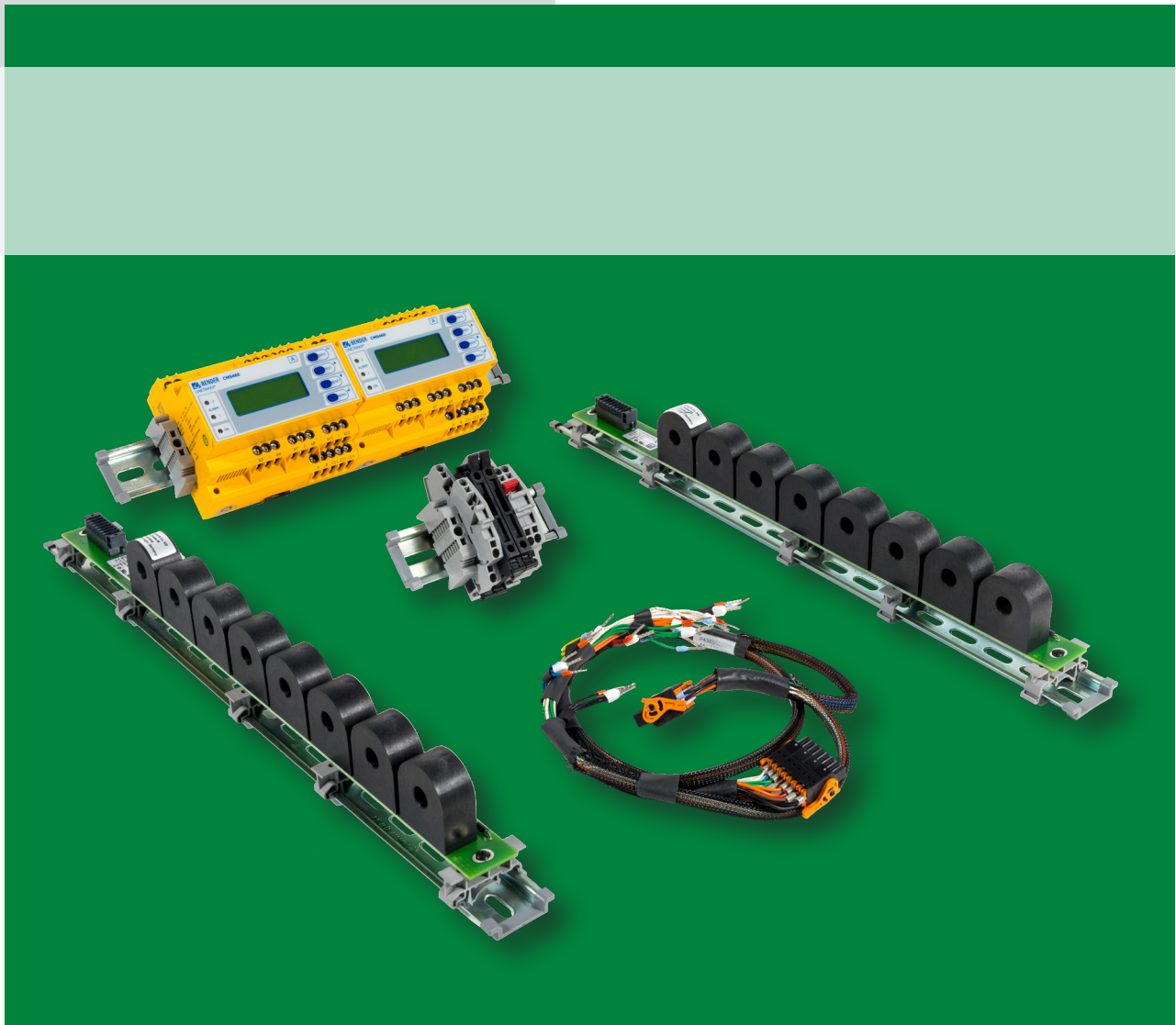


CMS460-KITS

Branch Circuit Current
Monitoring Kits for
Modular Isolation Power Panels



CMS460 KITS - Branch Current Monitoring



CMS460-KIT 2



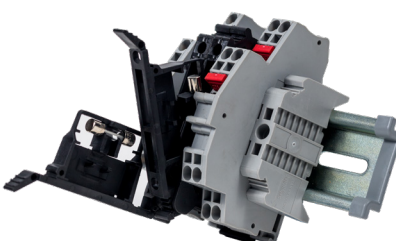
STW 3 Current Transformer

Features

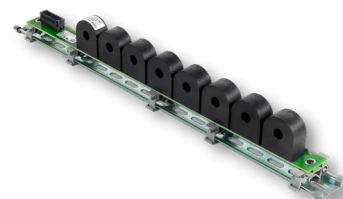
- Individual circuit load monitoring
- System load monitoring with STW3
- Backlit graphical display and alarm LEDs
- Can be pre-installed at factory or field upgraded
- Simple RS-485 communications connectivity between devices
- Monitor up to 16 Circuits
- Pre-wired terminal block for easy wiring
- "Plug-n-play" installation
- Includes over-current protection with field replaceable fuses.



CMS Harness
P43800092



Accessory Terminal Block
S10200800



CTAC10 Current Transformer Strip
S43800004 / S43800005

Product Description

CMS460

Compatible with Bender's line of Modular Isolated Power Panels; the CMS460 Modules provide quick and efficient monitoring and evaluation of branch load circuits. Independent alarm values can be set for each branch circuit when the ampacity threshold is met.

Kits are available to monitor up to 12 or 16 circuits simultaneously and interface via RS-485 communications. The CMS460 kit can be added at the factory or post-installation.

