

Building Safety, Security, and Control Solutions

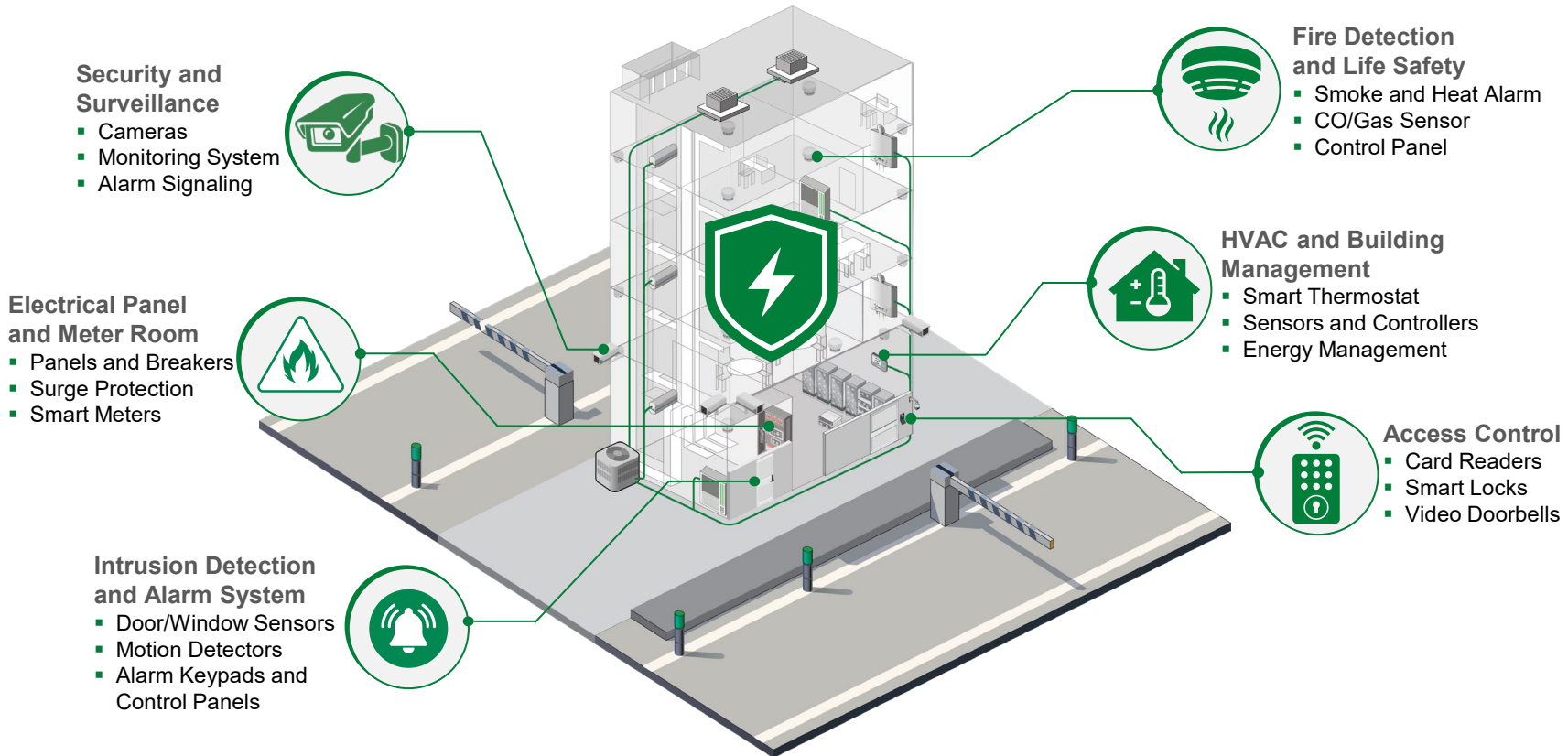


Building Controls

Users must independently evaluate the suitability of and test each product selected for their own specific applications. It is the User's sole responsibility to determine fitness for a particular system or use based on their own performance criteria, conditions, specific application, compatibility with other parts, and environmental conditions. Users must independently provide appropriate design and operating safeguards to minimize any risks associated with their applications and products. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [littelfuse.com/disclaimer-electronics](https://www.littelfuse.com/disclaimer-electronics).

