

Radio access  
& control

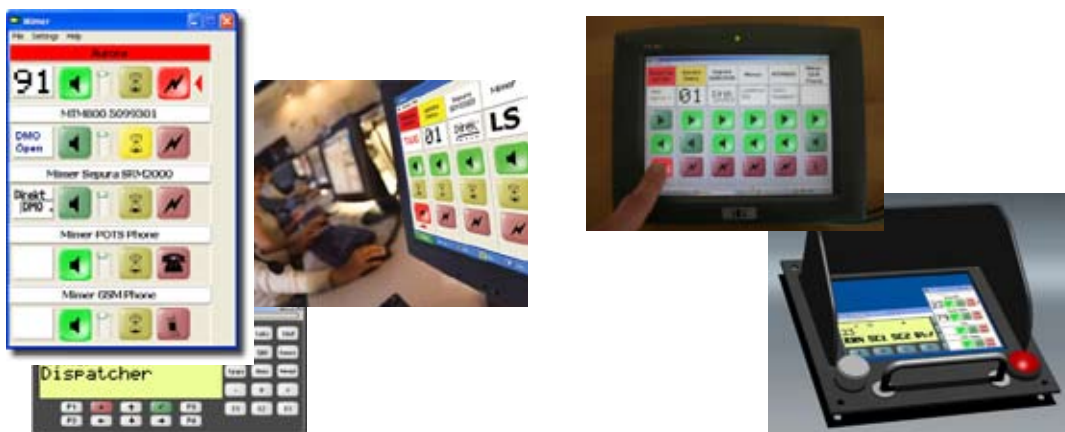
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## Radio-over-IP SoftRadio Operator consoles and accessories



- **SoftRadio Series Operator Interfaces and Applications**
- **Options, Specials and Accessories**
  - » Further your two-way radio network - to your needs, budgets and schedule
  - » Maximise availability, utilisation and access across your network
  - » Respond quickly and decisively to unforeseen needs and situations
  - » Simplify administration and maintenance
  - » Safeguard investment and extend use of existing assets and infrastructure
  - » Be prepared for new applications

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# 1. Introduction

Radio-over-IP (RoIP) allows us to connect radios and transport two-way radio communications over an IP-network. RoIP is essentially Voice over IP (VoIP) with Push-To-Talk (PTT), but with the ability to provide much more than simple two-way speech. With RoIP, users no longer need a physical radio to communicate via a radio network. An IP-enabled radio can be accessed from anywhere with access to an IP-network, be it from within an organisation's own intranet or via the internet. RoIP is by nature interoperable as radios are simply nodes on an IP-network, regardless of standard, frequency and RF-interface.

Radio over Internet Protocol sends analogue and digital 'radio payload' via IP-packets across a LAN or WAN. The sending node converts the payload into digital, organises the data into packets and sends these packets to the receiving node - much like goods in a shipping container. At the receiving end packets are reassembled into a constant flow of user data and as needed reproduced into an analogue signal. In a RoIP network, at least one node of a network is an IP-enabled radio: A radio in combination with an RoIP Interface Unit (RIU). The IP-Radio is the interface between IP-network (Internet) and the RF environment. The other nodes are typically an operator PC with a RoIP/VoIP based speech and control console, but can be basically any IP-capable device.

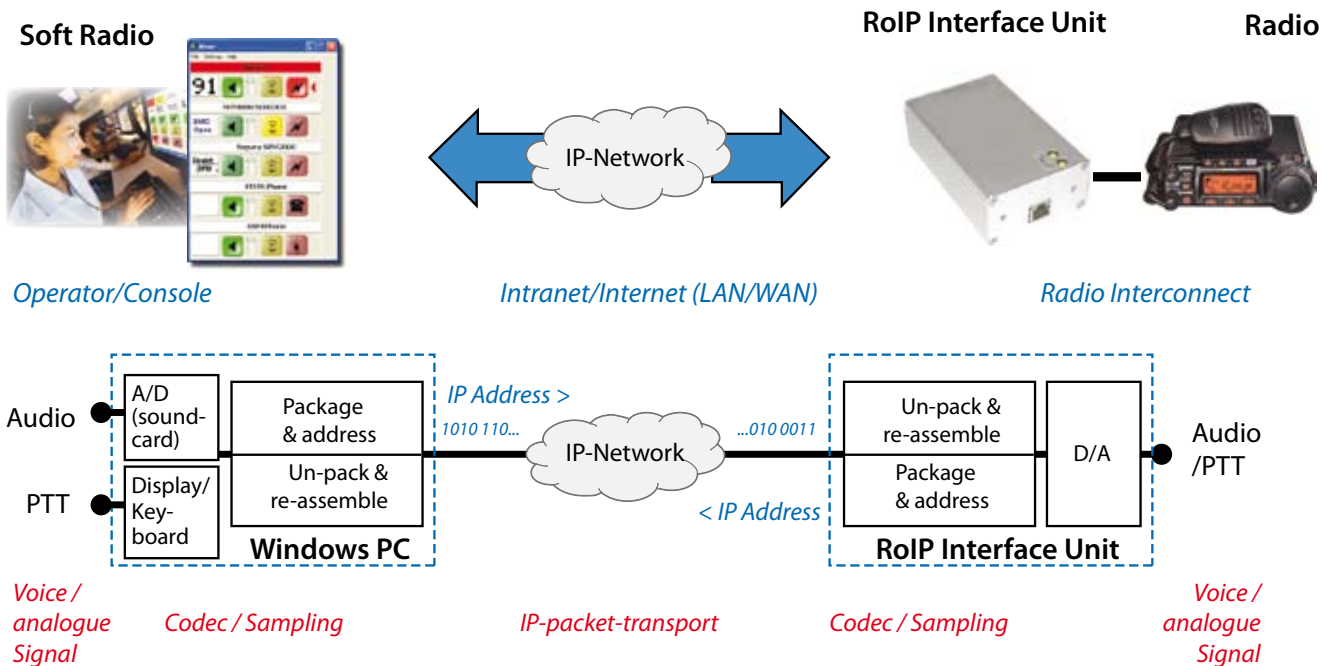


Figure 1. Basic Radio-over-IP Channel

The RoIP channel connects the operator to a remote radio via an IP-network and in turn via the radio to a mobile radio user. At the operator end SoftRadio, a Windows based RoIP/VoIP application provides the console and the interface between operator-PC and RoIP-Network. On the remote or radio side a dedicated RoIP/Radio Interface Unit (RIU) connects the radio to the IP-network.

To send from the operator, the SoftRadio on the PC converts the audio, PTT and any control signals to IP-compatible data and sends these to the IP-address of the remote RIU/Radio. This can include any applicable digital payload for the radio. The RIU then converts these back to the analogue and digital signals and formats required by the radio. Sending from the RIU to the operator is the same, simply in reverse. At the SoftRadio, the IP-packets are converted back into the payload and control content and displayed respectively reproduced into audio using the PC's sound card.

The key to building an efficient and effective RoIP Radio Network is the RoIP (Radio) Interface Unit, or Network Interface and its seamless integration with the operator-side applications.

