

Manual

MEG201AE VDSL2 Ethernet Extender Kit

VDSL2 Point to Point Solution
Consisting of 1xTransmitter and 1xReceiver

MEG201RAE VDSL2 Receiver

Part of VDSL2 Point to Multipoint Solution
used with VDSL2 Switch MEG821AE

MEG201TAE VDSL2 Transmitter



OVERVIEW

MEG201AE works as a transparent point to point Bridge for Ethernet and/or Telephony connections using a Transmitter and a Receiver. When used with the VDSL2 switch MEG821AE it is a Multipoint to Point solution. The MEG201AE uses new VDSL2 technology operating at different frequency bands with the feature to adapt its performance to the characteristics of the copper medium used. The following cable lengths and bandwidths are possible according to the band profile setup:

30a (Default band profile)	0-350m at 100Mbps down- and upstream 350-450m at 70-85/40Mbps downstream/upstream 450-600m at 40-60/10Mbps downstream/upstream 600-900m at 20-40/1-5Mbps downstream/upstream <i>Using Band profile 30a for distances beyond 900m is not recommended</i>
8d (Alternative band profile)	0-800m at 60-80/15 Mbps downstream/upstream 800-1200m at 30-50/5-10 Mbps downstream/upstream 1200-1500m at 30/2-5 Mbps downstream/upstream <i>Using Band profile 8a for distances beyond 1500m is not recommended</i>

Downstream: Traffic from Transmitter to Receiver
Upstream: Traffic from Receiver to Transmitter

For distances higher than those mentioned above, the MEG201AE is not the recommended product. Other Black Box xDSL products should then be your choice. Check MDS93x, MDS95x, MDE5xxx or MEG101 series products to get distances of many many kilometers

These distances may and will vary depending on the quality of your wires. Keep in mind that every intermediate connection of the cable will possibly increase losses and result in less reach and/or bandwidth. Avoid cables that are not truly isolated, that may get wet or are old and corroded. Running high power current nearby is also not recommended due to the possibility of induced interference.

Avoid using telephony RJ11 ribbon cables. These cables are built with using very low diameter stranded cables. Using them will mean that bandwidth is lower and reach is shorter!

The front-panel provides LED indication of system and interface status. The in-built POTS splitter allows a standard POTS phone to be connected at the Receiver. Full or half duplex mode LAN operation is automatically sensed and configured. The MEG201AE features an integrated 4 Port 10/100 Switch. Because of the switch please consider that some non standard Ethernet Frames will not pass MEG201AE.

MEG201AE is configured by Web management. The serial port is intended to be used by support staff with technical skills only. The standard IP addresses of the MEG201AE set up are:

Transmitter MEG201TAE	192.168.16.249
Receiver MEG201RAE	192.168.16.250

Use the Webbrowser of your choice (older versions of Netscape or IE may not be able to show you all options) to address MEG201AE. **The default password is admin**

The Modem



From Left To Right

- 1 Just a hole where in previous versions a RESET button was
- 2 4x10/100 LAN Ports
- 3 VDSL Link Port, middle Pins active (RJ11)
- 4 Phone POTS ab Port, middle Pins active (RJ11)
Transmitter side intended to use with a PBX (FXO)
Receiver side intended to use with a telephone or telefax (FXS)
- 5 Serial RS232 Port for use by authorized personnel only
- 6 Power Input (12VDC, max.1A)



