# Lauritzen Inc.
Bringing new ideas to renewable energy
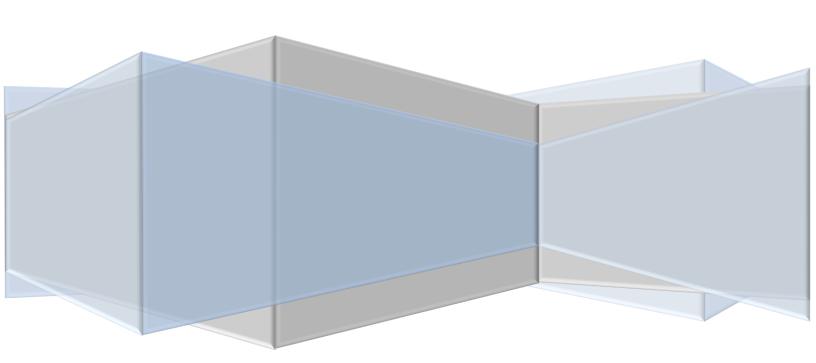
# Monitoring and Remote Control of Lauritzen Controllers

## November-2018

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# 1. Introduction

All Lauritzen controllers are shipped network ready, including software to enable worldwide remote monitoring and control through Lauritzen' Valhalla severs. This document will outline the server features, and client reporting states.

# 2. Remote Monitoring and Control

The philosophy behind Lauritzen control systems is to make them fully accountable. To accomplish this, controllers will continually transmit the following:
   1) data
   2) events
   3) instant state
back to the Lauritzen Valhalla server for further analysis.

Data is collected at the controller periodically – typically every 10-15 minutes, and contains information such as solar and tracker position, voltage, current, power, energy, and temperature.

Events are generated by the controller when an operational aspect takes place such as start of tracking, storm condition, server contact, or an error condition.

An instant state packet is collected by the controller and is transmitted to the server for every server contact. The statue information contains items such as a summary error and warning signal, and operational states such as that of a stop or service mode switch, and status of sub-systems.

Aside from the data, event and state information, the network connection can also be used to perform remote control and software updates.

# 3. Client Reporting State

A client can take one of 3 different reporting states: *offline*, *under-construction* and *online*. A user account at the Admin or higher privilege can switch a client's reporting state.

## 3.1. Client Reporting State: Offline

- A client in the *Offline* reporting state, may contact the Valhalla server.
- All data transfer, status and software maintenance are disabled.
- No maintenance fees.
- Assuming no external upsets, the client (controller) will continue to operate indefinitely.

## 3.2. Client Reporting State: Under-Construction

- When a client is in the *Under-Construction* state, it may contact the Valhalla server.
- All data, event and state information are transferred.
- Software maintenance features are enabled.
- Automatic fault reporting is disabled.
- No maintenance fees.
- A client who is reporting to the Valhalla server may reside in the *Under-Construction* state for up to 3 months. After that time, the client is automatically moved to the O*nline* state.

## 3.3. Client Reporting State: Online

- A client in the Online state, is expected to contact the Valhalla server regularly.
- All data, event and state information are transferred, and event data is processed for instant alarm handling.
- Software maintenance features are enabled.
- A client in the Online state is charged the regular maintenance fee.
- An *Online* client which has been absent for more than 180 days is automatically moved to the *Offline* state.

## 4. End User Service Responsibility

Lauritzen is an OEM company and is not setup to provide end-user (End-User) support. The Remote Control and Monitoring System is designed for Lauritzen customers (Customer) to provide End-User support.

Customer will typically make use of daily field reports to determine End-User equipment status. In case of failure, Customer will consult Fault Status, Data Recordings and System Events to determine actual failure cause, after which Customer will resolve failure with Customer's field personnel. In certain cases, failures can be obscure, or failure data difficult to interpret. In such events, Customer will consult with Lauritzen to determine failure. Lauritzen will provide remote support to Customer only, and Customer will remain responsible for Customer field personnel and End-User.

If Lauritzen equipment is found to be faulty, and Remote Control and Monitoring Maintenance fee is up to date, Lauritzen will service the equipment per Lauritzen's Limited Warranty policy.

## 5. Extended Warranty

All Lauritzen products are covered by our Limited Warranty as specified under

http://www.lauritzen.biz/about/warranty.html

With remote monitoring, the Limited Warranty policy remains in effect for as long as a client is in the *Online* reporting state, and customer account balances are current.

## 6. Schedule of Maintenance Fees

All networked controllers are supplied with 3 months of remote monitoring. Beyond this initial period, additional remote monitoring may be purchased according to the following schedule;

| Item | Description | Price (USD) |
|---|---|---|
| VAL-70240 | Annual license for stand-alone controller (SCX) | $60.00 |
| VAL-70200 | Annual license for field master controller (FMCX). Need to add VAL-70210 for reporting slave units. | $75.00 |
| VAL-70210 | Annual license for field slave controller (TMCX) | $15.00 |

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