D.8.0 Instruction Manual

The wording shown below will be inserted into each instruction manual.

This manual will be provided to the end-user with each unit sold/leased.

WAVEACCESS
WIRELESS COMMUNICATIONS

NetWeaver™ CU132
Point-to-Multipoint Central Unit

QUICK INSTALLATION GUIDE

Limited Warranty

WaveAccess, Ltd. warrants that the hardware incorporated in this product shall be free from defects in workmanship and materials, for the period of one (1) year from the date of original purchase. The foregoing warranty does not apply to any product which has been the subject of misuse (including static discharge), neglect, accident, tampering, or modification. WaveAccess' sole obligation to you for products failing to meet this warranty shall be, at WaveAccess' discretion, to repair or replace the nonconforming product, where: 1) you have obtained a valid Return Merchandise Authorization (RMA) number from WaveAccess' customer support, 2) you have returned the nonconforming product to WaveAccess, freight and insurance prepaid, and 3) WaveAccess has determined that the product is nonconforming and that such nonconformity is not a result of improper installation, repair or misuse by you or any third party. Any product replaced under this warranty shall become the property of WaveAccess and replacement products may be new or reconditioned products.

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Some states do not allow the exclusion of implied warranties or the limitation of incidental damages for consumer products. Therefore, the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights that may vary from state to state.

FCC WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: *Any changes or modifications of equipment not expressly approved by WaveAccess could void the user's authority to operate this equipment.*

Canadian Emissions Requirements:

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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1.   General

This booklet is intended to give a quick overview to installing the *NetWeaver CU132* Central Unit. After reading it, you will be able to quickly install your wireless Point-to-Multipoint system's central Point of Presence (POP). If you have a complex system requiring more advanced configuration, use a network management system, or if you need to change the *NetWeaver CU132*'s settings you should then read the User's Guide in the enclosed diskette. In all cases, it is suggested that you read this booklet first.

1.1   Packing List

The *NetWeaver CU132* arrives in a single package which includes the following items:
- *NetWeaver CU132* wireless central unit,
- A power supply,
- This Guide,
- Software diskette which includes the User's Guide in Adobe Acrobat (PDF) format.

You should also have received a second package which includes the antenna and cable kit you ordered with the system. This kit typically includes the antenna, antenna cable(s), transition cable, female-to-female N-type adapter (if necessary), external filter (for certain specific antennae in Europe or ETSI compliant countries), RF cable clamps and a lightning arrestor (if ordered).

[**Note:**]   You should have received all these items. If any of these items is incomplete or missing you might not be able to properly install the *NetWeaver CU132*. Please contact immediately your nearest Customer Support center.

1.2   System Overview

The *NetWeaver* is a Point-to-Multipoint (P-t-M) wireless access system capable of supporting hundreds of remote sites (single workstation or complete network at each remote). *NetWeaver* employs Frequency Hopping (FH) Spread-Spectrum technology at data rates of 3.2 and 1.6 Mbps. The FH radio provides good immunity against interference and enables operation of collocated systems, thereby increasing overall data throughput. *NetWeaver* has been optimized for IP traffic and provides high speed networking at distances of several miles.

The system is composed of central (*NetWeaver CU132*) and remote (*NetWeaver MDR132* and *SDR132*) units. The unit is designed for indoor use with the antenna outdoors. Up to ten central units can be collocated at a central site, allowing incremental network deployment.

The *NetWeaver CU132* transmits to all its corresponding remote units in a point-to-multipoint manner. The system software and bridging functionality ensure that data is only delivered to the correct remote unit. The *NetWeaver* remote units transmit to the central site in a *point-to-point* manner, the remote *NetWeaver* units **never** transmit in P-t-M mode.

Whenever more than a single *NetWeaver CU132* is operational at a single site, the collocated units must coordinate their transmissions to minimize interference. WaveAccess' **RFStacker**™ technology for

transmission coordination allows multiple *NetWeaver* antennae to be located in close proximity without jamming each other. However, since they still employ frequency hopping patterns which may collide from time to time, a relative degradation in throughput should be expected. As a result, when you have 10 collocated central units this may result in each utilizing only about 70 to 80 percent of the total throughput (i.e., the central site is 7 to 8 times greater than a single central unit).

