BCOM-USB Device

User Manual

www.kalkitech.com

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1. Introduction

1.1. Overview

This manual is intended for users of the BCOM-USB dual-port serial communication device and the ASE2000 Communications Test Set. It provides instructions for installing the BCOM-USB Windows drivers, update its internally stored ASE product license or upgrade BCOM-USB firmware.

This manual contains a description of:
- BCOM-USB Device
- BCOM-USB I/O Driver installation
  - Windows 7 / 8 / 8.1 / 10 I/O Driver Installation
  - Windows XP, and other earlier versions of Windows
- ASE License-Firmware Updater installation and use

The ASE License-Firmware Updater program is used to install new license information in the BCOM-USB flash memory and/or install new firmware releases onto the BCOM-USB device.

1.2. Technical Support

The BCOM-USB device is intended for use only in conjunction with the ASE2000 Communications Test Set (Version 1 & V2) and certain other applications developed by ASE. Support will only be provided on applications approved by ASE. The BCOM-USB device should be properly registered with ASE so information regarding the BCOM-USB device will be sent to the correct person.

Contact support@ase-systems.com for additional support.

<div align="right">**2**</div>

2.   BCOM-USB Device

2.1. Overview

The BCOM-USB is a 2-channel, serial RS-232 device that connects to a Windows machine through a USB port. This device is intended to be used with the ASE2000 Communication Test Set. In addition to handling traditional byte-oriented protocols such as DNP3, Modbus, IEC 870-5-101, etc., the BCOM-USB also handles bit-oriented protocols such as Conitel 2020, CDC Type I and II, as well as SDLC/HDLC protocols.

For a complete list of supported protocols, visit the ASE website at http://www.ase-systems.com.

2.2. Package Contents

The BCOM-USB device kit consists of the following items:

New Purchases Kit
- 2-channel BCOM-USB serial device
- Two DB-9 Female / DB-25 Male Cables
- 6 USB Cable with standard A / B connectors
- Monitor Cable (two DB-9 F, one DB-25 M, one DB-25 F connectors)
- ASE Null modem adapter
- DB-25 gender changer (two assorted DB-9/DB-25 adapters)
- ASE Installation & Documentation USB Drive

Figure 1: BCOM-USB device and USB cable

Figure 2: Serial cables and connectors

2.3. Device Description

The front of the BCOM-USB device has a USB connector for connection to a Windows machine and LED indicators for serial communication activity indications. Each channel has:

TX – Transmit Data
RX – Receive Data
RTS – Request To Send

CTS – Clear To Send
CD – Data Carrier Detect
ERR – Error Indication

Figure 3: Front view

The back of the BCOM-USB device has two DB-9 Male connectors and a Modem Power connector. The +5VDC Modem Power connector (MDM PWR OUT) is only for powering the ASE 2-channel Bell-202 Test Set Modem from the BCOM-USB device.

Figure 4: Rear view

It is recommended that the Modem Power be connected to the BCOM-USB device prior to connecting the BCOM-USB device to your machine.

The bottom of each BCOM-USB device contains a serial number which is used for device registration and BCOM-USB license management. For certain support and upgrade situations, you may be asked to provide this serial number.

Figure 5: Bottom view

2.4. RS-232 PIN-OUT

The following table illustrates the pin-out of the BCOM-USB 9-pin connectors.

Serial No.	Parameter
1	DCD – Data Carrier Detect
2	RXD – Receive Data
3	TXD – Transmit Data
4	DTR – Data Terminal Ready
5	Com – Common
6	RXCLKIN – Receive Clock In
7	RTS – Request To Send
8	CTS – Clear To Send
9	TXCLKOUT – Transmit Clock Out

Table 1: Pin-out of the BCOM-USB 9-pin connectors

2.5. I/O Driver Installation

This section describes the steps necessary to install the I/O drivers for the BCOM-USB Device. Driver files are provided for different versions of Windows. The correct driver files must be installed. For Windows 7, 8, and 10 systems, a set of digitally signed driver files are provided for both the 32-bit and 64-bit versions of the driver.

The BCOM-USB I/O Driver files are provided on the ASE Installation & Documentation USB Drive delivered with the product. These files may also be downloaded from the ASE website:

http://www.ase-systems.com/

This manual describes the updated drivers and installation procedures released by ASE. This includes signed driver files for newer versions of Windows (Windows 7 & later) and a more automated installation mechanism. The instructions provided here may be used on older versions of Windows (before Windows 7). It is important to follow these instructions carefully for a correct installation.

The prior driver files and manual installation instructions are available on the ASE Installation & Documentation USB drive or the ASE website.

The Drivers folder on the ASE Installation & Documentation USB Drive is shown in Figure 6 - Locating the driver files.
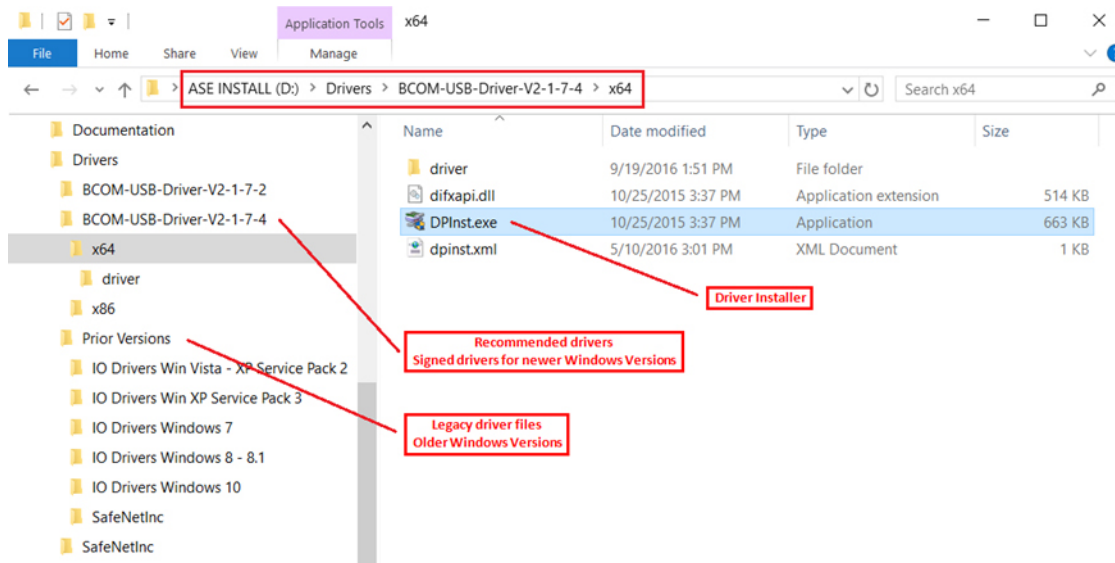

