Dorman Long Technology

Synchronous jacking and weighing systems

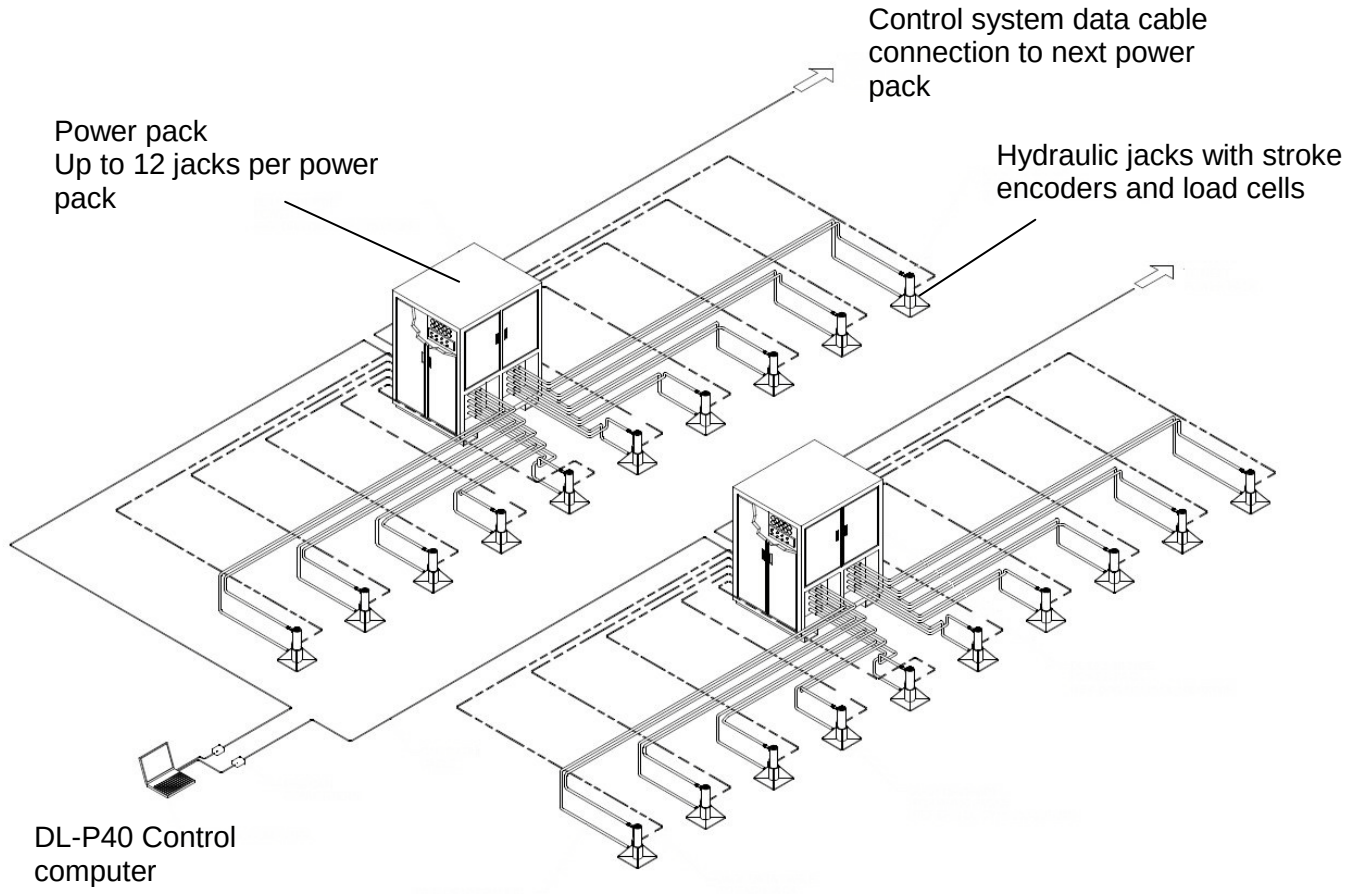
Introduction

DLT synchronous jacking and weighing systems are made to order, to suit the specific needs of each client. They can be used for simple weighing operations, or complex jacking and weighing operations in both onshore and offshore environments. Any size and stroke of jack can be supplied and the system can be expanded to offer synchronised control of up to 120 jacks from a single control computer. The core technology used for our synchronous jacking and weighing systems is the same proven technology that we use for our strand jack systems.

