

Ambient System PA Solutions



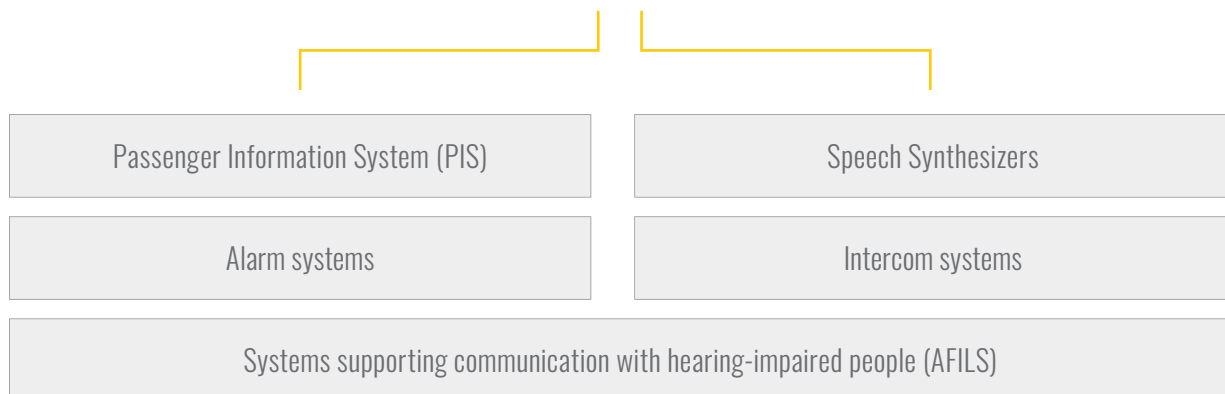
For small and medium
sized train stations

Solutions for Rail Infrastructure

This document is written in response to requests from railway and station operators from many countries to establish **standard 'kits' for their typical stations providing public address customer information solutions** without re-designing every system from scratch.

The reality is that most suburban rail stations around the world share the same features and Ambient has spent time working on a formula to **offer comprehensive packages to match those needs including all the standard requirements and performance in a cost-effective and simple to specify package.**

AMBIENT SYSTEM SOLUTION INTEGRATES WITH EXTERNAL SYSTEMS IN BOTH DIGITAL AND ANALOGUE DOMAINS



Furthermore, in addition to our **Small Station Kit (SSK)** we have considered the needs of the medium station and are pleased to present the **Medium Station Kit (MSK)** which delivers a scalable package for these larger projects.

We have created **acoustic models** to demonstrate the efficacy of our SSK and MSK kits and have incorporated induction loops, "ready to upgrade" EN 54 Voice Alarm compatibility and ambient noise compensation to **minimise environmental disturbance**. Our kits are based on the **latest technologies for minimum energy consumption**, giving these solutions a green rating as well having an eye on **cyber security and condition monitoring** within the products.



Further information, detailed design specifications, system examples, as well as standard equipment lists can be found in the **Ambient System White Paper** / „Public Address systems for train stations – design requirements and technical solutions.”

AMBIENT SYSTEM STANDARD KITS FOR TYPICAL STATIONS

providing public address passenger information solutions

SMALL STATION KIT (SSK)



MEDIUM STATION KIT (MSK)



No	Type	Description	Qty SSK	Qty MSK
1.	midIVES 8003LN	All-in-one 8-zone 1500W system amplifier	1	1
2.	midIVES 8003R	All-in-one system amplifier for rack cabinet	-	1
3.	ABT-P20	Sound projector – rated power: 20 W	20	50
4.	ABT-DMS	Paging station with electret gooseneck microphone	1	2
5.	ABT-NSC6	Ambient noising controller with pre-amplifier	1	2
6.	ABT-NSM(B)	Noise sensing microphone with enclosure for severe climatic conditions	4	10
7.	ABT-HLD5	Induction loop amplifier	2	5
8.	ABT-W6	Aesthetic wall speaker – rated power: 6 W / 100 V	2	3
9.	ABT-S206	Compact ceiling speaker – rated power: 6 W / 100 V	-	2
10.	GS110TP	Switch, 8x PoE, 2 x SFP	-	1

The kit quantities are based on **2 platform and 5 platform systems**. The **SSK** is designed for stations typically with two platforms, but is perfectly suited to station with up to 4 platforms. The **MSK** is designed for stations with 5- 8 platforms.

