Isolated Power Planning Guide

System Options for Isolated Power in Healthcare Facilities

PROTECT PATIENTS AND STAFF

With isolated power solutions from the leader in electrical safety.

Standards such as NFPA 99 and CSA Z32 require isolated power systems in all areas deemed "wet procedure locations" in healthcare facilities. Isolated power systems offer an invaluable advantage - early detection of ground faults allows for critical systems to remain online in a single fault condition.

Bender isolated power panels provide isolated power to electrical systems in operating rooms and other critical care areas. Utilizing the latest in technology, Bender equipment ensures that electrical ground faults are detected and located fast and automatically, in compliance with the latest standards and code requirements.

Bender provides advanced electrical safety technology to the healthcare industry, including:

- The latest in line isolation monitoring technology, providing advanced warning of faults to help reduce downtime and increase operational efficiencies

- Supplimental alarms including transformer load, temperature, and voltage to mitigate risk of electrical shock and fire

- Branch location of ground faults, fast and automatically - locate faulty equipment while the system remains online

- Fast notification to facility staff with modern digital remotes and communication gateways to connect to Ethernet and Modbus networks

- Complete, modular panel solutions for ease of customization and installation

- Equipment designed in strict compliance with many electrical codes and standards, including NFPA 99, NFPA 70, CSA Z32, UL 1047, and more

SERVICES FOR ISOLATED POWER SYSTEMS

Bender Services offer a wide range of benefits to ensure optimal performance of your Isolated Power Systems including:

- Complete services for new Isolated Power Systems regardless of original manufacturer
- Training for hospital staff to ensure proper understanding, use & care of Isolated Power System
- LIM (Line Isolation Monitor) and accessory software updates (Software updates pertain only to qualifying BENDER manufactured equipment)
- Testing performed utilizing BENDER developed industry leading LT3000 test instrument
- Troubleshooting of alarms
- Electronic documentation provided as required by accredited agency compliance audits

- Comprehensive testing & evaluation for annual and bi-yearly testing required by NFPA 99, NEC & many accredited agencies
- Clear & comprehensive CMS (Centers for Medicare & Medicaid services) and TJC (The Joint Commission) documentation
- NFPA 99 and NEC compliant testing & evaluation of Isolated Power Systems
- Maintenance and/or retrofitting of obsolete equipment
- Specialized engineering services provided by factory trained and authorized technicians
- Nationwide coverage

Testing and evaluation of your Isolated Power Systems includes:

- Measurements of hazard current & calculations of system impedence
- Receptacle ground tension test
- Ground continuity testing
- Receptacle polarity verification

- LIM functionality verification via external fault testing
- Touch voltage verification of exposed metal surfaces
- Verification of panel circuit breaker terminal torques

BENDER's Isolated Power System (IPS) Panel

BENDER's LIM2010 Line Isolation Monitor

BENDER's LT3000, An industry-leading testing instrument

BENDER's LIM2010 is ideal for retrofitting applications regardless of the current LIM's make and model. For the majority of applications, no metal cutting is needed and simple instructions facilitate a fast changeover. Its automatic self-calibration, self-check and digital display allow for yearly performance testing as opposed to bi-annual testing for analog LIMs (per NFPA 99).

Basic Configuration
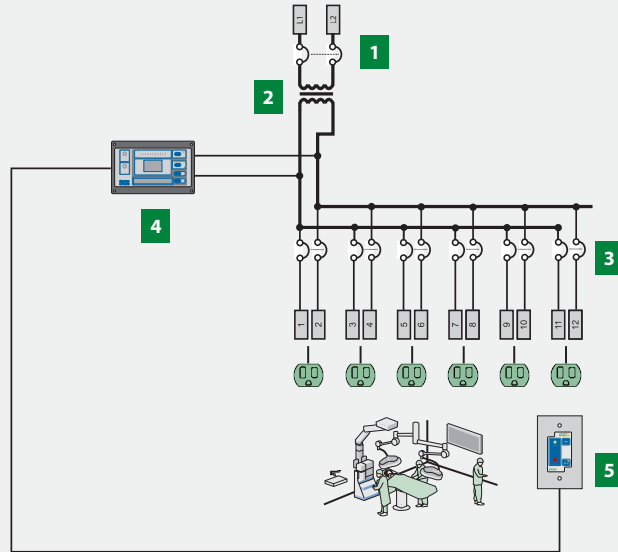## Includes required equipment for NFPA 99 compliance

