



**CASE STUDY**



**PN-EN 54-16**

**PN-EN 54-4**

**1438-CPR-0527**

# **midiVES Series PA/VA System for Train Line and Metro Applications**



**We make everyday life safer**

# midIVES PA/VA Series

Metropolitan railways are becoming a very important element of transport infrastructure, which allows to solve the problem of a significant increase in the population of large cities and their surrounding areas.

Such urban complexes require an adequate means of transport that will enable the daily movement of a large group of people. These people should be ensured security and quick access to information. For this reason, the metro railway facilities are equipped with modern public address systems as well as Voice Alarm Systems.

The system shall be responsible for the emission of passenger information messages, general messages (e.g. concerning unattended baggage) and, if necessary, also alarm messages. This will increase the comfort of travelers and their safety.

The system also enables manual paging by operators, which allows the facility staff and the relevant services to quickly react to the development of events in an optimal way.

THE midIVES IS A FULLY EN54 COMPLIANT PA/VA SYSTEM WHICH SHALL MEET ALL OF THE APPLICATION REQUIREMENTS

## midIVES key features:

- » A distributed system working in a TCP/IP network.
- » Unified management and visualization interface.
- » Full compliance with EN54.
- » Advanced DSP functions ensuring good speech intelligibility.
- » Ability to interface with SCADA, VMS, PSIM and Passenger Information Systems via system protocol (fully digital integration).
- » Ability to receive digital audio streams (UDP, SIP).
- » All-in-one design (device available in a rack or wall-mounted version).
- » Automatic volume control and background noise tracking.



midIVES is a series of compact PAVA devices, designed for medium-sized buildings and network applications. MidIVES devices work in Plug & Play technology - they are ready to work after hanging on wall or placing in a rack cabinet, connecting wires and installing batteries in the housing. The factory configuration can be edited and freely modified to meet the needs of a given building.

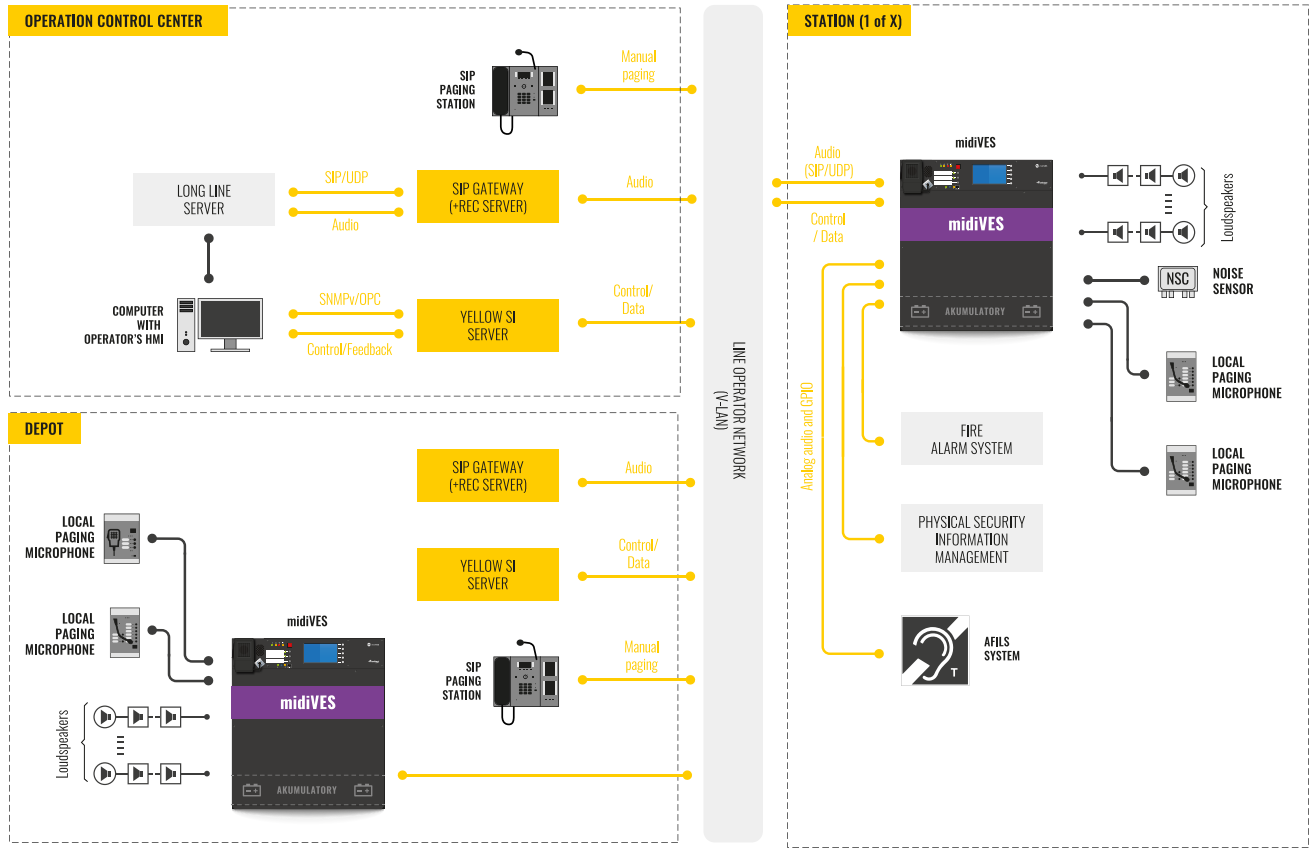
midIVES works in TCP/IP networks. Each system amplifier has a built in network card with both copper and fiber optic interfaces. The device can be connected to a line operators existing LAN network or directly to a backbone network.