STW 3

STW series current transformers are combined with the LIM2010 Line Isolation Monitor to provide system load current monitoring in Isolated Power Systems for healthcare facilities. Alarm notifications can be set when the total Isolation Transformer ampacity reaches a set threshold. STW3 models may be used on systems with up to 100 A of load current. Load monitoring is indicated on both the LIM2010 display, remote alarms (MK2000CBM) and via the systems communications bus.

Applications

- For use with Bender's line of Modular Isolation Power Panels

General Safety Information

Installation, connection and commissioning of electrical equipment shall only be carried out by qualified electricians. Particular attention shall be paid to:

- The current safety regulations
- The Safety and Installation instructions provided by Bender's Instruction Manuals for Modular Isolated Power Panels
- The operating manual(s) of any auxiliary connected Bender device including but not limited to: LIM2010, EDS441, CMS460, COM465IP, MK800 and others.

Prior to installation and before any work is carried out on the connecting cables, make sure that the MAIN POWER to the panel is disconnected. Failure to comply with this safety information may cause electric shock to personnel. Substantial damages to the electrical installation and destruction of the device may occur.

What's Included?

CMS460 Module (Single Unit)
S43800007

Current Transformer Module - LEFT Mount
S43800009

Current Transformer Module - RIGHT Mount
S43800008

Accessory Terminal Block - **S10200800**

CMS TO CT HARNESS
P43800092

- 1 Current Monitoring Module - One module can monitor up to 12 circuits.
- 2 Current Monitoring Modules - Two modules can monitor up to 16 circuits.
- 3 Current Transformer Strips; mounted on din-rail and brackets for easy installation. Each strip is designated for mounting on either left or right side of loadcenter.

**CMS460-KIT 1 shown*
**All mounting brackets & hardware are included*

CMS460 Module (Dual Unit)
S43800006

Current Transformer Module - LEFT Mount
S43800009

Current Transformer Module - RIGHT Mount
S43800008

Accessory Terminal Block - **S10200800**

CMS TO CT HARNESS
P43800092

- 4 Terminal Block Accessory pre-wired from factory along with fuses to provide power for all modular add-on accessories including: EDS441LNA Kits, CMS460 Kits, and COM465IP Kits.
- 5 Current Monitoring Module wiring harness equipped with quick disconnects to provide hassle-free wiring from CMS Modules to Current Transformer Strips.

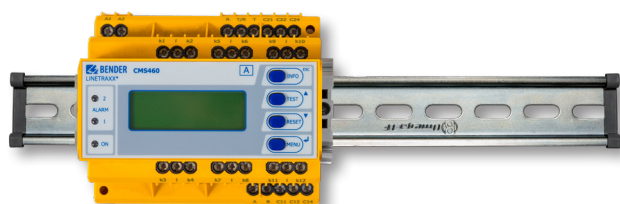
**CMS460-KIT 2 shown*
**All mounting brackets & hardware are included*

Ordering Information

Model #	Description	Number of Circuits Monitored	Article #
CMS460-KIT 1	One CMS Module, CT Strips, Harness, & Terminal Block	Up to 12	B561300163
CMS460-KIT 2	Two CMS Modules, CT Strips, Harness, & Terminal Block	Up to 16	B561300164

Frequently Purchased with

Model #	Description	Article #
COM465IP KIT	Communications Module & Accessory Terminal Block	B571300003
MK800-12RS	Central Monitoring Station, Flush Mount	B521301094
STW 3 KIT	System Load Monitoring Current Transformer	B561300165



CMS460 Module (Single Unit)
S43800007

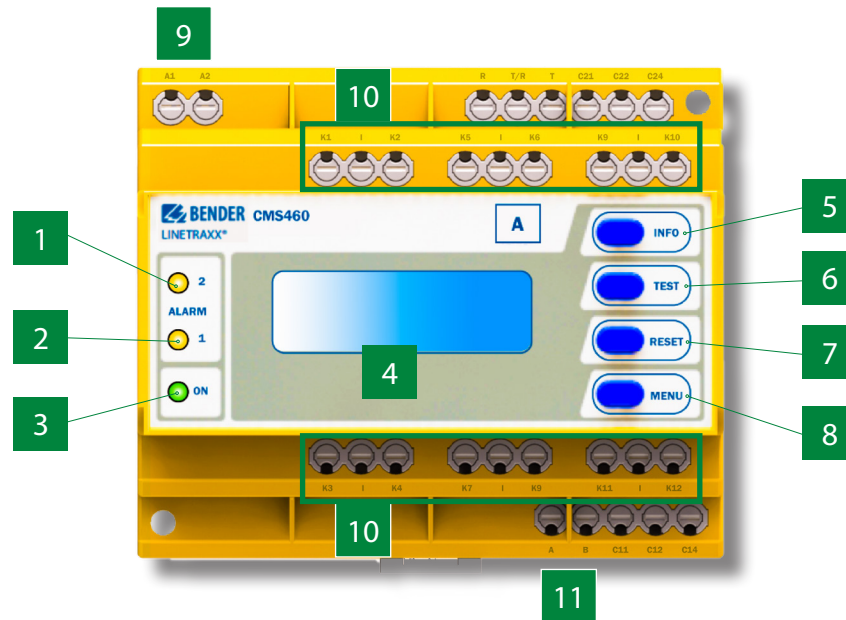


CMS460 Module (Dual Unit)
S43800006

Replacement Components

Model #	Description	Article #
CMS460 (Single Unit)	One CMS Module w/ Din Rail Mounting	S43800007
CMS460 (Dual Unit)	Two CMS Modules w/ Din Rail Mounting	S43800006
Accessory Terminal Block	Pre-Wired & Fused Accessory Terminal Block	S10200800
CMS460 to CT Harness	CMS to CT Wire Harness	P43800092
CT Module - LEFT	Current Monitoring Strip w/ Din Rail mounting - LEFT Side (odd numbered circuits)	S43800009
CT Module - RIGHT	Current Monitoring Strip w/ Din Rail mounting - RIGHT Side (even numbered circuits)	S43800008

Operating and Display Elements



1

ALARM 2 LED - Lights up when the measured value exceeds or falls below the set response value.