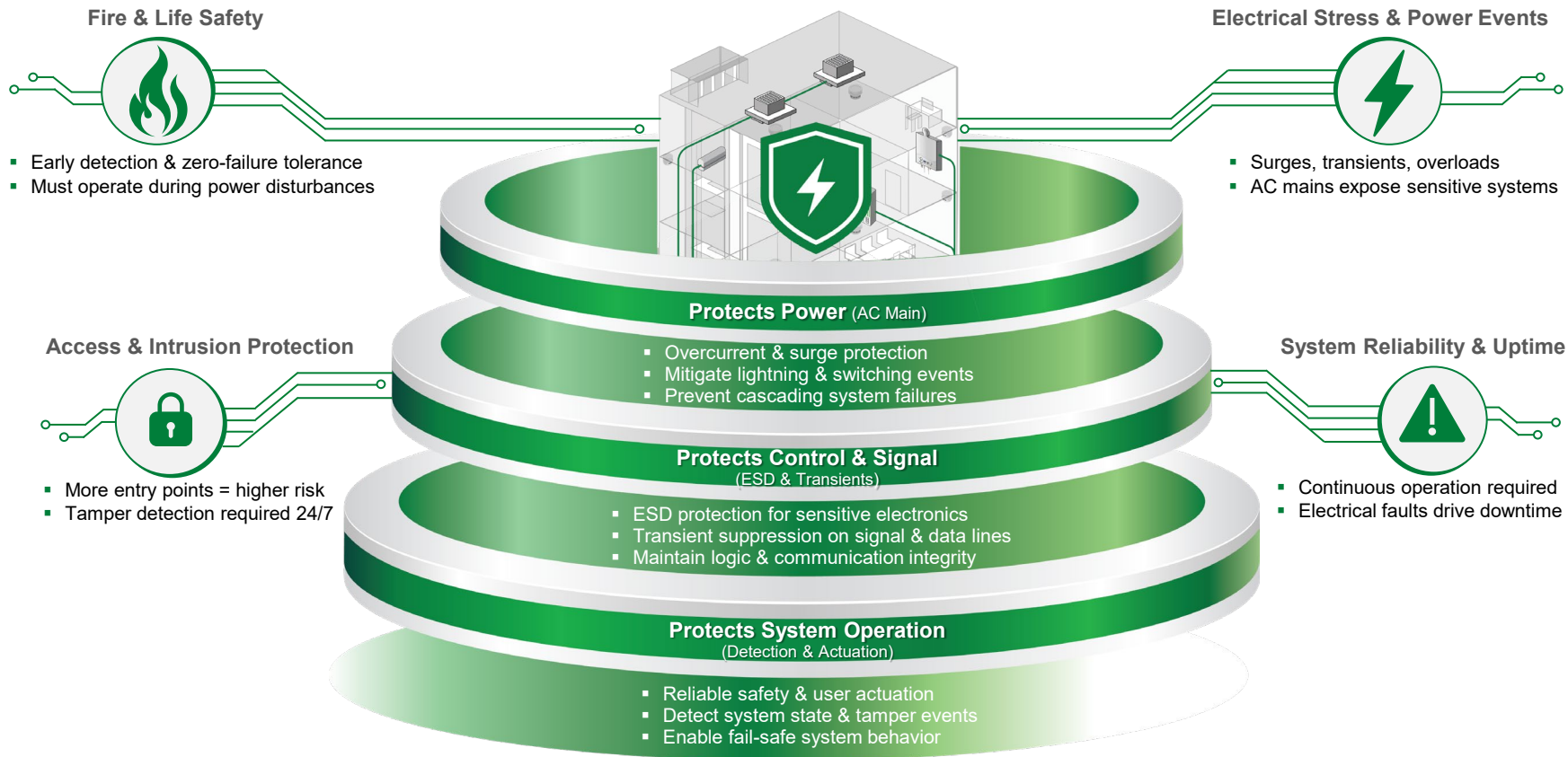
Integrated building safety, security, and power systems

Protecting critical systems across the entire building infrastructure



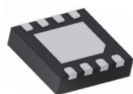
Building safety and security: challenges and solutions

