

Multi-EM

Multiple access to
Kinetic SBS-1 Ethernet Module Software

Software Operating Manual

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Preface

Multi-EM is a proxy software that can be connected by multiple Kinetic Basestation clients at the same time. Normally only one Basestation can connect to SBS-1 at a time.

Multi-EM simulates a SBS-1 device with an Ethernet Module (EM), so when Basestations are run via Ethernet they do not connect directly to the SBS-1, but to Multi-EM instead. Multi-EM itself is connected to SBS-1/EM.

Disclaimer

Multi-EM is in no way endorsed by Kinetic or ML&S or anybody else. Its use is entirely on your own risk. By using it you hold harmless the author of the application, jetvision.de, its officers and employees from any and all responsibility for any damage to your computer system, be it a hardware or software defect, or SBS-1 device or any device associated with its use, as it may occur. If you do not agree to this disclaimer remove the application from your PC.

Important limitations

All Basestation clients must connect Multi-EM at the first attempt. Subsequent autoreconnect attempts by Basestation are not supported. After a connection is lost by a Basestation client it must be shutdown and restarted. If Multi-EM stops or is shutdown all connected Basestations must close down and restarted after a restart of Multi-EM.

Network setup advisory

While possible in general it is not recommended to route the connection between the computer that runs Multi-EM and the SBS-1/EM device via the internet. Associated delays or packet losses may limit the serviceability of Multi-EM. If you insist on doing this, later notice the ports that need to be opened to pass through any of your firewalls.

Windows and other firewalls

Windows XP/Vista will ask for allowance to run Multi-EM as it exposes TCP servers. Please acknowledge this request. Otherwise Multi-EM cannot be run. Multi-EM runs a TCP server on port 20060 (or any other port as programmed) on your PC.

If you want to access Multi-EM from outside your Local Area Network, be sure to open port 20060 TCP (or any other port as programmed) in your router and/or firewall.

Now, please follow the step-by-step instructions:

Hardware installation (Ethernet Module)

Be sure your EM is properly installed according to the instructions http://www.hamradio.co.uk/downloads/Installing_the_Ethernet_Module.zip that come with EM.

IMPORTANT: Before installing the EM note the Ethernet Module's MAC address, which is printed on a label on top of the module. Best make a note here:

00 - 20 - 4A - - -

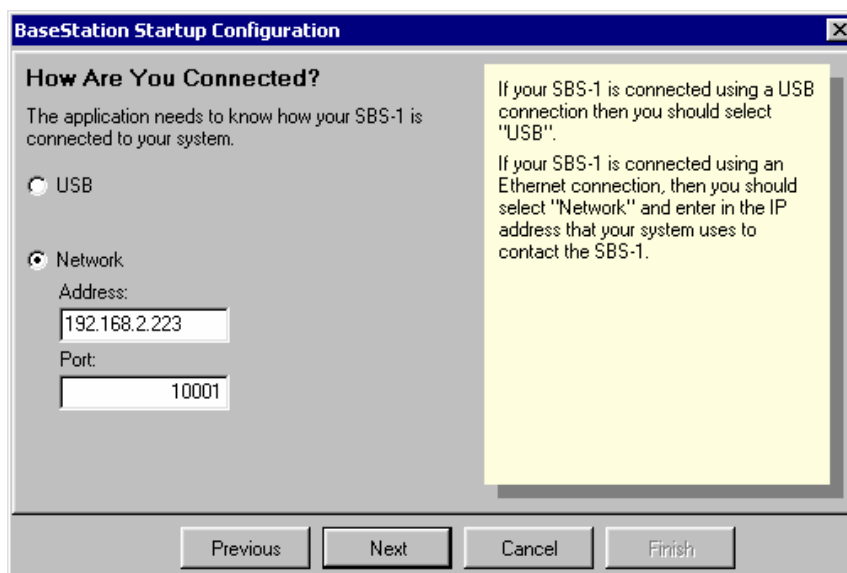
Now update your firmware! Before proceeding please test the EM with Basestation in a stand-alone configuration and verify everything is working ok.