Figure 6: Locating the driver files

2.6. Windows I/O Driver Installation

Follow these instructions carefully.
- If connected, disconnect the USB cable to the BCOM-USB device. The drivers will first be installed on the machine for Windows to find and match to the device when later connected.
- Choose the correct driver
  - For 64-bit Windows 10, navigate to Windows10/BCOM-USB-Driver-V2-1-7-4/x64
  - For 32-bit Windows 10, navigate to Windows10/BCOM-USB-Driver-V2-1-7-4/x86
  - For 64-bit Windows 7 and 8, navigate to Windows7and8/BCOM-USB-Driver-V2-1-7-4/x64
  - For 32-bit Windows 7 and 8, navigate to Windows7and8/BCOM-USB-Driver-V2-1-7-4/x86
  - For 32-bit Windows XP SP3, navigate to BCOM-USB-Driver-V2-1-7-4/x86
  - For 32-bit Windows XP SP2 and Vista, navigate to BCOM-USB-Driver-V2-1-7-2/x86
  - Older 32-bit Windows Server releases (like 2003), use the Windows XP SP2 drivers
  - Newer 64-bit Windows Server releases (like 2012), use the 64-bit Windows 7 drivers
- Locate the correct driver directory and driver installer application (DPInst.exe)
  - If using the ASE Installation media, refer to Figure 6 - Locating the driver files
  - If using the downloaded ZIP file, first extract the files. The directory structure is similar
- Launch the Microsoft Driver Package Installer (DPInst.exe)
  - Double-click on the DPInst.exe application
  - If required, right-click on the DPInst.exe application and choose 'Run as administrator'
- Follow the instructions displayed by the driver installation wizard
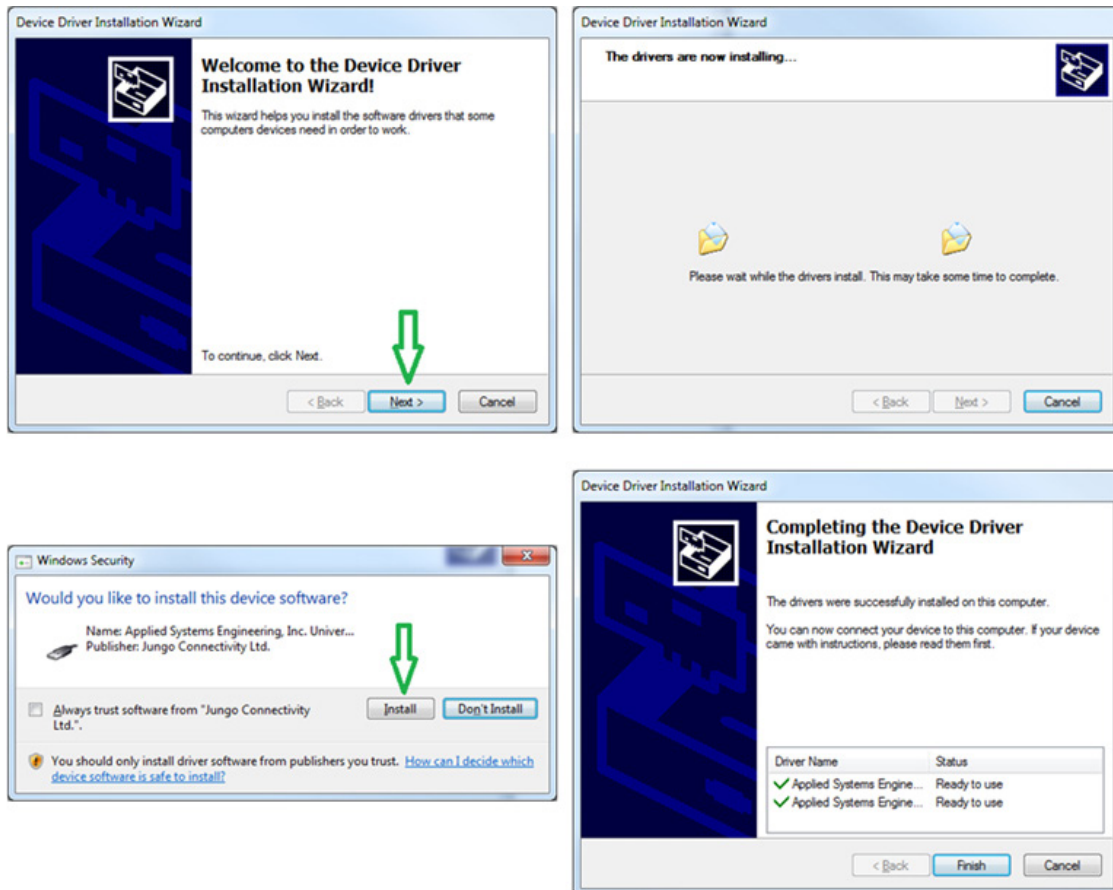
Figure 7: Driver Installation Wizard

- Connect the BCOM-USB device using the USB cable. Windows will now match the installed drivers to the BCOM-USB device. Notification messages may appear during this process. It will take a few moments to complete.

