VESSEL MONITORING

LyDams

**Large Yacht
Data Acquisition, Monitoring and Storage**

SENSORS
e.g.
hull loads
motions
vibrations
engine data
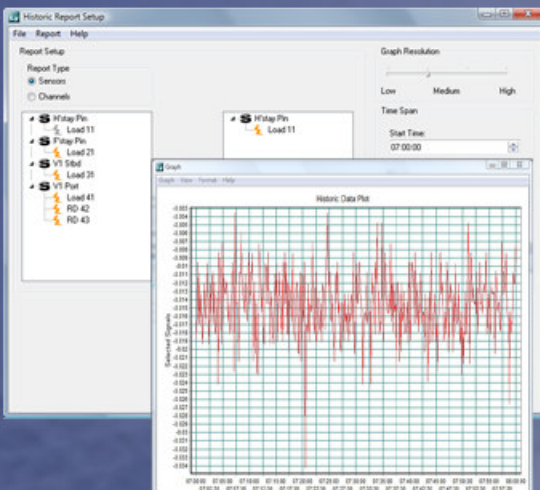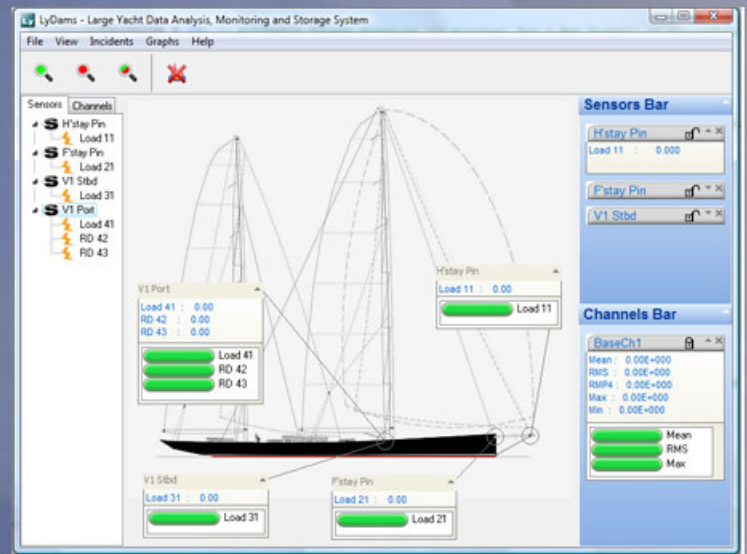
CANBus
system

LyDams
software

What & Why

- Motor and sail vessels
- Continuous monitoring of structure and environment
- Real time status of complex systems and structures

Features

- Data acquisition, monitoring and storage
- Analysis and plotting of historical data
- Damage models, warnings and alarms for real time failure prevention

Historic reports

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LyDams – Large Yacht Data Acquisition, Monitoring and Storage

Package developed by the Wolfson Unit MTIA, University of Southampton.

Initially developed in 2009 as an onboard load monitoring system for Baltic Yachts, it is currently being commissioned on Panamax, a ground-breaking 220ft LOA composite ketch.

INTRODUCTION

LyDams is a real time failure prevention software for the Windows operating system. The program enables the user to acquire, monitor, analyse, store and retrieve data obtained from onboard sensors. Examples are hull and rig loads, motions, vibrations and engine data.

LyDams provides the user with real time information on the state of the vessel, in the form of sensor readouts, warnings and alarms. A write-protected configuration file is used to provide levels above or below which warnings and/or alarms are promulgated on the system. The onboard data can be analysed in real time to yield statistical, comparative and exceedance results.

