

Pavian electronic siren



Powerfull state-of-the-art electronic siren with backup batteries and autodiagnosics



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Acoustics

A specially-shaped horns made of aluminium alloy and stainless steel in combination with a powerful 150 W pressure loudspeakers provide high-quality acoustic coverage of a desired area. Siren include 8 compact horns (490 x 160 x 200 mm) weighting only 5 kg each, that produce **acoustic pressure 115dB(A)/30m**.



Autodiagnosics

The Pavian siren has a full pack of in-built self-diagnostic functions providing that customers opt for two-way communication between the siren and control centre. A lot of parameters can be monitored remotely by an operator, thus there is no need for a technician to be sent to the siren, which significantly saves the operational costs. Namely:

- acoustic drivers
- amplifiers
- batteries voltage measuring
- power supply/charger status
- status of antenna and RF cabling (Return Loss - meter (dB), RF signal strength, RF signal level (uV)
- speaker's impedance measurement
- input voltage
- DC-DC converter vltage
- current consumption measurement
- inside cabinet temperature measurement



Communication

- 8 programmable digital/analogue inputs
- 8 programmable digital outputs
- 2x RS232/RS485 interface
- aBUS® interface for other modules of the aSCADA® system
- FFSK analogue modem support
- line interface Ethernet (the optional module required)

PAVIAN electronic sirens represent the highest level of electronic systems offered by Telegrafia. These are modular electronic devices primarily designed for **establishing large and complex warning systems** requiring sophisticated control and efficient siren status monitoring. They are also used as locally controlled devices where required due to a more complex interface with the environment or when a sophisticated algorithm for reacting to external signals is desired. Based on information gained from the environment, these systems are capable of reacting on the basis of modifiable algorithms and, in addition to acoustic warning system initiation; they are also capable of controlling external devices.

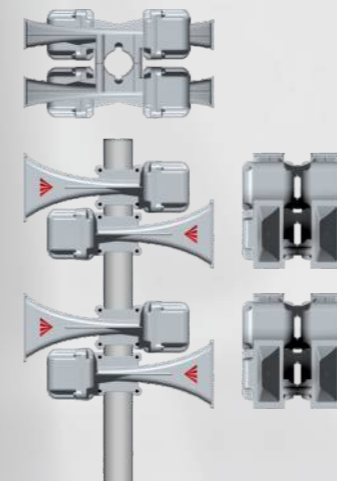
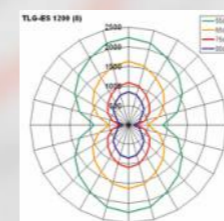


Main function and properties:

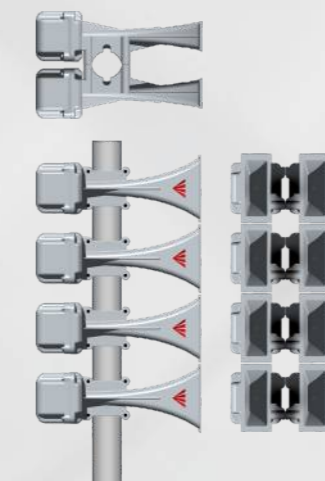
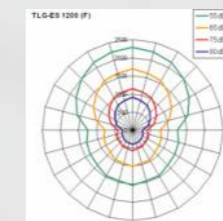
- The working temperature -25°C to +60°C
- The core of the siren consists of a control module, amplifier modules (Amplifier output is 2 x 150W), a power supply unit and a battery charger. The electronics of the siren are **fed from two 12V maintenance-free batteries**, which are continuously recharged from a 220V circuit
- The batteries are capable of ensuring **5 days in standby mode with 30 minutes constant activation**
- Sound recording playback from digital memory (SD card) in WAW, MP3 format
- Playback from combinations of different sound recordings
- **Up to 100 warning messages**
- 16 hours overall records length
- Class "D" amplifiers with up to 90% power efficiency - power amplifier output is galvanically isolated to prevent ground leakage on speakers
- Ability to **automatically switch over to a backup amplifier**
- Automatic broadcasting of emergency status announcements
- Storage of all the important events related to siren activities in the internal memory
- **Intelligent battery recharging**, charging current optimizing based on modern algorithms recommended by manufactures to prolong battery life
- **Ability to program different reactions** on the basis of different inputs
- Control of multiple sirens from one local control module
- IP65 stainless steel box with separate compartment for batteries;

Acoustic radiation characteristics:

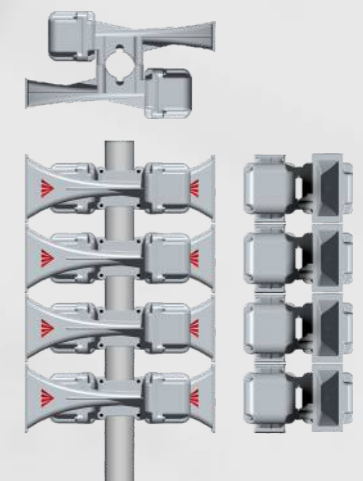
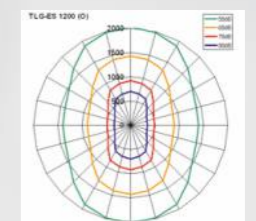
„8" shape



