LINKSYS®

BEFCMU10
EtherFast® Cable Modem with USB and Ethernet Connection

LED Table

LED	Color	Mode	Function
Power	Green	ON	12V-DC (0.6A min) power is connected.
		OFF	Power is not connected, power supply is incorrect or bad, or BEFCMU10 is bad.
Activity	Green	ON	Connection to PC or other Ethernet device, either through the USB or Ethernet port.
		FLASH	Data is being transmitted to or from PC (or other Ethernet device) through the BEFCMU10.
		OFF	Ethernet or USB cable is not connected, or Ethernet Adapter or USB port is not configured properly.
Cable	Green	ON or FLASH	Data is being transmitted between the BEFCMU10 and the Internet connection.
		OFF	No data is being transmitted between the BEFCMU10 and the ISP/MSO
Status	Green	ON	Unit is connected and Registered to the network
		FLASH (0.125 sec)	Ranging process is OK
		FLASH (0.25 sec)	Downstream is lock, and sync OK; will flash if unit looses sync or connection
		FLASH (0.5 sec)	Scan Downstream Channel
		FLASH (1.0 sec)	Boot up, not ready
		OFF	Error Condition

Technical Support Script for BEFCMU10

1. Ask the Customer if there is any physical damage to the BEFCMU10.
   a. Examples of physical damage are:
      i. evidence that the BEFCMU10 has been dropped or tampered with; cracks; damaged plastic; missing rubber feet; missing screws; damaged ports
   b. If the BEFCMU10 has been physically damaged it is out of Warranty, the Customer should purchase a new BEFCMU10.
   c. If the BEFCMU10 is not physically damaged, then continue.

2. With the BEFCMU10 power disconnected, ask the Customer to check the coaxial cable and splitter (if used).
   a. If the Coaxial cable and/or splitter are not connected properly (e.g. loose connections, damaged coaxial cables, etc.), adjust or replace.

b. If the Coaxial cable and splitter are OK, then continue.

3. Ask the Customer to connect the power cable from the BEFCMU10 to the wall.
   a. Power will be indicated by a solid green Power LED on the BEFCMU10.
   b. If the Power LED is OFF, have the customer check the power cable and wall jack and/or power strip (switch). Possible issues are:
      i. No power from the wall jack or power strip (try a different wall jack or check the switch on the power strip)
      ii. Power Supply has a loose connection
      iii. Incorrect or bad Power Supply
      iv. The BEFCMU10 is non-functional
   c. If the Power LED is still not ON, then RMA the unit.
   d. If the Power LED is ON, then continue.

4. Verify the connection from the BEFCMU10 to the PC (either via Ethernet or USB).
   a. **For Customers using Ethernet connection to BEFCMU10:**
      Ask the Customer to plug an Ethernet cable into the BEFCMU10, and plug the other end into an Ethernet Adapter on the PC. (Ethernet cable can be straight-through or cross-over as the BEFCMU10 has an auto-sensing Ethernet port.)
      i. Ethernet connection will be indicated if the Activity LED is ON.
      ii. If there is no Activity LED, have the Customer check the Ethernet connection. Possible issues are:
         1. Problems with another device on the network. If another device (a router, for example) is connected between the BEFCMU10 and the PC, try connecting the BEFCMU10 directly to the PC's Ethernet Adapter.
         2. Bad or disconnected Ethernet cable. Have the customer verify that the Ethernet cable connections are secure, or try a different Ethernet cable. The BEFCMU10 will auto-detect the type of Ethernet cable (can be straight-through or cross-over).
         3. Bad or incorrectly installed Ethernet Adapter on the PC (e.g. not currently connected or drivers not properly installed). Troubleshoot the Ethernet Adapter. If the Customer is having problems with the Ethernet Adapter, direct the customer to their computer's Network Card Technical Support.
         4. Bad Ethernet port on the BEFCMU10. RMA the unit.
      iii. If the BEFCMU10 does have an Ethernet connection, then continue.
   b. **For Customers using USB connection to BEFCMU10:**
      Ask the Customer to plug a USB cable's square, type-B connector into the BEFCMU10, and plug the other end (rectangular, type-A connector) into a USB port on the PC. (Supported operating systems are Windows 98, Windows 98 Second Edition, Windows Millennium, Windows 2000, and future support for Windows XP.)

      i. USB connection will be indicated by a solid Green Activity LED on the BEFCMU10.

