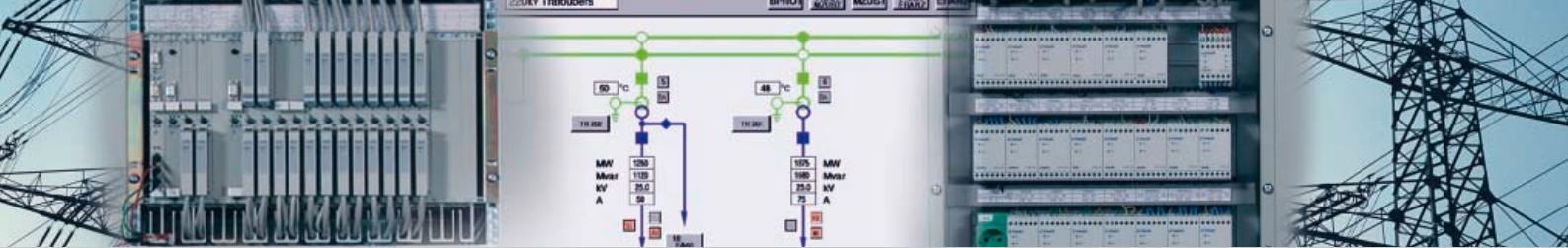




Power Distribution Control Systems
Field Units ME 4012 PA-F



ME 4012 PA-F Field Units



Universal Field Unit for the Use in High-Voltage and Extra-High-Voltage Switchgears

The automation technology for energy supply and distribution plants is rapidly advancing. New communication techniques and devices and standard protocol interfaces combined with the immense computing power of today's hardware components open the way to new concepts in distributed station automation. At the same time, the growing demands of utility owners for more cost-effective station control systems must be met.

ME 4012 PA-F is our solution for all aspects of distributed station automation in high-voltage and extra-high-voltage applications.

Whether as field unit or as switchgear interlock unit, due to its modular design the ME 4012 PA-F easily adapts to the specific task and the quantity of data to be processed.

IEC 60870-5 based information processing allows the assignment of quality characteristics to the process data items right at the source, which is a precondition for direct or indirect connection to existing or future network control systems.

Thus meets all requirements for the direct or indirect connection to existing and future power control systems.

The system's input and output modules are designed for the direct connection of binary signals of up to 220 V DC, the acquisition of secondary variables of current and voltage transformers (1 A, 2 A, 5 A or 100 V), as well as for the direct control of switching devices.

It is also possible to directly connect digital protection equipment using the system's two IEC 60870-5-103 interfaces.

A Secure Investment

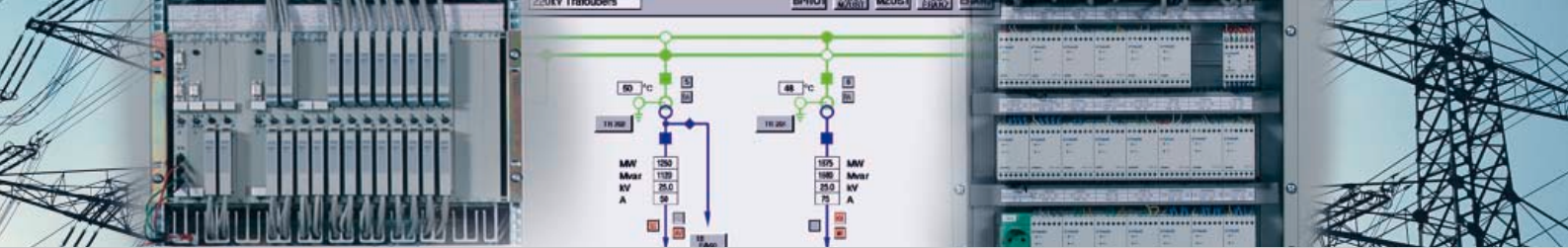
The system's future-oriented and platform-independent hardware concept based on embedded computer technology, a standard real-time operating system and Ethernet network capabilities secure your investment and guarantees long-term availability. Standard computer interfaces and data storage techniques as well as Web access to diagnostic information facilitate service and maintenance work and help plant operators to easily familiarize with the new ME 4012 PA-F.