„F" shape



„O" shape

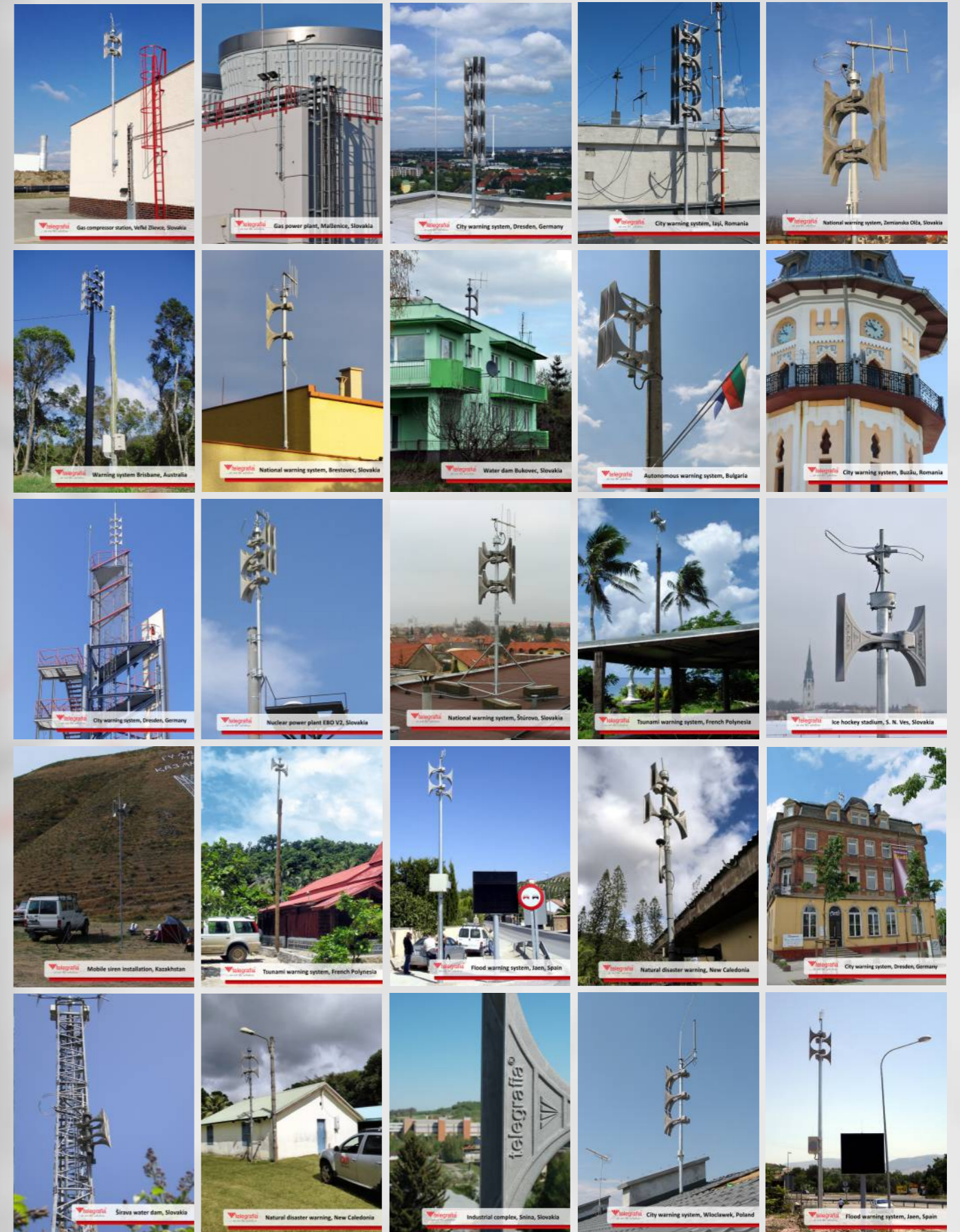
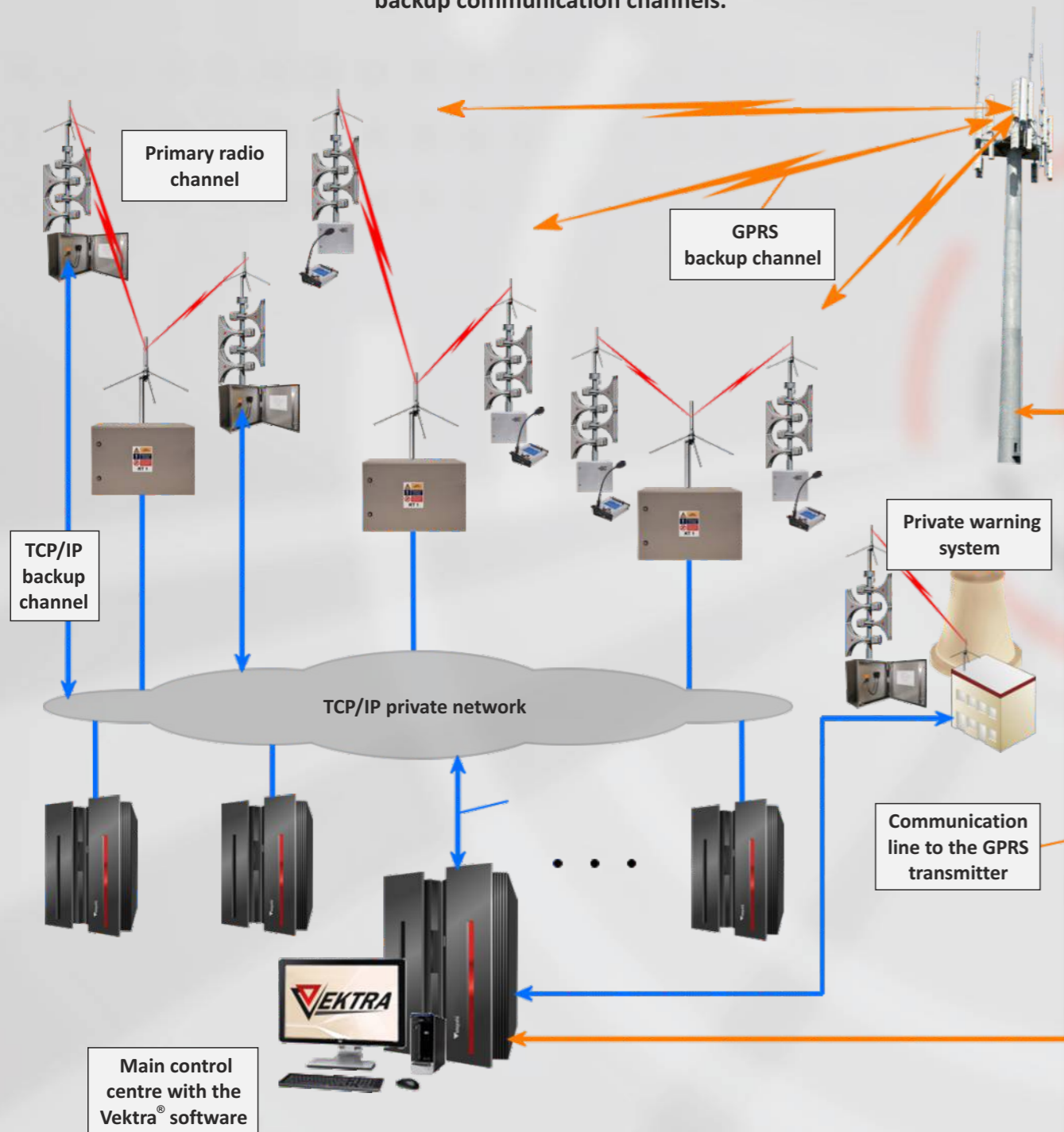


