

# **User Manual**

## **Local Navigator Bluetooth Base Station**

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## 1. Introduction

### 1.1 Functionality

The product described herein is a LAN Access Point with a Bluetooth interface. To operate this device, an Ethernet (IEEE 802.3 with 10/100 Base TX) interface connected via a RJ45 plug is needed. Power is supplied via an external 6V/500mA power supply which is included in this package.

The Local Navigator Bluetooth Base Station is used to connect an intelligent wireless device, like a Notebook or a PDA, to an existing LAN via a radio interface. This is in order to connect a wireless device with a Bluetooth card to, e.g. access the Internet, transfer files or use printers.



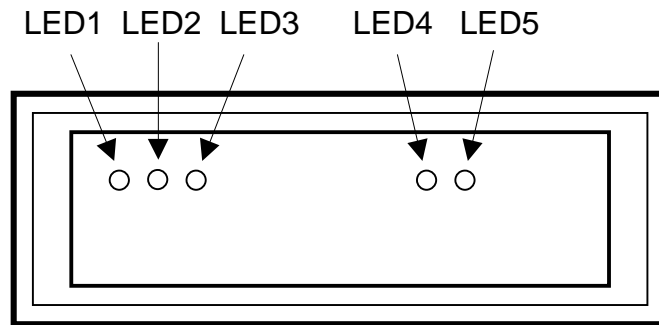
*Image 1.1 – The Local Navigator Bluetooth Base Station*

The new radio interface standard called Bluetooth is dedicated to supply the cost and power efficient installation of high-performance radio networks. The standard is defined in a way, that it can be used worldwide without any country-specific adaptations. The used radio frequencies are in the license-free ISM band, which is defined to be between 2.4 and 2.5 GHz. The radio transmission power (Class 3: 1 mW) is several orders of magnitude lower than that of GSM mobile phones. Bluetooth can therefore be used also in sensible areas with regard to radio transmission in general, e.g. medical areas. To achieve a good resistance against radio disturbances, the transmission is spread over a radio spectrum. The frequency used for transmission is changed 1.600 times per second. 79 different radio frequencies are available in total. Some single frequencies which are disturbed, have nearly no impact on the overall transmission characteristics.

## 1.2 Setup and External Interfaces

The housing is made of a two layered plastic case (Polystyrol UL94HB), a transparent front made of LUXACRYL, with five control LED's behind, and a back made of Aluminium.

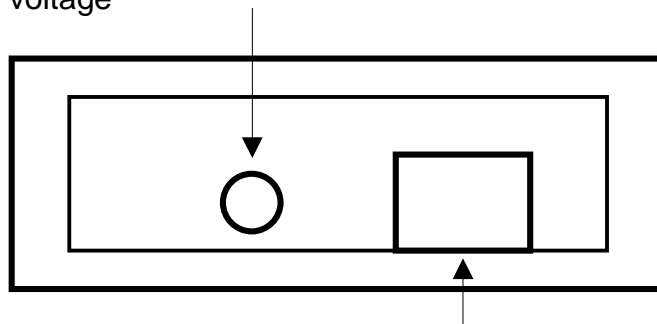
Front view:



LED1: red	Ethernet control
LED2: yellow	Ethernet control
LED3: green	Ethernet control
LED4: green	Operation
LED5: yellow	Status

Backside view:

DC input 6V/500mA for power supply with 2,5/2,1 mm plug, inside contact with positive voltage



RJ45 plug for 10/100Base-TX Ethernet interface IEEE 802.3

### **1.3 Security Notices**

lesswire may upgrade or change parts of the device, which may result in some differences of parts or data of this user manual.

The descriptions and procedures given in this user manual represent the data available at production of this document and these descriptions were checked thoroughly. Any liability for the content and any other liabilities are excluded.

- Read all installation notices carefully before connecting the device to power.
- The device is not specified for outside usage. It also cannot be used in humid environments and in rooms with care for explosives.
- The device does not have an explicit power switch. It automatically starts operation after connecting the power supply.
- Only use power supplies with the specified voltage and polarity and which are compliant with the security constraints of your country.
- Disconnect the power supply before opening the housing.
- There are no inside components which need customer maintenance. All maintenance, change, upgrade or repair work has to be performed by specially trained staff.
- When in operation, the security distance to the human body is 20cm, due to the radio transmission nature of this device.

For the LAN cable grounding:

- When the customer LAN is supplied by more than one power supply, the security groundings need to be tightly coupled.
- LAN cables can suddenly be exposed to hazardous high voltages (e.g. thunder storms, voltage peaks by energy suppliers). Care has therefore been taken when touching outside metal parts of LAN networks.

#### **Attention!**

All changes or modifications to the Local Navigator Bluetooth Base Station, which are not explicitly authorized by lesswire AG, can void the allowance for operation or the warranty!

## 2. Setup and Installation

### 2.1 Introduction

Please check the whole package for completeness of the content and for any viewable defects, before starting with the installation. Ensure, that the package has not been exposed to any humidity.

Please read the user manual and the security notices carefully.

### 2.2 Connecting the Local Navigator Bluetooth Base Station

#### 1. Connecting the device to the data line:

- The Local Navigator Bluetooth Base Station is connected to the 10/100 Base TX LAN network via a RJ-45 plug on the backside.
- To avoid any defects with the device, the officially valid security regulations for the setup of LAN networks need to be recognized.