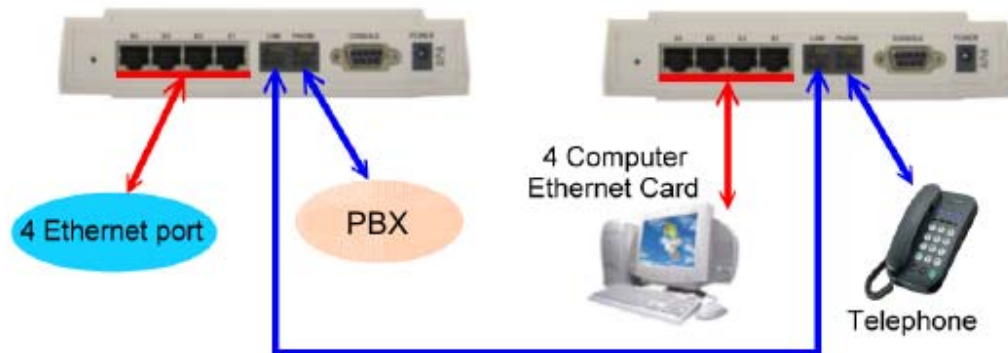
From Left To Right

- PWR Power LED
- E1-E4 Link LED for the Ethernet Switch Ports
Blinking while ongoing Activity
- LINK Link LED for the VDSL Port
Blinking while other side found and connection is being established
Steady On while VDSL Link valid

Note: Pictures in the manual mainly show the modem in white. Thanks to the features of digital photography. Of course MEG201AE is black and is only available in black.

INSTALLATION

For most applications you just need to connect the Transmitter and Receiver and power them up (Picture shows Transmitter on the Left, Receiver on the Right)



Since the Receiver and Transmitter have their own IP addresses please check that the addresses **192.168.16.249** and **192.168.16.250** are not in use by any other of your network equipment. Initially, it may be useful for you to just connect Transmitter and Receiver to the VDSL Line without connecting any other network equipment.

When using the VDSL2 switch (MEG821AE) please do not forget that all Receivers have the same default IP address. It is recommended to change the IP address of each receiver on its own before connecting to the switch.

For wire lengths within the distance limits previously mentioned (<900m), the system will automatically establish the Link and set itself up. The MEG201AE is built using a switching chipset and so some special Ethernet Frames will not pass across the VDSL Link. Standard TCP and UDP traffic will pass to the other side transparently. The MEG201AE is optimised for TCP traffic. If you use UDP traffic for Video Transmission with high Frame sizes you will experience non optimal results.

After the Link between the Transmitter and Receiver has been established successfully the WAN/LINK LED will be in a steady on state. At this point you should set up appropriate IP addresses for the Transmitter and Receiver. You do this by either using a PC within the subnet of the default IP addresses (192.168.16.x) or by setting a temporary IP address by RS232 connection. See the next chapters for more information.

CONFIGURING BY WEB

The MEG201AE can be configured by using a Web browser. The modems have default IP addresses and to use the Web Configuration method you need a PC within the same subnet as the default IP addresses of MEG201AE.

MEG201AE Transmitter 192.168.16.249
MEG201AE Receiver 192.168.16.250

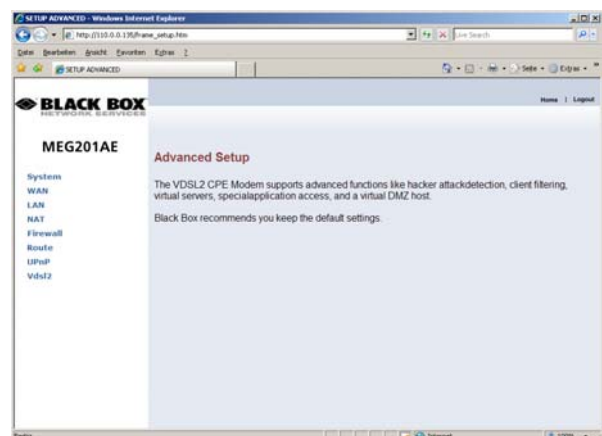
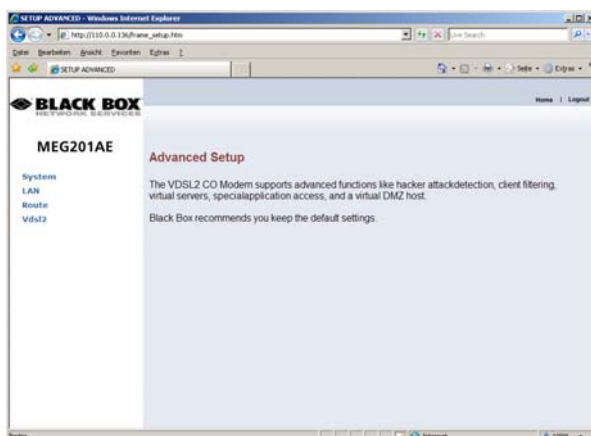
You can for example set your PC up with IP address 192.168.16.1. Please consult the manual of your operating system on how to do this. If you can not change the IP address of your PC then choose the alternative method to configure the IP address of MEG201AE by RS232 serial (see below).