          1. Note: This only indicates that there is a physical connection. This does not indicate that the BEFCMU10's USB drivers have been loaded, neither does it indicate that the USB drivers are properly configured. The BEFCMU10 drivers must be installed for proper USB port functionality.

      ii. If there is no Activity light, have the Customer check the USB connection. Possible issues are:

          1. Problems with another device. If another device (a USB hub, for example) is connected between the BEFCMU10 and the PC, try connecting the BEFCMU10 directly to the PC's USB port.

          2. Bad or disconnected USB cable. Have the customer verify that the USB cable connections are secure, or try a different USB cable.

          3. USB port(s) not correctly configured on PC (e.g. drivers not properly installed or not currently connected). Troubleshoot the USB port. If the Customer is having problems with the USB port, direct the customer to their computer's Technical Support.

          4. Bad USB port on the BEFCMU10. RMA the unit.

      iii. If the BEFCMU10 does have a functional USB connection, then continue.

5. The Status LED should be ON.

    a. If the Status LED is not ON, try pressing the reset button on the back of the BEFCMU10. If the Status LED still does not flash or turn on, then the BEFCMU10 is non-functional, RMA the unit.

    b. If the Status LED is flashing, then the BEFCMU10 is booting and registering. This may take several minutes. The Status LED flash will progressively get faster through the registration process until it is solid.

    c. If the Status LED is ON, then continue.

6. The Cable LED should be flashing. During heavy traffic flow, the Cable LED may be ON.

    a. Note: The Cable LED will only flash after the Status LED is ON. Status LED is verified in Step 5.

    b. If the Cable LED is OFF, then no data is being transmitted between the BEFCMU10 and the ISP/MSO. Possible issues are:

      i. Cable connection has not been provisioned (have the Customer contact their ISP/MSO.)

> ii. The BEFCMU10 has not been identified (by MAC address) at the ISP/MSO (have the Customer contact the ISP/MSO with the MAC address information.)
> iii. PC's Ethernet adapter is not configured as DHCP, or is configured with incorrect IP address information (for customers assigned Static IP addresses).
> iv. No data is being transmitted between the BEFCMU10 and the ISP/MSO.
> v. The BEFCMU10 is non-functional, RMA the unit.
>
> c. If the Cable LED is flashing or ON, then continue.

7. **Physical installation is complete and verified.** Follow the LAN and WAN tests below if the Customer still does not have access to the Internet

IP Address Verification

This section assumes that the Cable connection has been provisioned by the ISP/MSO, and that the Customer has a DHCP account (e.g. has NOT been assigned a Static IP address). This information would be provided by the ISP/MSO.

1. If the Customer does not have access to the Internet, then
   a. From a Command Prompt, ask the Customer to type: **ipconfig** (or **winipcfg** depending on OS)
   b. Ask the Customer to check the IP address of the Ethernet Adapter connected to the BEFCMU10. If more than one Ethernet Adapter exists, have the customer verify that the correct Ethernet Adapter is being checked.
      i. If the resultant IP address is **169.254.x.x**, then the PC has not found a DHCP server. Possible issues:
         1. The Ethernet connection is bad (the PC does not see the BEFCMU10, or the PC is not set up for DHCP)
         2. The PC MAC address and/or Host name has not been registered at the ISP/MSO. Contact the ISP/MSO.
         3. If the Status LED is OFF, the BEFCMU10 is non-functional, RMA the unit.
      ii. If the resultant IP address is **192.168.100.x**, then:
         1. The PC has found the BEFCMU10, and
         2. Has resolved an IP address with the BEFCMU10 DHCP server,
         3. However the BEFCMU10 has not registered with the ISP/MSO.
         4. Verify the physical connection from the BEFCMU10 to the wall jack.
         5. Verify that the Cable connection has been provisioned, and that the ISP/MSO has the correct MAC address for the BEFCMU10.

iii. If the resultant IP address is anything else, then the customer is connected to the Internet (unless the Customer has been assigned a Static IP address by the ISP/MSO). If the Customer is still having issues accessing the Internet (e.g.: browsing or retrieving email), have the Customer contact the ISP/MSO.

   c. If the Customer can still not get an Internet IP on the PC from the ISP/MSO, and still does not have access to the Internet, then contact the cable modem service provider.