In any system, you can supplement the quantities with additional items to meet the full requirement for the station. If, for example, the platforms are very long, it is possible to add **more ABT-P20 projector loudspeakers**.



Compact plug-and-play PA/VA amplifier



- › *All-in-one system with integrated TCP/IP audio networking*
- › *Powerful DSP based audio processing*
- › *State of art., highly efficient amplification modules*
- › *Easy installation and configuration*

midiVES 8003 / compact plug-and-play PA/VA amplifier

The sound system configuration for small and medium sized train stations is based on the **midiVES 8003 series compact plug-and-play PA/VA amplifier** (fully EN 54 complaint). The midiVES 8003 offers a **full set of monitoring functions** (including speaker line surveillance, **status requisition as well as audio DSP** (including ambient noise control)).

midiVES 8003 is equipped with a **single programmable stereo audio input**, which can be used to connect any type of sound source such as a digital audio interface or PC running a voice-to-speech application. It is also possible to receive external multicast audio streams by RTP or RAW UDP.

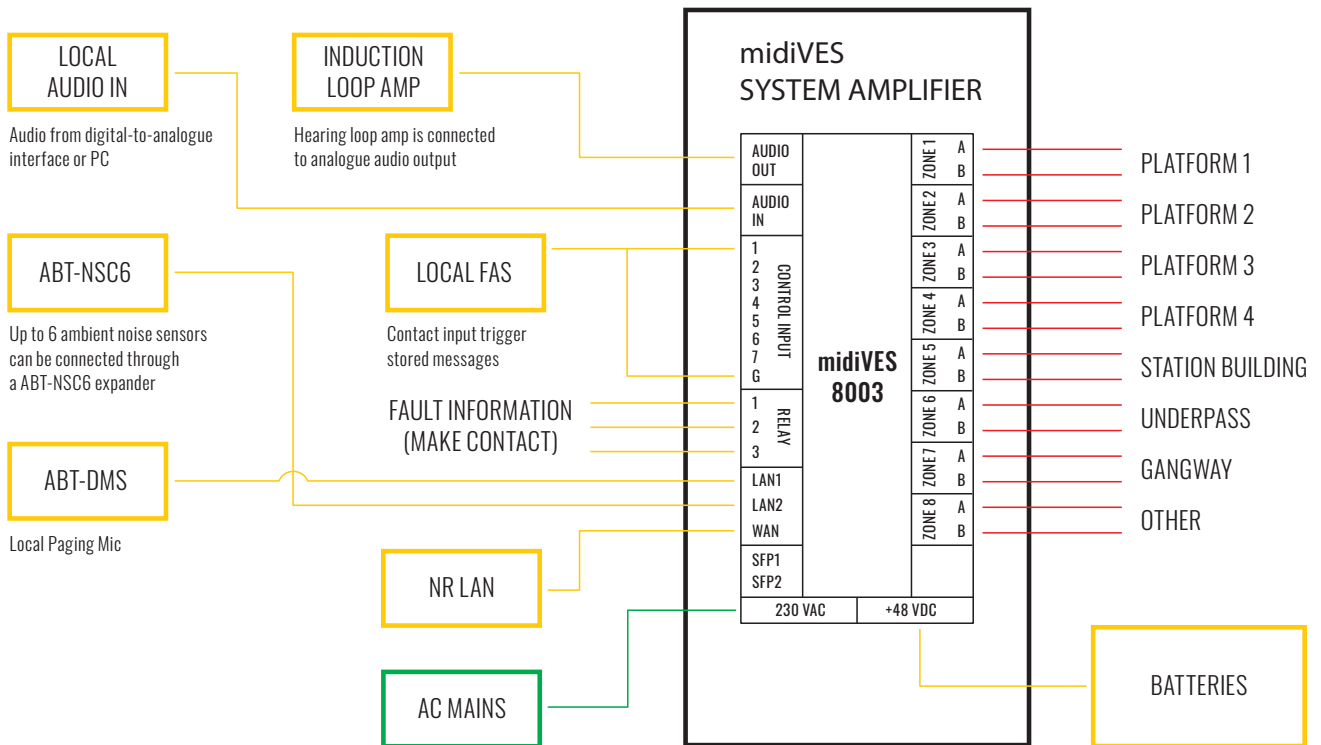
midiVES 8003 has internal message memory. Announcements stored in the unit can be triggered via communication protocol or relays (for example by local FAS system).