By entering the IP address as the URL into your browser you can get access. A window will appear asking you for login. **The default password is admin.**

(Transmitter on Left, Receiver on Right)



The Screen you will see looks very similar for both the Transmitter and Receiver. Click on Advanced Setup to configure the modem. The next screen will show you:



As you can see the Receiver offers you more options to configure. This is because you can use the Receiver as an ADSL2+ Modem to be used with your incoming Internet Service Provider Line as well as a point to point solution. Since the purpose of this manual is to describe setup for your VDSL2 link **please leave the options for WAN/NAT/Firewall/Route and uPnP unchanged!**

SYSTEM

Administator Settings (Transmitter and Receiver)

Allows you to change the default password

Firmware Upgrade (Transmitter and Receiver)

Allows you to upgrade the firmware

Device Mode (Receiver only)

Allows you to change the Receiver from VDSL2 Extender Set to ADSL2+ Router. Leave setting to Switch Mode for normal operation
(Switch Mode in Factory Default)

System Status

Information about the Device

Reboot

Lets you reboot the Device while leaving the settings unchanged

Reset System

Lets you reboot the Device while setting everything back to factory default

LAN

LAN Settings

Lets you configure IP Address and enable or disable the DHCP Server
(Disabled in Factory Default)

DHCP Client List

Lets you view the IP Addresses given to network devices by the DHCP Server

LAN Switch Port Setting

Lets you configure which Speed and Duplex Mode ALL 4 SWITCH PORTS do.
(Auto 10/100 Full/Half in Factory Default)

LAN Port Status

Lets you view the status of the four Switch Ports.

VDSL2

Channel Config

Lets you control the bandwidth passing across the Link.

(Factory Default is 64 kbps Minimum and 102400 kbps Maximum)

Also gives you the chance to set up Interleave. Higher Interleave values may give you a more consistent latency.

(Factory Default is 1ms)

Line Config

Lets you configure the target SNR value for your Link that is acceptable. By lowering that value you may get a link at a higher reach, but it will not be stable.

(Factory Default is 6 db)

Profile Config

Lets you configure the profile being used for your Link.

You can choose Profile, Band Plan, Filter and Tone Mode for the Transmitter.

You can choose Filter and Tone Mode for the Receiver.

Filter and Tone Mode of Transmitter and Receiver need to match.

(Factory Default for Filter is Off, for Tone Mode is V43)

The choosen Profile and Band Plan of the Transmitter are automatically detected by the Receiver

The Profile and Band Plan tell the Modems which frequencies are being used and how data is processed and transferred. The Filter and Tone Mode tells the modem specialities about the line.

Optimal Setups:

Profile 30a, Annex C_8K, Filter Off and Tone Mode V43 for High Bandwidth

Profile 8d, Annex A M1_EU32, Filter Off and Tone Mode B43 for Long Distance

Bands Config

Let you configure special frequencies to be used.

Do not make any changes unless specifically advised by Black Box!

LoopBack

Enable LoopBack Functions for Testing

Users are not intended to use this function !

Activate Deactivate

Activate or Deactivate the Link

The Link needs to be activated on both sides to operate

LineStatus

For every Frequency section you can view the SNR values.

They should be positive and the higher, the better.

