



*EIN-1
USERS GUIDE*

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Overview

The EIN-1 adapter offers you the exciting possibility to directly interface AMS controller products to a Local Area Network or the Internet. It can be used in combination with any AMS motor controller product, such as the MAX, CMAX, DCB, IBC, CCB or mSTEP series to name a few. The EIN-1 replaces our other interface adapters such as the SIN-9, 10 or 11. If you connect to a LAN network or the Internet, you will need only the EIN-1 in addition to the AMS controller product.

Also, you maintain the ability to connect up to 32 AMS controller products in a Party Line configuration and can communicate with them using a single EIN-1 device, exactly the same way as you would with a SIN-11 or SIN-10 device.

Therefore, the EIN-1 is conceptually similar to a SIN adapter, except that it interfaces to LAN rather than USB or RS-232.

EIN-1 features:

- Single and multi-axis operation (up to 32 axes) can be connected to one EIN-1
- Diagnostic LED's
- Power supply provided with the unit
- RJ45 female connection for LAN/Internet
- RJ45 male for connection to AMS motor controllers
- Simple to use

Note: The terms "AXIS," "CONTROLLER," and "MOTOR CONTROLLER" are synonymous in this manual.

Hardware Setup

These steps will help you start communications with any AMS product.

Equipment Setup

Make sure the following hardware is available

- EIN-1 which integrates the cable with an RJ45 male connector that connects to AMS controller products
- BLC-51-7 7ft. cable (CAT 5e) to connect to router of LAN/Internet (provided with the EIN-1)
- Power supply for the EIN-1 (provided with the EIN-1)
- AMS controller product, i.e. IBC-400, mSTEP407, MAX-410, DCB-241, etc. (not supplied with EIN-1)
- Computer connected to LAN/Internet (not supplied with EIN-1)

Hardware Connection

Connect the EIN-1 to your LAN/Internet using the provided BLC-51-7 (CAT5e) cable. One end of the cable goes to the LAN/Internet router, the other into the female connector of the EIN-1 which is labeled “10/100M Ethernet”.

****Note:** If you are intending to connect the EIN-1 directly to the LAN/Internet port of your computer, you will need a special crossover cable that is not provided with the EIN-1. The provided CAT5e cable will not work since the mapping of signal pins from one end to the other needs to be different.

Connect the RJ45 plug of the cable that originates from the green connector of EIN-1 to a SERIAL INPUT of your AMS controller product (please refer to the respective manual).

Now connect the power supply provided with the adapter to the EIN-1 and plug the supply cord into an outlet.

LED Indicators

The red PWR indicator should now light up indicating that the unit is powered up.

The green LINK indicator should also light up (blink) indicating connection to the LAN/Internet

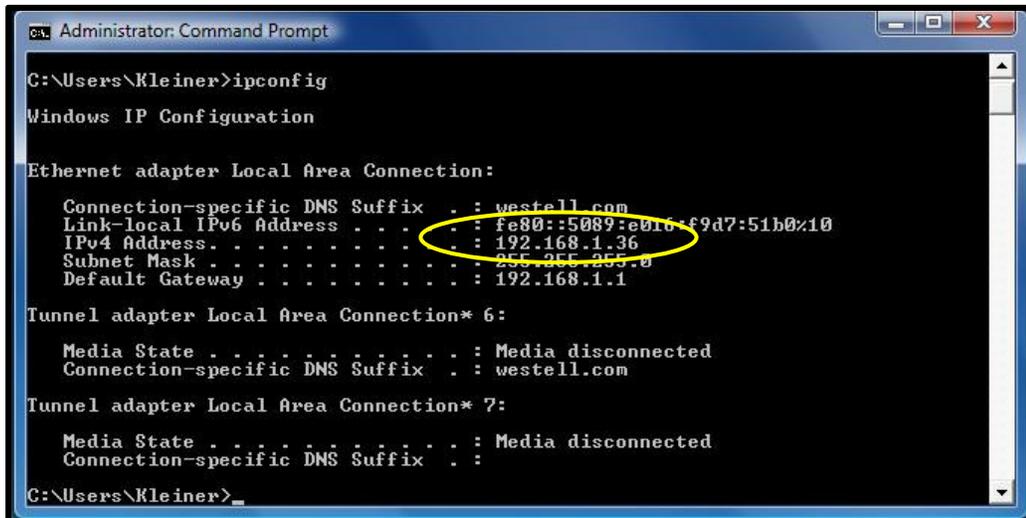
The orange ACT indicator will only light up when data is communicated across the EIN-1. Since we have not yet completed the setup it should not light up at this time.