2.7. Driver Installation Verification

To verify successful driver installation, open the Windows Device Manager and check for the two ASE BCOM-USB serial ports in the Ports group.

From the Windows Start menu type "Device Manager" into the Search Box next to the Start Menu or launch the "Control Panel" and click on "Device Manager" as shown below.

Figure 8: Control Panel

The Device Manager screen should show two ASE BCOM-USB Ports with their COM numbers in the Ports (COM & LPT) group. In this 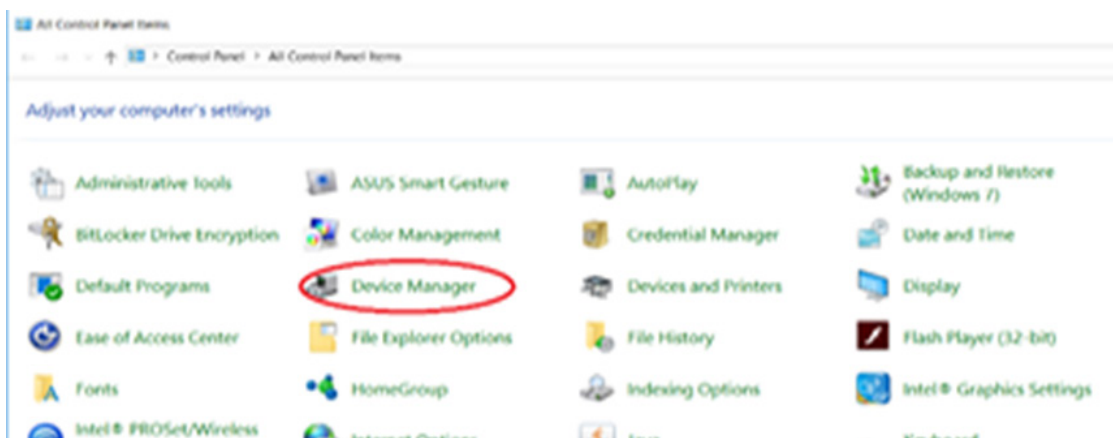example, COM3 & COM4 have been assigned by Windows. The BCOM-USB device also appears in the Universal Serial Bus controllers group as two ASE BCOM-USB-Enum (enumerators) devices, one for each port. For more information on Microsoft's assigned port numbers, refer to Appendix D.
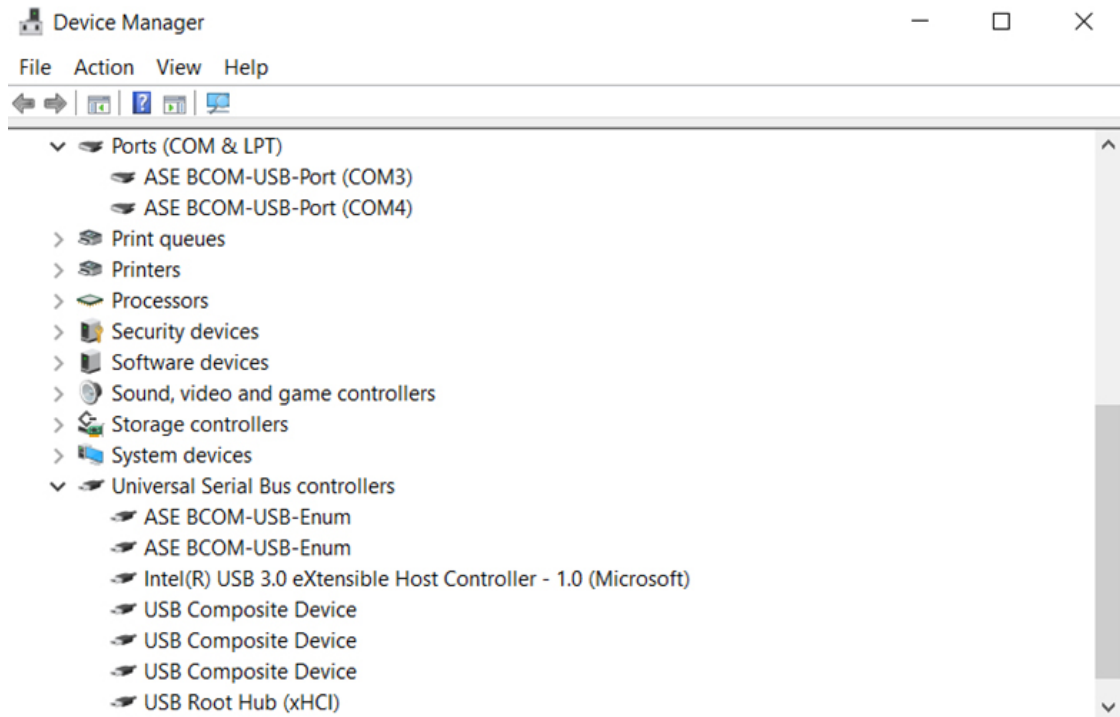
Figure 9: Device Manager

> ⚠ *Note: Refer to Troubleshooting section if your installation does not appear as above.*

2.8. Launch Menu Installation Assistant

This section describes using the Launch Menu utility from the ASE Installation & Documentation USB drive shipped with the BCOM-USB device. If installing ASE drivers from the unzipped driver file downloaded from the ASE website, this section does not apply.

1. The screenshot below, Figure 10, shows the "LaunchMenu" application in the top directory of the ASE Installation & Documentation USB Drive. Double-click to run this application.