7

RESET Button - Allows user to delete alarm and fault messages. Also used to scroll downward in menus.

2

ALARM 1 LED - Lights up when the measured value exceeds or falls below the set response value "Pre-Warning". Also lights up in the event of a device error.

8

MENU/ENTER Button - Used to toggle between the standard display, menu, and alarm display. Also used to confirm parameter settings.

3

LED Lights up when the device is switched on and flashes during power on until the device is ready for operation.

9

Supply voltage input terminals.

4

Backlit LCD, 7-Segment Display

10

CMS to current transformer strip wiring harness terminals.

5

INFO/ESC Button - Used to query standard information and to exit the menu without changing parameters

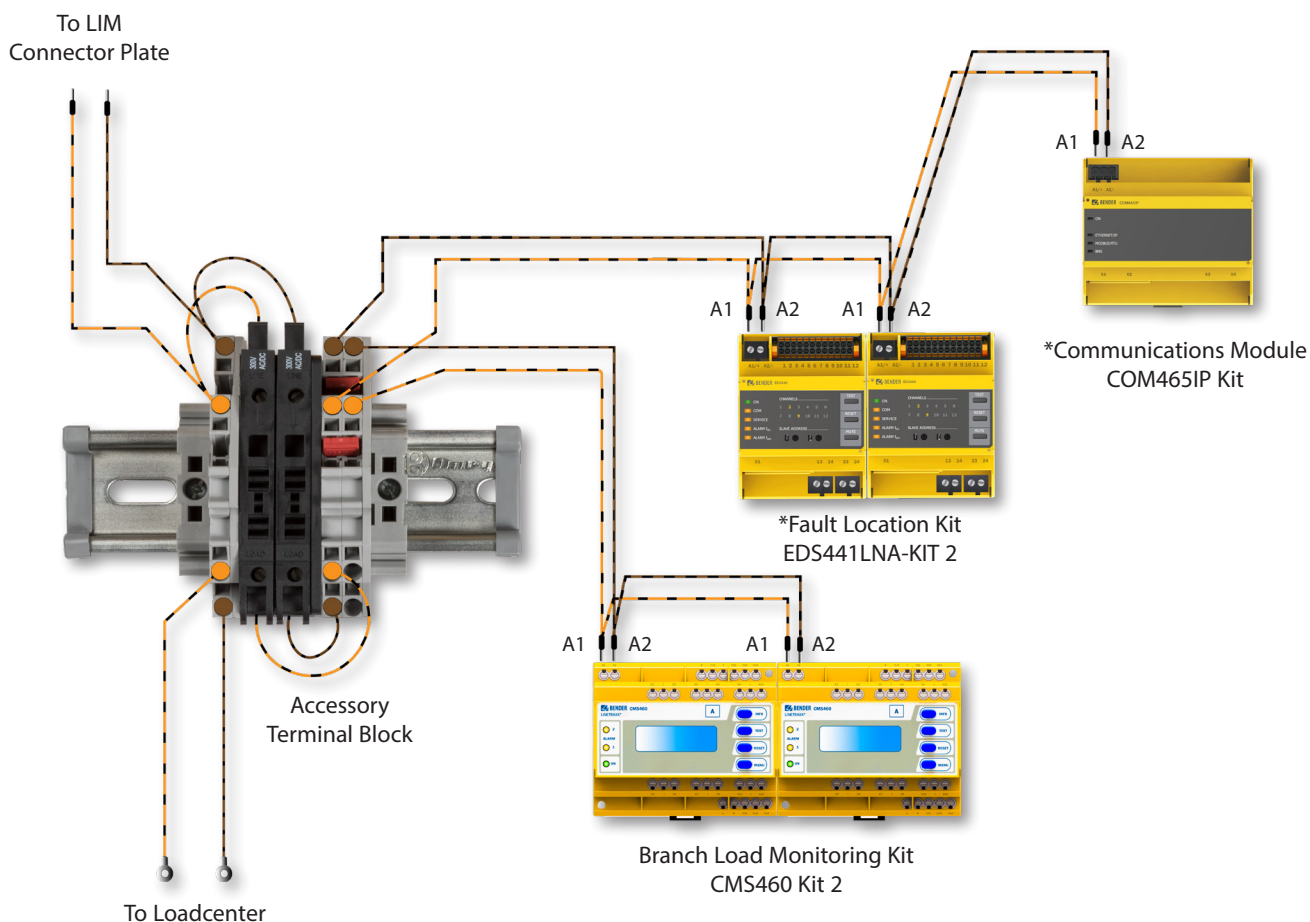
11

RS-485 Communications Wiring Terminals

6

TEST Button - Pressing this button triggers the self test feature of the device. Also used to scroll upward in menus.

