

# Solar Power Supply Low Battery Voltage Alarms

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## Industry Terms

**CO (Central Office)** – Typically referred to as the Telco provider’s hand-off point.

**Sub (Substation)** – Typically referred to as the Substation Side, customer side, or end user side of the Fiber Link.

**CFJ (Copper Fiber Junction)** - This is a High Voltage Protection term used to describe where copper signal is converted into a fiber signal for transportation into high voltage environments.

**OEI (Optical Electrical Interface)** - This term is used to represent when the fiber signal is converted back into a copper signal necessary for use in most communication equipment.

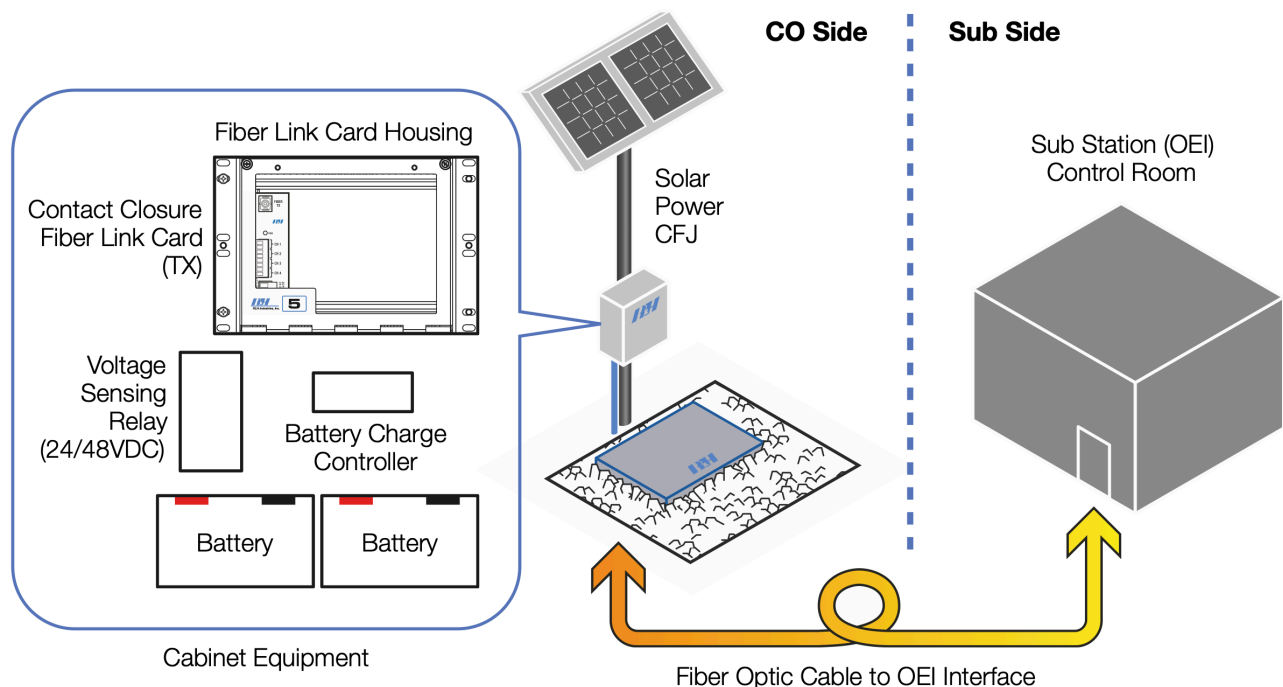
## RLH Solar Powered CFJ – Battery Alarming Solution

When powering the CFJ (CO Side) with Solar power the biggest concern is typically battery maintenance. To properly maintain an RLH Solar power supply we recommend **changing batteries at minimum every 3 years** when using our standard battery. Non-standard battery maintenance periods may vary as well as environmental conditions can affect the life of a battery.