> ⚠ *Always disconnect the BCOM-USB device first before installing the I/O drivers.*
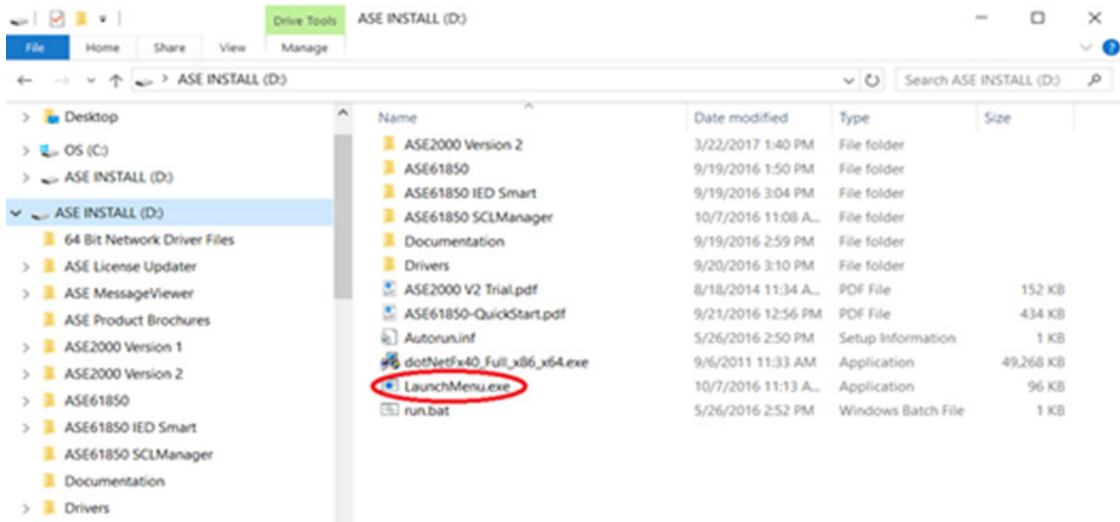
Figure 10: Launch Menu Installation Assistant

2. Refer below to **Error! Reference source not found**. Click on "BCOM-USB Device Driver." This will run the installer. The Launch Menu will automatically identify the Windows version and display it at the bottom. Clicking on the link navigates to the corresponding driver directory and launches the driver installer.

Figure 11: Launch Menu Drivers Group

The driver installation continues as described above in

3. Windows I/O Driver Installation.

3.   ASE License/Firmware Updater

3.1. Overview

This ASE License/Firmware Updater program is used to update the BCOM-USB device with a new BCOM-USB product license or device firmware. It may also be used to view license information stored on the BCOM-USB device.

The license information stored on the BCOM-USB device is read by the ASE2000 Communications Test Set to determine protocols, entitlement date, and other purchased features.
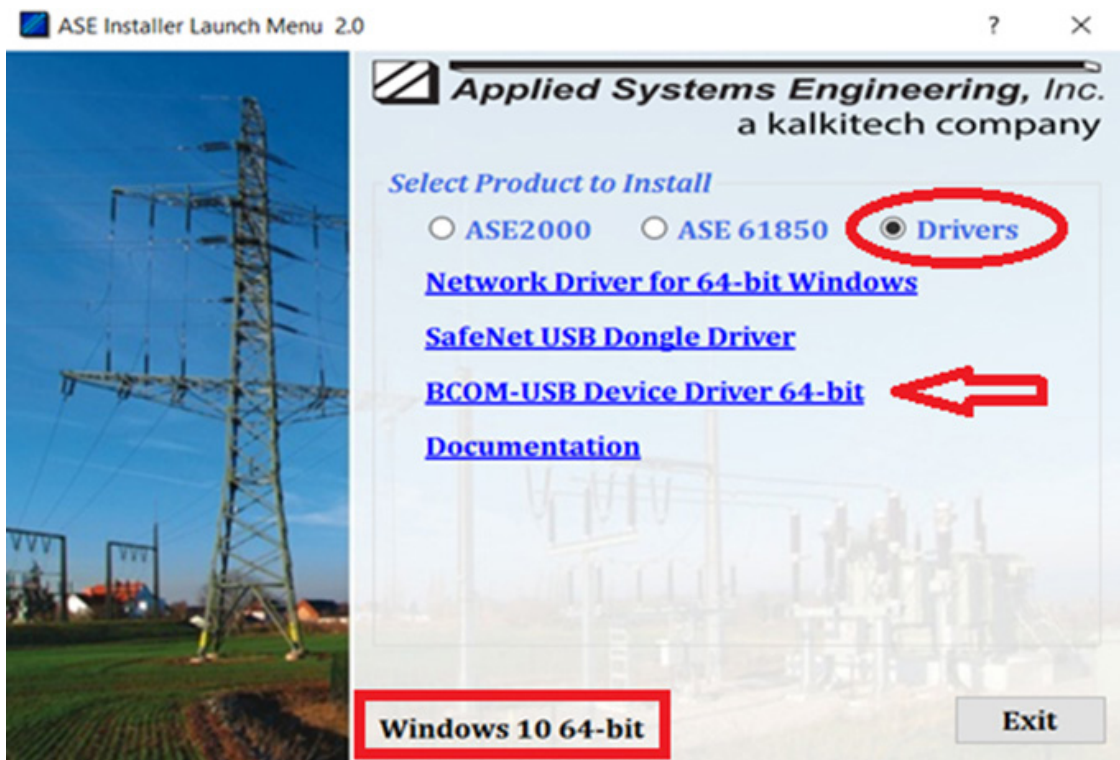
3.2. License/Firmware Update Program Installation