Ethernet Module IP configuration

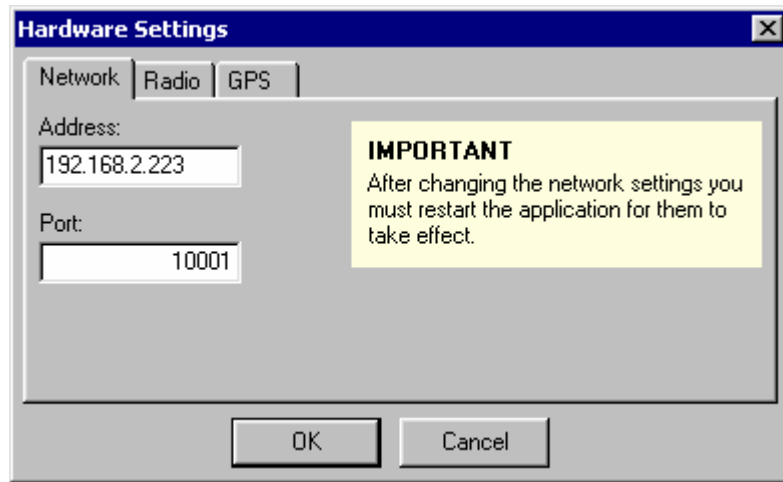
The EM is delivered by ML&S programmed with an IP of 192.168.1.170 and port 10001. Unless your Local Area Network operates in the range of 192.168.1.x you need to change this IP. There is no reason to change the port designator, though.

If you need to change your EM's IP or port please go to **Appendix B** of this document and return if you are done. (For further examples the EM runs at IP 192.168.2.223)

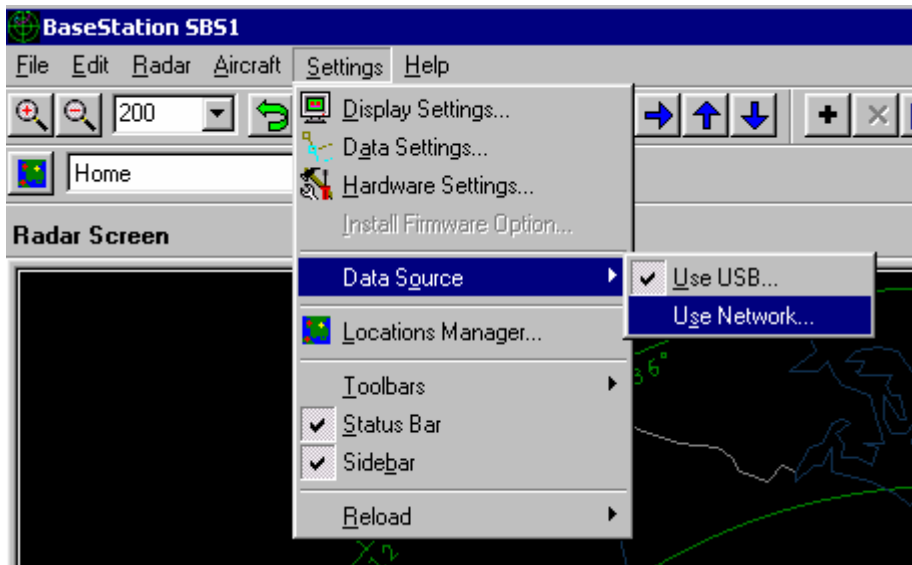
If you run Basestation for the first time, fill out this dialog with the **SBS-1/EM** IP.



Otherwise: to finally test your stand-alone configuration you need to assign the network IP/port to Basestation. Run Basestation and select the SETTINGS | HARDWARE | NETWORK dialog. Enter the IP (and port) of your **SBS-1/EM** and press OK.



