LOHU Dual 4961PX

High Capacity / Full duplex / Dual Radio Outdoor Wireless Bridge

User Manual
Version 1.4

LohuisNetworks

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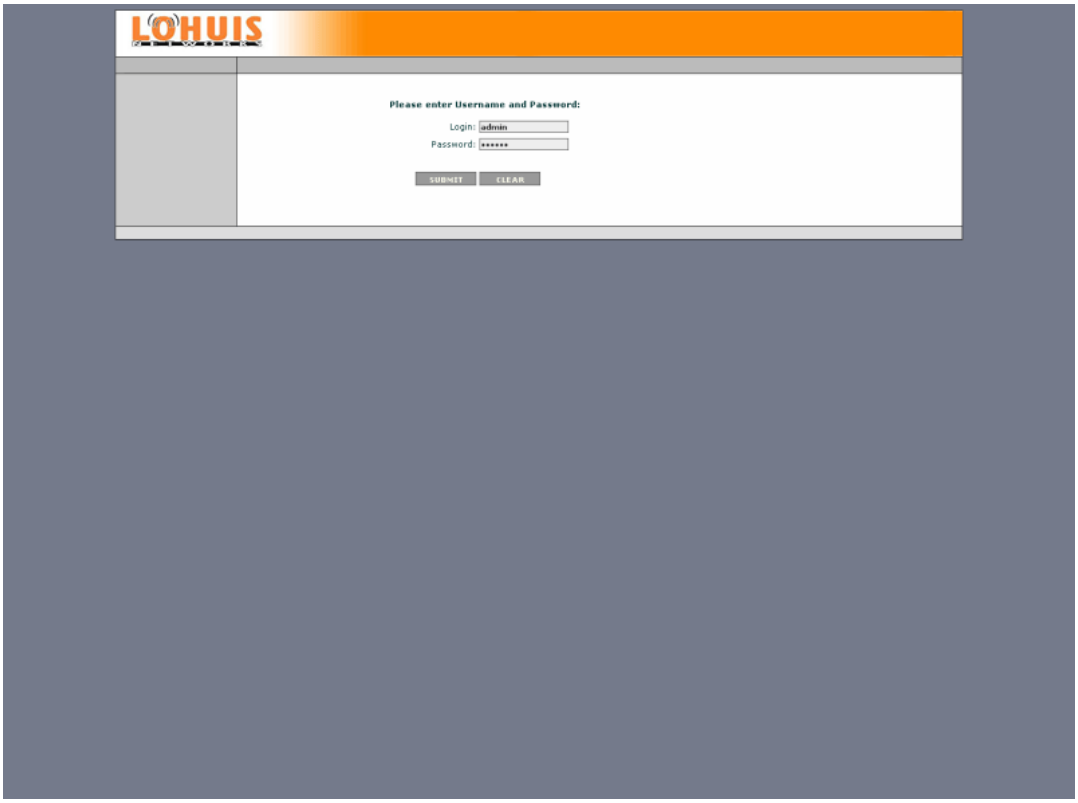
Software setup and configuration

Lohuis Dual 4961PX devices are configurable via WWW interface. Each device uses following default settings:
IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Login: admin
Password: public
The initial login screen looks as follows:

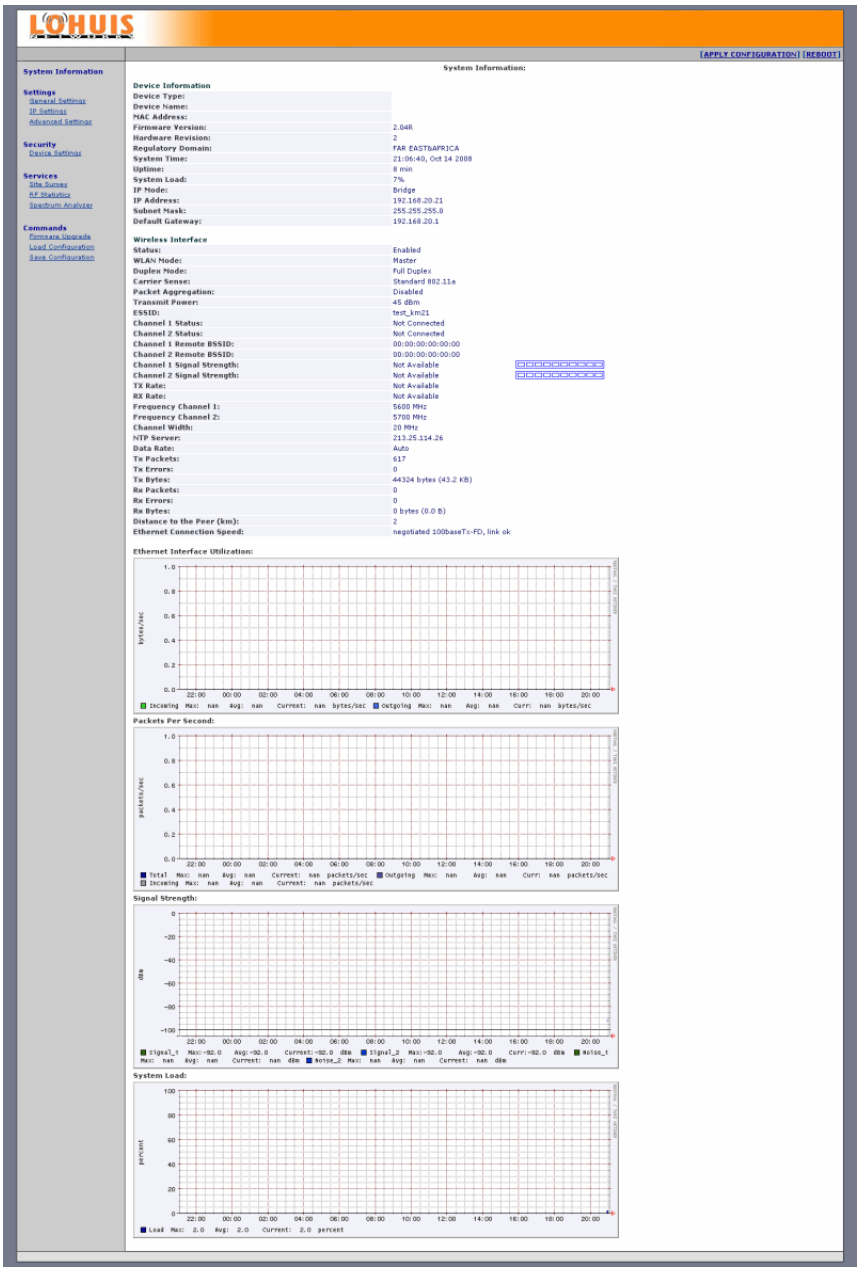


Please enter username and passwords, then press submit to log into the device.

