CMS460-KITS

Branch Circuit Current
Monitoring Kits for
Modular Isolation Power Panels

CMS460 KITS - Branch Current Monitoring

CMS460-KIT 2
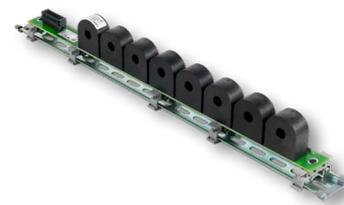

STW 3 Current Transformer

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.

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.

**CMS Harness
P43800092**

**Accessory Terminal Block
S10200800**

**CTAC10 Current Transformer Strip
S43800004 / S43800005**

What's Included?

CMS460 Module (Single Unit)
S43800007

Current Transformer Module
- LEFT Mount
S43800009

Current Transformer
Module - RIGHT Mount
S43800008
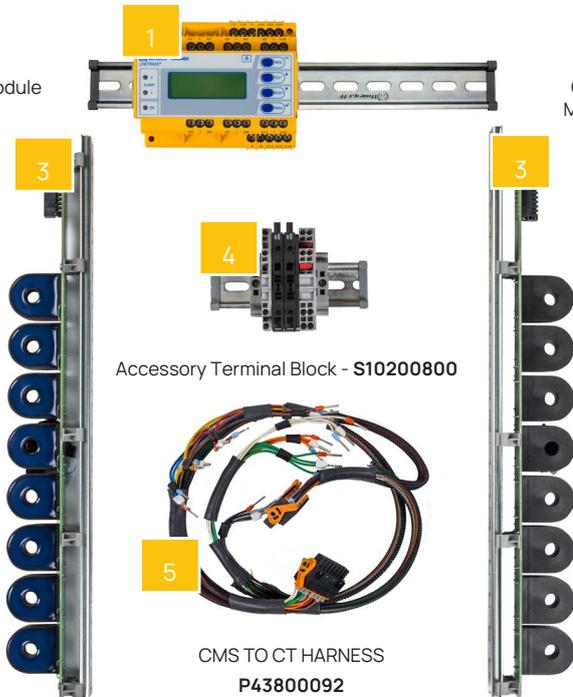
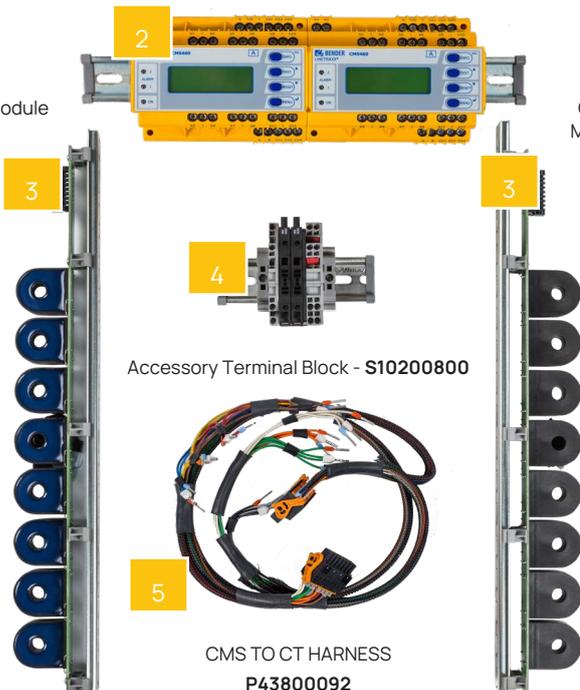Accessory Terminal Block - **S10200800**

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	B571300146
CMS460-KIT 2	Two CMS Modules, CT Strips, Harness, & Terminal Block	Up to 16	B571300147

