ONBOARD ROLLING STOCK COMMUNICATION

With our VoIP communication solutions, Vingtor-Stentofon aims to be the integrator’s choice in fulfilling client system requirements. We provide commercial off-the-shelf VoIP end-devices for PA, Intercom and Train Radio Integration. The on-board audio communication server is also part of our offering.

IP has slowly become the norm, at least for telephony services on-board. Now, there is also a standard series that defines the Train Ethernet Backbone and its applications - IEC 61375 / IEC 62580.

SIP has established itself as the preferred method of connecting emergency call devices to the onboard IPBX. Vingtor-Stentofon is at the forefront of an exciting new development in onboard communication with the ability to address a PA amplifier through SIP, directly from the IPBX.

Utilizing such open standards ultimately means more freedom of choice for our clients when it comes to future upgrades and alterations.
Onboard Communication - Technology Timeline

70’s
ANALOG
• Simple non-proprietary technology
• Simple integration
• Non-proprietary end-devices

90’s
DIGITAL
• Advanced proprietary technology
• Beginning of advanced integration
• Proprietary end-devices

10’s
VoIP
• Advanced proprietary technology
• Advanced Integration
• Proprietary end-devices

Now
SIP VoIP
• Advanced non-proprietary technology
• Simplified Advanced Integration
• Open end-devices (COTS)

EMERGENCY CALL POINT
Noise-cancelling intercoms with crystal clear audio both ways. Robust and vandal-resistant.

RADIO TO VOIP/SIP INTEGRATION
Bring radio communication through the IPBX and conversion to VoIP/SIP. An easy way to solve all call cases/ integration involving radio.

CREW UNIT
HMI Integration Cab Speaker Driver’s Unit

CAB SOLUTIONS
WE KNOW INTEGRATION

Our audio expertise and well known sound quality is reflected in a complete VoIP system onboard, ready to use by integrators or car manufacturers.

We enable better systems and ease of integration through commercial off-the-shelf (COTS) end-devices with robust hardware and software - all based on Open Protocols.

We focus on delivering a complete SIP Based VoIP audio communication package or core VoIP OEM components that are compliant with EN50155.

PA AMPLIFIER

Enables two separately SIP-addressable loudspeaker zones per amplifier. Eliminates one entire subsystem by using the IPBX as the PA controller.

IP LOUDSPEAKER

Each loudspeaker is individually IP-addressable. Ideal for small PA zones like crew compartments or when customers require the best possible system monitoring.

SIP AUDIO COMMUNICATION SERVER (ACS)

Our unified audio server will handle both PA announcement and Passenger Emergency calls from a single software platform and therefore eliminating the need for a separate PA controller.

OUR COMPETITIVE EDGE

EXPERIENCE: Critical Communication end-devices for 70 years.

MATURE SOFTWARE: SIP end-devices for over 10 years.

VOLUMES: 50 000-100 000 SIP-enabled end-devices manufactured annually - within the same software family, following a rigid test regime – for even more demanding markets than rolling stock.

ECONOMY OF SCALE: Rolling Stock Communication is a market with about 10 000 passenger coaches added to installed base annually. Although being a niche market, Vingtor-Stentofon are able to achieve economy of scale when it comes to robust software that is easily integrated in on-board systems.

FINANCIAL STRENGTH: A debt-free company with financial backing to be a partner for large long-term projects.

INNOVATION AND ADAPTATION: We are able and willing to continuously innovate for our customers.
ELIMINATE ONE ENTIRE SUBSYSTEM...

The implementation of SIP-addressable PA loudspeaker loops enables the same software (e.g. IPBX) to handle both Passenger Emergency Intercom / Crew Communication and Public Address (PA), as well as the required Train Radio Integration.