Configuration Tool

ME-DRP-NLT is a software tool for the configuration of the ME 4012 PA system components. Offering customer-specific user interfaces, it allows the engineering of project and database management, parameter assignment and plant documentation. Well-proven standard function blocks that accumulate the know-how gained in numerous implemented telecontrol projects, form the basis of plant engineering with the ME-DRP-NLT design tool and facilitate the configuration of field and plant interlocking, automatic switching sequences and remote and local operator control sequences.

ME-DRP-NLT allows the possibility of allocating function blocks to primary plant objects, described as logic nodes in IEC 61850, paves the way for the development of a communication interface for IEC 61850 applications, which is planned for the future.





Local Operator Control with Touch-Screen Panel Computer

Communicating with the station LAN over an IEC 60870-5-104 connection or directly with the field unit provides the field control and monitoring functions.

Station LAN

Depending on the implemented concept single or redundant interfaces based on IEC 60870-5-104 connect the ME 4012 PA field units to the station bus.

In addition to process data from switching devices and serially connected protection equipment, the station LAN quickly and reliably transmits all interlocking and

configuration data as well as clock synchronization and system information.

Furthermore, this solution sets the stage for the implementation of IEC 61850.

Compatibility

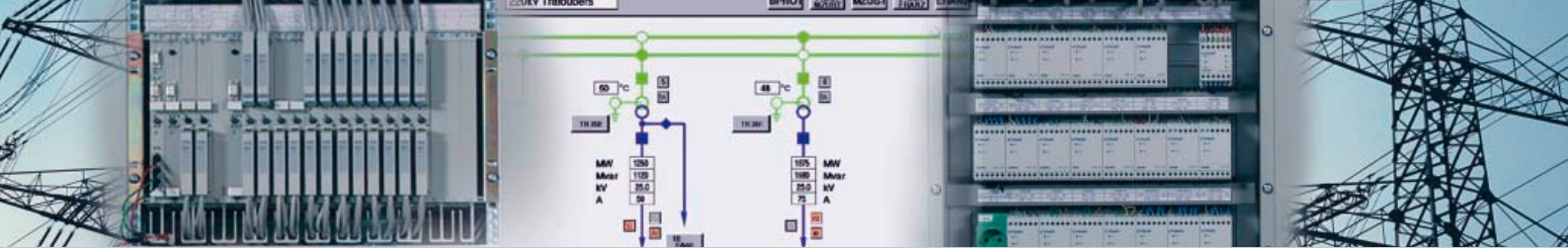
Smooth integration into the customers' existing and future station control systems using different station communication methods was a major aspect in the development of the ME 4012 PA-F system concept, the function units and the tools for configuration and parameter assignment.

For this purpose, a special coupler module is available ensuring a direct data exchange between the

ME 8012 SN system and the ME 4012 PA system.

Future station control systems will be based on station-internal communication via the Ethernet network. This will allow not only the data traffic via user-specific profiles of the IEC 60870-5-104 protocol, but also the integration of field units in the station LAN on the basis of IEC 61850 Part 8.