****Note:** If the orange led is lit up at this point remove the power from the unit and verify connections are correct.

Configuring the EIN-1

The foremost step is to assign a static IP address to the EIN-1 that matches your computer's subnet. The default address the unit is shipped with is 192.168.2.1 and to modify this address the IP address of your computer must be part of the same subnet. That means the three numbers to the left of each of the three "." must be identical to those of the EIN-1 (i.e. 192.168.2 is the subnet of 192.168.2.1). If they are not, you need to first temporarily change the IP address of your computer or use a computer that has a matching IP address. The following procedure will show you how to change your computers IP address to access the EIN-1 internal settings.

To check the IP address on your computer, start the "Command Prompt" which you will typically find in the "Accessories" group of windows based computers. Type "ipconfig" and hit the "Enter" key. **Take note of the information** in case you need to change it temporarily so that you have the original settings available later on.



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Administrator: Command Prompt

C:\Users\Kleiner>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : westell.com
    Link-local IPv6 Address . . . . . : fe80::5089:e016:f9d7:51b0%10
    IPv4 Address. . . . . : 192.168.1.36
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Tunnel adapter Local Area Connection* 6:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : westell.com

Tunnel adapter Local Area Connection* 7:

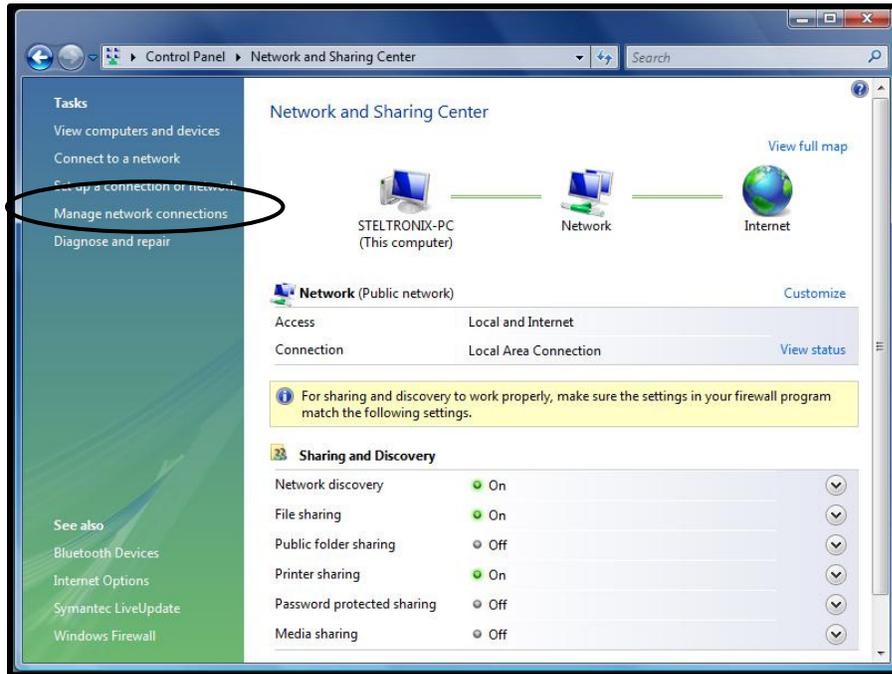
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

C:\Users\Kleiner>_
  
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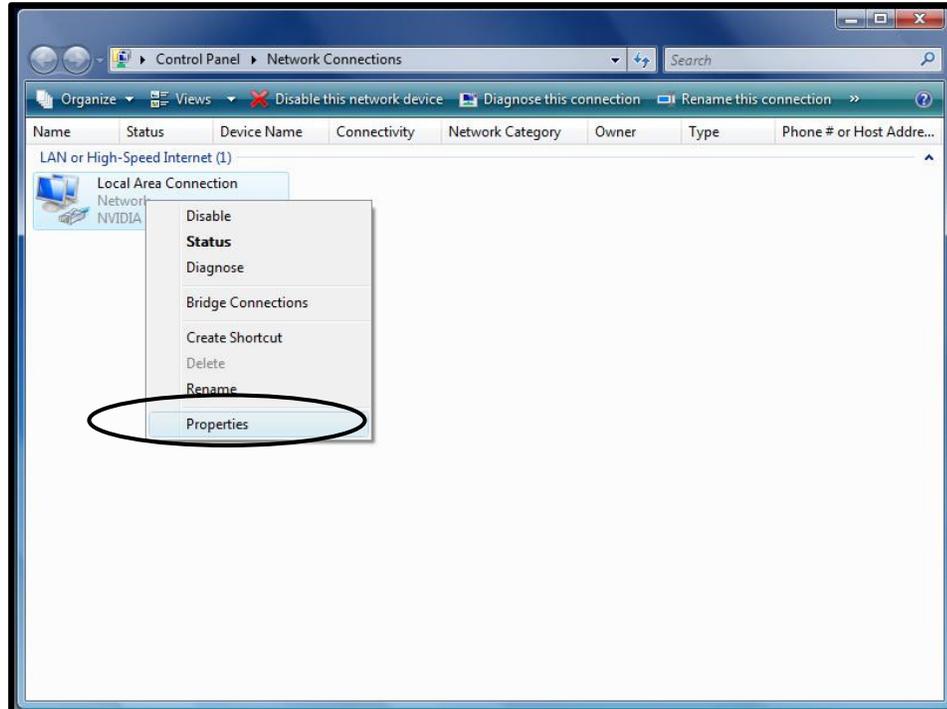
****Note:** The procedure to change the IP address may be different from computer to computer. Therefore, the steps you need to take on your specific computer may differ from the procedure described below. Please refer to the manual of your operating system for details. Alternatively you can search for instructions on the web. The following screen shots have been taken on a PC that is operating Windows Vista.