In Figure 1, you can see an example configuration where three *NetWeaver CU132* are collocated at the same central site. In this case, you can see that all the central units are interconnected not only through the Ethernet LAN at the central site, but also by a separate connection which is used to "daisy-chain" the central units. This second connection is the one used to coordinate transmissions.
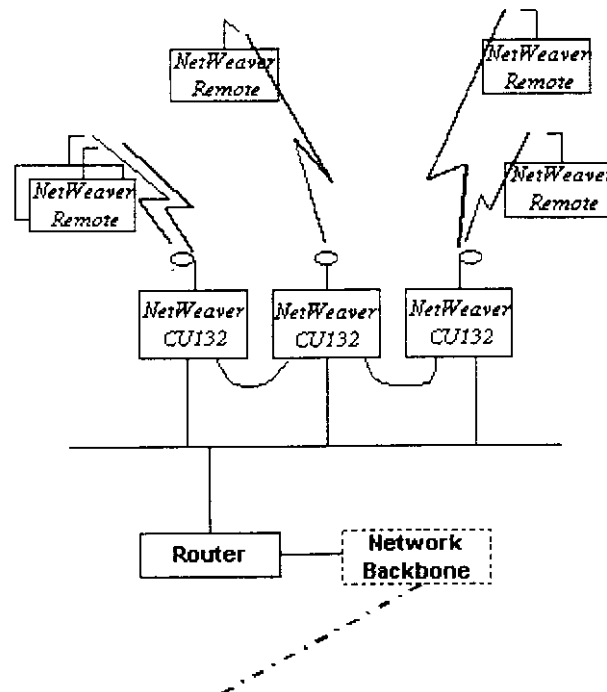

Figure 1, Example *NetWeaver* System Topology

The antenna type used in the *NetWeaver CU132* depends only on the geographical coverage required by the central unit. If 360° coverage is required by only one *NetWeaver CU132*, an omnidirectional antenna is suggested. If multiple central units are collocated, or only partial coverage is required, sector antennae should be used.

Please note that since the *NetWeaver CU132* transmits in P-t-M mode to all its associated remotes, it must adhere (in the US) to the FCC regulations which limit the transmission to +36 dBm in the combination of transmitter power and antenna gain. The *NetWeaver* remote units are not subject to this limit since they operate in point-to-point mode. Other countries have different output limits, *NetWeaver* has been designed with these constraints in mind, and the configuration sold in each country meets these local regulations.

2. Quick Installation

This chapter is intended to guide users in the basic installation process.

2.1 Wireless Set-Up Information

As part of the installation process, you will be requested to input your *NetWeaver CU132*'s ESS-ID number. Your wireless adapter comes with a default ESS-ID value, but for security (or non-interference reasons) you might want to assign a different ESS value to your network.

Please inquire from your system administrator what is your network's ESS-ID number. It is suggested you write it down here for quick reference:

Network's ESS-ID Number: _____

If you are employing several collocated *NetWeaver CU132* central units, they must all have the same ESS ID value in order to form a single network. This will also help in reducing interference. They must all have different hopping sequences in order to minimize interference between the different network sectors (you can choose among twenty-six different hopping sequences).

2.2 *The* NetWeaver CU132 *Antennae*

The *NetWeaver CU132* has several antenna options.

[*Warning:*] The antenna connectors on the *NetWeaver CU132*'s front panel are non-standard. Care should be taken that they are not damaged, since they cannot be replaced. Also antennae other than those supplied with the *NetWeaver CU132*, will not fit properly and might cause harmful interference.

[**Note:**] All of the *NetWeaver CU132*'s outdoor antenna options must be professionally installed. The cable kit provided by WaveAccess with all external antennae, which includes a transition cable from the non-standard connector(s) on the *NetWeaver CU132* to a standard N-type connector(s), must be used for all outdoor antenna installations. **These antennae must be professionally installed complying with the certified antenna and cable kits.** Please carefully review and follow the installation instructions included with each individual antenna kit. If you have any questions, please contact your nearest Customer Support center.

2.2.1 Antenna and Cable Options

The following tables show the antenna options and their specifications.