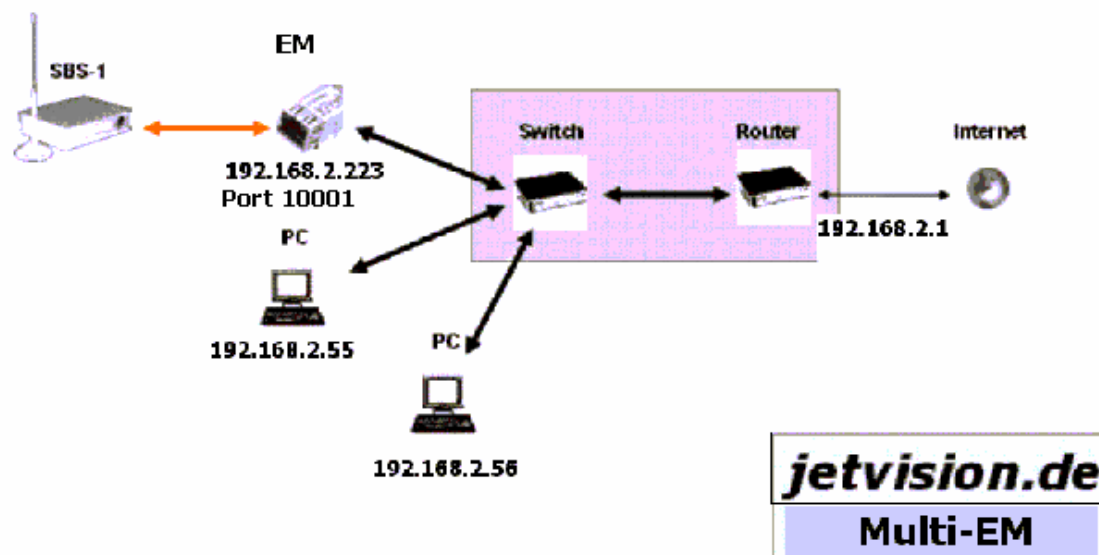
Open the SETTINGS | DATA SOURCE dialog and check USE NETWORK.



Close and restart Basestation for your final stand-alone test. If everything works well then continue.

Multi-EM network configuration

This is an example of a typical Multi-EM network configuration (IPs and Ports are selected just for demonstration purposes):



Place your Multi-EM software onto any of the computers connected to the network, 192.168.2.55 or 56 in this example. In the following section Multi-EM will be assumed to be placed on 192.168.2.55. This one is called the hosting computer. All other computers in the network that are expected to run Basestation must be able to connect to this computer. Remember to arrange your firewall settings accordingly.

Multi-EM software installation

The latest Multi-EM application can be found at

<http://jetvision.de/multiem/multiem.zip>

Download and unzip the contents of this file to any folder on your computer. If you have a Basestation installation installed on your computer it is recommended to install the files into the same folder as basestation.exe.

If you have purchased the full version of Multi-EM place the file multiem.pwf that was sent to you by e-mail into the same folder.

Remote computer Basestation installations

Because there is no need for USB drivers Basestation can be installed to remote computers by just copying a complete master Basestation folder. Be advised that you lose database synchronization when you run multiple Basestations. Copy/install Basestation to any computer you want to use it from.

Multi-EM activation

Search for the multiem.exe file and execute the application.

TRIAL VERSION ONLY:

If you run the *trial version* (no multiem.pwf file installed) you will get a warning message. Press OK to continue. Multi-EM will shutdown after 5 minutes in this case.

This is your starting screen.



Before you can enjoy Multi-EM you have to setup the network numbers. You should have at hand (example values in brackets):

- the network IP of SBS-1/EM (192.168.2.223)
- the network IP of the computer hosting Multi-EM (192.168.2.55)

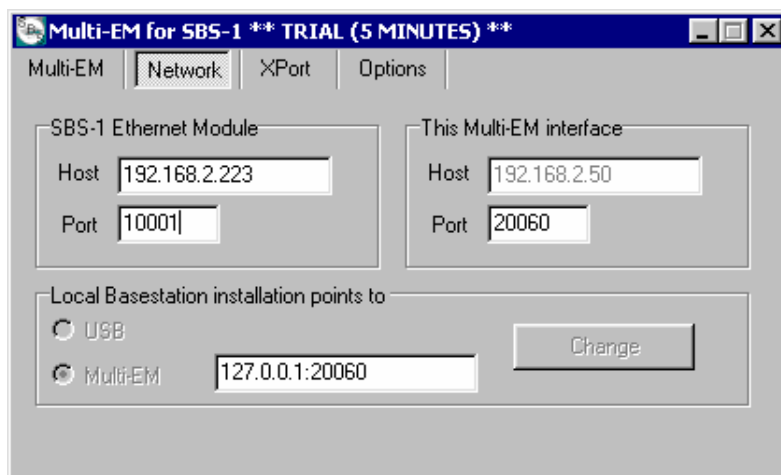
Please select the NETWORK tab and enter the SBS-1/EM IP to the SBS-1 ETHERNET MODULE field. The port should remain at 20060.

