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DATASHEET




1023122061

# ENA2060-DC1

Exigo Network Amplifier with 2 60 W Amplifier Channels 110 V DC

- Compact Ruggedised Enclosure
- Fan-less Design Minimising Maintenance
- 110V DC Power Input
- Rolling Stock Certified to EN45545 and EN50155
- 2 SIP Addressable channels
- High Power 60 W per Channel
- SNMP Support
- Designed according to UIC code 568
- Dual Ethernet Ports for Redundancy

See our Rolling Stock page.

SIP Exigo

## Description

The ENA2060-DC1 Network Amplifier for Rolling Stock incorporates SIP-addressable loudspeaker loops that enable the use of the same software for handling both Passenger Emergency Intercom / Crew Communication and Public Address (PA), as well as the required Train Radio Integration, thus eliminating one entire subsystem from the solution. This results in a well-integrated system with less complexity and more functionality, while the use of open standards offers freedom of choice when it comes to future upgrades and supply.

- Two SIP addressable audio channels – 2x60W
- Supports wide set of IP and networking standards
- Easily integrated into existing information concepts
- 100V speaker line technology – ease of cabling with galvanic separation
- UIC Code 558/568 Compatibility
- Supports direct audio routing to wide range of induction loop amplifiers
- Designed, manufactured and tested according to EN50155
- Designed, manufactured and tested according to EN45545
- Speaker loop monitoring
- Local audio inputs





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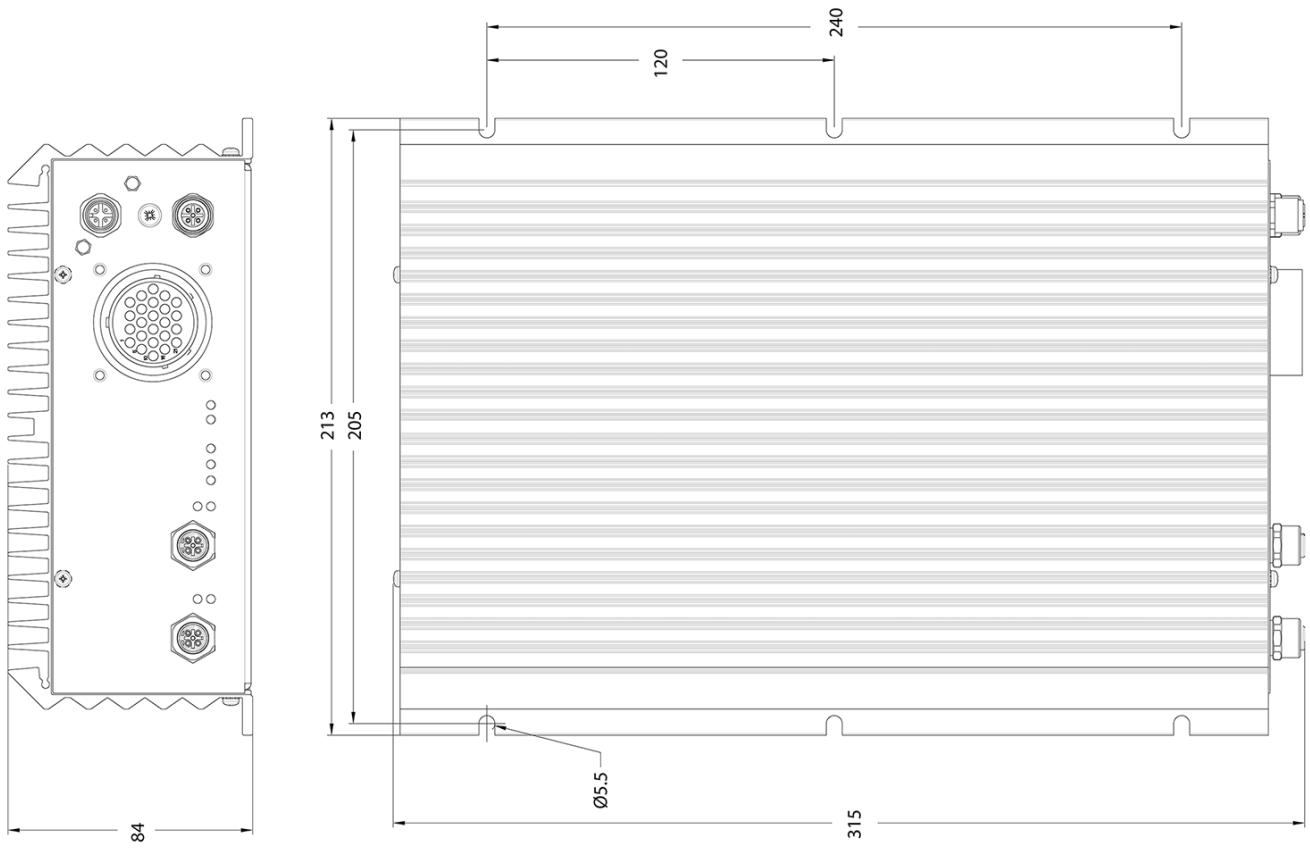
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- Additional I/Os for various integration options
- Fanless design
- Built to last with robust extruded aluminum frame
- Easy to install and commission with minimum maintenance overhead