Integration of ME 4012 PA field units based on the IEC 60870-5-104 communication protocol in existing station control system concepts based on proprietary communication protocols (Mauell's solution)

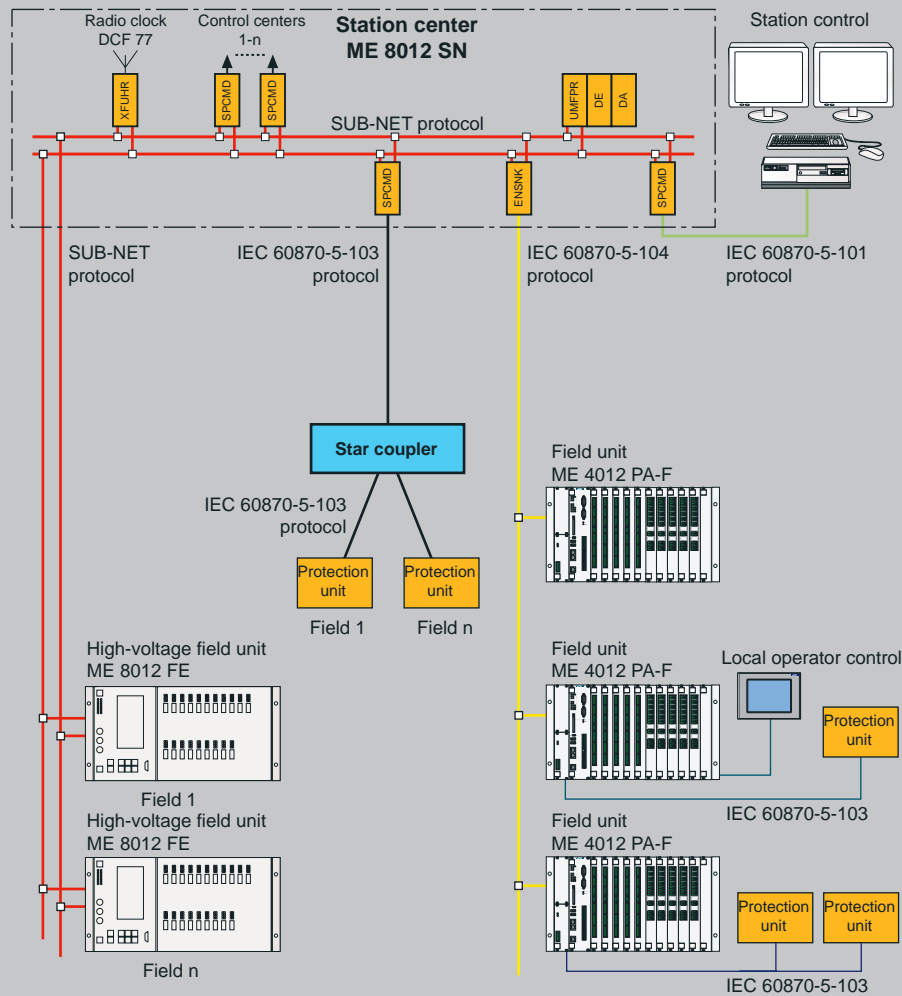
Main Features

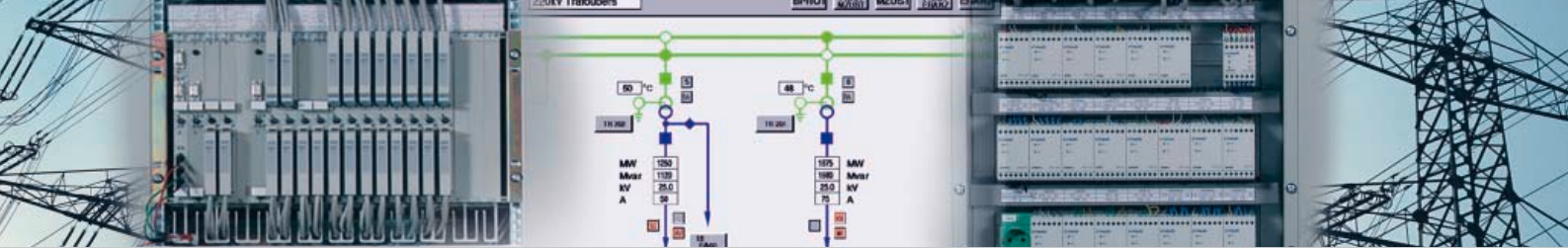
The station center as the centralized data collection unit distributes the process information to the control centers and implements plant-specific automation functions

Connection of distributed field units to the station center on the basis of the proprietary „ME 8012 SUB-NET protocol“

Connection of digital protection equipment to the station center by means of a centralized star coupler on the basis of the IEC 60870-5-103 protocol

System expansion by integrating ME 4012 PA field units based on the IEC 60870-5-104 protocol in the existing ME 8012 SN technology. The connection between the ME 8012 SN system and the ME 4012 PA system is implemented by means of a converter module installed in the station center.