Standard isolated power panel

MK2000P-G1 remote indicator

System notes:

- Minimum equipment required for compliance with NFPA 99

- Remote indication required when panel is not installed inside OR / ICU

Basic panel and system configuration

Key system components:

1 Primary circuit breaker

2 Isolation transformer

3 Secondary branch circuit breakers (provisionable up to 16 branches)

4 LIM2010 line isolation monitor

5 MK2000P remote indicator (with visual & audible indication, remote LIM test)

Panel configuration:

- Standard panel configuration
- One (1) LIM2010 line isolation monitor
- Provisions for up to 16 branch circuit breakers
- Options for built-in hospital grade receptacles & ground jacks
- Option for PLC controlled circuit lockout

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP

Additional equipment:

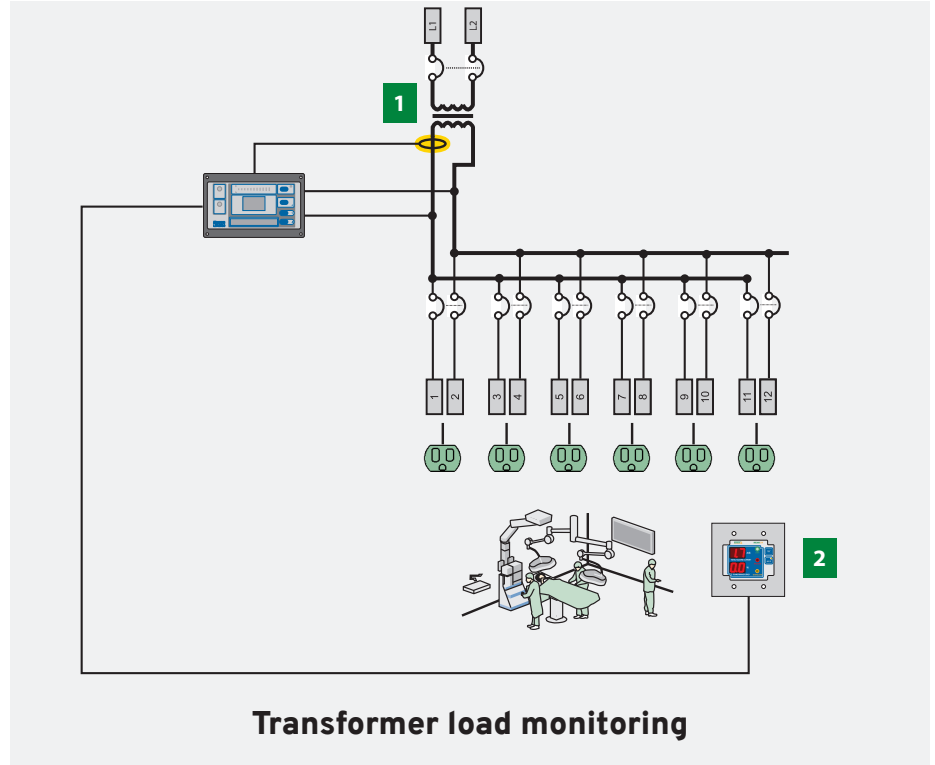- MK2000P-G1 remote indicator

Load Monitoring

Includes capability of monitoring transformer load

STW3 current transformer

MK2000CBM digital remote indicator

Transformer load monitoring

System notes:

- Adds capability of system load monitoring (for entire system)

- Load monitoring indicated on both LIM2010 and MK2000CBM remote

- MK2000CBM provides digital readout of both THC and transformer load

Key additional components:

1 STW3 load monitoring current transformer

2 MK2000CBM digital remote indicator

Panel configuration:

- Standard panel configuration with integrated system load monitoring

- Options for built-in hospital grade receptacles and ground jacks

- Option for PLC controlled circuit lockout

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA

- Backbox: B662408F

- Front trim: T6826R

- Interior: MIP10BASP-LM
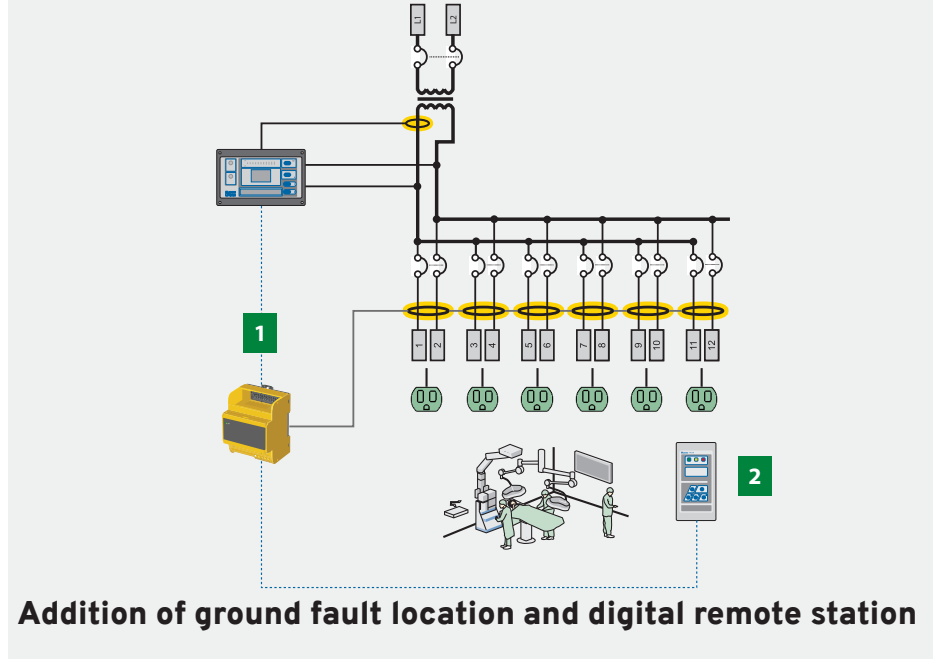
Additional equipment:

- MK2000CBM remote indicator

Branch ground fault location
Includes automatic indication of individual branches with ground faults

Fault location expansion kit

MK2430 remote indicating station
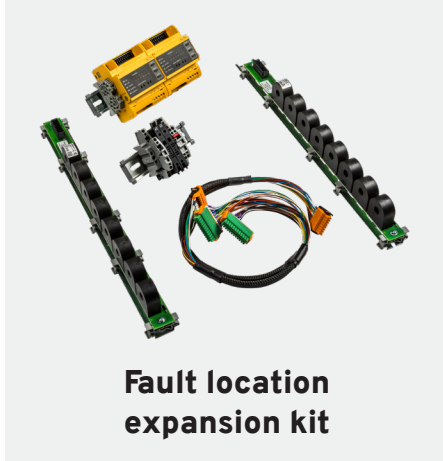
System notes:

- Automatic detection & indication of faulty branch circuit
- Digital display clearly shows faulty branch circuit
- Modular current transformer sizes allow for simple installation
- EDS module and current sensors can be built into the panel
- MK2430 remote provides alarm indication for both LIM and EDS module
- Simple RS-485 connectivity between LIM, EDS, and remote
- MK2430 can monitor multiple systems / panels
- Allows for future integration of other rooms and central nurses' desk monitoring

Addition of ground fault location and digital remote station

Key system components:

1 EDS441LNA-KIT-2 ground fault location expansion kit

2 MK2430 remote indicating station

Included in panel beyond standard:

- Fault location expansion kit containing evalator modules, current transformer modules, and hardware

