Univox® CLS-3T

Vehical Loop Driver

User manual

Univox CLS-3T, part no 212003

univox

Introduction

Dear Customer,

We would like to take this opportunity to say thank you for choosing Univox and for your support in our ongoing mission to bring affordable, high-quality products to market, something we've been doing since 1965. We hope that this system will serve you well for many years to come.

As part of Univox's long-term goals, we continuously strive to innovate new products and improve existing ones.
We always keep you, the customer and end-user, in mind when designing new products, and we work tirelessly for accessibility and equality. Everyone should hear everything!

To get in contact with your local distributor, please visit univox.eu. If you'd rather get in touch with us directly, you can do so at:

Phone: **+46 8 767 18 18**
Email: **support@edin.se**

Thank you, and enjoy the experience of perfect audio!

Sincerely,

Mattias Arrhenius, Managing Director, and the team at Univox

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Introduction

A Hearing Loop System, transmits the audio signal directly and wirelessly to a hearing instrument thereby increasing speech intelligibility primarily with an enhanced Signal-to- Noise ratio (S/N) compared to a PA system. Each hearing aid is configured with custom frequency response and dynamic range adapted for the user's hearing impairment.

Univox® CLS-3T Hearing Loop Driver

CLS-3T is a high-power loop amplifier, operating on 12-24 VDC, compliant with automotive regulation ECE R10 and EN50155 railway industry standard for electronic equipment on rolling stock. Being compact and powerful with its rugged chassis makes it ideal for installation in smaller areas such as in buses, trains, or any vehicle where a high current metal compensation is required.

The audio chain incorporates features such as an Enhanced Speech filter, Metal Loss Correction to fine-tune for the effects of metal loss, as well as the unique Dual Action AGC (Automatic Gain Control) which serves as auto-level input control and limiter.

Correctly installed, CLS-3T is designed to comply with IEC 60118-4.

Information

1. This manual is only valid for Univox® CLS-3T, referred to as "unit".

2. This manual shall always be available on-site.

3. Do not connect CLS-3T to other devices without full information and/or understanding of the function and interface of all devices and/or the system as a whole.

4. For proper function a loop load must be connected to the unit. Do not change the factory default in- and output settings without consulting Univox.

5. Do not open the unit unless authorized by Univox.

6. For correct function the unit needs to be properly grounded GND according to instructions in this manual.

7. Do not install the unit close to any heat sources and ensure free airflow

8. Disconnect the power supply before any maintenance.

9. Do not make any modifications whatsoever to the unit.

10. All service and maintenance work must be performed by qualified personnel only.

11. Never expose the unit to any liquid or moisture of any kind.

12. Loop field strength varies depending on the loop wire location and surrounding metal.

13. Do not install loop wires close to any inductive pickup systems without fully understanding the magnetic field distribution from the loop.

14. Speech Transfer Index, STI is not defined in the IEC 60118-4 standard. A full system includes the hearing aid adjusted for the user's hearing loss, meaning different STI-index for every individual hearing instrument.

15. Avoid using a speaker as a signal source, as being acoustically compensated for speakers not giving a correct frequency response.

Main features

Reliability – Specifically designed for vehicles with a focus on long-term use with mechanical, thermal and electrical ruggedness as well as EMC/EMI-protection.

Power – High output current for installation in modern light aluminum vehicles with extensively higher magnetic field absorption compared to iron-based vehicles.

Tamper proof – All setting controls and LED indicators are well protected inside the unit's shielded case.

Plug & Play – The unit is delivered pre-adjusted, insuring reproducible functions and performance on all installations. These settings must not be changed without a technical consultation with Univox.

Input variation – Enabled automatically by wide range AGC for constant output.

Output control – Automatic frequency and impedance control for high efficiency.

Enhancements – Presence voice filter + Metal Loss Compensation (MLC) internal.

Certification and standards – CLS-3T is certified and fully compliant with EN50155 for railway applications and automotive regulation ECE R10. As there is no switching, there is **no radiation noise from the unit**.