## 2. SoftRadio Operator Console & interface

SoftRadio enables an operator to connect from a standard PC to multiple two-way radios via an IP-network. SoftRadio is a structured and expandable, yet easy-to-use and robust family of software applications. Soft Radio is specifically designed for two-way radio networks and operations. The application runs on a standard Windows PC and utilizes the computers processor and sound-card to provide the RoIP channel and functions. The sound-card is used to convert audio from analogue to digital and back, allowing a simple and effective voice-communication with the remote user. The remainder of the RoIP processing is done via the software and the computer's resources. This eliminates the need for a second RoIP Interface Unit on the operator side and more importantly, opens up a range of possibilities to add functionality and enhance/extend usage of the RoIP based radio-network.



Figure 2. Basic SoftRadio Operator Interface with active Virtual Control Heads

- The operator can control up to 8 respectively 30 radios from one SoftRadio station
- The operator can monitor all his/her radios at the same time
- Audio from the other radios is received and monitored even when transmitting
- SoftRadio is easily expandable via add-on functions and applications
- SoftRadio can extend and integrate with dispatch and command & control applications
- SoftRadio supports radio Virtual Control Heads (with the appropriate RIU)

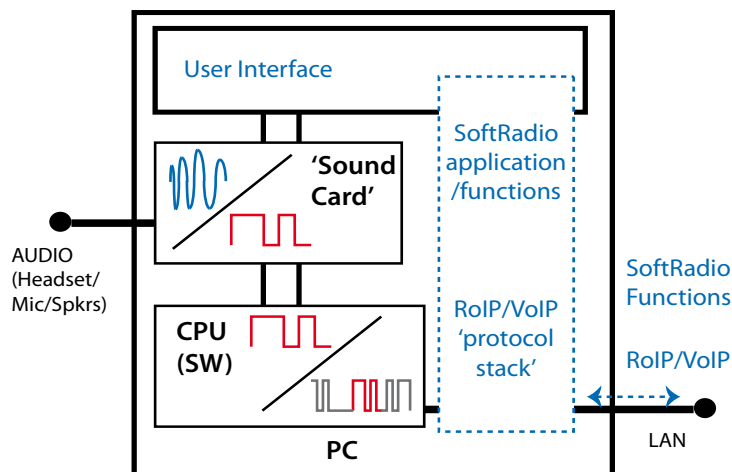


Figure 3. Principle block-diagram of SoftRadio

### 3. A basic RoIP Radio Network

A basic two-way radio network consists of multiple mobile radio users connected via one or more radio base-stations to one or more operators or dispatchers. In a RoIP based two-way radio network, base-stations and radio-sites are connected to an IP-network via RoIP Interface Units (RIU). Radio and RIU create an IP-enabled radio, or IP-Radio, identified via the IP-Address assigned to the RIU. The RIU provides a RoIP-Channel between operator and radio. In a LAN, RoIP transport is via UDP and in a WAN, via TCP. The SoftRadio connects an operator to an IP-Radios via that RoIP channel. SoftRadio can administer and access up to 8 RoIP channels, be it radios or other RoIP applications such as a phone-connect.

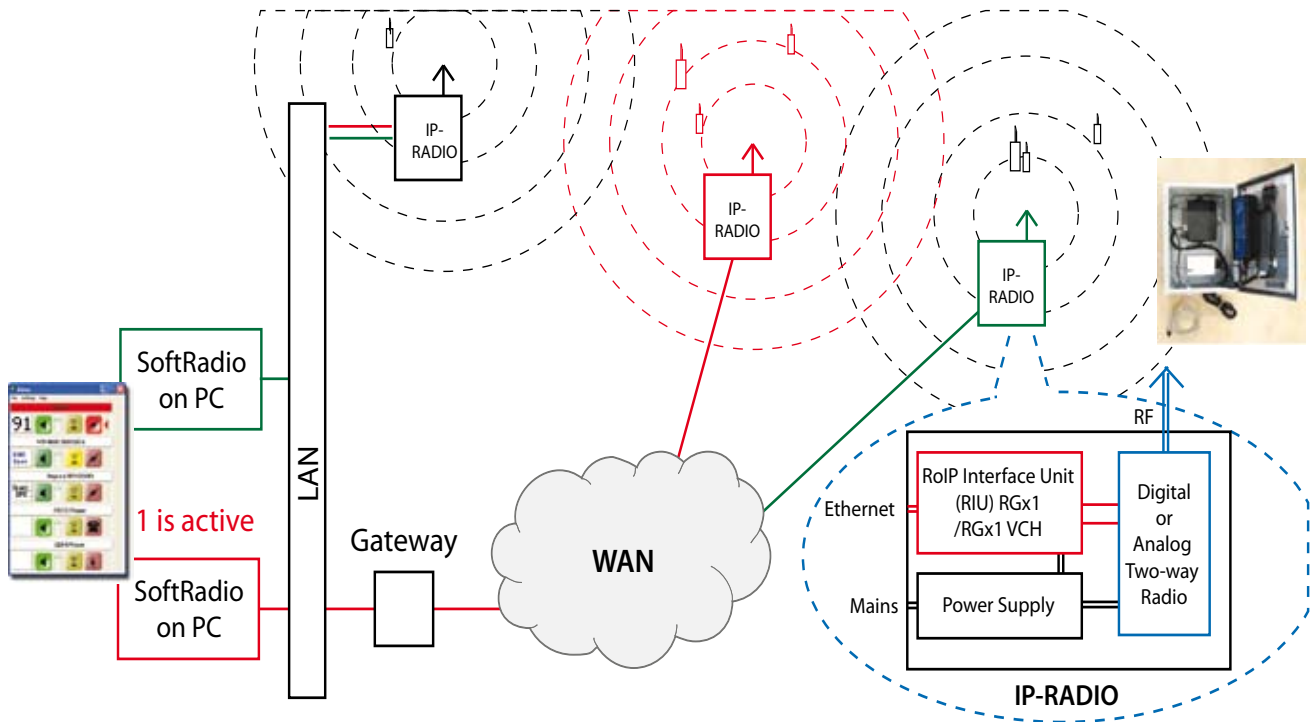


Figure 4. Basic RoIP Network with mixed UDP/TCP RoIP channels

There are two basic RoIP channels. In smaller RoIP networks, the operators access radios via the same local sub-net (LAN). Here UDP is used and the RIU can support up to 99 SoftRadios accessing its radio. Access is granted in order of PTT. The first PTT occupies the RIU. The the radio is 'released' when PTT ends.

In larger and more distributed two-way radio networks, operators and radios connect via the Internet or a larger Intranet (WAN). Here TCP transport is used and the RIU supports a 1-to-1 connection to a SoftRadio console. In essence, the RoIP channel is 'make-break-make', the connection with one SoftRadio needs to be completely released before another operator can access the RIU and radio. The RoIP channel is static rather than dynamic. On the operator end, SoftRadio maintains connections with up to 8 (available) RIU's. Its monitors the incoming traffic on all channels while transmitting on one.

### 4. Deploying SoftRadio Operator Console & Interface

SoftRadio is installed as any other PC-software.

