



## Modular48

Modular DC Power system  
for telecoms and hybrid  
applications



### Overview

The Modular48 is the Controllis cost effective, high efficiency DC power system designed specifically for telecoms and hybrid applications. The Modular48 can be configured as a standalone DC genset, or as a hybrid power system complete with air conditioned battery bank and renewable energy inputs, or as a compact dual DC generator solution.

### Key Benefits

- Low capital cost – lower than equivalent AC generator and rectifier systems
- High efficiency DC design - reduces fuel consumption compared to AC based systems
- Full remote monitoring and control – reduces maintenance and site visits
- Low fuel level, fuel theft, low oil level and generator fault reported to any mobile device as standard
- Live streaming telemetry data reported to any mobile device as standard
- Fault notification via SMS, email android, iOS as standard
- High security with hidden hinges and secure lock boxes
- DC Air conditioned and insulated battery cabinet
- Optional mains input with optimisation of mains and solar
- Optional solar and wind power inputs
- Optional 500 litre and 1100 litre integral tanks
- Optional Controllis Smart 2 Channel Low Voltage Disconnect system

### Comprehensive Remote Monitoring and Control

All Controllis DC generators utilise the Controllis Remote System Controller Hybrid Management Unit (RSC-HMU). The RSC-HMU monitors and manages a wide range of critical engine and fuel system parameters as well as generator site security. The RSC-HMU communicates directly to the Controllis Remote Management Server (RMS) which provides comprehensive configuration, alarm management and delivery. The RMS integrates into any telecom operator's NOC via SNMP or MOD/TCP-IP.

The Controllis Remote System Controller Hybrid Management Unit (RSC-HMU) interfaces back to the Controllis Remote Management Server via its internal 9 Band UMTS/GPRS modem, via any other IP interface or a RS485 interface available on site.

The RSC-HMU undertakes multiple management functions in the Controllis DC generators, including:

- Auto generator start management based on the 48V and 12V battery charge levels
- DC charging management for all battery chemistries
- Battery condition management
- Genset voltage control
- Time of Day load sharing for multiple generator sites
- Electronic engine speed control based on demand from the load
- Lubrication system monitoring & reporting
- Cooling system monitoring & reporting
- Optional Filter conditions monitoring & reporting
- Optional Fuel system monitoring & reporting
- Oil Level monitoring and reporting
- Engine and environment temperature monitoring & reporting
- Recording engine hours and maintenance log
- Security monitoring & reporting
- Unauthorised system movement detection
- Geographic location reporting
- Video monitoring of generator site
- Remote communications and monitoring of solar PV and other renewable sources
- The flexible design of the RSC-HMU allows additional bespoke monitoring functionality to be easily added.

## Battery Protection

All Controllis DC generators have been specifically developed to provide a safe and controlled solution for charging DC battery banks. The system monitors battery voltage, battery temperature and load current, and uses internal battery charging algorithms to provide the correct amount of voltage and current into the battery bank for the given conditions.

Controllis developed algorithms control the engine speed 50 times per second to vary the voltage to the appropriate level. In addition to the software control there are built-in hardware protection circuits that ensure the battery bank is never over-charged under any circumstances

## Fuel Saving

Controllis DC Generators have been designed to significantly reduce fuel consumption in site operation. These savings are accomplished by;

- The very high efficiency Controllis DCPrime Power® permanent magnet generator (PMG).
- Varying the engine speed according to site loads, therefore lowering fuel consumption by producing only the precise amount of power demanded at the deployment site.
- Mounting the DCPrimePower PMG directly on the engine fly wheel, negating the need for couplings or bearings.

The fuel savings for a typical site load compared to a modern correctly sized AC Generator and rectifier are usually between 20% and 25%. For smaller site loads hybrid operation using a battery bank can reduce fuel usage by up to 70% compared to a traditional AC installation. On sites suitable for solar and/or wind renewables a Controllis hybrid solution can reduce annual fuel usage by up to 90%.

## Highly scalable and protected battery

The Modular48 has an internal, scalable lithium ion battery capacity of up to 100 kWh. As the system is monitoring the battery charge, discharge and temperature parameters Controllis are able to offer industry leading warranties for our battery systems. The battery enclosure can be cooled (as required) by either single or dual 500W or 1000WDC air conditioners which are remotely monitored.

## Renewable Energy Integration

All Controllis DC generators integrate easily into renewable energy solutions. The Modular48 can be supplied with optional 48V solar PV charging controllers for up to 15 kW of solar capacity. The solar controllers are integrated with the Controllis RSC-HMU via MODBUS to provide full remote visibility of the entire system including solar output and battery status. For certain panel types the Modular48 is able to individually monitor their performance and report the results to the RMS. This enables easy identification of damaged or shaded panels.

When power demand is not met by the solar output or the energy stored in the battery bank, the Modular48 generator automatically activates and takes over the battery charging and site load role until the renewable source can again provide sufficient energy to meet site needs. The Modular48 generators can be integrated with other renewable systems including wind power and micro hydro-power.

## Durable Cost Effective Construction

The Modular48 enclosure is constructed using durable powder coated zinc plated steel.

The Modular48 standard sound level at 7m is less than 60dB. If ultra low noise levels are required the Controllis Quiet48 range of DC generators has a sound level of 50 dBm at 7m.

## Warranty, Support and Finance

All Controllis DC generator systems are sold with a comprehensive multi-year warranty on parts and labour. At the end of the warranty period there is an option to purchase an extended warranty. Controllis provide comprehensive support and training during the installation and commissioning phase of new deployments. After installation we provide 3rd tier support to your system managers on an as required basis. For large deployments we can arrange financing to qualifying companies.

As a direct customer of Perkins Engines our customer also benefit from in territory support from the Perkins Global Product Support Network.

## Modular48 Specifications

<b>Power Output</b>	7kW to 24 kWDC 48-57V
<b>Voltage Ripple</b>	<10 millivolts RMS
<b>Engine</b>	Perkins 1,100cc or 1,500cc engines
<b>Fuel</b>	Options for Diesel, LPG, natural gas, biogas and bioethanol
<b>Built in Hybrid Remote Power Controller</b>	Auto Engine Start Electronic Throttle Control 48V Intelligent Charging System 12V Intelligent Charging System Battery Temperature Monitoring Fuel Level Monitoring and Reporting Oil Level Monitoring and Reporting Optional Oil, Fuel and Air Filter Condition Pressure Drops Coolant Temperature Oil Temperature Environmental Temperature Exhaust Temperature
<b>Communications</b>	Ethernet & RS485 with built in LTE /UMTS /GSM (see Remote System Controller datasheet for full details)
<b>Internal Battery</b>	Up to 100 kWh, Lithium-ion
<b>Optional Internal Fuel Tank</b>	1,100 litres
<b>Corrosion Protection</b>	All external components are powder coated aluminium or zinc plated steel
<b>Paint</b>	Oven Baked Polyester Powder Coated
<b>Colour</b>	Standard RAL7035 (Other colours optional)
<b>Noise Level</b>	Less than 60dBa at 7m standard enclosure
<b>Environmental Operating Temperature</b>	-40C to +55C
<b>Internal Insulation</b>	Class O fireproof acoustic foam
<b>Enclosure Outdoor Rating</b>	IP54, NEMA 3R
<b>Vibration Isolation</b>	Anti-vibration mounts built in
<b>Dimensions (LxWxH)</b>	Generator or Battery Box Module: 146cm x 120cm x 173cm Fuel Tank Module: 298cm x 120cm x 53cm Dual Module with Tank: 298cm x 120cm x 226cm