Note that these figures reflect a 10 dB margin over ideal free space propagation and use the shortest permitted cable (see minimum cable segment length below). It is assumed that the remote end (*NetWeaver SDR132* or *NetWeaver MDR132*) uses its largest antenna, PG24, and the shortest permitted

cable. The central antenna is assumed to have a horizontal deviation from the remote equal to a quarter of its horizontal beamwidth (irrelevant in the case of Omni antennae).

The minimum segment length listed in Tables 5 and 6 indicates the minimum certified cable length per cable type. You should never attempt to use antenna cables with a loss of less than 1.3dB. For range calculations involving a different set of parameters (antenna types, cable losses, antenna aiming offset, etc.) WaveAccess has provided an Excel-based calculation tool in the enclosed disk. To determine your optimal setup and expected performance, use this spreadsheet or call your Customer Support center.

When antennae with narrow elevation beamwidths are employed and there are remotes scattered at various (short and long) distances with significant height differences between them, a situation where some remotes may not be within the main beam of the antenna may occur. In order to avoid this, one may consider optimizing the antenna tilt for the distant remotes as well as adding a central unit with a low gain omni antenna (such as OM08 or OM05) to simultaneously provide coverage for the nearby remotes.

Antenna Type	Gain	Beamwidth Horizontal/ Vertical[2]	Down Tilt	Range 3.2 Mbps[3] (miles)	Range 1.6 Mbps[3] (miles)
Omni[1]	10 dBi	360° / 8°	0, 2, 4°	1.9	7.7
	8.1 dBi	360° / 15°	N/A	1.5	6.1
	5.1 dBi	360° / 38°	N/A	1.1	4.4
Parabolic Dish[1]	19 dBi	18° / 20°	+/- 10°	5.0	20.0
Sector Panel[1]	16.1 dBi	90° / 7°	w/brackets	3.6	14.2
	12.5 dBi	90° / 10°	N/A	2.4	9.5
Narrow Sector Panel[1]	20 dBi	22.5° / 10.5°	w/brackets	5.6	22.4
	17 dBi	22° / 22°	+/- 10°	4.0	15.8

Table 1, US Antenna Options

Antenna Type	Gain	Beamwidth Horizontal/ Vertical[2]	Down Tilt	Range 3.2 Mbps[3] (km)	Range 1.6 Mbps[3] (km)
Omni[1]	10 dBi	360° / 8°	0, 2, 4°	2.2	7.9
	8.1 dBi	360° / 15°	N/A	1.8	6.3
	5.1 dBi	360° / 38°	N/A	1.3	4.5
Parabolic Dish[1]	19 dBi	18° / 20°	+/- 10°	5.8	20.6
Sector Panel[1]	16.1 dBi	90° / 7°	w/brackets	4.1	14.5
	12.5 dBi	90° / 10°	N/A	2.7	9.7
Narrow Sector Panel[1]	20 dBi	22.5° / 10.5°	w/brackets	6.5	23.1
	17 dBi	22° / 22°	+/- 10°	4.6	16.3

Table 2, Canada Antenna Options

Antenna Type	Gain	Beamwidth Horizontal/ Vertical[2]	Down Tilt	Range 3.2 Mbps[3] (km)	Range 1.6 Mbps[3] (km)
Omni[1]	10 dBi	360° / 8°	0, 2, 4°	0.5	1.8
	8.1 dBi	360° / 15°	N/A	0.4	1.4
	5.1 dBi	360° / 38°	N/A	0.3	1.0
Parabolic Dish[1]	19 dBi	18° / 20°	+/- 10°	1.1	3.8
Sector Panel[1]	16.1 dBi	90° / 7°	w/brackets	0.8	2.7
	12.5 dBi	90° / 10°	N/A	0.5	1.8
Narrow Sector Panel[1]	20 dBi	22.5° / 10.5°	w/brackets	1.2	4.3
	17 dBi	22° / 22°	+/- 10°	0.90.6	3.0