Please note that after changing device parameters and pressing submit button, new settings will only be saved when you press "Apply Changes" button at the right bottom of the configuration page. You also need to reboot the device for the device to start with new settings.

System Information

System information tab shows information about system hardware and operational parameters:



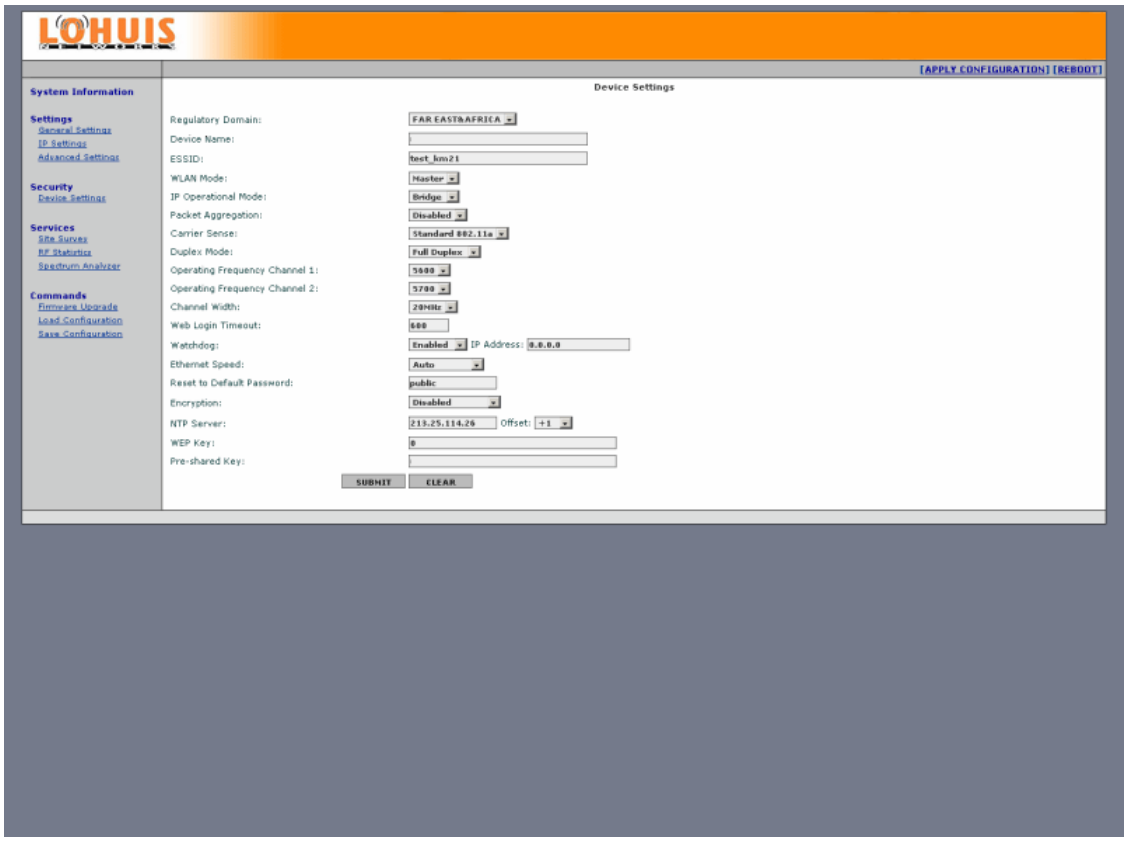
Device Information:
Device Type – Device type you are logged into.
Device Name - System Name for easy identification of the Lohuis Dual 4961PX unit.
MAC Address – Device MAC address.
Firmware Version – Current firmware version.
Hardware Revision – Device Hardware version.
Regulatory Domain – Currently configured regulatory domain.
Uptime – How long the device has been up and running since last reboot.
System Load – Percentage of current CPU utilization.
IP Mode – Network mode the device has been configured to operate. Available modes are Bridge and Router.
IP Address – Device IP address.
Subnet Mask – Currently defined subnet mask.
Default Gateway – Currently defined default gateway.

Wireless Interface

Status – Current interface status.
WLAN Mode – Wireless LAN Operational mode for the device. Available modes are Master and Slave - in order for two devices to create a wireless link one should be configured to operate as Master and the other should be configured to operate as Slave.
Duplex Mode – Configured Duplex Mode for the device which can operate either in Full or Half Duplex mode.
Carrier Sense – Configured - either 802.11a compliant CSMA collision protocol or disabled.
Packet Aggregation – Enabled or Disable built in packet aggregation.
Transmit Power – Current TX Power.
ESSID - An ESSID is the name of a wireless network. Devices on both sides of the link must employ the same ESSID in order to communicate with each other.
Channel 1 Status – Current connection status for the first RF interface.
Channel 2 Status – Current connection status for the second RF interface.
Channel 1 Remote BSSID – MAC address of the first RF interface of the device on other side of the link.
Channel 2 Remote BSSID – MAC address of the second RF interface of the device on other side of the link.
Channel 1 Signal Strength – Measure of how strongly a transmitted signal is being received by this device on it's first RF interface.
Channel 2 Signal Strength – Measure of how strongly a transmitted signal is being

received by this device on it's second RF interface.
Channel 1 TX Rate – Bit Data Rate at which this device first RF interface sends packets to the other peer.
Channel 2 TX Rate – Bit Data Rate at which this device second RF interface sends packets to the other peer.
Channel 1 Width – Configured Channel Width (Depending on Regulatory Domain available values are 5, 10, 20 and 40 MHz) for the first RF interface.
Channel 2 Width – Configured Channel Width (Depending on Regulatory Domain available values are 5, 10, 20 and 40 MHz) for the second RF interface.
Data Rate 1 – Configured data rate at which this device first RF interface should send packets to the other peer.
Data Rate 2 – Configured data rate at which this device second RF interface should send packets to the other peer.
TX Packets – Number of data packets that have been sent to the other peer.
TX Errors – Number of data packets that have been sent but not delivered to the other peer.
TX Bytes – Number of bytes sent to the other peer.
RX Packets – Number of data packets that have been received from the other peer.
RX Errors – Number of data packets that have been received from the other peer but had errors.
RX Bytes – Number of bytes received from the other peer.
Distance to the Peer – Configured distance between this device and Lohuis Dual 4961PX on the other side of the wireless link.
Ethernet connection speed – Current Ethernet port connection speed (or No Connection if there is no connection).