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Communication infrastructure with two-way radio communication as a primary channel and a combination of GPRS and TCP/IP as backup communication channels.



Two way radio control

Dedicated robust solution for high speed and excellent reliability



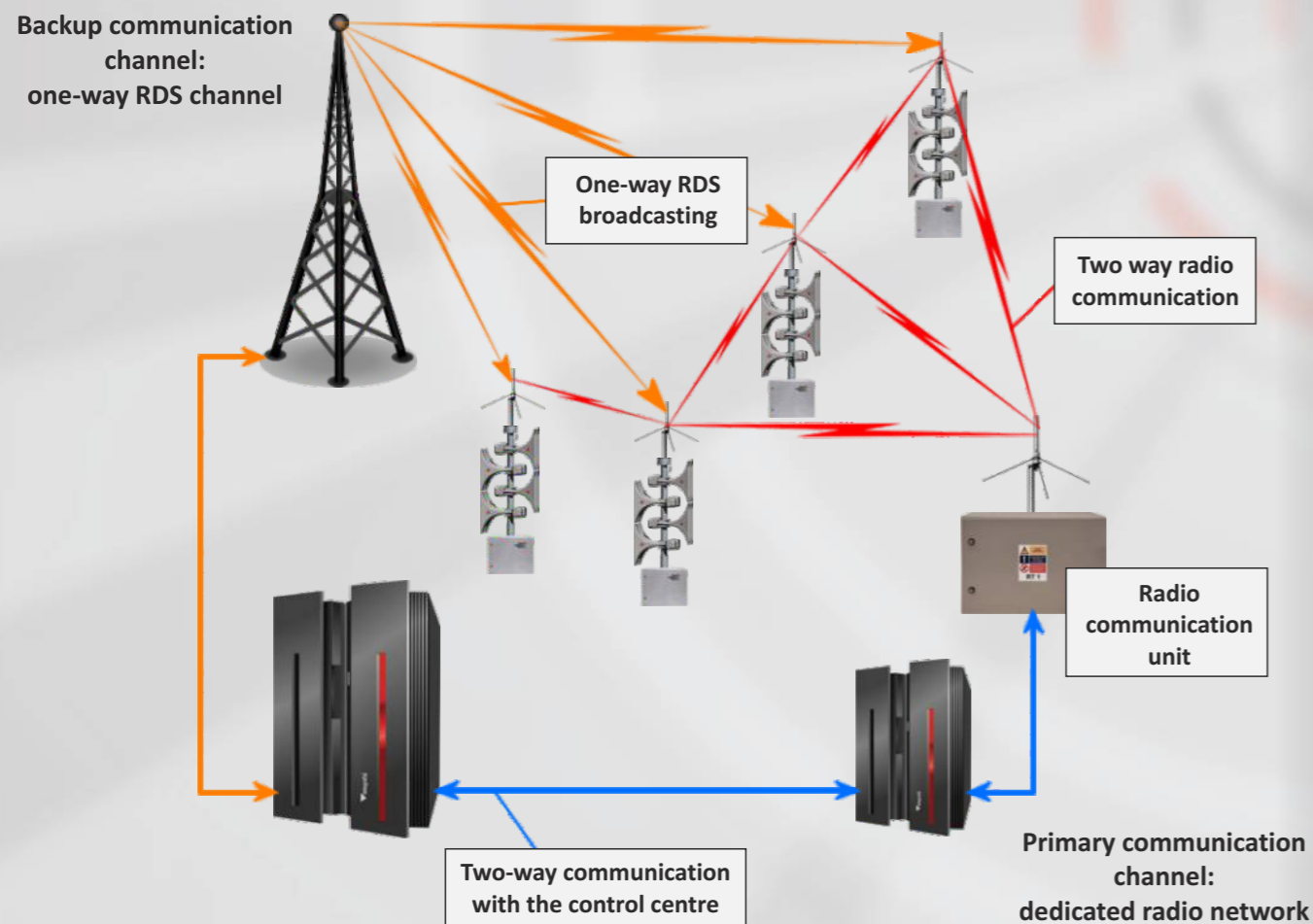
The control via a designated radio network is the preferred control method in terms of simple and extensive warning systems. Experience from all over the world shows that it is almost certain that power failures and fixed phone line communication failures occur in emergency situations.