- » **Stations are equipped with ABT-DMS digital paging microphones.**
- » **Local control centre supervising stations within a larger area shall be equipped with ABT-DMS-LCD microphones** to allow broadcasting to a larger group of stations.
- » Different **priority levels** shall be assigned to each sound source in the system.
- » Each platforms shall be designed as a separate zone.
- » Additional zones shall be designed for any gangways or underpasses leading to the platforms.
- » A separate zone shall be designed for the interior of the train station (passenger area).



ABT-DMS-LCD / Zone Microphone with LCD

ABT-EKB-20M / Microphone Keyboard Extension



MONITORING

Connecting the midiVES 8003 to a LAN network enables communication with remote paging microphone and YELLOW maintenance platform (which then enables status requisition, triggering stored messages, changing system preset, time setting etc.) The midiVES 8003 operates on 230 VAC.

SYSTEM CAPACITY

A single midiVES 8003 system amplifier has 2 main audio busses and a third standby audio bus which can be used in emergency. Maximum load per unit is 1000 W. The unit has 8 speaker zone terminals with two separated 100 V speaker line output each. Speaker lines are monitored for: open-, short-circuit, ground fault.

BACKUP POWER

Where required, a set of batteries can be added as a standby power supply. The MidiVES already includes a charger and space for these batteries.

midiVES 8003 is equipped with a single line output, which is used to drive the induction loop amplifier.

Maximum load for a single midiVES 8003 unit is 1500W. The unit can **power up to 16 speaker lines** – divided into 8 A/B zones. Each zone is freely addressable with independent level control, which combined with the ambient noise control function (independent for each platform) shall enable to **reduce the unwanted sound pollution for neighbouring areas.**

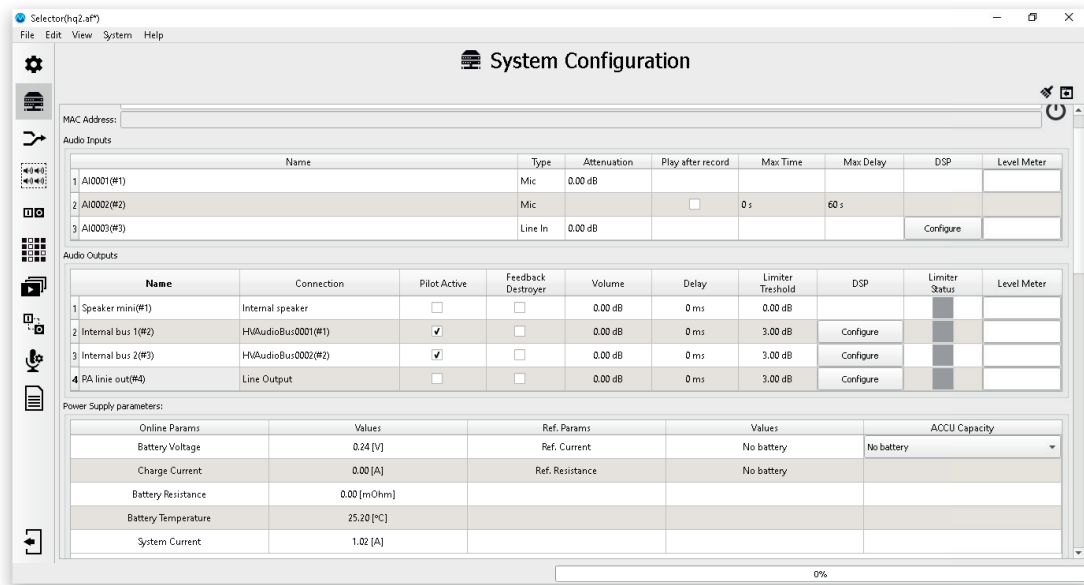
Onboard midiVES 8003 DSP enables: input EQ, outputs EQ, feedback suppression and audio limiter; routing, mixing and prioritizing capability. **The midiVES 8003 is equipped with an algorithm for ambient noise control.** Our kits include 2 ambient noise sensors per platform, connected via the ABT-NSC6 interface.