Integration of ME 4012 PA field units in Ethernet-based station control system concepts using IEC 60870-5 communication protocols (non-proprietary solution)

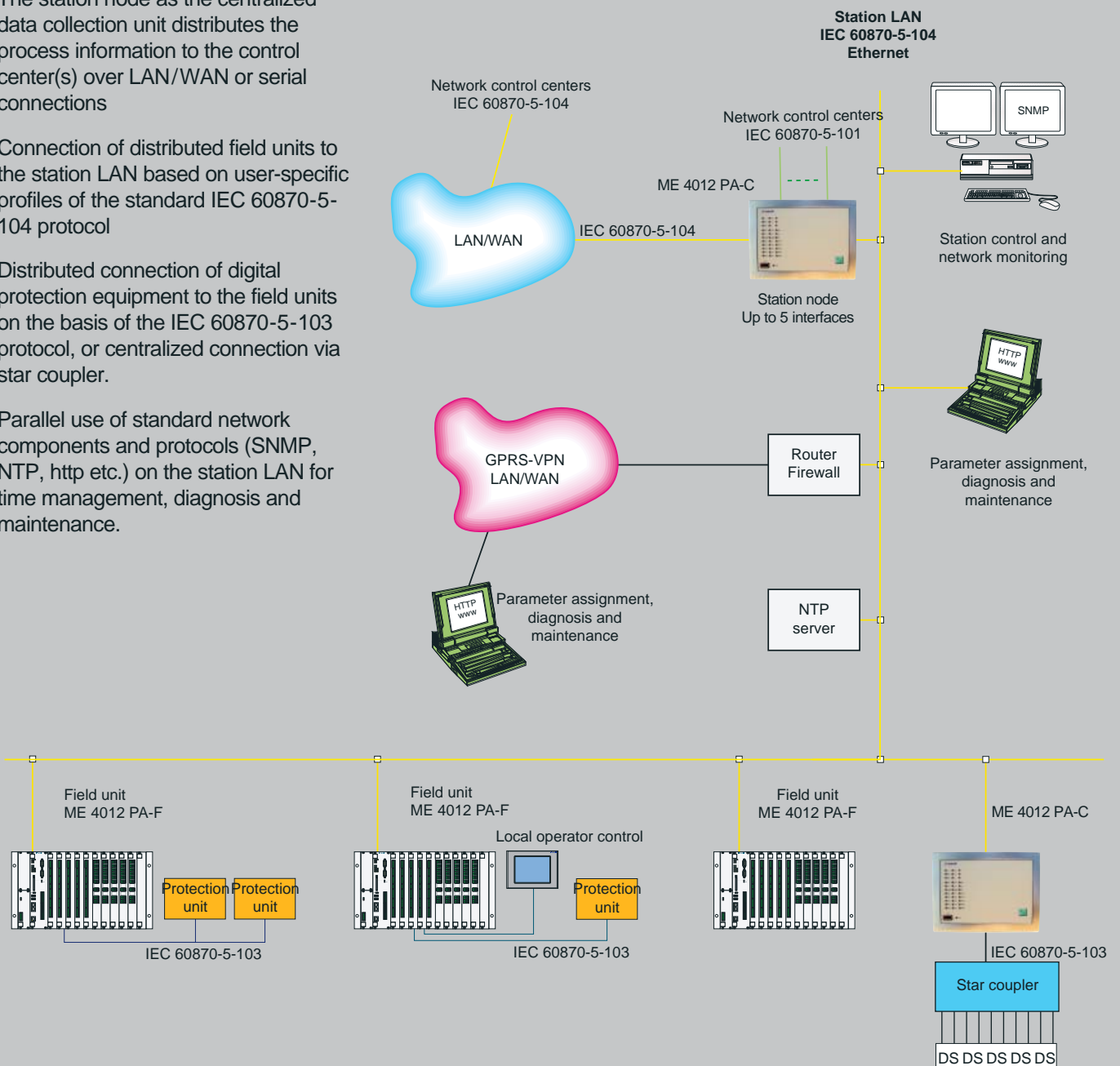
Main Features

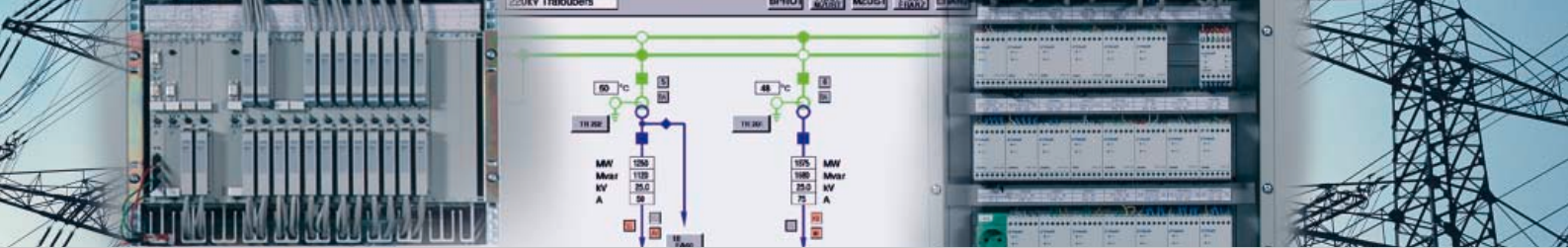
The station node as the centralized data collection unit distributes the process information to the control center(s) over LAN/WAN or serial connections

Connection of distributed field units to the station LAN based on user-specific profiles of the standard IEC 60870-5-104 protocol

Distributed connection of digital protection equipment to the field units on the basis of the IEC 60870-5-103 protocol, or centralized connection via star coupler.