#### 2. Connecting the device with power:

- Power is supplied via an external power supply with the voltage specified in this user manual.
- Please ensure, that your facility power supply is compliant with the input power of the AC adapter used.
- The output characteristics of the AC adapter have to be 6V / 500mA and need to be connected via a hole connector (positive voltage inside).
- Connect the device first with the LAN and then with power.

The Local Navigator Bluetooth Base Station is ready for service after connecting the data and then the power line.

After connection of the power supply, the green LED4 is switched on continuously and indicates the correct operation of the device.

The startup of the Local Navigator Bluetooth Base Station requires an initialisation phase. This phase is indicated by LED5 (yellow) flashing for appr. 3 seconds and then being switched off. The application is then correctly started.

### **3. Operational Modes and Configuration**

#### **3.1 Introduction**

Several parameters can be defined by the use of an internet browser in a way, that the operation in a network environment is performed without any problems. Elementary configurations like IP address, subnet mask and gateway IP address are defined. In addition, the operational mode (application and firmware update mode) is also defined. In the firmware update mode, an automatic firmware update via a FTP server as well as a manual upload of a new firmware can be accomplished.

#### **3.2 Operational Modes of the Base Station**

##### **3.2.1 Application Mode**

The application mode is the normal mode of the device. After shipment, the Local Navigator Bluetooth Base Station is always in the application mode which means, that it starts to execute the Bluetooth application after power-on.

When power is supplied, LED4 is switched on continuously and indicates the correct operation of the device. During a short initialization phase, LED5 is blinking for appr. 3 seconds and is then switched off again. After that, the application is started correctly and is ready for execution.

##### **3.2.2 Firmware Update Mode**

The user can also configure the Local Navigator Bluetooth Base Station in a way, that a firmware update can be performed. There are two general options for this procedure, one is the automatic firmware update, another is the manual firmware update.

When the automatic firmware update is selected, the Base Station starts a FTP client and searches after startup automatically for a FTP server in the network. After successful search of a FTP server, the Base Station searches the firmware update file on this server and start a FTP download. The new firmware is stored in the flash memory of the device and it is restarted with the new application software. If no FTP server can be identified, the existing application is started as usual.

When the manual firmware update is updated, the device will execute a FTP server after startup. From any FTP client in the network, a firmware upload can then be executed. This mode is indicated by a continuously flashing LED4 (green). After upload of the firmware file and the stop of the FTP session, the Local Navigator Bluetooth Base Station wil restart with the new firmware.

Configuration of the operational modes as well as of some necessary network setups required for the automatic firmware update are described in the following sections.

### **3.3 *Inquiry and Change of Parameters***

Inquiry of the actual setup of the Local Navigator Bluetooth Base Station is performed by a standard internet browser (Microsoft Internet Explorer or Netscape). Validity of the functionality and the network connection is also checked by the browser.

#### Procedure:

- Check, whether PC and Base Station are connected with the network and whether the Base Station is up and running (LED4 is switched on).
- Start the internet browser on your PC.
- Type the IP address of the Base Station into the address field of the browser and press 'Enter' or click 'Go'. The Local Navigator Bluetooth Base Station has the predefined IP address 172.16.200.86 after shipment.

If the PC can setup a connection with the device, the actual configuration of the Base Station is displayed by an internet page, as shown by the image 3.3.

Important Notice: If the Base Station is currently in manual firmware update mode (LED4 is blinking), access of the configuration is not possible. In this case, please perform a reset by disconnecting power.