#### 4.1 SoftRadio Connections Set-Up

Before SoftRadio can be used on the network, the system-administrator needs to run the SoftRadio/RIU connections utility. In Connections Set-Up, the system-administrator first must set the required IP-addresses, passwords and configure how SoftRadio connects to RoIP Interface Units (devices) that are located on the network. Devices are typically RIU's connected to radios, but can also be an RIU interfacing to a PSTN or Cellular Network, a Voice or Status Log, or a pure RIU-to-RIU Channel (SoftLine).

The Connections SetUp menu allows the administrator to configure more than the eight devices than normally each SoftRadio can handle. This allows the administrator to pre-configure a system-wide list of devices for all consoles (super-set of devices). This significantly simplifies administration as each operator can then simply choose from the super-set which eight devices are used on the specific console and eliminates the need to set-up every SoftRadio individually. Set-up files can also be copied from one computer to another, as long as each SoftRadio console (PC) has its own Operator ID.

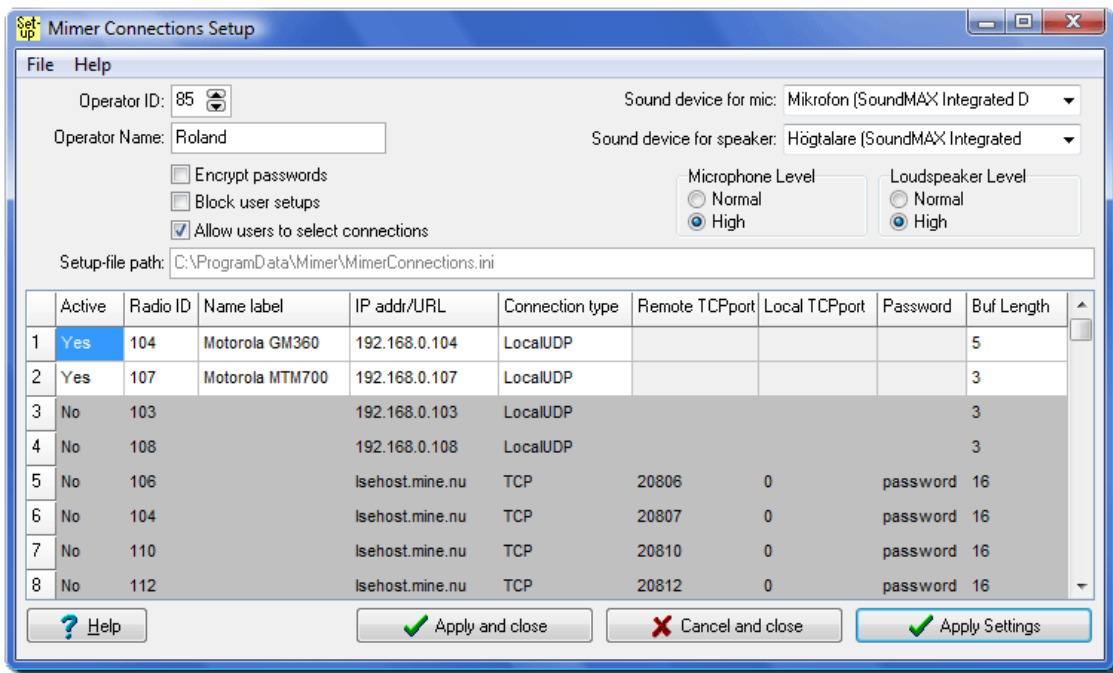


Figure 5. SoftRadio Connections Set-up screen

#### Common Settings:

- **Operator ID:** Needs to be unique for every PC
- **Operator name:** Used in systems with a Radio Server
- **Sound device:** Sets the Audio Device used (e.g. Headset), can be different than the default set for the PC
- **Encrypt Passwords:** Secure Passwords
- **Block user setups:** Disables changing Settings by users in SoftRadio. Tip: Install the Connection Setup utility under the PC-user "Administrator" to limit access to the System Administrator
- **Allow users to select connections:** Activates **Name Label** function
- **Levels:** Basic Audio-Levels (Detailed settings are done via the PC's Control Panel/Audio Devices)
- **Set-up file path:** Name and file-location of the setup-file

#### Device/Network Settings:

- **Active:** Activates this device in the console
- **Radio ID:** Corresponds to the rotary switches on the RoIP Interface Unit
- **Name Label:** Descriptive name for a device, requires "Allow users to select connections" to be selected
- **IP address/URL:** Sets the network-address/path to the Network Interface
- **Connection Type:** UDP for local networks (LAN, intranet), TCP for large intranets or via Internet/WAN
- **TCP-ports:** Required to pass through firewalls
- **Password:** Secures connection over the Internet, the corresponding password is set in the RIU
- **Buffer length:** Helps compensate poor audio due to a degraded connection (increase buffer)

#### General:

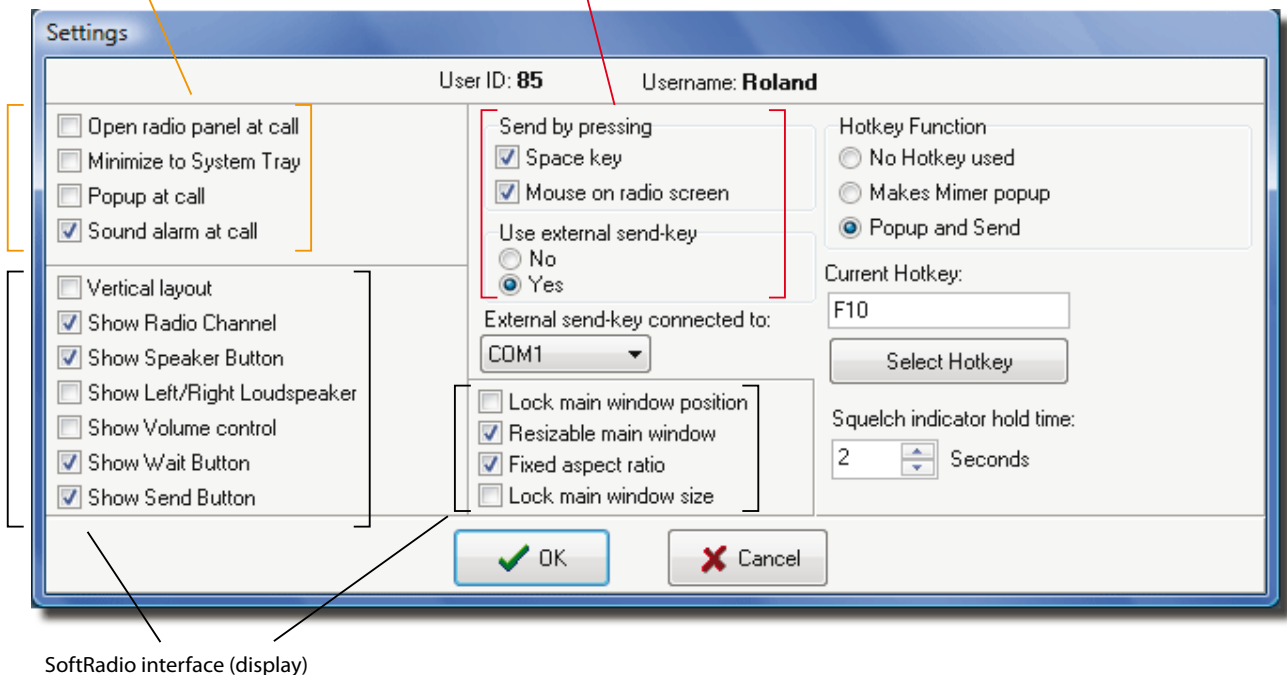
- **Apply and close:** Will write the new settings and then close the application window
- **Cancel and close:** Will **not** write the settings, but will close the application window
- **Apply Settings:** Will write the new settings and keep the application window open

## 4.2 SoftRadio User Settings

Settings is accessed from the Menu Bar in SoftRadio. Access to Settings can be blocked in Connection Set-Up, allowing only the system administrator to make changes (see above).