Managing fire, power, access, and reliability risks through layered protection



New products for building security and control systems

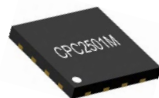
Solid State Relay



CPC1601M

- 60 V, 2 A, 1-Form-A latching relay
- No external MCU/control logic
- 2500 V_{RMS} I/O isolation
- Works in all existing 8 VAC to 24 VAC house installations
- Active Shut Down (ASD) & Under Voltage Lockout (UVLO)

Solid State Relay (Doorbell chime)



CPC2501

- 60 V_{max} bidirectional normally closed
- No external microcontroller or control logic required
- 1.8 A_{RMS} continuous load current, 5 A max for 16 ms
- 6x6 mm² QFN-16 package
- Works in all existing 8 VAC to 24 VAC house installations

TMR Switches



LF21173/
LF21177



LF21112

- 1.8 V to 5.5 V operating range
- LGA4/SOT23-3 package
- Ultra-low-power consumption
- High sensitivity and reliability
- Operates with smaller magnets for cost reduction
- Excellent thermal stability

C&K® Switches



KMR

- Gold-plated contacts that ensure high reliability and corrosion resistance
- Compact footprint (4.6 x 2.8 mm)
- low-profile actuator (1.9 mm or 2.5 mm height)
- IP67 sealing for protection against dust, moisture, etc.

Reed Sensor



59150



59143

- Flange-mount type
- 59150: 28.57 mm x 19.05 mm x 6.25 mm
- 59143: 23.00 mm x 14.00 mm x 6.00 mm
- Capable of switching 140 Vac/ 200 Vdc and 265 Vac / 300 Vdc at 10 W
- Hermetically sealed (IP67)

TRIAC



LX5

- 600 V / 0.5 A rated TRIAC robust enough to handle 24 V AC
- Enable space and cost savings in PCB assembly
- Surge current capability up to 9.5 A at 60 Hz
- SOT-23 package

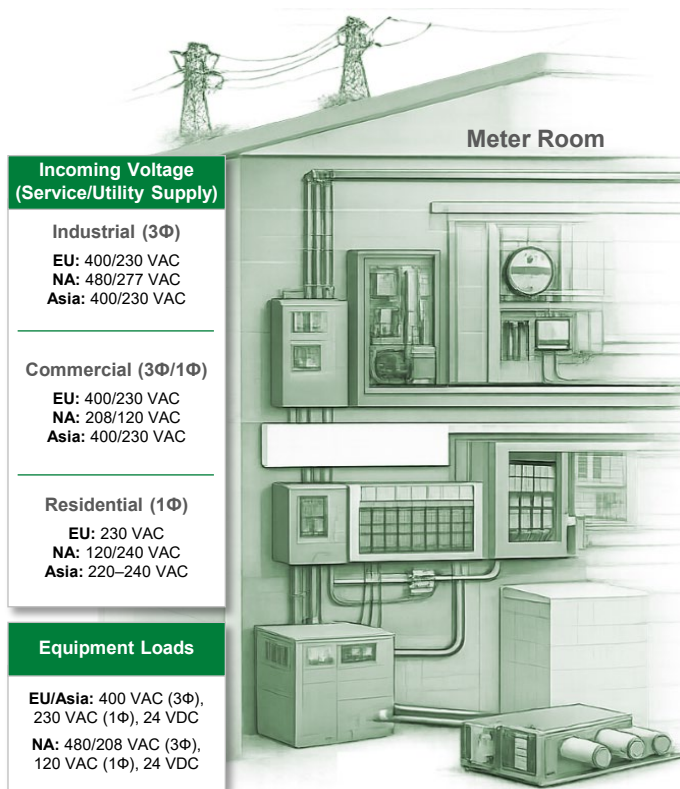
Electric Panel and Meter

Critical point of entry for all safety and security systems



Protecting AC mains—electrical panels and meter room

Critical point of entry for all safety, security, and control systems



Utility incoming AC mains (Service entrance/meter room)

- High-interrupt AC fuses
- Circuit Breakers
- MOVs/TMOV® Devices

Distribution & branch circuits (Inside electrical panels)

- Branch circuit fuses (UL/IEC)
- Circuit Breakers
- Fuseholders & distribution blocks

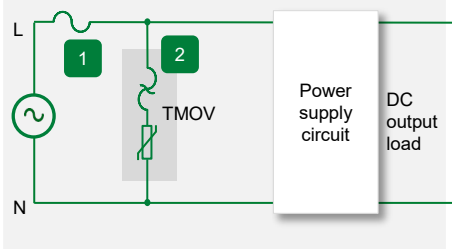
AC–DC power supplies (Interface between panel & electronics)