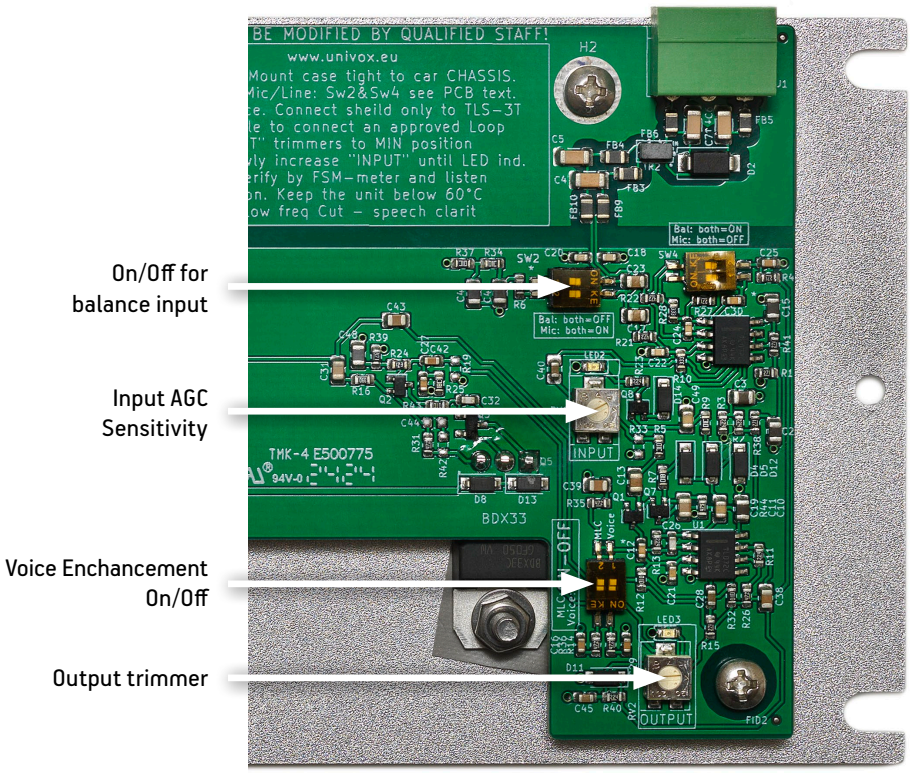
Connections overview

	Phoenix Terminal	Function	Data	Note
1. INPUT	Audio in +/-	Balanced	8 mV-7 Vrms	Internal adjustable
Input LED		Signal input		Internal
	⏚	⏚	⏚	Connected to CHASSIS
2. OUTPUT	Loop	Loop output	3-5 Arms	Floating
Output LED		Loop output		Internal
3. POWER	+/-	Power supply	12-24 V / <3 A	Fuse 4 A (slow)
Power LED				Internal
	⏚	⏚	⏚	Connected to CHASSIS

1. INPUT – Input signal
- Isolated differential/balanced input
- Overvoltage protection
- Separate chassis connection to the car
- Functional input range 3.5 mVrms to >20 Vpp@24 VDC

2. OUTPUT – Loop load connection
- Output current: Approx 1-4 Arms rms (load and power supply voltage dependent)
- Max output voltage: 21 Vpp@24 VDC, 9 Vpp@12 VDC, load dependent
- Level control: Preset potentiometer with internal LED indicator

3. POWER – Power supply
- VDC: 12-24 VDC
- Current:
  - Quiescent (idle) <20 mA
  - Slow average 2-4 A
  - Fuse C-Curve (slow)
  - Load dependent
- Protection:
  - Reversed Polarity
  - Overvoltage
  - Differential LC-filter, chassis and signal ground
  - Common Mode Transformer
  - Internal resettable fuse



System planning

Loop planning and installation in environments with high damping effects, particularly in small metal enclosures-like cars, differs from standard loop installations. Please contact Univox for guidance and detailed discussion regarding initial planning, protocol, and tuning of the first trial installation (technical and practical aspects regarding interface, loop wire figuration, and placement).