Table 3, European (ETSI) Antenna Options

Antenna Type	Gain	Catalog No.	Size (inches)	Mast Outside Diam. (inches)
Omni[1]	10 dBi	OM10	48 x 2.25	0.75-4.0
	8.1 dBi	OM08	30 x 1.5	
	5.1 dBi	OM05	13.5 x 1.3	≤2
Parabolic Dish[1]	19 dBi	PS19	19.25 F x 10	1.75-4.0
Sector Panel[1]	16.1 dBi	ST16	42 x 6.1 x 2.8	1.25-4.0
	12.5 dBi	ST12	26 x 3 x 1	
Narrow Sector Panel[1]	20 dBi	PN20	24 x 11.8 x 3	0.75-3
	17 dBi	PN17	12.6 x 11.8 x 3	0.75-3

Table 4, Antenna Physical Characteristics

Notes:

(1)   Some antennae have a female and some have a male N-type connector. In case of the latter a female-to-female N-type adapter should be supplied with the antenna.

(2)   All antennae should be mounted in a vertical polarization configuration (see the installation instructions included with each antenna kit).

Cable Number	Type and Outer Diameter	Attenuation Coefficient (dB/100 ft)	Minimum Segment Length (ft)
LMR-400	Flexible, 0.4"	6.7	20
LMR-600	Flexible, 0.6"	4.4	30
LMR-900	Flexible, 0.9"	2.9	45
LMR-1200	Flexible, 1.2"	2.2	60
LMR-1700	Flexible, 1.7"	1.7	80
LDF4-50A	Heliax 1/2", 0.63"	3.9	35
LDF5-50A	Heliax 7/8", 1.10"	2.2	60
LDF6-50	Heliax 1-1/4", 1.55"	1.6	85

Table 5, US Cable Assembly Options

Cable Number	Type and Outer Diameter	Attenuation Coefficient (dB/10 m)	Minimum Segment Length (m)
LMR-400	Flexible, 0.4"	2.20	6.1
LMR-600	Flexible, 0.6"	1.43	9.1
LMR-900	Flexible, 0.9"	0.97	13.7
LMR-1200	Flexible, 1.2"	0.73	18.3
LMR-1700	Flexible, 1.7"	0.56	24.4
LDF4-50A	Heliax 1/2", 0.63"	1.28	10.7
LDF5-50A	Heliax 7/8", 1.10"	0.72	18.3
LDF6-50	Heliax 1-1/4", 1.55"	0.52	25.9

Table 6, Canada and Europe Cable Assembly Options

2.2.1.1 Omnidirectional Antennae

There are three omnidirectional dipole antennae available for the *NetWeaver CU132*. All are meant for external mounting, should be used when full 360° coverage is desired. When these antennae are mounted on a mast, they should be located as high as possible in order to avoid any other object being located besides it.

The OM10 (and to some extent the OM08) omni antenna has very narrow elevation (vertical) beamwidth. Both the height and distance separation between the two sites must be taken into consideration when selecting this antenna. In most cases it is suggested that you order the appropriate down tilt option ahead of time, if available for that particular antenna, in order to maximize the coverage area.

2.2.1.2 Parabolic Dish Antenna

This is a high-gain directional antenna designed to provide narrow sectorization. This antenna is designed for outdoor mounting and can withstand extreme weather conditions. Please note that this antenna has a very narrow beam (only 18° horizontally) and should, therefore, only be used when conditions actually require it or when a very narrow coverage area is needed.

2.2.1.3 Sector Panel Antennae

These antennae are suitable for sectorization of the Central Unit POP. It is the best choice when several wide angle coverage sectors are required. Please note that at the 90° edges there is a drop in the antenna gain (as much as 3 dB), therefore, it is suggested that you overlap these antennae, and try to use only half the beamwidth as the sector width. With these antennae (especially ST16), down tilt must also be taken into consideration.

2.2.1.4 Narrow Sector Panel Antennae

These antennae are suitable for narrow sectorization of the Central Unit POP. It is the best choice when the remote sites are clustered in small areas. Here too there is a sharp cutoff of the antenna gain and is suggested that you overlap these antennae, using approximately half the beamwidth as the sector width.

2.2.2 Cable Options

All antennae come with a 20' LMR-400 cable kit, unless ordered differently. The standard kit consists of:

- A 2 feet transition cable which connects on one side to the non-standard connector on the panel (*"Main"*), and on the other side to a standard N-type male connector. This cable is relatively thin and functions as stress relief between the long and thick antenna cable to the box.
- A 20 feet low loss cable with male and female N-type connectors, respectively, on its two ends.