The main features of DLT synchronous jacking and weighing systems are as follows:

- DL-P40 computer control for accurate stroke synchronisation and load monitoring of up to 120 jacks from a single rugged and weatherproof control computer
- Stroke measurement accuracy to 0.1 % jack stroke.
- Load measurement accuracy to 0.5 % of the maximum jack load
- Load centre of gravity continuously displayed to an accuracy of 1 mm
- Full data logging of the jacking and weighing operations with the facility to create separate ‘snap shot’ log files of key data at any point in the operation. This greatly assists in the production of weighing and lifting reports after completion of the operation.
- Each jack is fitted with a load holding valve to securely hold the load in the event of a hose burst
- Each jack is fitted with a controlled load lowering valve for accurate and smooth synchronisation during load lowering.
- Piston pumps used in all power packs to give long life and good natural synchronisation
- Jacks pressure tested and certified to 150% working pressure. Power packs pressure tested and certified to 125% working pressure.

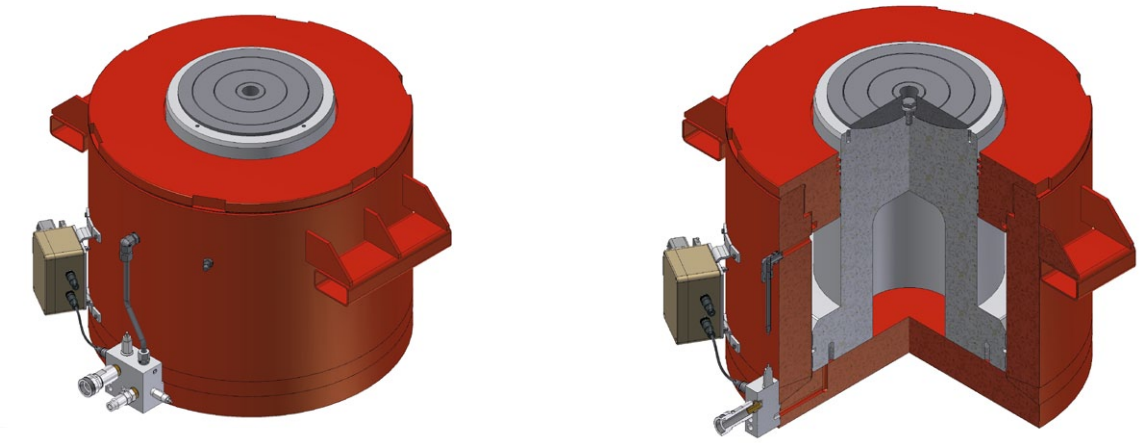
Typical layout of jacks, power packs and control computer :



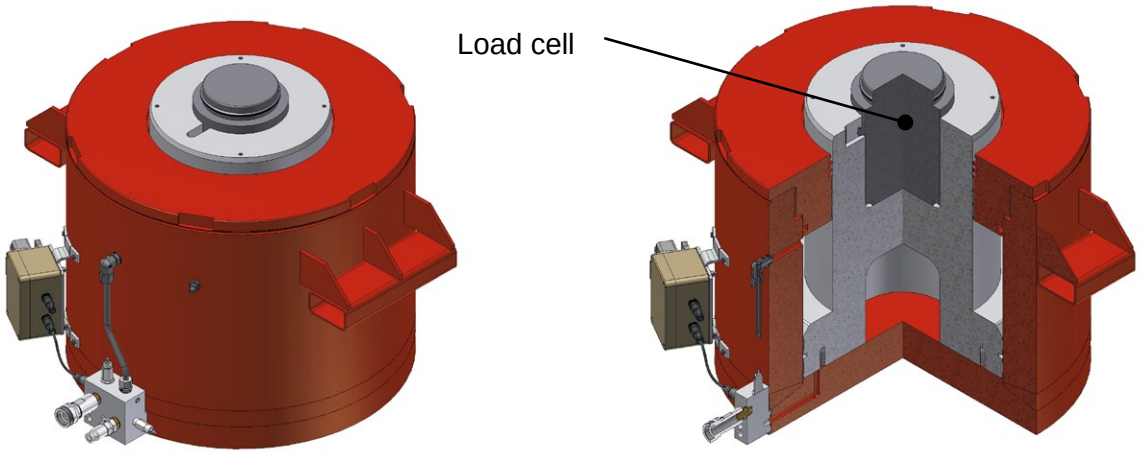
A typical DLT weighing jack:

Typical details for the jacks :
Jacks are designed to suit each customer's requirement, from 50 – 2000 tonnes per jack and stokes up to 6m. The basic options are shown below.

