



**MCL CONTROL**



## **SENTINEL** SuperCap Power Supply

An alternative to power wireless instrumentation and devices in classified areas

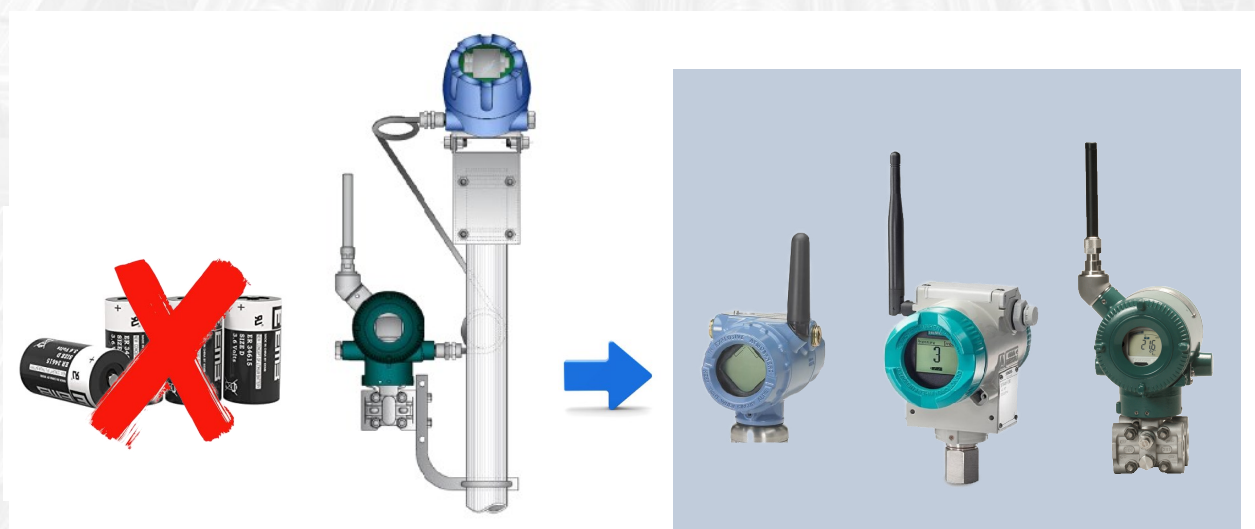
[www.mclcontrol.com](http://www.mclcontrol.com)



## INTRODUCTION

Due to current technology, many processes use wireless transmitters and devices in their outdoor facilities. These devices can be powered by non-rechargeable lithium batteries, which require replacement in periods ranging from 6 months to 1 year, depending on the required reporting frequencies.

Today, many users want a system that does not require battery replacement and can ensure continuous power supply to each transmitter, without the need for external power cables to minimize cable installation costs. Additionally, in many cases the power systems must be capable of being installed in C1D1 classified areas and supplying power to a device that is intrinsically safe.



Under this need, MCL Control has developed the **SENTINEL SuperCap-PS**, product, which consists of a bank of capacitors with a useful life of 100,000 charge-discharge cycles, which has been updated to house a solar cell within the box to charge the capacitors and to incorporate an intrinsically safe power supply of different voltages (5V, 7.2V, 12V, 15V, 20V) to fit the power requirements for many wired and wireless devices currently in the market. This solution has a large number of advantages and benefits.



## DESCRIPTION

The **SENTINEL SuperCap-PS** is a bank of super-capacitors designed to be charged from solar panels and to deliver backup power to the devices and instrumentation. The bank of capacitors is fed from either internal or external solar panel that is used to charge the capacitors during day time. The energy stored by each bank of supercapacitors ranges from 600 mWh to 800 mWh depending on the model, which is enough to deliver backup power during night time to loads from 32mW to 45mW with external solar panel (>3W) and up to 18 mW (with internal solar panel) of average power consumption for a period of 16h. The voltage output is 12V. Additional bank of capacitors can be paralleled to store more energy if needed.

The **SENTINEL SuperCap-PS** can be fitted in an explosion proof enclosure suitable to be installed in a Class 1 Div. 1 (ATEX zone 1) hazardous location, and also there are models available to be installed in an IP66 plastic enclosure for non hazardous locations.

Three cable entries are available for field wiring. Also one magnetic switch is included to power ON/OFF the output without opening the enclosure. The **SENTINEL-SuperCap-PS** is typically used to power wireless devices installed outdoor where sun light is available, eliminating the need of batteries and the associated cost of replacing the batteries, as the capacitors do not degrade significantly with the number of charging/ discharging cycles.





## FEATURES

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Suitable to be installed outdoor/indoor (IP66 enclosure).

Models available to be installed in Hazardous locations where flammable gas is present (Class 1 Div. 1 or Atex zone 1).

Powered from solar panels.

Up to 100,000 charge/discharge cycles.

Possibility of arranging banks in series or parallel to provide more energy storing capacity and/or output voltage.

Intrinsically safe output voltages.

Dual output voltages.

Short circuit protected output.

Suitable to be powered from intrinsically safe solar panels.

## TYPICAL APPLICATIONS

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Deployment of solar powered wireless and battery less sensors and Remote Terminal Units (RTU) for data acquisition and control for industrial plants in general.

Implementing wireless Fire and Gas detection system for outdoor installation.

Level monitoring and alarming in tank farms.

Well heads control and supervision for Oil & Gas.



## INSTALLATION OPTIONS

Different installation options are available to provide maximum flexibility and performance, as shown in the following figures.