Install the ASE License/Firmware Updater program. The installer is distributed on the ASE2000 Installation & Documentation USB Drive as shown in Figure 12 below. You may also download the ZIP file containing installation files from the ASE website at www.ase-systems.com. Double-click on "ASELicenseUpdater.exe" application (or "setup.exe") and follow the on-screen instructions. Following installation, the application will be added to the Program menu in the ASE folder.
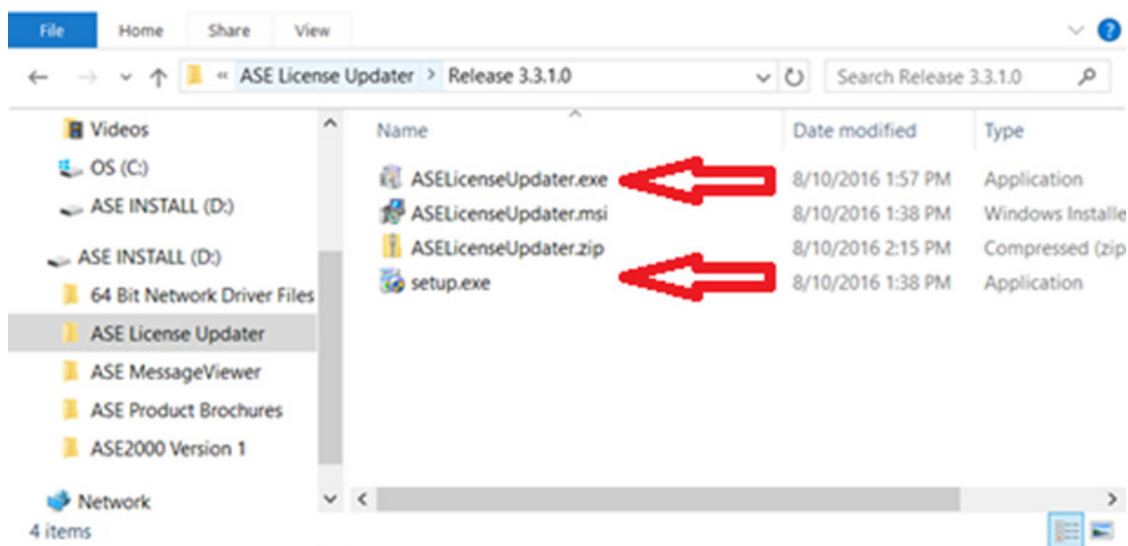

Figure 12: Installing ASE License/Firmware Updater Program

3.3. Viewing License Information

Connect the BCOM-USB device and launch the ASE License/Firmware Update program. Information about the BCOM-USB device will be displayed. The values shown will include Windows COM port assignments, serial number of the BCOM-USB device, current firmware version number, entitlement date, licensed products and features.
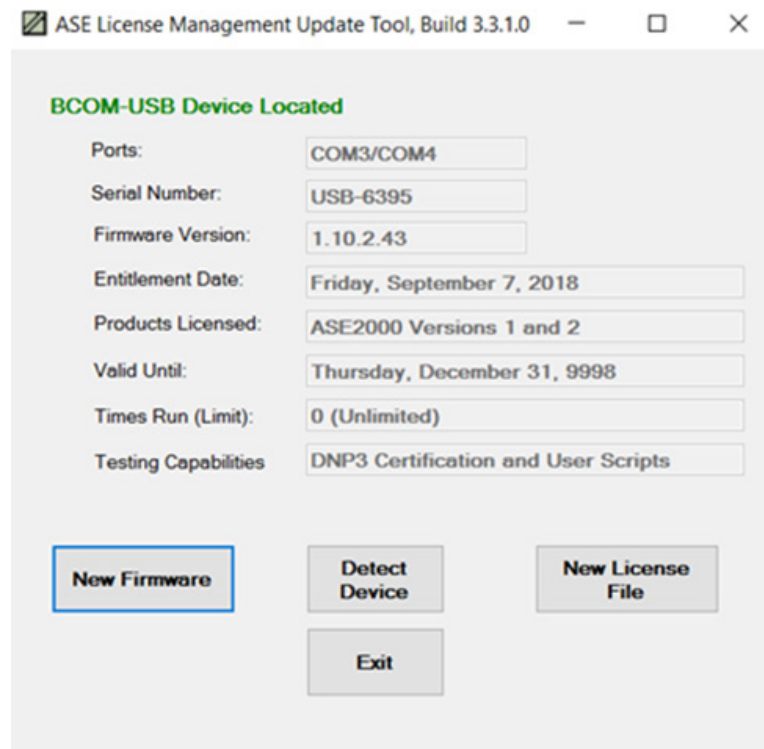

Figure 13: License and Device Information

- Ports – Two serial ports should be displayed. Windows assigns the COM port numbers.
- Serial Number – Serial number of the ASE BCOM-USB device. This number will match the serial number affixed to the bottom of the device.
- Firmware Version – Currently installed version of BCOM-USB device firmware
- Entitlement Date – Software maintenance expiration date. The ASE2000V2 Test Set release must have a build date earlier than this date.
- Products Licensed – This displays "ASE2000 Version 1 Only" if not licensed for ASE2000V2 Test Set operation. Otherwise, "ASE2000 Versions 1 and 2" will be shown.
- Valid Until – This will show "December 31, 9998" for a permanent license. If the license is temporary the license expiration date will be shown. A temporary license is issued when the BCOM-USB device is part of an exchange or upgrade and ASE has not yet received the unit being swapped. Once ASE receives the old unit, a permanent license will be issued. See below for installation instructions of the new license.
- Times Run (Limit) – Displays the number of times a non-permanent or non-version 2 license has launched the ASE2000V2 Test Set
- Testing Capabilities – Any extra features enabled by this license
- 61850 Support – Displays information regarding any of the ASE-61850 Suite products (not currently used with the BCOM-USB device)

