

# **Tn6** Road Tunnel FM Radio Re-Broadcast system



TL1-6T 10mW FM translator module incorporating 6 separate FM translators with 6 way splitter and combiner with break-in audio facility



LA-100LD-25 25W linear amplifier in 4U module, Class A 87.5-108MHz



LA-100LD-100 100W linear amplifier in 5U module, Class A 87.5-108MHz



LA2-100 MK3 25W linear amplifier in 5U module, Class A 87.5-108MHz, packaged for in-tunnel use



LA-25LD 12W linear amplifier module, Class A 87.5-108MHz

The Tn6 System provides a flexible and cost effective solution for re-broadcasting VHF FM radio channels into Road or Rail tunnels. The heart of the Tn6 system is the TL1-6T, six channel, VHF FM Translator module. with "On frequency" capability.

The TL1-6T, six channel VHF FM Translator module, incorporates a six way RF input splitter, six separate VHF FM translator modules and a 6 way RF output combiner all conveniently packaged in a 1U rack mount case. The unit has a single RF input and a single RF output (BNC's). A (BNC) balanced audio input is provided for the Break-in audio facility (BIF) functio, distributed to all channels simultaneously via an external contact command.

The TL1-6T or multiples thereof, provide the drive to a wideband VHF FM linear amplifier driving "leaky feeder" coaxial cables that allows multi-channel transmission into Road or Rail tunnels. If more than six channels are required, additional TL1-6T modules can be used with external splitters and combiners to increase the number of channels required.

Linear amplifiers in the range includes; 8W (RMS), 25W (RMS), 50W (RMS) or 100W (RMS)..

See back page for examples of system configuration utilizing combinations of the Tn6 modules.

Other related equipment that can be offered for designing a tunnel Re-broadcast system:

- In-tunnel signal quality monitoring with remote reporting.
- Remote monitoring and equipment status reporting.
- Wide band RF to Fibre optic modulator/demodulator for distribution to "intunnel" amplifiers.
- Multi-channel filters for coupling GSM, TETRA and UHF Radio into the radiating cable.

#### Linear RF Amplifier Range:

LA-25LD 12W Linear amplifier 2U module, single LDMOS device LA-100LD-25 25W Linear amplifier 4U module, 2x LDMOS device, 200VA PSU LA-100LD-50 50W Linear amplifier 5U module, 2x LDMOS device, 450VA PSU LA-100LD-100 100W Linear amplifier 5U module, 4x LDMOS device, 680VA PSU

## **Features**

Single or multiple tunnel outputs

Audio break-in facility (BIF) switched to all channels

**Receive/Transmit "on frequency" capability** 

100 kHz base-band to re-broadcast RDS & SCA sub-carriers

#### **TL1-6T TRANSLATOR SPECIFICATIONS (6 channels)**

 $\leq$  -60dBc

≤ 0.25%

87.5MHz to 108 MHz (F3E/F8E)

50 kHz (via DIL switches) +/- 75 kHz peak

-3dBm to -15dBm per channel (adjustable)

Tx (modulator) and Rx (local oscillator)

BNC (female) 50 Ohm (unbalanced)

BNC (female) 50 Ohm (unbalanced)

BNC (female) 40k ohms (balanced)

10dBm maximum (adjustable)

30Hz to 8 kHz pre-emphasised

-60dBm to -20dBm (per channel)

Dual SMPS +15V @ 1 Amp each

110V to 230V full range 50/60Hz

Compliant with CISPR 22 class B

≥ 65dB (50uS de-emphasis)

 $\leq 0.5\%$  (40Hz to 15 kHz)

 $\geq$  45dB (40Hz to 15 kHz)

Over-Temp/voltage/current

25VA nominal

Frequency range RF output power Harmonics and Intermods **Dual Synthesizers** Frequency increments Frequency deviation RF input connector RF output connector BIF Audio input BIF connector BIF frequency response BIF audio distortion Operating RF input level Stereo S/N ratio Stereo Distortion Stereo separation

POWER SUPPLY Туре Protection AC power input EMC rating Mains consumption

BIF command

PHYSICAL / ENVIRONMENTAL / TELEMETRY Operating temperature Dimensions (mm) Weight Summary alarm

-5°C to +45°C <90% Humidity 485W x 420D x 44H (1U) 3kg (approximately) Voltage free, with s/c or o/c contact s/c to ground to enable BIF

#### LINEAR VHF RF POWER AMPLIFIER SPEC'S (100W, 50W, 25W versions & 12W version)

	10014/ 0014
RF SPECIFICATIONS	100W, 50W
Operational bandwidth	87.5MHz to
RF Output power	≥100W, 5
3 <sup>rd</sup> order Intermodulation	≤ -50dBc (
3 <sup>rd</sup> order Intermodulation	≤ -50dBc (
3 <sup>rd</sup> order Intermodulation	≤ -50dBc (
Harmonics	≤ -60dBc
Input/Output Return loss	≥ 25dB

N, 25W & 12W versions to 108MHz 50W, 25W / 12W (RMS) (12 x 2W) 25W version only (12 x 1W) 25W version only (6 x 1W) 12W version only

485W x 412D x 176H (4U) mm

485W x 412D x 220H (5U) mm

485W x 412D x 222H (5U) mm

485W x 20D x 88H (2U) mm

#### PHYSICAL / ENVIRONMENTAL / PSU / TELEMETRY

Dimensions (LA2-100 MKII -25 485W x 320D x 222H (5U) mm Dimensions (LA-100LD-25) Dimensions (LA-100LD-50) Dimensions (LA-100LD-100) Dimensions (LA-25LD)

#### Weight Operating temperature A/C Mains consumption

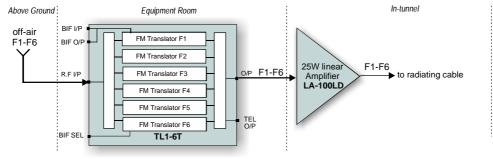
Summary alarm

Alarms/voltages monitored Telemetry RF Enable

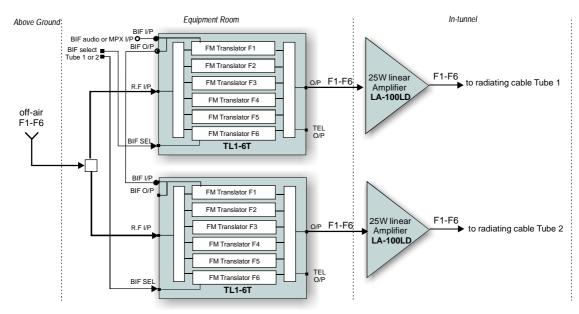
18kg (50-100W), 16kg (25W) & 5kg (8W) -5°C to +45°C <90% Humidity 480VA (100W), 240VA (50W), 145VA (25W) & 85VA (12W) Voltage free, with s/c or o/c contact Low current, Fwd, Refl and Temp' s/c contact to disable RF

#### **HIGHER POWER RF AMPLIFIERS**

LA-100LD-50 50W linear RF amplifier (2 Stage LDMOS, 240VA PSU) LA-100LD-100 100W linear RF Amplifier (4 Stage LDMOS, 480VA PSU)



### 6 x FM channels into 1 tube



Basic 6 x FM channels into 2 tubes with individual BIF control