Parallel use of standard network components and protocols (SNMP, NTP, http etc.) on the station LAN for time management, diagnosis and maintenance.





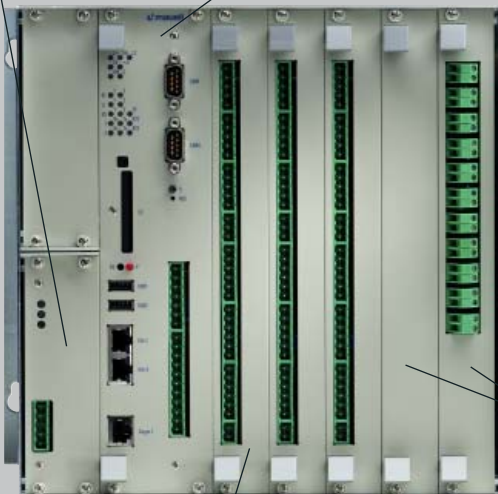
Features of the ME 4012 PA-F field units

Processing units Type BV000 GS51

- Parallel connection capability
- 220 VDC supply voltage

Processing unit Type VE706 AV01

- 2 serial interfaces IEC 60870-5-101/103
- 2 Ethernet interfaces IEC 60870-5-104
- 2 USB 1.1 interfaces, host
- CompactFlashCard 1 GByte max. (option)
- Integrated DCF radio clock (option)
- Hardware clock, 72 h reserve power
- Static/dynamic signaling concept
- 6 message inputs, 2 relay outputs
- Electronic output
- Status indication by means of LEDs