ChannelStatus

The Link performance

VersionInfo

Detailed Information about the software and hardware of MEG201AE

SNRGraph

Graphics showing you SNR values

BitsGraph

Graphics showing you where how much data is transferred.

CONFIGURING BY RS232

MEG201AE features a Serial RS232 Port. Use a straight through (1:1) cable to configure the MEG201AE using Hyperterminal or any VT100 application of your choice.

You need to setup a bitrate of **115200bps** with **8N1** without any handshaking.

If the MEG201AE has been powered up already you will see a prompt by hitting the ENTER key:

/ #

If you have not powered up MEG201AE, please do so and wait until the boot process is finished. The boot process finishes with the following (for the Transmitter, the Receiver looks very similar):

```
MEG201AE VDSL Transmitter
```

```
Image V 2.0.12 (CO)
```

```
FW:                v9.7.3.11.0.2
DSL-API:           v2.0.12
DFE-Drv:          v0.1.4.8
WEB-Interface:    vD.2x
```

```
-----
-----
Addr: 1200007c, value: bfffffff
```

```
BusyBox v1.00 (2006.05.29-14:43+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.
```

/ #

As you may identify from the commands above MEG201AE is a Linux based device. Many of the common Linux commands can be used here. However, please consider that you purchased a VDSL2 modem device, not a PC. And always keep in mind that Black Box gives you support for configuring a standard VDSL2 modem. If you try to use the MEG201AE as a Linux hardware platform and modify its internal software structure there is no support or warranty on the unit.

You can use the Serial Interface to configure an IP address by this command:

```
ifconfig adm0 <ipadress> netmask <subnetmask>  
(Example: ifconfig adm0 192.168.16.240 netmask 255.255.255.0)
```

This configuration is activated immediately but is only temporary because not stored in flash memory. We recommend you continue configuring by Web method.

Other commands very useful:

```
rawaccess -e          (Factory Default)  
reboot               (RESET)  
ping                 (check connectivity to an IP address)
```

The Serial Bootmenu

Sometimes it may be necessary to use the Serial Bootmenu. Please check with Black Box Tech Support before you attempting to do so.

While powering up the MEG201AE you can stop the boot process while this message is displayed. Press SPACE three times to enter the boot menu then:

```
Press <space> key tree times to enter boot menu..  
2
```

Loader Menu

```
=====
```

- [1] Xmodem Download
- [2] TFTP Client Download
- [3] Print Boot Params
- [4] Set Boot Params
- [5] Update bootloader
- [6] Exit

Please enter your number:

Option 1 enables you to upgrade the firmware by RS232 with Xmodem. This is a very slow but very secure upgrade method.

Option 2 enables you to upgrade the firmware by TFTP.

Option 3 will give you information about the device

Option 4 enables you to change CO/CPE status

Option 5 enables you to upgrade the bootloader

It is not recommended to use any of these options without consulting Black Box or unless specifically instructed by Black Box tech support to do so.

FIRMWARE UPGRADE

New Firmware Files may be available on <ftp://ftp.all-about-kvm.com>
You can download a ZIP File with two binary files.

**One file mentions “CO” in the filename and
is intended to be used with the Transmitter only.
One file mentions “CPE” in the filename and
Is intended to be used with the Receiver only.**

Avoid using any firmware file that sounds or looks like it is suitable for MEG201AE. Use only firmware files you retrieved yourself from our website or have been mailed to you by Black Box personnel.