midivES 8003 has a full set of surveillance functions typical for voice evacuation systems. It can report status and fault via relay contact output, MODBUS or SMS protocol.

- » Internal system (heat, memory, DSP, PCU, etc.) functions are monitored by self-diagnostic algorithms.
- » System paging microphones and noise sensors are monitored.
- » Speaker lines are monitored for open/short-circuit/ground leakage by impedance measurement and/or end-of-line modules.

A dedicated GUI is available for remote system maintenance:

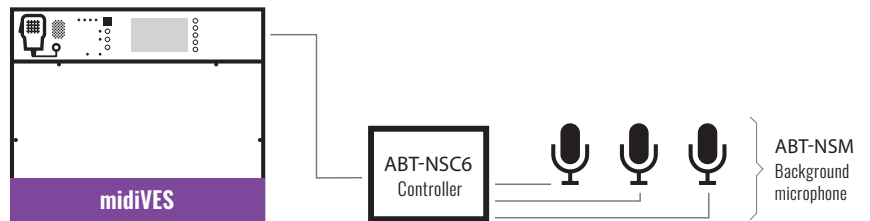
- » Zones status: fault, blocked or playing including the type of the source information
- » Parameters like current system consumption, temperature and batteries charging current, resistance available online
- » Advanced functions available: time scheduler, auto standby, message recorder, automatic playback to previously occupied zones
- » Global access to all midivES units from any point in the network
- » Access to fault register in details and events log
- » Speaker line impedance preview local and global
- » Charging parameter management



Automatic sound control system

Each system can be equipped with automatic volume control function. This function keeps track of the ambient noise level and adjusts the power input to the actual conditions within the area in such a way, so that the audio communication is delivered at the minimum intelligible level, improving the passenger experience.

It also reduces the sound transmitted to the surrounding area.



Loudspeakers

Selected loudspeakers maximize speech intelligibility and quality of broadband audio signals. High directivity speakers are recommended for use in densely developed urban areas.

- » **Platforms** shall be fitted with **ABT-P20 sound projectors** and/or **LA series** compact line arrays.
- » **Station interior** shall be fitted with **ABT-S206B ceiling loudspeakers**, **ABT-W6 wall loudspeakers** and/or **LA-30 line arrays**.
- » Special areas can be fitted with the **ABT-T1510 high IP horn speakers**.

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



ABT-P20 / Sound Projectors



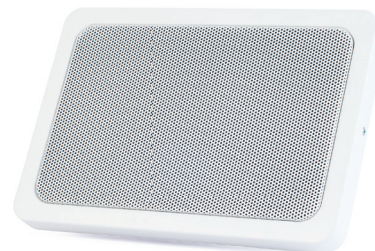
ABT-S206B / Ceiling-mounted Loudspeakers



ABT-T1510 / Horn-type Loudspeakers



ABT-W6 / Wall-mounted Loudspeaker



Example Design

The station shall be fitted with a PA system based around an all-in-one midiVES 8003LN system amplifier.

The system shall be responsible for transmission of general information, passenger information and/or safety instructions. It shall cover both stations platforms, each programmed as a paging zone.