If the BCOM-USB device is not connected, a warning will appear. Connect the BCOM-USB device and click "Detect Device". Check driver installation and USB cable connection if this condition persists.
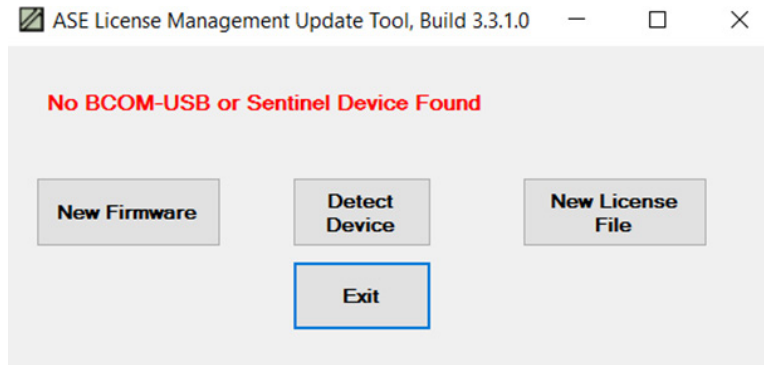
Figure 14: No ASE Hardware License Found

3.4. New License File Installation

New license files are sent via e-mail. Save the license file attachment in a convenient directory (for example, your Desktop or Documents folder) and start the ASE License/Firmware Updater program

Select the "New License File" button. Browse to the folder containing the new license and select the appropriate file. The file name will contain the device serial number and have an extension of .dat.

> ⚠️ *Note: the Device Serial Number is part of the license file name and must match the BCOM-USB serial number.*

Figure 15: Select License File

Select the license file and click "Open". The program will write the new license file to the BCOM-USB device. If the update is successful, the following message will appear:

Figure 16: Successful License Update

3.5. New Firmware Installation

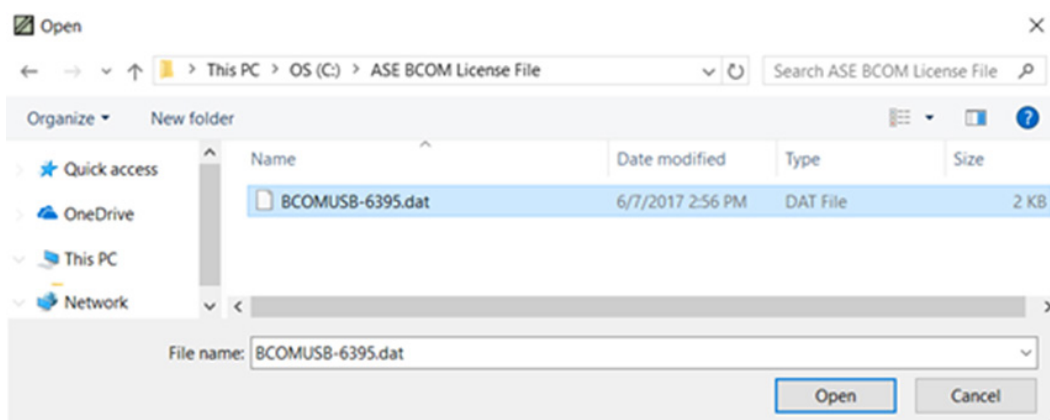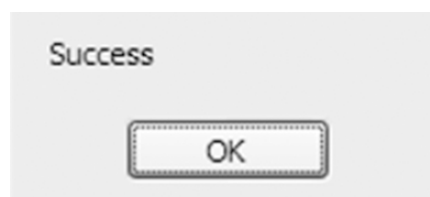The ASE License/Firmware Updater program is also used to install new firmware in the BCOM-USB device. The BCOM-USB device was released in April 2009 and a small number of firmware updates since then have been released. Registered users are notified by e-mail of new firmware releases with a description of the issue and solution. Release notices will also be available on the ASE web site at www.ase-systems.com.

Download and save the new Firmware file in a convenient in a convenient directory (for example, your Desktop or Downloads folder). If contained in a ZIP file, open the file and extract the firmware file – it will have .hex as the file extension. Start the ASE License/Firmware Updater program.

Click the "New Firmware" button and browse to the folder containing the new firmware file. Select the appropriate file. The firmware release number is part of the file name and the extension is .hex.

Select the firmware file name and click "Open". The program will write the new firmware to the BCOM-USB device while displaying a progress bar. If the update is successful, the message below will be displayed. Both "ERR" LEDs on the BCOM-USB device will blink on and off (ping-pong) to indicate successful transfer. Cycle power to the BCOM-USB device by removing and re-connecting the USB cable. After the firmware update and re-start of the BCOM-USB device, the current firmware version will be displayed on the ASE License/Firmware Updater window "Firmware Version" section.

> Download successful. Wait for channel error LEDs on front of BCOM-USB to blink, then cycle power by disconnecting and reconnecting the USB cable
>
> [OK]

Figure 17: Firmware Update Completion

After the firmware update and re-start of the BCOM-USB device, the current firmware version will be displayed on the ASE License/Firmware Updater window "Firmware Version:" section.

A

Appendix A – Windows Server 2003, XP, Vista I/O Driver Installation

Refer to BCOM-USB User Guide 1.5 for a step-by-step installation of the legacy drivers. This can be obtained from the ASE web site at www.ase-systems.com. The driver installation procedure described in this document will work for these older Windows versions by selecting the appropriate driver or using the Launch Menu Installation Assistant.

Appendix B – BCOM-USB Upgrade Kit Components

When provided as an "Upgrade Kit" to an existing ASE2000 Test Set kit with a PCMCIA card, parallel port dongle, or USB dongle, the components list below plus documentation and software installation media will be provided. The RS-232 Monitor Cable, DB-9 to DB-25 adaptors, NULL modem adaptor, and gender changer from the original test set kit should be retained and used with the BCOM-USB device. The test set enabling device, BCOM-PCMCIA card or dongle, must be returned within 60 days as part of the Upgrade procedure.