Wiring planning

Avoid installing the loop wire close and in parallel to analogue cables or any inductive pickup systems should be followed. Use standard audio practice and for an initial test setup, a junction box for easy and flexible loop configuration is recommended.

- Signal input cable – Balanced shielded screen wire. Connect signal to + and - at the three-pin input terminal (1). Connect the shield to the mid-connector (). Do NOT attach the shield elsewhere to avoid ground loops and interference issues.
- Power cable – Verify it can safely handle the max peak current of approximately.
- 2-3 ADC. A separate fuse 3 A, curve C on the positive branch is recommended, but its value depends on the actual loop load installation and should be verified.
- The installation – Should always be verified in for correct practical function. Please contact Univox for guidance and consultation.

Power connection

The unit can be connected directly to a 12-24 VDC power supply via a separate fuse. DC/ DC converter can be used to isolate the unit from the negative power supply and ground, allowing almost any other system voltage levels. Please contact Univox for further information. Standby current is within <50 mA range.

Separate external fuse is recommended for all installation protecting any faulty wire connections like loose or damaged isolation for power cables. Fuse values are typically between 2-3 A slow, but must always be verified on-site as it is dependent on the actual installation.

Input connection

Isolated differential low-ohmic at 0 dBu, 775 mVrms for high immunity. Avoid long parallel sections or any noisy signal cabling close to the loop wire.

Output connection

Loop figuration and wire coupling are vital for transmission and impedance matching. Long analogue wires in parallel with the loop wires should be avoided. It is highly recommended to verify system setup even for an experienced installer. Contact Univox for detailed information and planning. Basically no adjustments are required after the initial setup.

Amplifier settings

The default setting for CLS-3T is based on the Univox-specified loop load together with the initial test setup. Internal adjustments are possible but must be guided by Univox.

Measurement and test equipment

- Multimeter – Loop wire resistance measurements.
- LCR meter – Inductance measurements.
- Oscilloscope – Oscilloscope (normally not required) with current clamp.
- Univox Listener – Detecting peak values for speech.
- Field Strength Meter – Field distribution/variation for sinusoidal signal tests.

Troubleshooting

If the unit is not working as intended:

- Verify function with Univox® Listener.
- Check the loop system separately with a separate isolated signal source. If the loop system works without issues, double-check the connections and wirings. Avoid any feedback issues using normal audio practice.
- Check that the loop is not connected to chassis.
- Check that the loop is not an open circuit, short circuit or connected to chassis.

Standards

Univox® CLS-3T complies with following international standards:

- EN50155:2021 – Railway applications – Electronic equipment used on rolling stock
  - EMC and immunity tests
  - EN61373:2010 Shock and vibration
  - EN600068 Environmental testing
  - IEC 60695-2-11 Fire hazard testing
- ECE R10 is defining Electromagnetic Compatibility requirements of the vehicles and electronic sub-assemblies (ESAs) used in the automotive industry

Safety

The equipment should be installed by an audio visual technician observing 'good electrical and audio practice' at all times and following all the instructions within this document.

The installer is responsible for installing the product in a way that may not cause risk of fire, electrical malfunctions or danger for the user. Do not cover the loop driver. Only operate the unit in a well ventilated, dry environment.

Do not remove the cover without consulting Univox. There are no user serviceable parts inside. Refer servicing to qualified personnel. Please observe that the product warranty does not include faults caused by tampering with the product, carelessness, incorrect connection/mounting or maintenance.

Bo Edin AB shall not be held responsible or liable for interference to radio or TV equipment, and/or to any direct, incidental or consequential damages or losses to any person or entity, if the equipment has been installed by unqualified personnel and/or if installation instructions stated in the product Installation Guide have not been strictly followed.

Warranty

This loop driver is supplied with a 5-year warranty. Misuse of the product in any way including but not limited to:

- Incorrect installation
- Connection to non-approved power adapter
- Self oscillation resulting from feedback
- Force majeure e.g. lightning strike
- Ingress of liquid
- Mechanical impact will invalidate the warranty

Maintenance and care

Under normal circumstances the product does not need any special maintenance. Should the unit become dirty, wipe it with a clean damp cloth. Do not use any solvents or detergents.