Frequently Purchased with

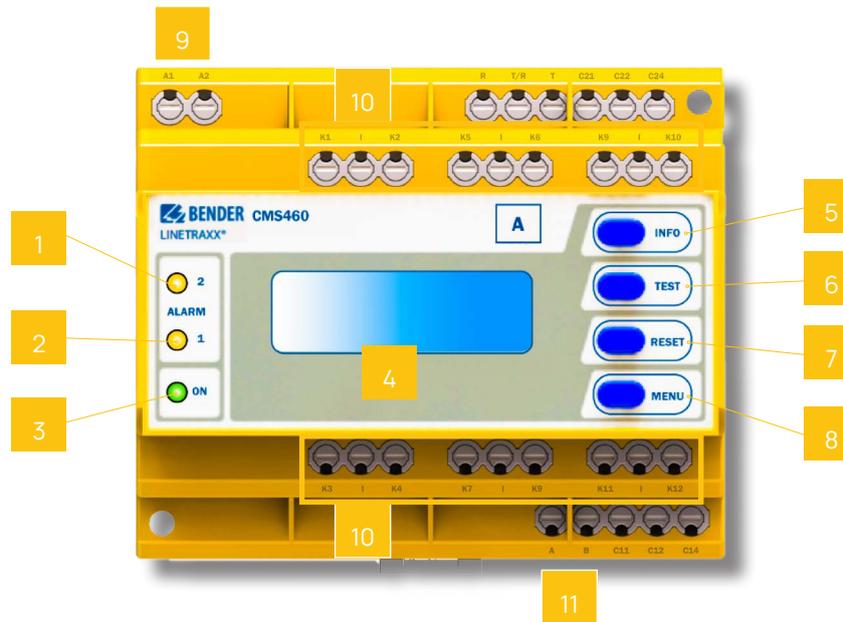| Model #	Description	Article #
COM465IP KIT	Communications Module & Accessory Terminal Block	B571300003
MK800-12RS	Central Monitoring Station, Flush Mount	B521301094
STW 3 KIT	System Load Monitoring Current Transformer	B561300165
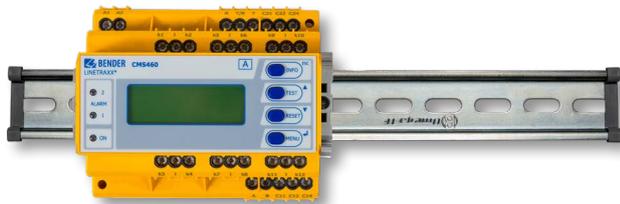
CMS460 Module (Single Unit)
S43800007
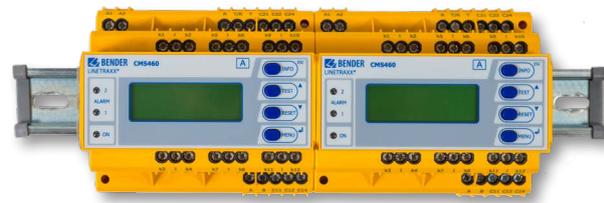
CMS460 Module (Dual Unit)
S43800006

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

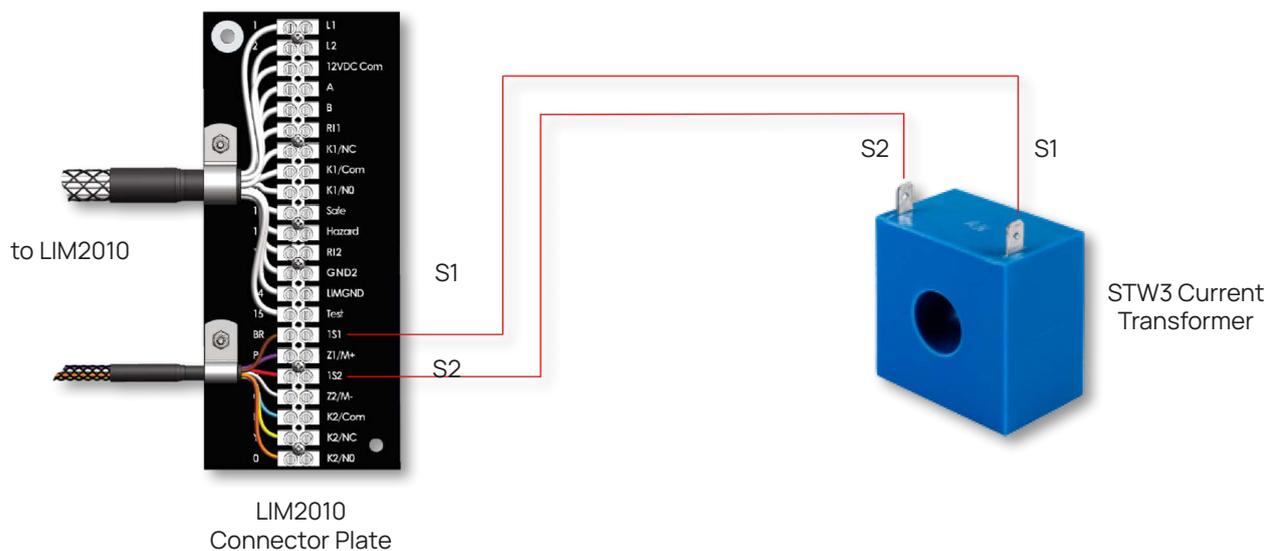|	
1	ALARM 2 LED - Lights up when the measured value exceeds or falls below the set response value.
2	ALARM 1 LED - Lights up when the measured value exceeds or falls below the set response value "Pre-Warning". Also lights up in the event of a device error.
3	LED Lights up when the device is switched on and flashes during power on until the device is ready for operation.
4	Backlit LCD, 7-Segment Display
5	INFO/ESC Button - Used to query standard information and to exit the menu without changing parameters
6	TEST Button - Pressing this button triggers the self test feature of the device. Also used to scroll upward in menus.
7	RESET Button - Allows user to delete alarm and fault messages. Also used to scroll downward in menus.
8	MENU/ENTER Button - Used to toggle between the standard display, menu, and alarm display. Also used to confirm parameter settings.
9	Supply voltage input terminals.
10	CMS to current transformer strip wiring harness terminals.
11	RS-485 Communications Wiring Terminals