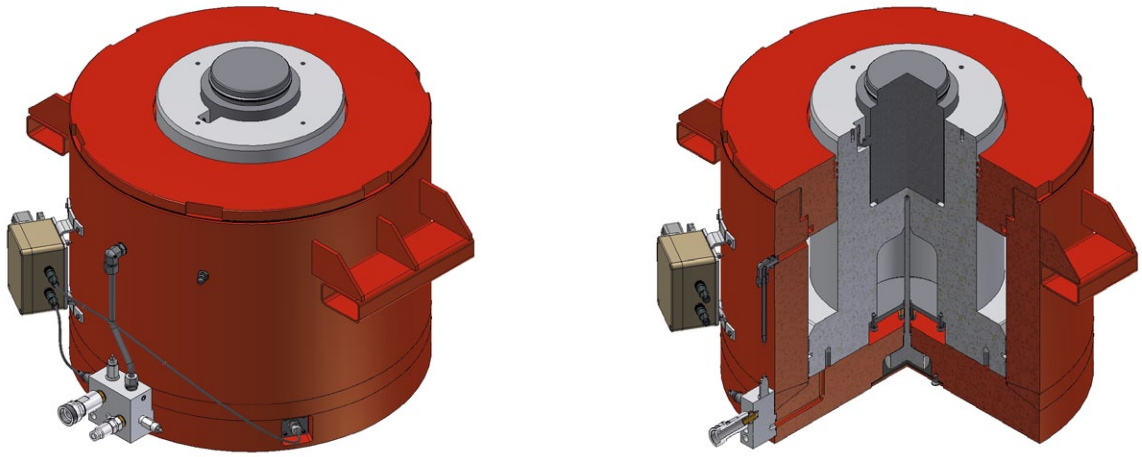
Option 1 - Jack with external stroke encoder and without load cell.
This type of jack uses the transducer pressure readings taken at the extend port block to give the load to 1% accuracy (after correcting for seal friction)



Option 2 - Jack with load cell and external stroke encoder .
Load accuracy to 0.5%



Option 3- Jack with load cell and internal stroke encoder:
Internal stroke encoders are more robust in a site environment.



DL-P40 Typical operating screen, showing a 40 jack system :

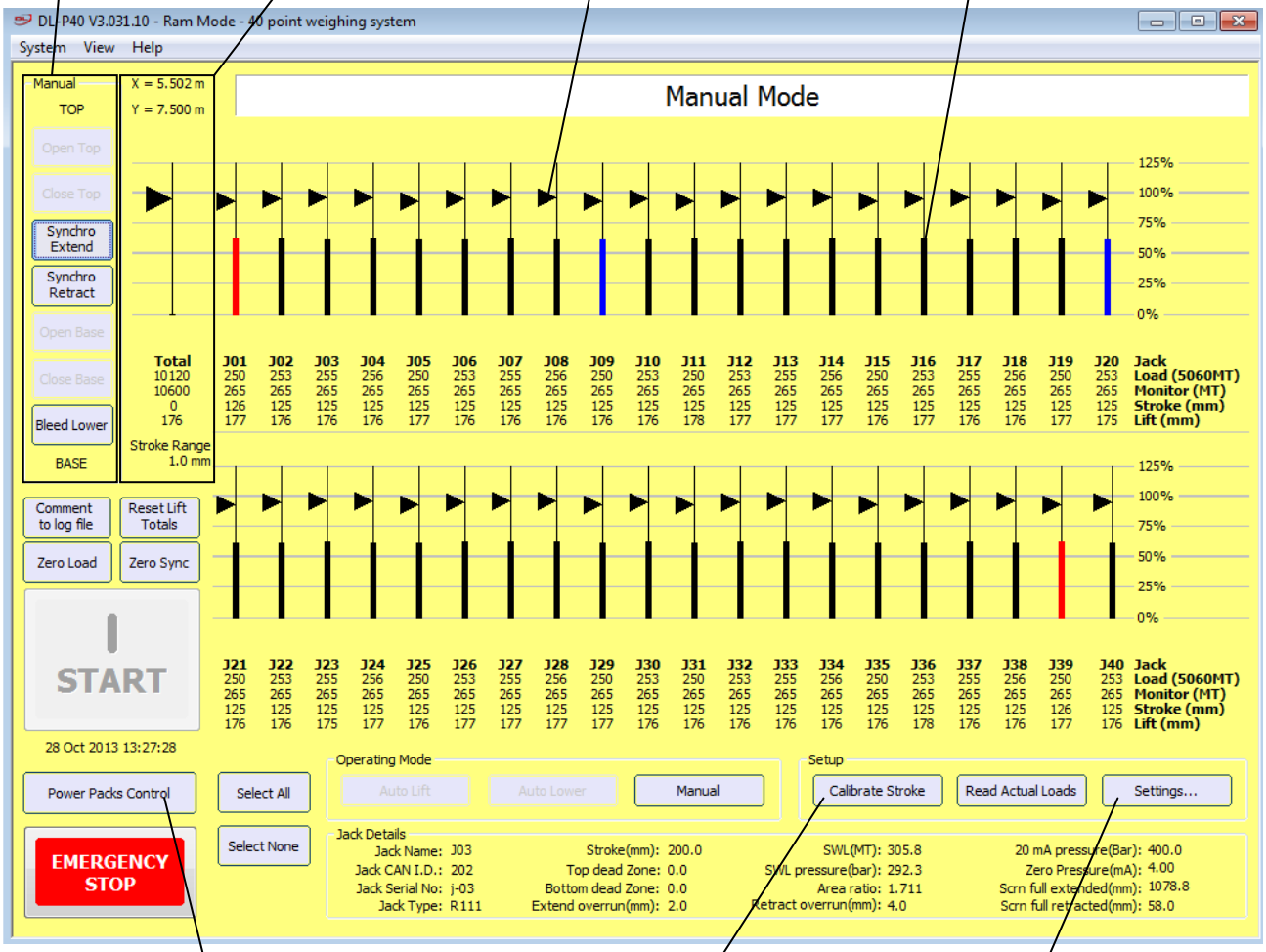
A second screen is used to show jacks 41 – 120.