There are three ways to upgrade your MEG201AE:

a.) By Serial and XModem

This is the recommended option. Get into the Serial Bootmenu of MEG201AE. In the Bootmenu select Option 1 and upload the appropriate file (CO for Transmitter, CPE for Receiver) with XModem Protocol.

b.) By TFTP

This is the fastest method, but you need a TFTP Server and some skills. Get into the Serial Bootmenu of MEG201AE. Select Option 2

At first choose Option S to set TFTP Parameters. You will be asked for the TFTP Server IP (probably IP Address of your PC running the TFTP Server), the Remote File Name (which is the filename of the appropriate firmware file (CO for Transmitter, CPE for Receiver)) and a temporary IP Address for the VDSL2 device to download the file (Needs to be an IP Address in the same subnet of your network). After having entered these values be sure to have the TFTP Server set up and running with the firmware file in the main directory. Then start the download with Option D.

c.) By Web

Firmware Upgrade is also possible by Web. Log on to MEG201AE, choose SYSTEM and then Firmware Upgrade. Upload CO for Transmitter and CPE for Receiver. Click on Apply and wait.

No matter which method you choose, after the upgrade you need to reset to factory default. Do not interrupt MEG201AE while upgrading. Repowering MEG201AE after upgrade and factory default is needed additionally in order to reset the VDSL2 chip.

HOW TO CHANGE IP ADDRESS

Option A: Using Default IP address

- 1 Set your PC address to IP address 192.168.16.1
- 2 Start your Browser
- 3 Go to URL 192.168.16.249
- 4 Login with password
- 5 Click on Advanced Setup (top right)
- 6 Click on LAN (on the left)
- 7 Click on LAN settings (showing up below LAN)
- 8 Enter the IP address of your choice
- 9 Click on Apply
- 10 Repeat from Step 3 with URL 192.168.16.250

Option B: Temporarily Changing IP address

- 1 Attach a straight through 1:1 serial cable
- 2 Start Hyperterminal
- 3 Open a serial session to your COM Port with 115200 Bps 8N1 No Handshake
- 4 Press Enter
- 5 Prompt shows up
- 6 Enter command `ifconfig adm0 <ipaddress> netmask <netmask>`
- 7 Start your browser
- 8 Go to URL <ipaddress> (Choose the one you entered in Step 6)
- 9 Login with password
- 10 Click on Advanced Setup (top right)
- 11 Click on LAN (on the left)
- 12 Click on LAN settings (showing up below LAN)
- 13 Check the IP address
- 14 Click on Apply
- 15 Repeat from Step 1 with the other modem

Troubleshooting

Symptom: Power indicator does not light up (green) after being powered on.

Cause: Defective External power supply

Solution: Check the power plug by plugging in another suitable power supply.
Check the power cord with another device. If this fails to resolve the problem,
have the power supply replaced.(KVT127E-PS)

Symptom: Link indicator E1,E2,E3 or E4 does not light up (green) after making a connection.

Cause: Network interface, network cable, or switch port is defective.

Solution: Power off and re-power the VDSL Modem.

Verify that the switch and attached devices are powered on.

Be sure the cable is plugged into both the switch and corresponding device. Check LED activity on your switch or corresponding Ethernet Device. Verify that the proper cable type is used and its length does not exceed specified limits (100 Meter). Check the Modem on the attached device and cable connections for possible defects.

Replace the defective Modem or cable if necessary.

Symptom: VDSL Link cannot be established

Cause: cable length is over specification or no connection

Solution: Please make sure phone wire must be connected between Transmitter and Reciver when both are power on. Use middle Pins of the RJ11 line port. Avoid using RJ11 telephony ribbon cables.

Try to setup Bandprofile 8a and check that Filter and Tone Mode are Setup identically.

What does not or may not work with MEG201 series products?

- ⇒ Jumbo Frames, max. Frame Size is 1536 bytes
- ⇒ Transmission of non-standard protocols
- ⇒ Routing just by using the VDSL Extender Set
- ⇒ PoE to provide power or to get power from modems
(If you require this, call Black Box for information on MPG101AE-R2)
- ⇒ Using with Black Box DTX5000 System
- ⇒ ISDN BRI/PRI/S0 or E1/G703 transmission by POTS port
- ⇒ Digital 2 wire phone connections like Up0E

What can I do if my line is too long?

Often there are different routes to get to the “other side”. Try to find out if there is a shorter or better quality alternative. If not, Black Box has other xDSL devices that will provide long distance connection.

