

LSMC Marine Load Banks

Vessel Management System Interface

The LSM800D automatic load shedding control interfaces with all management systems. It works hand in hand with energy and systems management and can be interfaced in a number of methods.

The important features are that in normal operation the Smartload® is looking at the load on the system busbar. This includes any supplementary load provided by the Smartload®.

This is independent of system management

The Smartload® system can be interfaced in many circumstances through its auxiliary inputs to load “dump”

Overview

The Smartload® is programmed to maintain a minimum load on the engine (normally set at 65%). As the load on the genset from the vessel approaches the set point it starts switching off loads in the load bank. By the time the genset load reaches 65% there is no supplementary load connected from the load bank.

Whilst the genset is on minimum load the management system may read the load on the system that includes some portion of load provided by the Smartload.

In multiple genset installations typically the second genset is initiated when the first reaches 80-90% capacity. It is important to understand that by this time the Smartload® has gone off the system.

It may then occur that as the second genset comes on line the total load on both gensets is then below the minimum set point and the Smartload® may need to provide supplementary loading again.

As the load on the system drops the second or third genset may drop out. The Smartload® instantly computes the load on the remaining gensets and adjusts the supplementary loading again. This is a constant process.

The reaction time of the Smartload depends on the rate of change of the load on the system. The processor ramps the response time up and down to provide soft loading in times of small load fluctuation, minimising contactor switching. When a large load change occurs, it disables in milliseconds.

In an emergency or predicted load situation the management system can switch off the Smartload® to ensure maximum genset capacity is available.

This is done through the enable/disable input circuit, typically in a fire situation or when an anchor winch or bow thrusters are operated.

Having said that, is not strictly necessary because the Smartload® will automatically switch off if the demand exceeds the set point.

After all, the reason for having the Smartload® is to provide minimum engine load at all times to achieve the benefits it provides. Longer engine life, lower emissions etc.

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The LSM800D has two CT input capacity.

The location and size of the current transformer (CT) is critical and in some multiple generator configurations more than one CT may be required. In some installations a summation CT may be required to accurately determine the system load condition.

This may occur with multiple gensets of different sizes and/or where the load is connected from multiple locations along the busbar system

Multiple generators can be controlled via one CT where the vessel load is on a common busbar. The 2nd CT input is commonly used with two generators of different sizes.

Some situations require that gensets are rotated to maintain equal engine hours. In this case it may be necessary to program the management system to switch to the appropriate CT to read the load correctly. i.e. one day genset is No.1 , the next it is No.2 or 3.

Dual Menu Operation – Upgrade Option

Upgrading the Smartload controller to a dual menu operation may be necessary when generators are combined or in sync, or when generators on vessels are of different capacities. The upgrade will provide access to a second operational menu, activated by a remote signal. CT locations and Dual Program technical support is available on our website. For further assistance, consult the factory regarding design of your system.

A fault output is provided to indicate an alarm condition in the Smartload®.

Additionally It has system safety interlocks to protect it from over temperature of the water, resistor over temperature, pump failure or overload, high pressure and loss of sufficient flow of cooling water.

Communication

Direct Connection

USB socket

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MODBUS RTU protocol. RS485 interface. 2 wire with signal ground and separate shield.

Refer to detail “System Interface” overview

Alarm and Status Monitoring - Available as an option.

Signal outputs for interfacing with the vessel management system.

Alarms

Voltage free out put to indicate a fault condition.

Data output signal provides alarm status of:

- Over temperature
- Over pressure
- Low water flow
- Pump overload or failure

Monitoring

Data output for vessel management system interface. Output signal provides status indication of:

- System kW loading
- Water flow rate

Vessel Management System Interface cont.

The control over the water temp and volume is particularly important to maintain minimum sediment build up, to increase service intervals.

The system has automatic air venting to prevent air pockets in the Smartload that may be caused by the pump pulling air in to the system.

Included are some typical schematics for CT location in different genset configurations to assist with understanding the system operation and CT sizes and locations