- Input fuses (equipment level)
- MOVs/TVS Diodes (on AC input)

AC mains protection topologies

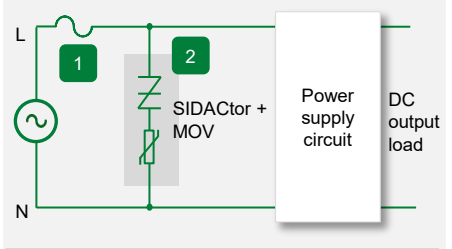
Click on the product series in the table below for more info

Differential mode protection 120/240 VAC and 208/120 VAC AC inputs



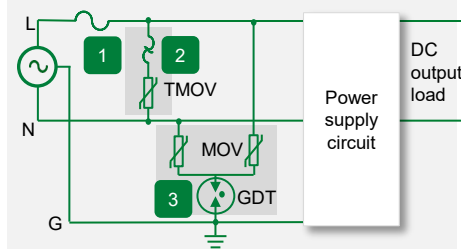
- Smart meters
- Cameras/doorbells
- Smoke alarms
- AC-DC power supplies

SIDACTor® + MOV 20/240 VAC & 208/120 VAC (sensitive electronics)



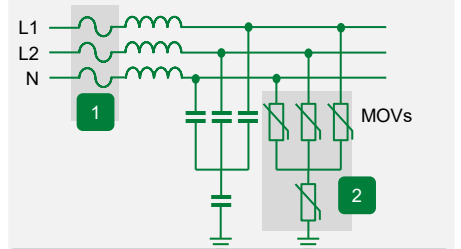
- Smart meters
- Control panel
- Smoke alarms
- Front-end PSUs

Differential & common mode protection 120/240 VAC, 208/120 VAC (harsh environment)



- Commercial/ industrial buildings
- Outdoor or noisy EMI environments

Three-phase input protection 480/277 VAC and 208 VAC three-phase systems



- Electrical panels
- Industrial/commercial equipment
- PSUs, HVAC, & VFDs

| | Technology | Function in Application | Product Series |
|---|-----------------|--|--|
| 1 | Fuse | Protects the power stage from overcurrent events | 2153.15 |
| | | AC line fuses for overcurrent or short circuit protection | JTD , CCMR , KLKD 606 , 504 , 505 |
| | Fuseholder | Supports fuse protection | LPSC , LPSM |
| 2 | TMOV or MOV | Protects the power supply unit from voltage transients and lightning | TMOV14RP300E , V10E420P |
| | SIDACTor® + MOV | | P2300 + V10E300P |
| | TVS Diode | | AK3-380C-Y |
| 3 | MOV + GDT | Protects the power supply unit from voltage transients and lightning | V10E300P + CG3 3.3 |

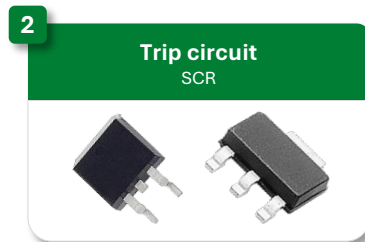
Littelfuse solutions for GFCI/AFCI receptacle and breaker



GFCI/AFCI
Receptacle



Breaker



Functions:

- **GFCI outlet**, ground fault circuit interrupter, is a circuit breaker that shuts off the internal circuit breaker when it senses an imbalance between the outgoing and incoming circuit. The main purpose is to protect people from electrical shock. The US National Electric Code defines when it is required.
- **AFCI outlet**, arc fault circuit interrupter, is a circuit breaker that detects electrical arcs and protects against electrical fires. In the US, over 40,000 fires are attributed to home electric wiring, resulting in 350 deaths and 14,000 injuries each year according to the US Product Safety Commission.
- **Conventional circuit breakers** only respond to overloads and short circuits.

