

Loop Condition Monitoring Option for ILD9

Use this brochure in conjunction with the ILD9 handbook. The information in this brochure supersedes the ILD9 handbook where any conflict arises. N.B. The slave in/out connector differs from standard; see paragraph 2.1.

1. INTRODUCTION

The ILD9 loop monitoring option provides an isolated status output to external monitoring systems. This indicates a fault when the loop becomes higher or lower resistance than normal, and also indicates a fault if there is an internal error such as excessive output DC level or overload. In the event of power failure, the monitor defaults to the fault condition output. The fault monitor is capable of being used in multiple amplifier installations, with both phased array and combined output loop systems.

The monitor outputs a low-level 18.9Hz signal through the loop and detects the signals on the amplifier loop terminals to determine the loop condition. This signal is inaudible but allows detection of loop condition through transformers and other components which do not pass DC current.

A fault condition is indicated by opening of an isolated relay contact and flashing of the amplifier power LED. When internal faults occur, the power LED flashes at a faster rate.

Warranty Information

This product carries a 5 year parts and labour warranty which could be invalidated if these instructions are not followed correctly, or if the unit is tampered with in any way.

The 5 year warranty is dated from the time the equipment leaves Ampetronic and NOT when it is installed.

2. CONTROLS AND CONNECTIONS

2.1 Back Panel Items

With a monitoring option fitted, the ILD9 has additional controls and connections on the back panel, illustrated below (fig. 1)..

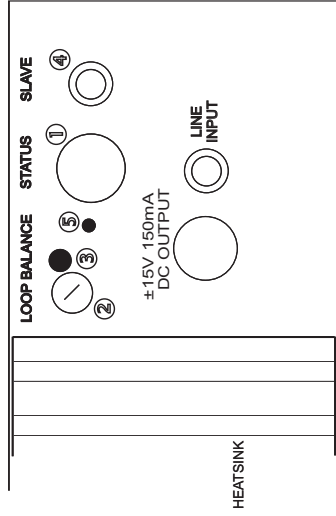


Fig.1

① Status Output and Sync Bus.

This is a 5 pin 240 DIN socket, with mating plug supplied. See fig. 1

Pin 1,2: Status Out. This is a relay contact, electrically isolated from the ILD9 internal circuits and chassis. The contacts are normally open, becoming closed only when the amplifier is switched on and no fault condition is detected. See 2.2(b) for multiple amplifier connection.

Pin 5: Sync Bus. When multiple amplifiers are connected together, the 18.9Hz oscillators must be synchronised for fault detection to operate correctly. In a multiple amplifier installation, the sync terminals of all amplifiers must be connected together. See item 2.2(b) for full information.

Pin 3,4: Ground. The amplifier signal ground is available at these contacts. Important: This pin should only be connected where there is no other ground connection between multiple amplifiers. Do not connect this terminal unless instructed to do so by Ampetronic Ltd.

② Loop Balance Control

This is used to trim the fault detector to match the actual loop impedance. Use a screwdriver to adjust the control. See 3.1 for instructions about the adjustment process.

5. SPECIFICATIONS (LOOP MONITOR)

Monitor Oscillator Frequency:	18.91Hz
Monitor Signal Output Level:	-30dB ref. 9.6 A (peak), or $\gg 0.30$ A (peak)
Amplifier Quiescent Power:	8W typical
Loop Impedance Set Point:	0.2 Ω - 3.5 Ω
Limits before fault indicated:	
Loop Impedance Variation:	$\pm 20\%$ typical relative to actual set point.
DC Error:	± 0.7 V
Compression Level:	30dB above threshold for >1 second.

4. FAULT INDICATIONS AND ACTIONS

The matrix below shows possible problems for different indications. The list is not exhaustive as unusual faults can occur in loop systems, although most of these are rare. Also note that a fault in one amplifier can cause all amplifiers connected to the same loop to indicate a fault.

Back Panel Null LED ⑤	Front Panel Power LED Indication	Indicated Condition or Possible Fault	Action
Off	On, Steady	Loop and Amplifier OK	-----
On	Slow Flash	Loop fault or fault in another amplifier in the installation	Check Loop and other amplifiers
On/Off	Fast Flash	Amplifier fault detected	If failed remove for repair
Off	Off	Amplifier failed or not switched on.	

If an amplifier is removed from a multiple installation with series 'status out' wiring, the 'status out' loop can be restored by fitting a jumper socket with a link between pins 1&2 to the 5-pin DIN plug. Note that whenever an amplifier is removed from a combined system, the loop balance will be affected on all amplifiers combined together.

Any failed amplifier should be returned to Ampetronic Ltd for repair. Field repairs without the authorisation of Ampetronic Ltd may invalidate the warranty.

③ Loop Null Button Press this button when setting the loop balance control. The detection window is narrower when this button is pressed, allowing accurate setup of the loop balance. See 3.1 for use.

④ Slave In/Out The insertion of a 6.3mm 3-pole jack breaks the link between the input stage / compressor and the power driver. The tip is the pre-amp output (after compression) and the ring connection is the input to the power amplifier (see below). This connector is mainly used for the connection of the special signal processor (SP5) used in low-spillover loop installations and in combined amplifier systems. The master unit controls the signal gain, and the slave unit operates purely as a power driver. This is essential to ensure full tracking between amplifiers. **Under no circumstances should this input be used as a normal input**, as this would bypass the automatic compression circuit. This compression is essential to the correct operation of other circuits which prevent RFI generation. Cable length must be less than 3 metres.

