DIVERSE YACHTS

Performance Racing Technology

LOADCELL HANDBOOK

Installation and Set-up manual

(HLA N2K)

4 Core Standard Cable

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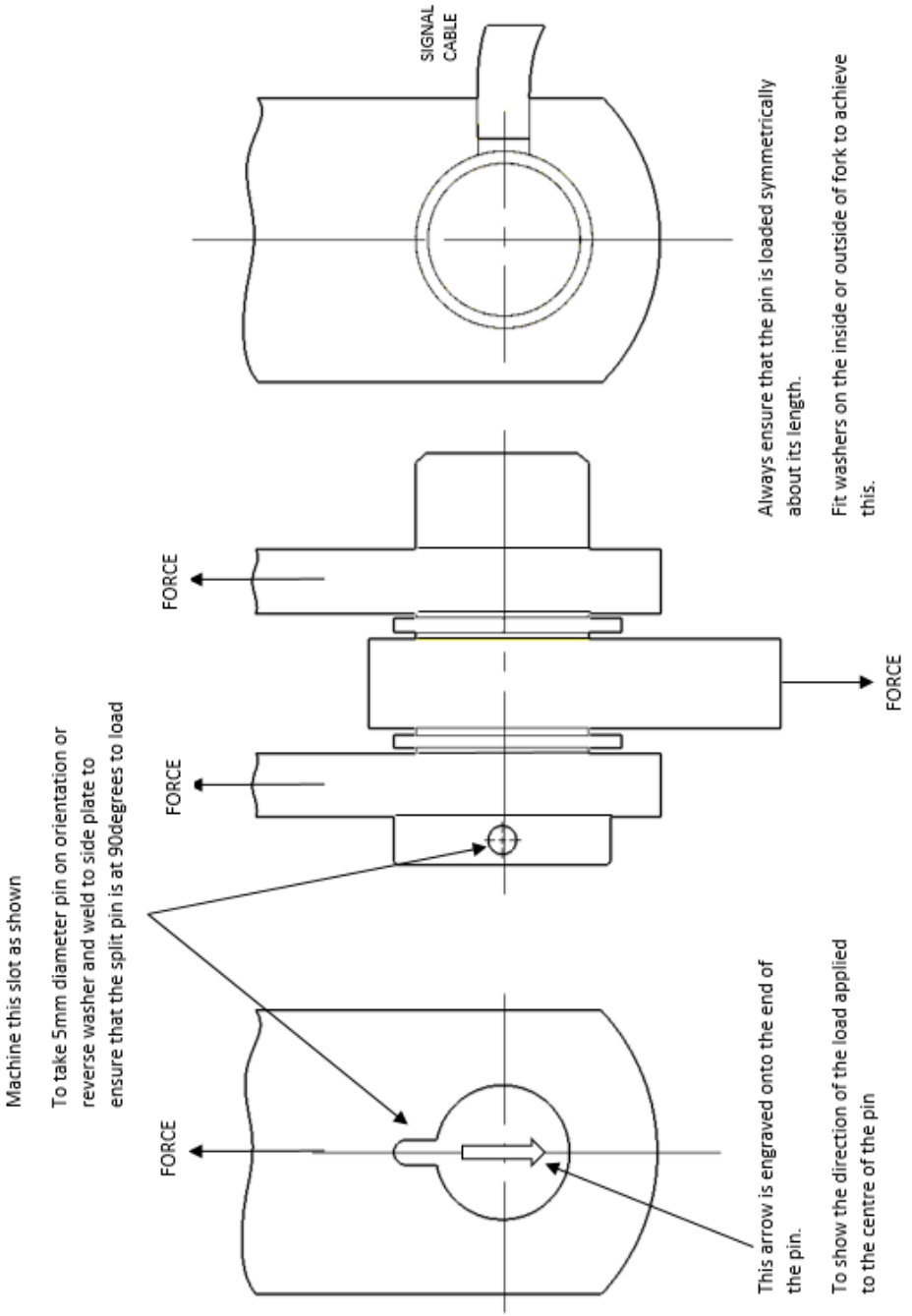
Fig 1. Standard Load Pin Instillation diagram



1. Load Cell Installation

The load cell (pin) is a totally sealed unit, constructed from the most suitable stainless steels available to withstand the loads and conditions of the marine environment. To ensure a long life for the load cell, careful installation is recommended especially with regard to the signal output cable and protective hose.