****Note:** After conducting this procedure it is important to activate all of the new parameter settings, to do so disconnect the power connector from the EIN-1 for a few seconds then reconnect it.

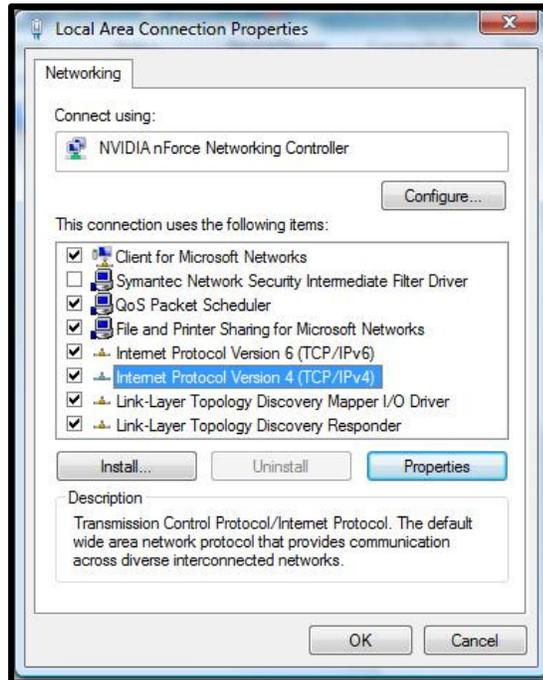
Open the “Control Panel,” then open “Network and Sharing Center.” Inside the “Network and Sharing Center” select “Manage Network Connections” on the left hand side.



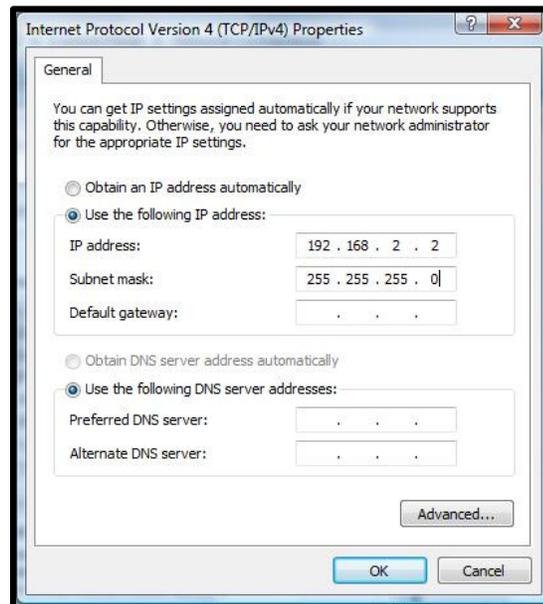
Right click on the network connection and select “Properties” from the pull-down menu.



A dialog window will open up.



With the mouse click on either “Internet Protocol Version 4 (TCP/IPv4)” or “Internet Protocol Version 6 (TCP/IPv6)” such that the respective line is highlighted (Some versions of windows will only have TCP/IP). Click on the Properties Button.

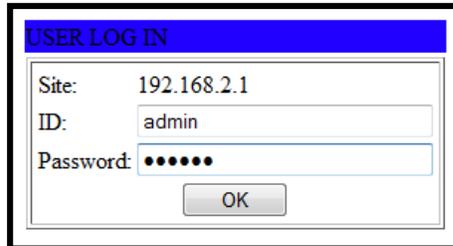


In the dialogue window you will be able to specify an address that matches the subnet of the EIN-1 IP address. As mentioned above the address needs to start with “192.168.2” to ensure it is in the same subnet as the EIN-1 in order to communicate with it. As the EIN-1 occupies the “.1” position in the subnet