Accessory Terminal Block Power Wiring

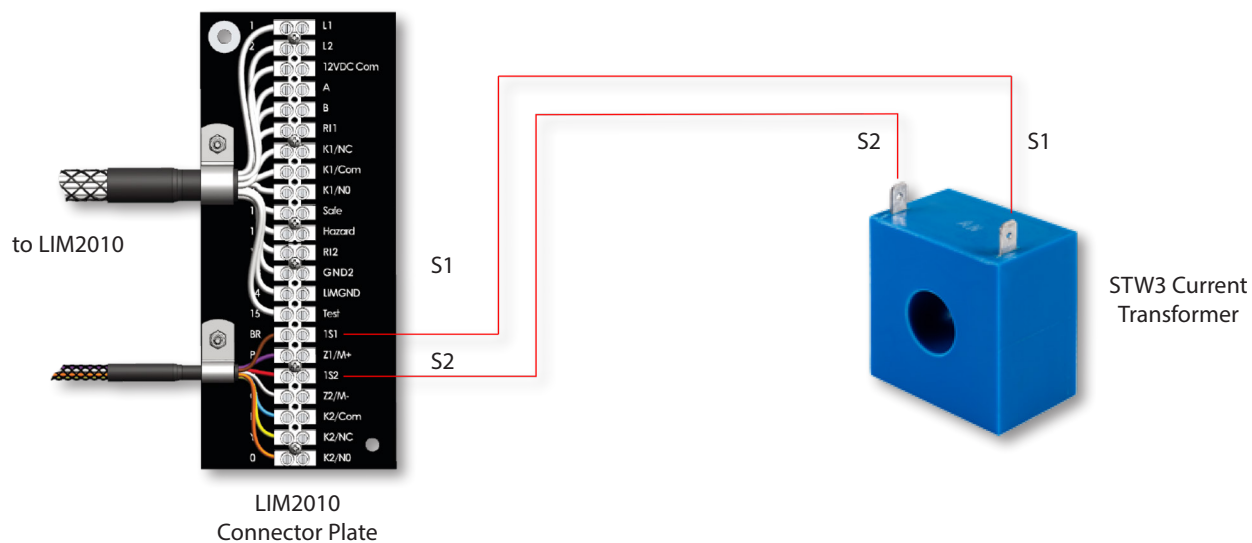


**Optional Components*

**All power wiring is provided with Accessory Terminal Block*

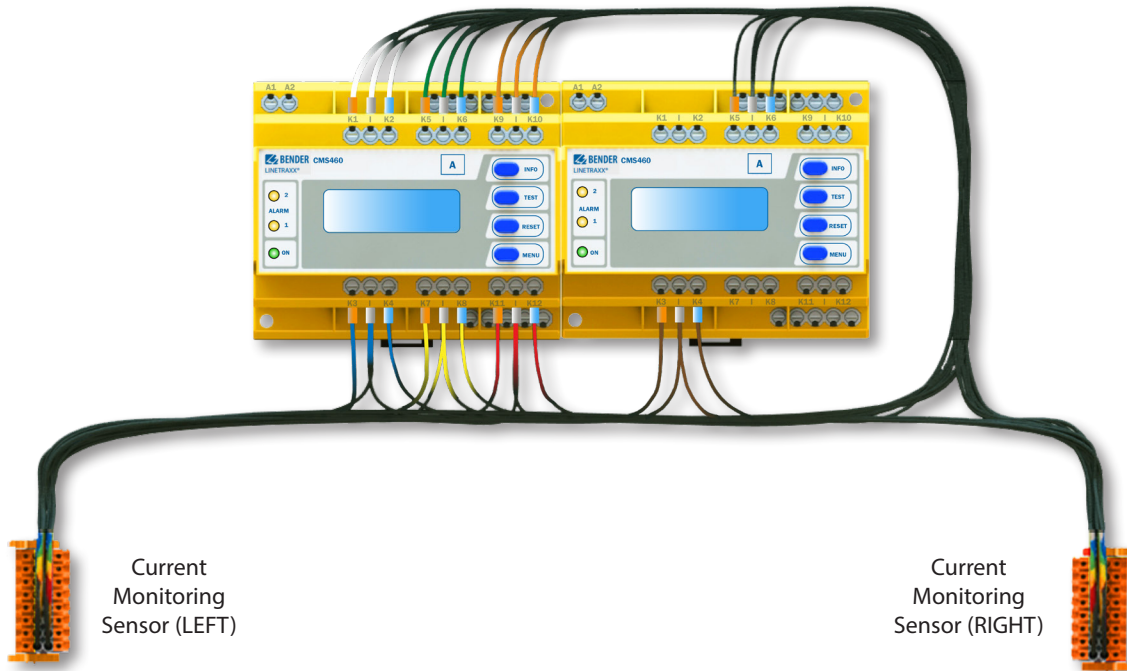
**All unused wiring will be covered with wire nuts*