For that reason modern electronic sirens are designed as separate units capable of announcing warnings during a power or public infrastructure failure. From the control perspective this requirement is perfectly met via a designated radio network established on separate infrastructure. However, high demands are placed on such infrastructure, especially the requirement of prompt siren

activation and subsequent prompt status identification, i.e. confirmation of activation execution.

For that purpose Telegrafia has developed a complete infrastructure for remote radio control and siren monitoring. This infrastructure enables establishing both simple radio networks consisting of several sirens and extensive warning networks consisting of thousands of sirens. Even in the case of the most extensive systems it is capable of activating sirens within a few seconds and is capable of subsequent status identification within dozens of seconds.

Typical solution with two communication channels



Advantages and features

- communication is optimized for fast activation and feedback confirmation of activation
- encrypted communication
- provides all information about the status of the sirens
- allows unscheduled transmission, error and alarm messages from the sirens
- any siren can act as a repeater
- allows silent tests of the sirens
- enables live broadcast of voice messages
- allows remote programming of new messages of the sirens
- automatically tests the sirens in case they were activated through RDS channel
- possibility to monitor sensors, connected to the system
- possibility to control other devices connected to the system
- possibility to run algorithms (scripts) uploaded into the sirens



Radiomodem RDM 02N

The radiomodem RDM 02N module together with transceiver is designed for wireless communication between different devices, for example: control centre – siren, siren – siren, etc. Each radio modem allows the retransmission of data and eliminates the building of special repeater stations, because the siren itself can act as a radio repeater.



GPRS and TCP/IP control



GPRS/EDGE based control

It is possible to use mobile operators' networks as a backup control of Pavian electronic sirens. These use GPS-GPRS, EDGE UMTS, HSDPA or HSUPA type data transfers, as well as text messages in rare cases. The advantage of this control method is that it is not required to establish a separate infrastructure; existing ones can be used instead. This type of communication requires an optional module, mounted in the siren box together with an antenna.

Nevertheless, this control method is usually used for purposes other than main control, since message transmission times can vary depending on the network's load. In emergency situations these networks are loaded to a maximum and siren control is not necessarily reliable. Moreover, electric backup of these networks does not usually meet warning system requirements.

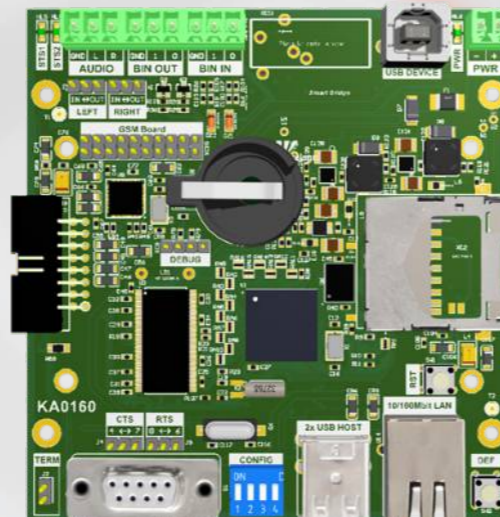


TCP/IP net based control

Control using TCP/IP networks represents another option for Pavian electronic siren control. Once an Smart bridge SBR11 module is added, the siren becomes a network IP device and can be controlled via such network. The advantage of this solution is the ability of using commonly-available and established computer network equipment for establishing warning system infrastructure or the ability of using an existing network.

Even WiFi wireless technology can be used, yet the disadvantage in the case of new WiFi based infrastructure is the small coverage of these devices and the number of access points that are required if an extensive area of coverage is required. Another disadvantage is that free frequencies dedicated to this purpose are used and congestion can occur, especially in cities.

When wiring is used, disadvantages generally applicable to the line control apply. This is due to the reliability issue related to emergency situations, caused by both very probable electric failure (required long-term backup of an extensive infrastructure is very demanding and expensive) and mechanical damage or line flooding.