Accessory Terminal Block Power Wiring

To LIM
Connector Plate

A1   A2

*Communications Module
COM465IP Kit

A1   A2   A1   A2

*Fault Location Kit
EDS441LNA-KIT 2

Accessory
Terminal Block

A1   A2   A1   A2

Branch Load Monitoring Kit
CMS460 Kit 2

To Loadcenter
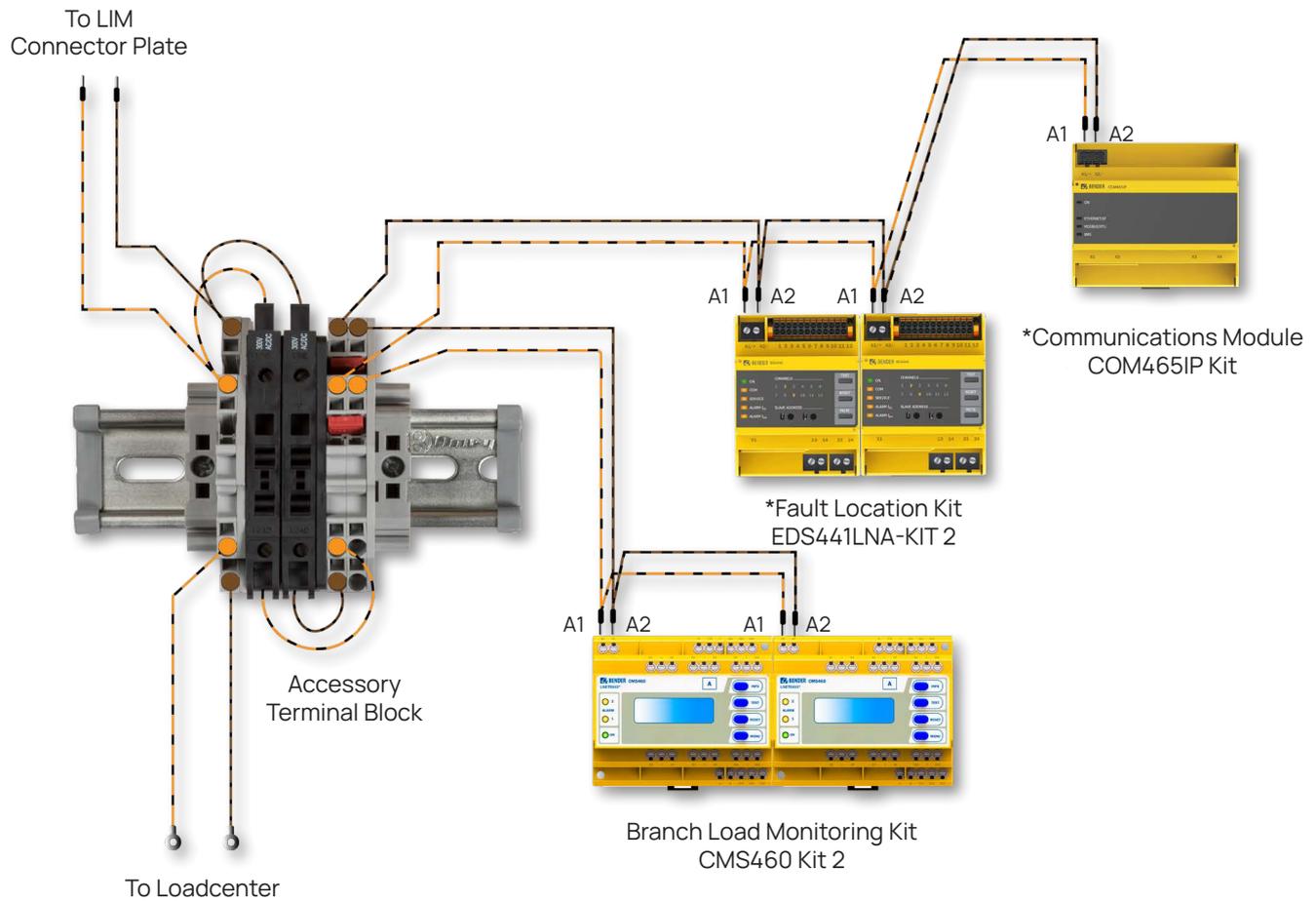
*Optional Components
*All power wiring is provided with Accessory Terminal Block
*All unused wiring will be covered with wire nuts