STW3 - CT Wiring

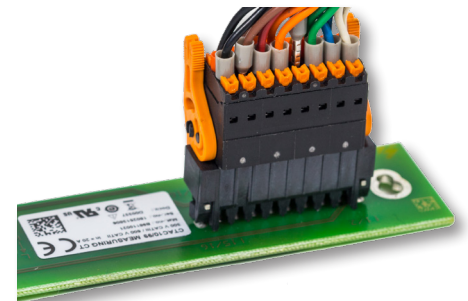


**Wiring and Mounting Hardware Included*

CMS to Current Transformer Wiring Harness Connections



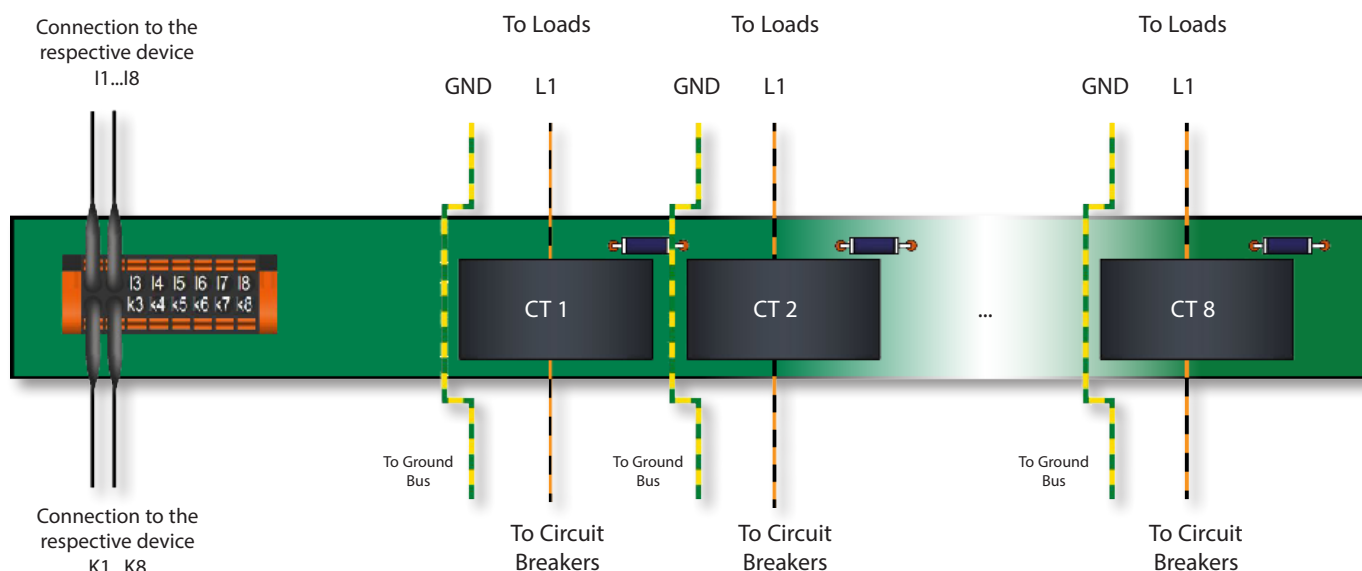
Channel	Circuit	Wire Color	Ferrule Color
K1	1	White	Orange
K1,K2 - COM	-	White	White
K2	2	White	Blue
K3	3	Blue	Orange
K3,K4 - COM	-	Blue	White
K4	4	Blue	Blue
K5	5	Green	Orange
K5,K6 - COM	-	Green	White
K6	6	Green	Blue
K7	7	Yellow	Orange
K7,K8 - COM	-	Yellow	White
K8	8	Yellow	Blue
K9	9	Orange	Orange
K9,K10 - COM	-	Orange	White
K10	10	Orange	Blue
K11	11	Red	Orange
K11,K12 - COM	-	Red	White
K12	12	Red	Blue
K3	13	Brown	Orange
K3,K4 - COM	-	Brown	White
K4	14	Brown	Blue
K5	15	Black	Orange
K5,K6 - COM	-	Black	White
K6	16	Black	Blue



Quick Disconnects to Current
Transformer PCB for
hassle-free installation

*Torque all terminal connections to **5 in-lbs.**

Current Transformer Wiring

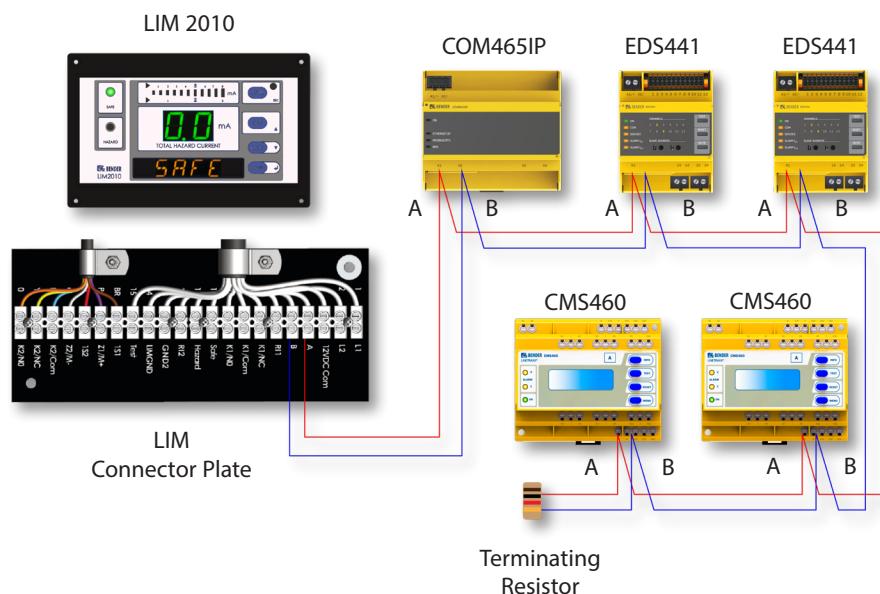


*Maximum AWG #6 wire permitted through CTAC10/99 sensor opening

RS-485 Communications Wiring

All RS-485 equipment must be connected in a daisy-chain configuration. Star connections are not permitted. Devices within multiple panels / areas must also be connected in a serial manner. Refer to figure below for sample RS485 connection between multiple panels and a nurse's station with an RS-485 connected remote indicator.

Additionally, each device requires a unique RS-485 address. Duplicate addressing will cause communication collisions and network interference. Re-addressing may be required when integrating equipment into existing installations. RS-485 addresses are not required to be numerically sequenced in the order they are wired. However, do not skip any numbers when addressing. If the system has a communication gateway, it must remain address 1.