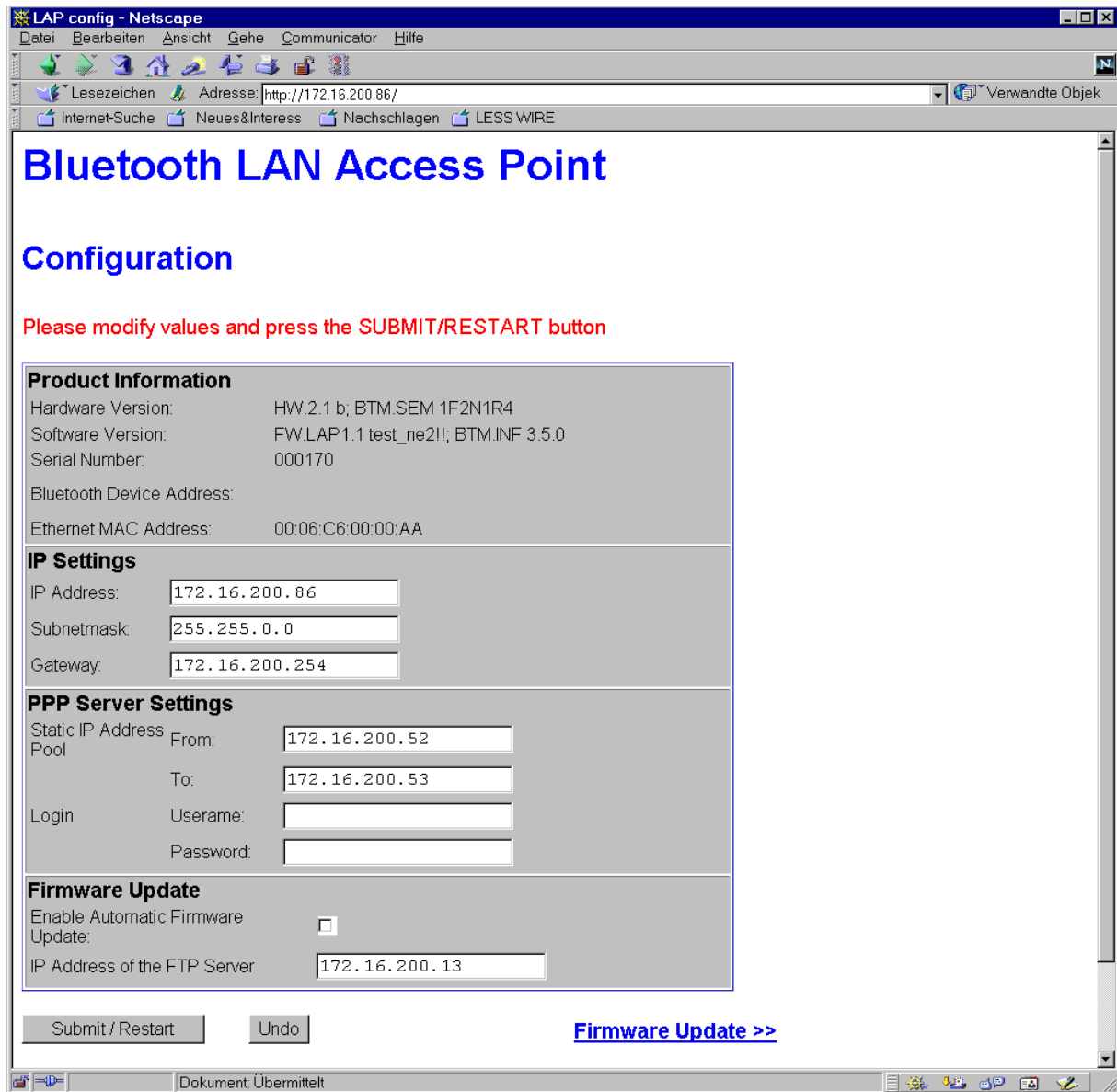


Image 3.3 – Configuration via HTML (default settings)

„Product Information“ lists some information about hardware and software versions of the device and of the include Bluetooth module. Serial number, Bluetooth device address and Ethernet address are also listed.

The following IP addresses can be edited manually. These inputs can be changed back by the Undo button of the browser.

When the configuration is finished, a click on the Submit/Restart button will transfer the data to the Base Station. The device will then perform a restart and the new parameters will be used.

A red status line in the upper view is showing the actual status of the configuration. If any bad value is entered and the Submit/Restart button is clicked, the status line will show the text ‘Bad values!’. Erroneous values will never be transmitted to the Base Station. All entered values can then be checked again, updated and transferred again.

**Important notice:** Before clicking on Submit/Resume, check all entered values for correctness and validity, especially the **setup of the IP address for the Base Station** and the **gateway IP address** and the **subnet mask** need to be verified thoroughly. It is a must to ensure, that the **default gateway IP address** and the **IP address** for the Base Station have the same address range!

The Local Navigator Bluetooth Base Station can only be accessed by an internet browser, when the configured IP address is known. This setting should therefore be indicated on the Base Station, e.g. by an appropriate label.

### 3.4 PPP Server Configuration

The PPP server settings are used to define the address area for the Bluetooth clients.

The first value (see Image 3.4: 172.16.200.52) is always the IP address of the Base Station as seen from the client side. All other addresses can be assigned to Bluetooth clients. These clients can then setup connections to the Base Station.

All Bluetooth connections which are setup by the clients, can be secured by a username / password inquiry, which will be performed before setup of a new connection. If no username and password is defined, any connection can be started without any user inquiry.

PPP Server Settings			
Static IP Address Pool	From:	<input type="text" value="172.16.200.52"/>	
	To:	<input type="text" value="172.16.200.53"/>	
Login	Username:	<input type="text" value="User1"/>	
	Password:	<input type="password" value="*****"/>	

*Image 3.4 - Example: PPP Server Settings*

### 3.5 **Shipment Settings**

To avoid inaccessibility of the Local Navigator Bluetooth Base Station, the shipment settings can always be recalled.

The following settings will be done, when the procedure is performed:

#### IP settings:

IP address:	172.16.200.86
Subnet mask:	255.255.0.0
Gateway:	172.16.200.254

#### PPP server settings:

Static IP address range from:	172.16.200.52
to:	172.16.200.53
Username:	-
Password:	-

#### Firmware update:

Enable Automatic Firmware Update:	<i>disabled</i>
IP address of FTP server:	172.16.200.13

#### Procedure:

- connect the power supply
- wait until LED5 (yellow) starts to blink and disconnect the power supply during the blinking phase
- reconnect the power supply and disconnect again during the blinking phase of LED5
- reconnect the power supply and watch LED5 being switched on statically for appr. 3 seconds
- the shipment settings are now stored again

## **4. Firmware Update**

### **4.1 Introduction**

The software of the Local Navigator Bluetooth Base Station will be updated several times in the future to follow up on additional needs of the customers and to stay in line with the Bluetooth standard. This product therefore includes a feature, by which the software can be upgraded in the future.