STW3 - CT Wiring

	L1
1	L2
2	12VDC Com
	A
	B
	RI1
	K1/NC
	K1/Com
	K1/NO
	Safe
	Hazard
	RI2
	GND2
	LIMGND
15	Test
BR	1S1
P	Z1/M+
	1S2
	Z2/M-
	K2/Com
	K2/NC
0	K2/NO

to LIM2010

S1

S2

S1

S2

S2   S1

STW3 Current
Transformer

LIM2010
Connector Plate

*Wiring and Mounting Hardware Included

CMS to Current Transformer Wiring Harness Connections

Current Monitoring Sensor (LEFT)

Current Monitoring Sensor (RIGHT)

Quick Disconnects to Current Transformer PCB for hassle-free installation
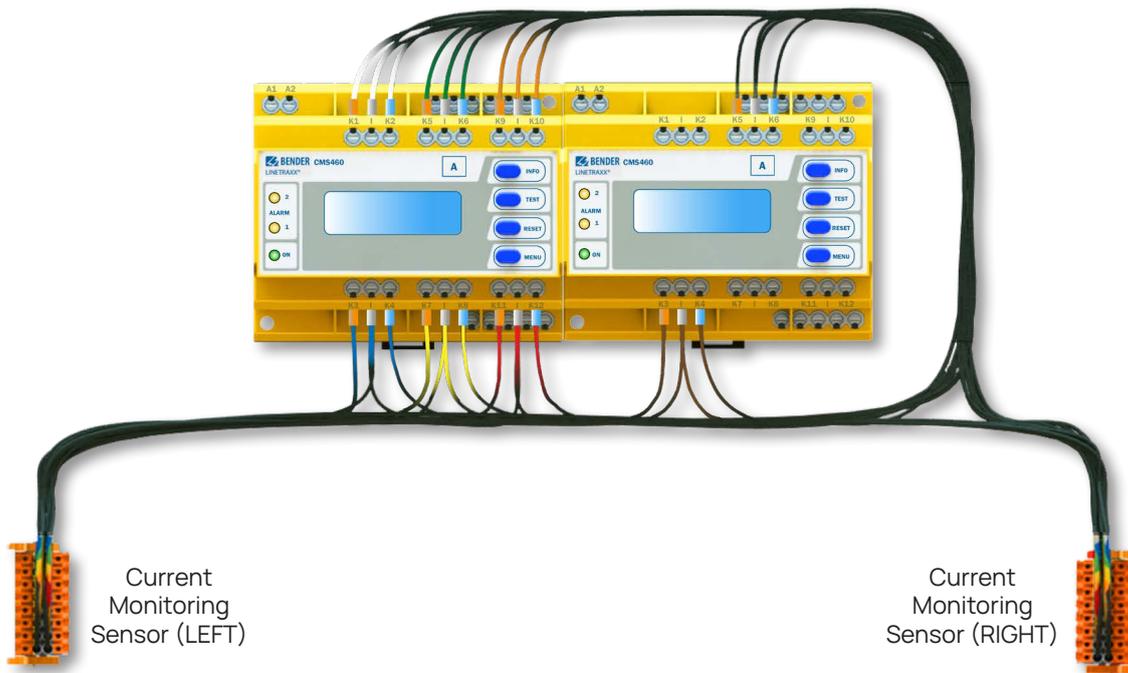
Channel	Circuit	Wire Color	Ferrule Color
K1	1	White	Orange
K1,K2 - COM	-	White	White
K2	2	White	Blue
K3	3	Blue	Orange
K3,K4 - COM	-	Blue	White
K4	4	Blue	Blue
K5	5	Green	Orange
K5,K6 - COM	-	Green	White
K6	6	Green	Blue
K7	7	Yellow	Orange
K7,K8 - COM	-	Yellow	White
K8	8	Yellow	Blue
K9	9	Orange	Orange
K9,K10 - 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