Standard Pins

Install the Shear Monitoring Pin (SMP) so that the pin will be at 90° to the load path, as shown in the sketch (Fig 1.)

The SMP should be a close fit in its associated holes.

Finally install the orientation washer, an accurate hole should be machined into the outside cheek of the chain plate to locate the washer pin. Alternatively a slot can be machined (Fig 1.) to achieve the same result. A further option of tack welding the reversed washer to the chain plate to prevent rotation of the pin. Always ensure the split pin is at 90° to load path.

Custom Pins: Install as per pin design

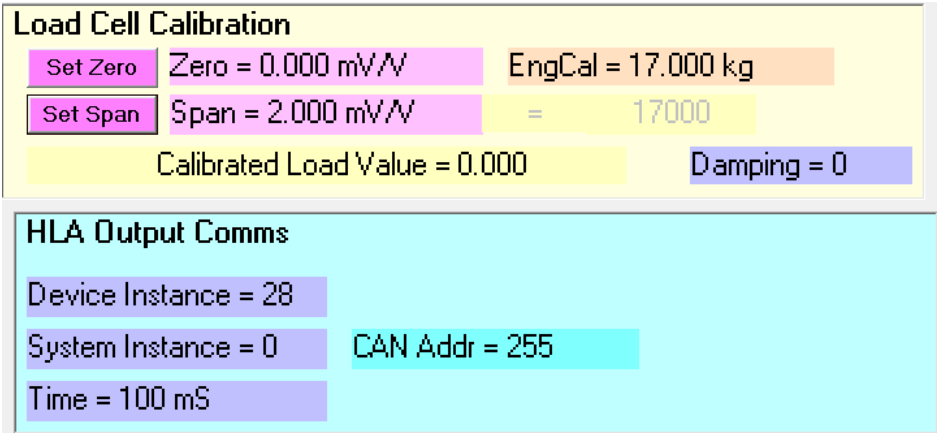
Route the output cable from the cell to the deck carefully to prevent it from being snagged or chaffed in service.

For forestay load cells it is recommended to take the cable over the bow an then into the hull so as to keep the cable safe from damage. The load-cell is supplied with a cable protection hose and should be measured for length (with a suitable loop for load cell flexing) and cut before feeding over the cable. Push and twist the hose into the hull through a 14mm hole and seal as necessary. The route of the cable, below should be kept away from any high power transmitting cables such as those associated with radar and radio.

2. Setting up

The links and pots have been pre-set. They should not normally need to be adjusted.

Plug the USB-TTL cable into the J4 connector on the HLA and a free USB port on the computer, switch on the supply voltage to the amplifier and start the HLA_N2K_Setup software.



Make sure the “Device Instance” matches the value for the load cell position (from instrument setup).

Make sure the CAL switch is set to OFF (slide to the left).
With no mechanical load on the load cell, click “Set Zero”.