Each midIVES is an audio network element, but is able to work independently of other devices. Even in case of total system failure the miniVES shall remain able to perform it's key programmed tasks (the device shall work in Island Mode).

In the case of a metro broadcasting system, the key feature is being able to broadcast to any point in the network from the Local Control Center and the ability to capture digital audio streams from the line operator's servers and Text-to-Speech applications (TTS).

- » midIVES enables integration with external systems via the Ambient System SMS protocol, which is made available for implementation to the company's partners free of charge.
- » Using the YELLOW SI server midIVES enables integration with external systems via Modbus, SNMP and / or OPC.
- » midIVES allows to receive audio streams from an IP network via the UDP protocol.
- » Via the SIP GATEWAY server, midIVES can intercept incoming messages from a SIP network, enabling integration with telephone networks and mobile devices.

# System Architecture



# Technical Specification

A single device of the midIVES series has three independent transformerless class D power amplifiers with 500W output each. The device allows to power up to 16 fully addressable high impedance (100V) speaker lines (8 AB zones). The system also provides the functionality of backup amplifier.

Built-in DSP provides the midIVES user with a range of digital audio processing tools, including: parametric EQ, audio limiter, acoustic feedback suppressor and an audio matrix with priority support.

The midIVES is a network system based on TCP / IP. It allows the distribution of background music between devices and maintaining the functionality of intercom between the main units and system microphones. Ease of operation was obtained thanks to the use of Ambient System proprietary communication protocol - the additional advantage of which is full compatibility with devices of the MULTIVES series.