The field THIS MULTI-EM INTERFACE should carry the IP of the hosting computer. Please check this entry.

If you have Basestation installed in the same folder as Multi-EM the field LOCAL BASESTATION INSTALLATION POINTS TO should be active.

Please select MULTI-EM and enter 127.0.0.1:20060 or the local IP:PORT as shown below (there is no difference between these entries)

Then press CHANGE.



Your Multi-EM is now ready to be run. Return to the MULTI-EM tab.

Every day's Multi-EM operation

Press CONNECT EM and wait until the CONNECTED message appears.

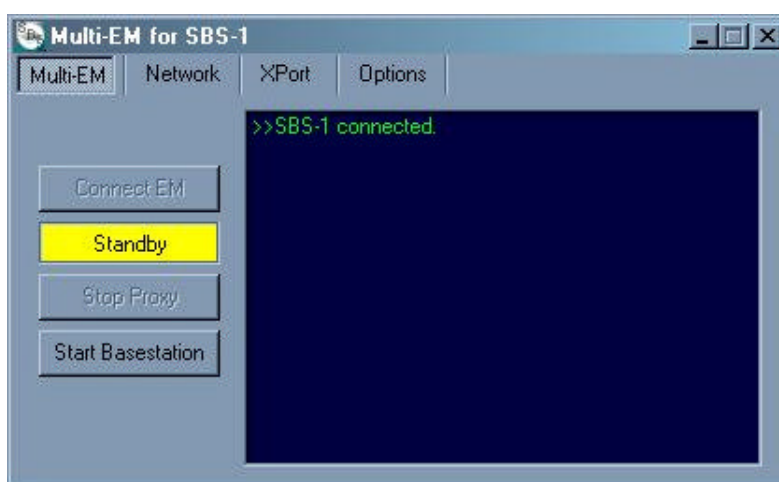
Errors that can appear:

3/10060 - SBS-1/EM not found and timed out

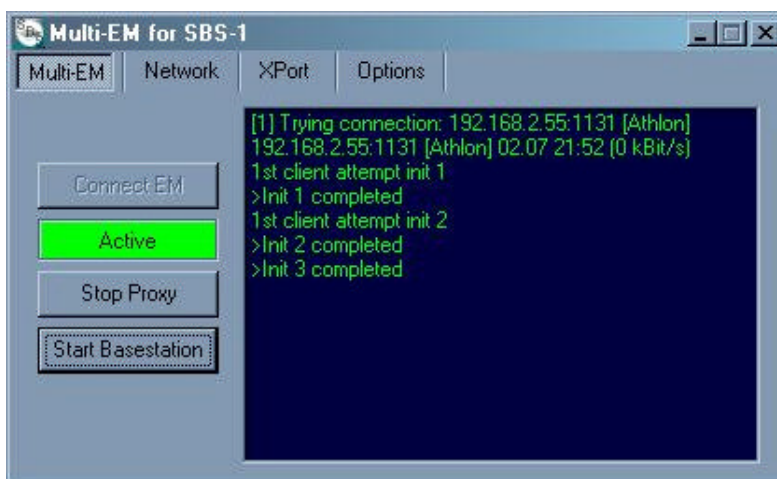
3/10061 - SBS-1/EM busy by another device

Press START PROXY.

If a local Basestation installation is available the START BASESTATION button is activated. Press this button and Basestation will start right away.



After some connection messages check this status does appear:



Your Basestation is properly connected now and flights should appear on the radar screen as usual.

You can check the Lantronix XPort data on the XPORT tab.

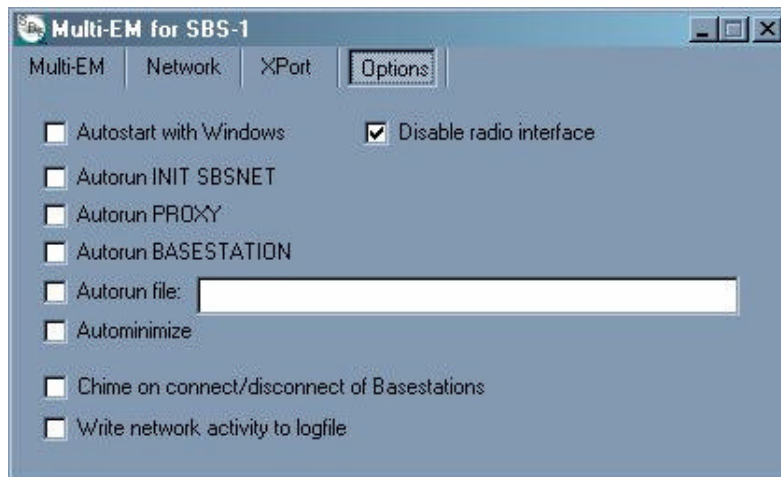


To enter the configuration dialog of the XPort device press the CONFIG DIALOG button.

