



EkoTek System Installation and Configuration Manual

Survey

Installation

Configuration

Maintenance

Part No. 9261-8173 Issue 2



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Approvals

Compliance

This product complies with the requirements of the EU Radio & Telecommunications Terminal Equipment Directive 99/5/EC.

FCC & Industry Canada Statement of Compliance

This device complies with Part 15 of the FCC Rules and Industry Canada Standard RSS 210.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference that may cause undesired operation.

Unauthorised modification to this equipment will void the user's authority to continue to operate the device within the scope of the Industry Canada and FCC Part 15 Rules.

A full technical specification for this product may be obtained from your Multitone representative.

WEEE Directive & Product Disposal



At the end of its serviceable life, this product should not be treated as household or general waste. It should be handed over to the applicable collection point for the recycling of electrical and electronic equipment, or returned to the supplier for disposal.



System Overview

EkoTek's personal security system consists of mobile devices that send assistance messages to other fixed or mobile devices, where the assistance message and location of the caller are displayed.

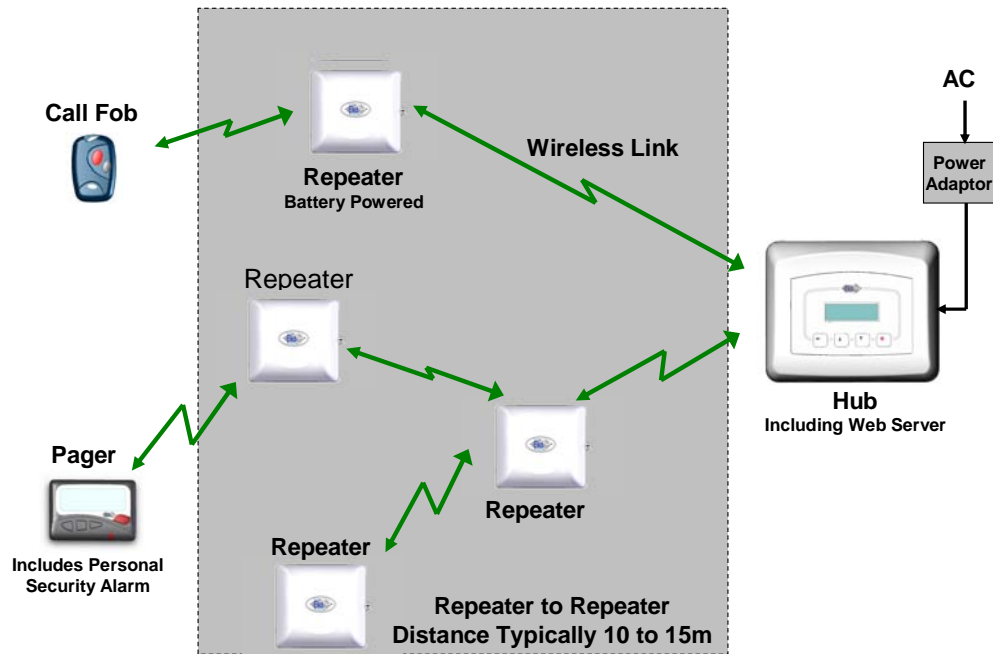


Figure 1 EkoTek Personal Security System

Messages are communicated via a backbone radio network, which makes use of Repeaters to relay messages around the network.

Due to the multi-hop nature of the backbone network, the physical shape and size of the network is defined by the layout of the Repeaters, which may be in 3 dimensions e.g. covering multiple floors in a building.

EkoTek is truly wireless (only the Hub needs AC power), making installation and expansion very quick and easy.

EkoTek Principles

Each EkoTek product is a node, that forms part of a self-organising radio mesh network.

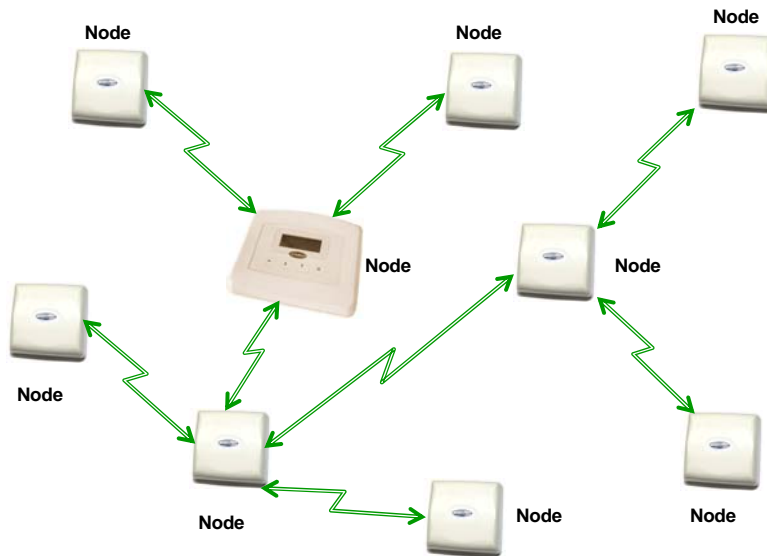


Figure 2. Self-Organising Radio Network

Each node in the network searches for links to nearby nodes, to form the network mesh. Organising the network is an automatic function carried out by the nodes themselves – configuration is not required.

As the network is self-organising, it is also self-repairing. Should a node (Repeater) fail, the network will automatically re-configure around the failed node.

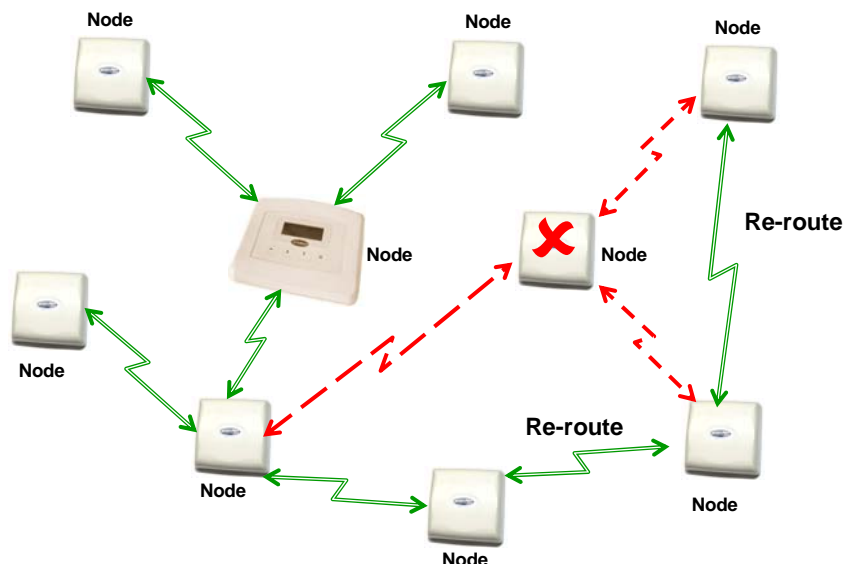


Figure 3. Node Fail Re-Routing

The dimensions of the network are defined by the layout and distribution of repeater nodes, the layout being arranged to meet the requirement e.g. reception and public areas of a hospital, accident and emergency department, or all floors of a building for security guard lone-worker protection.

Sizeable networks can be easily built, due to the large number of Repeaters supported by EkoTek.

Repeaters are normally installed on walls and/or ceilings. The Hub is installed either on a wall or on a desk, so that the display can be easily seen.

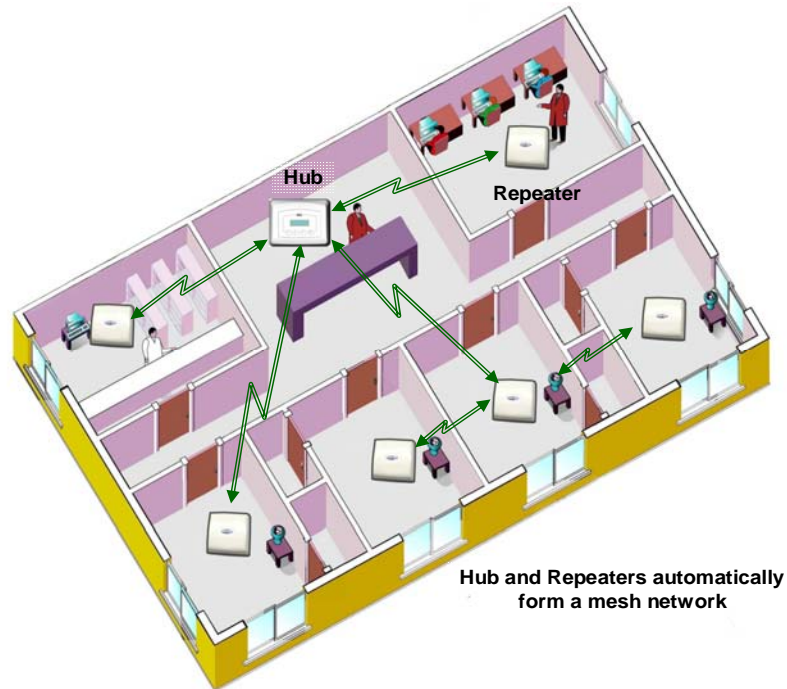


Figure 4. Typical Network Layout

Location Reporting

When a user raises an alarm signal, it is important to know the location of the user to ensure that assistance arrives as quickly as possible.

EkoTek provides accurate location reporting, based on location signals sent out by the Repeaters.

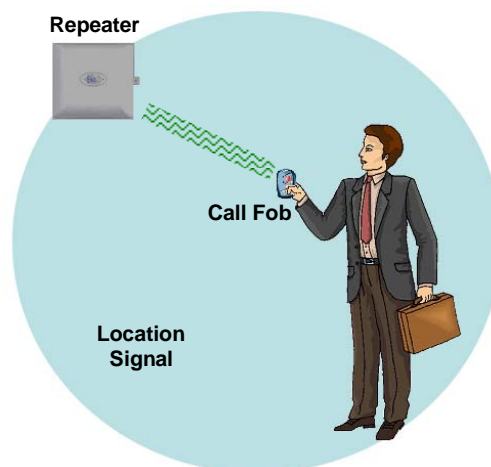


Figure 5. Location Reporting

When a user signals an alarm, the user identification (name), location and alarm type are included in the alarm message displayed on the Hub and sent to Pagers.

Beacons

Beacon signals are used to update a device with information of whom its parent is. A Repeater/Pager/Fob can only ever have one parent at a time. Every 1000ms the Repeater transmits to the Pager/Fob, which is then updated with its location and will continue to receive subsequent beacons from the Repeater (its parent). It will be shown as '**[location name]**' on the Pager's display. As the User moves from one Repeater towards another, they will receive a handover beacon from the Repeater being approached. The Pager then displays '**[location name]**'. The Pager/Fob then picks up location information from the new Repeater and updates itself with the new location.

Two-Way Acknowledgement

For peace of mind of the User, the acceptance of an alarm at the Hub or a two-way Pager by someone who will be going to the aid of the User, is signalled back to the User by the Call Fob lamp and beeper changing their alert patterns.

Two-Way Radio

All EkoTek radio links are two-way, providing the ability to signal both to and from all devices on the network.

Two-way radio provides the ability to quickly detect and correct any lost messages e.g. when a message is relayed from one Repeater to a second Repeater, the second Repeater will acknowledge receipt of the message. If the first Repeater does not receive an acknowledgement, it retransmits the message. This ability allows EkoTek to function, even in environments where there is radio interference or poor signal.

