
MPPT Solutions
from
Micha Solar

# Introduction

The **Micha Solar MPC-MPPT** range is designed to provide flexible and cost-effective solutions to end users requiring more than basic MPPT charge regulation.

Two controller cabinet types are available -a simple 'all-in-one' controller, and a flexible, high-power controller for systems requiring multiple component parts and sophisticated Load distribution.

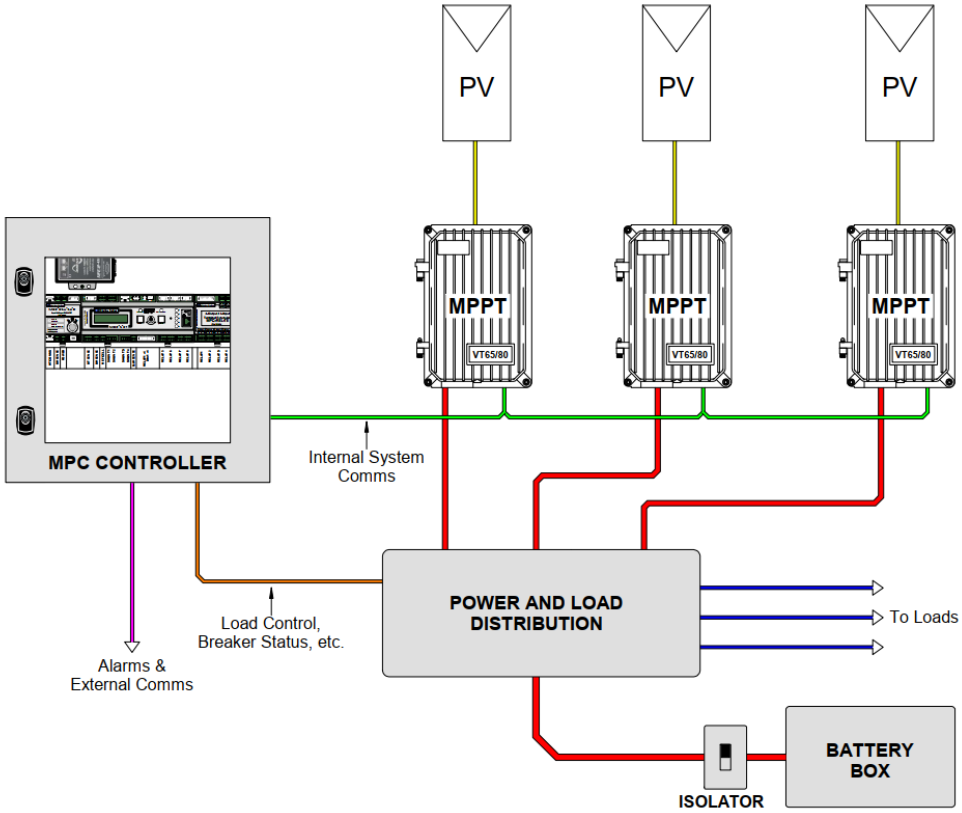
At the heart of the control cabinets is the **MPC-S-01**, a high-level programmable energy management controller, dedicated to industrial off-grid solar systems utilising Maximum Power Point Tracker (MPPT) technology. The MPC-S-01 is design to work directly with Studer's VT65 and VT80 controllers, with the VT65 available in an IP65 certified enclosure.

Designed to provide high performance and reliability, it is the first of a new generation of controllers from Micha, and includes many new features, including on-site software upgrades and datalogging via a USB memory stick, plus built-in RS485 and Ethernet connectivity. 12V, 24V and 48V system voltages are available.

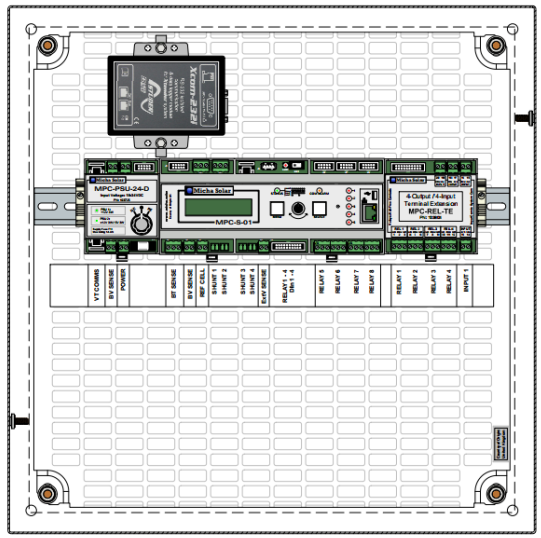
**MPC-S-01 Standard Features**:

- 2 x 16 Character LCD Display
- Rotary switch for fast and easy setting and selection
- Dedicated 'Common Fault' Indicator plus 5 User-configurable Alarm Indicators
- Built-in Sounder (use is optional)
- Automatic System Voltage Sensing
- Remote Battery Voltage Sensing
- Remote Battery Temperature Sensing and compensation.
- Reference Cell (Pyranometer) Input
- External Voltage Sense
- Four User-configurable Shunt Inputs
- Four Digital Inputs with User-configurable Functions
- Eight User-configurable VFC Relay Outputs. (At least one is required for any Load switching.)
- USB memory Stick for Data Logging and Software Upgrades
- RS485 and Ethernet Ports with MODBUS connectivity
- Expansion port for adding addition modules, including signal relay outputs, additional digital inputs, programmable 4-20mA outputs, etc.

# Type 1 MPC Control Box for Distributed Power Systems




INTERNAL VIEW



Typically housed in a 500mm x 500mm Painted Steel enclosure with optional window, the Type 1 offers a cost-effective control box with all available features. Alternative enclosure types can include Stainless Steel 304 or 316L, and GRP, with all versions rated to IP66.

A window in the enclosure door can be included to allow easy viewing of the controller and system status without the need to open the door.

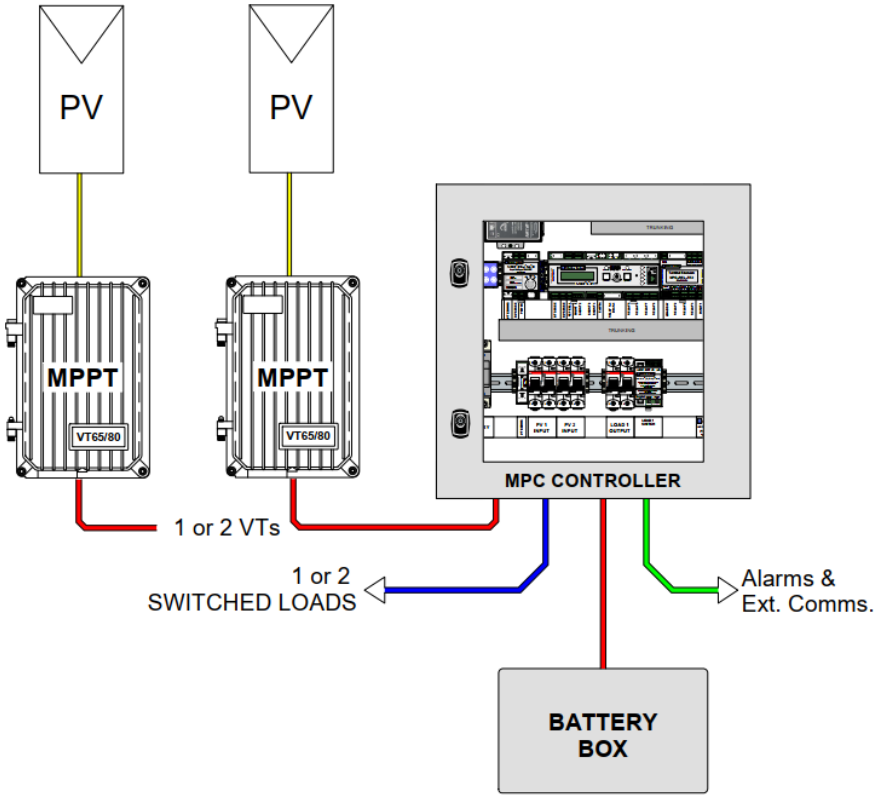
Nylon, Nickel-Plated Brass and SWA cable glands can be supplied with gland machining to suit.

With Type 1, all power connections are routed efficiently from up to 15 MPPT regulators directly to the Power and Load Distribution Box, with the MPC-S-01 providing control, monitoring and communications with both the separate elements of the system and remote equipment, such as an RTU. No high-power cabling is made to the MPC Controller.

Each MPPT can provide up to 65A-80A of charging power, allowing for the design of high-capacity systems, limited only by the practicality of handling high currents in the Battery Breaker Box. The ability to include more VT controllers than may be immediately necessary allows for added redundancy for ultra-reliability.

Custom versions with extra modules to provide additional relay outputs can be manufactured to order, with a range of plug-in expansion modules available. These include additional signal relay outputs, digital inputs, 4-20mA Transducers, Latching Alarm Indicators, Earth Fault Monitoring and an Array Anti-Theft Loop module.

