

## ProWatch DEIDE3 Spectrum monitoring

*ProWatch DEIDE3 offers key solutions in the scope of measurement, supervision and monitoring of digital & analogue TV/ Radio signals.*



### Monitoring systems

**ProWatch DEIDE3** consists of a remote monitoring system, based on three basic elements:

- Client Equipment with browser
- Remote Control Unit (RCU)
- Measurement Unit (MU)

A key part of this system is the use of communication standard protocols so that a client can accede to any MU from any place by means of a standard web browser without requiring the installation of proprietary software. The characteristics that offer the new **ProWatch DEIDE3** equipments, allow the design of a centralised system through a Remote Control unit able to manage the different Stations or Measurement Units.

The system **ProWatch DEIDE3**, is able to detect and to identify analogue and digital signals, besides it can carry out an automatic spectrum monitoring with possibility of remote control. Thanks to the versatility of its design, the system offers a wide range of possibilities.

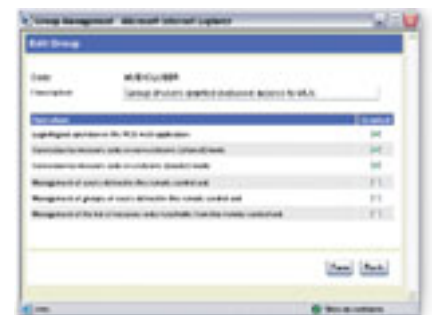


The unit of measurement is constituted by a **PROLINK-4C Premium**, which offers the most advanced features including a processor to perform a network connection using the SNMP protocol. This one station is called Measurement Unit (MU).

In the other end of the connection is located the RCU. A computer, properly authorised and a management application compose

this station. This last one specifically includes functions developed in accordance with the end-user. Based on this configuration, the RCU can carry out numerous actions:

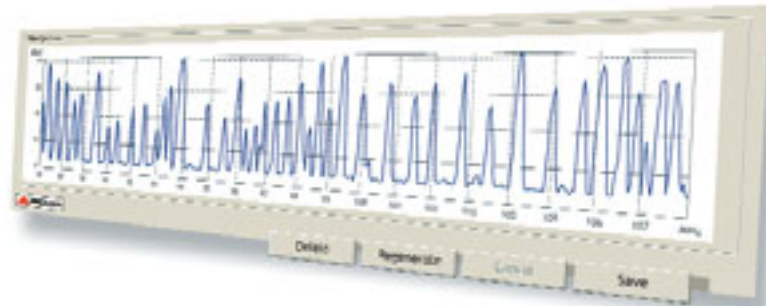
- Obtain status information about the Measurement Unit.
- System task scheduler, single or periodically measurements are programmed.
- Datalogger in real-time and statistics of measuring processes. (Historical).
- Real-time measurements.
- Measuring process control (varying operation parameters).
- Display data results (alarms, historical, system status...).
- Remote and automatic updating manager: Downloading new versions for MU applications (Updates).
- Video and audio data streaming for TV/radio tuned signals.
- Alarm generator via email.
- RCU and MU access control.
- MU priority manager and users group generation.
- Secure Module (Watchdog).



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### Monitoring the radioelectric spectrum

A special case of great interest is the monitoring of the radioelectric spectrum that allows the detection of **new signals or nonauthorised**, as well as the verification of the **transmission quality** for all carriers. The measurement unit MU, alert right away of anyone of these assumptions on the basis of definable limits.



Radioelectric spectrum exploration in continuous mode

### How it works?

- The system performs a spectrum reference sweep.

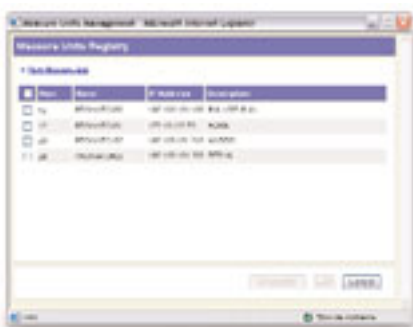
(The type and origin of each one of the carriers is identified and stored in a Database as a spectrum-reference).

- Later, continuous spectrum sweeps are done.

(The results of each one of these sweeps will be match with the reference one in order to generate alarms when anomalies are detected).

By means of the automatically comparison of sweeps of the electrical spectrum radio, the database of previously identified stations and the pre-established quality limits during the process, can yield to one of these events:

- A new carrier is detected.  
(If it is not identified in the reference sweep, the system generates an alarm).
- The level of one or several carriers fluctuates.  
The system registers the affected transmitter or transmitters and generates an alarm. The system can be set so that it sends warnings using the email.