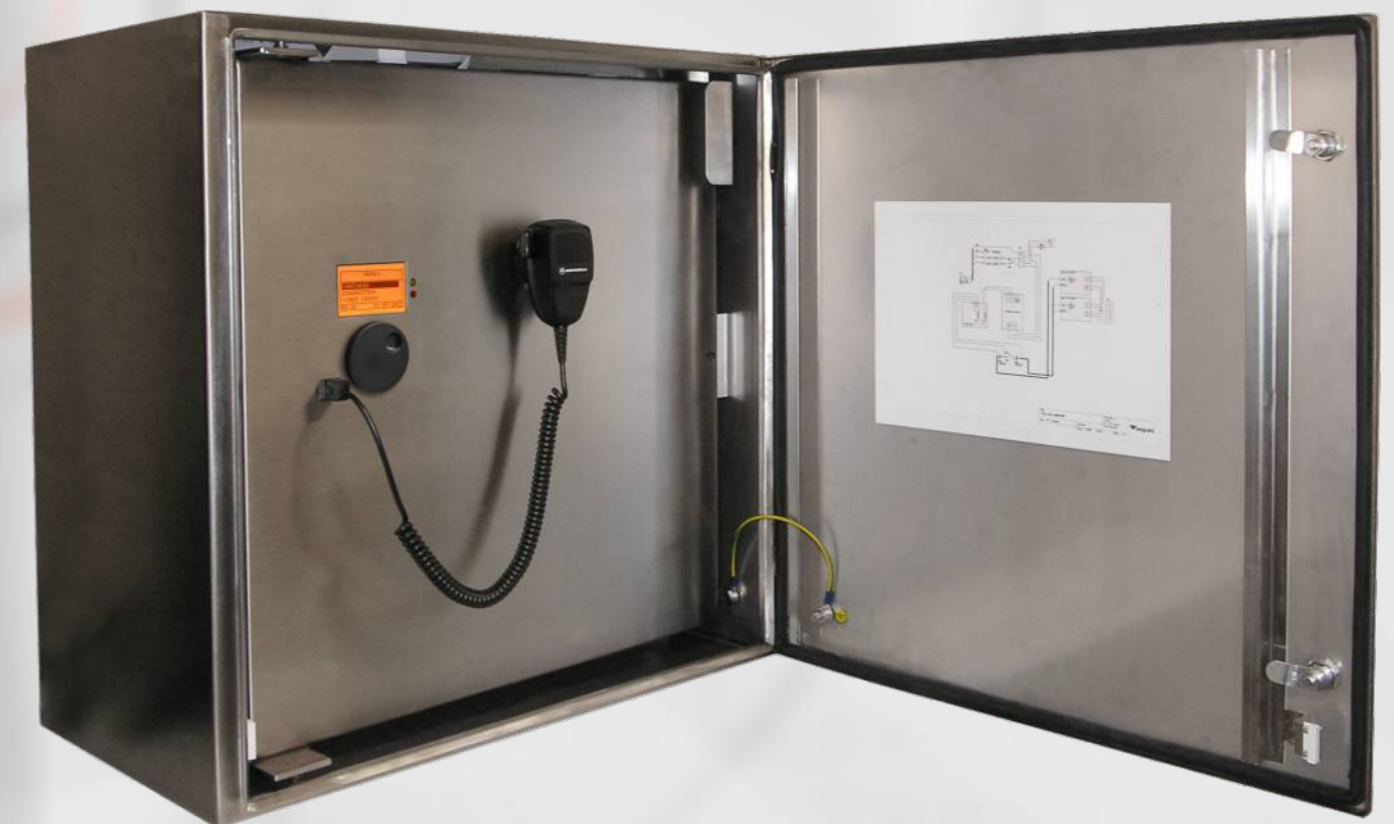


LCU11 (Local Control Unit) Internal

LCU11 (Local Control Unit) in its „Internal“ version is placed on the siren's internal door. It is accessible through the siren opening. It is used when the siren box is placed in an area accessible for the siren control. Door access is protected using a mechanical key and the use of the LCU11 control is protected by a means of authorisation via Dallas chip key.

This type of control allows an authorized operator to perform a lot of tasks directly on place without the necessity to use a centralized control centre:

- activation of the siren or the whole group of connected sirens
- selection of desired pre-recorded alarm
- direct live voice messages via in-built microphone
- run the integrated autotesting functions
- use of on/off switch



Operator's Control Panel

Integrated multi-purpose operator's device "all in one"

Operator's control panel is an **advanced warning, communication, and automation device of "all in one" type**, which also serves for interaction of the system with the operating staff. In the control centres **it can substitute several devices** and save costs and space at the same time. It enables the operating staff to respond to stimuli using a single device and one interface. It enables creation of various fully automated work scenarios as a response to external stimuli. It is thus an efficient tool for automation of processes in control centres of various types and unloads several routine activities from the system operators. Thanks to its communication capabilities, it enables creation of

unattended workplaces to which operated staff will only be called if an extraordinary event happens. Operator's control panel **is manufactured in three versions**: Basic, Professional, and Enterprise. They differ in functions, methods of control, communication interfaces, option to place additional orders for additional communication modules, and their price is optimised for use in many different applications. Operator's control panel can be used separately, or in concurrence with other devices and modules manufactured by our company, and also in concurrence with other manufacturers' devices.