SoftRadio Actions when a radio in the list receives a selective call

PTT



SoftRadio interface (display)

Figure 6. SoftRadio User Settings screen

### Settings:

- **PTT:** Sets which device/action executes a PTT. Selecting no option deactivates PTT, the user can only monitor the radio-communications. External PTT connects to the PC-COM port (Close pin 7 & 8)
- **Hot key:** Sets a keyboard 'hot key' action, useful for operators running SoftRadio in a minimised window
- **Squelch Indicator Hold Time:** Sets the time Squelch is held to indicate after the squelch (Tx) goes inactive. 1-2s is recommended to allow operators to better differentiate between radio-communications

## 4.4 SoftRadio & RoIP Interface - Tips for Set-Up

This chapter provides some useful information and tips on how to make your RoIP system work most efficiently and effectively.

### Monitor Tx Audio - RIU, allows operators to hear outgoing audio from other operators

The default setting is 'deactivated'. Operators can not hear the audio sent from other operators. This setting is preferable where several operators are in the same room as audio from the consoles can lead to feedback in the system. To allow operators in separate locations to hear both the audio from the radio(s) and from other operators (i.e. both sides of the conversation), set "Monitor Tx Audio" to "Active" in the RIU settings panel. The RIU then broadcasts the transmitted audio to all SoftRadio consoles using that RIU/radio combination.

It is possible to configure a mix of both settings: Set the appropriate RIU's to Active for "Monitor Tx Audio" and in addition exclude select operators by making the appropriate expert setting in their SoftRadio's 'ini-file'.

### Ring tone when using headsets - SoftRadio Connections Set-Up

Where SoftRadio is configured for use with a head-set, all audio including ring- or alarm-tones is sent to the head-set on the console (PC). To avoid missing a ring-tone or alarm, e.g. when no operator is wearing a head-set, ring-tones and alarms can be routed to a second audio card in the PC by making the appropriate expert setting in the SoftRadio 'ini-file'. (Note: This requires a second audio card and speakers to be installed).

### Multiple dispatchers - audible delay in audio broadcast

In some operations, consoles are configured so that multiple dispatchers can monitor the same radios via speakers. This is typically not an issue, but where different PC's and sound-cards are used, deviations in their performance can result in the audio being broadcast with slight differences in timing, even though the audio comes from the same radio and RoIP channel. Although only fractions of a second, this overlap of the audio is perceptible and hence annoying. It is recommended to use PC's and sound-cards of the same type and performance and further to check if other applications are loading the PC.

### Poor audio and feedback when using phones

The phone (**PhoneConnect**) add-on function to SoftRadio is designed for use with headsets. An automatic and self-adjusting echo cancellation on the PSTN interface is included. If issues with the audio occur in the PC we recommend to turn off the microphone feedback in the audio card (PC - Control Panel, Volume Control) and use a head-set. If a head-set is not possible, adjust to the speaker volume as low as feasible and keep an adequate distance between speakers and microphone.

### Expert settings - System Administrator only

There are a number of settings that can be configured within the SoftRadio's 'ini-file'. **We strongly recommend that this is only performed by an adequately trained system administrator.** An excerpt of possible settings:

- Prevent SoftRadio from being shut down
- Configure a second audio card for ring signal
- Block the Icon from the task-bar
- Block the blinking in the task-bar when transmitting
- Change the symbols/text on the buttons
- Turn off audio from other operators when enabled at RIU

Please contact us if you need to change any of the above functions and **before** you make alterations to the ini-file. (At the very least, first make a copy of the original ini-file...)

## 5. Operating SoftRadio - Standard Functions

The SoftRadio user interface is straightforward and easy to use. It provides an efficient and effective overview of the key status and functions of the connected radios. More detailed views can be accessed by either selecting a function or via the appropriate menus from the menu-bar. The SoftRadio interface can be configured to the user's preferences, e.g. either as a minimal window or as a maximum sized window in the forefront of the user's screen.

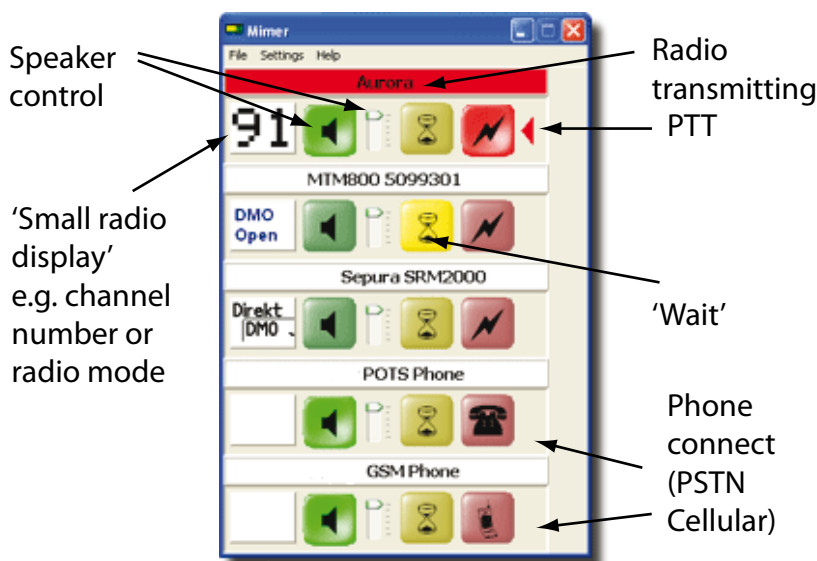


Figure 7. Configuration basic SoftRadio screen

SoftRadio automatically configures the rows (display bars, panels) according to the number and type of devices connected. Each device (Radio, PhoneConnect, StatusLog/VoiceLog, SoftLine et al) has its own area with the appropriate buttons and display. The layout and type of buttons can be configured for different purposes and users (SoftRadio User Settings). The SoftRadio screen supports both touch-screen and conventional PC displays with keyboard/mouse input.



**Speaker buttons:** ON/OFF toggle, can be expanded with two additional buttons for on/off right/left. When using a stereo-headset/speakers, an operator can configure one device for the left channel, one for the right to more easily select who is speaking. Separate volume controls are available for each speaker button. When the buttons are deactivated, audio remains ON.



**PTT (send) buttons:** Transmits the operator audio on the remote radio. The small red arrow on the right-edge of the panel indicates which radio is selected for external PTT. The red arrow when lit is used to indicate the radio last used by the operator. PTT can be deactivated for users that only monitor channels. The VCH display can be configured to execute PTT pressing the VCH display, providing operators on touch-screens ergonomically efficient operation.