The effect of the standard kit's losses on the system's range is already included in the antennae options table above.

[Note:]   All RF cables, including the transition cable, have to be anchored down in order to minimize the risk of breaking the *NetWeaver CU132*'s RF connector(s) and/or having the cables pulling the system. The provided cable clamps should be anchored to a solid object or wall.

In order to cover distances greater than 20 feet between the antenna and the *NetWeaver CU132*, you may order additional segments of 20 feet LMR-400 cable. All segments have the same male-female N-type connectors, so they can be easily extended to any multiple of 20 feet. Each additional cable segment, on either side of the link, reduces the system's range by 20%.

You can also use other cable types (see table 6 above) to increase the distance between the antenna and the *NetWeaver CU132*. Please note the minimum lengths required for each cable type.

2.2.3 Lightning Protection

First and foremost it is critical to connect the shield/enclosure of the antenna and/or cable to a good ground before the entry to the building. This will provide some lightning protection. In addition, it is highly recommended that every outdoor installation employ a lightning arrestor. The offered lightning arrestor has the same connector arrangement as the antenna cable segments (male/female). As a result, it can be installed between any two cable segments (the antenna and the transition cable are also considered "cables" for this purpose). However, the best location for the arrestor is just before the cable's entry to the building. In any case, the arrestor must be mounted outside the building.

The arrestor offered with *NetWeaver CU132* is self-resetting, meaning that no maintenance is needed even following a lightning strike. Follow the arrestor's installation instructions, and make sure that the grounding solution is according to those instructions.

2.3 Initial Installation

Before you install the unit you must choose a good location for your antenna to ensure a line of sight to the *NetWeaver SDR132* and *NetWeaver MDR132* remote stations. You must also ensure the shortest possible distance between the *NetWeaver CU132* and the antenna to minimize cable-loss.

2.3.1 Placement of the Antenna

[*Warning:*] The *NetWeaver CU132* antenna, should be installed **ONLY** by experienced antenna installers that are familiar with local buildings and safety codes, and wherever necessary are licensed by appropriate government regulatory bodies. Failure to do so may void the Product Warranty, as well as expose the end user to legal and financial liabilities. WaveAccess, its agents, resellers, or distributors, are not liable for injury, damage or violation of government regulation associated with the installation of the antenna.

The installer is also responsible that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines. Those guidelines imply that no human may conceivably be found within one foot of the front of the antenna. If such a situation may occurr, the installer is responsible for placing the appropriate caution signs to warn the public. WaveAccess, its agents, resellers, or distributors, are not liable for exposure to excessive RF energy levels due to improper antenna installation.

The front panel of the *NetWeaver CU132* has two antenna connectors, marked *Main* and *Aux*. Use *Main* only.

If you are using a single antenna, you must connect it to the front panel connector marked *Main* (the rightmost one). Use the leftmost connector, marked *Aux*, for diversity.

Figure 2, Front Panel of the *NetWeaver CU132*

The *NetWeaver CU132* has not been designed for outdoor use. It must be installed indoors and connected to the outdoor antenna using the supplied cable (see Figure 3). Installing a *NetWeaver CU132* outdoors will void its warranty.
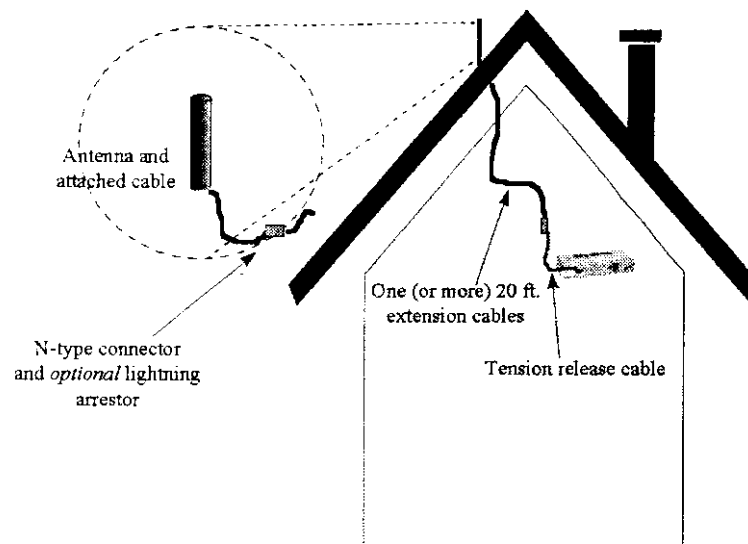

Figure 3, System Installation

Mount the antenna using the enclosed brackets, and according to the instructions included in the antenna and cable kit that you purchased. Align the antenna in the general direction of the remote units that this CU132 needs to cover.

