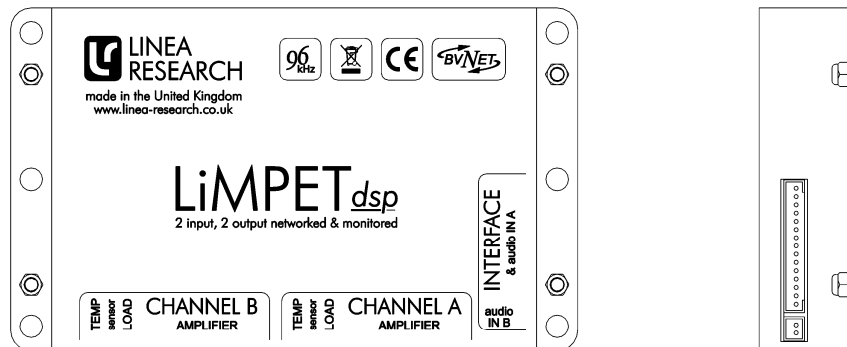


General

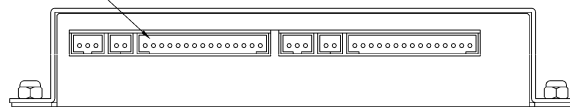
This datasheet presents the connection details required to integrate the Linea Research Limpet DSP with non-Linea Research amplifiers and input cards. For a description of Limpet's capabilities and applications please see the Limpet user documents DE1657 & DE1730. Linea produce a number of standard accessories for Limpet and are always happy to answer any questions. We can be contacted via www.linea-research.co.uk.

Mechanical Installation

Limpet should be mounted securely, away from extreme sources of heat. Linea Research are pleased to offer advice on optimal mounting positions and methods.



2mm 'PH' CONNECTORS



Connectors

There are eight multi-way connectors on Limpet. These connect the device to up to two amplifiers, up to two audio inputs, temperature sensors, load current monitors and a user interface. All the connectors are of the readily available, multi-sourced 2mm pitch JST 'PH' cable mounting housing type.

CHANNEL A amplifier

This is the connection to a single or dual channel power amplifier.

PIN	NAME	FUNCTION
1	DGND	Digital / dirty ground. Limpet will send noisy digital return currents down this pin.
2	AGND	Analog / audio ground. Limpet produces audio signals relative to this pin.
3	Audio A-	Impedance balanced return from DSP audio channel A, should be connected to a balanced input -ve or 'cold' terminal.
4	Audio A+	Impedance balanced send from DSP audio channel A, should be connected to a balanced input +ve or 'hot' terminal. The maximum output level is +5.5dBu.
5	Audio A	Unbalanced audio from DSP channel A. The maximum output level is +5.5dBu.
6	N/C	No connection
7	Audio B-	Impedance balanced return for DSP audio channel A, should be connected to a balanced input -ve or 'cold' terminal
8	Audio B+	Impedance balanced send for DSP audio channel A, should be connected to a balanced input +ve or 'hot' terminal

9	-PSU	-12V to -15V regulated, clean DC supply pin. The current is the same for both DSPmini and DSP.net versions of Limpet being 50mA. This pin is 'diode ored' with pin 9 of the channel B connector.
10	+PSU	+12V to +15V regulated, clean DC supply pin. The current required depends on the DSP board fitted inside Limpet. 200mA for DSPmini or 250mA for DSP.net. This pin is 'diode ored' with pin 10 of the channel B connector.
11	N/C	No connection
12	N/C	No connection
13	LIMIT- (input)	If this pin is taken at least 6V <i>negative</i> with respect to DGND, Limpet will indicate that the amplifier is in limit. In the case of the DSP.net version, the PC will show channel A limit.
14	PROT (input)	If this pin is taken at least 4V <i>positive</i> with respect to DGND, Limpet will indicate that the amplifier is in protect. In the case of the DSP.net version, the PC will also show this. Note that the PC will indicate PROTECT if either amplifier operates this line.
15	FITTED	This pin should be taken at least 4V <i>positive</i> with respect to DGND to indicate to Limpet that an amplifier is connected to this connector.

CHANNEL B amplifier

This is the connection to a channel power amplifier that will be driven with DSP channel B audio.

PIN	NAME	FUNCTION
1	DGND	Digital / dirty ground. Limpet will send noisy digital return currents down this pin.
2	AGND	Analog / audio ground. Limpet produces audio signals relative to this pin.
3	Audio B-	Impedance balanced return from DSP audio channel B, should be connected to a balanced input -ve or 'cold' terminal.
4	Audio B+	Impedance balanced send from DSP audio channel B, should be connected to a balanced input +ve or 'hot' terminal. The maximum output level is +5.5dBu.
5	Audio B	Unbalanced audio from DSP channel B. The maximum output level is +5.5dBu.
6	N/C	No connection
7	N/C	No connection
8	N/C	No connection
9	-PSU	-12V to -15V regulated, clean DC supply pin. The current is the same for both DSPmini and DSP.net versions of Limpet being 50mA. This pin is 'diode ored' with pin 9 of the channel A connector.
10	+PSU	+12V to +15V regulated, clean DC supply pin. The current required depends on the DSP board fitted inside Limpet. 200mA for DSPmini or 250mA for DSP.net. This pin is 'diode ored' with pin 10 of the channel A connector.
11	N/C	No connection
12	N/C	No connection
13	LIMIT- (input)	If this pin is taken at least 6V <i>negative</i> with respect to DGND, Limpet will indicate that the amplifier is in limit. In the case of the DSP.net version, the PC will show channel B limit.
14	PROT (input)	If this pin is taken at least 4V <i>positive</i> with respect to DGND, Limpet will indicate that the amplifier is in protect. In the case of the DSP.net version, the PC will also show this. Note that the PC will indicate PROTECT if either amplifier operates this line.
15	FITTED	This pin should be taken at least 4V <i>positive</i> with respect to DGND to indicate to Limpet that an amplifier is connected to this connector.