There are two options to perform a firmware upgrade. One is the automatic update of the firmware via a FTP server in the network. The other option is a manual firmware upload by any PC in the network.

### **4.2 Automatic Firmware Update**

When the automatic update mode is selected, the Base Station will try after the restart (click Submit / Restart button in the browser or power-up reset) to find a FTP server in the network under a pre-configured IP address. If this search is successful, the Base Station starts a FTP client. If a FTP server cannot be reached by the configured IP address, a restart without firmware update is performed. If the FTP server is addressed successfully and the FTP client could be started, a download file with the naming 'fwbs2\_XXX.bin' is searched on the FTP server. When a file with this naming convention is found, it is downloaded automatically. The Base Station checks whether the loaded file is a new version and if so, programs the new firmware to the flash.

The Local Navigator Bluetooth Base Station starts the new application automatically, when the flash is programmed.

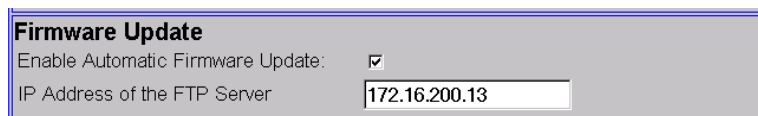
As long as the automatic firmware update mode is still set, this procedure is always performed after each restart of the device.

### Configuration of the Local Navigator Bluetooth Base Station:

The automatic firmware update mode is set by clicking into the check box 'Enable Automatic Firmware Update' as shown in Image 4.2.

The IP address of the FTP server, where the firmware files are stored also has to be specified in this dialog. It is a prerequisite, that the FTP server is in the same network as the Base Station.

When changing the data in this dialog, a click on Submit / Restart will transfer this information to the device and change the mode appropriately.



Firmware Update	
Enable Automatic Firmware Update:	<input checked="" type="checkbox"/>
IP Address of the FTP Server	<input type="text" value="172.16.200.13"/>

*Image 4.2 -Automatic Firmware Update*

After download of a new firmware version, the flash programming is started. This is indicated at the Base Station by LED4 and LED5 blinking in parallel. The following start of the application starts as usual with an initialization phase and LED5 is blinking for appr. 3 seconds. After that, the new application is in execution. To leave the automatic firmware update mode, the corresponding check box has to be disabled in the dialog and the Submit / Restart button has to be clicked.

Important notice: The discovery of new devices can in some networks last a specific time and is not possible in realtime. This can cause an inability to perform an automatic firmware update though configured, because the device is not already discovered in the network, when it starts a download. In this case the user or administrator should wait until the Base Station is discovered by the network and should then start a configuration session by the internet browser. A click on the Submit / Restart button should be sufficient to start a firmware update.

During automatic firmware update, the device is inaccessible for configuration.

A detailed description of the necessary configuration of the FTP server is given later in this document.

### 4.3 Manual Firmware Update

If the manual firmware update is active, a FTP server is started on the Base Station. It is therefore possible to perform a FTP upload by any PC in the same network

Necessary Configuration on the Local Navigator Bluetooth Base Station:

First, the Base Station has to be configured for manual update as shown in the following image.

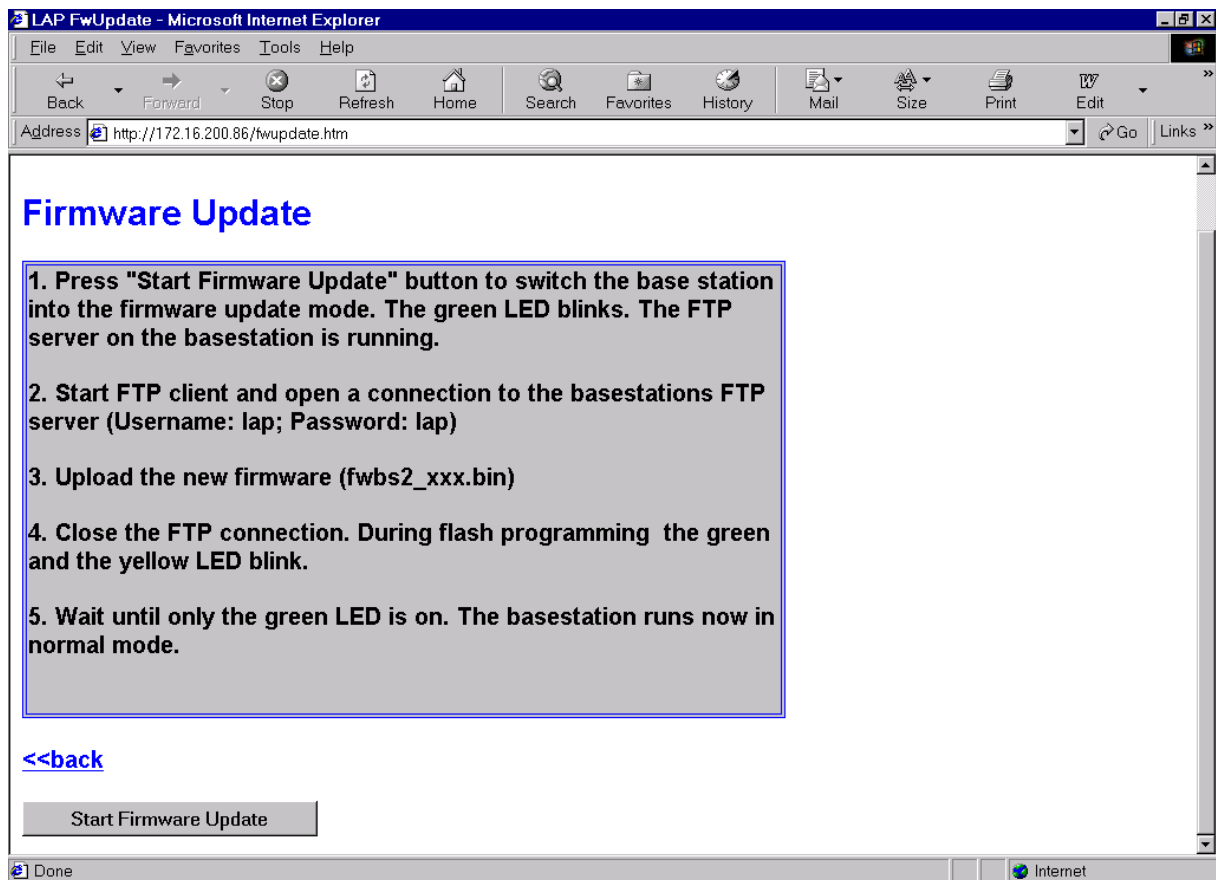
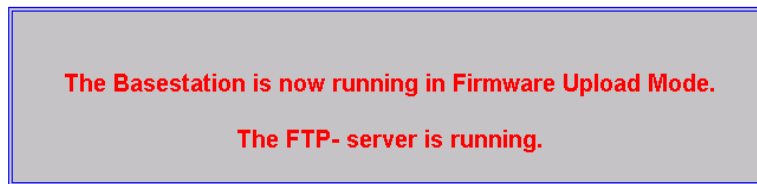