*Select Bender devices have a terminating resistors built into the device itself. No external resistor required on these devices

Technical Information

CMS460

System Ratings

Supply voltage U_s	AC/DC 100...240 V
Tolerance	-20...+15%
Frequency range of U_s	DC, 50/60 Hz
Rated Insulation Voltage	250 V
Rated Impulse Voltage	4 kV
Voltage Test acc. to IEC 61010-1	2.21 kV

Time Response

Start-up delay $t(\text{start-up})$ per device	0...99 s (0 ms)*
Response delay t_{on} per channel	0...999 s (200 ms)*
Delay on release t_{off} per channel	0...999 s (200 ms)*
Operating time t_{ae} at $I_n = 1 \times I_{n1/2}$	≤ 180 ms
Operating time t_{ae} at $I_n = 5 \times I_{n1/2}$	≤ 30 ms
Response time t_{an} for current measurement	$t_{\text{an}} = t_{\text{ae}} + t_{\text{on}}/2$
Scanning time for all measuring channels (current measurement)	≤ 180 ms
Recovery time t_b	500...600 ms

Connection

Connection	screw-type terminals
Rigid/flexible/conductor sizes	AWG 24...12
Multi-conductor connection	(2 conductors with the same cross section):
Rigid/flexible	0.2...1.5/0.2...1.5 mm ²
Stripping length	8...9 mm
Tightening torque	0.5...0.6 Nm

Interfaces

Interface/protocol	RS-485/BS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable: twisted pair, one end of shield connected to PE	recommended: J-Y (St) Y min. 2x0.8

Other

Operating mode	continuous operation
Degree of protection internal components	IP40
Degree of protection terminals	IP20
DIN rail mounting acc. to	EC 60715
Screw fixing	2 x M4 with mounting clip
Enclosure material	polycarbonate
Flammability class	UL 94V-0
Dimensions (W x H x D)	72 x 93 x 63
Weight approx.	approx. 242 g (EDS44x-L)
Approvals and certifications	UL508 open type device
Weight	≤ 450 g

CTAC10-99 Current Transformer

Insulation coordination acc. to IEC 60664-1

Rated insulated voltage	AC 300 V
Rated impulse voltage	4 kV
Overvoltage category	III
Pollution degree	3
Protective separation	(prim)-(sec)
Voltage test according to IEC 61010-1	2,2 kV

For primary routing through the current transformer, use an insulated cable which at least complies with the requirements for basic insulation.

CT circuit

Rated primary residual current	20 A
Rated secondary residual current	5.55 mA
Rated burden	max. 27 Ω
Nominal power	0.83 mVA
Frequency range	42 Hz...3 kHz
Rated continuous thermal current I_{cth}	80 A
Rated short-time thermal current I_{th}	$60 \times I_{\text{cth}} = 2.4 \text{ kA}/1 \text{ s}$
Rated dynamic current I_{dyn}	$2.5 \times I_{\text{th}} = 6.0 \text{ kA}/40 \text{ ms}$

Environment

Operating temperature	-25...+55 °C
Climatic class acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K5
Long-time storage (IEC 60721-3-1)	1K5
Classification of mechanical conditions IEC 60721	

Connection

Connector	TRM Connect 16x3,5
Clamping range, rated connection	0.75...1.5 mm ²
single wire	0.75...1.5 mm ²
flexible	0.75...1.5 mm ²
flexible with plastic collar ferrule acc. to DIN 46228/4	0.75...1 mm ²
flexible with ferrule acc. to DIN 46228/1	0.75...1.5 mm ²
Stripping length	10 mm

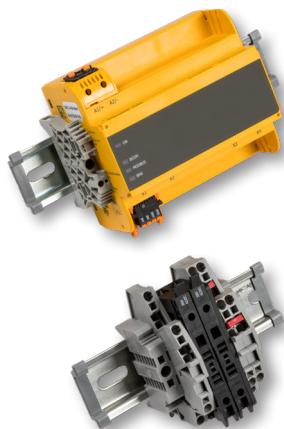
Connection EDS, CMS

Single wire $\geq 0.75 \text{ mm}^2$	0...1 m
Single wire, twisted $\geq 0.75 \text{ mm}^2$	0...10 m

Other

Degree of protection, internal components (DIN EN 60529)	
Degree of protection, terminals (IEC 60529)	
Screw mounting	Mounting bracket Phoenix 1201578 USA 10
Screw	Pan head screw TX10 M3.0x8
Flammability class	UL94 V-0
Approvals and certifications	UL508 open type device
Weight	≤ 450 g