Service

Should the system not work as expected, please contact us at ***support@edin.se***. Before returning a product to us for service you will need a **Service Number** from your distributor. They will also send you a **Service Report Form** which must be completed and returned with the product.

Technical data

For additional information, please refer to product data sheet and CE certificate which can be downloaded from ***www.univox.eu/products***. If required, other technical documents can be ordered from ***support@edin.se***.

Environment

To prevent possible harm to the environment and human health, please dispose of the product responsibly by following statutory disposal regulations.

Technical specifications

POWER SUPPLY	12-24 VDC	
	Power consumption	Low inrush current. Quiescent<50 mA, Speech 1-2.5 Arms
	External fuse	4 A, Slow
INPUT	Isolated differential input	
	Range	10 mV-7 Vrms@24 VDC
OUTPUT	Current	>5 Arms@125 ms RMS 1 kHz
	Functional range	1-10 Ohm impedance
	Max voltage	20 Vpp@24 VDC, 10 Vpp@12 VDC
FREQUENCY RANGE		100-6000 Hz
LOAD		1-10 Ohm
DUAL ACTION AGC	Dynamic range	>50-70 dB (+1.5 dB)
LED INDICATORS	Power	
	Output	
DISTORTION		<1%
IP CLASS		IP54
ENVIRONMENT	Temp range	-75 to 105°C
SIZE	L x W x H	150 x 90 x 25 mm
WEIGHT (NET)		320 g
PART NO		212003

This product is designed to meet the system requirements of IEC60118-4, when correctly designed, installed, commissioned and maintained. Specification data complied according to IEC62489-1.

Images


CLS-3T
Input
+ - -
Loop 12-24 VDC
- +
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BY EDIN


CLS-3T
Input
+ - -
Loop 12-24 VDC
- +
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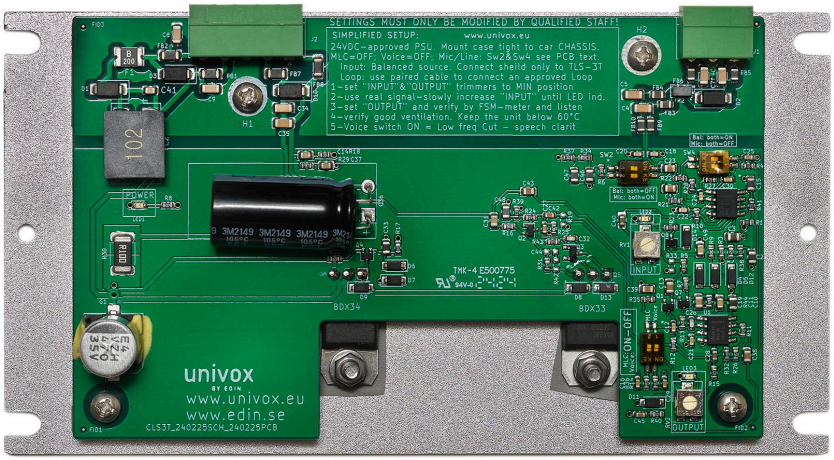
SETTINGS MUST ONLY BE MODIFIED BY QUALIFIED STAFF!
SIMPLIFIED SETUP: www.univox.eu
24VDC-approved PSU. Mount case tight to car CHASSIS.
MIC=OFF. Voice=OFF. Mic/Line: Sw2&Sw4 see PCB text.
Input: Balanced source. Connect shield only to TLS-3T
Loop: use paired cable to connect an approved Loop
1-set "INPUT"&"OUTPUT" trimmers to MIN position
2-use real signal-slowly increase "INPUT" until LED ind.
3-set "OUTPUT" and verify by FSM-meter and listen
4-verify good ventilation. Keep the unit below 60°C
5-Voice switch ON = Low freq Cut - speech clarit
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Notes

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