The program is designed for use by bridge personnel; it is assumed that the user has an understanding of the purpose for which the program is required.
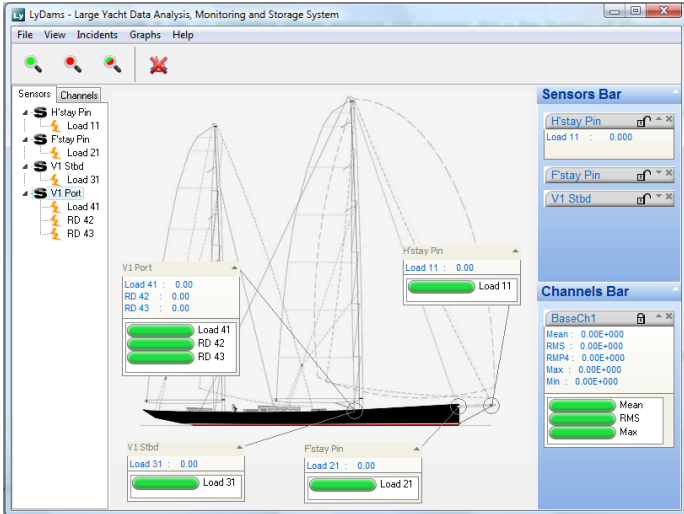
PROGRAM FLOW

The raw sensor output, or 'Raw Signals' are first converted by the program into 'Raw Data', which are time-stamped, calibrated and expressed in engineering units. Raw Data are then processed automatically to derive 'Channels' i.e. statistical results. Both Raw Data and Channels are logged by the system and stored.

A local removable hard disc can be used for mass storage of several months worth of logged data. Storage media with a lower capacity may be used for archiving at intervals of a month or two. Stored data are used by the program to produce historic graphs and reports.

VESSEL-SPECIFIC CONFIGURATION

The configuration file supplied with the program contains vessel-specific information, including number, type and positioning of sensors, calibration data, damage models and levels above or below which warnings and/or alarms are promulgated on the system. LyDams configuration files are protected, to ensure that data cannot be altered by the user.

The graphic interface includes several views of the vessel and the layout of the onboard sensors. These can be interrogated at any time to obtain a feedback on the system, e.g. alarms/warnings and sensor readouts.

DAMAGE MODELS, WARNINGS AND ALARMS

Raw Data and custom Channel may have an associated Damage Model, whose parameters are set up in the LyDams configuration file. A Damage Model highlights a state of possible risk for the quantity being monitored by issuing warnings and/or alarms. For example, if a Damage Model is associated to a tension signal for an element of the standing rigging of a sailing yacht, a warning will be issued when the load exceeds a pre-defined value.

A Damage Model is sensitive to two factors: the instantaneous value of the quantity being monitored and its past trend. For example, a shock load on the rigging, a constant load of moderate entity and a cyclic load with a high amplitude and a low mean value may all result in a warning.

HISTORIC GRAPHS AND REPORTING

Raw Data and custom Channels are stored initially in the memory of the acquisition PC and then written to log files at regular time intervals. The logged information can be retrieved automatically to obtain historic graphs, that is, graphs showing the variations of the desired quantity/ies between two points in time chosen by the user.
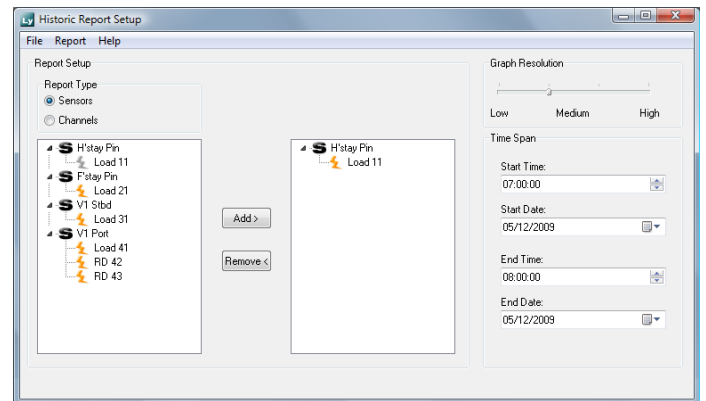
HARDWARE

LyDams is designed to process data from a range of hardware using a suitable interface. One of the most efficient systems and the one recommended is a system based upon CANBus technology. This has the advantage of reducing wiring to a minimum since all transducers are either already provided with the CANBus protocol interface or can be linked to a local CANBus interface.

HELP SYSTEM

The program comes with a full manual and online help system, which includes a comprehensive description of the program flow and a full glossary of terms showing the derivation of calculated data.

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