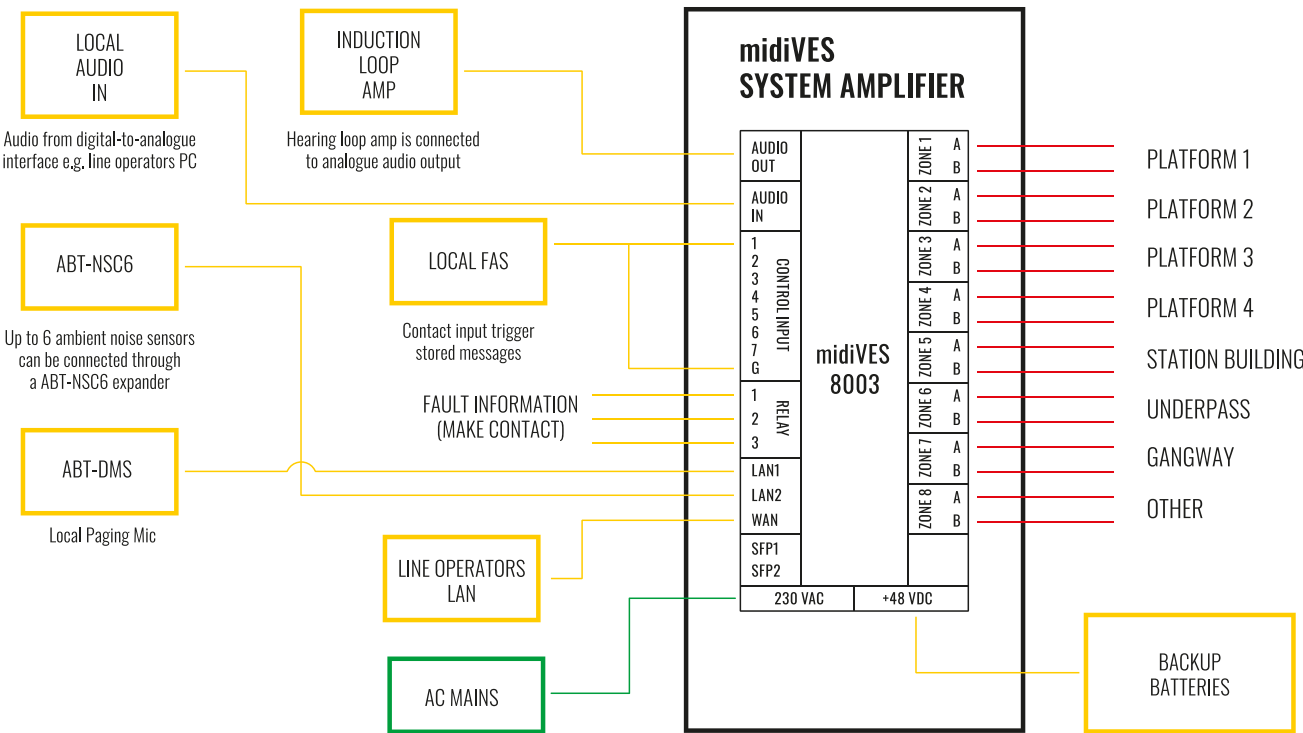


midIVES	8003LN	8003LNR	8003R	8003LNR + 8003R
No of AB zones	8			16
No of speaker lines	16			32
No of control inputs	7 + 2		7	14 + 2
No of relay outputs	3 + 2		3	6 + 2
Relay switching current (max.)	3 A peak*			
Relay switching voltage (max.)	50 V AC / DC peak			
Relay switching power (max.)	90 W*			
No of amplifiers / power	3 / 500 W			6 / 500 W
Redundant amplifier	Yes			Yes
No of messages played at the same time	3			6
Protection	Over-temperature, short circuit, overload, ground leakage			
Battery working time	30 hours + 30 minutes evacuation / 4 × 12 V VRLA batteries			
Ingress protection	IP30	Mounted in IP30 Rack		
Total audio load of the system	1500 W rms			3000 W rms
Operating condition	-5 to + 45°C / 5% to 95% humidity with no condensation			
Weight	23 kg	16,5 kg	16 kg	N / A
Dimensions (W × H × D)	440 × 525 × 350 mm	440 × 176 × 354 mm		600 × 765 × 600 mm
Finish	Black			
Optional functions				
No of audio inputs	1 – stereo to mono			2 – stereo to mono
Power sources – EN 54-4	1 × 24 V DC (150 mA max.) oraz 1 × 48 V DC (350 mA max.)			2 × 24 VDC (150 mA max.) and 2 × 48 VDC (350 mA max.)
Optional network card	2 × SFP module 1 Gb/s; 1 × POE 1 Gb/s, 100 Mb/s; 1 × LAN 1 Gb/s, 100 Mb/s connection; RS485 port; 1 × WAN 100 Mb/s connection		2 × LAN 1 Gb/s, 100 Mb/s, 1 × WAN 100 Mb/s connection	2 × SFP module 1 Gb/s; 1 × POE 1 Gb/s, 100 Mb/s; 3 × LAN 1 Gb/s, 100 Mb/s; port RS485; 2 × WAN 100 Mb/s
GUI 4,3" color touch screen	Yes	Yes	No	Yes
DSP	Input EQ, outputs EQ, feedback eliminator and audio limiter, delay up to 30000 ms – routing, mixing, prioritizing included			
Mikrofon strażaka	Yes	Yes	No	Yes