*Torque all terminal connections to 5 in-lbs.

Current Transformer Wiring

Connection to the
respective device
I1...I8

To Loads

To Loads

To Loads

GND   L1

GND   L1

GND   L1

I3 I4 I5 I6 I7 I8
k3 k4 k5 k6 k7 k8

CT 1

CT 2

...

CT 8

Connection to the
respective device
K1...K8

To Ground
Bus

To Ground
Bus

To Ground
Bus

To Circuit
Breakers
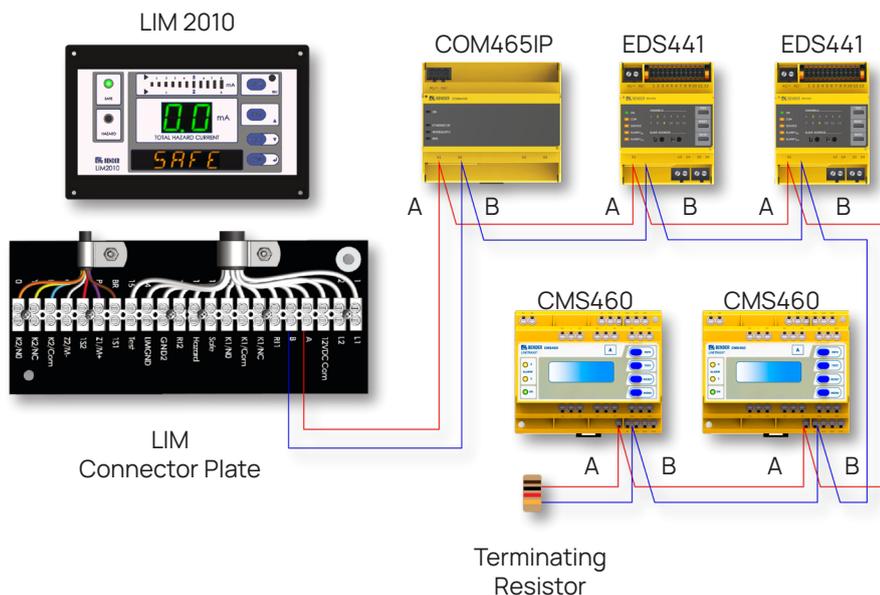
To Circuit
Breakers

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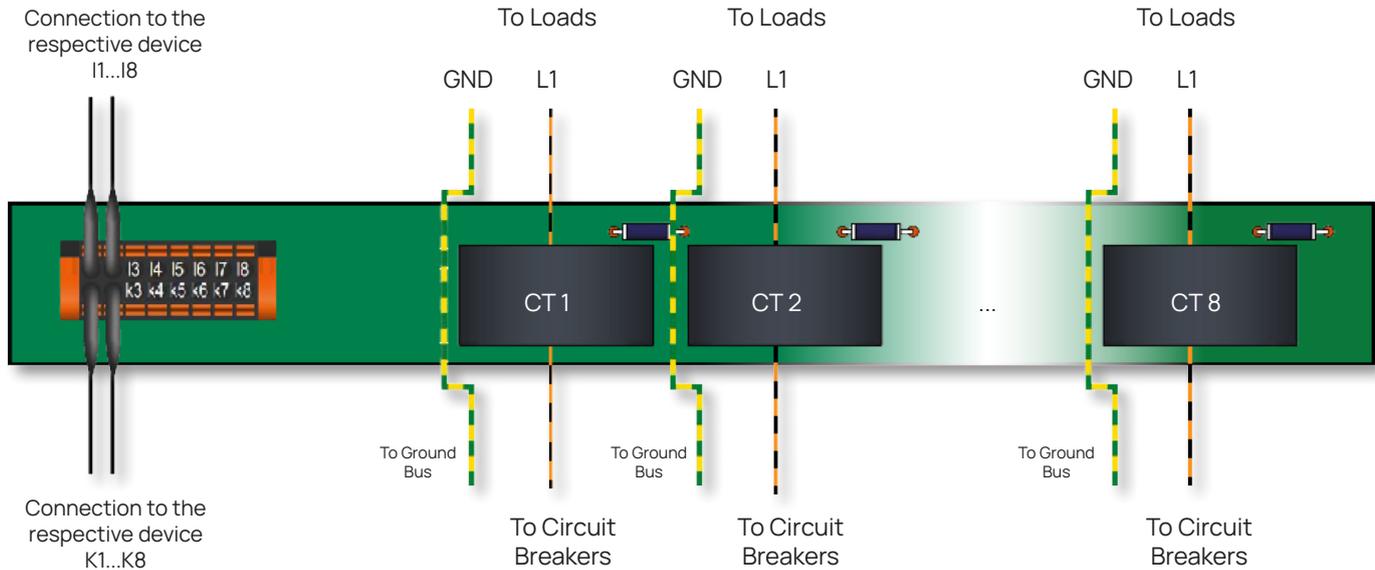
*Maximum AWG #6 wire permitted through CTAC10/99 sensor opening

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.

LIM 2010

COM465IP   EDS441   EDS441

A   B   A   B   A   B

LIM
Connector Plate

CMS460   CMS460

A   B   A   B

Terminating
Resistor

*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 Us	AC/DC 100…240 V
Tolerance	-20…+15%
Frequency range of Us	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(start-up) per device	0…99 s (0 ms)*