Upgrade Kit Contents
- 2-channel BCOM-USB device
- Two DB-9 Female / DB-25 Male Cables
- 6 USB Cable with standard A / B connectors
- 6 Power cable to power the ASE 2-channel Bell-202 test set modem

Figure 18: Upgrade Kit Contents

Appendix C – Removing The BCOM-USB Drivers

Make sure the BCOM USB device is inserted in a USB socket. Locate the BCOM-USB in the device manager as shown.
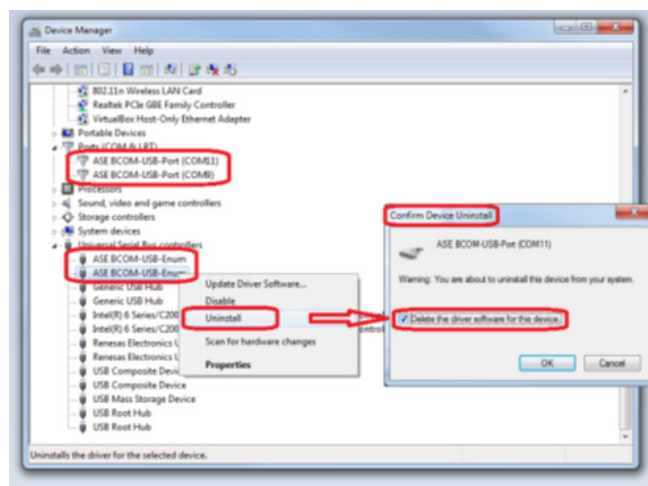

Figure 19: Remove BCOM-USB Drivers

For each of the four devices shown above in Figure 19 (two under Ports and two under USB Controllers):
- Select each device
- Right-click and select Uninstall
- Check the option to Delete the driver software for this device
- Select OK

After removal of the BCOM-USB device drivers, repeat the procedure to install the I/O drivers.

D

Appendix D – Microsoft COM Ports

COM ports are assigned automatically by Windows.

The COM ports can be changed by going into Windows "Control Panel" then "Device Manager." Right click on the ASE BCOM-USB-Port (COMx) with "x" being the port assigned. Click "Properties" then click "Port Settings" tab. Click the "Advanced…" button. And next to "COM Port Number" dropdown, the COM Port can be changed. Click "OK" and then "OK" again in the next screen to save the setting.

E

Appendix E – Verifying BCOM-USB Operation

BCOM-USB Connection And Driver Testing

- Connect the BCOM-USB device to the Windows machine using the USB cable
- Check power light on BCOM-USB box
  - Confirms connection to a good USB port on your computer with sufficient power
  - To reset the BCOM-USB box, disconnect and reconnect the USB cable
  - When connected to a USB Hub, use externally powered USB Hub
- Windows recognizes BCOM-USB device
  - Open the 'Device Manager'
  - Two ASE BCOM-USB Ports (COMx) should appear in Ports group
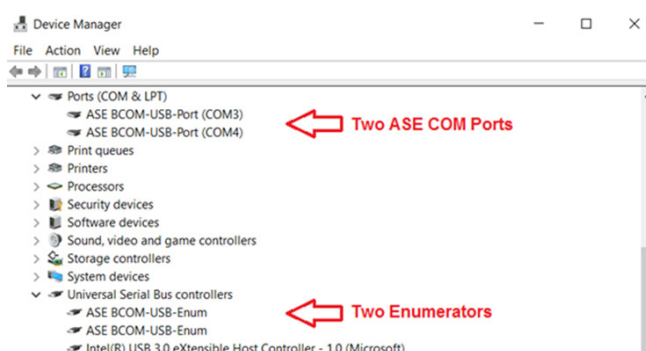
Figure 20: Windows 10 Device Manager 2.1.7.4 I/O Drivers
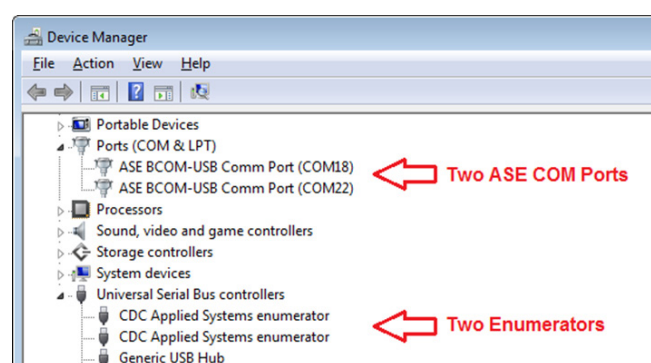
Figure 21: Windows 7 Device Manager 2.1.7.2 I/O Drivers

- Yellow warning flag(s) at left of ASE device means the drivers are not installed
  - Install the BCOM-USB drivers
  - Repair BCOM-USB driver installation using 'Update Driver'
- Yellow warning flag near 'Unknown Device' means USB communication failure
  - BCOM-USB device not recognized; try another USB port
  - Use USB 2.0 port if USB 3.0 (super speed) port fails (some machines only)

BCOM-USB Communication Send Request Test

If the I/O drivers appear to be installed correctly but you are unable to communicate with the device you want to test, the first thing to do is verify that communications to the BCOM-USB device works properly.

- Launch ASE2000 (V1 or V2) application in Master Simulation mode
- Choose Constant Carrier in Communications Line Properties
- Send a simple command (for example: DNP3 Serial -> Reset Link -> Send Once)
    - Request To Send (RTS) and Transmit (TX) lights should flash on BCOM-USB
    - No serial cable connections are necessary for this test
    - No response is expected, but request should transmit

If this test fails, reset the BCOM-USB device by disconnecting and reconnecting USB cable and try again.