With increased communication and monitoring at substations and remote facilities, RLH has developed a solution for a low battery voltage alarm transported over fiber back to the sub side (OEI) location of the equipment where typically an RTU or other IED exists that can notify operation and maintenance personnel that battery maintenance is required.

In the following sections we will review two solutions and additional points of interest. The first solution will be for adding alarming capability to existing solar power installations and the second would be setup your solar power installation system to support low battery alarming.

### CFJ - Remote Solar Powered Equipment Solution



## New Solar Power Installations

For new solar powering installations we recommend using a charge controller with a built in low voltage relay alarm option as it simplifies installation and reduces the total load as an external voltage sensor is not required.

The RLH Contact Closure transmitter card was designed to require little power making it ideal for this application.

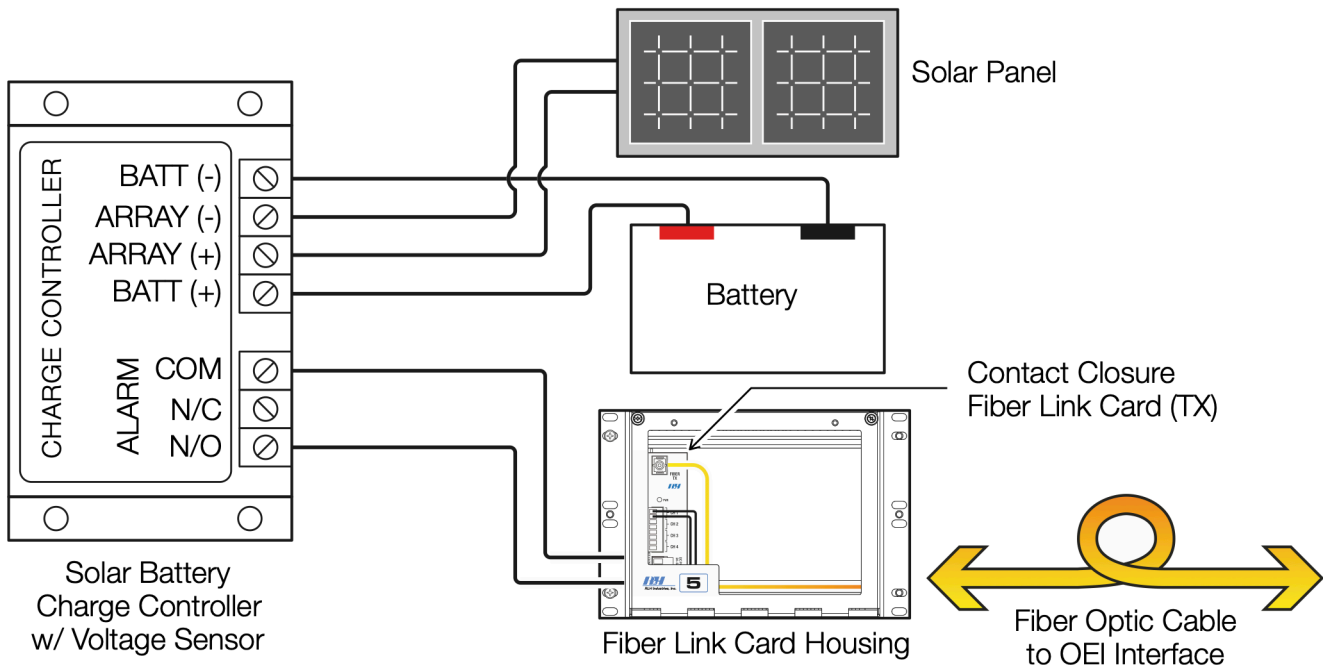
### Estimated Load Adding RLH Contact Closure System

0.36 Watts @  
24VDC, 15ma

**RLH Fiber  
Contact Closure  
Transmitter Unit**

We have a sample of how you would typically wire a solar power supply when intending to transmit a low voltage alarm into the sub-station.