Possible uses

Operator's communication centre, it integrates and interconnects:

- IP phones (it is an IP phone as such)
- mobile network (it is a mobile phone as such)
- communication industrial and door announcers (it is an announcer as such)
- radio stations and radio networks
- analogue phones
- voice evacuation public address systems and sound distribution systems
- warning systems
- it serves as a recording device for voice prints

Control centre for warning systems

It tests and controls the siren network.



Automation system

Evaluates the data from connected detectors and performs various types of actions.

Announcer's panel and control unit in voice evacuation public address systems

It is sufficient to connect amplifier and loudspeakers.

Announcing device

Automatically sends voice messages and short messages.



User interface

- 8 functional push buttons
- possibility to extent it with additional modules, each with 16 push buttons
- rotary encoder with a pushbutton
- activating programmable push button located under the protective cover
- large well-arranged graphic LCD display
- possibility to authorise using the Dallas iButton or RFid
- ergonomic microphone for live announcements broadcasting

Audio

- playing announcements from the SD card
- playing MP3 files from the USB flash
- live announcements from the microphone
- inbuilt FM tuner
- inbuilt loudspeaker
- 4x communication line mono input

Communication options

- WiFi interface
- Xbee interface 2,4 Ghz
- aBUS and CAN buses
- Ethernet 100/10 Mbit
- GPRS for remote control
- GPS module for time synchronization
- 2x serial line RS232 / RS485
- galvanically isolated binary inputs and outputs

BASIC version



PROFESSIONAL/ENTERPRISE version



Extended panel with 16 additional push buttons



Operator's Control Panel

Integrated multi-purpose operator's device "all in one"

A - standardly included D - added upon additional payment

Audio

	BASIC	PROFESSIONAL	ENTERPRISE
playing the sound signal from the microphone	A	A	A
playing the voice prints and warning signals from the SD card	A	A	A
playing the voice signal from other external audio inputs	A	A	A
playing MP3 files from the USB flash	-	A	A
playing radio broadcasting from the inbuilt FM radio	-	A	A
recording sound prints to the SD card	-	A	A
announcement zone selection	A	A	A
announcement or warning signal selection	A	A	A
possibility to combine more prints for an announcement	-	A	A
different possible announcement priorities depending on the occasion	-	A	A

Interfaces

eight galvanically isolated analogue inputs (current or voltage mode)	D	D	A
four galvanically isolated binary inputs	D	D	A
four galvanically isolated binary outputs	D	D	A
communication with the entourage via the RS232 or RS485 interface	A	A	A
communication with the entourage via the ZigBee interface (requires additional module)	D	D	D
communication with the entourage via the WiFi interface (requires additional module)	D	D	D
communication with the entourage via the line interface TCP/IP (requires additional module)	D	D	D
communication with the entourage via the GSM/GPRS interface (requires additional module)	D	D	D
communication with other modules via the internal aBUS	A	A	A
authorisation via the iButton (RFid) (requires additional module)	D	D	D
configuration or programming of various responses to input stimuli (response scenarios)	A*	A*	A

Control

simple control using the push buttons	A	-	-
displaying basic statuses by LEDs	A	A	A
comfortable intuitive control using 8 push buttons and rotary encoder	-	A	A
displaying the system statuses using the 120 x 90 mm display	-	A	A

System

saving all important events related to work of individual modules to internal storage	A**	A	A
testing of individual system modules	A***	A	A
automatic dispatch of emergency announcements to a superior level	A****	A	A
alternate accumulator charger (alternate accumulator is used when the equipment is not powered from the centre)	A	A	A

* limited by the given version interface types

** events can only be read by a service technician via a connected computer

*** more simple version of basic test with summary output (OK/FAILURE)

**** more simple version of summary output (OK/FAILURE)

VEKTRA[®] software

Software application for automating processes performed at notification and warning centres

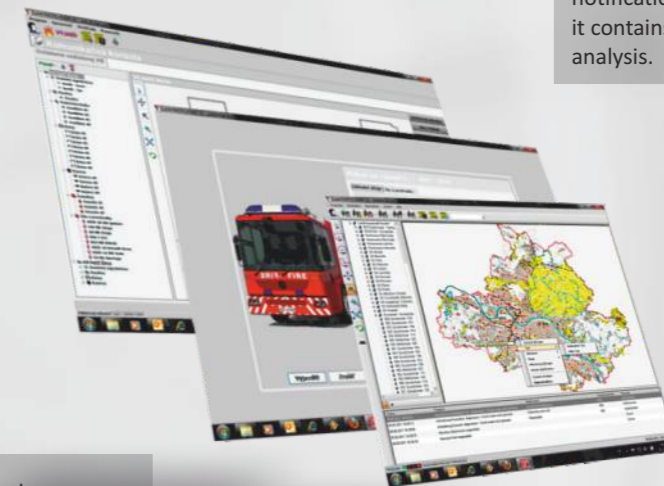


VEKTRA Warning

The **VEKTRA Warning** software application enables full control of the warning systems and provides various methods of activating such systems.

VEKTRA Recording

VEKTRA Recording records phone and radio communication at the notification and warning centres and it contains tools for subsequent analysis.



VEKTRA Notification

This is designed to fully automate the notification process when an emergency situation occurs - calling crisis management teams, emergency committees and others via phone, facsimile and email.