**Wait button:** Sends out a tone message on the radio channel to acknowledge users that they have been heard, but the operator is busy at the moment. The wait button will remain lit at all operators using that radio as a reminder that a user is "on hold". Pressing the wait button again or when an operator presses PTT for that radio turns wait off.



**Phone button / GSM Phone button:** Opens a phone line and brings forward the dial-pad. A speed dial list is available. Symbols are used according to the type of phone connected.



**Small radio display button:** Displays a part of the radio's physical display. The content of the small radio display can be configured (depends on the type of radio). Pressing the small radio display button toggles (brings forward or closes) that radio's Virtual Control Panel.

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**GM1280 - MPT**

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**Radio Name Bar:** The radio name displayed is defined in **RoIP Interface Unit Set-Up ('ID String')**. Pressing the Radio Name Bar will bring forward, or close that radio's Virtual Control Panel. The Radio Name Bar changes colour according to the status of the radio:

- Grey - Not connected to the Network Interface
- White - Stand By
- Yellow - Incoming audio
- Red - I am transmitting
- Orange - Another PC is transmitting
- Blinking Green - Selective call has been received
- Light Blue - Phone call on-hold



**Virtual Radio Control Panel:** This panel is automatically selected based on the type of radio the RIU is configured for. The size of the radio control panel can be chosen in increments, (3 - 4, depends on model). All keys on the Radio Control Panel are replicated on the PC keyboard, making input for channel selection and selective calls easy, e.g. on a Motorola GM380, the green button corresponds to the Enter button on the keyboard and the red button to Esc.

## 5.1 Virtual Control Head

The Virtual Control Head allows the operator to remotely control a radio using the functions and interface of the radio's standard control head. The SoftRadio VCH panel replicates the radio's standard control head. Buttons can be pushed via the mouse, via a touch screen or via the computer's keyboard. Operators can use a remote just as if he/she is sitting in front of the radio. As with the standard SoftRadio interface, multiple dispatchers can operate and share the same radio. Hence they need to bear in mind that changes made to the radio-setting by one operator will affect all users since they share the same radio.

The key to the Virtual Control Head (VCH) is the extra functionality built into the RoIP Interface Unit that allows the RIU to connect to the radio's control bus between radio and control head. The RIU interfaces with the control bus and sends respectively receives the control-data as part of the RoIP data-transport to the operator's SoftRadio console. On the console, a type-specific VCH-interface (application) creates the display and reproduces the radio's state, e.g. channel selection and operating mode. In turn, the VCH-interface takes the operator's control-input from mouse, touch-screen and/or keyboard and sends the control-input via the RoIP-Channel to the remote RIU and radio.



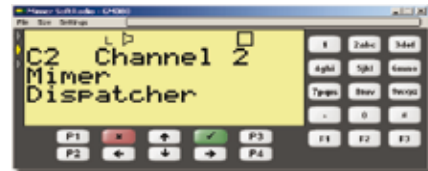
Ericsson Aurora / Niros TRX3001  
(Standard control head will work in parallel)



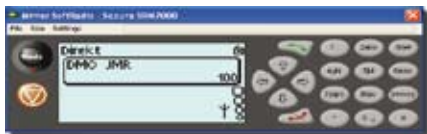
Motorola GM360  
(Should also work with GM660, CDM1550, GM338 and GM160 - yet not factory-tested)



Icom IC-F1610 / F2610  
(Standard control head will work in parallel)



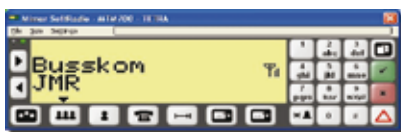
Motorola GM380 (also works with GM398)



Sepura SRM2000 / SRM3500 / SRG3500  
(Standard control head will work in parallel)



Motorola GM1280



Motorola MTM700 / MTM800  
(Motorcycle Control Head)



Motorola MotoTrbo, DM3600/DM3601

Figure 8. Radio specific Virtual Control Heads

## 6. Enhancing and 'growing' the Radio Network

Two-way radio is about connecting users in a way that suits their needs and environment: Direct communication between mobiles, group-talk, broadcast, or as is often the case, connecting to mobile users from a central dispatch centre. Operating a network obviously requires more than just voice communication. The network needs to be configured, controlled and maintained. Radio stations at remote sites need to be administered. Usage, configuration and payload needs to be optimised. Applications need to be updated and integrated. Interoperability is an increasingly important requirement. Staff and indeed organisations need to respond quickly and decisively to new and often unforeseeable situations. While radio networks are built on common technologies and standards, the organisations that use them have their own unique practices and structures. It is essential that any 'solutions' retain and further that competence. Only then can the variety of challenges, day-to-day, mid- and long-term be met efficiently and effectively.

All this is realised with a structured and flexible operations 'platform' that utilises the variety of existing resources and technologies efficiently while adding and enabling the addition of capabilities - without the need for expansive 're-design'. A platform that comprises the elements and interworkings that can grow with the operation's needs, rather than an expensive and proprietary 'closed' system. A modular, structured and open platform with distributed resources:

- Capabilities are embedded, flexible and expendable
- System-architecture supports the 'evolution' of new capabilities
- The platform is 'upward' compatible and supports lateral integration