### Wire Diagram of Typical System with Low Voltage Alarm

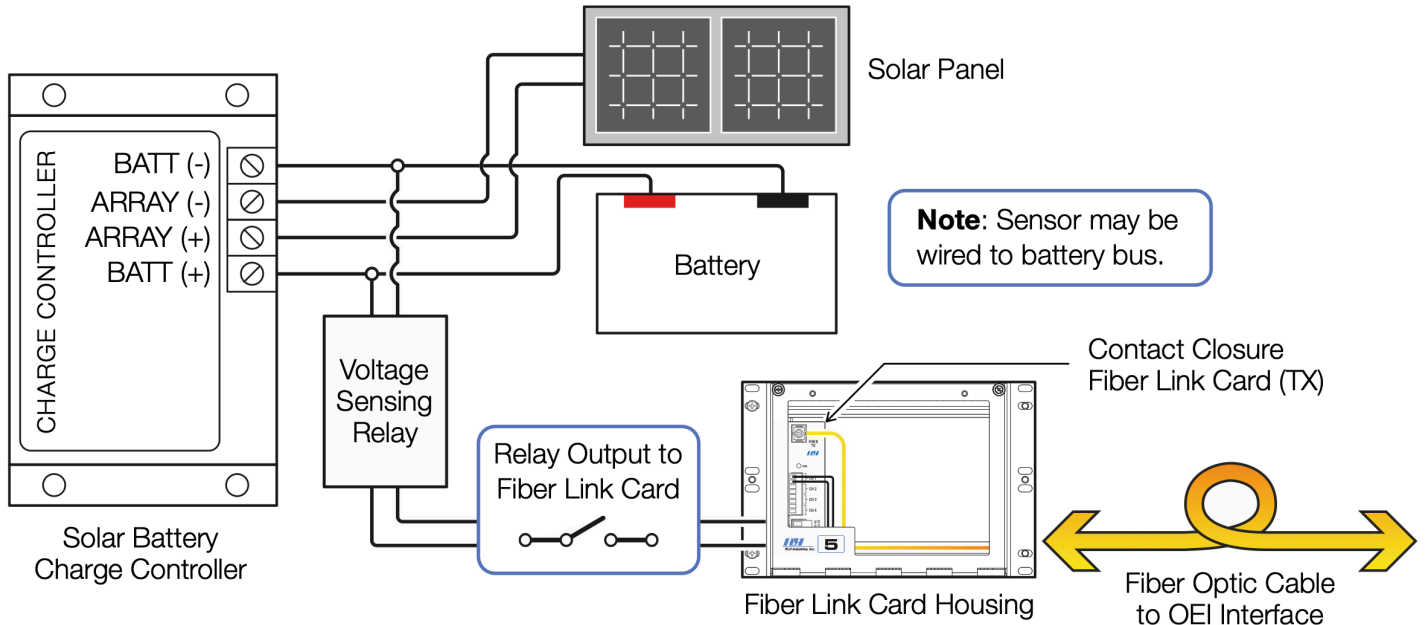


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## Add Low Voltage Battery Alarm to Existing Solar Power Installations

The wiring diagram below shows how you can add a low battery alarm to any 24 VDC or 48 VDC solar power solution. With the use of a voltage sensing relay and the RLH Industries Contact Closure over Fiber solution we are able to transport the low voltage alarm to any control or communication room for integration into notification systems.

### Wire Diagram of Adding Low Voltage Alarm to an Existing System



### CO Side / CFJ

Using both a voltage sensing relay and contact closure transmitter card that consume minimal power we are able to make this a feasible solution. The total load depends on the state of the voltage sensing relay device.