The PASSWORD field is filled for full versions only.

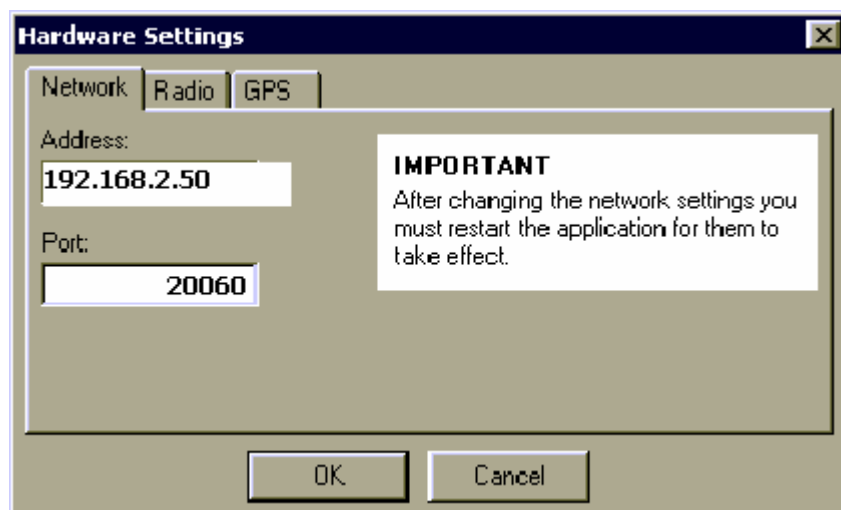
There are numerous options available on the OPTIONS tab.

Be aware Multi-EM will most likely disable SBS-1 functions as the radio interface.



Configuring more (remote) Basestations

If you want to install Basestation on another PC in your network configure each Basestation in the same way as described above, **BUT ENTER THE IP OF THE HOSTING COMPUTER**, not the IP of the SBS-1/EM.



Access via Internet

You need a network router to access your hosting computer from outside your local area network. The router must redirect any TCP internet traffic to your internet IP port 20060 to your hosting computer's port 20060.

In addition you may need a dynamic DNS service to resolve your internet IP at any time.

Configuration of an internet access goes much beyond this tutorial. Please check the internet for more hints.

Ports usage

Ports used by Multi-EM:

10001 TCP or as assigned in the NETWORK dialog.

Ports used by SBS-1/EM:

20060 TCP or assigned

9999 TCP

30704 TCP

30718 TCP

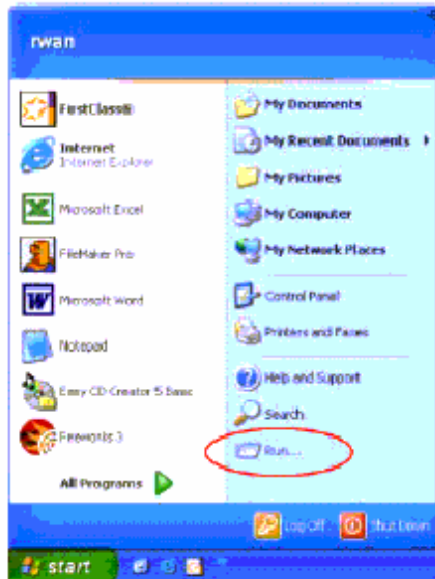
Do not assign any of the above ports to another application.

Appendix A

Find a free IP address in your private network

[If you know how to find a free network IP on your network you may skip this chapter](#)

Open your Windows start menu and click on RUN...



A dialog will appear, now enter CMD and press OK. (for Win 98 and 2k enter COMMAND instead)

A DOS window box will appear with a command prompt. Behind the prompt you enter: IPCONFIG and then press return.