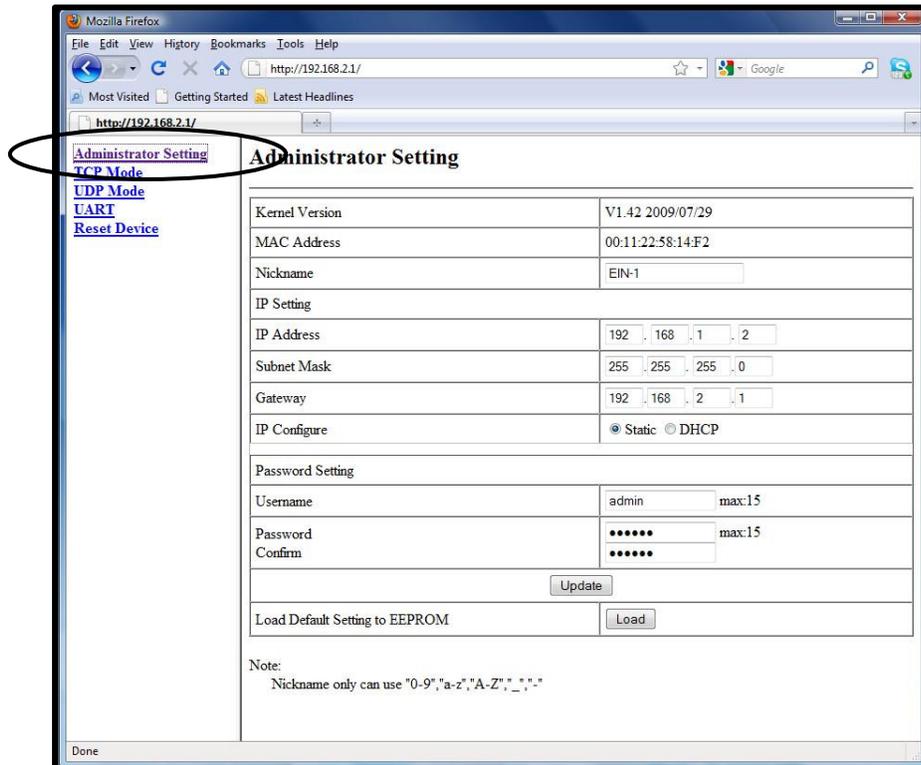
“192.168.2,” you can assign your computer the next available position in that subnet (i.e.192.168.2.2). The subnet mask needs to be set to “255.255.255.0.”

****Note:** Take note of the original settings in this window (commonly set to “Obtain an IP address automatically.” You can recheck your IP address by following the very first step of this section Finding your Computers IP address.

Now that the EIN-1 and your computer are part of the same subnet, you can change the parameters of the EIN-1. In order to do so open a browser window and type: <http://192.168.2.1> and hit the “Enter” key. You will be prompted to log in. Use “**admin**” as user ID and “**system**” as password.



As part of the Administrator settings page, you can give the EIN-1 a new IP address, for example in the original subnet of your computer or any that you would like to interface with it. Also, you can change the device number in the subnet, which is the number to the right of the last “.” to any value between 1 and 254. You can also change the user name and password. In case you should forget it, you can always reset all parameters including username and passwords to the factory defaults. See the section “Resetting the EIN-1” in this manual for more details.



Once all desired changes have been entered on the administrator settings page, please press “**UPLOAD**”. The system will respond with the message “Setting Saved FAILL” in a green box. This means that the settings were saved successfully even if it may sound otherwise.

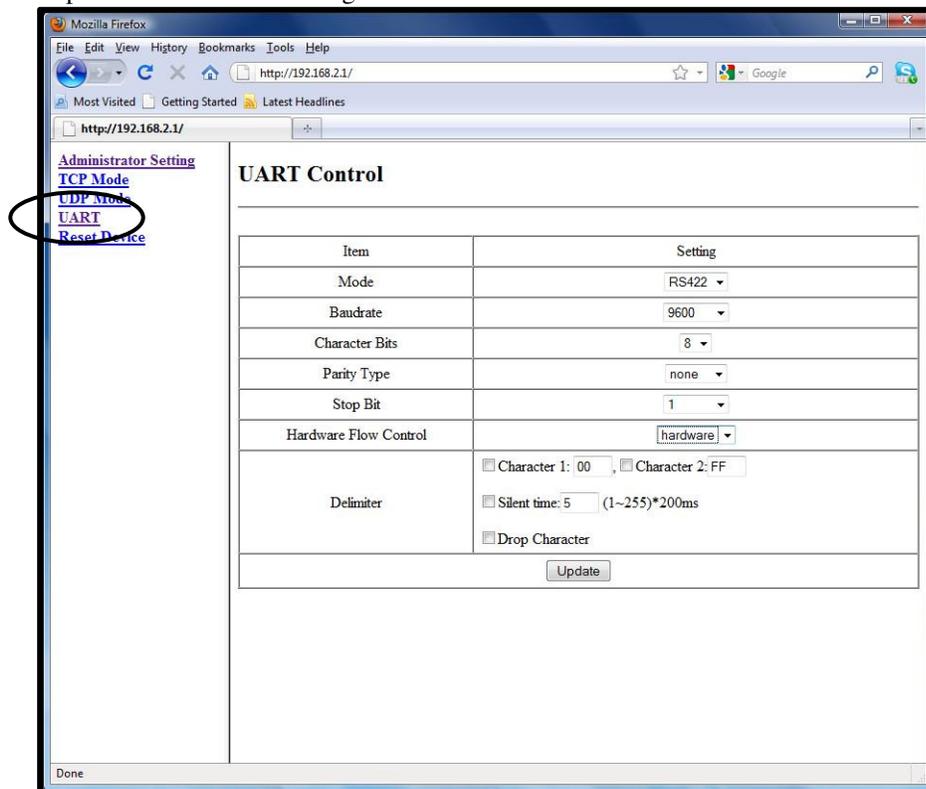
****Note:** AMS sets the following UART parameters to the proper values prior to shipping the EIN-1. You can skip this setting if you have not reset the device as described in the section “Hardware Reset.” If you have reset the device the defaults will be different and the parameters will need to be set as per the instructions below in order to establish communication with AMS products.