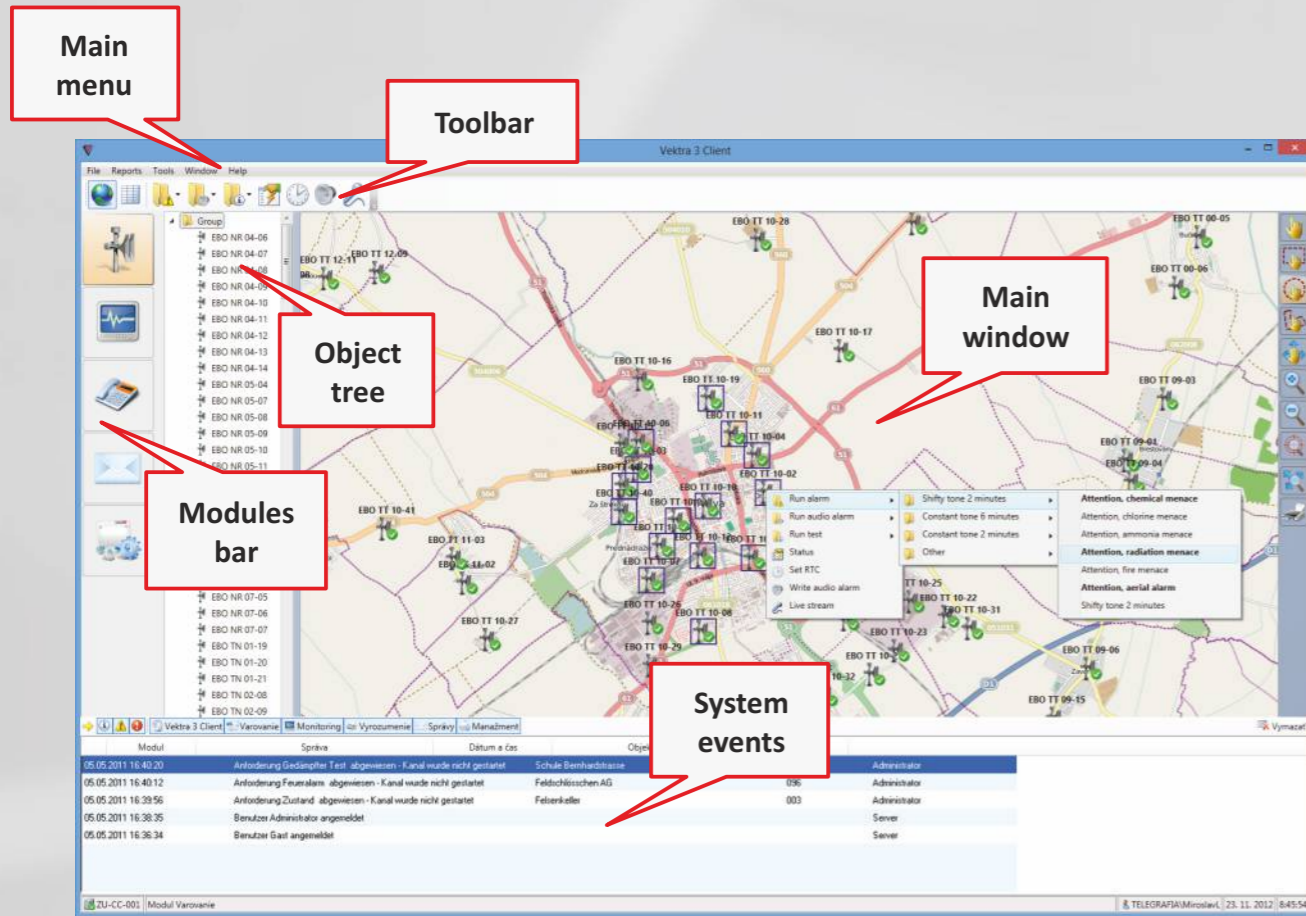
VEKTRA Monitoring

This processes and evaluates data from different sensors, and if the admissible values are exceeded it informs the operators and activates processes in the **VEKTRA Warning** and **Notification** software modules.

All warning systems, and especially electronic sirens, represent devices that are used infrequently. Yet, when used one must be sure that they are functioning, including the communications channels used to operate such equipment. That is the reason why modern sirens from the Telegrafia company provide detailed information on the status of their individual components. **The Vektra[®] Warning module** continuously communicates with the warning systems, gathering and evaluating their status information. If any failure is discovered the module informs the operators of the required service action.

Software application Vektra[®] offers complex functionality necessary for most extensive warning systems. It automates all routine tasks, which operators conduct after announcement of extraordinary event. It contains modules for support of activities conducted on dispatching centres. Actions which are running in the third generation of **Vektra[®]** application are producing outputs via several observable interfaces. One of them is system events window which shows all actions and important events in **Vektra[®]**.

Vektra® user interface (main window)



Another core functionality of the **Vektra® Warning module** is warning system activation. The module provides a wide range of options for warning system activation - separate activation, activation of default groups and of dynamically formed groups just before such activation, e.g. by marking the desired area on a terrain layout.