A further benefit of two-way radio is the ability to download configuration parameters to all devices from the Hub, using over air programming. Devices do not hold their own configuration, as this is sent by the Hub upon request, when devices are powered up. Hence even Pagers have their configuration held at the Hub, making it unnecessary to recall mobile devices for configuration change, as any updates are made centrally at the Hub.

Frequency Hopping

EkoTek radio links can be configured to operate on a fixed frequency, or to hop across all 16 available frequencies. Frequency hopping increases the immunity of EkoTek systems to radio interference. If a message is lost due to interference on a frequency, the loss is immediately detected and the message retransmitted on the next frequency in the hopping sequence.

Frequency hopping is especially useful where the local radio environment may be unknown, or subject to change. EkoTek's combination of message loss detection, automatic message retransmission and frequency hopping, makes for a very robust radio infrastructure.

Components

Single Hub



The Hub forms the central device in the mesh network. All communications pass to and from the Hub, which can be located at any physical point on the network i.e. it can be at the edge of the network as it does not need to be at the physical centre. See Appendix 2 Specifications on page 50 for specifications.

A Hub display shows alarm messages in a similar way to a two-way Pager.

For configuration, a PC running a web browser is connected via Ethernet to the web server running on the Hub.

Other connections on the Hub are for alarm relay contacts, external paging systems and power input.

Internal rechargeable batteries allow the Hub to function for several hours should the AC power fail.

For more information see 9621-8276 EkoTek Hub User Guide.

Repeater

Repeaters form the backbone of the self-organising radio mesh network. Each Repeater automatically forms links to nearby Repeaters, to allow messages to pass across the backbone.



Two screws hold the Repeater on a ceiling or wall. Two internal Alkaline `D` size primary batteries power the repeater. The voltage is continuously monitored and reported to the Hub and/or Pagers, raising an alarm should the voltage fall, requiring that the Repeater batteries be replaced.

Repeaters also transmit location beacon signals, which are used by the mobile devices to determine their location, which is sent when assistance messages are generated.

Repeaters may form the mesh network in 3 dimensions, with Repeater-Repeater radio links able to pass via walls and ceilings if necessary.

By default, all Repeaters operate on the same radio channel as the Hub. This is the default configuration used by most systems and it is not normally necessary to change from this.

However, where there is a need to force Repeaters to make links to other specific Repeaters e.g. when a building-building link is required and this is specifically required to be above the height of passing vehicles, repeaters can be configured at the Hub to only operate on specific channels. See the Multitone document "Example EkoTek System Configurations" for more information on 'special' configurations.

Battery replacement is quickly achieved by sliding the repeater from the backing plate and lifting out the old batteries. No tools are required for this. An optional locking screw can be inserted where necessary to help prevent tampering with the Repeater e.g. where the Repeater is installed in a public environment, within reach of passers by.

Repeaters continually test links to adjacent Repeaters, detecting link failures and automatically searching for and establishing a new links should a one fail.

Network moves and/or expansion are achieved by moving or adding new Repeaters where required, making any network changes rapid and cost effective.

2-Way Pager



EkoTek's 2-way Pagers have the following key functions:

- Display of and response to assistance calls from other 2-way devices
- Display of paging messages created by using the Hub web server
- Generation of personal security assistance calls (same as a Call Fob)

For more information see 9621-8275 EkoTek Pager User

Guide.

Display of and Response to Assistance Calls

EkoTek's 2-way radio network provides message interchange between devices. For example, when a Call Fob raises an assistance message, this is displayed on Pagers and the Hub. A Pager/Hub user can then accept the call, which is then signalled back to the Call Fob and indicated to the User by a change in the LED/beep pattern being emitted by the Call Fob during the assistance call.

Display of Web server Paging Messages

A two-way paging application runs on the Hub, with paging messages being created via a page on the web server, using an attached PC and web browser such as Internet Explorer.

The web server paging display shows when paging messages have been delivered to the Pager and also the response "Yes/No". The Pager User is able to send a response to the message, by pressing the appropriate button on the Pager.

With this two-way paging function, simple task management systems can be easily created.

Personal Security Calls

In a similar way to Call Fobs, Pagers are able to generate assistance calls using the red assistance button on the Pager, or the in-built man-down or dead-man functions. A Pager can therefore function as both an alarm unit and a display, eliminating the need for certain Users to carry both types of units, as necessary with other types of systems.

Powering

An 'AAA' size battery powers the pager. Either rechargeable NiMH, or disposable Alkaline batteries may be used. Charging contacts on the Pager are used when the Pager is inserted into a charging rack.

Call Fob



The Call Fob allows assistance calls to be raised, using the location signals from Repeaters for accurate location determination. The Call Fob also supports dead-man and man-down features.

The configuration of the Fob is downloaded from the Hub, when the call fob is powered up.

The selection of the Call Fob features is by Hub configuration. All Call Fobs are physically identical and support the same features (if enabled at the Hub).

An LED, buzzer and vibrate motor are contained within the Call Fob and are used to indicate the call status, changing when a call is accepted by a remote user on the Hub, or a 2-way Pager. Indication of "assistance on its way" is signalled in this way.

An `AAA` size battery powers the Call Fob. Either rechargeable NiMH, or disposable Alkaline batteries may be used.

For more information see 9621-8277 EkoTek Call Fob User Guide.

Configuration

Configuration for all devices is held on the Hub and downloaded to each device at power-up.

The Hub defaults allow a new system to operate 'out-of-the-box', only requiring the location names for the Repeaters to be entered on the Hub web server configuration page.

Each device has its own unique factory set serial number for identification, but there is no factory programming of the devices. The Hub configuration set for the devices during installation, defines whether device options (e.g. man-down) are enabled or not.

Pager addressing is configured at the Hub – there is no need to factory program Pagers.

Network Parameters

An EkoTek system controlled by a single Hub is able to support up to 500 devices. See [Appendix 2 Specifications](#) for maximum numbers for each type of device.

The default configuration is for all EkoTek devices to use the frequency hopping radio channel used by the Hub, which defaults to channel 15. Other channels can be configured using the Hub web server interface, with up to 16 channels being available for simultaneous use by a single EkoTek system and Hub. See the Multitone document "Example EkoTek System Configurations" for more information on 'special' configuration.

A single EkoTek radio channel supports up to 90 Repeaters. The Repeaters can be configured in any physical deployment, as long as each Repeater is able to establish and maintain a suitably strong signal with a nearby Repeater, which has a path back to the Hub.

Repeaters can be deployed in long chain configurations if required e.g. to extend service along a corridor.

Diagnostics and Statistics

Each EkoTek device collects statistics on network performance and on messages. These statistics are regularly sent to the Hub and can be viewed using the web server.

Failure (loss) and battery low indications for EkoTek devices are detected by the Hub and reported on the Hub and/or Pager displays.

Network Design and Survey

Overview

The survey is used to assess the number of Repeaters required and best locations. It is suggested that the surveyor reads the System Overview (page 2) to become familiar with the basic principles of operation.

Pre-requisites

Two survey units

Site plan

Placement Rules

Each Repeater connects to the Hub, either directly or via another Repeater. The number of Repeaters required is dependant upon the size and layout of the building and the consistency of the radio coverage.

The EkoTek Hub/Repeaters must not be installed in areas where explosive gas, or dust products, may be present. Protect the devices from liquids, extreme temperatures and strong magnetic fields. Do not install in places where they will be exposed to strong sunlight, or electro-magnetic interference.

Hub

The Hub is normally placed in an area such as a control room or reception desk, where it is possible to monitor the display when required. Other considerations are to minimise the number of hops required for any Repeater to connect to the Hub; it is better if possible that the Hub be located at the centre of the network. The Hub must be located near to an AC mains socket outlet and it should also be borne in mind that connection via a modem link to the telephone network may be required, so access to a telephone socket would also be necessary.

Repeaters

Ideally Repeaters should be spaced 10-15 meters apart. They should be no closer together than 6 metres, except where there is a structural barrier such as a wall between Repeaters, sufficient to attenuate the radio signal. The maximum range is 20 metres, but placing equipments at this distance should be avoided if possible, as any degradation of the radio path may result in the loss of connection between Repeaters.

Multi-Storey Buildings

The EkoTek can be used in multi-storey buildings, provided that the floors are of concrete construction. The concrete floor provides sufficient attenuation of the radio signal to ensure that the Pager/Fob is located on the correct floor. In wooden floored buildings, the Pager may pick up a beacon from the floor above or below, giving an inaccurate location for the device.

In order to establish which floor the Pager/Fob is on, it is important that Repeaters are placed at the entrances to the bottom and top of stairwells. The actual placement of the Repeater may not necessarily be in the stairwell itself, but in a room leading onto the stairwell, in order to provide sufficient radio separation between Repeaters.

Corridors

In long corridors it may be prudent to place a Repeater in the middle of the corridor as well, to ensure robust radio connection in the mesh.

Room Placements

If locating individual rooms, place the Repeater as central to the room as convenient. Placing it on the edge of the room may allow a sufficient strength of location signal to pass through the wall, to be seen as a beacon by a Pager/Fob in the adjacent room.

It is however highly unlikely that the signal would pass through more than one wall.

In large rooms such as warehouses, it may be necessary to place more than one Repeater to ensure adequate radio coverage.

Between Buildings

If buildings are sufficiently close together, radio signals may pass between them. However, if for example a vehicle passes between the buildings, it may cause signal deterioration and the Repeater to loose contact with its parent. On a multi-storey building, it would be better to force the Repeaters on the first floor to form the link between buildings, by setting the downstream link of the parent to be a specific channel and the upstream link of the Repeater to be also the same channel.

Mesh Structure

A Repeater can only have one parent at a time, but the principle of a mesh network is that if a parent goes down, then the Repeater can look to connect to a new parent to reform the network. If it is unable to locate a new parent, then the network will be broken. It is therefore important to ensure that if a Repeater is off, then its "child" has a path to another parent. In most networks this is not a problem, as a Repeater may see many potential parents.

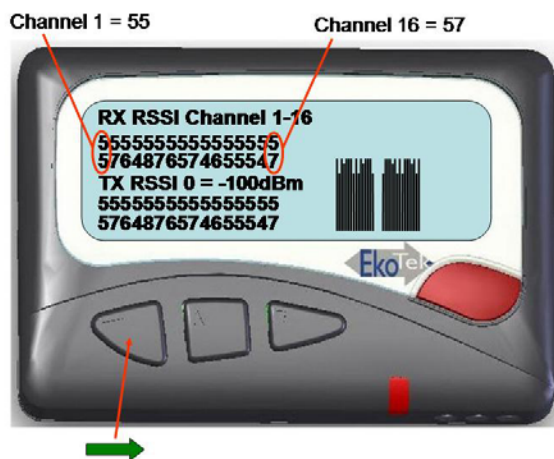
The survey unit

The survey unit is designed to assist in the placement of Repeaters and trouble -shooting the network. The Pager continuously transmits a signal, either to another Pager or to a Repeater and measures the signal received from that device.

The left button on the pager scrolls the menus. When taking measurements, always hold the pager by the left hand side to avoid masking the signal which is transmitted from the right hand side. Also avoid placing your body between the pager and the measured device, as this will also attenuate the signal.