The UART section on the left hand side of the screen, it is very important that these settings are correct or else the communication between the EIN-1 and AMS controllers will not work.

The following settings must be selected:

- RS422
- 9600 baud
- 8 character bits
- no parity
- 1 stop bit
- Hardware flow control: none

Then press “Update” to save these settings.



****Note:** To activate all of the new parameter settings including the new IP address, disconnect the power connector from the EIN-1 for a few seconds then reconnect it. Since the new IP address you specified is now active, you need to make sure that your computer is in the same subnet as the EIN-1 and if you changed the subnet of the EIN-1, you may need to change the IP address of your computer to be able to communicate with the EIN-1 again.

Installing the “VCOM” Software

With the above steps completed, the EIN-1 is now configured. In order to communicate with AMS products, virtual COM port software “VCOM” needs to be installed first.

Download the “vcomsetup.exe” file from the AMS website. You can find the download link either from the “Tech Documents” section or the EIN-1 product page in the “Products” section.

****Note:** This installation may automatically restart your computer during installation. Be sure to **save all** work and close any other programs prior to installation. If your computer does restart automatically, the installation is not complete, there will be a window that will appear and finish the installation once the computer restarts.

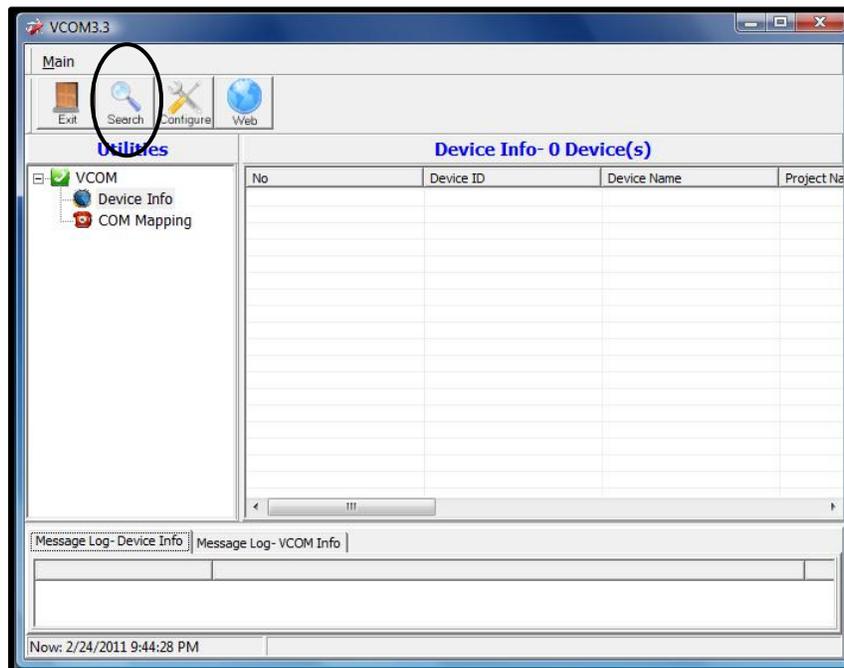
To install this program find and double click the downloaded executable “vcomsetup.exe” and follow all of the onscreen prompts.