General Settings



Regulatory Domain – Please select regulatory domain that is most appropriate to your location.

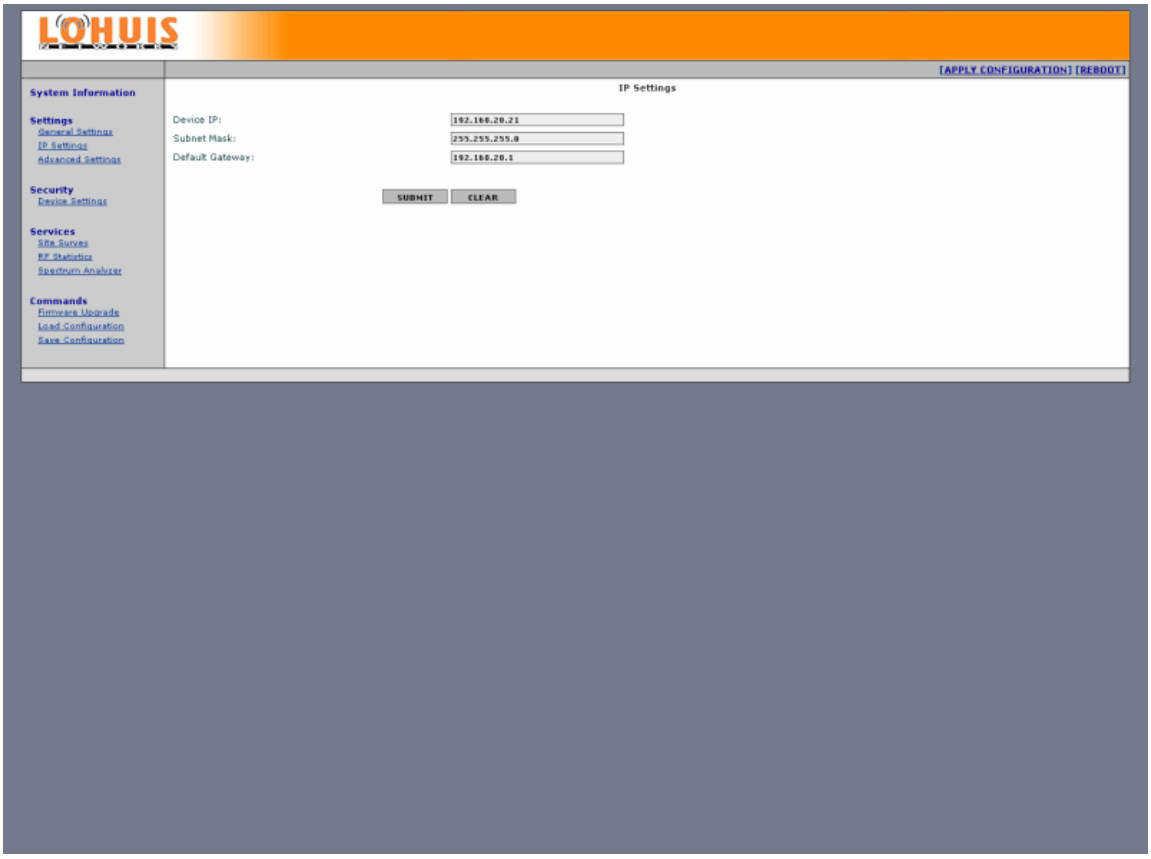
Supported Regulatory Domains and allowed frequency ranges are defined as follows:
Europe – 5500 – 5700 MHz with DFS, 20 MHz, 10 MHz and 5 MHz selectable channel sizes
OFCOM UK – 5735 MHz, 5755 MHz, 5775 MHz, 5835 MHz with DFS, 20 MHz, 10 MHz and 5 MHz selectable channel sizes
USA – 5745 - 5825MHz, 20 MHz, 10 MHz and 5 MHz selectable channel sizes
Far East & Africa – 4920 – 6100 MHz (236 channels), 40 MHz, 20 MHz, 10 MHz and 5 MHz selectable channel sizes.

Device Name - This is the system name for easy identification of the Lohuis Dual 4961PX unit.

ESSID - An ESSID is the unique name shared among all peers in your wireless network. The name must be identical for all devices and points attempting to connect to the same network. It shall be up to 32 characters length.
WLAN Operational Mode - Wireless LAN Operational mode for the device. Available modes are Master and Slave. To create a Point to Point wireless link device on one side of the link should be configured to operate in Master mode and the device on other side of the link should be configured to operate in Slave mode.
Carrier Sense - This option allows to disable standard 802.11 CSMA/CA backoff mechanism. Disabling 802.11 CSMA greatly improves performance when operating in area with noise generated by other (especially non 802.11 compliant) devices.
Duplex Mode - Configured Duplex Mode for the device which can operate either in Full or Half Duplex mode.
Operating Frequency Channel 1 - Frequency the channel is operating on. Depending on configured Regulatory Domain this will either be DFS where user can not manually select frequency (ETSI and UK regulatory domains) or list of allowed frequencies for manual selection (USA, Far East & Africa domain).
Operating Frequency Channel 2 - Frequency the channel is operating on. Please note that proper channel separation must be preserved when manually selecting operating frequencies - to avoid self interference the space between channel edges must be at least 20 MHz. This means that if 20 MHz channels are used then the second channel should be at least 40 MHz away from the first one, or if 40 MHz channels are used then the second channel should be configured to be at least 60 MHz away from the first one.
Channel 1 Width: - Channel width the device uses on the first RF interface. Available values (depending on Regulatory Domain) are 20 MHz (standard width), 10 MHz (half width), 5 MHz (quarter width) and 40 MHz (802.11a Turbo mode).
Channel 2 Width: - Channel width the device uses on the second RF interface. Available values (depending on Regulatory Domain) are 20 MHz (standard width), 10 MHz (half width), 5 MHz (quarter width) and 40 MHz (802.11a Turbo mode).
Web Login Timeout – Enter the value the management Web session should be kept alive without any action from the user.
Watchdog – If enabled then Lohuis Dual 4961PX device will send 3 ICMP Echo Requests to the configured IP address, each in 3 minutes interval. If there is no single ICMP Echo Reply to any of these requests, then the device will reboot itself.
The device also has independent hardware watchdog built in, that checks for critical operational parameters and reboots the device, should the system hang or become unstable. That watchdog works all the time, regardless of the ping watchdog configuration.
Ethernet Speed – LAN Port connection speed - available values are Auto (Auto Negotiation), 100Mbps FDX, 100Mbps HDX, 10Mbps FDX, 10Mbps HDX.
Reset to Default Password – Password that is used to reset device to factory default