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-LM-D42

Additional equipment:
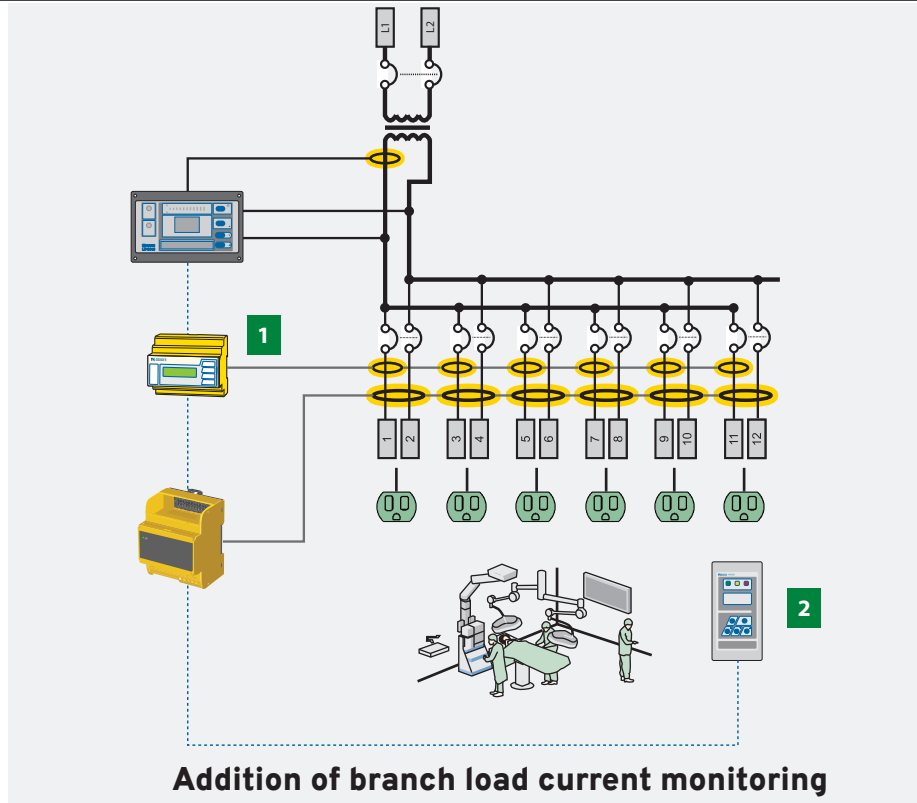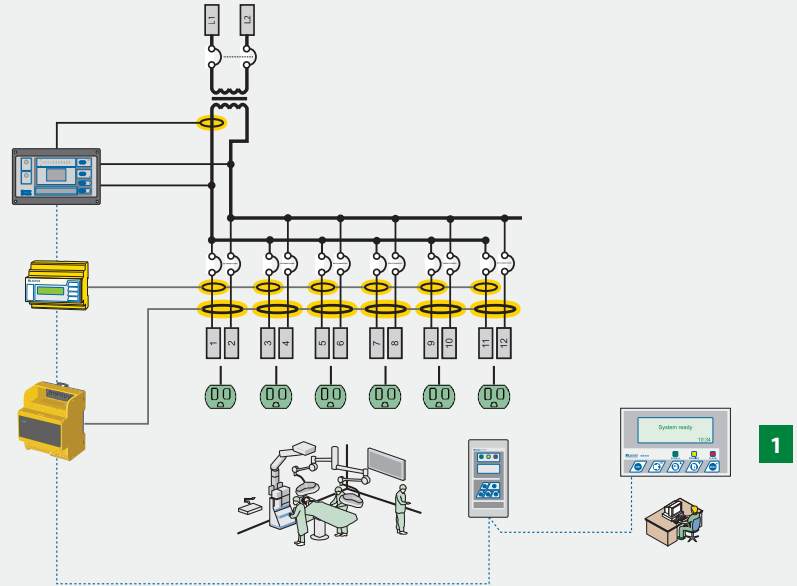
- MK2430 remote station

Branch load monitoring
Adds load monitoring for individual branch loads
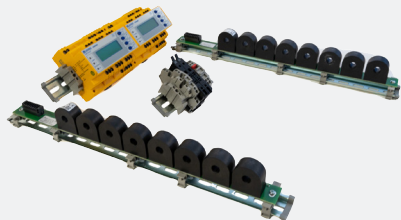
Branch current monitoring expansion kit

System notes:

- Automatically detects and alarms on overload for individual branches
- Displays load current values in real-time on digital display
- Integrates into RS-485 network with other equipment
- Load current alarms also displayed on MK2430 and MK800 remote stations
- CMS460 information made available on communication bus

Addition of branch load current monitoring

Key additional components:

1 CMS460-KIT load monitoring expansion kit

2 MK2430 remote indicating station

Included in panel beyond standard:

- Two (2) CMS460 load current modules
- Two (2) CTAC10/99 current transformer modules