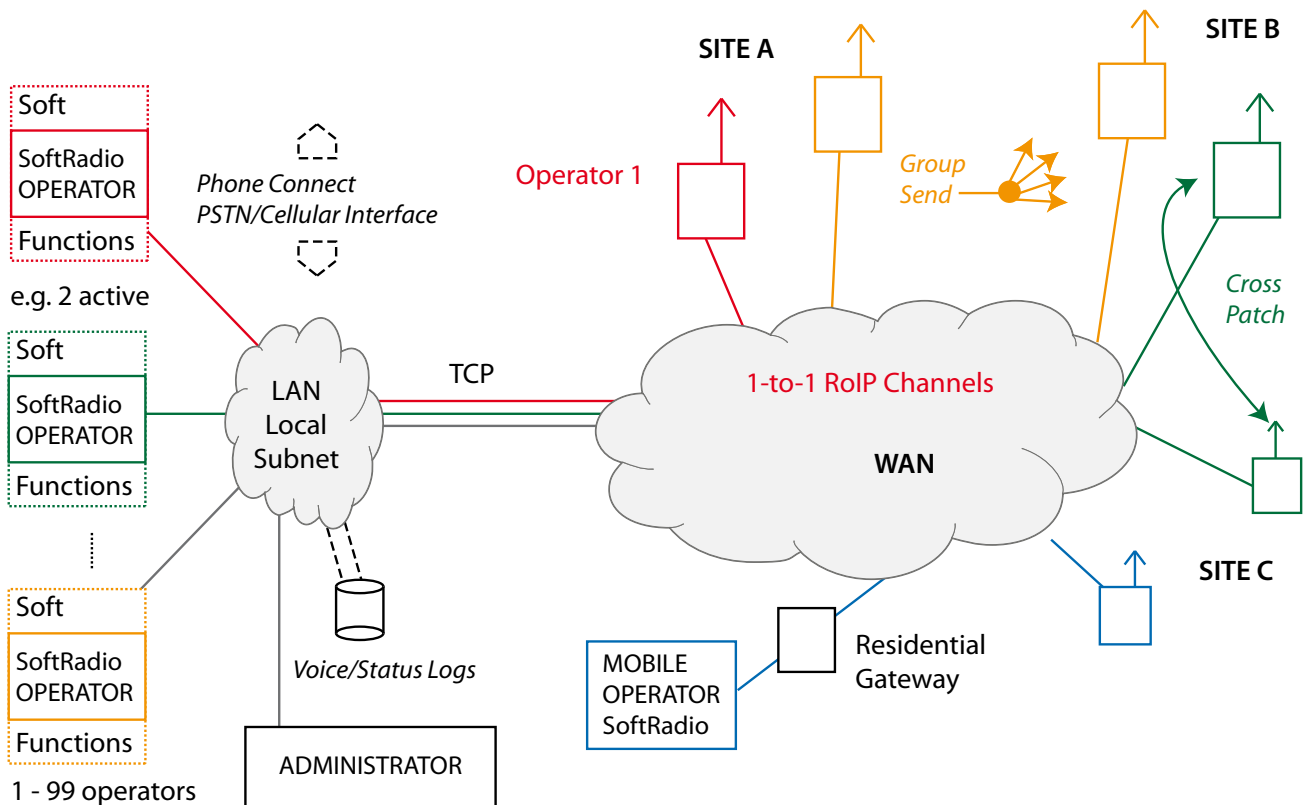


Figure 9. Enhanced RoIP Two-Way Radio network

On the operator side, SoftRadio makes the most of the inherent flexibility in a PC based application and infrastructure. The RIU itself is built on a structured and flexible platform, enabling new applications with a minimum of development. A smart network significantly simplifies administration and integration. Elements are simply nodes on a network. Operators can readily add and extend functionality, without necessarily changing the physical network-elements. SW-Applications can be readily added to consoles and control-centres, simply by installing compatible application building-blocks: The 'soft-functions'. This structured approach is not new. What is new is the means to do this efficiently; 'smart' RoIP network elements such as RIU and SoftRadio. It simply makes sense to take full advantage of their inherent capabilities.

## 7. Enhancing the Operator Console - SoftRadio Add-On Functions

SoftRadio is more than a PC-based operator-console. It is a platform. Designed from the beginning to grow and expand, SoftRadio provides a simple, cost-effective and efficient base from which to grow network-capability, when and where it is needed.

### 7.1 SoftRadio - CrossPatch

SoftRadio CrossPatch add-on allows operators to very simply and dynamically cross-connect two or more radios. In essence, CrossPatch routes the RF-payload from one radio via the RoIP channel to the RF-interface of the radio(s). CrossPatch allows operators to cross-connect users on different radio channels, in different frequency bands or even on different radio-types, e.g. from an analogue channel to a digital talk group.

CrossPatch provides network operators and organisations a highly cost-effective tool for migrating from old to new radio-technology and formats. Using CrossPatch means networks can retain essentially the same coverage and migrate to a new technology or radio-type and upgrade radio-sites successively with the upgrade of mobiles. CrossPatch is also highly efficient in dynamic situations where coverage and configuration of the network needs to be set-up quickly and tailored to the unique situation. For example personnel on a rescue site may use one simplex channel on-site and another for calling back to base. Both channels can be used more effectively by using a CrossPatch, improving coverage and capacity of the ad hoc network.

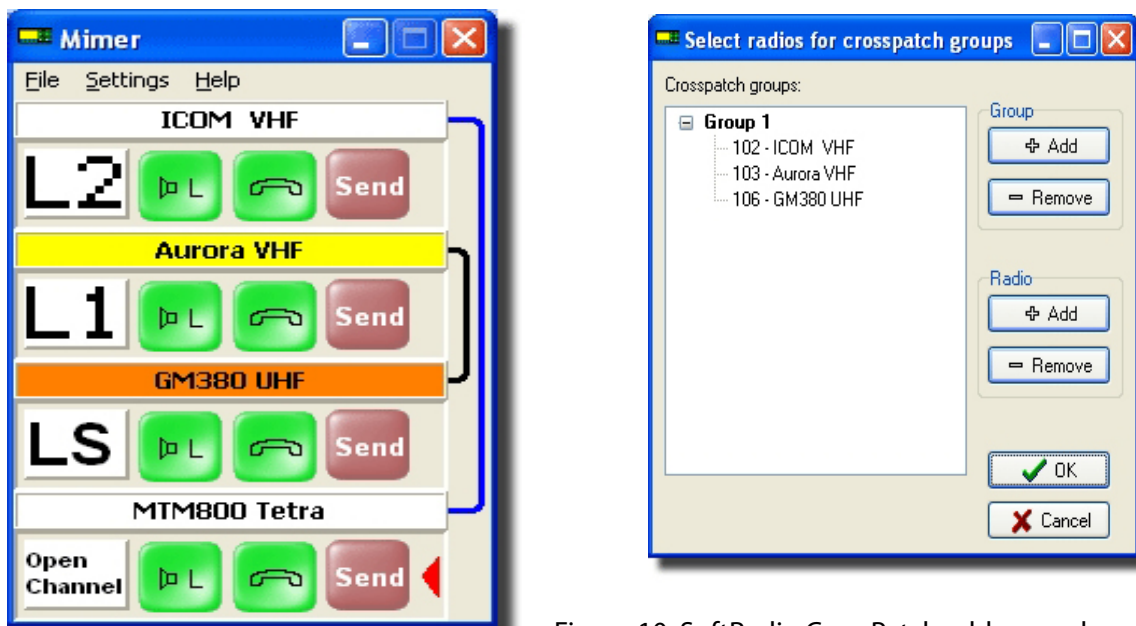


Figure 10. SoftRadio CrossPatch add-on and configuration

Up to eight radios can be in the same patch. Each operator can make up to four patches at the same time. A radio that is in a patch set-up by an operator can still be used by all other operators. (It can not be placed into a new patch while in an active 'patch') The operator that made the patch controls it and is the only one allowed to release the patch. CrossPatch works between any RIU device, including between radio and telephone.

### Typical applications

**Area extension:** Cross-connect radio-stations to other radio-stations in other area

**Linear-extension:** 'Chain-connect' radio-stations, e.g. in tunnels

**Migration:** Mix 'old and new' technology, extending the usage of existing assets while migrating to new radios

**Cross Band:** Cross-connect a radio in VHF to a radio in UHF.

**Cross System:** Cross-connect an analogue channel to a digital talk group, connect a radio to a phone.

**Disaster-Response:** Dynamically configure users and groups across radio and response systems. E.g. firemen on Tetra hand-held's with plant-workers on analogue hand-held's with an emergency coordinator at a PABX

**Phone-patch:** Route phone calls to users in the field via the two-way radio system, thereby overcoming overloaded or unavailable networks, e.g. when an emergency overloads the cellular network's capacity

## 7.2 SoftRadio - GroupSend

The SoftRadio GroupSend add-on allows operators to very simply configure outgoing transmissions to be sent on up to 8 remote radios simultaneously. From the operator's point of view, GroupSend adds a simple 'tick-box' option to the radio-display bar and a common GroupSend button to the SoftRadio user-interface. The operator selects the GroupSend 'tick-box' on the radios to be used in the GroupSend transmission. To transmit a GroupSend, the operator simply uses the GroupSend button analogous to the radios' PTT buttons.