GFCI/AFCI breaker protection

A critical safety interface between utility power and branch circuits

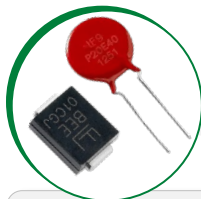
AC mains protection

120/240 VAC

- Measurement accuracy
- Surge and fault exposure
- Long service lifetime (10 to 20 years)

277/480 VAC

- Directly exposed to utility disturbances



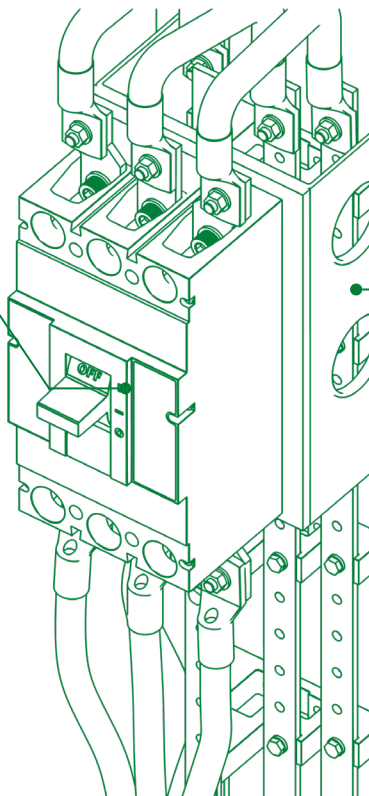
AC mains protection

MOV/
TMOV

- 150 to 320 VAC MCOV
- Up to 20 kA surge (8/20 μ s)
- Thermally protected
- UL1449 compliant

TVS
Diode

- 1,000 W peak pulse power capability
- Low-profile package
- Excellent clamping capability
- Fast response time

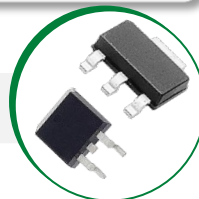


Trip circuit

Trip circuit

- Triggers contact opening on fault
- Safely disconnects power

Electronic switch to energize the trip coil

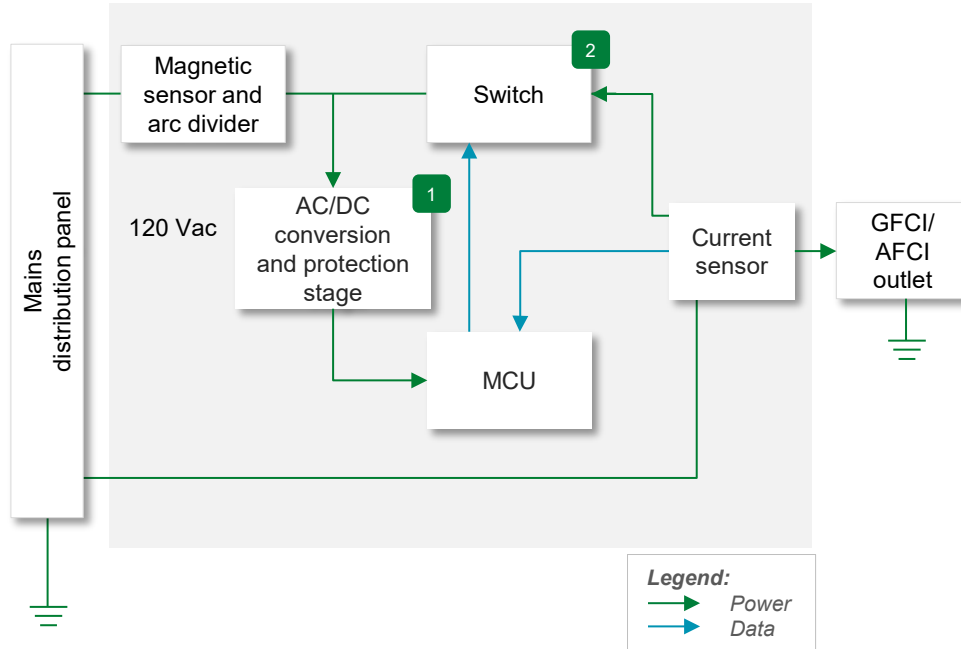


SCR

- Surge capability > 15 Amps
- Blocking voltage (V_{DRM}/V_{RRM}) capability—up to 600 V
- High dv/dt noise immunity; improved turn-off time (T_q) < 35 μ sec