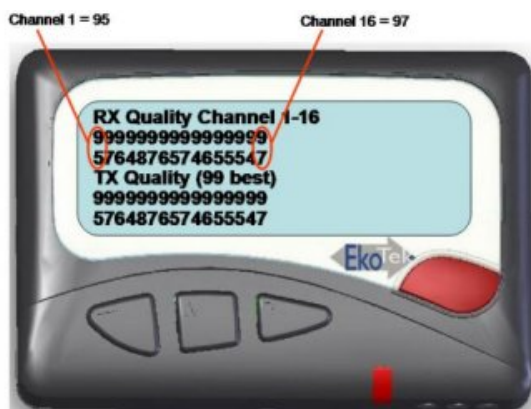
Note: The survey Pager is continuously transmitting a signal and the battery life is short. To avoid unnecessarily draining the battery, remove when not in use.

RSSI



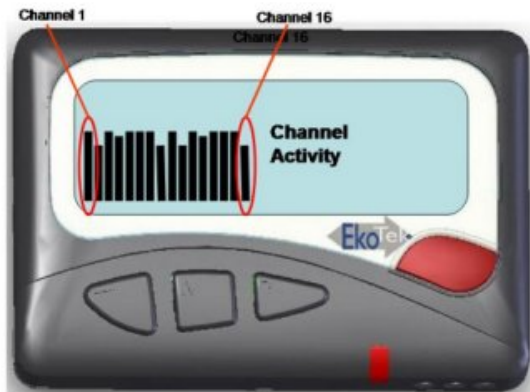
This screen indicates the signal strength for each channel in both the RX and TX paths. The measurement for each channel is displayed as a vertically stacked number. Ideally the RSSI should be 15 or above.

Quality



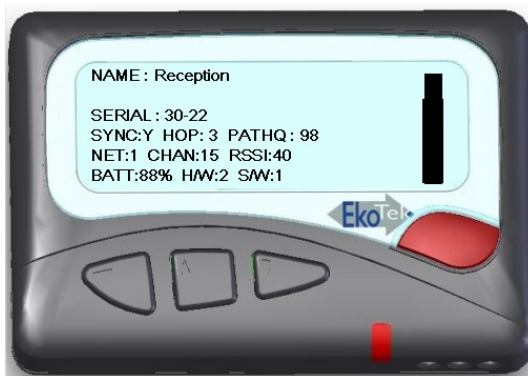
This screen indicates the quality for each channel in both the RX and TX paths. The measurement for each channel is displayed as a vertically stacked number. The range of reported values is 0 to 99 with 99 being the best quality.

Channel Activity



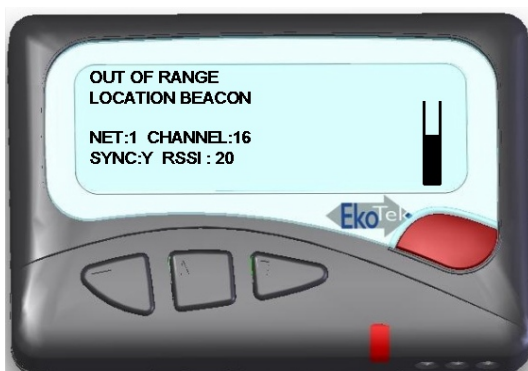
This shows the activity on each channel and is useful in determining the amount of WiFi activity on the system.

Repeater Info.



This screen shows information about the Repeater that the survey pager is connected to. The bar display shows the strength relative to the programmed Repeater location range.

Out of Range Location Beacon



This screen displays information about nearby Repeaters. The bar display shows the strength relative to the programmed Repeater location range.

How to Survey

Decide on the location for the hub.

Ask the customer which locations are critical for accurate call location reporting and mark on the plan those places as locations for Repeaters. It may be every room, a defined area or different floors. In very large rooms consider the use of more than one Repeater.

Also mark on the plan the positions for Repeaters at the top and bottom of all stairwells, to allow location tracking between floors.

The customer may also want to have a location change when persons leave a critical area. If so, mark Repeaters on the site plan at the exit of those critical areas.

When all the likely places for Repeaters have been marked, inspect the site plan to estimate if the distance between Repeaters exceeds the 10-15 metre maximum separation rule. If there appears to be a long gap between repeaters, consider if there are Repeaters on the floor above or below that can form a path for the network.

If a Repeater appears to be isolated, use survey Pagers to check the RSSI. Place a Pager at the Repeater and measure the RSSI at it's nearest neighbour. Remember it's nearest neighbour may be on a different floor. If the nearest neighbour is the other side of a thick wall, other marked locations may provide a more viable route. If in doubt it is best to place in-fill Repeaters, as the more Repeaters in a network the more robust the network is liable to be. If the RSSI is below 20, then consider placing another Repeater in between.

Installation

Pre-requisites

Prior to installation, the following items are needed:

- Site Plan with the position of the Hub and all the Repeaters clearly marked.
- An AC mains socket outlet for the Hub.
- An Ethernet connection to the LAN or dedicated PC.
- A working telephone line and AC mains socket for the PPP connection.
- A line for TAP connection if required.

Tools required

- Pozidrive screwdriver with PH1 bit.
- Screwdriver with 2.5mm blade.
- Stepladder.
- Cordless drill with 5mm masonry bit.
- Metric ruler.
- Laptop with Ethernet port.
- Ethernet patch cable.
- Fob and pager.
- It may also be useful to have a survey unit.

Parts required

EkoTek Hub with AC supply unit.

US robotics 5630D modem with AC supply unit and a RS232 (proprietary) connecting lead. See RS232 Connecting Lead.

EkoTek repeaters: Quantity as required by survey. It is also suggested that a spare Repeater is supplied, in case there is a need for in-fill that was not detected on the survey.

Installing the Hub



Figure 6. Hub

The Hub can be freestanding on a desk, or wall mounted using the screws provided.

To remove the cover, depress the two protruding plastic tabs and separate the top from the back plate.

Wall Mounting

Mark the position of the screws on the wall. The two screws should be spaced precisely 120mm apart.

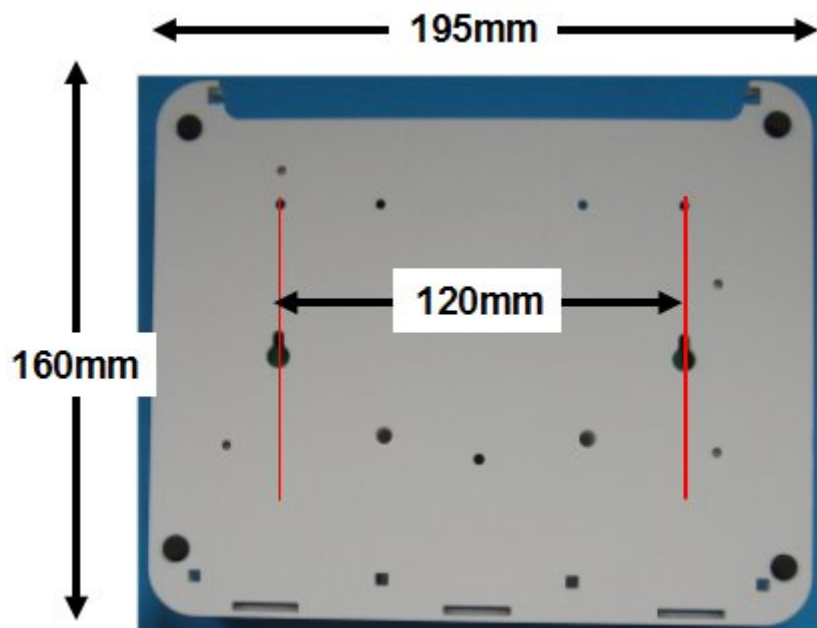


Figure 7. Hub Back Plate

Drill two holes with a 5mm masonry bit to a depth of 25mm.

Insert the wall plugs and screw the screws in using a PH1 Pozidrive bit. Leave 7mm of the screw protruding.

Locate the screw heads in the holes in the back-plate and pull the unit down to lock into place.

Interface Connections

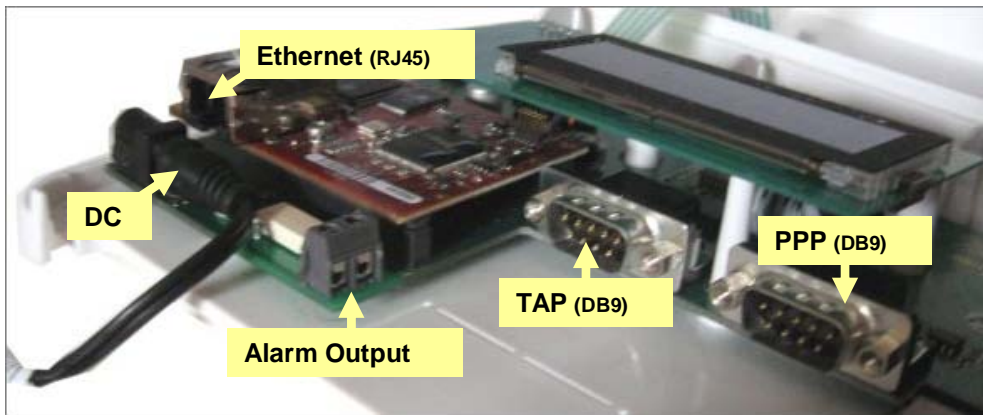


Figure 8. Interface Connections

Plug in the AC to DC power adapter

Plug in the Ethernet patch lead to connect to the LAN or PC. See also Connect the Hub to the PC using Windows XP (page 23).

If an external alarm is to be activated from the Hub, connect a pair of wires from the alarm output shown in Figure 8. Interface Connections. The alarm output is a simple make contact and can be used to operate a customer provided alarm relay. This is not designed to provide a direct contact for AC mains operated equipment.

Connect the DB9 TAP connection to the customer's paging system if required. The connection cable should be as specified by the paging system.

The PPP connection is made after the modem has been set-up. See

PPP Modem (page 17) for further details.

Repeaters



Figure 9. Repeater

Mounting the Repeater

Remove the back plate from the Repeater by sliding it in the direction shown.

Use the back plate to mark the position of the screw holes on the wall or ceiling.

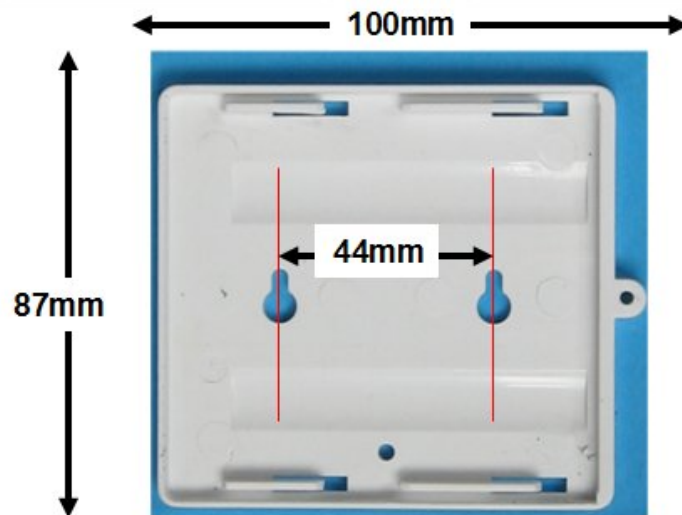


Figure 10. Repeater Back Plate

If fixing to masonry, drill two holes with a 5mm masonry bit to a depth of 25mm and insert wall plugs.