Add-Ons and Accessories

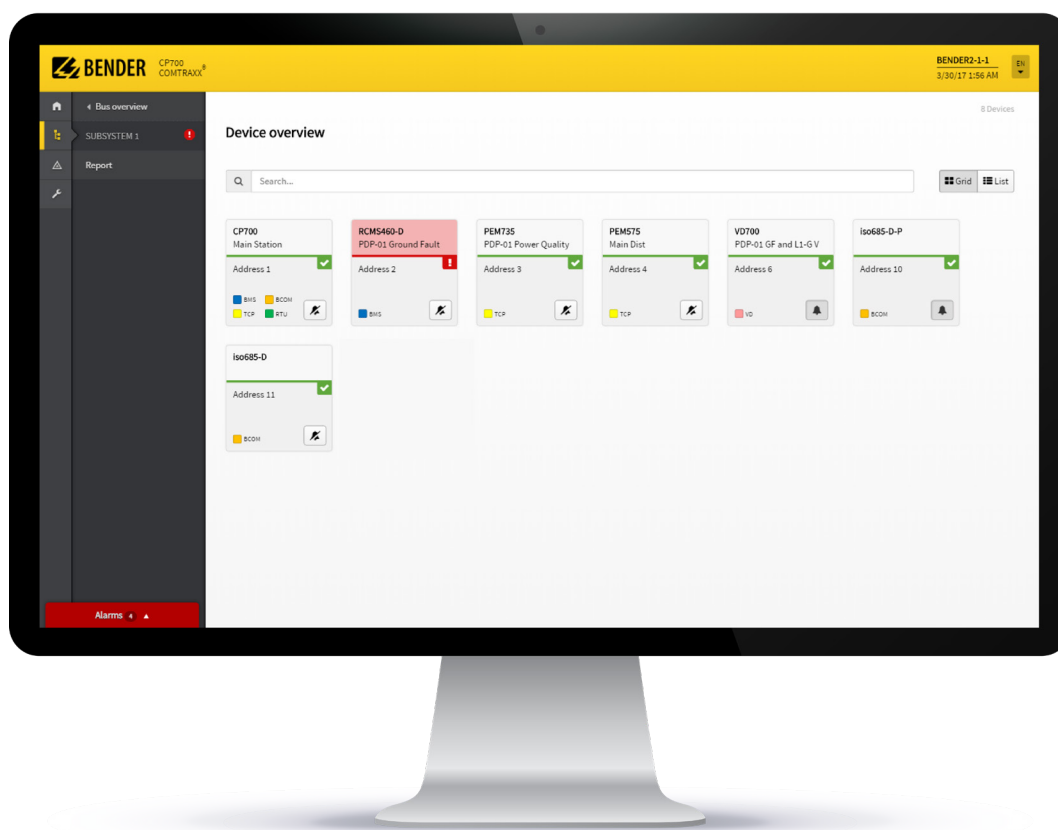


COM465IP KIT - Remote Communications

Adds remote communication capabilities to CMS Load Monitoring Kit. The expansion kit can be added at the factory or post-installation with easy-to-install upgrade kits.

Bender's COM465IP gives technicians and staff the ability to see the status of their Load Monitoring as well as monitor any alarm indications and location monitoring in real time via a web server. This can be accessed from any network-connected PC, Tablet, or Smartphone.

Additionally, the COM465IP acts as a Modbus TCP gateway, providing integration capabilities into building management systems.



COMTRAXX® Webserver

- Easy to use status indication for connected devices
- Unified status screen for all connected devices
- Communication buses (Bender RS-485 bus, Bender Ethernet bus, Modbus/RTU, Modbus/TCP)
- Drill-down for each device shows detailed information, including readings for all branches for multi-channel devices
- Configure compatible connected devices remotely
- Configure compatible connected devices remotely
- Modern design - HTML5-based interface, works in most modern web browsers
- Responsive layout - touch-friendly layout for mobile devices
- Grid-type and list-type views available for viewing status
- Create custom system visualizations
- Custom alarms created using virtual setpoints appear in the same list as connected devices