Subrack Type BT005 AS002

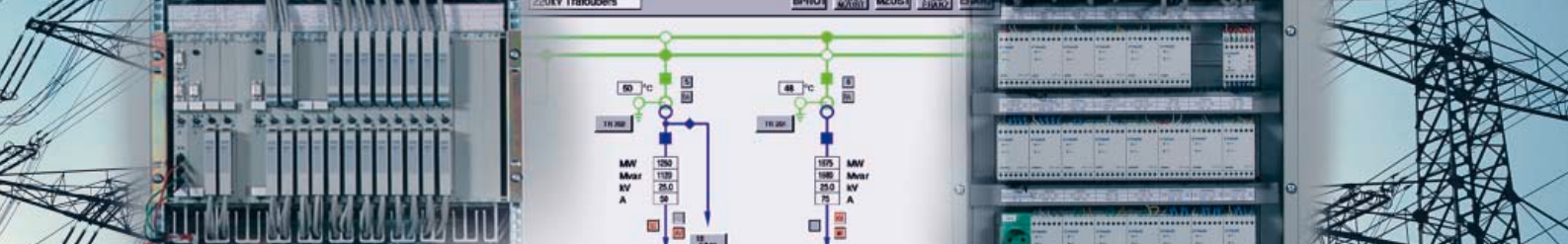
- Subrack with backplane bus

Direct measurement Type AD008 AP01

- 4 direct measurements $100 V_{\text{eff}}$
- 4 direct measurements $1/5 A_{\text{eff}}$
- 16-bit resolution
- Frequency and $\cos \varphi$ computation
- Measuring range up to $\pm 120\%$
- 2 slots

Signaling and control unit Type EA514 AP02

- 14 message inputs
- Signaling-circuit voltage 60 V DC or 220 V DC
- 6 command outputs, bipolar
- Switching voltage 220 V DC / 230 V AC
- Making capacity 1 000 VA
- Disconnection data 220 V DC; 50 VA inductive load



Technical Characteristics

Device type

ME 4012 PA-F field unit



Versions

BT-F-6HE-05P

BT-F-6HE-11P

Application

High-voltage and extra-high voltage

High-voltage and extra-high voltage

Design

Surface-mounting unit

19" flash mounting or 19" surface mounting

Number of I/O units

5

11

Expansion of I/O units

11

11

Number of I/O signals

42 messages, 8 measuring values,
18 commands

126 messages, 8 measuring values,
54 commands

Expansion of I/O signals

154 messages, 60 commands

154 messages, 60 commands

Connection

Binary signals

Plug-in terminals 2.5 mm² max.

Plug-in terminals 2.5 mm² max.

Analog signals

Screw terminals 2.5 mm² max.

Screw terminals 2.5 mm² max.

Dimensions (WxHxD)

300 mm x 266 mm x 208 mm

483 mm x 266 mm x 208 mm

Environmental conditions

Storage temperature

-40 °C to +70 °C

Operating temperature range

0 °C to +45 °C

Humidity class

F acc. to DIN 40 040, dew not permissible

Electromagnetic compatibility

Noise immunity

DIN EN 61000-4-2:96-03

ESD: contact and air discharge, 8/15 kV

DIN EN 61000-4-3:97-08

EM-RF field, 10V/m

DIN EN 61000-4-4:96-03

Burst, 2 kV

DIN EN 61000-4-5:96-09

Surge: symmetrical/asymmetrical, 2/1 kV

DIN EN 61000-4-6:97-04

RF-inlet, 10 V

DIN EN 61000-4-8:96-02

Magnetic fields: perm. field/short duration, 30/100 A

DIN EN 50204:96-02

EM-RF field of digital mobile telephones, 10 V/m

Noise emission

DIN EN 0875-11:92

Radio interference, Group 1, Class A

Electrical safety

DIN EN 50 178:98-04

Condition requirements

IEC 255-5

Dielectric strength, Class 3

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