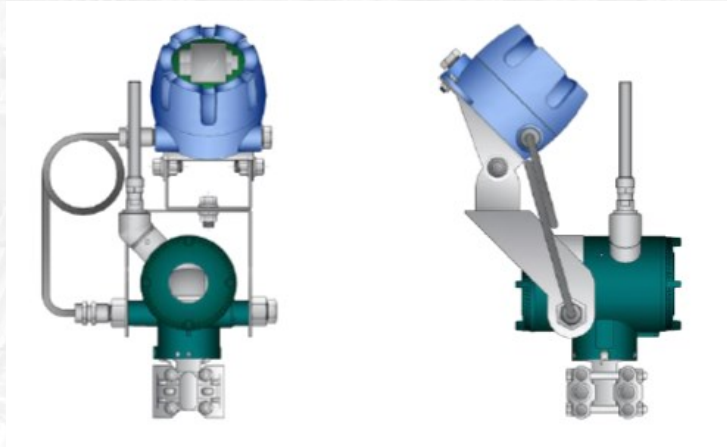
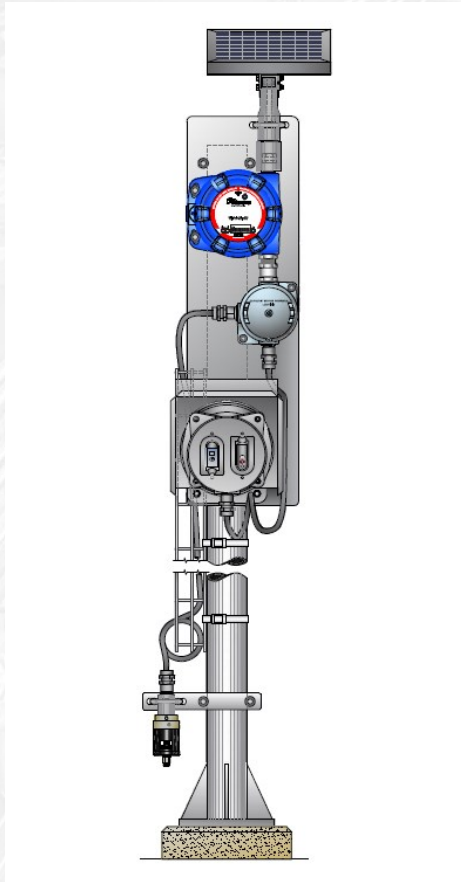


Figure 1.- SuperCap with internal solar panel to replace 7.2V lithium battery pack for wireless transmitters.

In the case of Figure 1, the bank of supercapacitors with an internal cell is used to power an ISA100.11 wireless transmitter that typically uses 7.2V non-rechargeable lithium batteries, which must be replaced in ranges from a few months to 1 or 2 years depending for data publication frequencies of 5s. With the **SENTINEL SuperCap-PS** with internal cell, the use of batteries in outdoor applications can be eliminated since it is capable of supplying 7.2V (the same voltage as lithium batteries) and has an intrinsically safe source which guarantees replacement of the transmitter in case of fault in zones classified C1D1 (Zone 1). As part of the solution, an adapter is provided that fits internally in the same battery receptacle and which is connected to the **SENTINEL SuperCap-PS** through a cable, for which an adaptation of the ISA100.11 transmitter encapsulation must be made for the cable entry. With this solution, an uninterrupted source of power to the ISA100.11 transmitter can be achieved in places with nights duration of up to 16 hours and with transmitter data publication times of up to 3s, even in periods of cloudy days. The whole arrangement can work in C1D1 (Zone 1).

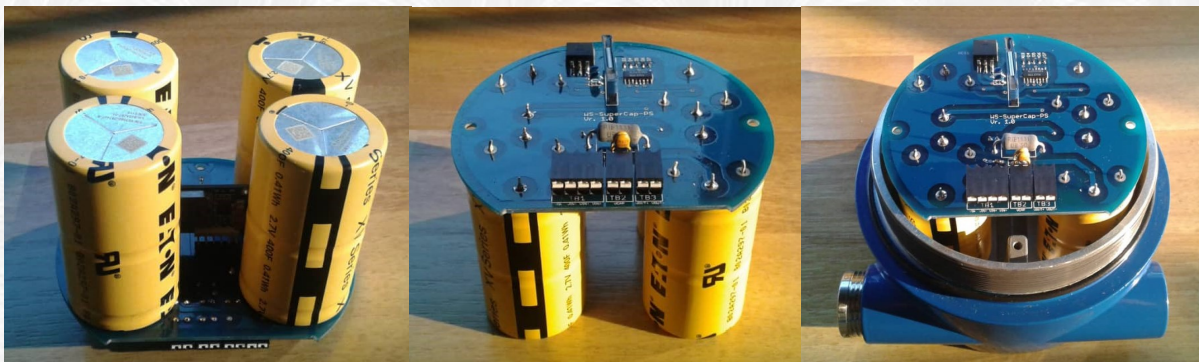


The arrangement shown in Figure 2, can be used, among other applications, for the deployment of fire and gas detection systems in outdoor environments. In this case, each Sentinel RTU can be connected to an energy efficient gas and fire detector.

The entire arrangement is powered by a 5W solar panel suitable for C1D2, which charges the bank of Supercapacitors to provide power to the system at night. The RTU, capacitor bank, and F&G detectors can be located in areas classified as C1D1.

Figure 2.-SuperCap with external solar panel to power the Wireless Sentinel RTU + low power instrumentation.

## SUPERCAPACITORS VIEW





## More information:

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