INTERFACE & audio input A

This is the connection to the user control panel. Linea produce some ready made options that can directly interface with this connector and conveniently provide commonly required functionality.

PIN	NAME	FUNCTION
1	DGND	Digital / data ground. Connects to the Limpet DGND system, used for non-audio returns.
2	ONLED	Power for an 'ON' LED. Connected to the Limpet +PSU rail via a 1k0 resistor.
3	LED 0	These pins will be driven to +5V via a 220 Ohm resistor when the DSP activates them.
4	LED 1	These pins have different functions depending on the type and configuration of the DSP.
5	N/C	No connection
6	+PSU	Interface electronics supply. Connects directly to the Limpet +PSU rail.
7	+5V6	Interface electronics supply. Connects directly to the Limpet +5V6 PSU rail.
8	SW 0	This pin has different functions depending on the type and configuration of the DSP.
9	SW 1/out	This pin has different functions depending on the type and configuration of the DSP.

10	Audio A+	Non-inverting or 'hot' audio input. Fed to the DSP channel A input. (+10dBu max for DSP.net, +5.5dBu max for DSPmini)
11	Audio A-	Inverting or 'cold' audio input/ Fed to the DSP channel A input. (+10dBu max for DSP.net, +5.5dBu max for DSPmini)
12	N/C	No connection
13	BvNet+	Idle high differential communications data. Must go directly to RJ45 pin 1 (white/ orange)
14	BvNet-	Idle low differential communications data. Must go directly to RJ45 pin 2 (orange)
15	AGND	Analog / audio ground. Limpet receives audio signals relative to this pin.

CHANNEL B audio input

This is available on a 2 way connector situated next to the 'interface' connector.

PIN	NAME	FUNCTION
1	Audio B+	Non-inverting or 'hot' audio input. Fed to the DSP channel A input. (+10dBu max for DSP.net, +5.5dBu max for DSPmini)
2	Audio B-	Inverting or 'cold' audio input/ Fed to the DSP channel A input. (+10dBu max for DSP.net, +5.5dBu max for DSPmini)

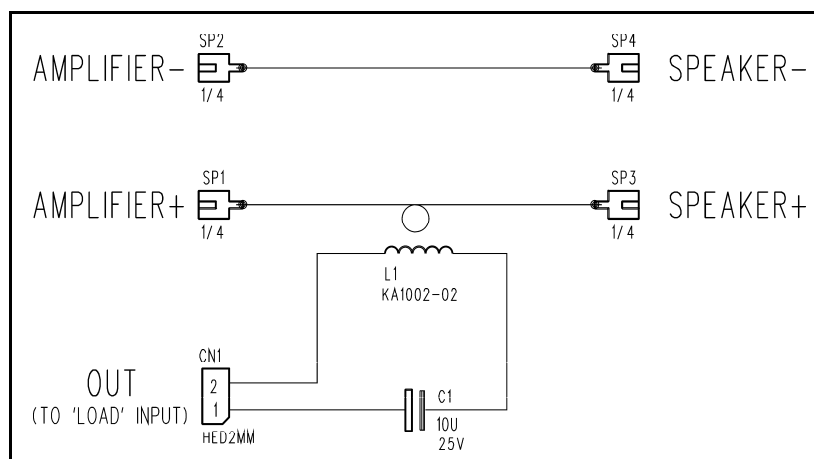
TEMPerature sensors

These inputs are designed to connect directly to the National Semiconductor LM35 range of temperature sensors. Note that these sensors are available in both TO-92 and TO-220 packages, either being suitable for use with Limpet. Beware however that the two types have different pinouts. Linea can supply ready made assemblies if required.

PIN	NAME	FUNCTION
1	V+	Connects directly to the LM35 V+ pin
2	Vout	Connects directly to the LM35 Vout pin
3	GND	Connects directly to the LM35 ground pin

LOAD sensor

When used with a DSP.net family DSP board, Limpet can perform load impedance monitoring (please see the DSP.net datasheet DE1720). Current sensing is performed using a dedicated current sense transformer for each channel. This transformer provides isolation between the amplifier output and the Limpet which means that Limpet can be easily interfaced to both ground referenced and bridge tied loads.



The above circuit is required to interface the amplifier output to the Limpet current sense input. Linea can supply this on a small ready assembled PCB (part number PC1045) ready to be screwed inside an OEM speaker. The 'OUT' connector of this assembly should be connected to the 'load' input on Limpet.

Linea can supply the individual components should the OEM wish to incorporate the current monitoring as part of a passive crossover board.