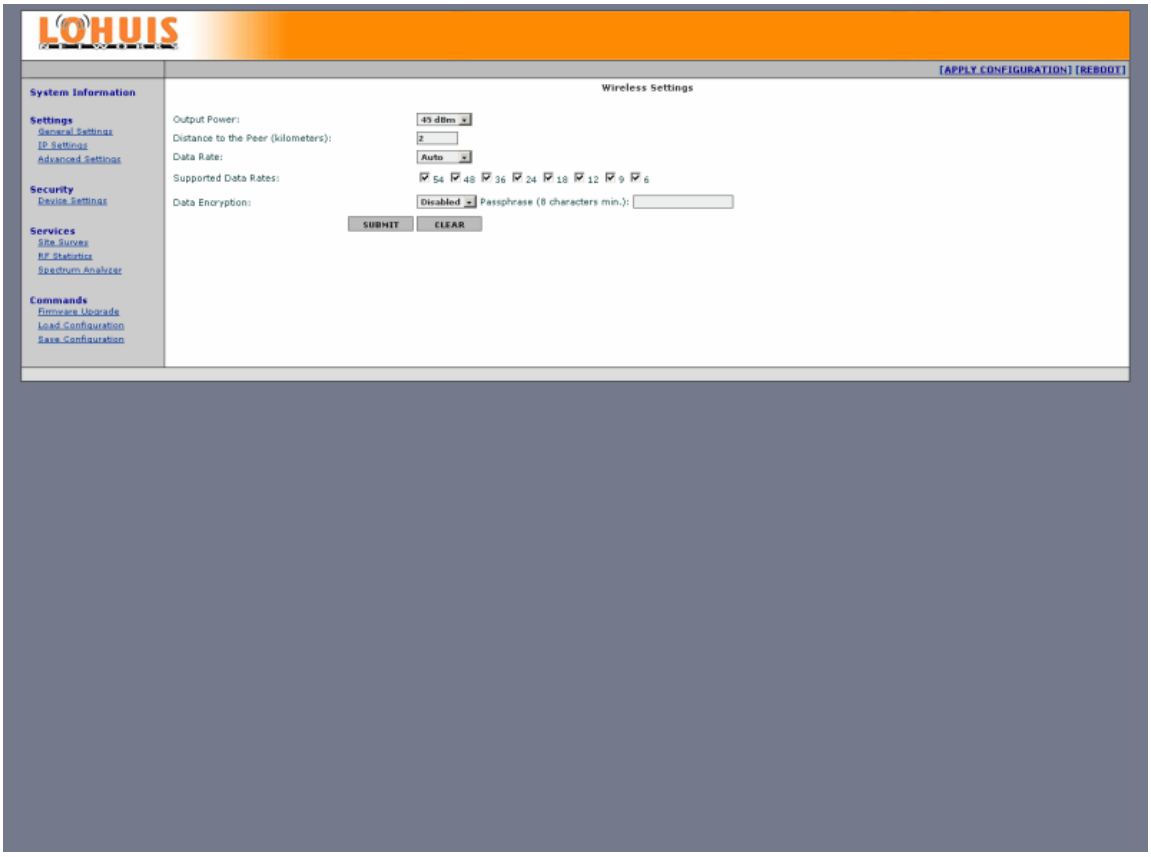
settings using Reset software.
Encryption - Select generic encryption algorithm
WEP - Wireless Equivalent Privacy
WPA - Wireless Protected Access
WEP Key – Enter WEP encryption key here. Keys are entered as hexadecimal numbers in following format:
64 bit WEP: xxxx-xxxx-xx
128 bit WEP: xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xx
156 bit WEP: xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx
WPA Pairwise - select WPA encryption scheme - TKIP or CCMP (AES).
WPA Pre-shared Key - the key is entered as 8-63 characters long string, ie. Lohuis.

IP Settings



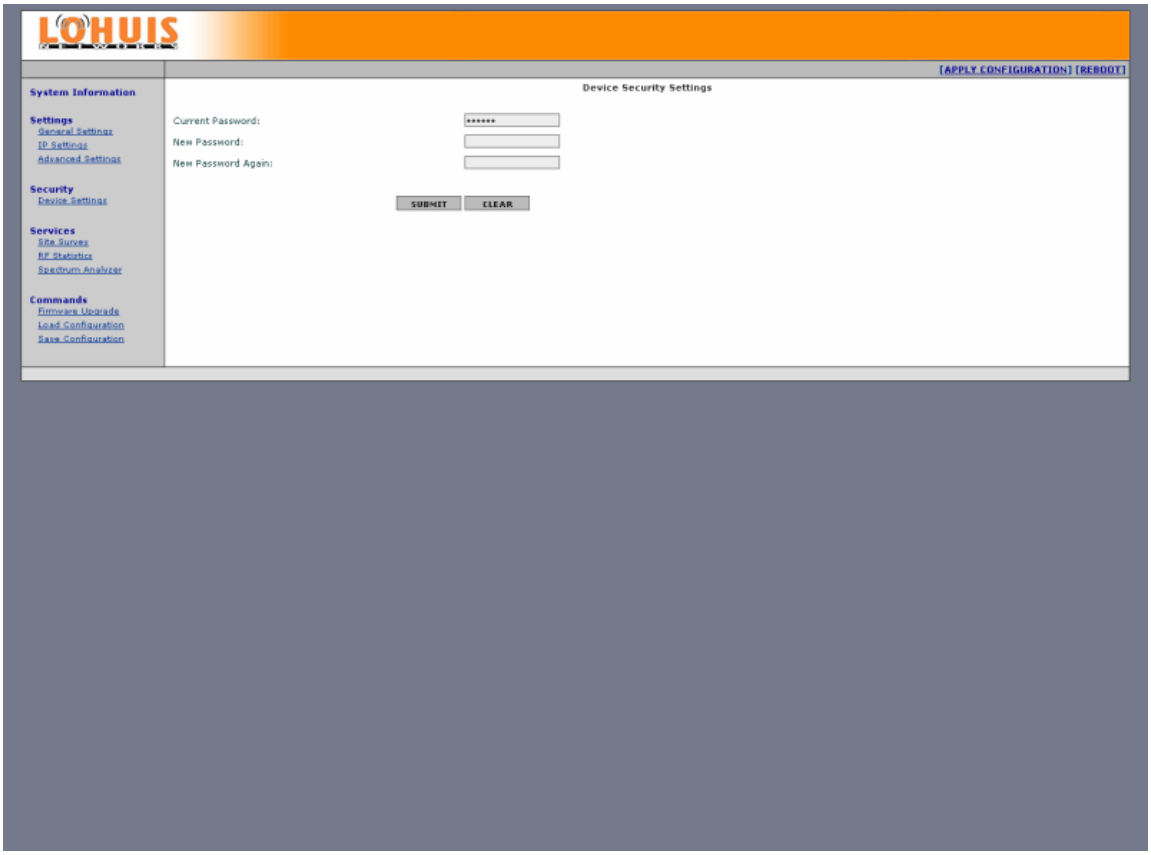
Device IP – Enter device IP address here.
Subnet Mask – Enter network subnet mask here.
Default Gateway – IP address of a router where traffic going outside of the local network will be forwarded.