Screw the back plate in position using a PH1 Pozidrive bit.

Ensure the batteries are in place and slide the Repeater into position.

Lock the Repeater (if required) by screwing the small screw provided in the installation parts, as indicated by A in the photo above

PPP Modem



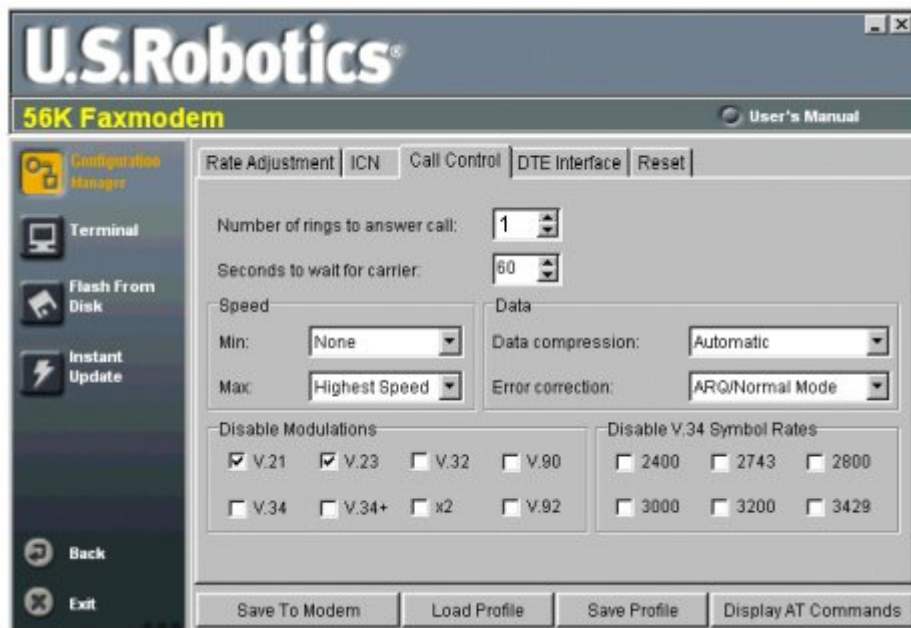
PPP connection to the Hub is made using a US robotics 5630D modem.

1. Plug the modem into the serial port of a PC using the serial interface cable provided with the modem. Use an adapter if the PC does not have a serial port. See Appendix 3 (page 51) for details of cable pinouts.
2. Install the US Robotics software onto the PC, from the CD provided with the modem.
3. After installation, locate the software in the programs menu on the PC and start.

The software automatically detects if the modem is connected.



Click the Configuration Manager and go to the Call Control tab



Set the **Number of rings to answer call** box to 1.

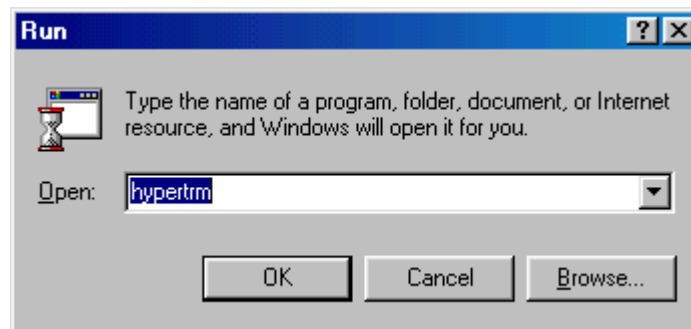
Click the **Save to Modem** button, which stores the current values from the Configuration Manager's fields to the writable memory of the modem.

Using Windows Hyper Terminal to Set Interface Speed

A terminal program is an application that will enable a PC to communicate directly with a modem. If you are using Windows 2000 or Windows XP, you can use the Windows HyperTerminal program as it is included as part of the operating system.

1. Check that the modem is connected to a serial port on the PC.

2. Load HyperTerminal:
 - Click Start > Run
 - In the box which appears, type in: **HYPERTRM**
 - Click OK.



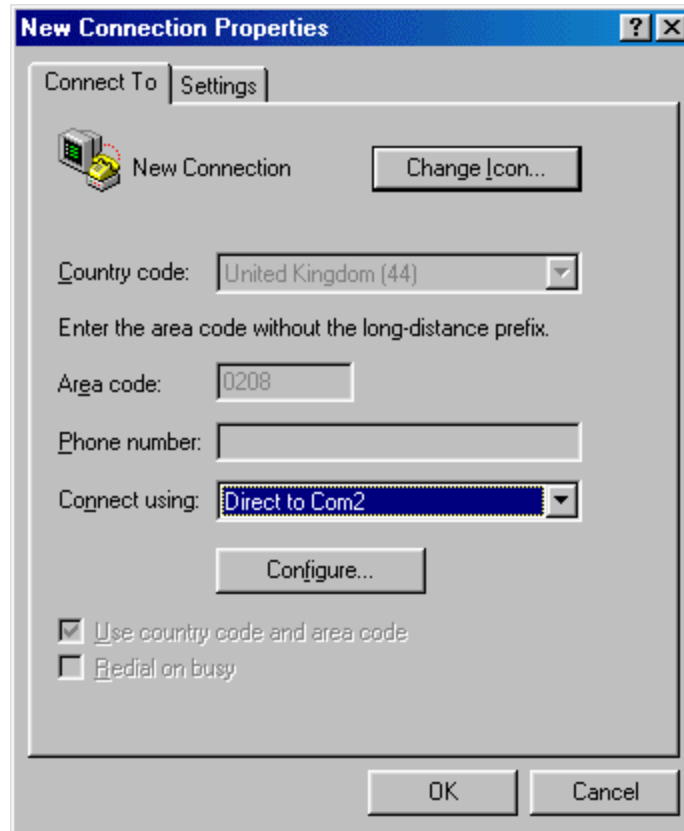
If you see the error message 'Cannot find HYPERTRM' you will need to install HyperTerminal:

- Click Start > Settings > Control Panel > Add / Remove Programs.
 - In Add / Remove Programs select Properties and then click the Windows Setup tab.
 - Double-click Communications
 - Check the box for HyperTerminal
 - Click OK, and then OK again to install.
 - **Note:** You may be asked for your Windows installation disk for this procedure.
3. When HyperTerminal starts you will be presented with a 'Connection Description' dialogue box.
 - Click '**Cancel**' to continue.

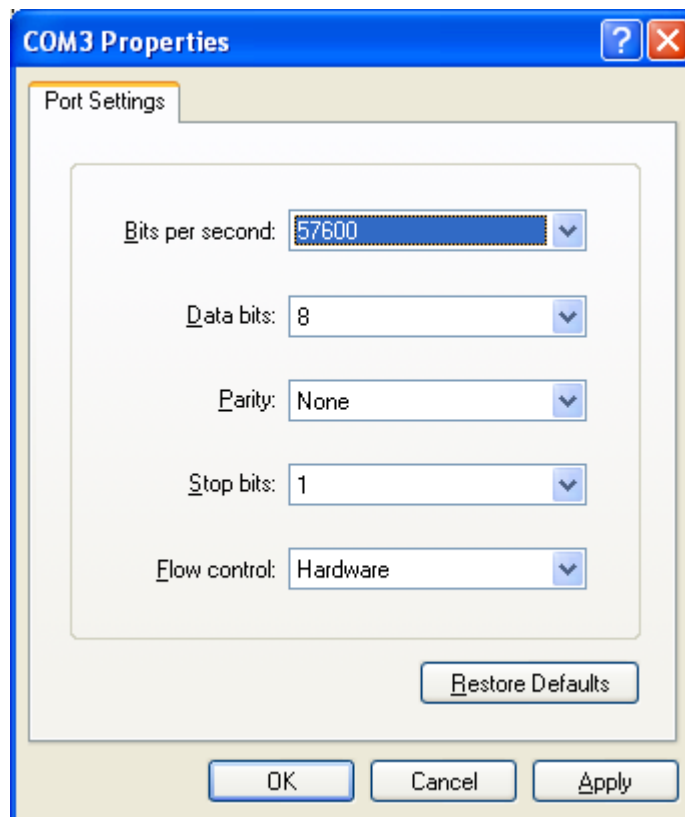


4. Select your COM Port:
 - Select 'File' then 'Properties' from the menu bar and the 'New Connection Properties' window will open.
 - Click on the arrow for the 'Connect Using' drop down box.

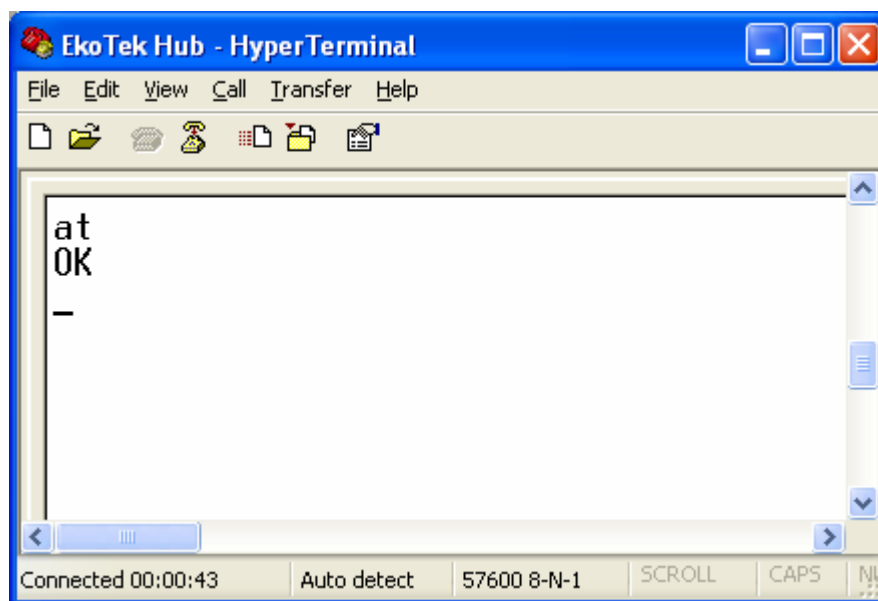
- Select 'Direct to ComX' (where X is the COM Port you are using to connect the modem. - e.g. COM1, or COM5, etc).
- Click OK.



- Configure the port to set the interface speed to 57600.



5. Click OK - a blank terminal window will open. You should now be communicating directly between the COMPORT and modem. To confirm this, type in the two letters 'AT' and press 'enter'



- Type in 'AT' (Enter)
If you are communicating, the modem will reply with 'OK'. If so, proceed to **Step 6**.

If no 'AT' or 'OK' appears, then there is a basic communication issue between the PC and the modem - most likely the COMPORT selected is incorrect - check this and try again.

If problems persist:

- Check Windows Device Manager (where available):
 - Check that the Modem is installed.
 - Check the COM Port is enabled and has no clashes (indicated by a yellow exclamation mark next to it).
 - Check the COMPORT is enabled in the system BIOS setup.
6. To store the configuration of the port speed in the modem, type '**AD&B2&W**' and press 'Enter'. You should receive an 'OK' as a response.
 7. Remove the lead from the PC COM port and connect to the PPP socket on the Hub.
 8. Close the cover on the Hub. Ensure that the ribbon for the keypad is connected to the header on the daughter board, as this is sometimes dislodged when the cover is removed.
 9. Test by dialling in to the modem from a PC. The User name and Passwords are both 'EkoTek'. The modem should auto answer and the EkoTek menu screen should be displayed.



