



DLAI
Digital Load Amplifier



User Manual

HB-DLA1-V1.00

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Introduction

Congratulations on your purchase of the DLA1 Digital Load Amplifier from Tinley Electronics.

Disclaimer

Tinley Electronics Ltd accept no responsibility for the use of this equipment. This equipment is not designed to replace conventional navigation procedures. Information in this document is subject to change without notice. Tinley Electronics reserve the right to change its products and documentation without obligation to notify any person or organisation of such changes.

DLA1 Calibration

The DLA1 can be calibrated via a Dataline display, a PC running a terminal program or by using the pushbutton and screw adjustment inside the top cover.

Calibration should be performed with no load on the load cell.

Test Calibration

To momentarily test the unit and check the calibration, press the pushbutton during normal operation. The unit will resume normal operation on releasing the pushbutton.

Pushbutton Calibration

Depending on the type of instruments/displays connected to the DLA1, it may be useful to connect a voltmeter to the 0-5V output to read the adjustments whilst they are being made during 'Pushbutton Calibration'. With the exception of 'Zero Calibration', you can choose to either calibrate or skip each calibration function by simply not turning the adjustment screw and pressing the pushbutton to skip to the next function. The current function will only calibrate if you turn the adjustment screw $\frac{1}{4}$ turn to initiate. You may also switch off the unit at any time during calibration. Values already entered will still be stored.

B&G Instruments

When calibrating the DLA1 for connection to a B&G linear input, it is recommended that you leave the calibration value set at the factory default 1.25 Volts. Calibration will then be straightforward by setting the B&G 'Cal Val 3' at a B&G display using the following formula:

$$\text{B\&G 'Cal Val 3'} = \text{Certificate Cal Figure} \times 520$$

Adjust the 'Cal Val 3' figure to fine tune calibration. 'Cal Val 2' may require a small negative value to fine tune zero

TackTick Instruments

When calibrating the DLA1 for connection to a TackTick Wireless Interface, it is recommended that you set the output mode to TackTick before calibrating DLA1 to the load cell.

Start Pushbutton Calibration

Hold pushbutton pressed while powering up DLA1

Unit enters 'CALIBRATE' mode, switching in a calibration resistor and outputting the current calibration figure. To adjust this figure, turn the adjustment screw until the output changes to the desired value and then press the pushbutton to move onto the next calibration function. To keep the current calibration figure but reset and store the zero value, press the pushbutton without turning the adjustment screw. It is very important to have no load on the load cell at this point!

Set Trip Point

The DLA1 enters 'TRIP SET' mode and switches out the calibration resistor. If the trip point is set between 0.1 and 5 the unit outputs the currently set trip point figure from the 0-5 Volt output. If the trip point is switched off, the unit will output 0V. If the trip point has been set to over 5, the unit will output 5V. To adjust this figure, turn the adjustment screw until the output changes to the desired value and then press the pushbutton to move onto the next calibration function. To keep the current trip figure, press the pushbutton without turning the adjustment screw.

Calibrate Voltage

The DLA1 enters 'BATT CAL' mode. The 0-5V output is not used in this calibration mode. You need to connect the DLA1 to a Dataline display or a PC serial port to the NMEA 0/P to adjust the battery voltage.

To adjust the battery voltage, turn the adjustment screw until the output changes to the desired value and press the pushbutton to move onto the next calibration function. To keep the current voltage calibration, press the pushbutton without turning the adjustment screw.

Mode Select

The DLA1 enters 'MODE SELECT' to enable the setting of the NMEA output for Normal Dataline displays or TackTick systems in either Tonne Force (TF) or Kilo Pound Force (KLBS). To change mode turn adjustment screw until output changes to desired type and press

pushbutton to move onto the next calibrate function. To keep current mode, press the pushbutton without turning the adjustment screw.

Pushbutton Calibration function chart

Pushbutton	Adjustment Screw	Function	0-5 Volt Output	NMEA Output
Press		Test output	Calibration Figure	Calibration Figure
Hold & Power Up		Reset Zero	Calibration Figure	Calibration Figure
	Adjust calibration	Calibrate	New Calibration Figure	New Calibration Figure
1 press		Store Zero and Calibration		
		Relay Trip Point	Trip Point (0.1-5V only)	Normal Operation
	Adjust Trip Point	Set Relay Trip Point (If a load is applied, trip point can be adjusted / tested to actual load)	New Trip Point (0.1-5V only) (Note B&G display will show trip point if calibrated)	Normal Operation
2 press		Store Trip Point		
	Adjust Battery Calibration	Battery Calibration	Off	Normal Operation (Battery Volts output shows current adjusted value)
3 press		Store Battery Calibration		
	Cycle through NMEA Modes	NMEA Mode Select	Normal Operation	Current selected Mode
4 press		Store NMEA Mode		
		Normal Operation	Normal Operation	Normal Operation

PC Terminal Calibration

Connect DLA1 to PC serial port as follows:

PC	DLA1
TX	NMEA 1 I/P A
GND	NMEA 1 I/P B
TX	NMEA O/P A
GND	GND

Set terminal program to NMEA protocol = 4800 baud, 8 data bits, no parity, 1 stop bit, no flow control, send line ends

The DLA1 is happy to accept the following sentences sent as individual characters, so typing them directly via a terminal program works well. The terminal program must be set up to 'send line ends with new lines' to enable the return key to send <CR><LF>.

Calibrate and Zero

Send: \$PTINC, xxxx<CR><LF>

where xxxx = Calibration Figure X 100 (tonnes or lbs)
i.e. 1.25 = 0125

DLA1 performs calibration and stores data

Set Trip Point

Send: \$PTINT, xxxx<CR><LF>

where xxxx = Trip Point X 100 (tonnes or lbs)
i.e. 2.50 = 0250

DLA1 stores data

Calibrate Voltage

Send: \$PTINV, xxxx<CR><LF>

where xxxx = Actual Input Voltage X 100 i.e. 12.80 = 1280

DLA1 calibrates and stores data

Mode Select

Send: \$PTINM, x<CR><LF>

where x = 0 for Normal Dataline, x = 1 for Tacktick KLBS,
x = 2 for TackTick TF

DLA1 stores data and switches the mode if it has changed

Specifications

Power

Voltage Input 10 to 32 VDC
Current consumption 50 mA

Construction

Rugged ABS case, Silicone Gasket, Cable Gland, IP67

Dimensions

80mm x 135mm x 53mm including gland

NMEA 0183 Output

\$YXXDR,G,xx.xx,,001*hh<CR><LF>

where **xx.xx** = load units dependent on calibration

\$PSTOB,xx.x*hh<CR><LF>

where **xx.x** = battery volts

Or Proprietary TackTick output

CANBus Output (NMEA2000 compatible)

PGN 65288 (Proprietary) Load Output in Tonnes Force:

Byte 1 = FF	Manufacture
Byte 2 = FC	Manufacture & Industry Group
Byte 3 = Load	Least significant byte
Byte 4 = Load	Most significant byte
Byte 5 = FF	Unused
Byte 6 = FF	Unused
Byte 7 = FF	Unused
Byte 8 = FF	Unused

PGN 126996 Product Information:

Bytes 102-110 = unique 8 character (digit) serial number

PGN 059392 ISO Acknowledge

PGN 059904 ISO Request

PGN 060928 ISO Address Claim

Level B compatible

LEN=2

0-5 Volts Output

Output impedance 10k ohm

Accuracy better than +/- 2%

Linearity better than +/- 0.5%

Specifications may change