2. If the Customer has access to the Internet, then **INSTALLATION IS COMPLETE**.

LAN Connection (Ping Test)

1. These tests will determine if the BEFCMU10 can be accessed by the local network. Follow the steps below to verify the Ethernet connection indicated by the Activity LED on the BEFCMU10.
2. If the Customer has a DHCP account (has NOT been assigned a Static IP by the ISP/MSO) then the following changes are not necessary – continue to Step 4. TEST (1). If the Customer has a Static IP, then before these tests can be run, the Customer must change the local PC IP address to be on the same subnet as the BEFCMU10.
   a. Instruct the Customer to write down the current IP settings (so the PC can be changed back when the test is finished)
   b. Instruct the Customer to set the IP address to: 192.168.100.2 and the subnet mask to: 255.255.255.0
   c. After the tests are finished, instruct the Customer to change their IP settings back to what they were originally.
3. TEST (1)
   a. Ask the Customer to go to a Command Prompt (C:>)
   b. Ask the Customer to type **ping 192.168.100.1**
   c. If the response comes back "Destination Host Unreachable", the PC and BEFCMU10 are not on the same subnet, or there is no connection from the PC to the BEFCMU10.
   d. If the response is a "Reply from", then there is an Ethernet connection.
   e. After the tests are finished, instruct the Customer to change their IP settings back to what they were originally.
4. TEST (2)
   a. Ask the Customer to open a Browser Window
   b. Ask the Customer to type **http://192.168.100.1** in the browser address field.
   c. If the browser returns a "Page can not be displayed" message, then there is no connection, or the PC is not on the same subnet as the BEFCMU10, or the IP address of the BEFCMU10 has been changed.

d. If the browser opens the web interface to the BEFCMU10, then there is an Ethernet connection, and this interface can be used to check the status of the BEFCMU10 (instructions below).

e. After the tests are finished, instruct the Customer to change their IP settings back to what they were originally.

WAN Connection (Ping Test)

1. These tests will determine if the PC can be accessed by the cable network through the BEFCMU10.
2. These tests assume that the PC IP address is DHCP, or Static as assigned by the ISP/MSO. If the IP address has been changed (for example, if the IP address was changed to accomplish the tests above), make sure that the PC IP address has been reset to the original configuration.
3. TEST (3)
   a. Ask the Customer to go to a Command Prompt (C:>)
   b. Ask the Customer to type **ping x.x.x.x** (fill in the IP address a known working/valid IP address)
   c. If the response is "Not Found", then the PC is not connecting to the cable WAN (Internet). The problem could be with the BEFCMU10, with the PC, or with the cable connection. If the BEFCMU10 and the PC have passed all troubleshooting tests above, ask the Customer to contact the ISP/MSO.
   d. If the response is a "Reply from", then the Customer is connected to the cable WAN (Internet).
4. TEST (4)
   a. Ask the Customer to go to a Command Prompt (C:>)
   b. Ask the Customer to type **ipconfig** (or **winipcfg** depending on OS)
   c. Ask the Customer to read back the PC IP address of the Local Area Connection
   d. Ping the Customer PC IP address from the Tech Support Side.
   e. If the response is "Not Found", then the PC is not being seen by the cable WAN (Internet). The problem could be with the BEFCMU10, with the PC, or with the cable connection. If the BEFCMU10 and the PC have passed all troubleshooting tests above, ask the Customer to contact the ISP/MSO for cable network verification.
   f. If the response is a "Reply from", then the Customer is connected to the cable WAN (Internet).

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BEFCMU10 Status via Web Browser (Cable Modem Information Wizard)

This Web Browser access is not necessary to verify or enable connection, and the following screens are provided for informational purposes only.

1. Ask the Customer to access the BEFCMU10 via the browser window.
   a. Ask the Customer to open a Browser Window
   b. Ask the Customer to type **http://192.168.100.1** in the browser address field
   c. If the Customer does not have DHCP addressing enabled on the Ethernet adapter, have the Customer change the IP address on the PC to match the subnet of the BEFCMU10 before accessing the browser window, and remind the Customer to note their current IP settings before making any changes, so that they can revert back to their original settings after the test is complete.

2. System Information Page
   a. Provides basic information about the BEFCMU10, including hardware and firmware version.

Cable Modem
INFORMATION · WIZARD

| System | Startup | Signal | Status | Log |

System Information

This page provides the basic information about your cable modem.

Standard Specification Compliant	DOCSIS 1.0
Hardware Version	3.0
Software Version	1.0.4 Release 2 (befcmu10v104r2c.bin)
Cable Modem MAC Address	00:00:25:04:20:00
Cable Modem Serial Number	KBG1802277
CPE-end Interface	Ethernet & USB
CM certificate	Not Installed

Cable Modem Basic Information   Internet

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3. Startup Procedure Page
   a. Provides information about the startup process of the BEFCMU10. This page will correlate to the flashing Status LED.