Please check MDS932AE-10BT-R2, MDS952AE-10BT and/or MDS5110AE, MDE5210E/MDE5211E to be an alternative for your application by calling your Black Box office. Check www.blackbox.eu for local mail addresses, phone and fax-numbers.

Tech Support

It is our main philosophy to provide high quality service and support on Black Box products and equipment. If you have any questions please feel free to contact Black Box Free Tech Support. Check www.blackbox.eu for phone numbers of your local office.



Data



Voice



Hotline



Black Box Worldwide Offices

As well as the Black Box International Subsidiaries listed below, we also have a worldwide network of distributors ensuring efficient shipment of stock and delivery of the right local technical and language support that you need.



[Australia](#)



[España](#)



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[Suomi](#)



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Product Features & Specification

- => Compliant with IEEE802.3 10BASE-T standard.
- => Compliant with IEEE802.3u 100BASE-TX standard.
- => Compliant with ETSI, ITU, ANSI standards
- => Max bandwidth is 100Mbps up to 350m
Max distance is 900m with Profile 30a and 1500m with 8a
- => Supports 1 * RJ-11 connector for Ethernet over VDSL.
- => Supports 1 * RJ-11 connector for telephone/PBX connection.
- => Supports 4 * RJ-45 port for 10/100Mbps Ethernet with Auto MDI/MDIX.
- => Supports long packet size up to 1536 bytes
- => Voice and Data work on the same 2 wire telephone line.
- => Supports flow control IEEE802.3x for Full Duplex & Back Pressure for Half Duplex.
- => Supports Surge protection.
- => Provides LED indication Power, Link/Active Status for Ethernet port and Link for VDSL port.
- => External switching power adapter Input: AC 85-240 volts/50-60Hz; Output: DC 5V/1A or above.
- => Power Consumption: Transmitter&Receiver 7.5W
- => Operating Temperature: 0°C ~ 50°C (41F ~ 122F)
- => Storage Temperature: -20°C ~ 65°C (-4F ~ 149F)
- => Humidity: 10 to 90% (non-condensing)
- => Dimensions: 184 x 146 x 40 mm (7.2" x 5.74" x 1.57").

Available Accessories:

MEG201AE	VDSL2 Extender Set (1xTransmitter, 1xReceiver)
MEG201TAE	VDSL2 Transmitter
MEG201RAE	VDSL2 Receiver
MEG821AE	VDSL2 8 Port Switch
MDS9XX-DIN	DIN Rail Mounting Set
KVT127E-PS	Spare Power Supply for International Use

DECLARATION OF CONFORMITY

Standard(s) to which Conformity is Declared

EN55022: 1998 +A1:2000 +A2:2003, Class A
EN61000-3-2: 2000
EN61000-3-3: 1995 +A1: 2001
EN55024 :1998 +A1: 2001
IEC61000-4-2: 1995 +A1: 1998 +A2: 2000
IEC61000-4-3: 2002 +A1: 2002
IEC61000-4-4: 1995 +A1: 2000 +A2: 2001
IEC61000-4-5: 1995 +A1: 2000
IEC61000-4-6: 1996 +A1: 2000
IEC61000-4-8: 1993 +A1: 2000
IEC61000-4-11: 1994 +A1: 2000

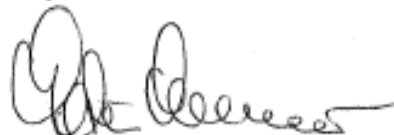
Importer's Name	<i>Black Box Deutschland GmbH</i>
Importer's Address	<i>Ludwigstr. 45 B</i> <i>D-85399 Hallbergmoos</i>
Type of Equipment	<i>Informationsverarbeitungsgerät</i>
Model Number	<i>MEG201AE</i>

Year of Manufacture *2008*

I the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s)

Date: *14.2.2008*

Address: *Hallbergmoos*



Signature

Peter Obermeier
Full Name

Managing Director
Position