10. Set up system configuration using the browser as described in the next section

The Browser Interface

Accessing the HUB with the browser interface

In order to configure and setup the Hub, a PC or a network Ethernet connection needs to be made to the Hub. This connection can also be used to monitor the EkoTek network. Once the connection has been made, then communication with the Hub is achieved through a web browser.

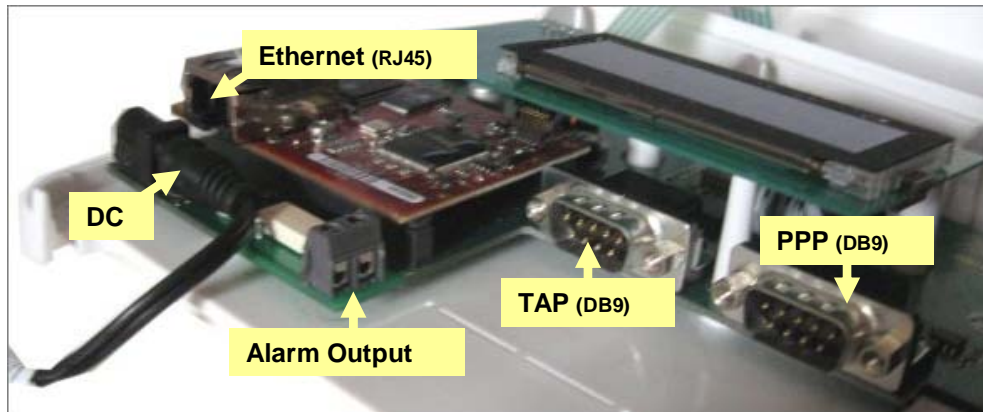


Figure 11. Hub Interfaces

Connect the Hub to the PC using Windows XP

On the PC: -

1. Click the Windows start menu and select Control Panel.
2. Click 'Network and Internet connections.
3. Click Network Connections. With the network cable disconnected, the Local Area connection will be shown as unplugged (X).



4. Open the Hub. To open the Hub, push the two locking tabs in and then separate the cover from the back plate.
5. Connect an Ethernet (RJ45) patch cable to the RJ45 connector, See Figure 11. Hub Interfaces.
6. Connect the other end of the patch cable to the Ethernet (RJ45) connector on the PC.

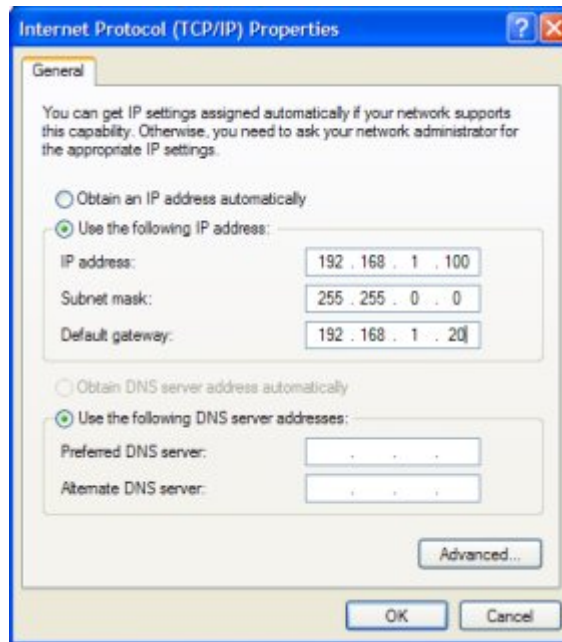
7. If connected correctly the screen will change to show the cable connected.



8. Double click the Local area connection icon to open the properties window.



9. Scroll the new window and select the 'Internet Protocol TCP/IP' menu item.
10. Click the Properties button.



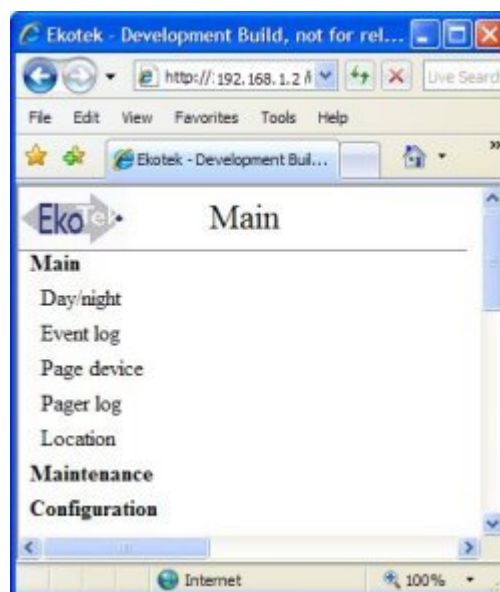
11. The default shipped configuration for the Hub is -
 IP address: 192.168.1.2 (1.1.1.1 if via PPP serial port)
 Subnet mask: 255.255.0.0
 Default gateway: 192.168.1.20

In order to communicate between the PC and the Hub, the IP address of the PC has to be set to the same Network and Subnet as the Hub. To achieve this select 'Use the following IP address' and enter the IP address in the same range as the Hub (in the example above 192.168.1.100 and a subnet mask of 255.255.0.0 Gateway 192.168.1.20).

12. Click OK to finish.

Using the Web Browser to Access the EkoTek Hub

In the address field of the web browser, type the IP address of the Hub (default is 192.168.1.2 for ethernet) and click the refresh button. The browser then connects to the Hub web interface.



Main menus

[Day/Night](#)

[Event Log](#)

[Page Device](#)

[Pager Log](#)

[Location](#)

Day/Night

Day/night settings

Operation mode DAY

Event Log

The screenshot shows the 'Event log' page in a web browser. The page has a navigation menu on the left with links for 'Main', 'Day/night', 'Event log', 'Page device', 'Pager log', 'Location', 'Maintenance', and 'Configuration'. The 'Event log' link is selected. The main content area shows a list of events, with a 'Latest' button at the top right and a 'Previous' button at the bottom. The events are listed in a table format with columns for time, date, and event description.

Time	Date	Event Description
17:00:14	31/05/2007	PS Assist Stephen = Training Room
15:51:06	31/05/2007	PG REPEATER Maintenance required
14:12:20	31/05/2007	PS Assist Cleared Stephen Fob
14:11:54	31/05/2007	PS Stephen Accepted (Stephen Fob)
14:11:44	31/05/2007	PS Assist Stephen Fob -
14:11:41	31/05/2007	PS Assist Cleared Stephen Fob
14:11:00	31/05/2007	PS Assist Stephen Fob -
14:09:53	31/05/2007	PS Assist Cleared Stephen Fob
14:09:45	31/05/2007	PS Assist Stephen Fob - Car Park
14:09:24	31/05/2007	PS Stephen Accepted (Stephen Fob)
14:08:56	31/05/2007	PS Assist Stephen Fob = Car Park
14:08:40	31/05/2007	PS Assist Cleared Stephen Fob
14:08:13	31/05/2007	PS Assist Stephen Fob - Training Room
13:34:34	31/05/2007	PG REPEATER Maintenance required
12:37:38	31/05/2007	PS Assist Cleared Stephen Fob
12:37:18	31/05/2007	PS Stephen Accepted (Stephen Fob)
12:36:43	31/05/2007	PS Assist Stephen Fob - Car Park
11:52:10	31/05/2007	PG David's test repeater 23 Maintenance req
05:11:06	31/05/2007	PG Mezzanine Development 8 Maintenance requ
04:02:50	31/05/2007	PG Mezzanine Marketing 2 Maintenance requir
17:04:19	30/05/2007	PS Assist Cleared Stephen Fob

The event log keeps track of all events on the system. It records: -

The time and date for each event recorded.

PS = Personal security.

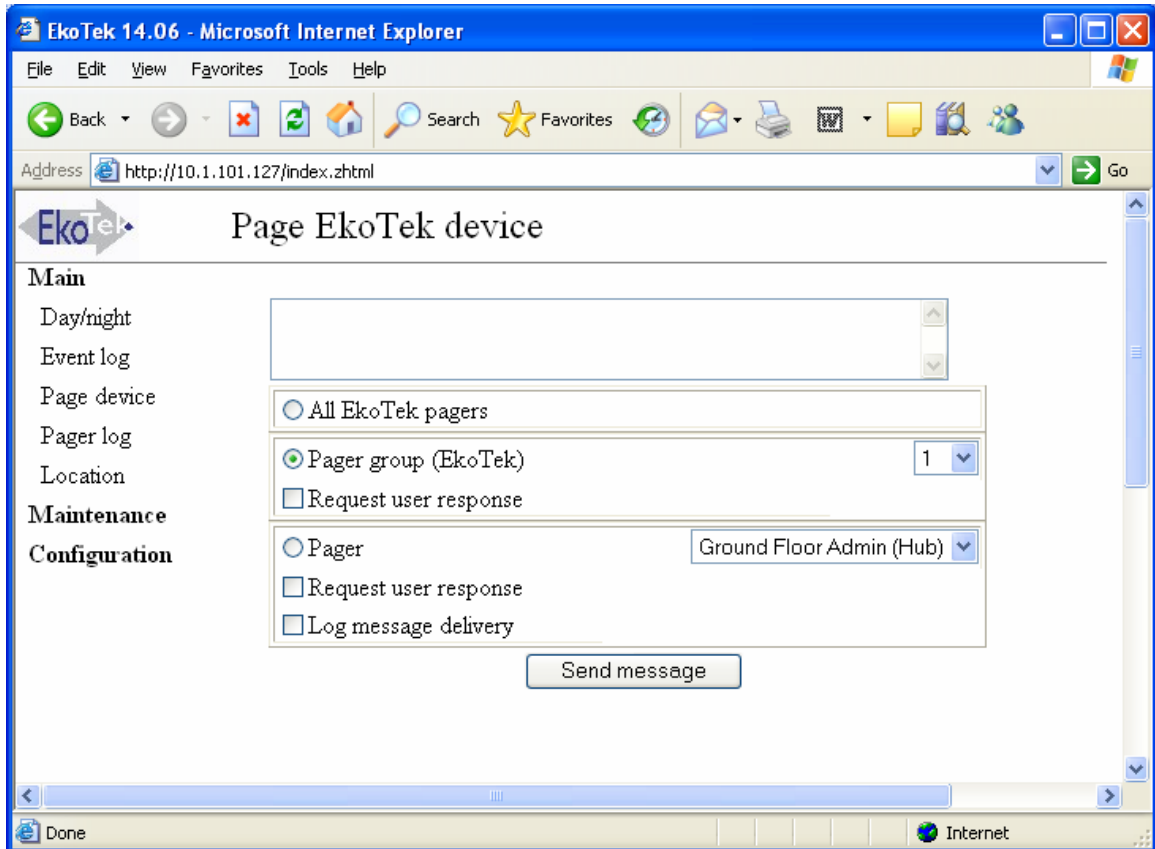
PG = Paging application.

Type of event and event details

The event log –stores the last 9000 events in flash memory, each event being a pager message sent (and in the case where delivery/user response is requested any message delivery/user responses), or an alarm being raised/accepted/cleared maintenance message (i.e. device with low battery/not reporting its status).