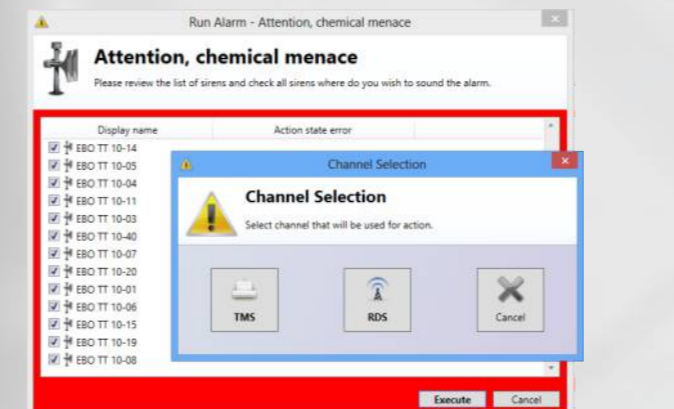
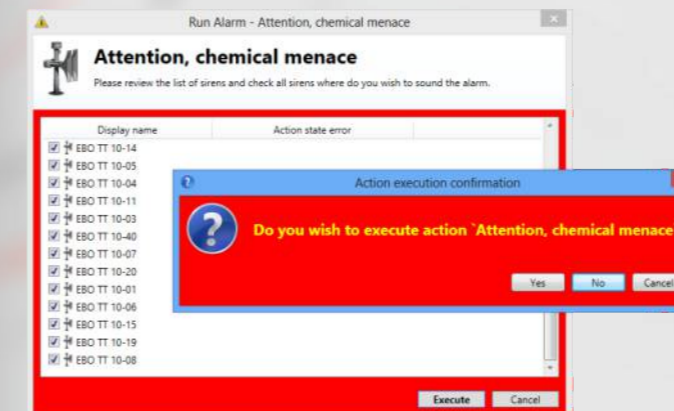
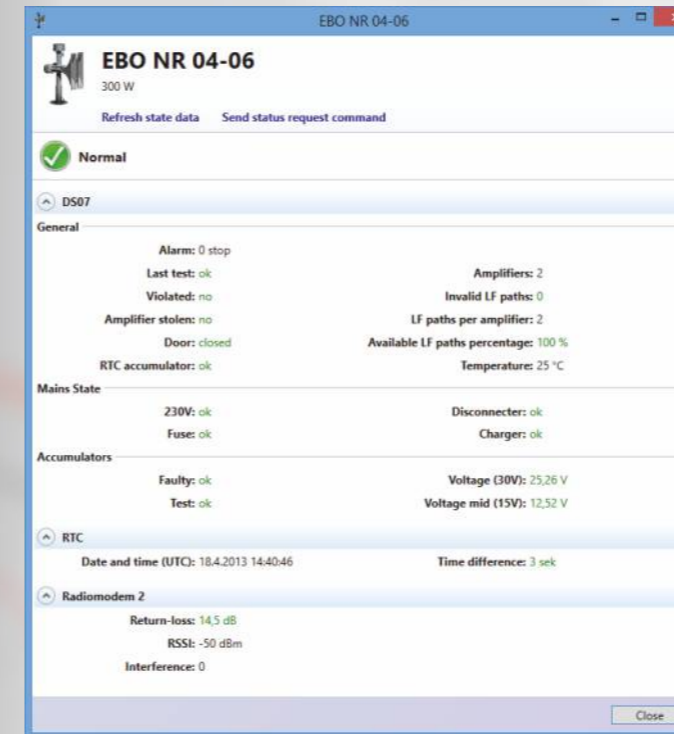
The display section of the module has an integrated GIS environment, which is capable of both displaying terrain and various other layouts, and this allows activities connected to emergency notification more effective, for instance via a visual display of the threatened areas depending on the threat type, a visual display of the acoustic siren coverage etc.

The third core functionality is **communication channel monitoring**. Not only the terminal elements of the warning systems (sirens, central offices, beacons...) but also the communication channels designated for such elements, as well as additional related infrastructure all have to be functioning.

The **Vektra® software** is equipped with a wide range of functionalities related to monitoring of the entire radio network infrastructure. It monitors the status of individual devices - communication units, radio modems, aerial systems and the status of the radio channel itself.

Main functions and properties:

- the **Vektra® Warning module** enables full control of warning systems and provides various methods of activating such systems
- ensures complete supervision of warning devices by continuous communication
- provides monitoring of communication channels, their functionality and accessibility
- easy interface with actual state of objects by corresponding graphical symbols
- **Vektra®** software can be configured to run with any given audio alarm set
- alarm can be activated on individual sirens or on group of sirens
- adaptable interface with the option of writing and activation of audio alarms: audio alarms can be recorded on all electronic sirens from Pavian line
- all sirens connected to a dispatching centre are recording the alarm at the same time
- each audio alarm can be activated at any point of time
- recorded alarm is stored in electronic siren, until it is rewritten by different audio alarm for same audio alarm record number
- **live message broadcasting** - audio alarm is recorded via microphone and then recorded on all sirens in system, and instantly activated
- **test operation feature including complex testing of siren modules**
- system information window shows detailed information about progress of test operation
- status operation reads information about object state. Information in status is valid after test, as some characteristics of electronic sirens can only be correctly measured in test
- history of activation option
- set RTC (Real Time Clock) action - synchronizing time on object with time on controlling computer with **Vektra®** software
- objects in all modules of **Vektra®** can be edited in management module
- only users with permission can log into system and depending on rights for user, run actions in different modules
- system events report shows overview about system operation and actions of user working with application
- all reports that show information with date and time also provide start date and end date filtering options
- printing of the reports
- many language versions available



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Portable solution: Pavian CAR



extremely fast and simple installation
no need for assembly tools
TIME-SAVING IN EMERGENCY SITUATIONS

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