APPLICATIONS

CALL SERVICES

DEVICES

INFRASTRUCTURE

FREEDOM OF CHOICE

SIP has broken the proprietary link between communication subsystem servers and end-devices. It is no longer necessary to use end-devices from the manufacturer of servers or vice versa. This gives the integrator greater freedom of choice, as well as making the end-customer less reliant on specific manufacturers now and in the future.

LESS COMPLEXITY

Onboard communication is all about solving the various communication needs of the end customer. There are numerous call cases that must be supported through integration between the subsystems. For instance, emergency calls from a passenger must arrive at the driver’s radio, with the possibility of it then being forwarded to the Operation & Control Center (OCC) through the Train Radio System. Both the driver and the OCC need to be able to address the onboard PA system.

In another example, if crew members are on board, they need to have the ability to call each other in different parts of the train, as well as communicate with the driver and the OCC. The devices they call from should also be able to address the PA system and so on. Reducing the number of communication subsystems makes it easier to support all the various call cases required. It is also easier to add call cases going forward, as unexpected alterations or add-ons can arise further along in the project.
...BY USING YOUR VOIP TELEPHONY SYSTEM AS PUBLIC ADDRESS

As a result, one entire subsystem can be eliminated, simplifying the system with better integration and providing more functionalities.

COMMON NETWORK INFRASTRUCTURE

Emergency call points and other equipment have already been based on VoIP technology for a long time within the Rolling Stock sector. One of the main advantages is in using the common Ethernet infrastructure. Completely native VoIP PA systems (with complete IP integration to each individual amplifier) has long been lacking in the Rolling Stock industry. The PA system has often required a separate networking architecture, which makes the distribution of amplifiers less convenient and with increased cabling. With VoIP PA, more products can share the same network infrastructure. SIP has long been available for VoIP telephony end-devices. Now SIP is also available for VoIP amplifiers.

LESS APIs

In order to provision, monitor and integrate various systems, integrators need to relate to the API of all subsystems. Telecom subsystems have come a long way in standardizing the API through CTI - Computer Telephony Integration. Relating to less APIs makes integration much simpler, with less potential points of failure. Since SIP has enabled the IPBX to address amplifiers directly, communication with the API of a PA controller is no longer necessary.
This Vingtor-Stentofon amplifier provides two individually SIP-addressable PA channels, each with up to 60W of amplifying power. The two channels and compact form factor enables various configuration and redundancy options regarding zoning within the train.

With Ethernet, the distribution of amplifiers is effortless.
The OEM module features an extremely compact form factor as space is at a premium within Rolling Stock. However, it is stacked with Vingtor-Stentofon technology for various applications related to end-devices. As a result, all the various devices will have the same robust firmware and integration possibilities.

* We can also support with EN50155 compliance OEM kit so that integrator/car manufacturers can use our kit without any additional certification.
OEM-MULTIPLE USES
The same hardware can be used to build various solutions.

SOFTWARE & INTEGRATION
The Integrator can relate to the same firmware for the various solutions.

PA FEATURES
- Manual announcement from the train diver
- Announcements zones management and integration of multiple SIP amplifiers
- Call stacker for live announcements and announcements from rail control center with lower priority
- Master-master mode for easy handling of multi-traction compositions
- Priority handling of on-board and announcement from rail control center
- Text-to-speech engine for multiple languages

EMERGENCY CALL FEATURES
- Call routing of on-board driver intercom terminal and emergency call terminals
- Conference features for discreet listen-in function of multiple listen-in terminals or intercom station
- Monitoring of attached IP amplifiers and intercom terminals run on virtual machine or can be on our hardware supports redundant configuration (primary / secondary node)

NETWORK MONITORING SYSTEM (NMS):
- Internal hardware faults
- Software faults
- Loudspeaker loop faults

AUTOMATIC PROVISIONING:
- Software and configuration files on TFTP Server

MANUAL CONFIGURATION:
- Web server in device
- Vingtor-Stentofon configuration tool

OTHER INTEGRATION:
- HTTP requests
- SNMP or Vingtor-Stentofon API
- I/Os

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