



# PowerOasis Controller (D)

## Product Specification



### Use smart generator-battery management to cut diesel usage by 50% or more and reduce site OPEX for generator powered base stations

There are over 400,000 diesel generator powered base stations around the World, with this figure expected to increase by 50% over the next four years. Although renewable power installations will accelerate during the same period, to replace or supplement generators, diesel consumption and generator management will continue to present significant opex challenges to mobile network operators.

Most of these diesel generators are typically running at inefficient 20% to 30% loads, which results in generator damage and increased servicing costs. By intelligently integrating the generator with a battery bank, the PowerOasis Controller (D) is able to run the generator for shorter periods at optimum loads in order to charge the battery, which in turn powers the telecoms equipment. The benefit is reduced wear and tear, increased generator lifetime and less frequent service intervals. Furthermore, diesel consumption can be reduced by 50% or more, leading to further OPEX savings.

The PowerOasis Controller (D) provides pro-active diesel generator control, which differs from conventional reactive generator management products by including predictive algorithms to determine when to activate or de-activate the generator. Rather than triggering generator run-time solely on the battery state of charge, it combines multiple triggers from sensors and intelligence gathered from many site elements.

Designed specifically to provide high availability power for base stations, the PowerOasis Controller (D) includes full status and alarm monitoring through tight integration with the PowerOasis Manager remote management system, which also provides parameter monitoring, reporting and re-configuration of system operating parameters.

#### Features at a glance

- Intelligent generator management to optimise engine load, runtime and service life
- Sophisticated battery management to maximise power storage and extend lifetime
- Fuel level metering to measure diesel consumption and detect theft or contamination
- Upgrade path to solar and wind renewable power
- Most generators and deep cycle batteries supported
- Optional weather sensors and weather data logging to predict suitability for adding renewables
- Optional smart meter interface for a/c power consumption measurement
- Optional rectifier control for battery charging, set point control and state of charge monitoring
- PowerOasis Manager remote monitoring, control and measurement via SMS, GPRS or backhaul



## Smart Generator Management

The PowerOasis Controller (D) intelligently integrates diesel generators with a battery bank to optimise generator run times and provide power to the telecoms equipment. Multiple factors are considered when determining when to run the generator including:

- Battery state of charge
- Quiet periods
- Maintenance run requirements

13 different generator starter types are supported as standard with additional types available on request.

## Smart Fuel Management

Diesel is a significant operating expense requiring efficient management. The PowerOasis Controller (D) includes a number of fuel management features including:

- Fuel level metering and consumption measurement to aid in determining the correct number of refuelling truck rolls
- Fuel density measurement to detect deliberate or accidental fuel contamination such as dilution following theft
- Fuel level jump alarm, which indicates a leak or theft from the on-site fuel tank

## External Interfaces

The PowerOasis Controller (D) includes a range of interfaces to provide flexible, expandable interconnectivity, including:

- 8 off opto-isolated discrete inputs
- 8 off relay SPDT outputs rated at 30V DC/4A
- 8 off opto-isolated 12-bit analogue inputs
- RS485/MODBUS for sensor interfaces
- RJ-45 10/100 Base-T Ethernet for backhaul, external modem or engineering terminal connection

The use of the MODBUS standard provides interfacing capability to a wide range of industrial sensors.

## Smart Battery Management

Deep cycle batteries are utilised to store energy between generator runs and to provide power to the telecoms loads. Battery lifetime is dramatically influenced by state of charge management, which must adhere to the manufacturer's recommended charging profile if battery lifetime is to be maximised.

In addition to conforming to state of charge requirements, the PowerOasis Controller (D) integrates with rectifiers to protect batteries from repeated high depth of discharge and over charging via configurable low and high voltage thresholds.

## Smart Remote Monitoring

The PowerOasis Controller (D) is fully supported by the PowerOasis Manager remote monitoring system to provide remote management via SMS/GPRS modems or over the backhaul. The various monitored parameters include:

- Generator alarms
- Generator fuel level
- Battery conditions
- Power consumption

Authorised users can also modify the system configuration such as alarm thresholds, and generator runtime variables.

## Optional Features

The PowerOasis Controller (D) supports a number of optional features that are enabled by providing the appropriate sensors, including:

- Weather monitoring and recording, which can be used for renewable equipment dimensioning and to build the business case for upgrading to solar and/or wind power
- Upgrade path to incorporate renewable power sources
- Smart meters to accurately record grid power consumption for sites connected to unreliable grids
- Rectifier control to leverage a rectifier's battery management features