Install the *NetWeaver CU132* as near the antenna as possible to minimize the cable length. If you require longer cables, please contact WaveAccess or your local distributor to get an extension.

[*Warning:*] Using an antenna or cable other than those recommended or supplied with the *NetWeaver CU132*, whether installed indoors or outdoors, could cause degradation of the system and could void the authority to operate this equipment. In addition, **the use of unauthorized antennae or external amplifiers violates Federal law and FCC's regulations**. Doing so may void the Product Warranty, as well as expose the end user to legal and financial liabilities.

[*Warning:*] The *NetWeaver CU132* antenna emits high radio frequency energy levels. In situations when unauthorized persons may approach in close proximity to the front of the antenna, an

appropriate warning sign to advise against approaching within 1 ft (30 cm) from the front of the antenna, should be placed near the *NetWeaver* antennae.

For safety reasons, an antenna installed outdoors should be fitted with a lightning arrestor. Such devices protect the *NetWeaver CU132*, as well as the life of any person in contact with the wireless access station when the antenna is struck by lightning.

[*Warning:*] A lightning arrestor should be installed on any antenna mounted outdoors. Failure to do so may void the Product Warranty. WaveAccess, its agents, resellers, or distributors, are not liable for injury or damage caused by lightning striking the antenna.

After you have installed the antenna, the installation is a simple process:

2.3.2   Connecting The *NetWeaver CU132* To The Network

The next step is to connect the *NetWeaver CU132* to your network. To do this all you need is a standard 10Base-T (UTP) Ethernet cable.

Connect one end of the cable to the hub or router. Connect the other end to the back side of the *NetWeaver CU132*, to the connector marked *ETHERNET*. The system is now connected and ready to begin work.

2.3.3   Connecting Several Collocated *NetWeaver CU132*s

If you have a large or multi-sectored POP, you will to collocate several *NetWeaver CU132* units. You do this by connecting the different *NetWeaver CU132* units together using a standard 10Base-T (UTP) Ethernet cable.

Connect one end of the cable to the rear side of the *NetWeaver CU132*, to the connector marked either *LINE 1* or *LINE 2*. Then connect the other end of the cable to the next *NetWeaver CU132* making sure you connect it to the other connector.

For example, if you connected the cable on the first *NetWeaver CU132* to *LINE 2*, on the second *NetWeaver CU132* you must connect the cable to *LINE 1*. The system is now connected and ready to begin work.

2.3.4   Powering Up The Central Unit

Next, connect the round connector of the power supply to the *DC IN* connector in the back of the *NetWeaver CU132*. After the power supply has been securely connected to the unit, plug it in to the mains.

[*Warning:*] Use only the supplied power supply. Using a different power supply may damage the *NetWeaver CU132* and invalidate the FCC certification.

[Note:]   Always connect the power supply to the unit first. Plug it in only after it has been connected to the Central Unit.
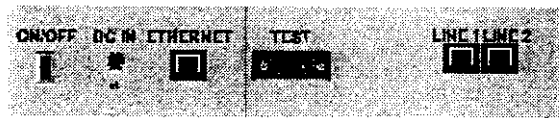

Figure 4, *NetWeaver CU132* **Central Unit's Rear Panel**

Once you have plugged it in, raise the power switch in the back of the unit to turn it on. At this point, the *PWR* LED should have lit up, this signals that the *NetWeaver CU132* wireless Central Unit has powered up.

After ten seconds the *OK* LED will blink. This signals that the initial system software (also called software Version 0) has loaded correctly and the *NetWeaver CU132* has completed its self-test routines. After a few seconds, the programmable system software (or Version 1) will have been loaded and the *OK* LED will light continuously. For an explanation of the difference between the initial system software and the programmable system software, see the User's Guide.