Setting up the virtual COM port

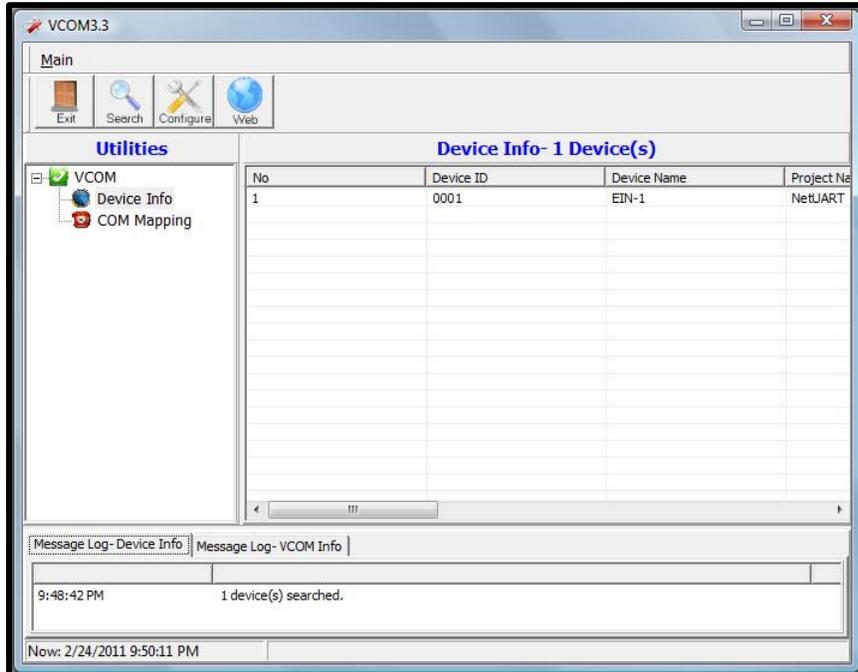
Once the VCOM installation is complete, go to the start menu “Programs” and locate the software, it will be under the “IC Plus corp.” directory. Start the VCOM executable in the VCOM directory.

****Note:** Windows may suspect that this program is malicious and prompt for you to block it upon first opening. Be sure to click “unblock” to allow the program to continue opening

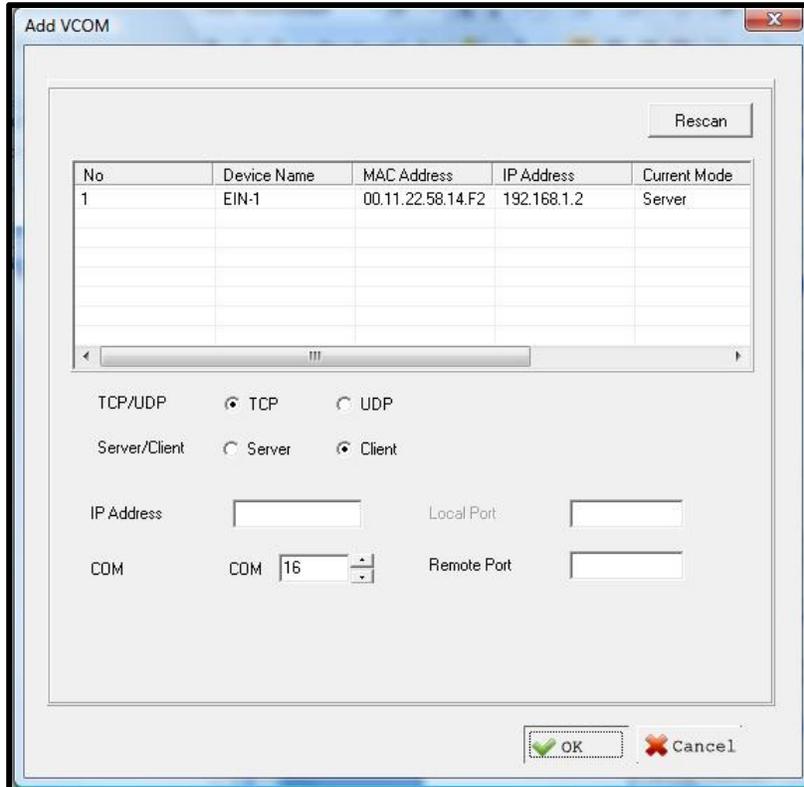
When opened the application will immediately be reduced to the tray. Locate the VCOM icon (Swiss army knife) in the Taskbar and depress it. This will show the VCOM window.



If you press the “Search” button, the software will search your network for all available devices and display them. If the above installation has been performed correctly and the EIN-1 is on the same subnet as your computer, it should appear in the list of devices.



The next step is to set up the virtual COM port. Click the COM mapping icon on the left hand side of the VCOM window. Now click the green “Add” button further up on the screen. A pop-up window will appear listing the devices found.



Make sure the EIN-1 is highlighted. You can select the desired number for the COM port to assign to the EIN-1. You need to make sure, however, that this COM port is not already occupied. Hit “OK” to complete the COM port assignment. In order to use the AMS Cockpit software (recommended), please ensure that the COM port you select is between 1 and 15.