Image 4.31 HTML page for manual firmware update

By clicking on the 'Start Firmware Update' button, the Base Station starts the manual update mode. LED4 (green) starts to blink and an HTML page as shown by image 4.32 will be displayed by the browser.



*Image 4.32 Manual firmware update was started*

The FTP client can now be started on the PC.

Procedure:

- copy the firmware update file (naming: fwbs2\_xxx.bin) into a directory of the PC, e.g. C:\temp
- open a DOS window and change to the directory with the firmware file, e.g. cd C:\temp
- start the FTP client, e.g. ftp <enter>
- open the Base Station, e.g. open 'IP address' <enter>, whereas the correct IP address of the Base Station has to be entered
- the inquiry of the username has to be answered by 'lap' <enter>
- the file upload can be started by, e.g. put 'fwbs2\_xxx.bin' <enter>
- if this action is completed, a 'Transfer Complete' response and the total number of transferred Bytes and the data transfer rate is displayed
- type in 'bye' <enter> to close the FTP session

Now the flash programming on the Base Station starts. This is indicated by parallel blinking LED4 and LED5. The start of the application again commences with LED5 blinking for 3 seconds. After that short period, the new application is started. Flash programming is omitted, when the uploaded firmware version is not new.

Important notice: The Base Station is inaccessible for configuration during manual firmware update mode. This mode can be left by a power off / on sequence or by ending the FTP session ('bye' <enter>).

#### 4.4 Administration of the FTP Server in the Network

To perform an automatic firmware update of the Local Navigator Bluetooth Base Station, a FTP server needs to be provided in the same network. The Base Station will try to open a FTP session to this server by the username 'lap' and password 'lap'. As a subdirectory to FTP root, a directory with the name 'bs2' has to be created. User 'lap' has to have read and write access capability to this directory. As required by the actual scenario, a file with the naming 'fwbs2\_xxx.bin' and containing the firmware update file has to be stored in the subdirectory 'bs2'. The TCP port of the FTP server has to be configured as '21', which is the standard port setup.

The images 4.41 to 4.45 show a sample configuration using the FTP server IIS of Microsoft in a Windows NT 4.0 environment.