# Local Configuration

Each station is equipped with at least 1 midiVES device.



midivES allows to broadcast messages from the Passenger Information System, local dispatcher's paging consoles, basically any sound sources connected to the analogue audio inputs of the device and the devices internal memory.

midivES can be integrated with the facilities Fire Alarm System, so that in the event of a hazard outbreak, the system shall broadcast automated messages - according to a pre-programmed scenario.

midivES provides a complete set of monitoring and self-diagnosis functions required in the context of PAVA systems. It can report its status via control outputs, Ambient System proprietary SMS communication protocol (to be implemented by the Integrator, made available free of charge after signing an agreement), or via the YELLOW platform.



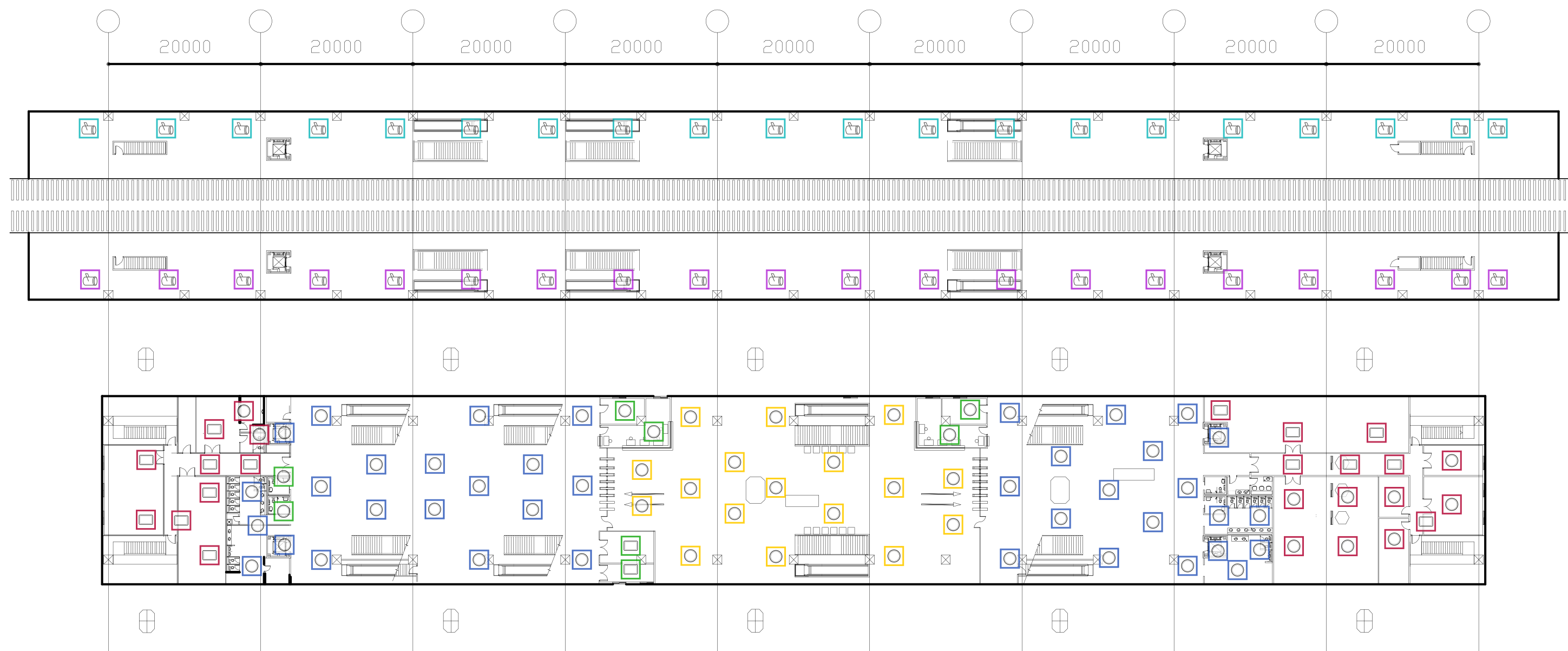
## The system shall monitor:

- » Internal functions such as heat, power input, memory status, etc.
- » Network connectivity, including remote paging and fireman's microphones.
- » Loudspeaker lines for short-circuit, open circuit and earth fault (in a way imperceptible to users, using impedance measurement, pilot tone, loop isolators or end-of-line modules).

midivES IS RESPONSIBLE FOR CAPTURING, PROCESSING AND MATRIXING AUDIO SIGNALS TO THE APPROPRIATE BROADCAST ZONES. A SEPARATE ZONE OF THE SOUND SYSTEM SHALL BE AT LEAST:

EACH PLATFORM
EACH CONSOURCE AREA (GANGWAY, UNDERGROUND PASSAGE)
GENERAL PASSENGER AREAS
WAITING AREA
STAFF AND TECHNICAL ROOMS

# Example System Layout



- |  |                           |  |                           |  |                                   |
|--|---------------------------|--|---------------------------|--|-----------------------------------|
|  | ABT-P20 sound projector   |  | Platform 1                |  | Concourse (unpaid area)           |
|  | ABT-S206B ceiling speaker |  | Platform 2                |  | Waiting area                      |
|  | ABT-W6 wall speaker       |  | Staff and technical rooms |  | Staff rooms in the passenger area |



# Loudspeakers

The Ambient System portfolio includes numerous loudspeakers. Usually in the case of office buildings the following devices shall be used:

- » The platorms shall be fitted with ABT-P20 type sound projectors, ABT-T1510 horn speakers and/or ABT-LA30 slim line array columns.
- » The inside of the station shall be fitted with ABT-S206B ceiling speakers, ABT-W6 wall speakers and ABT LA60/LA30 series line arrays.

**ABT-LA30/ABT-LA60**  
Line Array Loudspeakers Columns



Model	ABT-LA30	ABT-LA30
Rated Power	30W	60W
Sensitivity [1W/1m]	93 dB SPL	95 dB SPL
Frequency Response	141 Hz -20 kHz	136 Hz -20 kHz
Tappings	30 / 15 / 7,5 / 3,8 W	60 / 30 / 15 / 7,5 W
Dimensions	510 x 80 x 110	870 x 80 x 110

**ABT-P20**  
Sound Projectors



Model	ABT-P20
Rated Power	20W
Sensitivity [1W/1m]	91 dB SPL
Frequency Response	130 Hz - 20 kHz
Tappings	20 / 5 / 10 / 2,5 W
Dimensions	210, Ø143

**ABT-S206B**  
Ceiling-mounted Loudspeakers



Model	ABT-W6
Moc znamieniowa	6W
Sensitivity [1W/1m]	93 dB SPL
Frequency Response	120 Hz -20 kHz
Tappings	6 / 3 / 1,5 / 0,75 W
Dimensions	115, Ø143

**ABT-T1510**  
Horn-type Loudspeakers



Model	ABT-T1510
Rated Power	10W
Sensitivity [1W/1m]	103 dB SPL
Frequency Response	340 Hz - 9 kHz
Tappings	5 / 2,5 / 1,25 / 0,62 W
Dimensions	236, Ø156