Advanced Settings



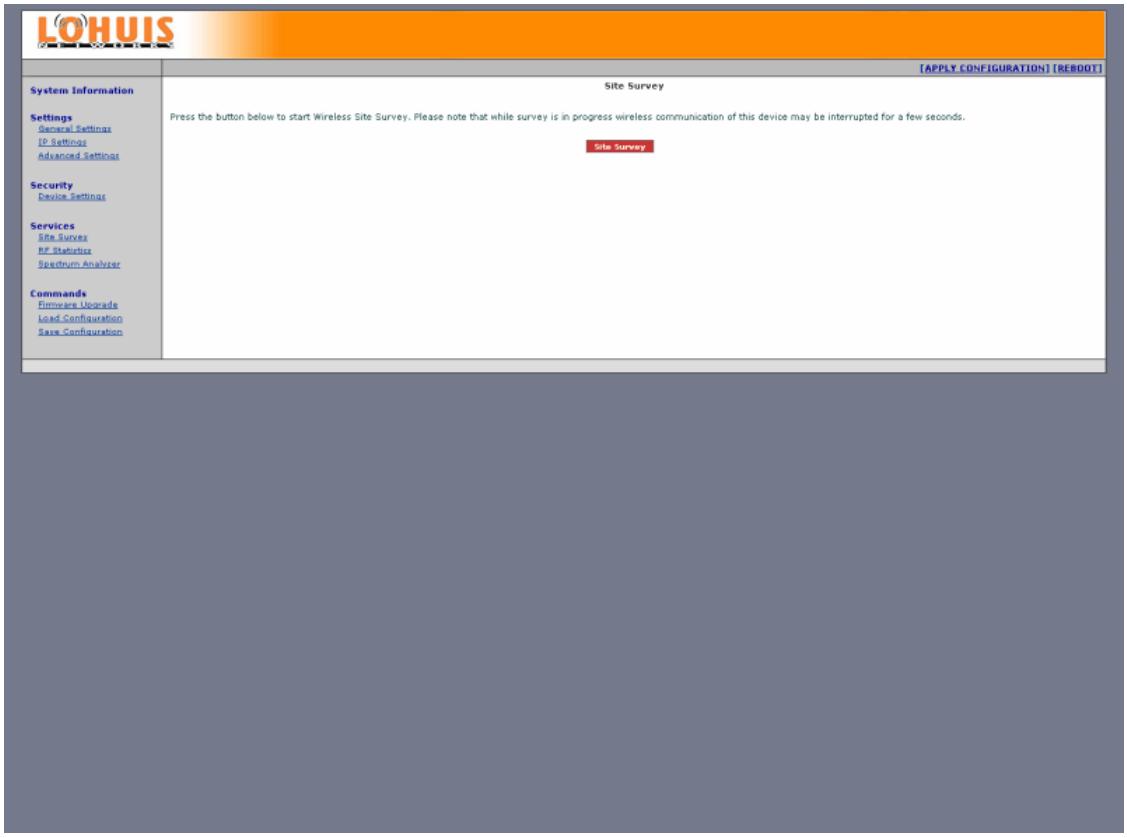
Output Power: - By default, the Lohuis Dual 4961PX transmits data at the maximum output power available for the regulatory domain selected and frequency used. With Transmit Power Control (TPC) you can adjust the output power of the unit to a lower level in order to reduce interference for other RF devices.
Distance to the Peer – Configure distance between Lohuis Dual 4961PX device and it's network peer. Please note that this setting is essential for proper link operation - if the value configured is too low, then bridges won't operate reliably.
Data Rate 1 – Data rate at which this device first RF interface should send packets to its peer.
Data Rate 2 – Data rate at which this device second RF interface should send packets to its peer.
Data Encryption – Enable or Disable over the air Lohuis proprietary data Encryption here. This encryption scheme works only between compatible Lohuis devices.

Device Settings



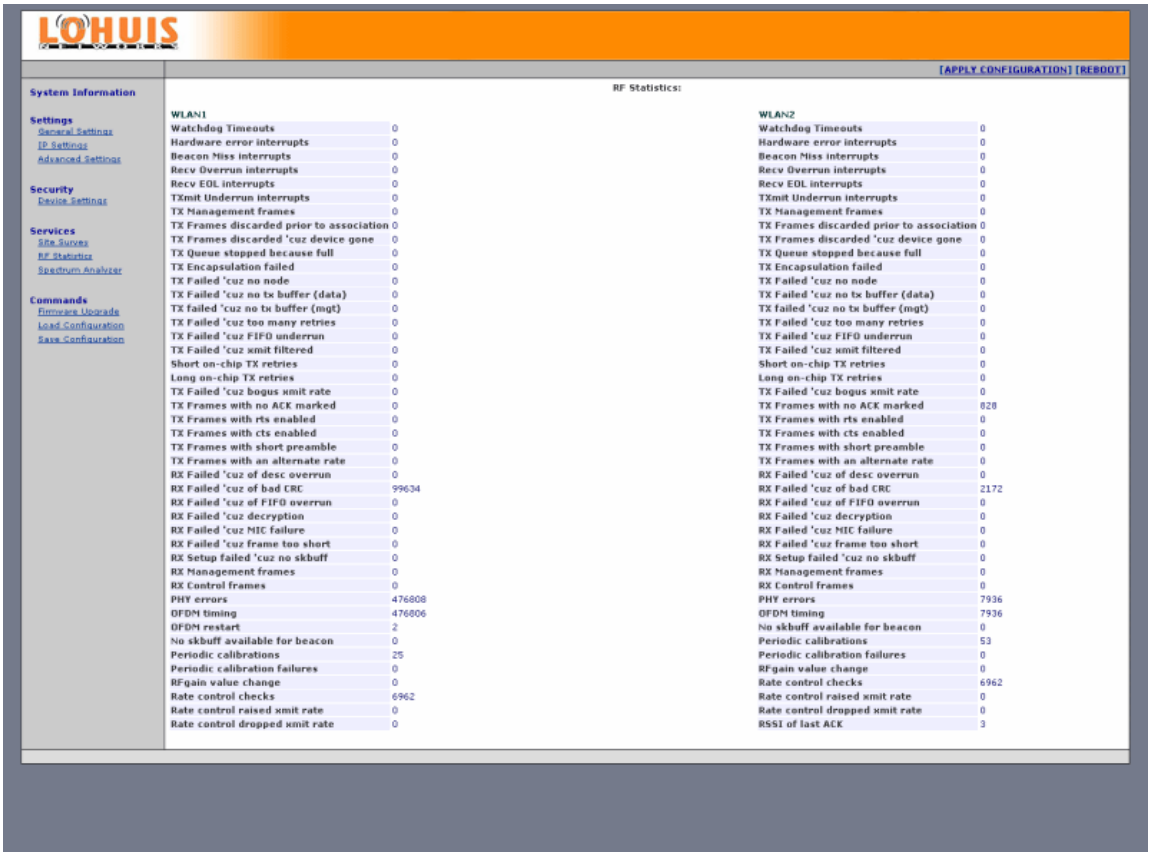
Use this screen to change password which is used to access and configure the device.