Figure 11. SoftRadio GroupSend add-on and configuration (SoftRadio with four radios, two configured for GroupSend)



#### Typical applications:

**System-Messages:** Broadcast system-messages to all mobile users (on up to 8 radio-sites), e.g. to notify of maintenance

**Emergency Messages:** Broadcast urgent messages to all mobile users (on up to 8 radio-sites), e.g. to evacuate a site

**Notify User:** GroupSend a notification across an area to notify a mobile user whose location is unknown

**Call-Back Notification:** GroupSend a notification to request a call-back, e.g. for security guards on patrol

**Cross-System Notification:** GroupSend a message via different radio-systems to notify users e.g. in an ad hoc and mixed radio-network set-up for an emergency situation

### 7.3 SoftRadio - PhoneConnect

The SoftRadio PhoneConnect add-on allows operators to very simply connect from SoftRadio to PSTN and Cellular phones. From the operator's point of view, PhoneConnect simply changes the one or more of the eight radio panels to a phone access panel. Instead of pushing "send", the operator selects the handset symbol.



PhoneConnect (PSTN, Cellular)

Doing so opens a number pad (1). Selecting it again opens a speed dial pop-up window (2). PhoneConnect allows an operator to use the same SoftRadio console and audio set-up used for two-way radio to make a call via a land-line or cellular telephone, greatly improving the efficiency of operations.

Each operator can have his/her own phone line or share one or more lines with other operators. Calls can be made, received and put on hold for other operators to take over. With both PhoneConnect and GroupSend together on a SoftRadio console, operators can patch both radio communications and phone-calls across the network, e.g. forwarding phone-calls to two-way radio users and vice versa.

Figure 12. SoftRadio PhoneConnect add-on with dial-pad and speed-dial pop-up windows

**Analogue (PSTN, conventional) Phone:** The physical connection to the phone-line (PSTN) is made via the RoIP Interface Unit. The RIU connects to a standard two wire, DTMF phone line. A fixed cellular phone with PSTN access/interface, a GSM-modem and even a satellite phone with a PSTN interface can be connected.

**Digital Phone (VoIP Phone):** The connection to a VoIP-Phone or VoIP switch (SIP) is made via LAN with a Network Repeater as a gateway. (A RIU is not required when connecting via a Network Repeater)

## 7.4 SoftRadio - VoiceLog

The SoftRadio VoiceLog add-on allows operations to easily record and recall all audio communications to a server. From the operator's point of view, VoiceLog simply adds a VoiceLog display-bar to the SoftRadio user-interface. (Note: The VoiceLog display-bar takes up one display-slot of the maximum eight display-bars the standard SoftRadio console supports).

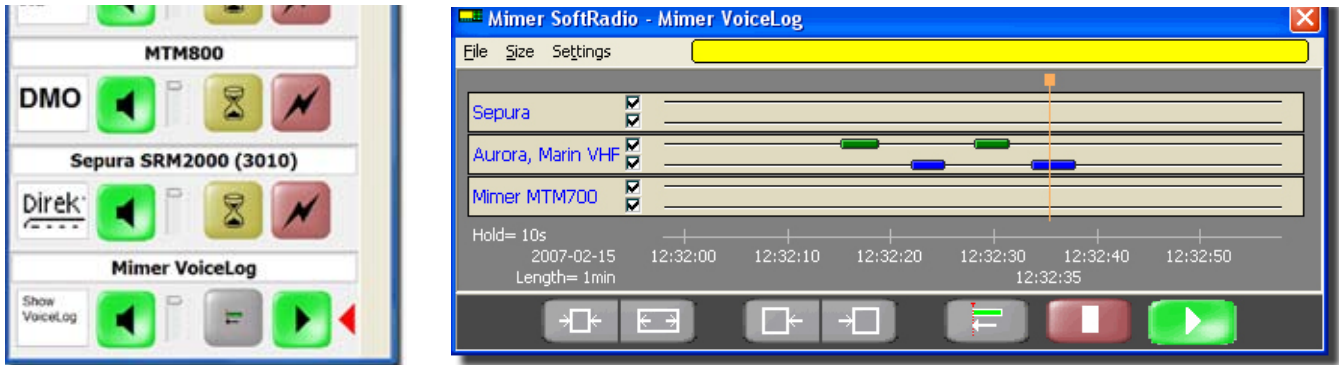


Figure 13. SoftRadio VoiceLog add-on VoiceLog playback window

VoiceLog records all audio for each SoftRadio console (operator) and each radio channel to a common server. All recordings are in standard WAV-format and named with date, time and audio path. VoiceLog runs on most Windows computers or Servers. Recordings are made with the appropriate ID and time-stamp(s) allowing users to recover and assess communications quickly and effectively. Two time-lines of recordings are displayed for each device (radio, phone), one for outgoing and one for incoming audio. Each duration of active audio is represented by a burst on the time line. The operator simply sets the marker on a burst to play back the recording. Each operator can recall his/her conversations for a preset time, (e.g. an hour or a day). In many situations and organisations it may be required to investigate past communications, e.g. after an incident. A supervisor or investigator can listen to all recordings on the server. How much is recorded and available depends on traffic load, the size of the storage medium (hard drive) and what back-up schemes are used. (20 hours of constant recording require approximately 1GB of storage)

## 9.4 SoftRadio - StatusLog and ObjectLog

The SoftRadio StatusLog and ObjectLog (option) add-on allows operations to record and recall all incoming status calls and voice requests from the field. ObjectLog enables operators assign objects and duties to mobile radios, e.g. for patrol schedules. Every console in the network displays the same information in real time.

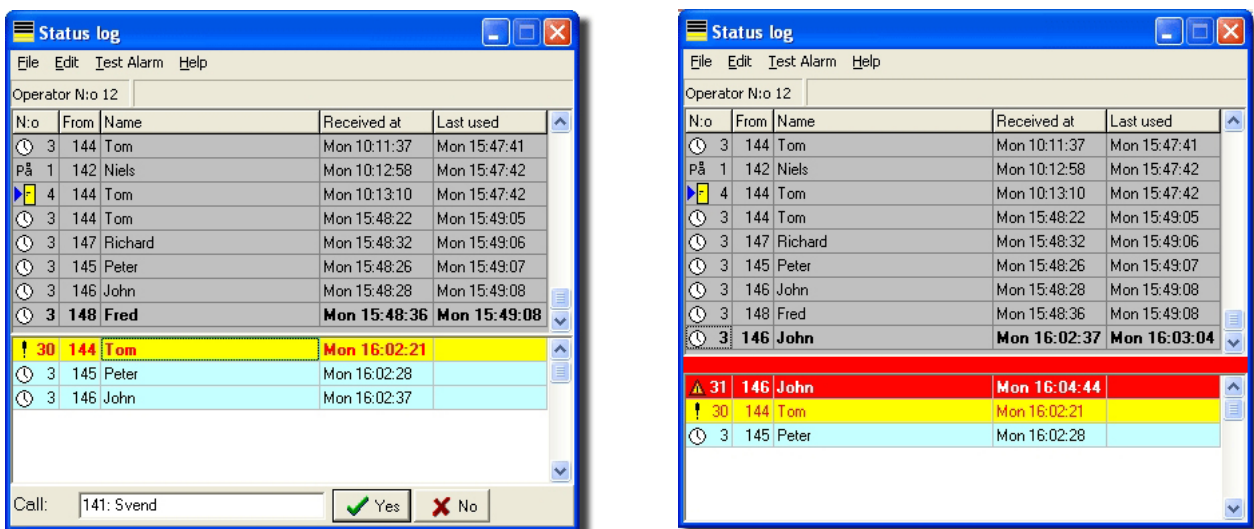


Figure 14. SoftRadio with StatusLog showing calls, status with a call in progress (left) and an incoming emergency call (right)

## Status

Every incoming status is logged with a time stamp, e.g. "log-in", "lunch", "maintenance" etc. Status messages can be exported to other systems. StatusLog can be configured to log and display status on the consoles or only log to the server.