The system shall be controlled remotely. For this reason the system amplifier shall be connected to the station operators VLAN network. Announcements shall be broadcast into the system from the Passenger Information System (PIS) via analog line audio inputs.

The system shall have required features such as:

- » The system shall have an integrated microphone located in the system amplifiers front panel.
- » The system shall have a TCP/IP network interface for remote maintenance and control.
- » The system shall have 3x 500W in-built D-class power amplifiers (1 backup).
- » Each zone shall be independently addressable. Each zone output shall have 2 isolated speaker line outputs with (A/B) with overload and short-circuit protection.
- » The system shall support priority paging.
- » The system shall enable continuous monitoring of each component including connected speaker lines. The scope of surveillance shall comply with EN54-16 and BS-EN 60849.
- » Loudspeaker lines surveillance shall be available via impedance method with a built-in adaptive algorithm for following slowly varying impedance changes and the ability to set impedance tolerances for each loudspeaker line in any range from 5% to 100% of the saved reference.
- » The system audio matrix shall work in full music band (20Hz -20kHz, +/- 1 dB).
- » The system shall have an internal clock and a scheduler function (time based events).
- » Built-in DSP processor shall enable the improvement of Speech Transmission Index.
- » The system shall be fitted with automatic gain and noise control features.

No	Type	Description	Quantity
1.	midivES 8003LN	All-in-one 8-zone 1500W system amplifier	1
2.	ABT-NSC6	Noise sensing controller	1
3.	ABT-NSM (B)	Noise sensor (outdoor)	2
4.	ABT-P20	Fire sound projector ALU Power: 20W, 100V	20
5.	HLD5	Induction loop amplifier	2

HLD5 / Hearing Loop

- › *Driven from Ambient System PA/VA*
- › *Choice of internal or external loops*
- › *100sqm coverage*
- › *IP66 Enclosure*
- › *Easily configurable*
- › *Efficient power use with sleep mode*
- › *Continuous self-testing*
- › *Intelligent protection system*



ABT-HLD5

The ABT-HLD is designed for use in railway, airport and other transport applications. The wall mounted unit can be fitted in a public area and is remotely powered and fed from the Ambient System central rack for both power and audio for simple connectivity. Inside the box there is an internal aerial that can create a small loop field around the unit, suitable for use near display boards or maps. Alternatively, a loop can be arranged outside the unit to cover up to 100sqm. The unit is fully monitored and reports status back to the Ambient System PA / VA system.

Application:

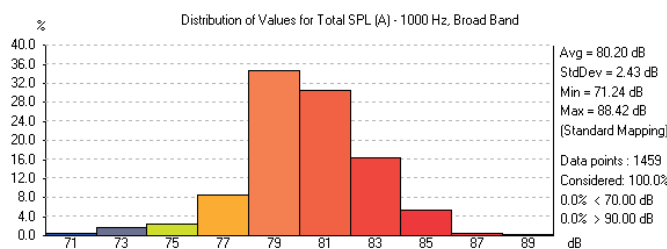
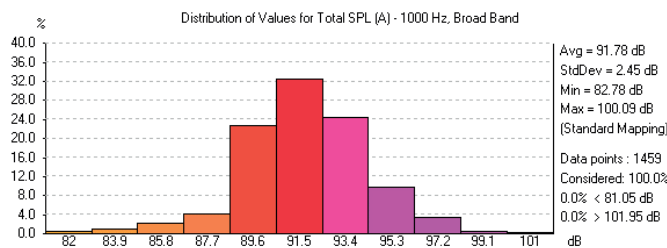
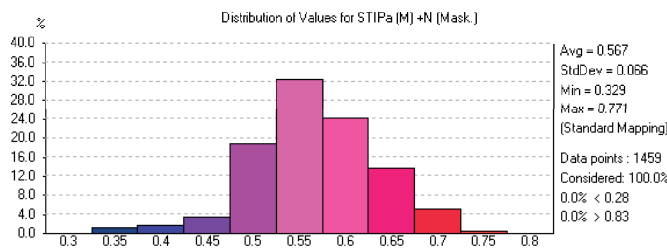
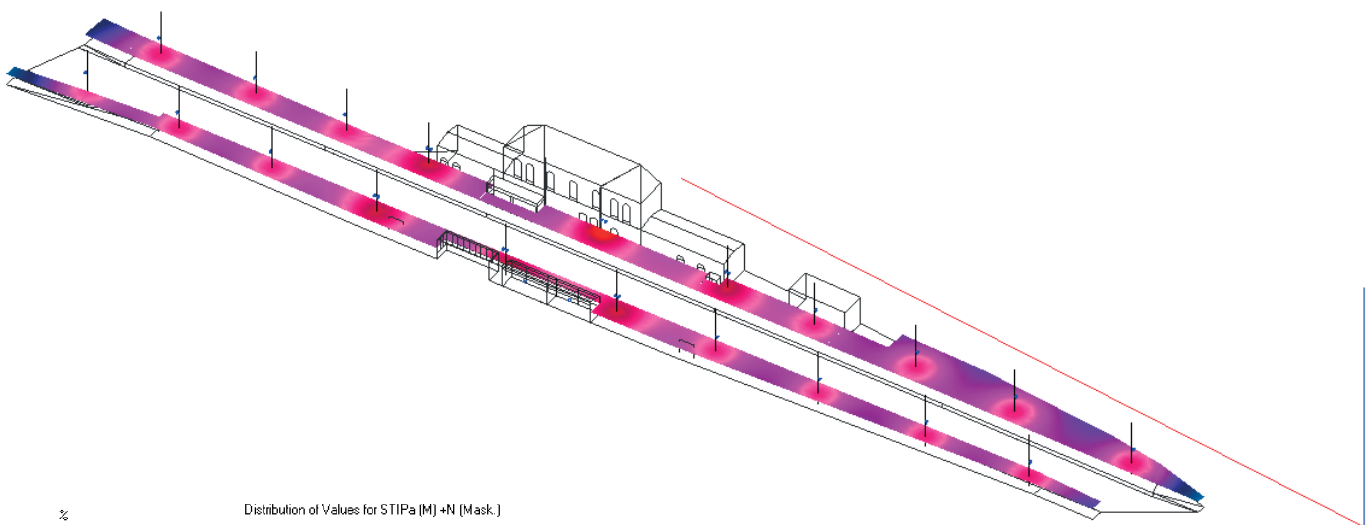
In addition to use in transport, this loop device could be used in any small to medium project in conjunction with an Ambient System midiVES in projects such as meeting rooms or lecture halls.

Technical Specification	
DC Power	24V / 4A
Max power consumption	96W
Construcion	Aluminium Powder Coated
Dimensions	99 x 200 x 40 mm HxWxD
Weight	1,5 kg

Calculations performed for a standard two platform city train station

The necessary condition of audible messaging is assuring adequate volume level of broadcast. Intelligibility and clarity of messages however depend not only on their absolute volume level, but equally on the relative level of the broadcast signal level to the ambient noise, as well as reverberation.

All of these factors must be taken into account, which is why the selection and arrangement of loudspeakers were verified by acoustic simulations when designing these kits.



EXAMPLE:

A typical station with two 200 metre platforms shall be equipped with ABT-P20 type sound projectors placed at lamp posts and/or on station building infrastructure.

Each speaker covering an area of platforms up to 16 running metres shall achieve fair STI (in the range of 0,45 – 0,60) at an SPL level of 80 dB(A).

Maximum sound pressure level at 1,5 m height above ground exceeds 90 dB(A) – with speakers driven with speech signal at half of their rated power.

CONTACT INFORMATION

HEADQUARTERS

AMBIENT SYSTEM Sp. z o.o

ul. Bysewska 27
80-298 Gdańsk | Poland

T: + 48 58 345 51 95
ambient@ambientsystem.pl

SALES

NEIL VOCE

n.voce@ambientsystem.pl
T: (+44) 743 733 95 57





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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