option and click **Apply** to make the changes take effect.



Output Mode

Depending on the output signal source, you may need to configure the mode to "**From TTL In**", "**From DIFF In**" or "**IRIG-B from internal RTC**".

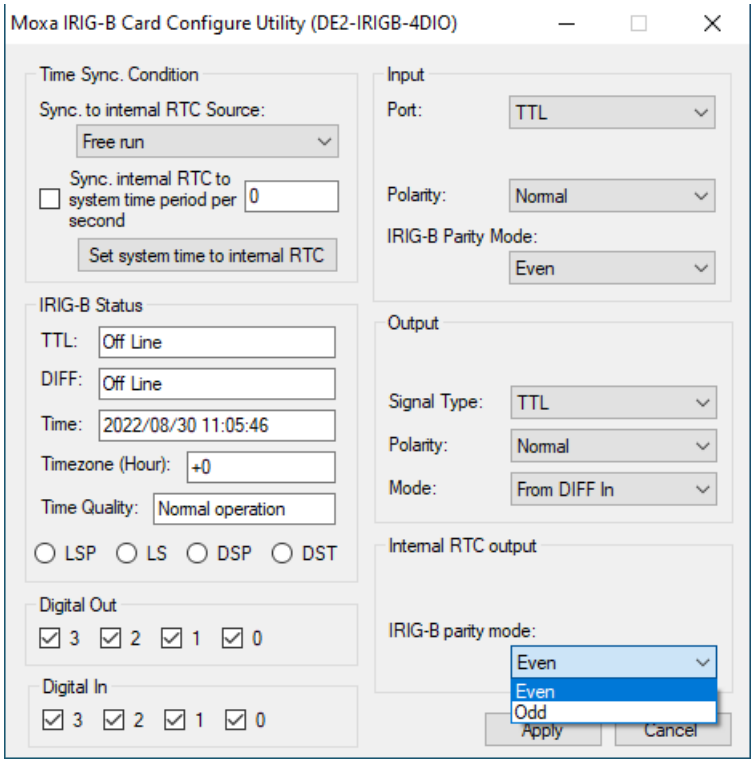
From the **Output Mode** drop-down list box select an option and click Apply to make the changes take effect.



IRIG-B Parity Mode

Depending on your country, you may need to configure the parity mode. For example, in China, select **Odd** parity mode.

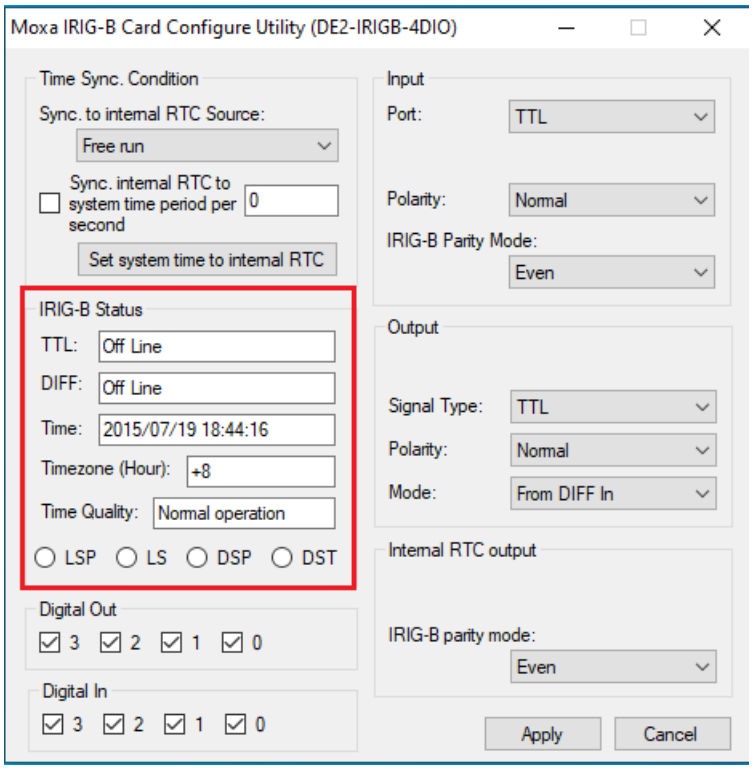
From the **IRIG-B parity mode** drop-down list box select an option and click **Apply** to make the changes take effect.



Check IRIG-B Status

You can check the current IRIG-B status and time information in this utility.

- **TTL:** TTL status (Normal/Off Line/Frame Error/Parity Error)
- **DIFF:** DIFF status (Normal/Off Line/Frame Error/Parity Error)
- **Time:** The time of input source
- **Timezone (Hour):** The timezone of input source
- **Time Quality:** Time Correction accuracy
- **LSP:** Leap second pending at the end of minute
- **LS:** Leap second type
- **DSP:** Daylight saving time change pending at end of minute
- **DST:** Daylight saving time in effect