# Type 2 MPC Control Box for small Stand-Alone Systems

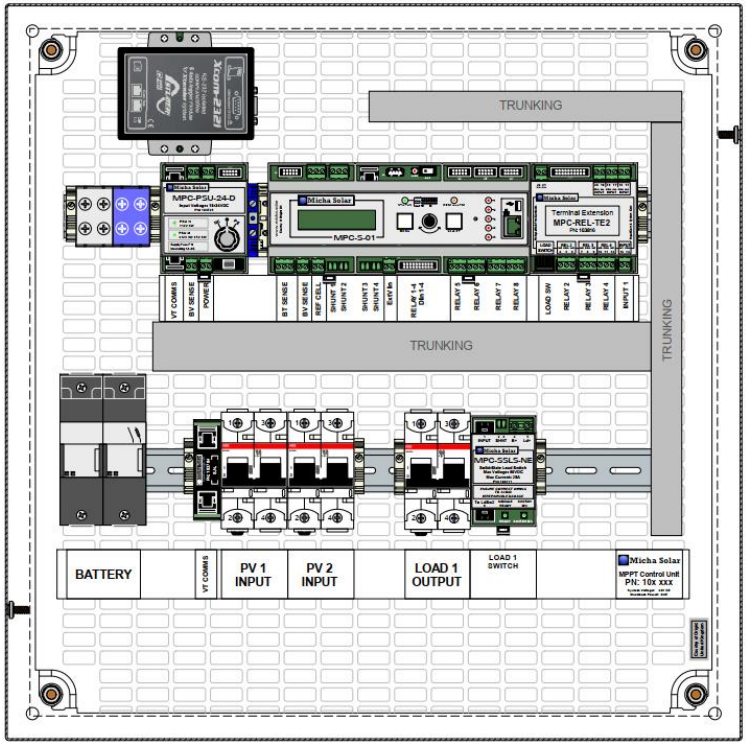



One or two Studer VTs can be connected directly to the MPC Type 2 Control Box, which can also incorporate one or two Load switches. Protective breakers are fitted to the PV and Load, with an optional fused isolator for the Battery connection.

With a current handling capacity of 65A-80A per VT, maximum power in excess of 7kW can be obtained, depending on the system voltage.

A maximum total Load switching of 100A can be achieved with one or two individually programmable load switches, rated at 25A, 50A and 100A.

To keep the Type 2 cost-effective, limited customisation will be available with restrictions dependent on available space within the cabinet.