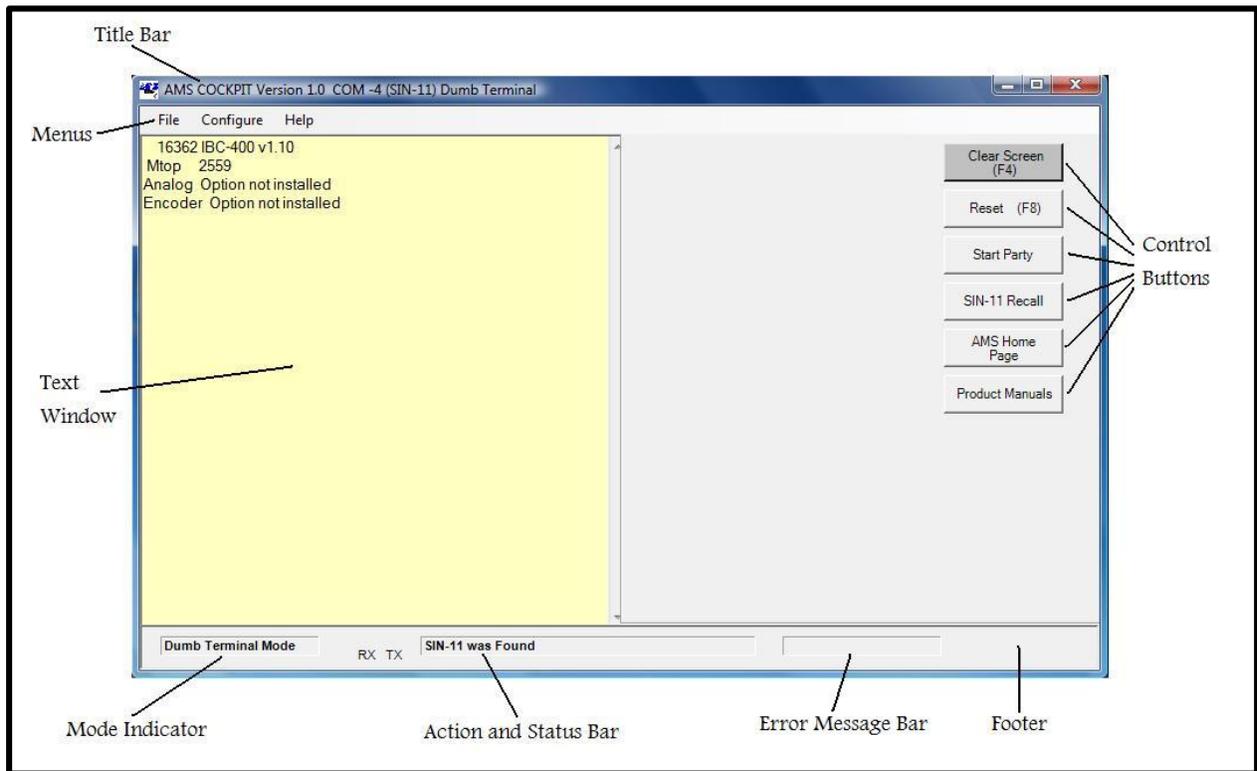
AMS Cockpit

To communicate with the AMS controller please download the “AMS Cockpit” software from the AMS website. The software can be used free of charge. Please go to “Tech Documents” and then “Software Downloads.” Note that other terminal programs cannot be readily used in combination with the EIN-1 as opposed to the SIN-11 or SIN-10 due to the necessary handshaking procedure used in AMS Cockpit. Please contact us in case you should have questions on this handshaking procedure.

Prior to starting AMS Cockpit, make sure that the EIN-1 (cable coming from the port labeled “RS-422/485” is connected to the serial in port of the AMS controller product that you intend to communicate with (please refer to the respective product manual if needed). A motor may be connected to the controller product but it is not required in order to establish and verify successful communication.

Never connect or disconnect any motor while power is on!

Now power up the AMS controller product. Once this is accomplished, please start the AMS Cockpit software.



1. Hit the “spacebar” key to “sign-on” to the device after power on.
2. The motor controller should display the sign-on with the product model and software version.
3. Check the name assignment by entering “X” followed by “Enter” (Examine command). The name will be the end character of the first parameter line. It is usually “A.” If it is not a readable character or you want a different name, follow the “Axis Name Assignment” procedure described further on in this manual.
4. Verify commands using a command such as “M 1000” to move and “M0” to stop. In case you do not have a motor connected, you can verify that the commands have in fact been issued by reading the counter using the “Z” command.

Now is a good time to setup motor speeds, currents and other parameters for your application.

Special keys will produce unique actions:

1. **^C** (control C) acts as a reset. The ^C is sent to reset any axis on the party line and the SIN-11 itself.
2. **Esc** (escape) aborts any in-process command.
3. **Backspace** (←) edits input lines in a conventional fashion.
4. **&** preceding a command signals a “local” SIN-11 command.

Single & Party Line Mode

AMS products can be operated in either of two modes:

- Single Mode (Dumb Terminal Mode): In this mode only a single controller may be connected to the party line bus. Only in this mode can a controller's address be assigned and saved. Pin 8 (“party”) of the RJ-45 connector is not asserted. If you are using only one axis this mode is sufficient.
- Party Line Mode: In the PARTY mode, multiple controllers may be addressed on the party line bus. Every axis must have a distinct axis name and every command must be preceded by the axis name so that the respective axis will recognize commands intended for it.