GFCI/AFCI breaker block diagram

Click on the product series in the table below for more info



| | Technology | Function in Application | Product series |
|---|------------|---|----------------------------------|
| 1 | MOV | Protects power unit from voltage surges such as lighting and transients | UltraMOV |
| | TVS Diode | Protects sensitive electronic components from voltage transients | 1KSMB |
| 2 | SCR | Triggers electro-mechanical relay to disengage electrical contacts during fault | SCR up to 1200 V |

Littelfuse solutions for smart electricity meters



1

Anti-tamper

Reed Switch, TMR, Detect Switch



3

Communication Interface

TVS Diode Array, SIDACtor®, Optocoupler



2

Metrology System Unit

MOV, Fuse, TVS Diode, eFuse, SiC MOSFET, PPTC, NTC



4

I/O Protection and Control

SSR, Fuse, TVS Diode, MOV, Tactile Switch



Smart meter protection: power, signal, and detection

A critical interface between utility power and building security systems

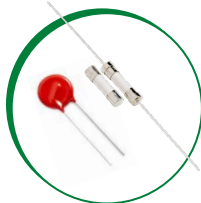
Power input & metering interface

120/240 VAC

- Measurement accuracy
- Surge and fault exposure
- Long service lifetime (10 to 20 years)

277/480 VAC

- Directly exposed to utility disturbances



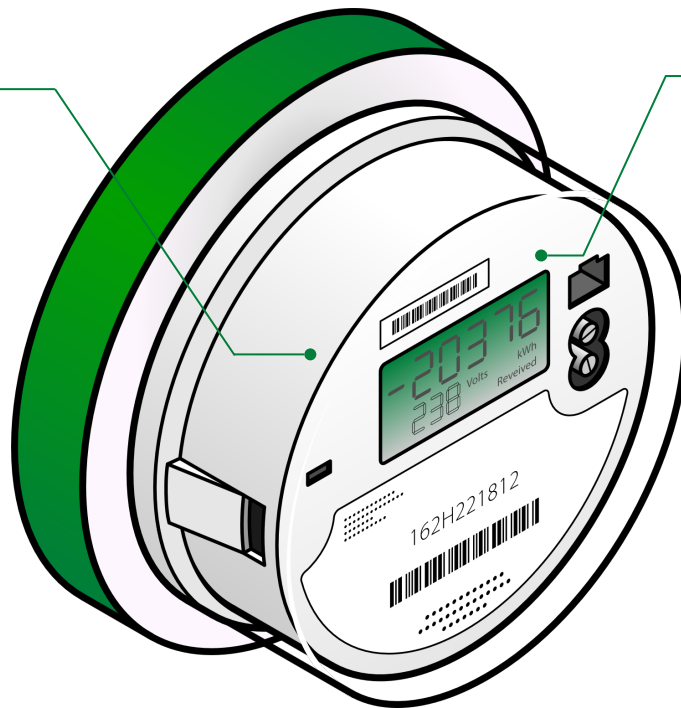
AC mains protection

Fuses

- Voltage rating: 250–600 VAC
- Current rating: 0.5 to 20 A
- Interrupt rating: >10 kA
- Temperature: –40 to 125 °C

**MOV/
TMOV**

- 150 to 320 VAC MCOV
- Up to 20 kA surge (8/20 μ s)
- Thermally protected
- UL1449 compliant



Metrology unit

**DC Voltage
Rails**

- Short circuit & ESD
- Sensitive electronics (ASIC/MCU, sensors, etc.)

Protection of LV DC rails in metrology unit



PPTC

- Resettable overcurrent protection
- 6 to 60 VDC rails
- 50 mA to 1 A hold current
- –40 to +85 / 105 °C

**TVS
Diode**

- ESD and transient protection
- 5 to 24 VDC rails
- 400–1500 V peak pulse power
- Unidirectional

