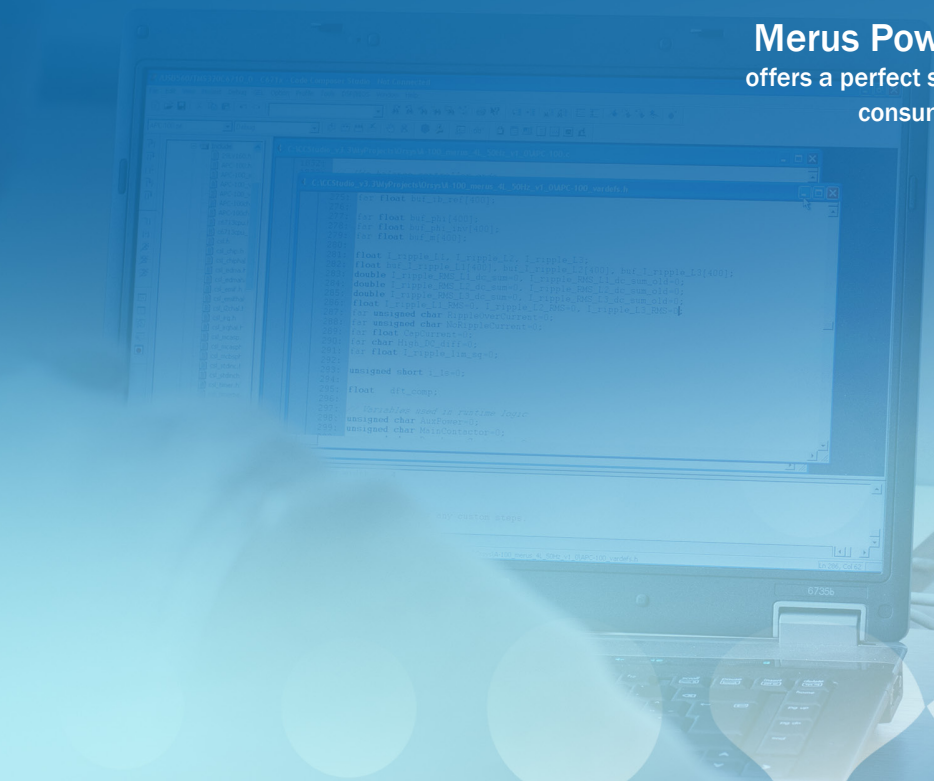
MERUS POWER

# Merus Power M-Series
# - Active Harmonic Filters



## Merus Power M-Series Solutions

offers a perfect solution for power producers and consumers to meet the grid challenges

## Merus Power Dynamics

has the solutions for power quality and energy saving, for both industrial and commercial applications. Dynamic reactive power compensation and harmonic filtering solutions form the core of our product offering – everything aimed at saving energy and improving power quality.

### Harmonics and power quality

Power quality is commonly defined as the power grid's ability to supply a clean and stable power flow as a pure sinusoidal wave form that should remain within specified voltage and frequency tolerances. In today's electrical networks, deviations from these ideal conditions are frequent due to increasing non-linear and other loads disturbing the grid.

### Merus Power M-Series STATCOM solutions

Merus Power M-Series STATCOM is a very reliable solution at a competitive investment cost for heavy industries, wind and solar farms as well as for electric utilities. Use of advanced 3-level IGBT technology makes it swift in detecting and responding to grid disturbances. Built on proven and fast Modular Controller Concept (MCC) design, M - Series STATCOM delivers superior performance for flicker and harmonic mitigation, voltage balancing as well as dynamic reactive power compensation in heavy industries, grid stability and connectivity challenges.

Scalability and smaller physical foot print make it a preferred solution when flexibility is needed. It is equipped with sophisticated and powerful SCADA based multi-lingual HMI which offers improved visibility and timely operative actions even from remote location.

## Customer Challenges

- Instability of the power system
- Reduced energy efficiency and system availability
- Electrical and electronic equipment damages
- Overheating of cables, motors and transformers
- Damage to controllers and sensitive equipment
- Tripping of circuit breakers
- Capacitor overloading and degrading
- Excitation of network resonance
- Premature aging
- Utility requirements for grid connection not achieved

**Advanced Power Quality Solutions**

## Direct savings

- Improved energy efficiency
- Increased capability of power transfer
- Reduced power losses in transformers, bus bars and switchgear
- Availability of additional production capacity
- Tariff savings in reactive power
- Capital expenditure savings via correctly dimensioned equipment

## Indirect savings

- Compliance with demanding grid codes
- Prevents damage and premature aging of equipment
- Avoidance of loss of production, data and work due to unplanned stoppages

## Communications and monitoring

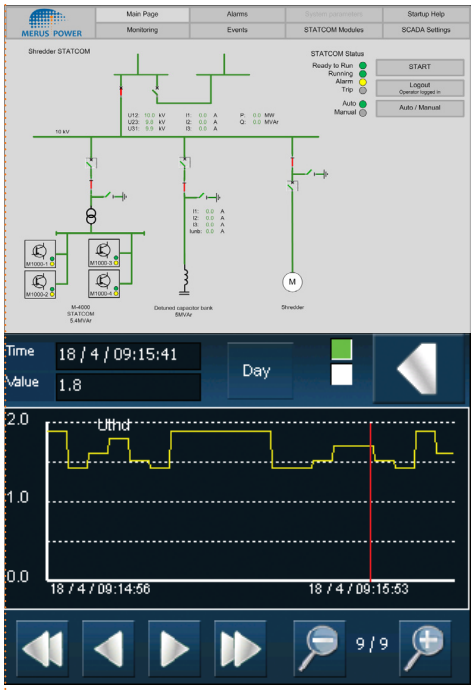
The Merus Active filter user interface has been designed for smooth and easy operation of the device. The needs of an operator or engineer working on the device as well as the requirement for remote access and monitoring of the system are all integrated into the design of HMI. It is an efficient tool in the commissioning and setting of parameters and configuration.