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-LMC2-D42

Additional equipment:

- MK2430 remote station

Central monitoring station

Provides a central point for monitoring system alarms

MK800RS (as shown) remote station

Addition of central monitoring station at nurses' desk

Key system components:

1 MK800 remote station

System notes:

- All components connected by same two-wire RS-485 network

- MK800 provides large screen for notification of alarms for hundreds of systems

- Nurses' desk able to see alarms from multiple rooms and a central point

- Compatible with any panel type

Technician visualization & remote integration

Includes advanced technical visualizations & communication

Communication expansion kit

CP907 HMI Station

Addition of technician monitoring station for all systems

Key additional components:

1 COM465IP-KIT communication expansion kit

2 CP907 HMI Station

Included in panel beyond standard:

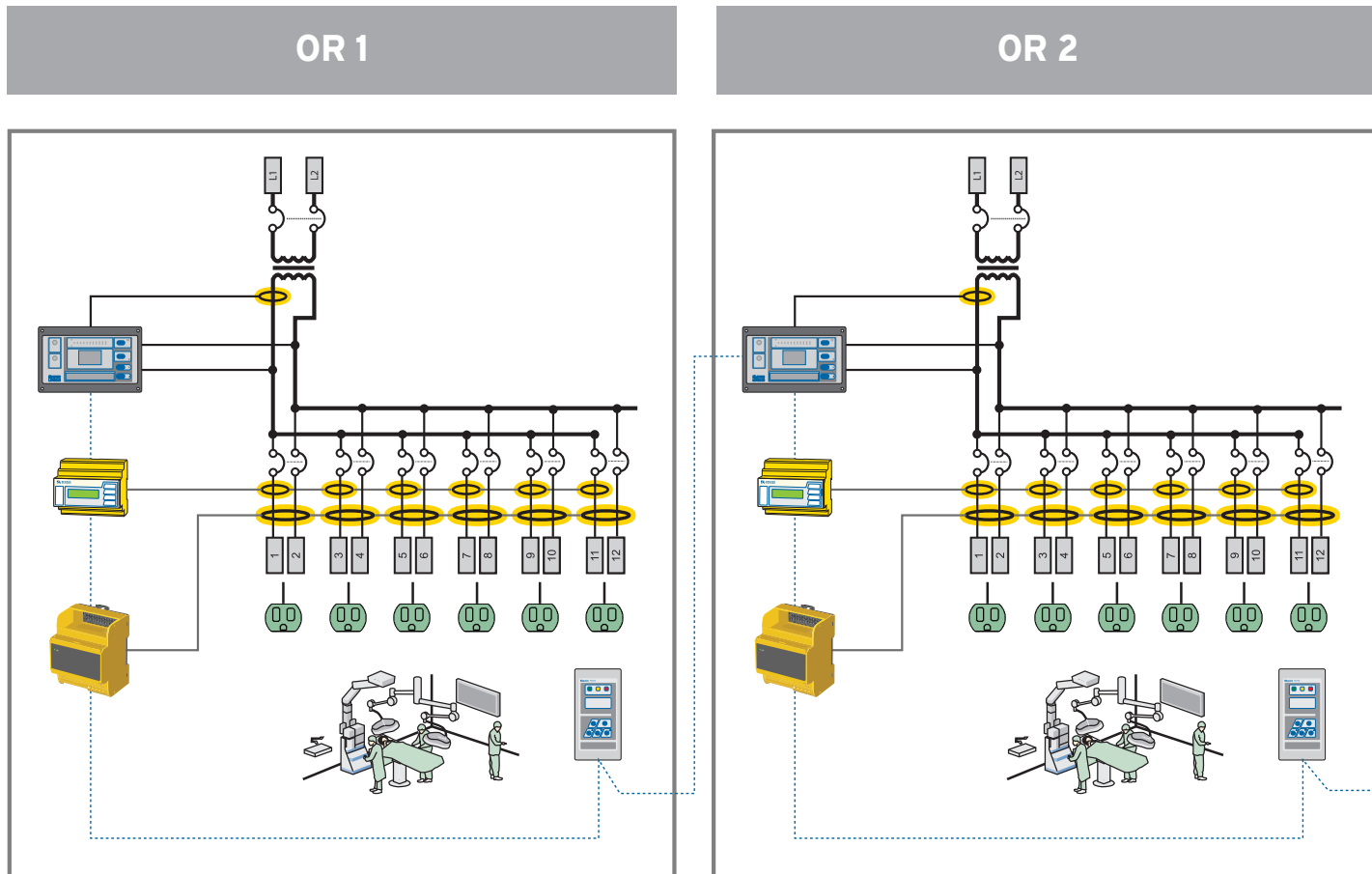- Communication expansion kit, including COM465IP gateway and hardware