Response delay ton per channel	0…999 s (200 ms)*
Delay on release toff per channel	0…999 s (200 ms)*
Operating time tae at In = 1 x In1/2	≤ 180 ms
Operating time tae at In = 5 x In1/2	≤ 30 ms
Response time tan for current measurement	tan = tae + ton1/2
Scanning time for all measuring channels (current measurement)	≤ 180 ms
Recovery time tb	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 mm2
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

Connection

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 x I_{cth} = 2.4 kA/1 s
Rated dynamic current I_{dyn}	2.5 x I_{th} = 6.0 kA/40 ms

Environment

Operating temperature	-25…+55 ℃
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 ≥ 0.75 mm^2	0…1 m
Single wire, twisted ≥ 0.75 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.
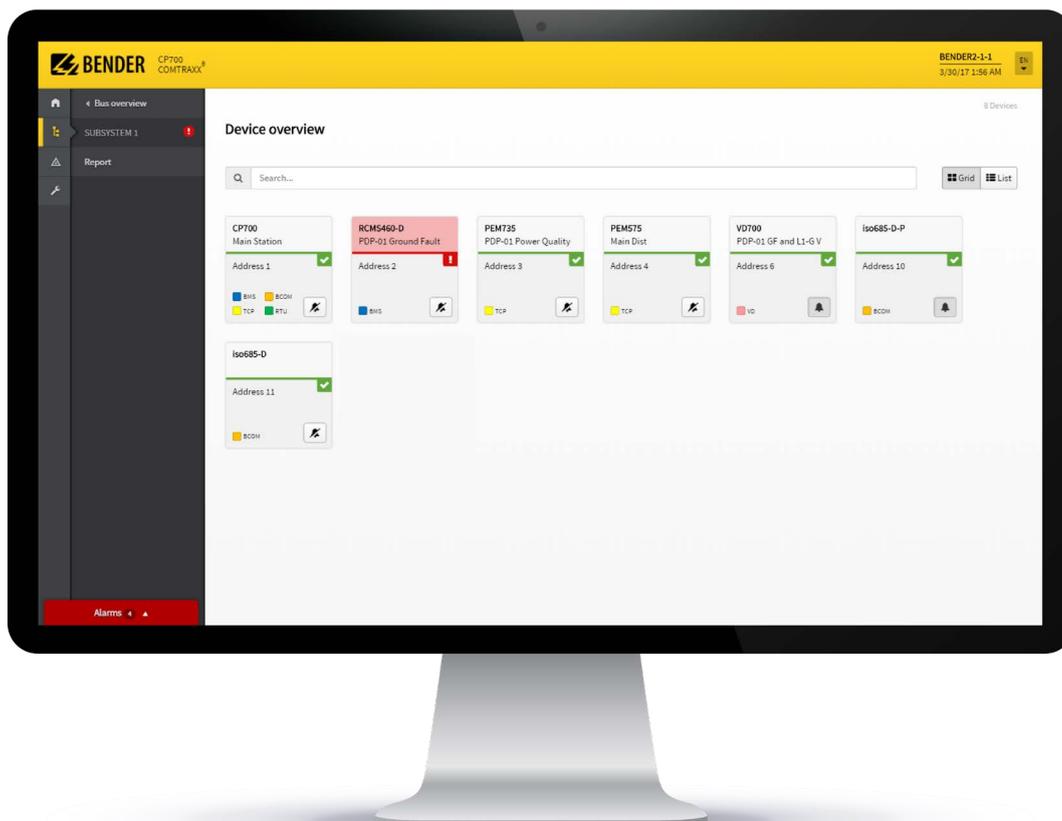
COMTRAXXX ® Webserver