****Note:** parameters, programs, and motion commands may be sent to a connected controller in either mode.

The default power-up mode is single (dumb terminal). In the example in the previous section dumb terminal mode was used to communicate with the controller.

The single mode is a “straight through” connect. All received characters pass to the RS-422 bus and received characters are returned to the terminal. This mode is useful for single axis debug, diagnostics, and assigning the axis name, which will be required for party line mode. Programs may be typed into a controller's NV memory in the single mode.

Axis “Name” Assignment

If more than one axis is to be used, each must have a different name assigned. This procedure is required only once and it must be done in **single mode**.

Refer to the specific AMS product manual for a detailed description this procedure.

1. Make sure the controller is powered down
2. Connect the cable from the EIN-1 port labeled “RS-422/485” to the serial in of the controller
3. Power up the controller & the EIN-1
4. Start AMS Cockpit

There are now two methods to assign names, the “software” method and “hardware” method

Software Method

This is a new method using control characters as commands to assign names and initiate party-line operation. The advantage is that the hardware “switch” is no longer necessary. These features will be introduced into product as revisions are implemented.

1. Enter Ctrl N (^N) to assign the name. When the “name?” prompt is displayed, key in the desired name character (a-z or A-Z) and immediately that character will be stored in memory.

CAUTION – Never do this when more than one controller is attached or all names in all controllers will become the same.

2. When the name is captured, the controller will restart. Use a space character to sign-on again.

Hardware Method

1. After power on (reset) before signing on with the space key, type the desired name character (A for our example), followed by the space key. The attached controller will “sign-on.” with “x v2.05” or similar.

2. Enter the “Examine” command: X followed by “Enter”. The axis name will be displayed at the end of line one.

3. Type S followed by “Enter” to store the name in non-volatile memory. The name is now saved.

Proceed with the above steps for all axes that need to be named.

Choosing Names

Any ASCII letter between A and Z (upper and/or lower case) can be used. For example A, Y, & z are all valid.

Party Line Startup

There are two ways to start-up party line mode:

1. Newer products, such as the mSTEP, IBC, CMAX and MAX series support a command to enter party line mode: Issuing “Control” and “P” (10 hex) at the same time will instantly switch all controllers connected to the Party Line chain to Party Line mode. Earlier products such as the DAX or DCB-241 do not support this Party Line entry by command and require the Party Line entry as described below. Note that when you enter Party Line Mode using the “Control” and “P” Command you will not receive a reply from the controllers or any confirmation in the Terminal window.
2. All AMS products except the mSTEP and IBC series can be set to Party Line by pulling pin 8 of the serial in or Serial out connector on the AMS controller to Ground. When using the EIN-1 this is easiest accomplished by integrating a switch at the RS-422/485 port of the EIN-1. This switch can be requested free of charge when ordering the product from AMS – usually AMS will check if it is required when you order the EIN-1. In case your unit does not have the switch but you need it, please contact us.

Once you have entered Party Line Mode by either of the above means, you can issue a command to each of the axes present to ensure correct operation. For example if you named one of the axes “A”, you could issue the following command: “A+1000”. **Note that when using the EIN-1 in Party Line Mode, every line needs to be terminated by a “line feed” (0A hex). On a PC keyboard this can be emulated by holding the “Control” key and issuing “Enter”.** The motor connected to axis A should index 1000 steps (provided the parameter setup is correct). In a similar fashion you can issue commands to all axes present.

Multiple Axes Connected in Party Line

One to 32 axes (or more, dependant on cable lengths and type) may be addressed by one EIN-1. Each axis must have a **unique** pre-assigned name stored in its NV memory. If you try to address an axis that does not currently exist, the returned string will contain a “?” and the unknown name character.

Reset Procedure

There are two ways to reset the EIN-1 to its factory settings: software and hardware.

To reset by software, you need to log onto the device by entering “http://” followed by the IP address of the EIN-1 in a browser window. After logging on with the username and password you will see a menu to reset the unit. This will only work if you know the IP address of the EIN-1 and if the computer you are using is part of the same subnet.

Note that if you reset the unit to its factory settings also the user name and password, as well as the IP address are reset. This means that you may need to change the IP address of your computer first to be able to communicate with the EIN-1 again after the reset.

To reset the device by hardware, please follow the steps below:

- Disconnect the green connector, the LAN cable as well as the power connector from the EIN-1
- Remove the two Philips type screws from the 2 outer sides of the unit.
- Lift cover off of unit
- Locate the white reset switch – it is between the power plug and the Ethernet plug
- While pressing the white switch plug in the power supply
- Continue to depress the reset switch for at least 10s until the green LED which initially is dim green goes off (may be hard to see). You are on the safe side if you depress the switch for 10s after plugging in the power supply
- The device has now been reset to its factory defaults.

Contact AMS

Email: support@stepcontrol.com

Phone: 603-882-1447

Address: 29 River Road Suite B Essex Junction, VT 05452