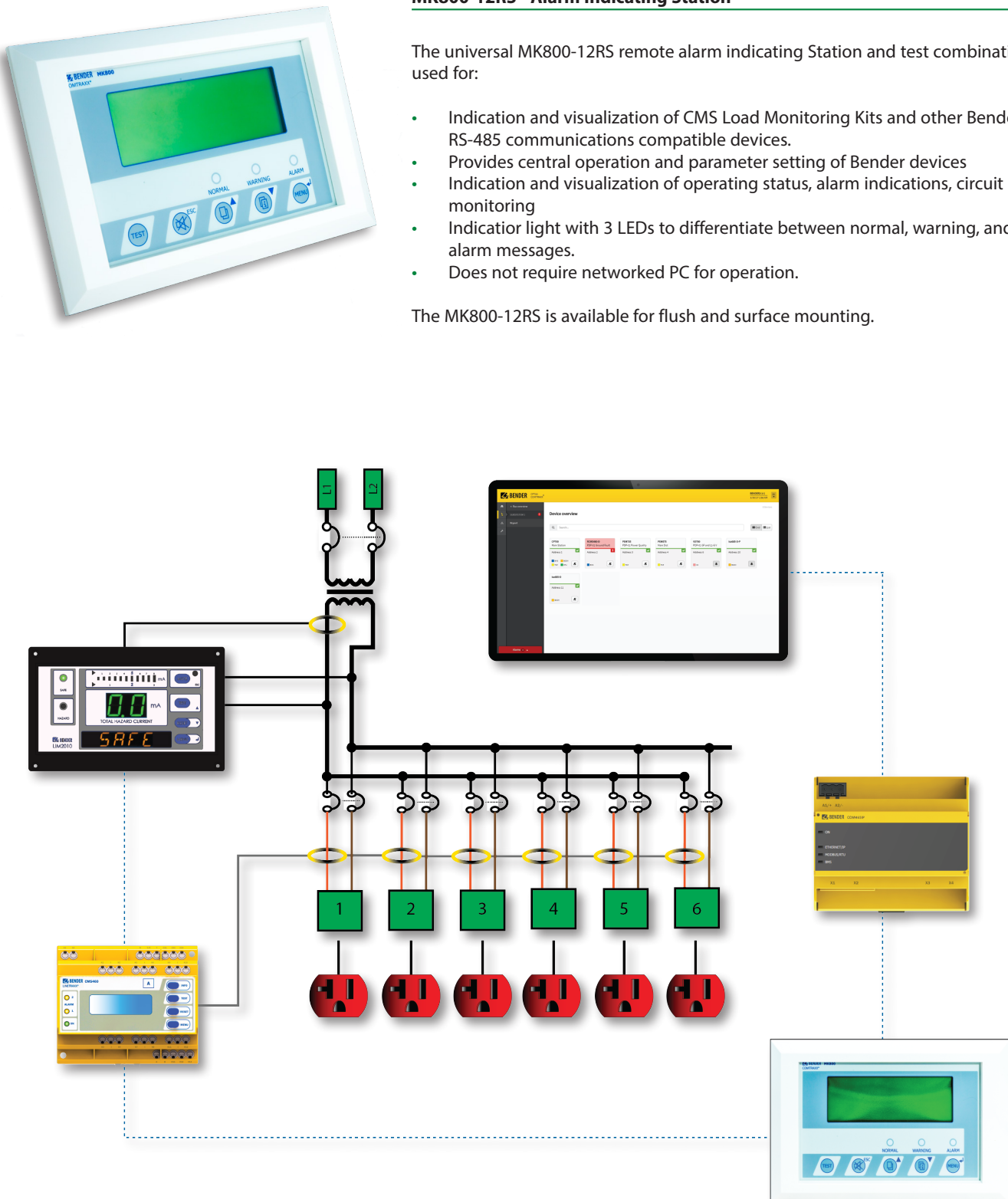
Add-Ons and Accessories

MK800-12RS - Alarm Indicating Station

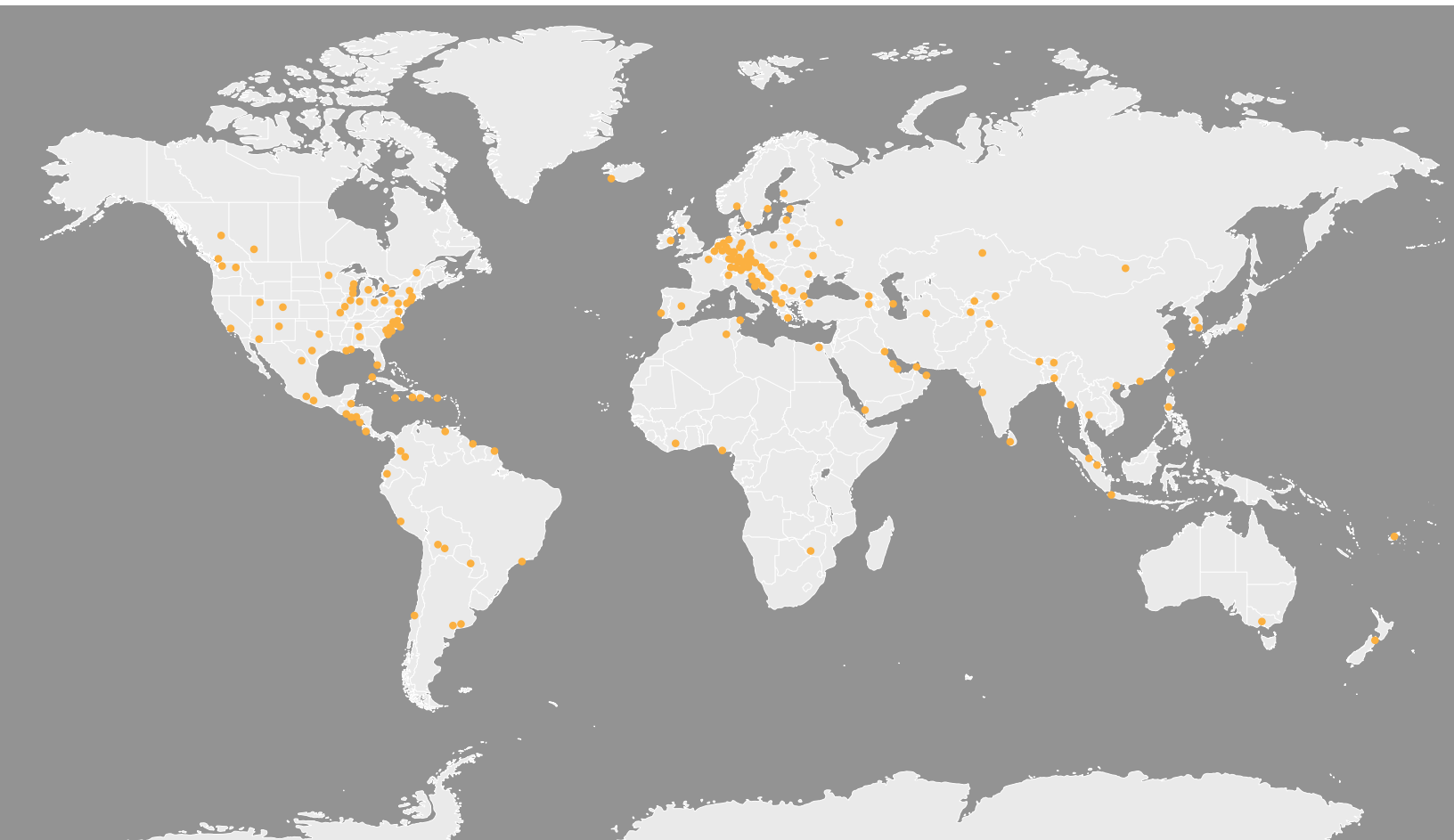
The universal MK800-12RS remote alarm indicating Station and test combination is used for:

- Indication and visualization of CMS Load Monitoring Kits and other Bender RS-485 communications compatible devices.
- Provides central operation and parameter setting of Bender devices
- Indication and visualization of operating status, alarm indications, circuit monitoring
- Indicator light with 3 LEDs to differentiate between normal, warning, and alarm messages.
- Does not require networked PC for operation.

The MK800-12RS is available for flush and surface mounting.



Bender is located in 70 countries around the world.



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