Sample part numbers:
(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-GW-LMC2-D42

System notes:

- All components connected by same two-wire RS-485 network
- Technicians view all systems from a centralized point
- COM465IP provides centralized, browser-based interface for viewing device status
- COM465IP provides integration into building management systems via Modbus/TCP
- CP907 series station provides advanced touchscreen visualizations of system
- One COM465IP can view up to 99 device addresses; additional COM465IP modules can be connected to view additional devices.

Complete systems for multiple rooms

A complete solution for multiple operating rooms, centrally monitored

OR 1

OR 2

System notes:

- All systems connect to each other with simple, two-wire RS-485 network
- Nurses' desk monitors multiple systems from single location
- Integratable into existing Modbus/TCP networks
- Central visualizations for technicians and maintenance personnel for all systems
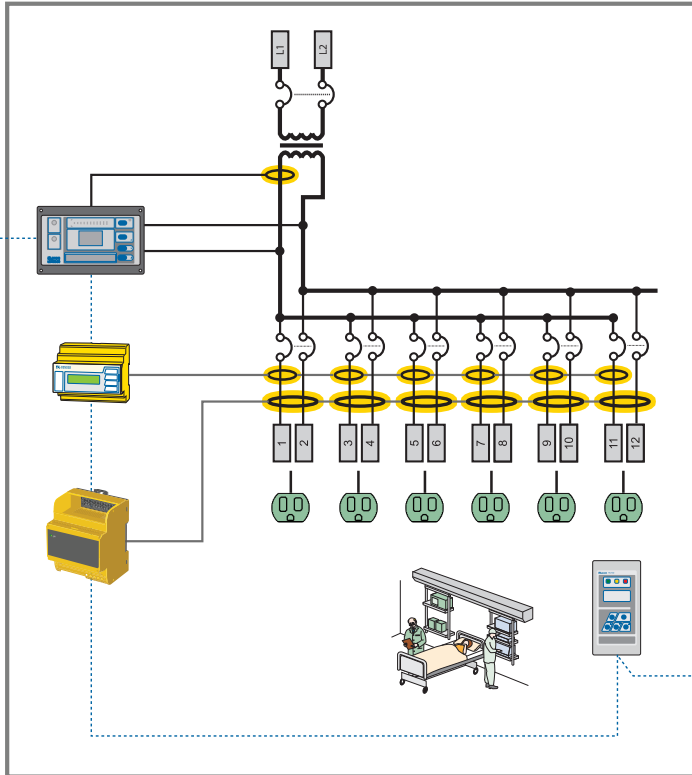
Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-GW-LMC2-D42

Other equipment:

- 3x MK2430
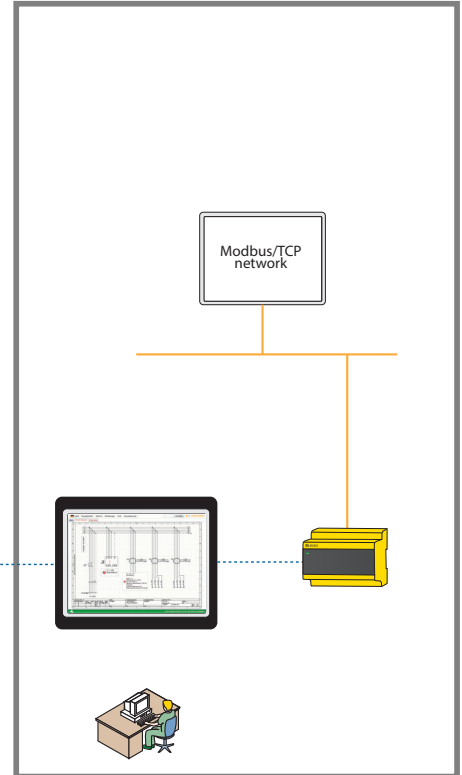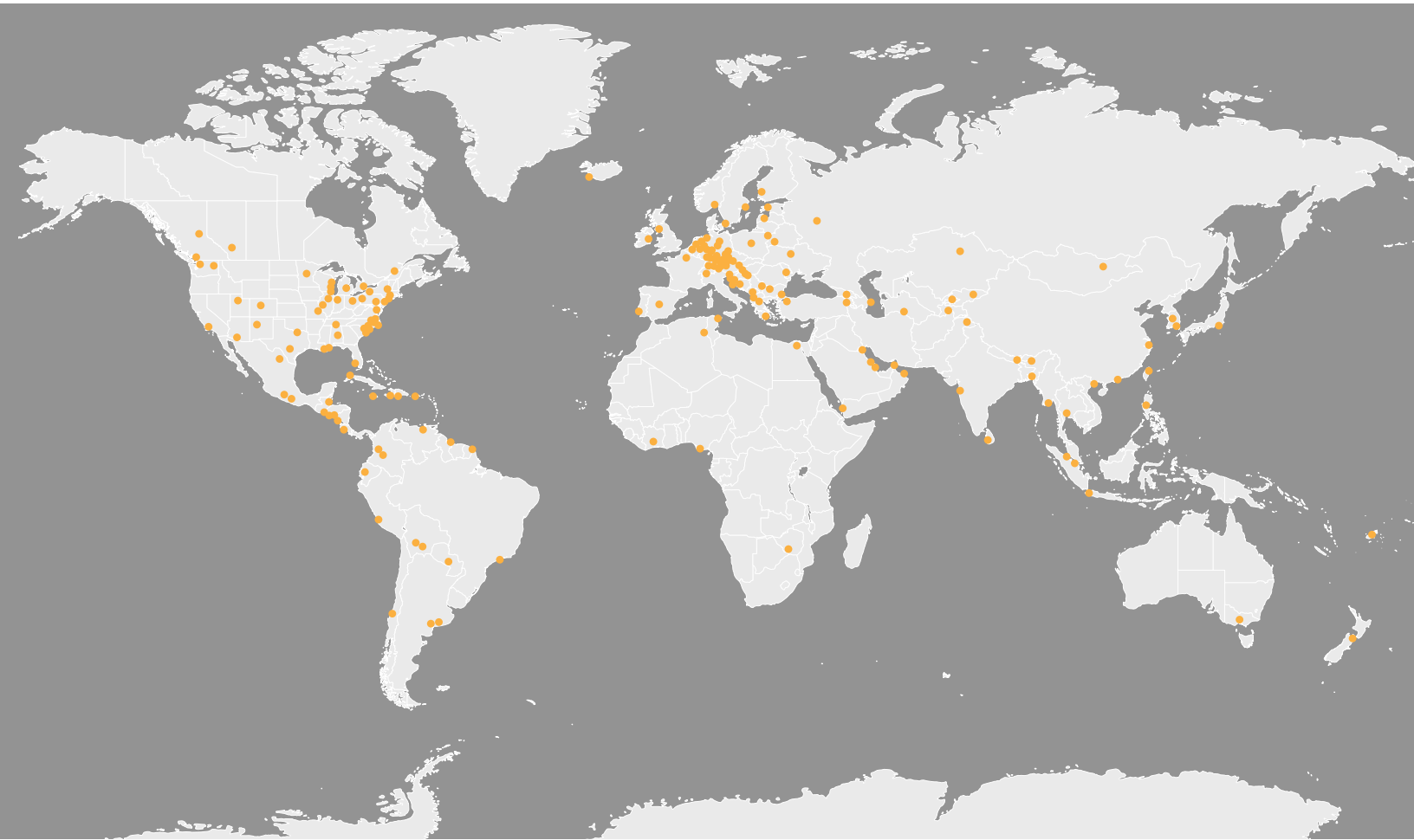- 1x MK800
- 1x CP907 HMI Station

L1 L2

Modbus/TCP
network

1 2 3 4 5 6 7 8 9 10 11 12

System ready
10:34

BENDER
The Power in Electrical Safety

Bender is located in 70 countries around the world