A modern on-board system normally features an IPBX with SIP capability for emergency call points and their radio integration. The IPBX can be based on proprietary or an open source software architecture that runs on EN50155 approved hardware. Given the usual requirement for on-board PA, the IPBX can easily handle the function of being the PA controller. A complete PA System can thus be provided just through the use of an EN50155 approved SIP amplifier. Eliminating one entire proprietary subsystem not only reduces the total system cost, but also time spent in integration work. Moreover, a clean and robust integration means enhanced passenger safety.

The ENA2060-DC1 Network Amplifier is intended to cover one carriage consisting of two or more PA zones. Examples of such zones can be the left and right side of the carriage, upper and lower deck, or even outside speakers. Redundancy can be achieved by using two amplifiers which ensure that at least 50% of the loudspeakers will still work in case of a failure in one IP PA amplifier (A-B amplifier setup). Hence, public address announcements will still be audible with only a minor drop in sound pressure level.
https://youtu.be/2NIU64wTf8c?si=h_IyTjIesSLiHPmp
Or see our Rolling Stock page.

## Technical Dimensions








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# Specifications

| MECHANICAL | |
|---|---|
| Dimensions (HxWxD) | 84 x 213 x 315 mm |
| Mounting | Flange mounting - 6 pcs M5 bolts |
| Weight | 5.3 kg |

| ENVIROMENTAL | |
|---|---|
| Operating temperature | -40C +70C, EN50155 Class T2 + T3 |
| Operating humidty | Yearly average <75% RH; during 30 consecutive days 95% |
| Air pressure | 70kPa - 106 kPa, according to EN300 019 |
| Ingress protection | IP-42 |

| ELECTRICAL POWER | |
|---|---|
| Connector | M12 A male |
| Power supply interruptions | EN50155 Class S2 |
| Power supply change over | EN50155 Class C1 and C2 |
| Standby power consumption | < 15W |
| Max power consumption | < 170W |





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**AUDIO 100V OUTPUT**

| | |
|---|---|
| Connector | M12 A female |
| Audio output power | Class-D, 60W per channel, 2 channels |
| Frequency response | Hardware: 200Hz - 19kHz |
| Audio codec | G.722 (200Hz - 7kHz) |
| THD | < 0.4% |
| SNR | 70 dB |
| Protection | Self protecting during overload or shorts with temporary shutdown according to EN50121-3-2 |
| Monitoring | Line impedance measurements @21kHz |
| | Detects: Short circuit between phases and ground faults |
| | Control: Digitally controlled |