### Total Load of the Relay Voltage Sensor and RLH Contact Closure System

#### ALARM STATE - ENERGIZED

1.5 Watts @ 24VDC, 62.5ma	+	0.36 Watts @ 24VDC, 15ma	≈	<b>1.86 Watts</b>
<b>RLH Voltage Sensor</b>		<b>RLH Fiber Contact Closure Transmitter Unit</b>		<b>Total Load</b>

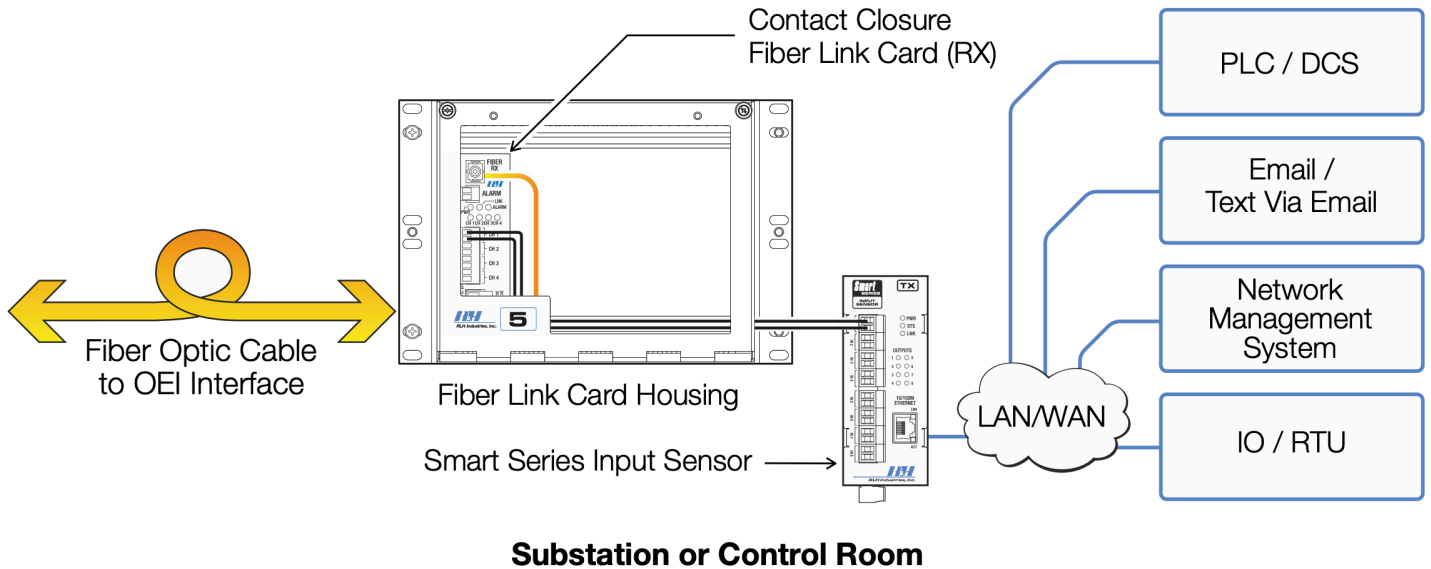
#### NORMAL STATE - DE-ENERGIZED

0.5 Watts @ 24VDC, 22ma	+	0.36 Watts @ 24VDC, 15ma	≈	<b>0.86 Watts</b>
<b>RLH Voltage Sensor</b>		<b>RLH Fiber Contact Closure Transmitter Unit</b>		<b>Total Load</b>

## Additional Points of Interest

RLH Industries, Inc. offers an Input Sensor that will monitor the relay output and allow your low voltage battery alarm to trigger an email, be monitored via SNMP, or provide status via Modbus TCP. The below diagram shows how you would integrate the smart series sensor with the Contact Closure over Fiber Card Rx unit.

### Different Types of Integration Options for System Monitoring



## Product Reference Information

### RLH Solar Power Supplies & Accessories:

<https://www.fiberopticlink.com/products/power-supplies/solar-power-supplies/>

### Contact Closure over Fiber Solutions:

<https://www.fiberopticlink.com/products/fiber-optic-isolation-systems/fiber-cards/#control-signals>