Site Survey



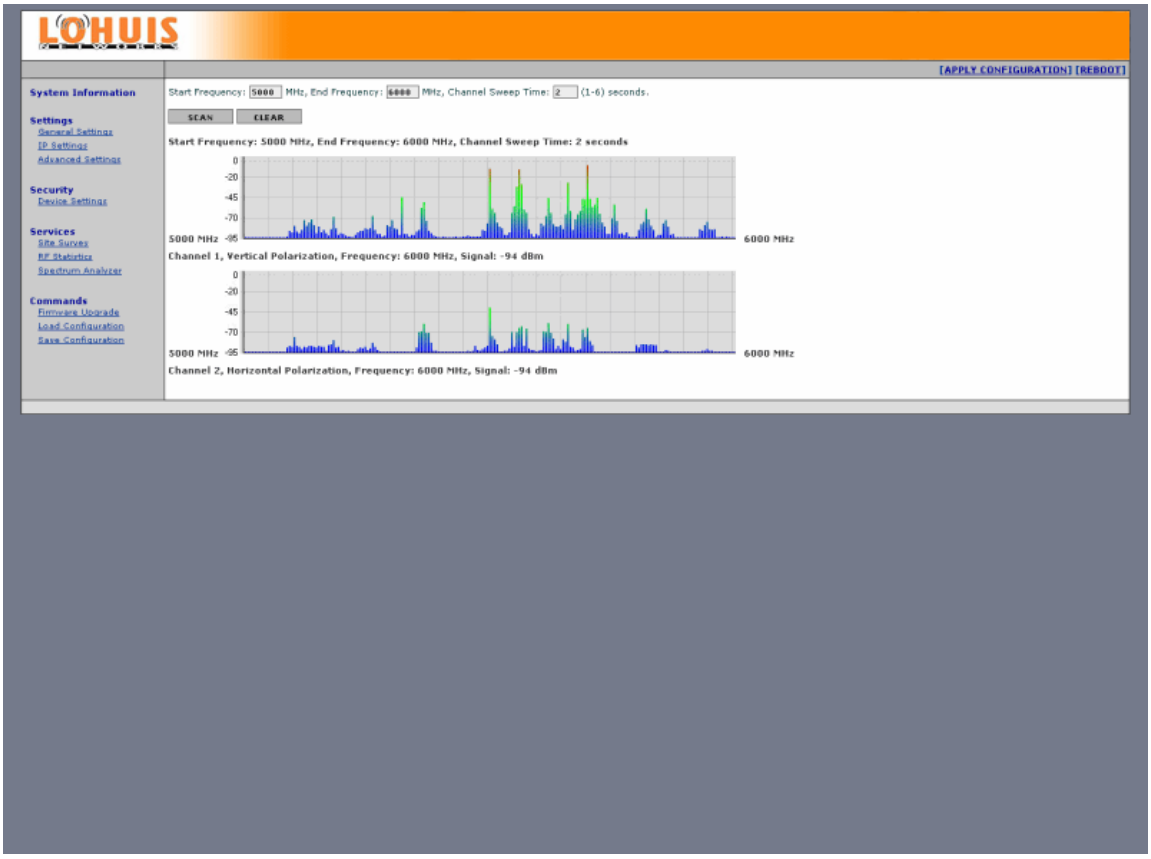
This tab allows to see other Access Points in range of each of the Lohuis Dual 4961PX interfaces.

RF Statistics



This tab allows to see advanced RF statistics.