Operating buttons

Plan co-ordinates of the centre of gravity , the total load on the system and the stroke range (max-min stroke)

Load in each jack shown graphically as % of expected load, with actual values listed below

Stroke of each jack shown graphically as % full stroke, with actual values listed below



Click for power pack control screen :

- Turn power packs on and off
- Control variable speed (when fitted)
- Monitor oil temperature & level
- Monitor oil pressure
- Monitor power usage

Automatic stroke calibration

Click for settings screen :

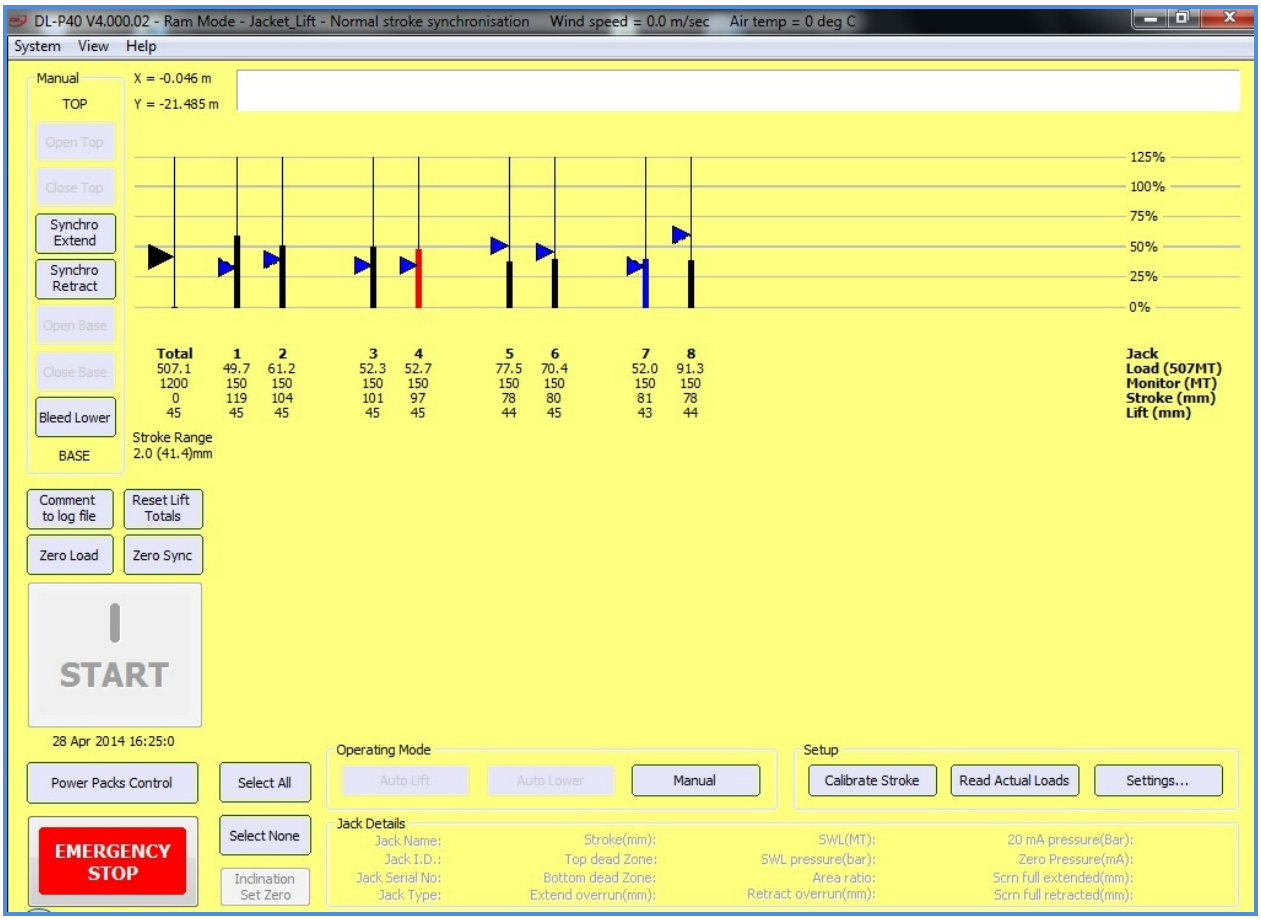
- Jack name and position on screen
- Expected load for each jack
- Plan co-ordinates of each jack
- Allowable synchronous stroke range
- Max allowable load for each jack
- Many other settings