BCOM-USB Communication Loopback Test

For this test, the two BCOM-USB communication channels will be connected together and two copies of the ASE2000 software will be used to verify communications. One copy will simulate Master operation and the other will simulate RTU operation. The ability to send and receive on both BCOM-USB ports will be tested.
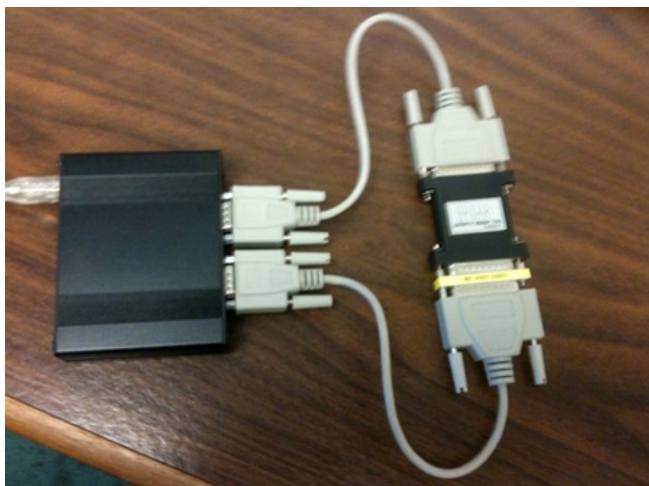

Figure 22: Loopback Cabling

- Connect the "A" and "B" BCOM-USB channels together using the two RS-232 cables together with a NULL modem adaptor and gender changer as needed
- Communication Settings
    - Set Carrier to Constant
    - Set Baud Rate to same value
- Send a command from the Master ASE2000 and confirm response from RTU ASE2000

Troubleshooting

Disable The Web Driver Search

During device installation, Windows attempts to locate a suitable driver by searching the Internet. This does not help in the case of the BCOM-USB device and disabling this behavior has been shown to make a difference in some cases. If you proceed with the steps below, you may want to undo these steps once this driver is installed. Note that, depending on your operating system version, phrases below may appear in slightly different, but similar, wording.

- Click the Windows Start ICON, right-click Computer, and click Properties
- In the Tasks list at the left, click Advanced System Settings
- On the System Properties dialog box, click the Hardware tab, and then Windows Update Driver Settings

USB Cable Issues

If the BCOM-USB device is intermittently failing, the USB cable may be faulty. The ASE BCOM-USB device is delivered with a standard, 6-foot, USB A/B cable. Using different, particularly very long USB cables can cause problems. Since the device receives power from the Windows machine through the USB cable, a lengthy USB cable may not provide enough power for the BCOM-USB. When a long USB cable is required, power to the BCOM-USB device can be provided by using a USB hub with external power.

USB 3.0 Ports And BCOM-USB 'Unknown Device'

When the ASE BCOM-USB device is connected to some USB 3.0 ports, the drivers are not installable and the Device Manager marks it as an 'Unknown Device'. ASE has not been able to reproduce this issue; all USB 3.0 host controllers we have tested do not have this problem. Although unproven, it is likely there is a timing issue between some older USB 3.0 host controllers and the BCOM-USB device.

Resolution:
Move the BCOM-USB device USB cable to a USB 2.0 port and follow the standard ASE installation instructions. Some laptops and desktops have both USB 3.0 and USB 2.0 ports. The USB 3.0 ports are labeled as SuperSpeed (USB 2.0 is known as HiSpeed), usually with the letters SS before the USB symbol as in this image. Sometimes, but not always, the inner tab for USB 3.0 ports is colored blue.
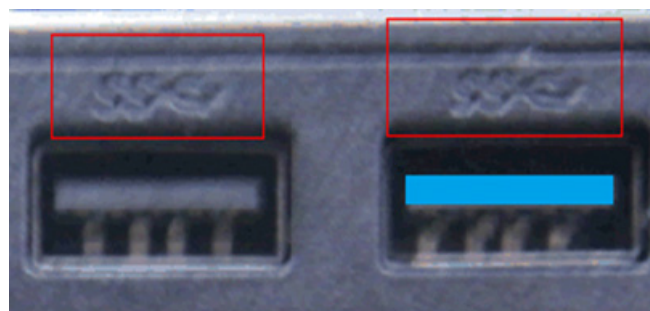

Figure 23: USB 3.0 Ports

Cause of Problem:

The SuperSpeed USB 3.0 interface is designed to be backward compatible with USB 2.0. Therefore a USB 3.0 connection must determine whether a device can communicate at 5.0 Gb/sec (USB 3.0) or 60 Mb/sec (USB 2.0) speeds. It is during device detection where this failure may occur. This problem is not unique to the ASE BCOM-USB device. See the technical details section for more information.

Most USB 3.0 ports work properly with the ASE BCOM-USB device. USB 3.0 first became available on Windows machines around 2011. Some of these machines may have early versions of the USB 3.0 hardware and drivers exhibiting this problem. Later USB 3.0 implementations do not seem to have this issue.

Alternate Solutions:

When no USB 2.0 port is available, inserting a USB 2.0 hub between the USB 3.0 port and the BCOM-USB device may work. Note that the BCOM-USB device gets power from its USB connection. Most USB hubs have an optional power supply and it is recommended that a powered USB hub be used. This solution is untested.

Updating the USB 3.0 drivers on your computer may also fix this issue. This solution is untested. This suggestion should only be tried with approval or assistance of your company's IT or technical team.

Current Status:

When (or if) Applied Systems Engineering can acquire a machine exhibiting this problem, further investigation will occur. Suggested solutions can be verified and if possible a change to the BCOM-USB firmware to avoid the problem can be developed.

Document Revision History

Revision	Date	Comment
1.0	April 22, 2009	Initial Release
1.1	April 27, 2009	Re-formatted for better ordering of information
1.2	October 28, 2009	Added separate I/O driver installation instructions for Windows 7
1.3	July 2, 2010	Updated Windows 7 I/O Driver Installation instructions
1.4	July 13, 2015	Add Windows 8 instructions and minor cleanup
1.5	February 1, 2016	Add Windows 10 to Windows 7 & 8 instructions
2.0	August 9, 2017	Added 2.11.7.4 driver installation instructions, launch menu instructions, appendices, and troubleshooting
2.1.1	November 13, 2017	Added Windows 10 driver support details

Table 2: Document Revision History

For additional technical support questions, please contact ASE Support at: support@ase-systems.com