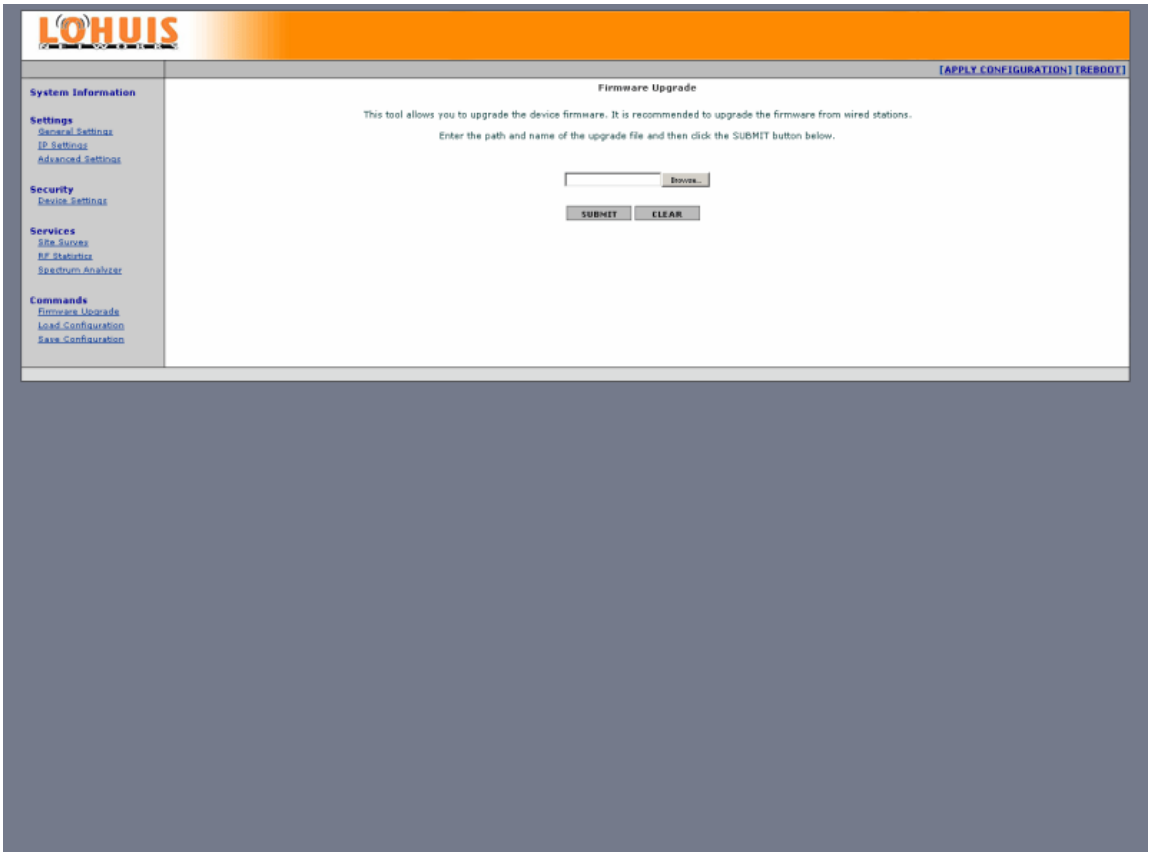
Spectrum Analyzer



Spectrum Analyzer is an utility that lets the user scan specified frequency range to see what other transmitters are operating there. It is strongly recommended to use this tool right after the first link deployment to select channels that are interference free, for best possible device and link performance.

After finishing the scan you can point using your cursor on the specific signal bar on the graph to see frequency and signal level reading for that specific frequency.

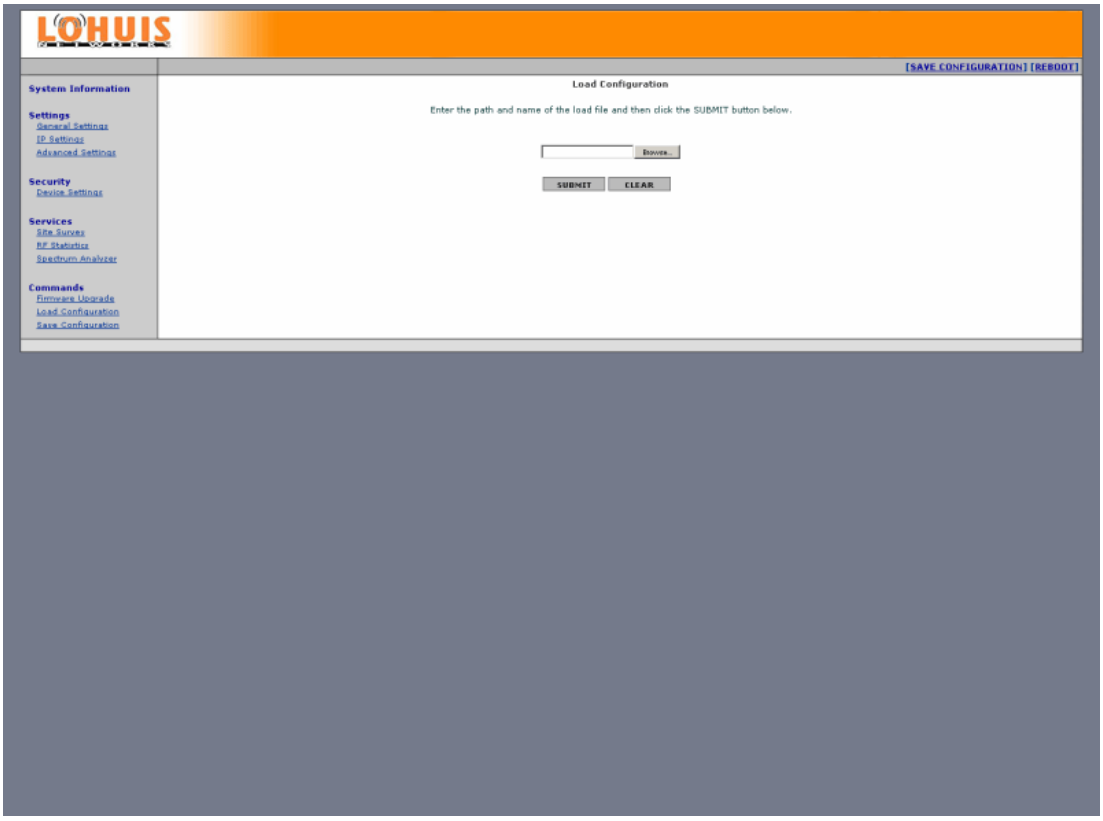
Firmware Upgrade



This page allows you to upgrade the device firmware. It is recommended to upgrade firmware only to newer version than the one currently installed in the device.

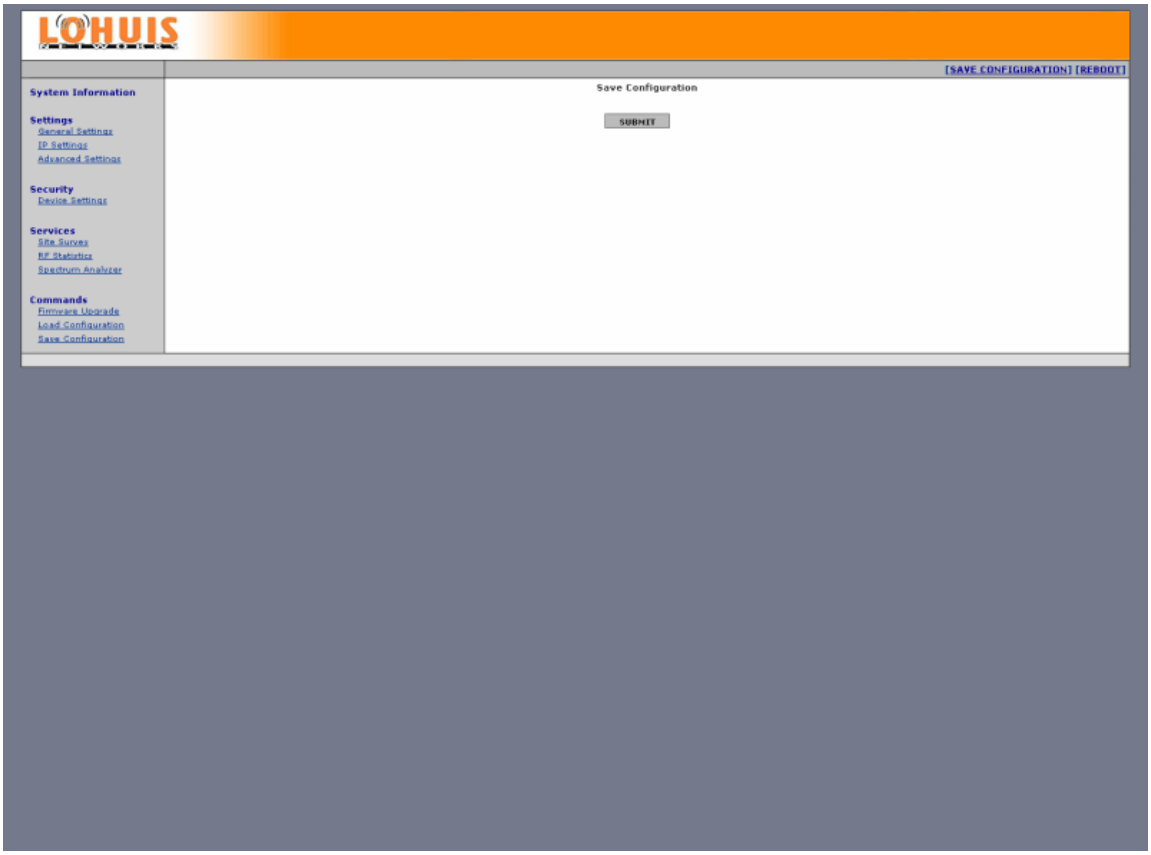
Please always remember to reboot the device first before you proceed with firmware upgrade.