## Voice Call Requests

StatusLog can log voice call requests from users in the field. In this set-up, all calls to all operators are logged to one radio number and placed in a common queue, regardless of how many operators are active on the system. The operators handle the calls according to the queue and which radio they are assigned to.

## Time Stamping

Every call is time stamped when it is received, when it is first answered and when it is last handled. Priority and emergency calls are given a higher status and can be assigned an external alarm signal to alert the operators.

## Emergency

An emergency call will trigger a red square across all screens and an alarm tone from the computer until a dispatcher clears the alarm. The emergency call is placed at the top of the queue for voice calls.

## Optional ObjectLog

ObjectLog allows to pre-program (pre-set) 'objects' and 'mobiles' with specific 'conditions'. For example at a manufacturing plant (object), a security guard (mobile) arrives at 07.00 and does his rounds at 10.15 for 20 minutes (conditions). In this example, ObjectLog will keep track of when the guard:

- Logs in at the plant
- Starts the rounds
- Calls in the routine status-update
- Returns from rounds
- Logs out from plant

Different parameters can be assigned to every object (plant) and every mobile (guard, radio-number). Object conditions (round-duration) and mobile parameters (guard, radio-number) can be changed dynamically. If any one of the conditions set is not fulfilled in its allotted time, a warning is sent to the mobile. If the appropriate response is not received, an alarm is raised at the dispatch console/control centre.

ObjectLog can be used for many types of applications that are required to send in a status and receive an corresponding time-stamp, e.g. at an airport or logistic centre. StatusLog/ObjectLog can be customised. It is currently available for MPT-systems and for 5-tone systems with a Tetra system in development. StatusLog is Windows software that runs on most Windows computers or Servers.

## 9.5 SoftRadio Tailored Options - ongoing developments

SoftRadio is continually enhanced and extended. Quite often, these developments start off as very specific customer requirements. Often these needs are actually quite common and more users and customers can benefit from them. Here is a list of such developments that have been added to our product family. Please feel free to contact us at any time to discuss your specific needs.

### MPT1327 Speed Dial List

This special speed dial list simplifies selective calling and text messaging using a SoftRadio console, much easier than using the radio's virtual control panel. The Speed Dial List is configured on an individual SoftRadio console, but can be copied between the PC's. Speed Dial List is currently available for MPT-Systems.

### Selective call routing with Ericsson Aurora

The Ericsson Aurora radio, (Niros TRX3001), has in-built seven-tone capability. Radio, RIU and SoftRadio can be configured to route the seven possible selective calls to multiple SoftRadio consoles. On the console, the operator determines which calls (1 to all 7) his/her SoftRadio console will act upon.

### Selective call routing with Tone Decoder

A tone en-/decoder in the RoIP Interface Unit encodes the analogue signalling-tones as data messages and sends these to the SoftRadio console(s). SoftRadio is pre-set to react/respond to the different codes.

### Text Export

Text Export allows information displayed in the radio control panel on Motorola radios to be exported to other systems. This can e.g. be useful to export an incoming SDS (Short Data Service - TETRA) message received by the TETRA-radio to a different (non-TETRA) two-way radio system or network.

### No Shut Down

SoftRadio can be set up to start automatically and can not be shut down by the operator.

### Hook Switch

Operators with handsets can use the hook switch to control the loudspeaker on/off, not only on their own computer but also on the other operators computers. This is done via a data message over the network.

### Base station Tone PTT/ Base station DC-Keying

In some systems base-stations are connected via a 2- or 4-wire telephone line (land-line). Here the RoIP Interface Unit can provide PTT over the land-line by sending a single tone (Tone PTT) or a DC-Current (DC-Keying) over the line to initiate transmission.

### External Alarm

External Alarm provides a logic output on the SoftRadio's PC COM-port when a radio receives a selective call.

## 10. Dispatcher Terminals and Accessories

It is crucial that operators and users can utilize the system and network in a way that suits their needs and capabilities - only then can a system be truly efficient and effective. We offer a variety of solutions and continually work on providing the 'look & feel' users need and expect. Please feel free to contact us with your ideas and requirements.

### 10.1 Dispatcher Terminals

The most common method is to use SoftRadio on a standard office PC. Yet this is not always possible or appropriate. Tailored or special dispatch consoles are the best solution for safety systems, industrial control rooms, outdoor applications, land-vehicles and ships.



#### Touch screen PC, all in one

Perfect for industrial control rooms that use a separate PC for the radio dispatch console (SoftRadio). The PC uses XP Embedded from a flash memory card and has no hard drive. It comes with built in LAN/WLAN.

Figure 15. SoftRadio console on touch screen PC

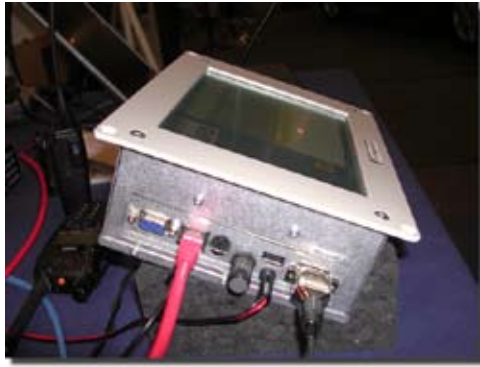


Figure 16. SoftRadio on touch screen PC for installation in a control panel (used in Command & Control vehicles)



### Waterproof Touch Screen

Design of a water proof touch screen. The knob adjusts the light from very bright to nearly dark so that it can be used at sea. The red button is a PTT and the hand rest is used when the boat is rocking so that you still can find your way on the touch screen. (Note: Screen only, requires PC)

Figure 17. Design of Waterproof SoftRadio console

## 10.2 Dispatcher Accessories

SoftRadio consoles run on Windows PC and operators can select from a wide range of readily available accessories and components. We can certainly assist in the selection and delivery and equally provide a full, turn-key configuration for your operations.



Stereo-Headset

We recommend to use stereo-headsets in most central dispatch environments. This allows the operator to configure SoftRadio so that one radio (or other device) is on the 'left' and one on the 'right' audio channel.



Audio-Kit

For operators that need to switch their headset between the ordinary office phone and their SoftRadio console.



Desk-top PTT (left)

Foot-switch PTT (right)



Example Desk-top goose-neck PC-microphone



These are a few examples of components that have been used and which we can recommend.

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