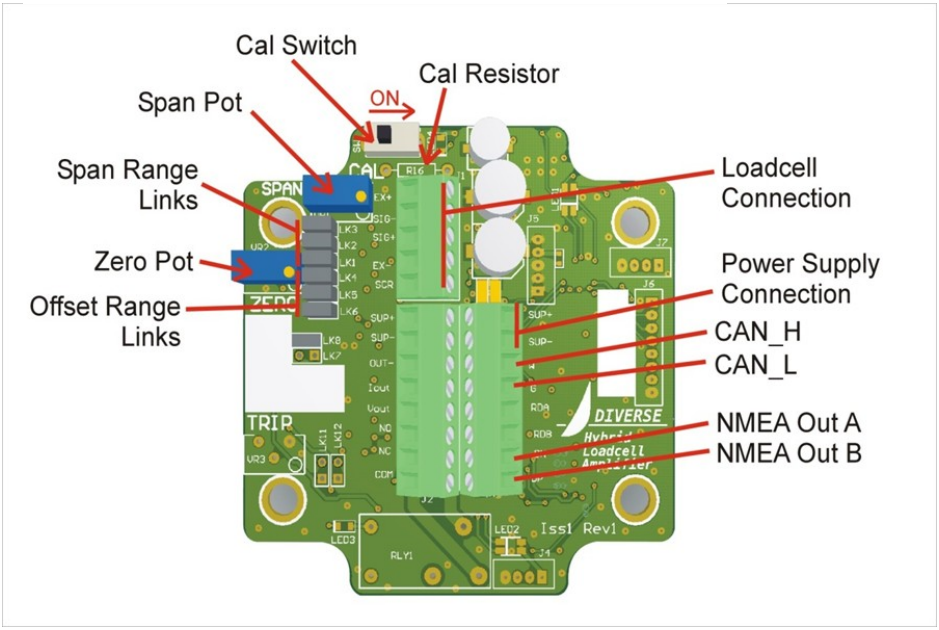
Then follow one of the below options:

Preferred Option:
Load the load cell to a known value between half and rated load (for example with a calibrated load cell in line). Set “EngCal” to this load (in tonnes), and click “Set Span”. Unload the load cell and recheck the zero reading.

If not possible to apply a known load:
Switch the CAL on (to the right), set “EngCal” to the “Cal Equivalent (Tonnes)” figure found on the calibration certificate, and click “Set Span”. Switch the CAL off and re-check the zero reading. Leave the CAL switch off in use.

The amplifier is now set up.

3. Hybrid Loadcell Amplifier (HLA)



Connections

Terminals	Colour	Function
EX +	RED	Load cell + supply
SIG -	YELLOW	Load cell -signal
SIG +	GREEN	Load cell + signal
EX -	BLUE	Load Cell - supply
SCR	BLACK	Load Cell cable screen

SUP +	RED	12-24Vdc
SUP -	BLUE	0 V

Terminals	CAN / NMEA2000 output
CAN H	HIGH
CAN L	LOW

Terminals	NMEA 0183
TDA	NMEA OUT A
TDB	NMEA OUT B

Coarse Span links

Link	Span range
LK1 + LK3	0.5 – 1.8 mV/V
LK2	1.5 – 3.4 mV/V
No links	3.2 – 5.0 mV/V

Coarse Zero Links

Link	Max offset mV/V
No links	
LK4	0.1
LK5	0.2
LK6	0.4

4. Specification

Power Supply	12-24V DC Nominal (10-31.5V Max Range)
Load Cell Input	120-1000 ohm Full Bridge 4 wire connection
Excitation Voltage	5V Nominal (test EX+ and EX On load cell input)
Input Range	0.5 – 5 mV/V for FSD 3 ranges, Jumper link selectable, approx 0.5-1.8, 1.5-3.5 & 3.2-5 mV/V FSD
Zero Offset	up to +/- 1.9mV/V (on 350R bridge), in 4 ranges
Digital Output	CAN, NMEA2000 or NMEA0183

Load Cell function test

Remove wiring from the HLA amplifier and test resistances which should be generally as follows:

RED to BLUE	350 ohms (this may vary slightly)
YELLOW to GREEN	350 ohms

Any excitation to any signal wire should have equal readings to one another, I.E, If red to yellow reads 262 ohms, blue to yellow, red to green or blue to green will show the same reading.

Test the above wires to the earth of the load pin with no more than 50V insulation test. All cores and the screen (black wire) should be isolated from earth.

Amplifier function test

Reconnect the load cell to the HLA amplifier and perform the following tests:

1. Ex+ to EX– should be approximately 5Vdc
2. With no load applied there should be 0V dc on OUT– to V out
3. Switch the CAL on and OUT– to V out will read CAL equivalent