Load Configuration



You can use this option to load device configuration from file.

Save Configuration



You can use this option to store current device configuration in a file.

TFTP Firmware upgrade

Each Lohuis device allows firmware upgrade via TFTP.

From the Windows DOS box you need to enter following command:

```
X:\>tftp -i -s 192.168.1.254 PUT Lohuis_Dual 4961PX_1.02R.bin admin_public

WinAgents TFTP Client version 1.3 Copyright (c)2004-2005 by Tandem Systems,Ltd.
http://www.winagents.com - Software for network administrators

Transfering file Lohuis_Dual 4961PX_1.02R.bin to server in octet mode...
Using blocksize = 512
Using TFTP timeout = 10s
File Lohuis_Dual 4961PX_1.02R.bin was transferred successfully.
1964844 bytes transfered for 63 seconds, 31188 bytes/second

X:\>
```

Please note that username (admin) and password (public in this case) required for authorization are sent to the device as remote file name (admin_public).

The device will accept firmware, reflash and reboot automatically.

Emergency firmware restore procedure

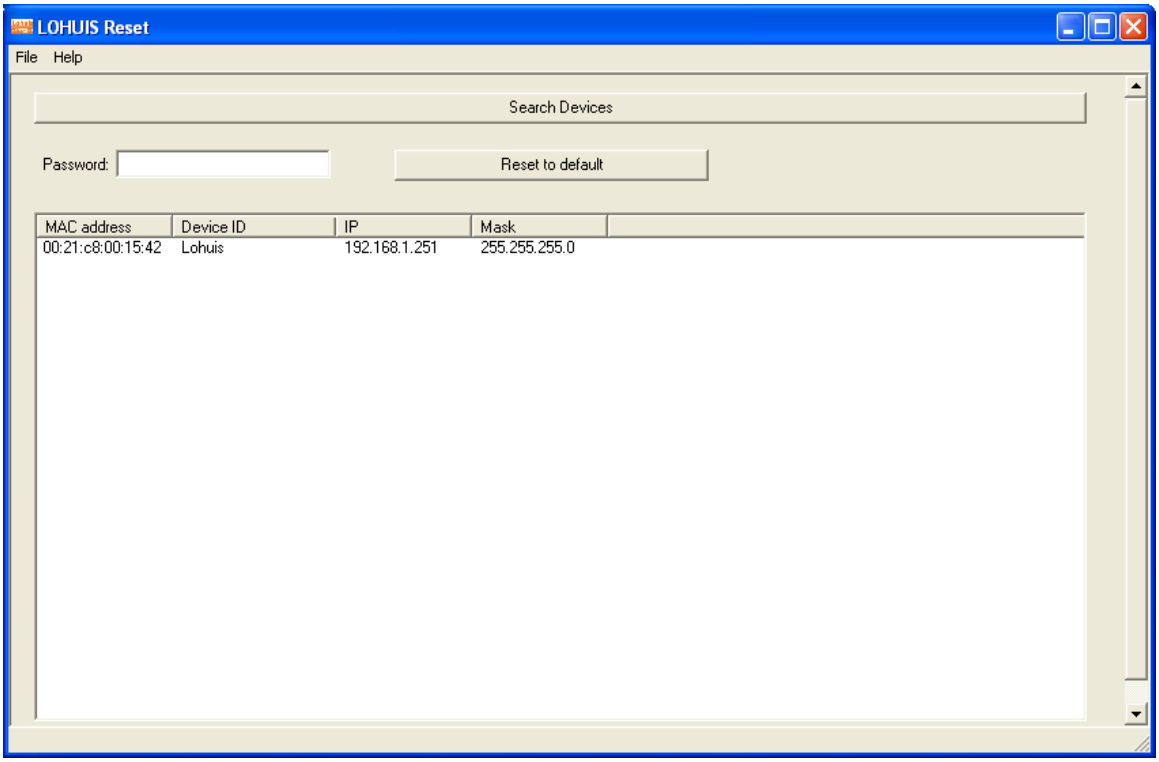
Should the Lohuis device fail or loose power during firmware upgrade the built-in bootloader allows easy firmware restore.

This is the step by step procedure required to perform:
1. You need to obtain tftp server software, the free one is available at http://tftpd32.jounin.net/
2. Install tftpd32.exe into the catalog where firmware files are located
3. Rename the firmware file into upgrade.bin
4. Change your computer IP address to 192.168.1.23 netmask 255.255.255.0
5. Connect the Lohuis device to the computer via cross-over cable or via network switch
6. Turn on the Lohuis device, it should initiate the transfer automatically, automatically reflash and reboot itself.

Resetting device to default settings

In order to reset Lohuis device to factory default settings you need to use Lohuis reset software .

Lohuis Reset will locate any compatible Lohuis device regardless of its IP address located on the same physical subnetwork with the computer it is running on.



After selecting the device you want to reset enter "Reset to Default Password" in the Password: field and press button.

If you have changed Reset to Default Password to one you no longer remember then please email us at support@Lohuis.com stating device type and MAC Address and we will provide you one time, generated password that will let you reset the device to factory default settings.