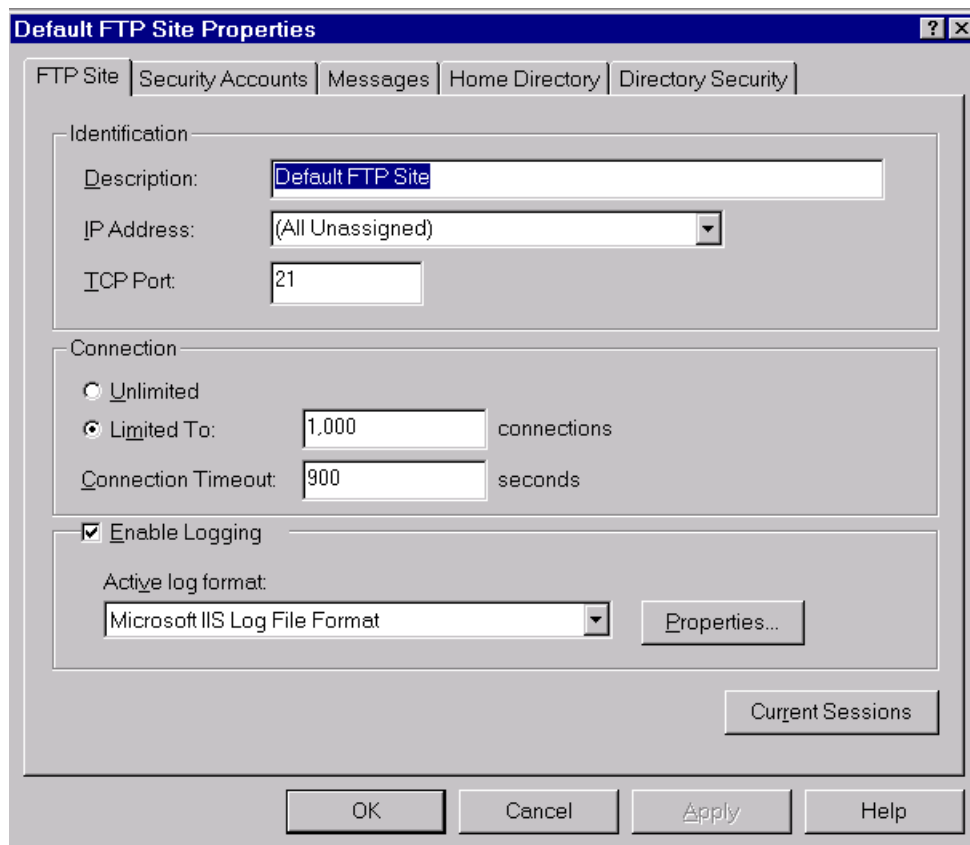


Image 4.41 - IIS: Default FTP Site Properties



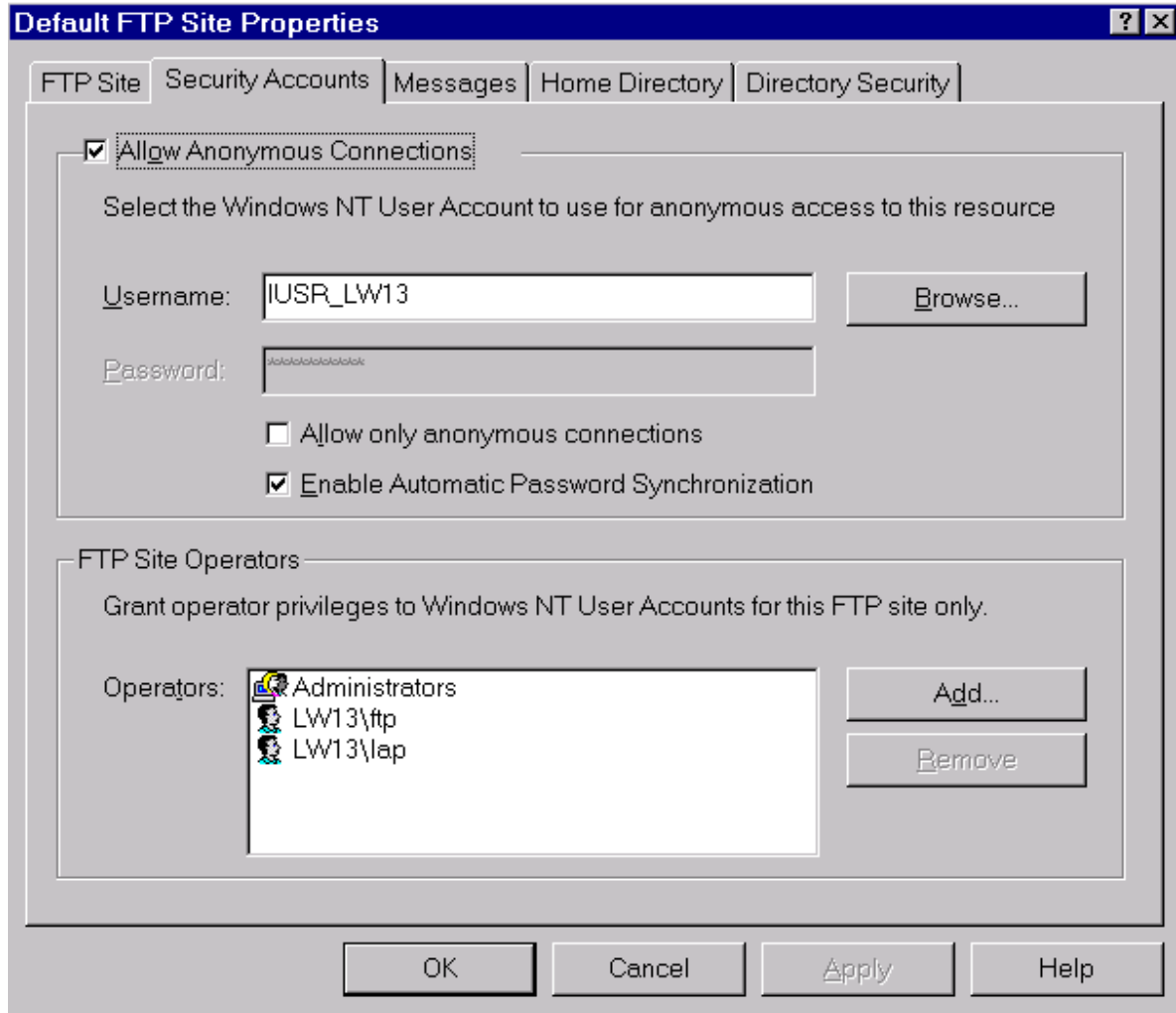


Image 4.42 - IIS: Default FTP Site Properties - Security Accounts

- applying the command ,Add' will add User „lap“ with Password 'lap' as Operator

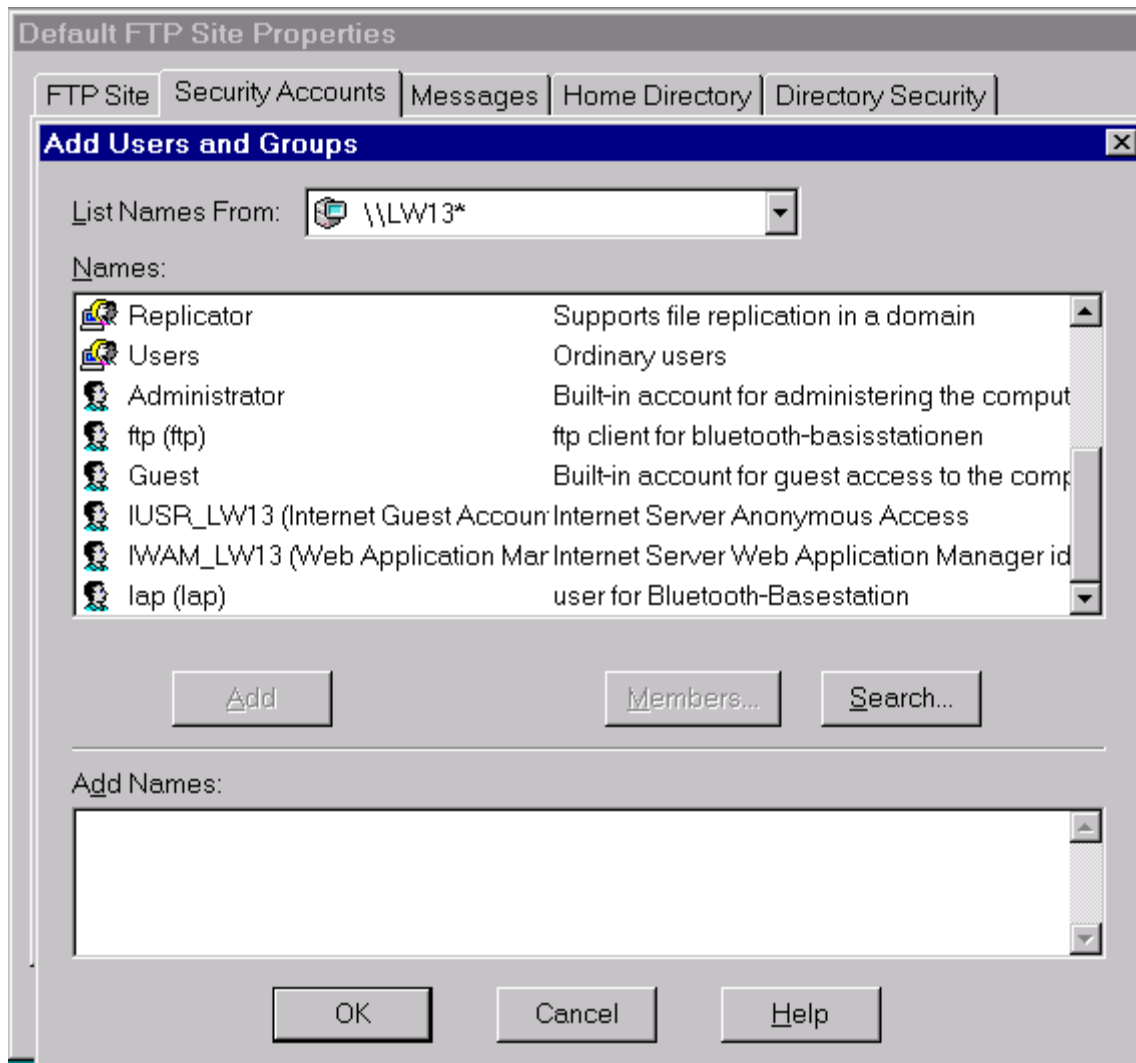


Image 4.43 - IIS: Add the User

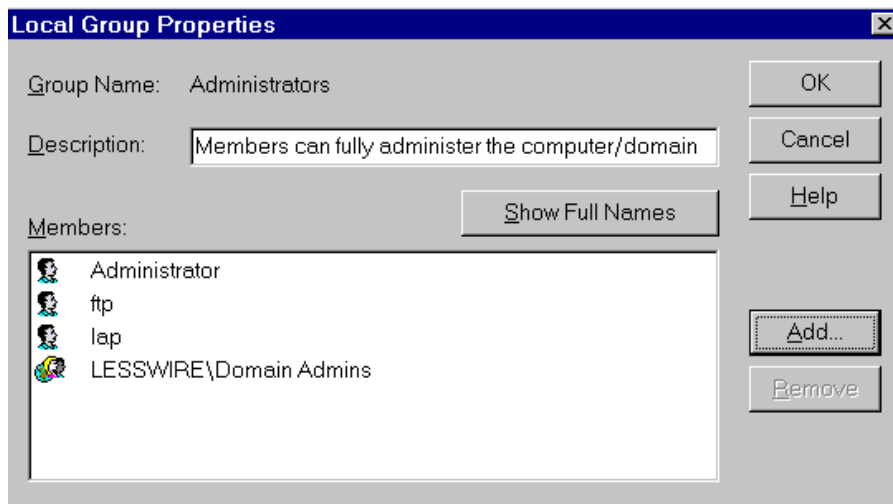


Image 4.44 - IIS: Provide user ,lap' with administrator rights

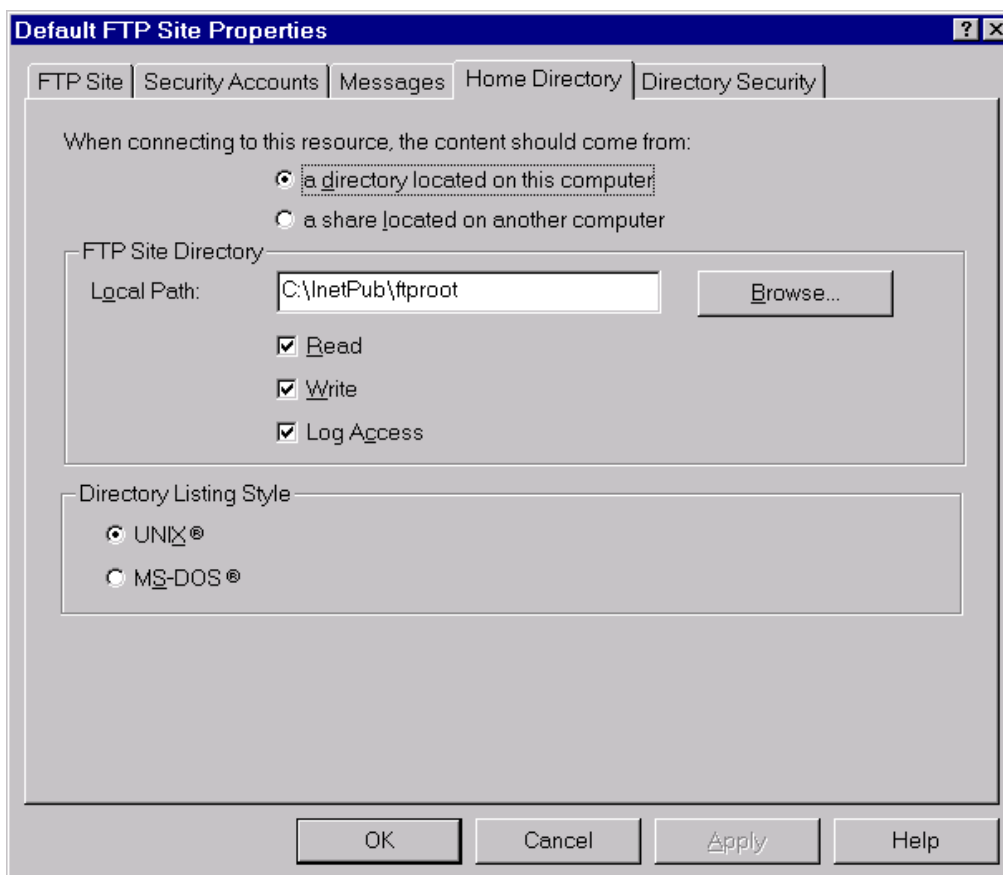


Image 4.45 - IIS: Specify the ftp root directory

- as a subdirectory to ,ftproot', the directory 'bs2' with the file „fwbs2\_xxx.bin“ is created

Important notice: It is recommended to test the settings of the FTP server by running one FTP test session manually. To do this, open a DOS window and enter the following commands: „ftp“ → <Enter> → „open localhost“ → <Enter> → „ftp“ → <Enter> → „ftp“. Now