The operator can select any combination of jacks to extend and retract and simply presses the Sychro Extend and Sychro Retract buttons to lift and lower the load. The system will automatically sychronise all the jack stokes to maintain the required level of stroke synchronisation. A log file of all jack loads, user commands and warnings is automatically saved for every operation and the operator can comment to the log file at any time using the ‘comment to log file’ button.

4 No DL-WJ600 weighing jacks with load cells of 0.5% load accuracy. 200mm stroke, 600 MT SWL per jack.

16 No 1250 MT jacks with 2000mm stroke, being used for onshore weighing of a topside using hydraulic pressures for a load measurement accuracy of 1% after correction for seal friction.

A typical control screen and weighing report for an eight jack weighing operation using load cells for a load measurement accuracy of 0.5%:



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Jacket Weighing Report

Date:
Time:

Client -
Project: Jacket Weighing

Corner	Jack Sl. No.	Jack ID	Load Cell ID	Position		1st Lift			2nd Lift			3rd Lift		
				X-Cordinate	Y-Cordinate	Weight	Moment X-axis	Moment Y-axis	Weight	Moment X-axis	Moment Y-axis	Weight	Moment X-axis	Moment Y-axis
1	300/1401/03	1	22471	-7.548	-10.000	49.70	-375.136	-497.000	54.20	-409.102	-542.000	54.40	-410.611	-544.000
	300/1401/04	2	22472	-5.618	-10.000	61.20	-343.822	-612.000	56.30	-316.293	-563.000	57.70	-324.159	-577.000
2	300/1401/02	3	22470	5.618	-10.000	52.30	293.821	-523.000	65.60	368.541	-656.000	57.90	325.282	-579.000
	300/1401/01	4	22469	7.548	-10.000	52.70	397.780	-527.000	40.30	304.184	-403.000	46.50	350.982	-465.000
3	600/1401/04	5	22464	9.290	-30.000	77.50	719.975	-2325.000	74.50	692.105	-2235.000	74.70	693.963	-2241.000
	600/1401/03	6	22463	7.210	-30.000	70.40	507.584	-2112.000	75.80	546.518	-2274.000	76.50	551.565	-2295.000
4	600/1401/01	7	22465	-7.210	-30.000	52.00	-374.920	-1560.000	52.70	-379.967	-1581.000	51.80	-373.478	-1554.000
	600/1401/02	8	22466	-9.290	-30.000	91.30	-848.177	-2739.000	88.90	-825.881	-2667.000	89.00	-826.810	-2670.000
					Total:	507.10	-22.894	-10895.000	508.30	-19.895	-10921.000	508.50	-13.266	-10925.000

		Moments Sum		COG	
	Total Weight	X-axis	Y-axis	X-axis	Y-axis
1st Lift	507.10	-22.89	-10895.00	-0.05	-21.48
2nd Lift	508.30	-19.89	-10921.00	-0.04	-21.49
3rd Lift	508.50	-13.27	-10925.00	-0.03	-21.48
Avg.	**507.97**			**-0.037**	**-21.485**

Weight in 'MT'
Cordinates in 'm'

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