Smart meter protection: power, signal, and detection

A critical interface between utility power and building security system

Anti-tamper and physical security



Mechanical/magnetic sensing

C&K® Switch

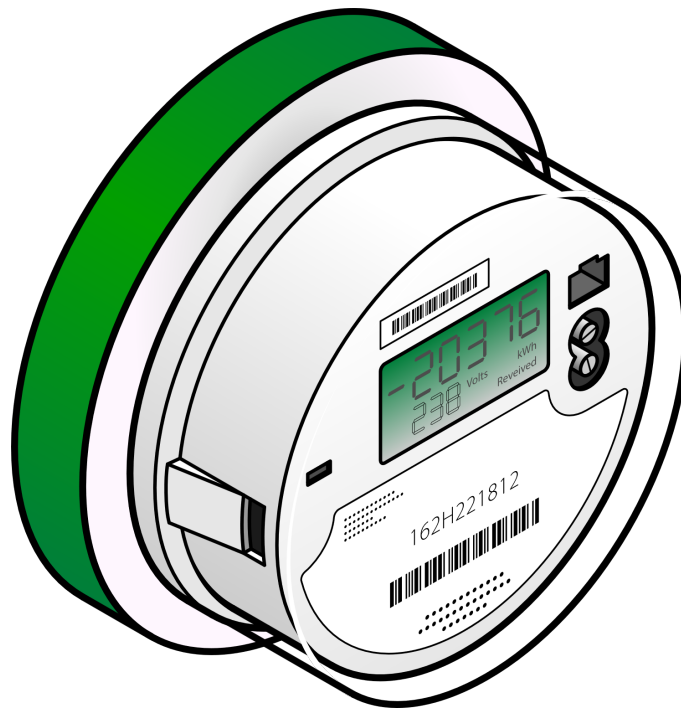
- Detect or Tactile Switch
- Physical tamper
- High reliability
- Defined actuation point

Reed Sensor

- Cover-open detection
- Zero standby power
- Proven long life

TMR Sensor

- Magnetic attack detection
- Detects strong external fields
- Supports advanced anti-fraud detection



Load switching and signal interfaces



Enabling safe switching and reliable signal interfaces

TVS Diode Array

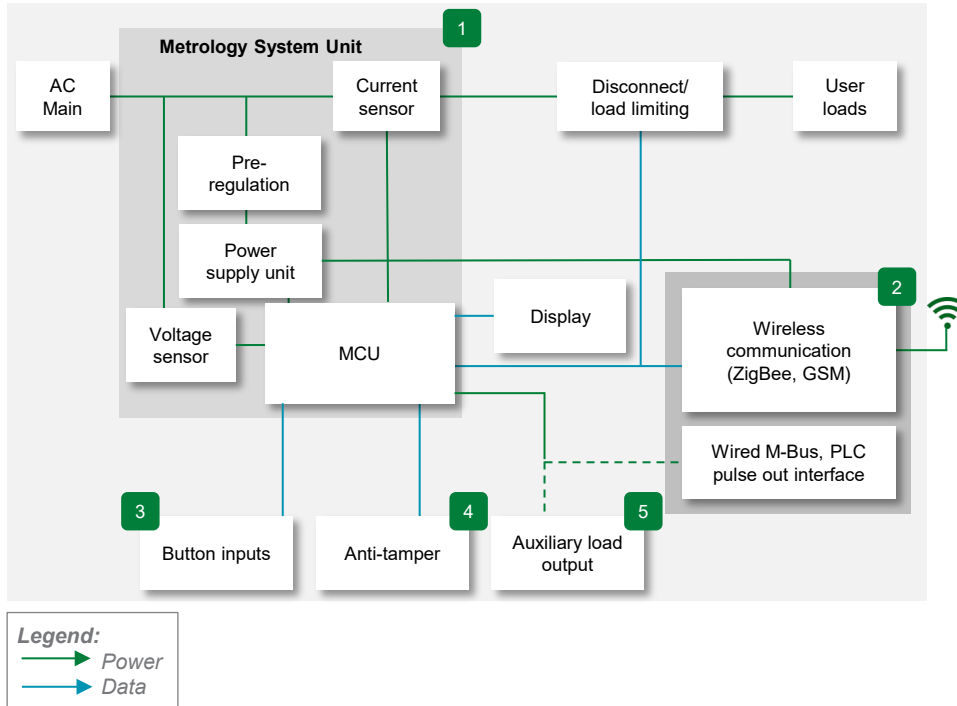
- ESD protection
- I/O protection
- ± 5 to ± 15 V signal line
- 400–1500 V peak pulse power

Solid State Relay

- Isolation between MCU & load outputs
- Up to 3750 V_{RMS} isolation
- UL/IEC certified
- Low drive power