Configuring Digital Input and Output Status

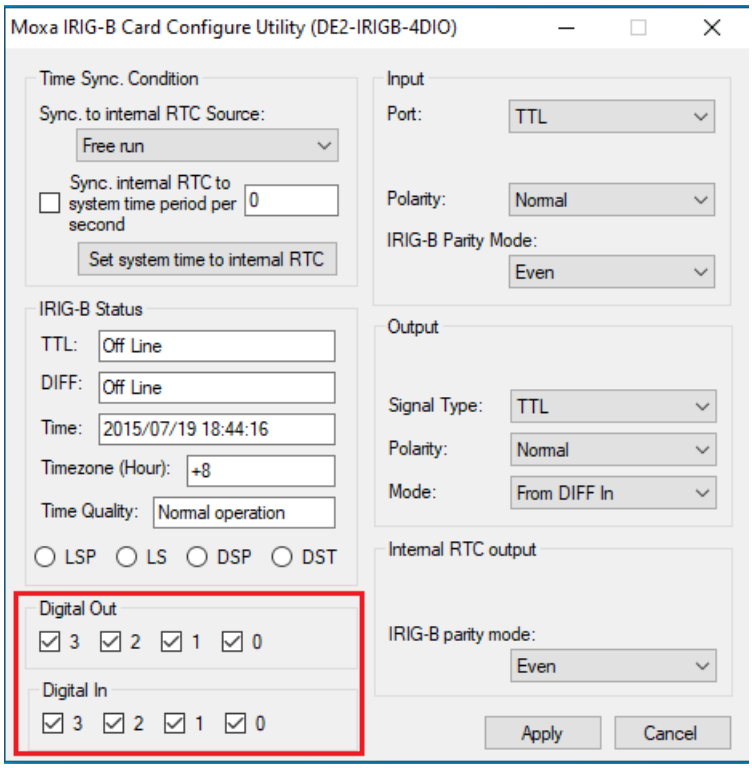
The DE-2-IRIGB-4-DIDO module features four digital outputs and four digital inputs. You can use IRIG-B utility configure the digital output and digital input status.

To control a **digital output**, select or clear the associated check box. The following table shows the signal and logic state for the check box.

Check box	Signal	Logic
Selected	High	1
Not selected	Low	0

To read status from a **digital input**, select or clear the associated check box. The following table shows the signal and logic state.

Check box	Signal	Logic
Selected	High	1
Not selected	Low	0



Using the mxIrigUtil Command

The mxIrigUtil command is available in the destination folder that you selection during the installation process. The list of available parameters and options for the mxIrigUtil command is the same in Linux and Windows.

To display the help information, in a command line window, enter the mxIrigUtil command without a parameter.

```
File path: C:\Program Files (x86)\Moxa\DA-IRIG-B Utility\
Usage: mxIrigUtil -f function_id [-p parameters] [-c] [-h]
Show the utility information if no argument apply.
-h: Show this information.
-c: Indicate the n-the IRIG-B Card.
-f: Pass function id argument to execute specific functionality.
-p: Parameters for each function, use comma to pass multiple variable
```

The following table describes the function IDs.

Function ID	Function description	Parameters
0	Display the hardware device ID. For example, Hardware ID = 1 (DA_IRIGB_4DIO_PCI104)	N/A
1	Display current internal RTC time.	N/A
2	Set internal RTC time	-p yyyy,MM,dd,hh,mm,ss Where yyyy is the year (2000 – 2099). MM is the month (1-12). dd is the day of the month (1-31). hh is the hour of the day (0 -23). mm is the minute (0-59). ss is the second (0-59). Default value is 2014,01,01,00,00,00 if no argument.
3	Display the RTC synchronization source.	N/A
4	Set the RTC synchronization source.	-p Source Source: 0(free run (Internal RTC)), 1(port 0 /Fiber input), 2(port 1 input) Default value is 2 if no argument.
5	Display IRIG-B signal status. Possible statuses are: 0–Normal 1–Off Line 2–Frame Error 3–Parity Error	-p Source Source: 1(port 0/Fiber input), 2 (port 1 input) Default value is 2 if no argument.
6	Display IRIG-B input parity check mode. Possible modes are: 0–Even 1-Odd 2-None	-p Source Source: 1(port 0/Fiber input), 2 (port 1 input) Default value is 2 if no argument.
7	Set IRIG-B input parity check mode	-p Source, Mode Where Source: 1(port 0/Fiber input), 2 (port 1 input) Mode: 0 (Even), 1 (Odd), 2 (None) Default value is 2,0 if no argument.
8	Display IRIG-B Output Parity Check Mode	N/A
9	Set IRIG-B Output Parity Check Mode	-p Mode Mode: 0 (Even), 1 (Odd) Default value is 0 if no argument.
10	Display pulse per second width (ms)	N/A
11	Set pulse per second width (ms)	-p Width

Function ID	Function description	Parameters
		Width: [0-999] (width: 0-999 ms) Default value is 0 if no argument.
12	Display input signal type	-p Port Port: 0(port 0/Fiber input), 1(port 1 input) Default value is 1 if no argument.
13	Set input signal type	-p Port, Type, Inverse Port: 0(port 0/Fiber input), 1(port 1 input) Type: 0(TTL), 1(Differential) Inverse: 0 (no inverse), 1(inverse). Default value is 1,1,0 if no argument.
14	Get output signal type	-p Port Port: [1-4] (output port[1-4]) Default value is 1 if no argument.
15	Set output signal type	-p Port, Type, Mode, Inverse Port: [1-4] (output port[1-4]) Type: 0(TTL), 1(Differential) Mode: 0(From Port 0/Fiber Input Port), 1(From Port 1 Input), 2(From IRIG-B encode(Internal RTC)), 3(From PPS encode) Inverse: 0(No inverse), 1(Inverse) Default value is 1,1,2,0 if no argument.
16	Display digital output	-p Port Port: 0(DO0), 1(DO1), 2(DO2), 3(DO3) Default value is 1 if no argument.
17	Set digital output	-p Port, Level Port: 0(DO0), 1(DO1), 2(DO2), 3(DO3) Level: 0(low), 1(high) Default value is 0,0 if no argument.
18	Display digital input	-p Port Port: 0(DI0), 1(DI1), 2(DI2), 3(DI3) Default value is 0 if no argument.
19	Display FPGA firmware build date	N/A

For example, if you want to set the IRIG-B RTC time to 2014/01/01 03:25:00, enter the following command.

```
mxIrigUtil -f 2 -p 2014,1,1,3,25,0
```