If you have connected your *NetWeaver CU132* to the Ethernet network, you will see the *Link* LED light continuously to signal that the network has been detected and they are communicating. After you have completed these steps, your *NetWeaver CU132* wireless unit is working and ready for final configuration.

The *NetWeaver CU132* has three other LEDs, *ETX*, *WTX*, and *Sync*. The *ETX* LED will momentarily blink whenever the *NetWeaver CU132* sends a packet to the Ethernet network. The *WTX* LED will blink whenever the *NetWeaver CU132* transmits a packet over the radio medium.

The *Sync* LED has two states, either blinking fast or continuously lit. When this LED is blinking, it signals that the unit is not communicating with another Central Unit. Whenever the *Sync* LED lights continuously, it means that the *NetWeaver CU132* has discovered a collocated *NetWeaver CU132* **Central Unit** and they are communicating over the cable connected in Section 0, above.

2.4   Basic Software Configuration

This section refers to the basic parameters which you must set-up in order to install the *NetWeaver CU132*, if the default values are not being used. The *NetWeaver* remotes must work with a Central Unit to connect to the Internet service provider's network.

[Note:]   If you are installing the *NetWeaver CU132* wireless Central Unit using the shipped default values, you can skip this section.

To configure these parameters, you need to have a *bootp* server and *tftp* capabilities. These are standard features on many operating systems such as Unix, and are also available as add-ons to Novell NetWare or Windows NT. There are also several Windows-based *bootp* and *tftp* software modules available. In

the event that you do not have access to *bootp* and *tftp*, see the User's Guide for a list of possible sources for this kind of support.

Figure 5, Example TCP/IP Configuration of *NetWeaver CU132*

In Figure 5, you can see an example of configuring the *NetWeaver CU132*'s IP address on the *bootp* server. This example is based on NetManage's Chameleon TCP/IP suite, most other *bootp* server software have similar screens that allow you to input your wireless adapter's MAC address and what will be its IP address.

2.4.1   Setting Up *bootp* and *tftp*

The remote bootstrap procedure, *bootp*, needs to request a boot file from the *bootp* server. It does this by sending a request with its proper MAC address (the MAC number in the ID label).

Every *NetWeaver CU132* has both a MAC address and default IP address, hop sequence and ESS-ID. When setting up your *bootp* and *tftp* server, you decide which wireless access station to bootstrap and what are their respective *bootp* files and IP addresses.

[Note:]   The wireless access unit's IP address, as well as the *tftp* server are not used for the *bootp* process. These items are only relevant in further configuration and management stages.

To indicate the unit to be bootstrapped, you include the MAC address to bootstrap as well as the name of the *bootp* file (and its path, if needed). Once the *boot* and *tftp* server have this information, all you have to do is turn on the *NetWeaver CU132*, which will then query the server to receive the information. The server then sends the appropriate information based on the querying MAC address. To create the *bootp* bootstrap file, read the Section below.

2.4.2   The *bootp* Configuration File

All the basic configuration changes are performed using a *bootp* file. This feature allows a *NetWeaver CU132* to boot from an external source instead of using its internally stored data.

When you perform an external boot, the information you give the wireless LAN station through the *bootp* file is stored in the *NetWeaver CU132* and used in all subsequent automatic bootstraps (without any further need for a *bootp* server). To perform an external boot, *bootp* needs a file that will be used to bootstrap the system, this is called the *bootp file*. When setting-up your server the *bootp file*'s name and path must be specified.

```
BASIC_CONFIGURATION
        Example Configuration
        Switch_To_Version 1
        ESS_NO 5266
END
```

Figure 6, Typical *bootp* File

The *bootp* (or configuration) file contains a few parameters that are read by the *NetWeaver CU132* and used to set-up the bootstrap requirements. Other parameters are presently updated only through a SNMP manager or using the ASCII monitor system, for explanation on how to use these configuration systems see the User's Guide.