Once 9000 events have been recorded, any new event received is stored and the earliest recorded event is removed from the log.

Page Device



Pager Log

The pager log stores the last fifteen Pager messages, which had either, log message delivery, or request user response, ticked. Messages are kept until the sixteenth new message with response/delivery request ticked, or if Hub is reset.

Note: The pager messages are also written into the event log.

Location

Device location		
Name	Location report time	Location
PAGER	10:16:53 01/01/2000	First Floor
FOB	10:25:15 01/01/2000	First Floor

If location reporting for mobile devices has been enabled under the device mode, the Location screen shows the last location reported by each mobile device.

Maintenance Menus

[Device Status](#)

Device Status

Device status			
Name	Battery level	Last report	
1 HUB	100%	12:10:02 06/06/2007	Details
2 PAGER	72%	10:16:21 01/01/2000	Details
3 Ground Floor	90%	22:50:25 03/01/2000	Details
4 First Floor	85%	22:47:53 03/01/2000	Details
5 FOB	71%	10:25:13 01/01/2000	Details

[Refresh](#)

Each device in the mesh connects to the Hub via a parent device (repeater or directly to the hub itself). Maintaining this connection is important. These stats relate to that connection. Status reports are made every 4 hours.

Device Status Hub

Device status	
HUB	001-0000001
Name	HUB
Hardware-software	001-137
Last report	10:52:57 07/06/2007
Battery level	100%
Upstream link	Direct connection
Beacon loss count	62
Parent sync loss count	0
Link quality	100
Link strength	100
Upstream traffic	7

[Request Update](#)

Hub: Serial Number.

Name: Name given to device.

Hardware-Software: Revision number.

Last Report: Time and date stamp.

Battery Level: For Hub will always be 100.

Upstream Link: The name of the parent device to which the local device is connected by the radio mesh (reported on the Hub as 'Direct connection').

Beacon loss count = this records beacons lost during start up/reset.

Parent sync loss = number of times that a loss of sync has occurred.

Link quality = general quality of link to parent, Scale 1 to 100 where 100=best.

Link strength = RSSI of parent link, Scale 1 to 100 where 100=best.

Upstream traffic = count of packets sent to parent.

The stats are simple incrementing counters.

Device Status Repeaters

Device status	
REPEATER	030-0000082
Name	Ground Floor
Hardware-software	002-137
Last report	22:50:25 03/01/2000
Battery level	90%
Upstream link	REPEATER 030-0000083
Beacon loss count	896
Parent sync loss count	5
Link quality	44
Link strength	100
Upstream traffic	303
<input type="button" value="Request Update"/>	

Repeater: Serial Number.

Name: Name given to device.

Hardware-Software: Revision number.

Last Report: Time and date stamp.

Battery Level: Shows battery level. An alarm is given when battery level drops to 20% and a replace battery message initiated at 5%.

Upstream Link: Name and serial number of Repeater or Hub connected to.

Beacon loss count = missed parent beacons. This counts the number of times the Repeater has lost contact with its parent, either through faulty parent or degradation of the signal to the parent.

Parent sync loss = number of times that a loss of sync with parent has occurred.

Link quality = general quality of link to parent. Scale 1 to 100 where 100=best.

Link strength = RSSI of parent link. Scale 1 to 100 where 100=best.

Upstream traffic = count of packets sent to parent.

The stats are simple incrementing counters.

Device Status Fob and Pager

Device status		Device status	
PAGER	020-0000022	FOB	010-0000001
Name	PAGER	Name	FOB
Hardware-software	001-137	Hardware-software	001-137
Last report	10:16:21 01/01/2000	Last report	10:25:13 01/01/2000
Battery level	72%	Battery level	71%
Beacon loss count	0	Beacon loss count	1
Parent sync loss count	0	Parent sync loss count	0
<input type="button" value="Request Update"/>		<input type="button" value="Request Update"/>	

Pager/Fob: Serial Number.

Name: Name given to device.

Hardware-Software: Revision number.

Last Report: Time and date stamp.

Battery Level: Shows battery level regardless of whether the mobile battery level monitor is set to on or off. See Mobile device monitor (page 35).

Beacon loss count = missed parent beacons. This counts the number of times the Repeater has lost contact with its parent either, through faulty parent or degradation of the signal through moving out of range of the Repeaters.

Parent sync loss = number of times that a loss of sync with parent has occurred.

Request Update: click to retrieve current stats.

Configuration menus

The EkoTek configuration menus are: -

[System](#)

[Radio](#)

[Devices](#)

[Device Mode](#)

[Pager Groups](#)

[Alert Rules](#)

[Factory Reset](#)

[Delete All](#)

[Passwords](#)

[Archive](#)

Password

When a configuration menu item is opened at the beginning of a session, a password is requested. The default is user: **admin** and the password is not set (blank). Once access is gained the password can be set as required.



System Settings

This page sets the network interfaces. It enables set up of Hub settings, clock, external connections and the browser language.

Click 'Configuration' and select 'system'.

Set Clock

The clock operates in two modes, one displaying the current time (if JavaScript is enabled on the browser this will update, if not then the clock is a snapshot of the time the page was loaded).

1. Click the details button and enter the current time and date.

2. Click submit to set.

Note: An illegal clock setting will return to clock display mode, but the original settings will be retained.

Hub IP configuration

If the Hub is to be connected to an Ethernet Server/Network, then the IP address, subnet mask and gateway should be set within the address range of the network, to allow the Hub to be accessed from the network. Once the IP address is configured, then the Hub can only be accessed using that IP address, so a note should be made of any IP address that is set.

Note: An illegal IP setting will return to system settings and the original settings will be retained.

External Connections

Section for setting up external paging and logging connections.

Tap connection

If the Hub is to be connected to a wide area-paging network, then a modem is connected to the serial port. The data rate should be set to the modem speed (Options 1200, 2400 and 9600 bits per second). The data format should be set to match that of the receiving device (Options 7 bit even parity or 8 bit no parity)

Remote Logging

1. Click 'Remote event logging' to allow system event messages be sent to a remote device.
2. Click 'Remote debug logging' to forward all received/transmitted messages to remote machine.
3. Set the IP address of remote logging machine (logging messages sent to port 514) of the remote computer. Click submit to set the new external connection settings.

Note: No check is made that the remote logging machine exists.

Language

The browser interface is available in English, French (Francais), or Spanish (Español). Select required language from the drop list and click 'Submit'

Radio Settings

Radio settings	
Network identifier	<input type="text" value="07"/>
Delay optimisation	BALANCED ▾
Frequency hopping	OFF ▾
Device auto-register	ON ▾
Mobile device monitor	OFF ▾
Radio language	ENGLISH ▾
Auto-register names	HUB ▾
	<input type="button" value="Submit"/>
	<input type="button" value="Details"/>

Network identifier

The network identifier enables mobile devices to detect movement between EkoTek systems, forcing them to re-request their config. from the Hub. An example application is where a customer has two sites - each site should be set with a different identifier, so that when employees move between sites their mobile device will obtain the local config. when the device moves to a new site. The default is 01.

Note: Overlapping EkoTek networks are not supported in the first release.

Delay optimisation

Options: Inbound or balanced.

Inbound is used for maximum speed of delivery in the direction towards the Hub and is normally only used when there are no Pagers on the network i.e. no outbound user messaging (useful if external paging is intended as the main method of alerting users, or the German specification system).

Balanced is used where there are EkoTek Pagers on the system, to give a balanced speed of message flow across the radio network, both towards and from the Hub.

Balanced is fine for most applications and is the default.

Frequency hopping.

The 2.4GHz WiFi band has 16 channels. Frequency hopping allows the radio to change frequency (hop) between different channels in the band. This helps the system avoid interference from other WiFi devices using the spectrum and offers more security from eavesdropping, if this is a consideration.

The system can also be set to use a fixed frequency.

Usually only the first 14 channels are used for WIFI systems and setting to use a single fixed frequency in channels 15 or 16 could prove to be more robust where there is heavy WiFi usage. Set to 'on' or 'off' as required.

Device auto-register

If device auto register is set to 'on', any unknown device that is detected is permitted to join the network. These devices will be given default names. If the auto register is set to 'off', devices need to be manually added to the database before they will be recognised as on the system.

Mobile device monitor

All Repeaters are automatically monitored for battery condition and presence on the network, with Paging messages generated on low battery or absence of the device from the network. Mobile devices (Pagers and Fobs) can also be monitored for battery condition and presence on the network. Set to 'OFF', 'BATTERY', 'NETWORK+BATTERY' as required.

Note: The battery condition will be displayed on the Device status page, regardless of this setting.

Radio language

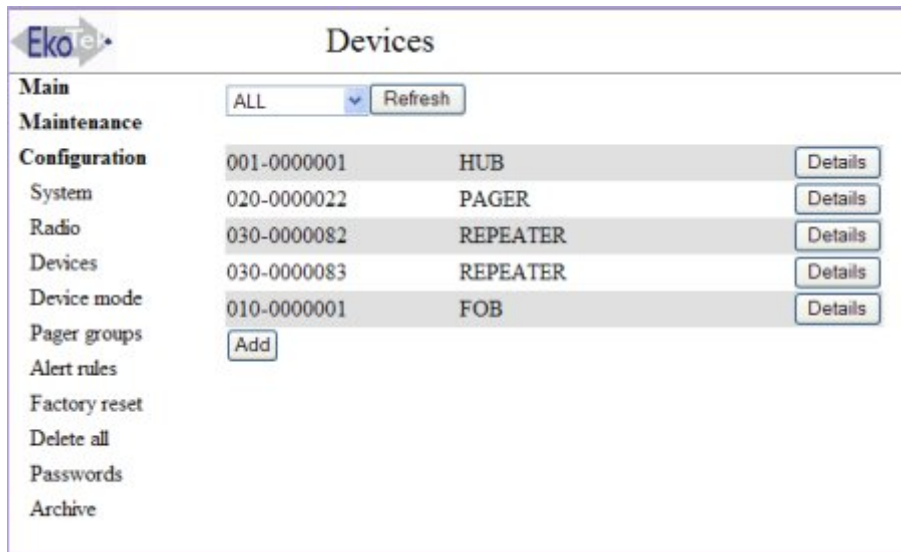
The Pager display language is available in English, French (Francais), or Spanish (Español). Select required language from the drop list and click 'Submit'.

Auto-register names

When the network detects a device, it is given a default name appropriate to the device type: Hub, Repeater, Pager or Fob. This default name can be redefined if required.

Select device from the drop list and click 'Details'. Enter a new name for the default and click submit to set. For example, to set all Pagers to register as 'Staff' and all Fobs as 'Visitor'.

Devices



The overview page lists all the devices connected in the EkoTek network.

Refresh:

To get the current list of devices, select the hardware type to be listed from the drop list and click the 'Refresh' button.

The devices will then be listed; the first column gives the hardware type-serial number of the device, the second column gives the device name and the third provides a "Details" button, to go to that specific device's record.

The serial number of each device is displayed and the device name.

001-xxxxxxx indicates a hub

010-xxxxxxx indicates a fob

020-xxxxxxx indicates a pager

030-xxxxxxx indicates a repeater

Click the 'Details' button to see the details of any device.

Add

Click 'add' to go to the 'add a new device' entry pages.