a FTP session is opened by applying the username for the Base Station. When the command 'dir' is issued, the directory 'bs2' should be displayed. By entering the command 'cd bs2', the directory setting should be changed to 'bs2' and the file 'fwbs2\_xxx.bin' should be listed. The FTP server is correctly setup for the automatic firmware update, when this file is listed. The FTP session can be shut down by entering 'bye' at the DOS prompt.

It is also very important, that directory and file names are specified in lowercase letters in order to achieve a correct file download.

## 5. Technical Specifications

### Technical specifications:

Wireless Interface:	Bluetooth V1.1
<i>Bluetooth</i> Profiles Supported:	LAN Access
Frequency Range:	2 400.0 – 2 483.5 GHz (license free ISM band)
Range:	10 meters
Radio Transmit Power:	0 dBm
Number of active clients:	5 (upgradable to 7)
Antenna:	integrated
LAN Protocol:	IEEE 802.3
LAN Interface:	10/100 BaseTX, RJ-45 socket
Indicators:	LED for power, network activity, status
Dimensions:	158x95x33 mm
Weight:	250 gr. (excluding external power supply)
Remote Configuration:	standard Web browser
Power Requirements:	6 VDC (external power supply)
Power Consumption:	< 500mA

## 6. Support / Warranty

### Warranty period:

The warranty period for this product is one (1) year from the date of product purchase.

### Warranty service:

If you think your product needs servicing, refer to our web-site for technical support. If your product needs a hardware repair that is covered under warranty, lesswire will give you instructions for sending the device to lesswire, at your own expense. You will be responsible for transport and insuring the product against loss. lesswire will repair or replace the device, deliver it back and pays the return delivery costs.