**MULTICONNECTOR**

| | |
|---|---|
| Connector | Circular 24pos connector, TE 1-796387 |
| | Contains signals desribed below |

**AUDIO 0DBV LINE OUTPUT**

| | |
|---|---|
| Audio channel | Parallel output of each 100V channels |
| Gain | -40 dB +2dB |
| Impedance | 600 Ohm |
| Levels | 0 dBV (1Vrms) |
| Frequency response | Hardware: 200 Hz - 19kHz |
| Audio codec | G.722 (200Hz - 7kHz) |



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**AUDIO INPUTS**

| | |
|---|---|
| Microphone input: | Electret microphone suitable for 2V bias |
| Input impedance | 1 kOhm |
| Frequency response | Hardware: 200 - 19kHz |
| Audio codec | G.722 (200Hz - 7kHz) |
| THD | 0.4 % |
| SNR | 70dB |

**NETWORK AND PROTOCOLS**

| | |
|---|---|
| Connector | M12 D female x 2 |
| Ethernet | 2 x 10BASE-T, 100BASE-X, Auto negotiation, Audio MDIX |
| LAN protocols | IPv4 (with DiffServ), TCP, UDP, HTTPS, TFTP, RTP, DHCP, SNMP, STENTOFON CCoIP® , NTP |
| SIP | RFC 32612 (SIP base standard), RFC 3515 (SIP refer), RFC 2976 (SIP Info) |
| DTMF | RFC 2833, RFC 2976 (SIP Info) |
| Management | HTTP/HTTPS (web configuration) |
| | SNMPv1, SNMPv2c |

**GENERAL INPUTS AND OUTPUTS**

| | |
|---|---|
| 2 x GPI | Configurable |
| 2 x 24Vdc Control outputs | 200 mA per output |
| | Short circuit protection according to EN50121-3-2 |



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**UIC**

| | |
|---|---|
| Designed according to UIC code 568 | |
| UIC Audio input | 2 Vrms |
| | 200 Hz - 19 kHz bandwidth |
| | Input impedance 10kOhm |
| UIC priority, UIC on/off | Current loop 24Vdc/10mA |
| | Galvanically isolated |

**INDICATORS**

| | |
|---|---|
| Power indicator | Green LED |
| Fault indicator | Yellow LED |
| Status indicator | Green LED |
| Audio indicators - one per channel | Blue LED |

**CERTIFICATIONS**

| | |
|---|---|
| EN50155 – S2 | Railway applications – Electronic equipment used on rolling stock – Voltage variations |
| EN50155 – T2 + T3 | Railway applications – Electronic equipment used on rolling stock – Temperature requirements |
| EN50155 – C1 + C2 | Railway applications – Electronic equipment used on rolling stock – Supply changeover |
| EN50121-3 | Railway Applications – Electromagnetic compatibility Part 3-1: Rolling stock – Train and complete vehicle |
| IEC/EN 61373 Category 1, Class B | Railway applications – Rolling stock equipment – Shock and vibration tests |
| EN45545 | Railway applications. Fire protection on railway vehicles |
| EN/AS 60849 | Requirements related to speech intelligibility |
| ROHS | 2011/65/EU (ROHS) + 1907/2006EU (REACH) |





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**OPERATIONAL**

| | |
|---|---|
| MTBF | 161000 hous |
| MTTR | 10 minutes |

**LINE INPUT**

| | |
|---|---|
| Input levels | 1 Vrms |
| Input impedance | 10 kOhm |
| Frequency response | Hardware: 200 - 19kHz |
| Audio codec | G.722 (200Hz - 7kHz) |
| THD | 0.4% |
| SNR | 70 dB |

## Used With



TCIS-2 | Audio Intercom

IP and SIP Intercom

Item Number: 1008111020




TCIS-5 | Audio Intercom

IP and SIP Intercom

Item Number: 1008111050



ELSIR-10C

Network Ceiling Speaker, 10W, Ethernet

Item Number: 1023300010





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