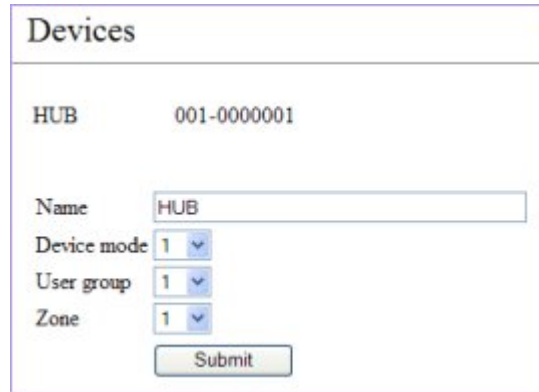
1. Select device type from menu.
2. Enter serial box and enter the serial number and name. The entry screen below is for a Repeater. Similar screens are shown for Hub, Fob and Pager, with the appropriate hardware code displayed.

3. **Submit: Click** to add the new device. If valid, then the individual device entry page is displayed. If not possible (invalid serial number length, attempt to add a device prior to the Hub, attempt to add a second Hub, too many devices already on-system etc.) then 'Invalid device request' is displayed. If a device exists in the database with the

same serial number as the new requested device, the existing device details will be displayed.

Details

Hub



Devices

HUB 001-0000001

Name HUB

Device mode 1

User group 1

Zone 1

Submit

Name

The name of the Hub may be changed, by entering a new name in the box.

Device mode

Each Pager and Fob is allocated a device mode (1-32). The device mode defines the alarms and responses to them. See Device Mode (page 38).

User group

Select from the drop list, to set User group 1-16.

Zone

Fixed devices are allocated a Zone number, allowing assist messages from mobile devices to be sent to different Pager groups, based on the Repeater (Zone) that the mobile device is connected to. Up to 16 zones are supported by the EkoTek system.

Submit

Click Submit to enter changes.

Repeater



Devices

REPEATER 030-0000082 Remove

Name Ground Floor

Device mode 1

Zone 1

Submit

The name of the Repeater may be changed, by entering a new name in the box.

Device mode

Each Repeater is allocated a device mode (1-32). The device mode defines the alarms and responses to them. See Device Mode (page 38).

Zone

Each Repeater is allocated a zone. Repeaters set with the same zone will all connect to that Hub. This ensures that when a repeater is within the mesh of more than one Hub, it is forced onto the required Hub. Up to 16 zones are supported by the EkoTek system.

Submit

Click Submit to enter changes.

Pager and Fob

<p style="text-align: center;">Devices</p> <p>PAGER 020-0000022 <input type="button" value="Remove"/></p> <p>Name <input type="text" value="PAGER"/></p> <p>Device mode 1 ▾</p> <p>User group 1 ▾</p> <p style="text-align: center;"><input type="button" value="Submit"/></p>	<p style="text-align: center;">Devices</p> <p>FOB 010-0000001 <input type="button" value="Remove"/></p> <p>Name <input type="text" value="FOB"/></p> <p>Device mode 1 ▾</p> <p>User group 1 ▾</p> <p style="text-align: center;"><input type="button" value="Submit"/></p>
--	--

Name

The name of the Pager/Fob may be changed, by entering a new name in the box.

Device mode

Each Pager and Fob is allocated a device mode (1-32). The device mode defines the alarms and responses to them. See Device Mode (page 38).

User group

Select from drop list to set User group (1-16).

Submit

Click Submit to enter changes.

Device Mode

Device mode		
HUB	3 ▾	<input type="button" value="Details"/>
FOB	6 ▾	<input type="button" value="Details"/>
PAGER	1 ▾	<input type="button" value="Details"/>
REPEATER	1 ▾	<input type="button" value="Details"/>

This section allows changes to be made to device parameters. The initial page presents a list of the different hardware types. A drop down menu allows selection of a specific device mode (1-32) for the hardware type and a details button, which re-directs the browser to the specific hardware device mode (HUB, FOB, PAGER, REPEATER).

Hub Details

Device mode

HUB

Channel

Location range

Manual alarm enable Alert text
 Operation

Alarm audible alert

Deadman alarm enable Alert text

Timer interval (minutes)

User alert period (seconds)

Alarm clearance Alert text

Alarm escalation period (minutes)

The device mode entry page hardware type is followed by the modifiable device mode name (defaults 1->32).

Channel:

Select from the drop down menu (1 -> 16) to set the RF channel to be used by the Hub. The default value of 15 should be used where possible.

Location range:

Defines the range of the location signal from the Hub. The default value is '2' which gives an approximate range in indoor environments of 3m. A value of '1' gives the shortest range and '10' the longest range. The range should not be set to high values in deployments where location signal penetration through walls and floors is not desired.

Manual alarm enable:

Set the manual alarm and ways the device can raise manual alarms, i.e. via button press(es).

Alert text:

Modify text to define the message sent to Pagers when the alarm is activated. Defaults to 'Assist'.

Operation:

Define how many button presses are required to trigger the manual alarm (one or two) selected by drop-down menu. Select either 'Single click' or 'Double click'.

Alarm audible alert:

Define whether device buzzer sounds when manual alarm is raised.

Deadman alarm enable:

Enable the deadman automatic alarm. This is raised if no input is received from the User when prompted by the device.

Alert text:

Modify text to define the message sent to Pagers when this alarm is activated. Defaults to 'No response'.

Timer interval:

Sets the time between User input prompts (minutes).

User alert period:

Sets the time that the buzzer prompt sounds on the device without User input, before the alarm is raised (seconds).

Alarm clearance: Alert text:

Modifiable text appears in the message sent to Pagers when any alarm for this device is cleared. Defaults to 'Cleared'.

Alarm escalation period:

If an active alarm is not cleared within this period of time, then the device re-sends the alarm with a raised escalation level (minutes).

Submit:

Submit the requested configuration.

Repeater Details

Device mode

REPEATER

Upstream channel ▼

Downstream channel ▼

Location range ▼

The device mode entry page hardware type, followed by the modifiable device mode name (defaults 1->32).

Upstream channel/Downstream channel:

(Repeater only) Used to determine the RF channel of the Repeater, selected via drop down menu (1 -> 16) and *As parent* Allows a Repeater to use the same RF channel as its parent device. The default mode of operation, this allows for a self-organising radio network.

Location range:

Defines the range of the location signal from the Repeater. The default value is '2' which gives an approximate range in indoor environments of 3m. A value of '1' gives the shortest range and '10' the longest range. The range should not be set to high values in deployments where location signal penetration through walls and floors is not desired.

Submit:

Submit the requested configuration.

Pager and Fob Details

Device mode	
PAGER <input type="text" value="1"/>	
Manual alarm enable <input checked="" type="checkbox"/>	Alert text <input type="text" value="Assist"/>
Operation <input type="text" value="Double click"/>	
Alarm audible alert <input checked="" type="checkbox"/>	
Alarm vibrate alert <input checked="" type="checkbox"/>	
Deadman alarm enable <input type="checkbox"/>	Alert text <input type="text" value="No response"/>
Timer interval <input type="text" value="30"/>	(minutes)
User alert period <input type="text" value="10"/>	(seconds)
Mandown alarm enable <input type="checkbox"/>	Alert text <input type="text" value="Man over"/>
Tipover trigger period <input type="text" value="5"/>	(seconds)
User alert period <input type="text" value="5"/>	(seconds)
Alarm clearance <input type="text" value="Cleared"/>	Alert text <input type="text" value="Cleared"/>
Alarm escalation period <input type="text" value="1"/>	(minutes)
Enable location reports <input checked="" type="checkbox"/>	
<input type="button" value="Submit"/>	

Device mode	
CALL FOB <input type="text" value="1"/>	
Manual alarm enable <input checked="" type="checkbox"/>	Alert text <input type="text" value="Assist"/>
Operation <input type="text" value="Single click"/>	
Alarm audible alert <input checked="" type="checkbox"/>	
Alarm vibrate alert <input checked="" type="checkbox"/>	
Deadman alarm enable <input type="checkbox"/>	Alert text <input type="text" value="No response"/>
Timer interval <input type="text" value="30"/>	(minutes)
User alert period <input type="text" value="10"/>	(seconds)
Mandown alarm enable <input type="checkbox"/>	Alert text <input type="text" value="Man over"/>
Tipover trigger period <input type="text" value="5"/>	(seconds)
User alert period <input type="text" value="5"/>	(seconds)
Alarm clearance <input type="text" value="Cleared"/>	Alert text <input type="text" value="Cleared"/>
Alarm escalation period <input type="text" value="1"/>	(minutes)
Enable location reports <input checked="" type="checkbox"/>	
<input type="button" value="Submit"/>	

The device mode entry page content for the Pager and the Fob are the same. The hardware type is followed by the modifiable device mode name (defaults 1->32).

Manual alarm enable:

Sets the device to raise manual alarms, i.e. via button press(es)

Alert text:

Modifiable text appears in the message sent to pagers when this alarm is activated.

Defaults to: Assist

Operation:

Define how many button presses are required to trigger the manual alarm (one or two) selected by drop-down menu. Single click, Double click.

Alarm audible alert:

Define whether device buzzer sounds when manual alarm is raised.

Alarm vibrate alert:

Define whether the vibrate motor is activated when a manual alarm is raised.

Deadman alarm enable:

Enable the deadman automatic alarm. This is raised if input is not received from the User, when prompted by the device.

Alert text:

Modifiable text appears in the message sent to Pagers, when this alarm is activated. Defaults to: No response.

Timer interval:

Time between user input prompts (minutes).

User alert period:

Time that the buzzer prompt sounds on the device without user input, before the alarm is raised (seconds).

Mandown alarm enable:

Enable the tip over switch automatic alarm; will raise an alarm if the unit has been moved away from an upright position for a defined period of time.

Alert text:

Modifiable text appears in the message sent to pagers when this alarm is activated. Defaults to: Man over.

Tipover trigger period:

Length of time a device must be moved away from upright, until the User warning buzzer sounds (seconds).

User alert period:

Length of time that the buzzer sounds on the device, without it being returned to the upright position and the cancel button pressed, before the alarm is raised (seconds).

Alarm clearance - Alert text:

Sets the text to appear in the message sent to Pagers, when any alarm for this device is cleared. Defaults to: Cleared.

Alarm escalation period:

If an active alarm is not cleared within this period of time, then the device re-sends the alarm with a raised escalation level (minutes).

Enable location reports:

If selected, then the 'locate mobile device' page will display the last known location of this device.

Submit:

Submit the requested configuration.

Pager groups

These pages are used to manage Hubs and display Pagers into groups. Devices may appear in none, one or many Pager groups. Each group is restricted to thirty-five devices.

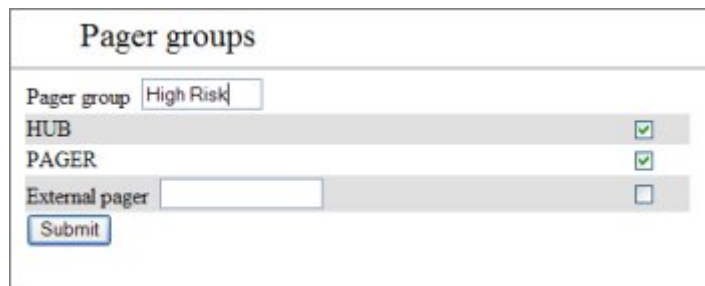
Pager group selection page



The list of 32 Pager groups is given in a drop-down menu (by default 1 - 32). Each group can be assigned a name if required, using the Pager Group entry page.

