

Microgrid Control System

FLEXIBLE YET COMPREHENSIVE

Our Microgrid Control System (MCS) manages sources and loads towards cost optimised and uninterrupted energy delivery from both grid-connected and islanded local distribution networks (microgrids). The MCS solution consists of:

- ✓ industry-leading supervisory software that offers a comprehensive control and prioritisation solution,
- ✓ flexible hardware that can easily be configured to measure / control at any point within the distribution network,
- ✓ reliable controller to extender communication via IP based networking across meshed WiFi or wired ethernet,
- ✓ flexible third-party device communication via modbus over RS485,
- ✓ powerful monitoring and configuration capabilities via local touchscreen Human Machine Interface or internet portal.

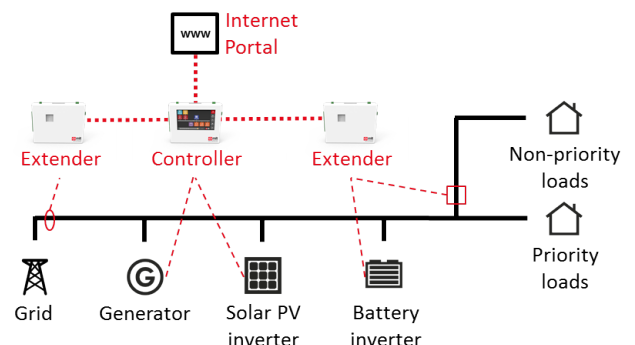


Typical Applications

Where the microgrid is grid-tied

Where the utility supply is too small, the MCS offers the customer an alternative to the costly upgrading the utility supply. In the example on the right, the MCS controls the shedding of non-prioritised loads, starting of generators and battery inverter export, optimised according to the customer's requirements (e.g. lowest energy cost or minimum inconvenience).

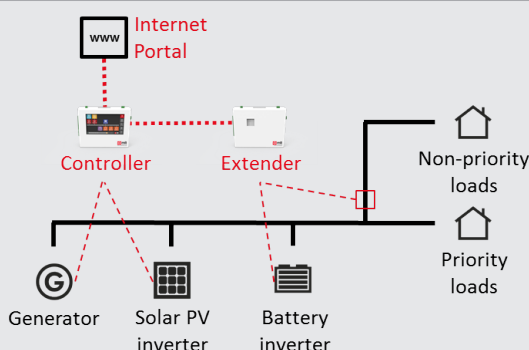
The MCS adds further value through controlling the PV output to prevent export into generators, and can be configured to utilise the battery inverter for time-of-use energy trading where this makes financial sense.



Where the microgrid is isolated

In an off-grid application, the MCS can control towards reliable and uninterrupted energy delivery through for example the controlled shedding of non-priority loads, or the timely starting of generators based on battery state-of-charge info.

In microgrids with renewable energy sources the MCS can ensure that the generator is optimally loaded by controlling the export of renewable power (assuming that the renewable inverters allow such control). The MCS can also protect the generator against reverse current from renewable sources, by controlling the inverter generation limit.



Physical Connections



GND
FEEDBACK 1
GND
FEEDBACK 2
GND
FEEDBACK 3
GND
FEEDBACK 4
GND
FEEDBACK 5

RELAY 1 - C
RELAY 1 - NC
RELAY 1 - C
RELAY 2 - C
RELAY 2 - NC
RELAY 2 - NO
RELAY 3 - C
RELAY 3 - NC
RELAY 3 - NO
RELAY 4 - C
RELAY 4 - NC
RELAY 4 - NO

ANALOG OUT +
NOT CONNECTED
ANALOG OUT -

NOT CONNECTED
VOLTAGE L3
NOT CONNECTED
VOLTAGE L2
NOT CONNECTED
VOLTAGE L1
NOT CONNECTED
NEUTRAL

SUPPLY L
SUPPLY N

CURRENT 3 -
CURRENT 3 +
CURRENT 2 -
CURRENT 2 +
CURRENT 1 -
CURRENT 1 +

Example Projects Designed by MLT

Kagga Kamma Lodge, Cederberg

Offgrid 24/7 energy supply system, prioritizing PV energy, then battery up to specified state of charge, then diesel generation, with non-essential load shedding when peak capacity is about to be exceeded.

Installation partner: MLT Drives, 2012

Load size: ~100kVA

Hotel Verde, Cape Town

Grid-tied PV and wind generate directly into customer's load, with export limiting optional. Seamless fail-over to PV and batteries for essential loads when the grid falls away.

Installation partner: MLT Drives, 2013

Load size: ~300kVA

Silverlands, Namibia

Due to regular load shedding the backup generators at this site run often. The DieselSaver controls the output of several PV inverters for optimal diesel generator lifespan and fuel saving.

Installation partner: MLT Power, 2016

Load size: ~200kVA

Verdun farm, Ceres

Constrained grid supply contributed to the client requesting a MCS-based solution that controls a grid-tied diesel generator, dynamically limits PV export, and sheds loads when required to manage the peak demand as seen by the utility.

Installation partner: Treetops Solar, 2017

Load size: ~300kVA



Specifications

Dimensions	230mm (l) x 170mm (w) x 50mm (h)
Mounting Method	Panel Mounted
Ingress Protection	IP20
Power Supply	230Vac, 50Hz
Signal Inputs	3 x Vac (330Vac maximum) 3 x Iac (5.8Aac maximum) 1 x 0-10V / 0-20mA input
Signal Outputs	1 x DAC out (0-3.3V)
Digital Inputs	5 x inputs
Digital Outputs	4 x relay outputs - rated switching current: 5A (NO) / 3A (NC) - rated switching voltage: 250Vac / 30Vdc
Comms	TCPIP over Ethernet / WiFi Modbus over RS485 / UART-TTL MCS limited to 1 Controller and 31 Extenders
Local Human Machine Interface	MCS Controller: 7inch touchscreen MCS Extender: LCD display
Remote Monitoring	via MLT Inverters portal

Components:

- MCS Controller (FG-MG-AA)
- MCS Extender (FG-MG-AB)
- MCS Site License & Config Assistance (FG-MG-AC)
- WiFi connection (FG-RC-CE)
- WiFi antenna (FG-RC-CG)
- 3G connection (FG-RC-CA)
- IP65 enclosure (FG-MG-AD)
- Annual Remote Monitoring & Control Subscription (FG-MG-AF)

Local Distributor / Installer
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