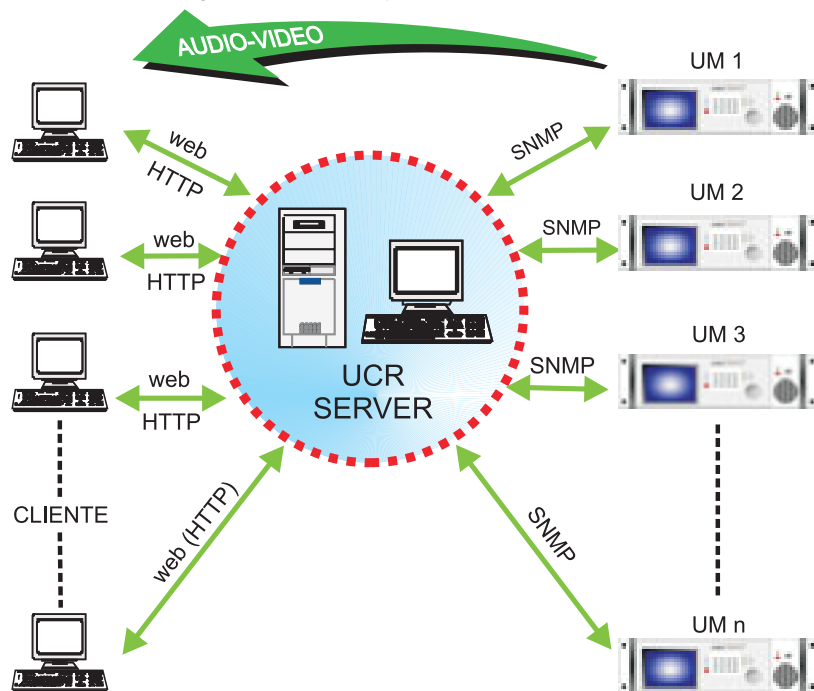


### Remote control

Several MU can be managed from the Remote Control unit even when are located thousand km far away by using the different protocols based on TCP/IP (SNMP, HTTP, MAIL (SMTP), FTP...).

In this graph, it is possible to observe the Measurement Units operating connected through a network by

MU and reports accurate data to locate system application measurements. Thanks to the global positioning system included in the **ProWatch DEIDE3** equipments, it is possible to know in real-time, and with a highest accuracy, in which geographic world point, is placed each one of the measurement equipments. This is a very interesting characteristic in those cases that are generated alarms.



means of HTTP (Web) protocol between the client and RCU and SNMP between the RCU and the Measurement Unit that manage them and receive the required data.

The use of the **GPS** is optional in the **ProWatch DEIDE3** system. When the application includes the control by GPS position, the operation can be activated or be deactivated, modifying the configuration of the system.

The system **ProWatch DEIDE3** allows to connect a GPS unit through a USB port, which uses NMEA protocol. This GPS unit is a part of the

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### Measurement Units

The Measurement Unit is designed for 19" rack assembling. It has built-in: the power supply general system, the measurement equipment, a processor based on an industrial PC and a device to digitalize and compress video and audio.

The processor has available several peripherals, which are necessary to the system control: hard disk, USB ports, Ethernet and serial port, keyboard adapter, and display and interface for the control of the specific hardware to capture audio and video.

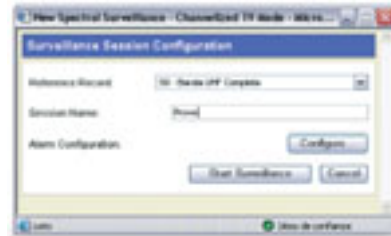
The processor is based on an Embedded PC of high performance and very low consumption. This allows an easy use with portable units or those applications in which the equipment set must be powered through a battery system.



### Monitoring Points

The Measurement Unit can be optionally used in local mode, adding to it a display and a keyboard. This possibility allows that the **ProWatch DEIDE3** system be deployed in portable units or monitoring points attended by technicians, facilitating the daily task of anomalies detection, and without discard the possibility of providing data to a centralised control system (RCU).

The number of Measurement Units, which can be managed by the **ProWatch DEIDE3** system, depends only on the network capacity and the application type executed in the RCU.



### Customized application

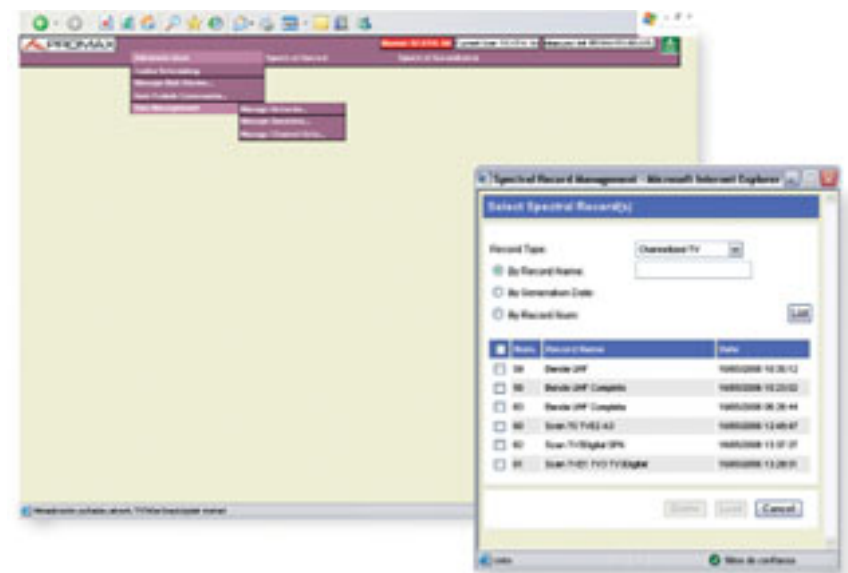
The control application has several software modules on which the customized final application is made up. These basic modules determine the type of applications to be run.