Click 'Details' to open the Pager Group entry page and set up a group.

Pager group entry page



Pager group

Enter text for the Pager Group name.

All the connected display equipped devices are listed (by name) and a checkbox denoting membership to this group. Check the box to add the devices to the group.

External pager

If connection is to be made to an external Pager, enter the Pager identifier into the number field for, this the identifier sent via the TAP output interface. Check the box to add the external Pager to the group.

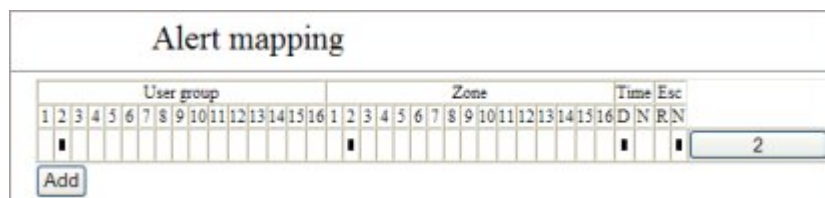
Submit

Submit the new Pager group membership.

Note: - if more than 35 devices are selected, the changes will not be executed and the Pager group will revert to it's saved settings.

Alert rules

Alert rules manage the target Pager groups for alarms raised and enables all those alarms raised in different zones and by devices assigned to specified user groups, to be directed to particular Pager groups. Alarms with raised and normal escalations and at different times of day, can be similarly routed. The page operates in a number of modes, displaying the current rules table, allowing new rules to be added and existing rules to be modified and deleted.



If any rules have been entered a table is displayed, the top row of which contains: -

User group: Parameters set in the device entry. Groups 1 to 16.

Zone: Parameters set in the device entry. Zones 1 to 16.

Time: The day/night setting of the system. D =Day, N= Night.

Esc: The escalation level of the alarm. R = Raised, N=Normal.

A black square means that a particular group/zone/time of day/escalation has been included in the rule). The end of the row is a button containing the name of the Pager group that is targeted by the rule. If there are more than 16 rules in the table, the header will be repeated after the last rule.

Edit mapping.

Clicking the Pager group name button at the end of the row causes the page to be re-loaded with modifiable rules; the selected rule will appear as a shaded row and in place of the Pager group name a remove button appears. The checkboxes are pre-loaded with the current rules settings. Change the rule settings as required and then click submit to save the amendments.

Alert mapping

Edit rule details

User group 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Zone 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Time of day Day Night

Escalation Raised Normal

Pager group 2

User group																Zone																Time	Esc					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	D	N	R	N			
█																█																█				█	█	<input type="button" value="Remove"/>

Remove

Clicking the 'Remove' button will remove that rule from the table.

Add

Click the 'Add' button to enter a brand new rule: note that this will only appear if there are currently fewer than 32 rules.

Alert mapping

Enter new rule details

User group 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Zone 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Time of day Day Night

Escalation Raised Normal

Pager group 10

User group																Zone																Time	Esc			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	D	N	R	N	
																																				2

Clicking the Add button will present a screen very similar to the edit rule mode; the initial line is **Enter new rules details** followed by the options and (clear) checkboxes as for

the edit. No rule table entry is shaded. Pressing submit will cause a conflict check, as with the edit rule function.

User group: Select the user group(s) using the rule.

Zone: Select the zone(s) using the rule.

Time of day: Select the day and/or night settings of the system.

Escalation: The escalation level of the alarm. R = Raised, N=Normal

Pager Group: Select a pager group.

Submit: The submission of the rule will cause a check for rule conflicts: any specified alarm event must only result in a single pager group target. If a conflict is detected the change is not made, the edit rules detail table will remain on the page (with the requested new settings) in order to enable the conflict to be resolved.

After a successful submission the Alert Mapping page shows the new rule added to the list.

Alert mapping																																					
User group																Zone																Time		Esc			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	D	N	R	N		
Add																																					

Factory reset

Factory reset	
<p>Proceeding with this action will delete all devices from the database and return all settings to factory values</p>	
<input type="button" value="Factory reset"/>	

Click 'Factory Reset' button to return network to factory settings (all devices deleted, IP addresses reset etc). The following text appears: 'Proceeding with this action will delete all devices from the database and return all settings to factory values'.

Delete all devices

Delete all devices	
<p>Proceeding with this action will delete all devices from the database</p>	
<input type="button" value="Clear database"/>	

Click the 'Clear database' button to clear the database of all network devices, but leave passwords, IP addresses etc. as set.

The following text appears: 'Proceeding with this action will delete all devices from the database'.

Passwords



Change the system passwords.

User name followed by a drop-down menu containing: -

User

The User level allows access to all pages within the Main and Maintenance menus and to the passwords page under the Configuration menu (it can only change the password for the user).

Admin

Admin level allows access all functions.

New password

Enter new password in the text input box.

Submit

Submit the new password.

The following text will be displayed according to the outcome

'user/admin password changed' or 'password change failed'

A password change failure may also be accompanied by the following

'New password must be between 4 and 8 characters long'

If the web user is logged in as User and is attempting to change the admin password.

'You do not have permission to change this password' is displayed.

Archive

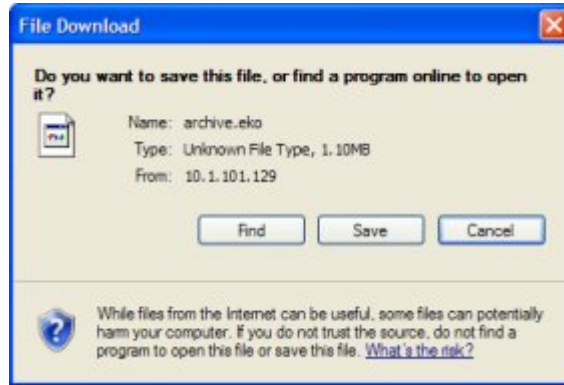
This page is used to manage archiving and restore system configuration.

Download current configuration to archive file

1. Click the Download button.



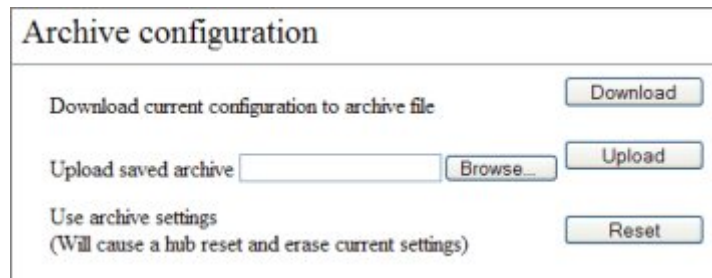
2. In the "File download" pop-up box, click save and save the file to a location on the PC.



Upload saved archive



1. Click the 'browse' button and locate the saved archive.
2. Click the 'upload' button and the configuration from the selected file is transferred to the Hub. This may take a few minutes. If there is a failure to upload a saved configuration, this will result in the display of the following message: *'Error encountered uploading requested file'*.



3. If a valid configuration has been uploaded to the Hub, the following lines are displayed: *'Use archive settings (Will cause a hub reset and erase current settings)'*.
4. Click the reset button to reset the Hub to the archived settings.

Final Checks

Connect a PC to the Hub over the Ethernet connection.

Open the device status in the maintenance menu.

Device status				
Name	Battery level	Last report		
1 HUB	100%	12:10:02 06/06/2007		Details
2 PAGER	72%	10:16:21 01/01/2000		Details
3 Ground Floor	90%	22:50:25 03/01/2000		Details
4 First Floor	85%	22:47:53 03/01/2000		Details
5 FOB	71%	10:25:13 01/01/2000		Details

[Refresh](#)

Check that all the Repeaters are seen by the Hub. If a Repeater is not seen it may be:

- Out of reach of a parent
- Faulty
- Or the battery may be flat or disconnected.

Investigate cause using a survey pager. In cases where it is too far from the nearest Repeater to get a viable link, then a Repeater may be needed to infill and complete the mesh.

Click the details for each Repeater and check the strength and quality of the link. If the link looks marginal, remove the parent of that Repeater from the network and see if it will sign on to a different parent with a better link.

Device status	
REPEATER	030-0000082
Name	Ground Floor
Hardware-software	002-137
Last report	22:50:25 03/01/2000
Battery level	90%
Upstream link	REPEATER 030-0000083
Beacon loss count	896
Parent sync loss count	5
Link quality	44
Link strength	100
Upstream traffic	303

[Request Update](#)

Register a Pager and a Fob on the system in the same paging group and see if an alarm from the Fob is received at the Pager and that the response is sent to the Fob on the network.

This completes the installation.

Appendices

Appendix 1: Miscellaneous system messages

The following on-system messages are generated in addition to the web-server interface.

Personal security messages

Accepted

Generated as a consequence of a Pager accepting a raised alarm.

Pager response messages

Delivered

Accepted

Rejected

Denoting the delivery acknowledgement and appropriate User acceptance/rejection.

Maintenance messages

LOW battery

Generated when the battery level drops to 20%, will be re-generated for every further 3% drop until

REPLACE battery

Is generated at 5% battery level and re-generated for every further drop.

If a fixed device fails to report its status as scheduled on 4 consecutive occasions (each report sent at 4.5 hour intervals) and if the device remains persistently not reporting its status (i.e. a further 6 consecutive missed status reports), the following message is generated:

Maintenance required

Generated when maintenance is required.

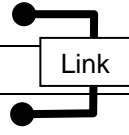
Appendix 2 Specifications

Specifications

Radio Frequency	2405 – 2480 MHz
Radio Channels	16
Channel Operating Mode	Fixed frequency, or frequency hopping
Radio channels simultaneously used per system	Max 16
Radio Power	10mW
Radio Coding	CDMA IEEE 802.15.4
Hub Power	AC-DC Power Adaptor
Hub Backup Batteries	3 x `C` cell NiMH rechargeable batteries
Repeater Power	2 x `D` cell High Capacity Alkaline Manganese batteries
Pager Power	1 x `AAA` cell High Capacity Alkaline Manganese, or NiMH rechargeable battery
Call Fob Power	1 x `AAA` cell High Capacity Alkaline Manganese, or NiMH rechargeable battery
Max. number of Repeaters per radio channels	Max. 90
Max. number of Pagers	Max. 127
Number of Pagers in a Pager group	Max. 35
Max. number of devices per system	Max. 500

Appendix 3 RS232 Cable Pin outs for connecting Modem to the Hub

DB25	DCE	DB9	
2	TXD	3	Transmitted Data
3	RXD	2	Received Data
4	RTS	7	Request to Send
5	CTS	8	Clear to Send
6**	DSR	6	Data Set Ready
7	GND	5	Signal Ground
8	CD	1	Rec. Line Signal Detector



** = not connected

Related Documentation and Revision History

Revision History

Issue	Date	Author	Revision
1	June 2007	M Windett	Initial Document.
2	30.08.07	R.Robertson	Production Issue

Related Documentation

Title	Part Number
EkoTek Pager User Guide	9261-8275
EkoTek Hub User Guide	9261-8276
EkoTek Call Fob User Guide	9261-8277
EkoTek Fob Quick Instructions	9261-8311
EkoTek Pager Quick Instructions	9261-8312
EkoTek Hub Help Files (HTML)	4761-8313



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