⑤ Loop Error LED When lit, the loop monitor is not balanced or a fault is detected. See 3.1.

2.2 Connection of amplifiers.

(a) Single Amplifier. In this configuration, only the monitor terminals are connected, as in fig. 2.

A monitoring loop of up to 28VDC/120VAC, 0.5A may be connected to the monitor terminals. Do not connect any wires to the sync bus

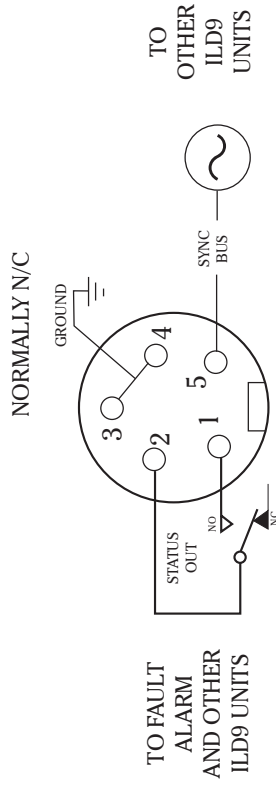


Fig.2

or ground terminals.

(b) Multiple Amplifiers. In this configuration, all except the ground terminal are used.

For *combined amplifiers*, connect the amplifier signal paths together using 'Slave Out' from the master amplifier to 'Slave In' on each slave amplifier, with screened cable linking the units. See below.

In *phase shifted* loop systems, follow the connection drawing supplied with the SP5 for the 'Slave' connections.

In either case, connect the 'sync bus' pins of all amplifiers together in parallel. The 'status out' connection may be wired in series if one indication is required for all amplifiers, or a separate indication pair can be taken to a concentrator from each amplifier. Both of these links are shown in fig. 3.

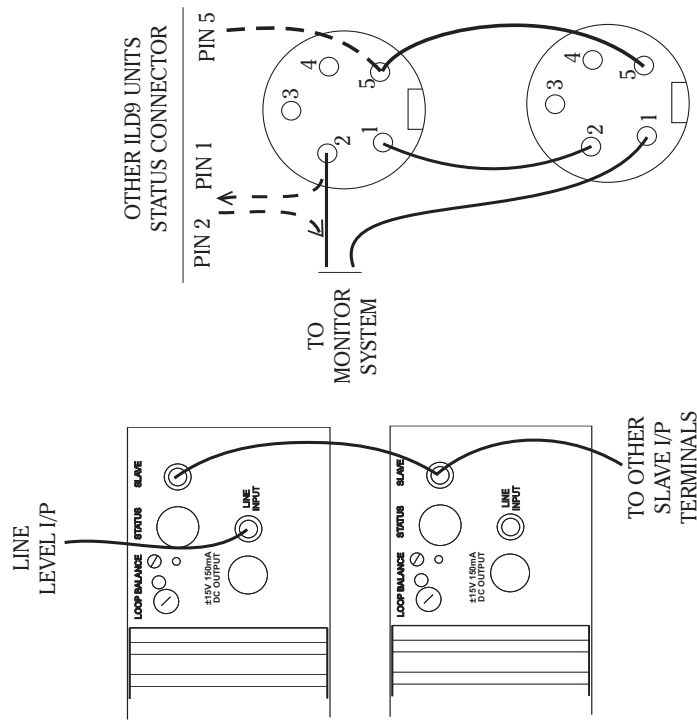


Fig.3

3. SETTING UP THE LOOP MONITOR

The setting of the ILD9 audio signal controls is independent of the loop condition monitor, so the condition monitor can be set up before signals are applied. This will only be possible if all connections in the system are correct, so ensure that the system connections are complete before proceeding. (Note: If the loop balance is not set up, the power LED will continue to flash after start-up, but the output relay will be heard to click on and the amplifier will drive current.)

(a) Single Amplifiers. The loop balance control allows the monitor to be set so that more than $\pm 20\%$ change in loop impedance causes a fault to be indicated. To set the control, follow the procedure below, referring to fig. 1.

- (i) Set the 'loop balance' control ① fully anticlockwise. LED ⑤ should be lit.
 - (ii) Press the 'loop null' button ② in and hold it in until the end of this procedure.
 - (iii) Turn the loop balance control ① very slowly clockwise until LED ⑤ goes off.
 - (iv) Continue to turn control ① very slowly clockwise until LED ⑤ lights again.
 - (v) Note this position, and now turn control ① very slowly anticlockwise. LED ⑤ will go off; continue turning until it lights again.
 - (vi) Now set the 'loop balance' control ① half way between the current position and the position noted earlier.
 - (vii) Release the 'loop null' button. ②
- The loop monitor is now set up correctly. No further adjustment should be required.

Note that the response of the loop monitor to control changes is necessarily very slow, and so it is essential that the balance control is moved very slowly to avoid turning it too far. If at all unsure, the operator should stop and wait for the balance to stabilise before continuing.

(b) Multiple Amplifiers. With multiple amplifiers the system should be wired up and the amplifiers connected together before attempting to null the loop monitor circuits. Each amplifier's loop monitor should be set up following the procedure in 3.1(a) above. The setting of 'loop balance' on one amplifier does not affect any other amplifier, although the series 'status out' circuit will not be completed until the last amplifier is balanced.