- Equipment measurement control module:  
It does available for the application all the remote control commands included in the **PROLINK-4 Premium** measurement equipment.
- MySQL Database manager:  
It allows the remote access to the MU to be managed through basic functions: SETH, GET and TRAP. It is the base for the Measurement Unit remote control.

- HTTP web server: Provides the services required to manage the UM by means of a web browser.

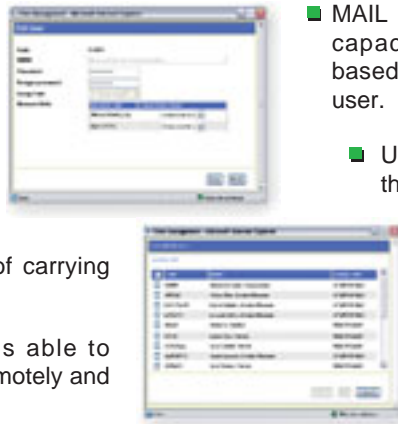


- SNMP Agent: It allows the remote access to the MU to be managed through basic functions: SETH, GET and TRAP. It is the base for the Measurement Unit remote control.
- MIB Files: Together with SNMP agent, they determine the MU remote control capacities. It has three basic files: The MIB of direct access to the database, a MIB of direct access to measurement equipment and a MIB to accede to the Autonomous Management Module generated in according to each application.



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- Task scheduler module (CRON): It manages the accomplishment of the diverse tasks corresponding to programmed measurements and monitoring, in a single or periodically form.
- Secure Module (WATCHDOG): It provides the capacity to reinitiate the **ProWatch DEIDE3** equipment Operating System periodically with the possibility of carrying out backups of data.
- Versions management: The system is able to download via FTP the update files in a remotely and automatically form.

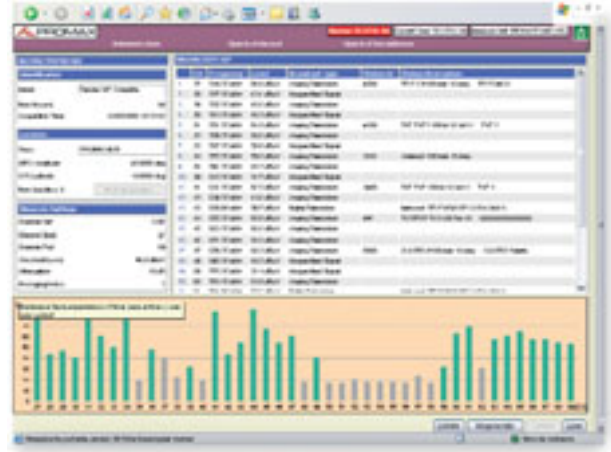
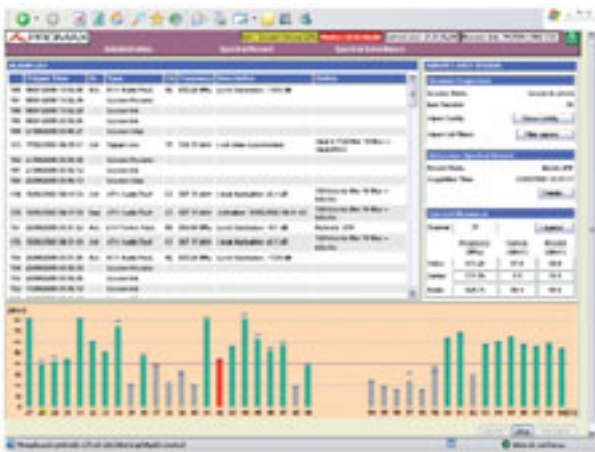


- MAIL manager module (SMTP): It provides the capacity to send electronic mail messages based on the detected alarms and set by the user.
- Users manager module: It allows to register the users login/logout, as well as to modify their priorities. The users can be grouped and be classified according to their responsibilities and system access level.

## Identification of the carriers detected in the band

During the spectrum monitoring, at any moment it appears a spectrum representation or a graph representing the levels of all the carriers, according to the user preferences.

In the graph appears, followed by a color code, all band channels, including the busy channels and those that shows any problem (transmission nonidentified, reception low quality due to some problem, etc).



### Selection, tuning and visualizing

It's possible to access to the service list from a digital multiplex and to select any desired channel. Through the display and the loudspeaker built-in you can watch and hear the aerial transmission.



The remote control mode allows transmissions of audio (VoIP) and video (Streaming Video) through the network for any channel under test as well as to supervise it from a control centre.

### Network full supervision.

In order to use the **PROWATCH** equipment remote control mode it is necessary to have previously registered in a database all the control network equipments.

Each one of the equipments must have a unique address IP and a descriptive name to allow the connection using the network.