**ABT-W6**  
Wall-mounted Loudspeakers



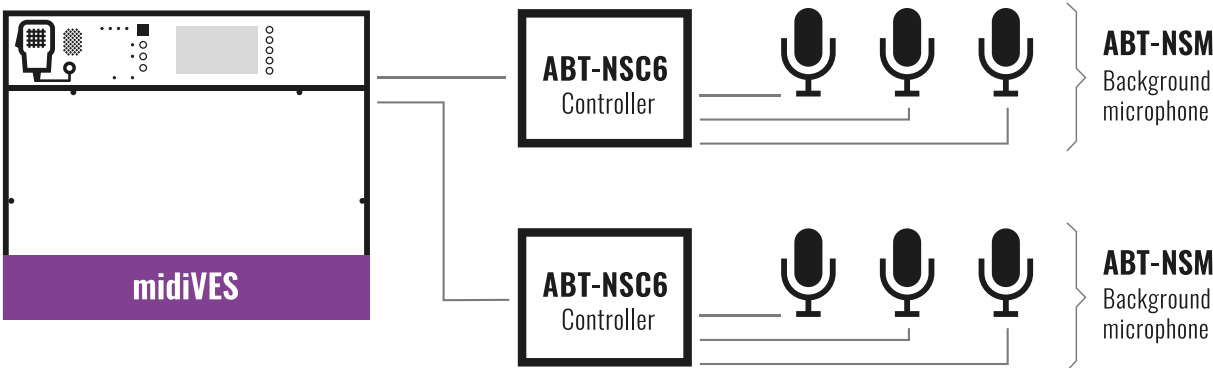
Model	ABT-W6
Rated Power	6W
Sensitivity [1W/1m]	94 dB SPL
Frequency Response	120 Hz -20 kHz
Tappings	6 / 3 / 1,5 / 0,75 W
Dimensions	260 x 180 x 80

# Ambient Noise Sensors

midivES can be equipped with one or more ABT-NSC6 interfaces, each of which allows to connect up to 6 noise sensors to the system. The function of automatic noise tracking allows the system to work with good intelligibility, while adjusting the volume level to the actual acoustic conditions at the station.

The solution allows to:

- » Increase passenger comfort.
- » Limit undesirable sound emission to areas adjacent to the station.



## System Microphones

The midiVES system communicates with remote paging stations via a TCP/IP network. Each of the units can be powered locally (using a power supply) or through a system cable (via PoE). Each unit can be assigned a selected priority level.

**The built-in message buffering function allows to record a broadcast addressed to a busy loudspeaker zone and play it back automatically once the zone is released.**

- » A local system operator shall use the ABT-DMS paging microphone
- » If the system is to operate as VA, then it can be fitted with ABT-DMFS alarm consoles
- » The line operator at the OCC can use the ABT-DMS-LCD unit, or the ABT-ICDG-1 SIP paging station (VoIP)

### ABT-DMS

Zone microphone



Zone microphones made available to the facility staff will enable the transmission of general messages. The units will also allow to control the emission of music signals in selected zones (BGM function).

### ABT-DMFS

Fireman microphone



The fireman's microphone is a device with the highest priority of operation, ensuring the transmission of emergency messages to people present in selected or all facilities. It is monitored both electrically and acoustically.

### ABT-DMS-LCD

Zone microphone with LCD



Zone microphone with a touch LCD display; It facilitates work in a system with a large number of zones.

### ABT-ICDG-1

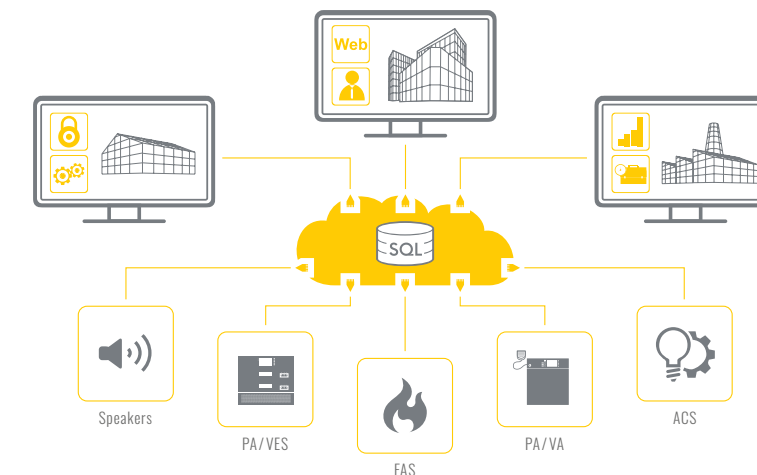
ABT Paging phone station



The SIP paging station allows easy access to many zones. It combines the functions of a dispatch station and a SIP telephone. It can cooperate with other systems, e.g. INFO-SOS columns.