Systems with several devices, or even hybrid systems that include active filters and conventional reactive power compensation, can be managed with one HMI. The monitoring and reporting features and optional remote access help the user to get optimal benefits and return on the active filter investment.

Advanced communications enables the features to be integrated to factory and substation SCADA systems.

## Powerful UI features

- *Merus M-Series is equipped with modern easy to use 3,5" touch screen display.*
  One touch navigation in the system enables quick and easy access to essential functions of the system
- *Efficient commissioning*
  The menu structure and procedures have been designed to support logical steps of commissioning procedures.
- *Selectable reporting*
  The reporting parameters can be easily customized to those of the greatest interest for each individual customer.
- *Monitoring and analysis*
  Monitoring and analysis tools utilize the graphical interface and enable quick visual monitoring of major operating parameters and access to history data.
- *Remote access*
  The remote access via internet or user preferred connection is available using stardard communication protocols. The remote access connection utilizes the same HMI software.
- *Multiple languages*
  HMI comes with multiple languages. English, Chinese, Russian, Spanish and German are available. Other languages are optional.

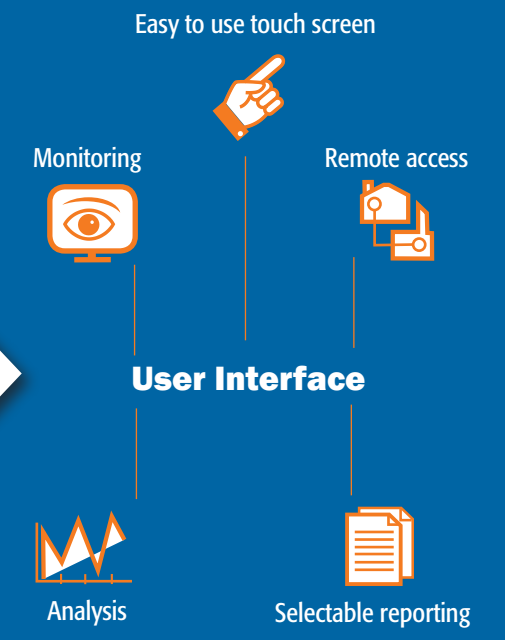



## Features and Highlights

- Fast and accurate performance
- True modularity with Cubicle and system design
- Realtime controller
- User friendly multi-lingual touch screen graphical HMI
- Advanced cooling design

## Applications

- Utilities with weak grid
- Steel Industry
- Oil and Gas
- Wind Farms and Solar Farms
- Waste and Waste Water Treatment Plant
- Automotive
- Crusher, Shredders, Conveyers in car, mining and other applications
- Heating, Ventilation and Cooling (HVAC) System
- Lifts and Port Cranes
- Pulp and Paper and Other heavy industries




## Customer Benefits

- Quick return on Investment
- Strict quality control ensures low maintenance cost and increase product life
- Robust performance meets regulatory standards
- Low operational losses (no mechanical breakers)
- High reliability and minimum losses due to advanced 3-level IGBT technology
- Integrated single solution for reactive power compensation, harmonic filtering, voltage balancing and regulation
- Redundant and flexible
- Easy to commission and use along with remote access option

## Application area of M - Series STATCOM

Large industrial motors are used in heavy industries such as waste water treatment plants, crusher and shredders, HVAC system, automotive plants, and pulp and paper, among the others. Such large motors, uninterrupted power supplies (UPS) and different kinds of rectifiers draw non-sinusoidal currents and cause problems such as voltage drop, flicker, voltage unbalance and voltage distortion.

Electric utilities along with wind and solar farms also face several power quality and grid integration challenges such as low voltage ride through (LVRT), localized voltage collapsing and limited power transfer due to weak grids. Proven technology of Merus Power M - Series STATCOM can effectively address these challenges. Long experience and customer-focus help us to design and propose optimal solutions to maximize savings with affordable investment costs.

## Technical Specification

| Model | M500 | M1000 |
|---|---|---|
| Nominal voltage | 690V ±10% | 960V ±10% |
| Performance | up to 31th harmonic, ITHD reduction 95% | up to 17th harmonic, ITHD reduction 95% |
| Nominal current | 420A | 820A |
| Nominal frequency | 50 / 60 Hz | |
| Nominal reactive power | 500 kvar | 1350 kvar |
| Topology | Three (3) wire | |
| Response time | << 1 ms / 1 cycle (selective mode) | |
| Switching frequency | 8 kHz | 4 kHz |
| Controller | Digital controller | |
| Operation modes | Harmonic: ALL / ALL but no fn / Selective, Voltage: Voltage and / or reactive power | |
| HMI | 3,5" touch screen, power quality monitoring and reporting functions | |
| HMI Language | En / Ger / Spa / Chn / Ru, other languages optional | |
| Communications | Ethernet / RS485, ModBus | |
| Dimensions | 1420 x 1100 x 2000 | 2120 x 2220 x 2150 |
| Weight | 1160 kg | 2180 kg |
| Cooling media | Air | Liquid |
| Power losses | < 3 % | |
| Ambient Temperature | 0...40°C, without derating | |
| Modularity | Parallel operation possible | |
| Noise | 70 dB | 80 dB |
| Protection degree | IP 21 | |
| Standards | IEC | |
| Altitude | 1000 m without derating | |
| Humidity | Maximum 95% RH; non-condensing | |
| Color | RAL7035, other colors on request | |
| Installation | Indoor, floor assembly, cable entry bottom | |

MERUS POWER

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