The first line of the *bootp* configuration file should always include the header line ***BASIC_CONFIGURATION***. This informs the unit that the following lines are configuration items. The last line of the *bootp* configuration file should always be the closing line, ***END***. Other possible items are:

*   ***Switch_To_Version*** this chooses between initial system software and programmable system software
*   ***ESS_NO*** this chooses the ESS-ID number
*   ***#*** it is used to denote that from this point to the end of the line we have entered a comment.

The *NetWeaver CU132* software diskette includes a sample *bootp* file called ***nw0.bf***. This file can be used as a basis to create your own bootp files.

A program called ***btptest.exe*** is also included in the software diskette, and it is used to check if the bootp file is correct or has an error.

[Note:]   You **should** use the testing program before performing a *bootp* with your file. This will avoid errors that could take time to correct.

2.4.2.1 Switch_To_Version

This parameter receives a value of either **1** or **0**. Its purpose is to inform the *NetWeaver CU132* whether it should switch to the programmable system software (Version 1) at the end of the bootstrap, or remain in the initial system software (Version 0). Version 1 is the operational software version typically used at all times, Version 0 is the basic (factory-loaded) software and it is used for support purposes.

A value of **1** causes the wireless central unit to switch to the programmable system software. This value should always be used in routine work.

A value of **0** causes the device to remain in the initial system software after bootstrap is complete. This value should only be used when instructed to do so by a software update or a Customer Support engineer.

[Note:]   In the initial system software (Version 0) the *NetWeaver CU132* disables the wireless network, and is only accessible through the Ethernet port. Never leave the system in this mode unless requested to do so by Customer Support. This will avoid errors that could take time to correct.

2.4.2.2 Changing the ESS Number

The ESS-ID number is changed using the *ESS_NO* bootp field. The *NetWeaver CU132* expects to receive in this field a valid ESS-ID Number.

A valid ESS-ID is any number between **0** and **8191** (13 bits). All *NetWeaver CU132* wireless access stations are configured at the factory with an ESS-ID of *5266*.

The ESS-ID Number is used to uniquely identify a wireless network. In order to connect to a Central Unit in the wireless access network, the wireless Home Unit should have the same ESS-ID number as the Central Unit.

[Note:]   For a *NetWeaver SDR132* wireless station or *NetWeaver MDR132* wireless access unit to join the wireless Internet network that has been established it must identify itself with the same ESS-ID Number as the *NetWeaver CU132* Central Unit. If the wireless station and the Central Unit have different ESS-ID Numbers they will reject each other's transmissions and will not communicate.

2.4.2.3 Entering Comments Using

Any text entered after the **#** sign on a line is considered a comment and is ignored by the *NetWeaver CU132*. This feature is useful for you to keep track of changes, and to document special features if you have multiple bootp files.

2.4.3   Bootstrapping From the *bootp* File

After the *bootp* file is complete, and has been tested using the *btptest.exe* program, we can bootstrap the wireless home unit. Turn the *NetWeaver CU132* off and then back on again using the power switch on the rear of the wireless access station.

The *NetWeaver CU132* will now inquire if there is a *bootp* and *tftp* server. If the server is found, it will proceed to receive the appropriate information, and boot according to the information in the *bootp* file.

This concludes the basic installation and configuration for the *NetWeaver CU132* wireless access station.

Limited Warranty

WaveAccess, Ltd. warrants that the hardware incorporated in this product shall be free from defects in workmanship and materials, for the period of one (1) year from the date of original purchase. The foregoing warranty does not apply to any product which has been the subject of misuse (including static discharge), neglect, accident, tampering, or modification. WaveAccess' sole obligation to you for products failing to meet this warranty shall be, at WaveAccess' discretion, to repair or replace the nonconforming product, where; 1) you have obtained a valid Return Merchandise Authorization (RMA) number from WaveAccess' customer support, 2) you have returned the nonconforming product to WaveAccess, freight and insurance prepaid, and 3) WaveAccess has determined that the product is nonconforming and that such nonconformity is not a result of improper installation, repair or misuse by you or any third party. Any product replaced under this warranty shall become the property of WaveAccess and replacement products may be new or reconditioned products.

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FCC WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning: *Any changes or modifications of equipment not expressly approved by WaveAccess could void the user's authority to operate this equipment.*

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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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D.7.0 Bill of Materials

Not Applicable