## Surveillance features

midiVES provides a complete set of monitoring and self-diagnosis functions required in the context of PAVA systems.



- » YELLOW is an integration software, for management and visualization of audio and security systems.
- » YELLOW offers an efficient way of management.
- » YELLOW enables continuous monitoring of the midiVES system and its components.
- » YELLOW enables easy integration with third party systems via protocols such as: SNMP, Modbus and OPC.

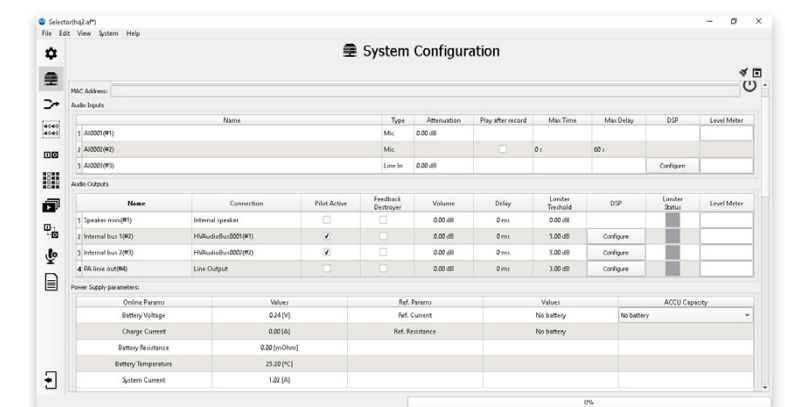
**The system is monitored using advanced self-control mechanisms:**

- » Internal functions (temperature, memory, DSP power, etc.)
- » Connectivity between network components of the system, including remote zone and fireman microphones.
- » Loudspeaker lines for short-circuit, open circuit and earth fault (in a way imperceptible to users, using impedance, tone, loop isolators or end-of-line modules).



**SELECTOR - dedicated management application that allows for remote diagnosis of faults, without the need to call the maintenance team to the site.**

- » Global access to midiVES devices from any point in the network.
- » Access to the system log and event log.
- » View of connected speaker line impedance.
- » Battery charging parameter management.
- » Zone status: normal, blocked, in fault, broadcasting.
- » Access to many other parameters.



## Integration with Other Systems

The midiVES can be integrated with other systems via analogue interfaces in the form of audio and control inputs/outputs, or completely digitally:

- » By the use of the Ambient System proprietary SMS protocol.
- » Through SNMP, Modbus, or OPC (using the YELLOW SI Server).

midivES OFFERS THE POSSIBILITY OF INTEGRATION WITH OTHER SYSTEMS IN BOTH THE DIGITAL AND ANALOGUE DOMAIN

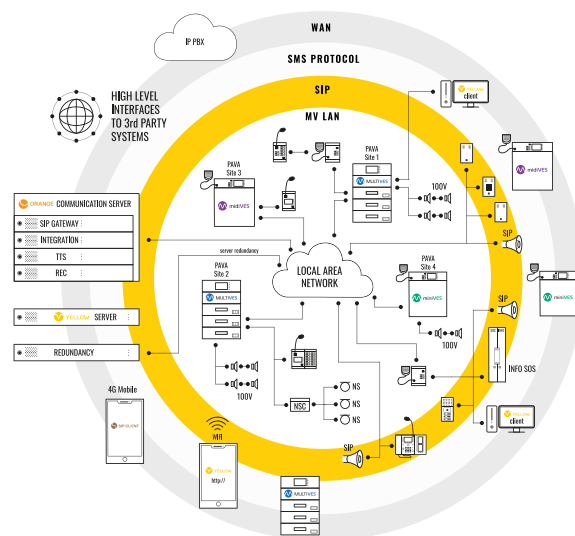
## FIRE ALARM SYSTEM (FAS)