- 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 set points 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.
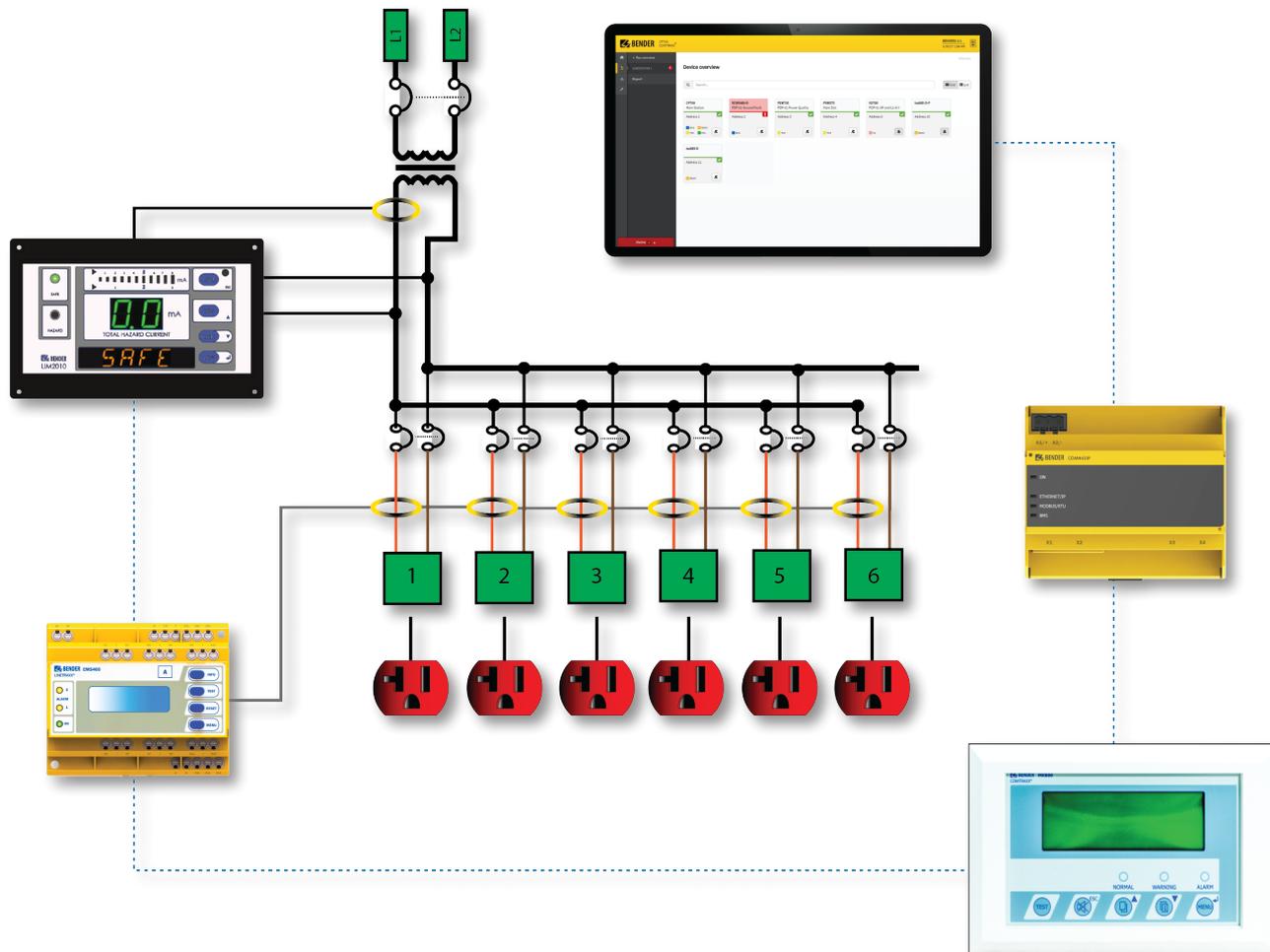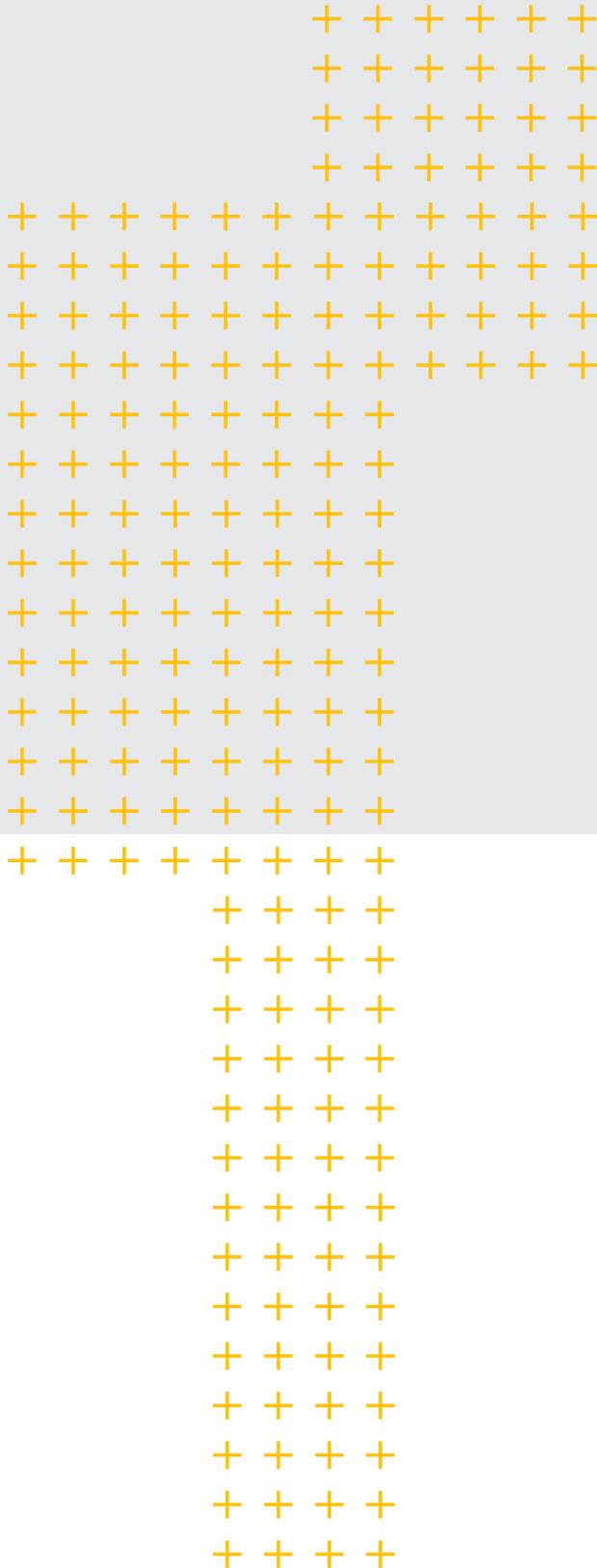
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