Now a listing of available network devices on your computer will appear, much like this:

```
C:\WINNT\System32\command.com
Microsoft (R) Windows DOS
<C> Copyright Microsoft Corp 1990-1999.

Z:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 134.114.70.143
    Subnet Mask . . . . .             : 255.255.255.0
    Default Gateway . . . . .         : 134.114.70.1

Z:\>_
```

In this case the computer is connected to a network IP range 134.114.70.1 to 134.114.70.255. The gateway is 134.114.70.1. One device is connected that got the IP 134.114.70.143. A free IP may be e.g.134.114.70.170. Do not use IPS that end at .1 or .255.

If you run a DHCP (dynamic IP) server inside your network be sure you do not select an IP from this range.

Appendix B

Assign a new network IP to your SBS-1/EM

This example assumes that

- you connect to SBS-1/EM from a computer with network IP **192.168.2.7**
- your current SBS-1/EM IP is **192.168.1.170**
- you want to change the SBS-1/EM IP to **192.168.2.170**, which is a free IP in your network

1) Set your computer IP to **192.168.1.7** for a while.

You do this by opening your network icon, then Properties, then Internet Protocol (TCP/IP), then Properties
IN CASE - If you had a dynamic IP checked (Automatic IP address or so) you need to enter the IP AND the network mask 255.255.255.0, then press OK

2) Start your internet browser and go to <http://192.168.1.170>

3) Press empty return on the authentication dialog

4) Go to NETWORK (1)

5) Enter **192.168.2.170** under IP ADDRESS (2)

6) Enter **192.168.2.1** under GATEWAY (2)

7) Press OK (3)

LANTRONIX® Firmware Version: **V6.5.0.3**
MAC Address: **00-20-4A**

Network Settings

1

Network

Server

Serial Tunnel
Hostlist

Channel 1
Serial Settings
Connection

Email
Trigger 1
Trigger 2
Trigger 3

Configurable Pins

Apply Settings

Apply Factory Defaults

IP Configuration

Obtain IP address automatically

Auto Configuration Methods

BOOTP: Enable Disable

DHCP: Enable Disable

AutoIP: Enable Disable

DHCP Host Name:

Use the following IP configuration:

IP Address: **2**

Subnet Mask:

Default Gateway:

Ethernet Configuration

Auto Negotiate

Speed: 100 Mbps 10 Mbps

Duplex: Full Half

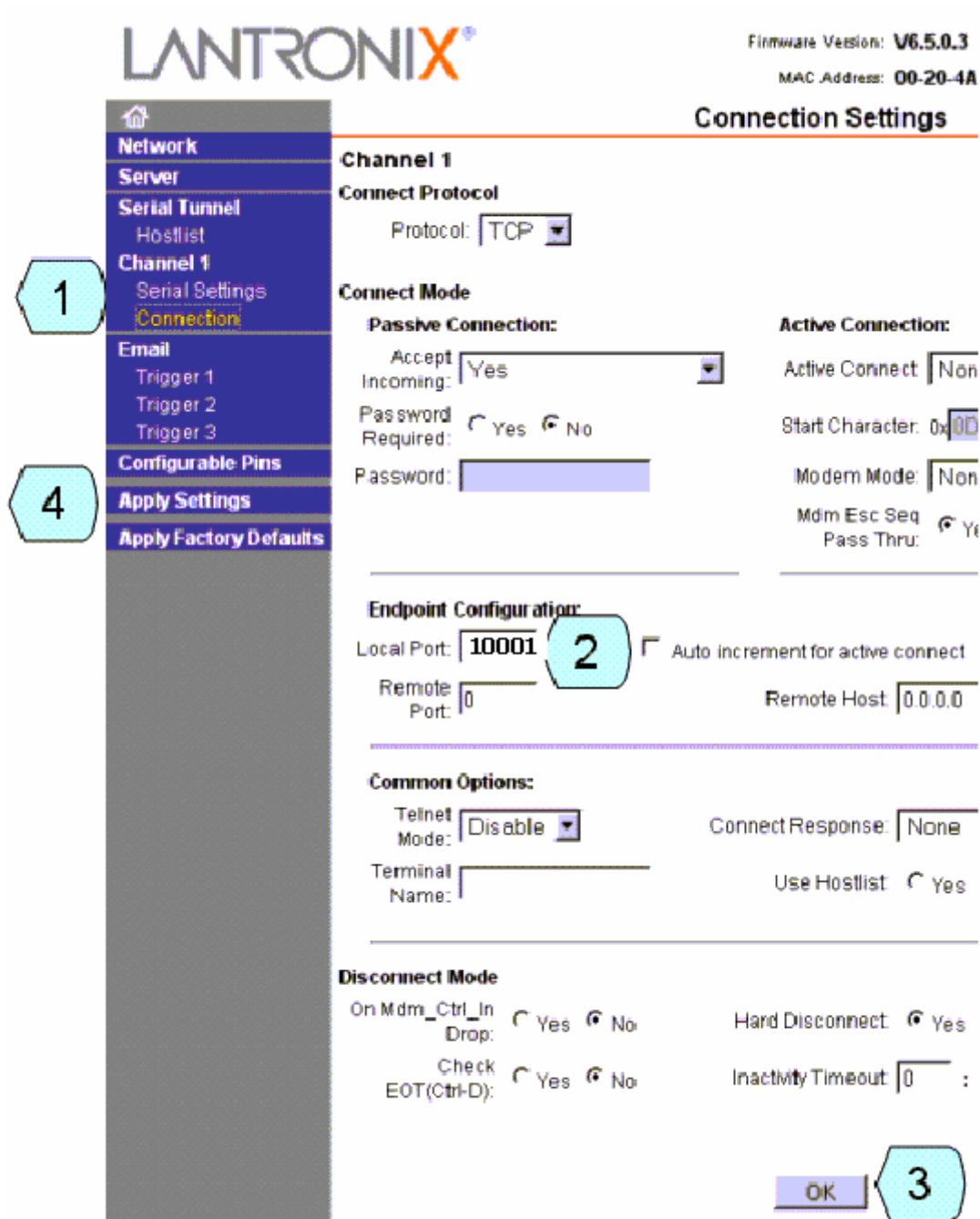
3

7) Go to CHANNEL 1/CONNECTION (1)

8) Check your PORT is 10001, otherwise enter so (2)

9) Press OK (3)

10) Press APPLY SETTINGS (4)



9) See the Xport reboot. There will be no return and the screen will freeze. Close your browser

10) Reset your computer IP to **192.168.2.7**. Use the same procedure as above.

11) Start your internet browser again and go to <http://192.168.2.170>

12) See the dialog pop up (everything worked well) and close your browser.

13) Run Basestation as normal

14) Enter IP **192.168.2.170** to SETTINGS/HARDWARE/NETWORK

15) Select SETTINGS/DATA SOURCE/USE NETWORK...

16) Restart Basestation

17) Voila

Appendix C

Find the MAC address of your EM adapter

In case you have not noted the MAC address of your EM adapter you may find it necessary to recall the address later.

Connect your SBS-1/EM properly within the same IP address range as your computer.

As described in Appendix A open a DOS box.

Execute a PING <ip address> to your EM adapter (in this case 192.168.2.180)

Execute an ARP /A command. The MAC address for this adapter is shown (in this case 00-20-4a-a3-0a-bc)

```
C:\WINDOWS>ping 192.168.2.180

Ping wird ausgeführt für 192.168.2.180 mit 32 Bytes Daten:

Antwort von 192.168.2.180: Bytes=32 Zeit=1ms TTL=64
Antwort von 192.168.2.180: Bytes=32 Zeit<10ms TTL=64
Antwort von 192.168.2.180: Bytes=32 Zeit<10ms TTL=64
Antwort von 192.168.2.180: Bytes=32 Zeit<10ms TTL=64

Ping-Statistik für 192.168.2.180:
    Pakete: Gesendet = 4, Empfangen = 4, Verloren = 0 (0% Verlust),
    Ca. Zeitangaben in Millisek.:
        Minimum = 0ms, Maximum = 1ms, Mittelwert = 0ms

C:\WINDOWS>arp /a

Schnittstelle: 192.168.2.50 on Interface 0x1000002
Internet-Adresse      Physische Adresse    Typ
192.168.2.1           00-08-54-d1-5f-59   dynamisch
192.168.2.180        00-20-4a-a3-0a-bc   dynamisch
```

Appendix D

Upgrade to full version

The trial version of Multi-EM is limited to 5 minutes of operation. To purchase the full version please go to <http://multiem.jetvision.de>

Support

Send e-mail to support (at) jetvision.de