## BUILDING MANAGEMENT SYSTEM (BMS)

### INTERNAL COMMUNICATION SYSTEM (INTERCOM)

### TECHNICAL MONITORING SYSTEM (TMS)

## Integrated Security Platform

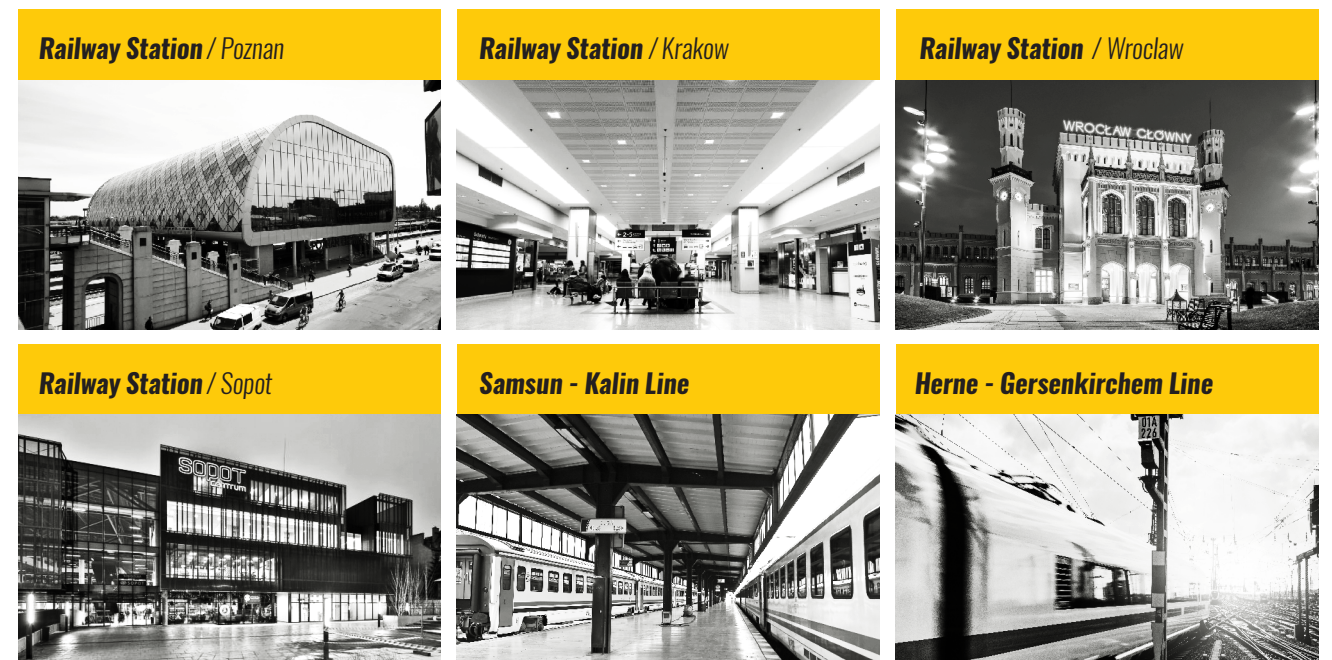


**Ambient System presents the concept of an Integrated Security Platform, consisting of:**

- » EN54 certified VA System based on MULTIVES and midiVES product line-ups.
- » SIP based intercom with powered SIP loudspeakers.
- » YELLOW as a visualization and management system .

The platform extends the standard functionality of the Voice Alarm System with additional features such as two-way communication between system users and operators, as well as the ability to present data coming from various systems in the form of one, consistent and easy-to-use Graphical User Interface (GUI).

## References



## Contact

## HEADQUARTERS

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Those interested in obtaining more information are encouraged to visit the website [www.ambientsystem.eu](http://www.ambientsystem.eu) and to register in the customer zone at: <https://ambientsystem.eu/en/customer-area/customer-area-log-in/customer-area-registration/>





*We make everyday life safer*

*Ambient System products are continually improved. All specifications are therefore subject to change without prior notice.*

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