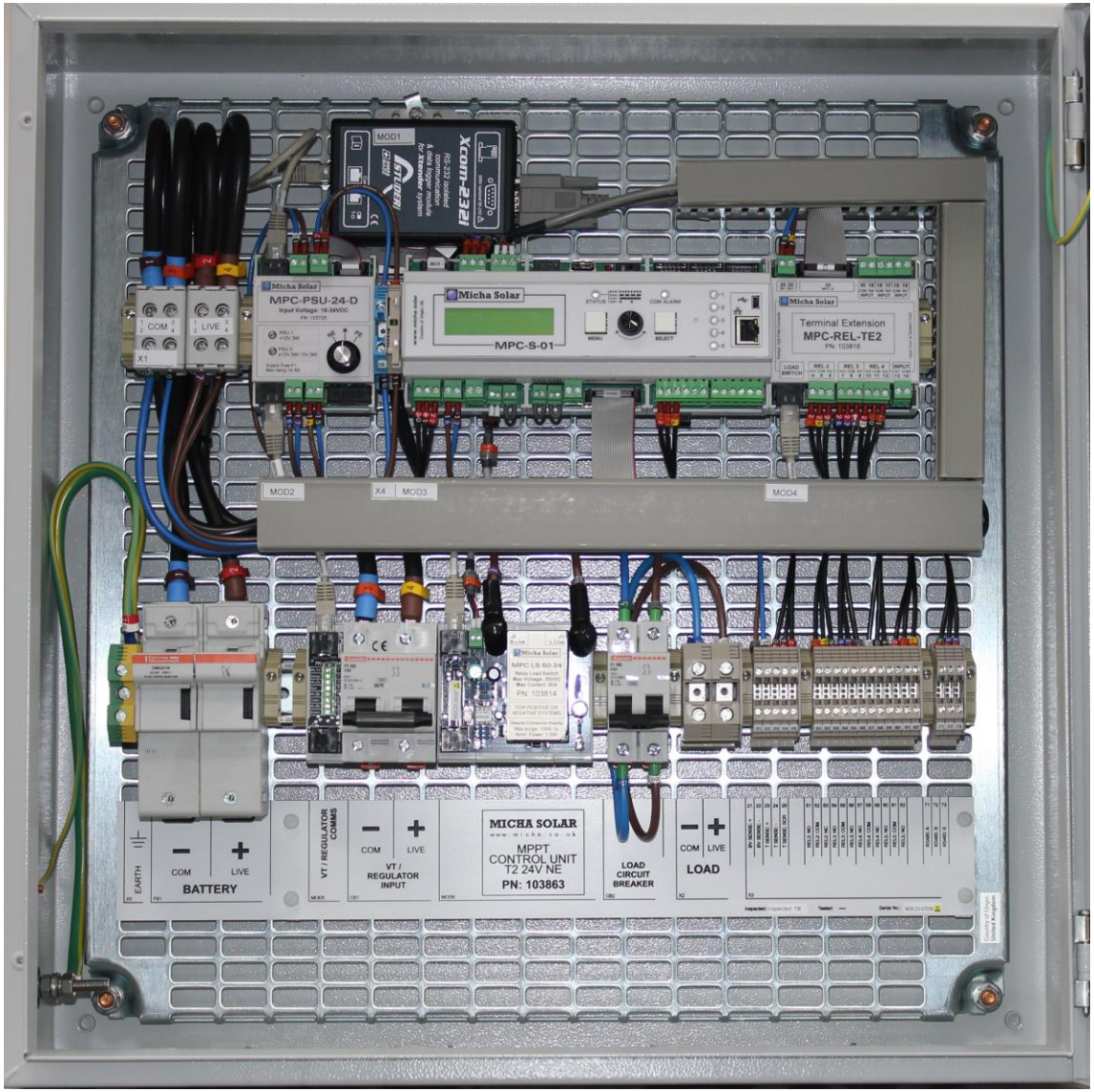



Typically housed in a 600mm x 600mm Painted Steel enclosure with optional window, the Type 2 can be supplied with single or dual PV inputs, and with one or two loads rated at 25A or 50A. 2 Pole MCBs protect the PV and Load connections, and the Battery connection is typically made to a fused isolator.

Alternative enclosure types can include Stainless Steel 304 or 316L, and GRP, with all types rated to IP66. A window in the enclosure door can be included to allow easy viewing of the controller and system status without the need to open the door. Nylon, Nickel-Plated Brass and SWA cable glands can be supplied with gland machining to suit.

**Examples**

**PN 103863**: MPC-MPPT Controller Type 2 24V with single VT input and single 50A Load. Enclosure: 600 x 600 x 200mm Painted Steel IP65



**PN 103864**: IP65 MPPT Regulator: Single VT65 with optional 2P MCB on PV input and communication breakout PN 103819.

Enclosure: 600 x 400 x 200mm Painted Steel (IP65) plus 40mm depth of heatsink on rear.



Micha has developed an IP65 solution for housing the Studer VT65, allowing no derating for heat dissipation using a unique method of heat transfer. Independently tested and certified IP65. Also available in Stainless Steel, with or without optional protection on PV input and Battery output.

## MPC-S-01 / MPPT Controller Specifications and Features

**Ratings:**

**Maximum Charging Power:** 15 x VT80: Nominally 1,200A at 12V, 24V, 48V

**Maximum Load Switching:** Limited only by switching components

**System Voltages:** 12V, 24V, 48V

**IP Rating:** Up to IP67

**Operating Temperature:** -5°C to + 55°C ambient. (Most components rated to +80°C operating temperature.)

| Features: | Standard | Expansion | Comment |
|---|---|---|---|
| LED Indicators | 6 | - | Common Alarm, plus five user programmable |
| LCD Display | 1 | - | 2 x 16 Alphanumeric Display |
| Audible Alarm | Yes | - | Use is optional |
| Switched signal relays | 8 | Up to 24 in total | User programmable functions, volt-free changeover contacts |
| Digital Inputs | 4 | Up to 12 in total | User programmable functions, including custom labels |
| Pyranometer Input | 1 | - | Can be used in conjunction with reference cell |
| Voltage Sense Inputs | 2 | - | One for remote Battery Voltage Sensing |
| Temperature Sense Input | 1 | - | Can be used for Temperature Compensation, with 3 user programmable alarms |
| 4-2mA Outputs | - | Up to 4 in total | User programmable functions |
| Shunt Inputs | 4 | - | User programmable, Charge/Load |
| Communication/Monitoring | MODBUS | - | Available on RS485 and Ethernet ports |
| Datalogging | Yes | - | Status logged every 60s on USB memory stick, limited only by memory size |
| Load Control | 2 | - | User programmable, with separate pre-warning function |
| Battery Voltage Alarms | 6 | - | User programmable, 3 High Voltage and 3 Low Voltage |
| Configuration | - | - | Pre-configured settings file can be uploaded from USB memory stick |
| Software upgrade | Yes | - | Software upgrades can be installed from USB memory stick |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| *Document History* | *Version* | *Date* |
|---|---|---|
| *First release* | *1* | *24-Jan-2023* |
| *Updated photographs* | *2* | *30-Jun-2023* |
| *Addition of general specifications* | *3* | *28-Dec-2023* |