Cable Modem
INFORMATION · WIZARD

| System | Startup | Signal | Status | Log |

Startup Procedure

The page provides information about the startup process of the cable modem.
You may check this connection sequence to know the current status of your cable modem.

Procedure	Status	Comment
Acquire Downstream Channel	Locked	531000000 Hz
Connectivity state	OK	operational
Boot state	OK	operational
Latest Adjustment Time	OK	Fri Nov 30 15:02:44 2001
Get Configuraton File	OK	basic_mic.cfg
Security	Disable	Disable

Cable Modem Startup Information   Internet

4. Signal Page
   a. Provides information about the status and quality of the communications between the BEFCMU10 and the cable modem network, including upstream and downstream information.

Cable Modem
INFORMATION · WIZARD

| System | Startup | Signal | Status | Log |

Signal

This page provides important information about the status and quality of the communications between your cable modem and the cable modem network.

Downstream Channel

The data shown in the table below provides information about the signal coming from the network to your cable modem.

Lock Status	Locked	Modulation	QAM256
Channel ID	0	Symbol rate	5360537 sym/sec
Downstream Frequency	531000000 Hz	Max Bit Rate	No Limit
Downstream Power	4.96 dBmV	SNR	36 dB

Upstream Channel

The data shown in the table below provides information about the signal being transmitted to the network from your cable modem.

Lock Status	Locked	Modulation	QPSK
Channel ID	1	Symbol rate	2560 ksym/sec
Upstream Frequency	30000000 Hz	Max Bit Rate	No Limit
Upstream Power	49.00 dBmV		

Cable Modem Basic Information | | Internet

5. Status Page
   a. Provides information about the operational status of the BEFCMU10 and the PC(s) connected to it, including the system-up-time and IP addresses of both the BEFCMU10 and the PC(s).

Cable Modem
INFORMATION · WIZARD

| System | Startup | Signal | Status | Log |

Status

This page provides important information about the operational status of your cable modem and the device(s) you have connected to it.

Cable Modem

The data shown in the table below provides information about the operational status of your cable modem.

System Up Time	12min:2sec
Network Access	Allowed
Cable Modem IP Address	172.16.0.11

CPE Connections

The data shown in the table below provides information about the customer premise equipment (CPE) connected to your cable modem.

CPE	MAC Address	IP Address	Connect To
PC-1	00 : 00 : 00 : 17 : df : 78	40.0.0.4	Ethernet

Cable Modem Status Information   Internet

6. Log Page
    a. Provides information that can be used to resolve problems with the BEFCMU10

Cable Modem
INFORMATION · WIZARD

| System | Startup | Signal | Status | Log |

Log
This page provides important information that can be used to resolve problems with your cable modem.

Time	Priority	Description
2001-11-30 14:57:49	information	Scan Downstream Frequency...
2001-11-30 14:57:54	information	Sync recovery loop is locked
2001-11-30 14:57:57	information	Beginning ranging process. Initial Power=49.00 dBmV
2001-11-30 14:57:57	information	Got a map with the new UCD change count, and changed upstream parms
2001-11-30 14:57:59	debug	DHCP_coldstart() successfully
2001-11-30 14:57:59	information	DHCP: IP complete
2001-11-30 15:06:25	information	Processing Configuration File
2001-11-30 15:06:25	information	Sending Registration Request
2001-11-30 15:06:25	information	Received REG-RSP from CMTS
2001-11-30 15:06:25	notice	Cable Modem Status set to Registration Complete
2001-10-15 10:26:26	information	Authorized
2001-11-30 15:06:25	notice	CM RF interface LinkUp
2001-11-08 15:30:57	warning	Cable Lost FEC lock
2001-11-08 10:01:03	warning	Never Found the Downstream from CMTS
2001-11-07 16:35:22	notice	SW Download INIT - Via NMS SW file:befcmu10v104r2c.bin - SW server:10.0.0.2
2001-11-07 16:35:49	notice	SW download Successful - Via NMS SW file:befcmu10v104r2c.bin - SW server:10.0.0.2
2001-11-08 15:03:12	critical	SYNC Timing Synchronization failure - Failed to acquire FEC framing
2001-11-08 13:35:48	critical	SYNC Timing Synchronization failure - Loss of Sync
2001-10-17 15:14:57	information	USB config ready

Cable Modem Event log Information   Internet