Electricity meter system block diagram

Click on the product series in the table below for more info



| | Technology | Function in Application | Product series |
|---|-------------------------------|---|---|
| 1 | MOV | Protects power units from transients and lightning | Ultra MOV , CIII , TMOV |
| | Fuse | Protects power stage from overcurrent | 215 , 514 , 835 |
| | TVS Diode | Protects sensitive electronic components from voltage transients | SMAJ , SMBJ |
| | NTC | Senses the temperature of power semiconductor devices | End-banded Chip |
| | MOSFET | Provides high-frequency load switching | Polar™ , X2-Class |
| 2 | PolySwitch® Resettable Device | Protects the power stage from overcurrent events | TRF600-150 |
| | Protection IC (eFuse) | Helps protect the supercapacitor system and provides charge/discharge control circuitry | LS0502SCD33 , LS2406ERQ23 |
| | MOSFET | Provides a switching function in pre-regulation circuit for charging capacitor | X2-Class |
| | TVS Diode Array | Protects wired communication interface from user- induced ESD events | SC1205 , SC1210 |
| 3 | SIDACTor® | Protects sensitive electronic components from damage due to lightning surges | SEP0xx |
| | Tactile Switch | Switch for triggering display, resetting, etc. | KSC , KSE , PTS |
| 4 | Reed Sensor/TMR | Prevents magnetically induced tampering | 59177 , MDSR-10/TMR |
| | Detect Switch | Detects tampering of the meter casing | SDS , DDS |
| 5 | Solid State Relay | Provides isolation from the MCU and load output | PLA192 , CPC1394 , CPC1983YE , PLA193 , PLA194 , CPC1343G |
| | TVS Diode/MOV | Protects auxiliary I/O from voltage transients due to overload | SMCJ/SM7 |

Fire Detection and Life Safety

Protection for systems where failure is not an option



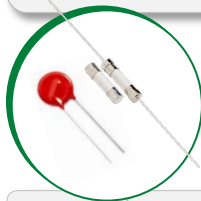
Smoke and heat detector—power and alarm reliability

Ensuring continuous operation, robust protection, and dependable alarm signaling

Power input & system continuity

- Powered from AC mains
- Must remain operational during:
 - Surges
 - Faults
 - Brownouts

Power disturbances must not disable life-safety systems.



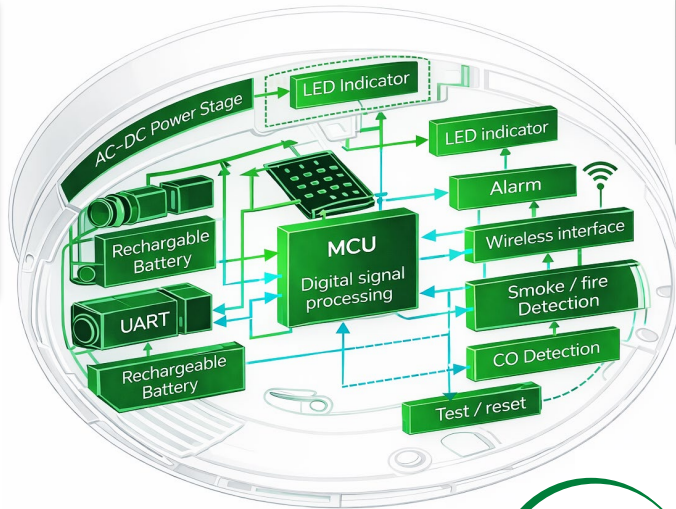
AC mains protection

Fuses

- Voltage rating: 250–600 VAC
- Current rating: 0.5 to 20 A
- Interrupt rating: >10 kA
- Temperature: –40 to 125 °C

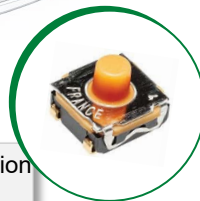
MOV/ TMOV

- 150 to 320 VAC MCOV
- Up to 20 kA surge (8/20 μ s)
- Thermally protected
- UL1449 compliant



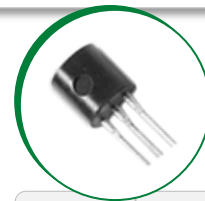
C&K® Tactile Switch

- Ultra-low current consumption
- Operating life (1M cycles)
- IEC 60068-2-42 qualified
- Rugged sealing & resistance to corrosion



Alarm Signaling & Load Control

- Drives alarm loads (horn/piezo sounder)
- Must activate reliably during emergency



Alarm switching

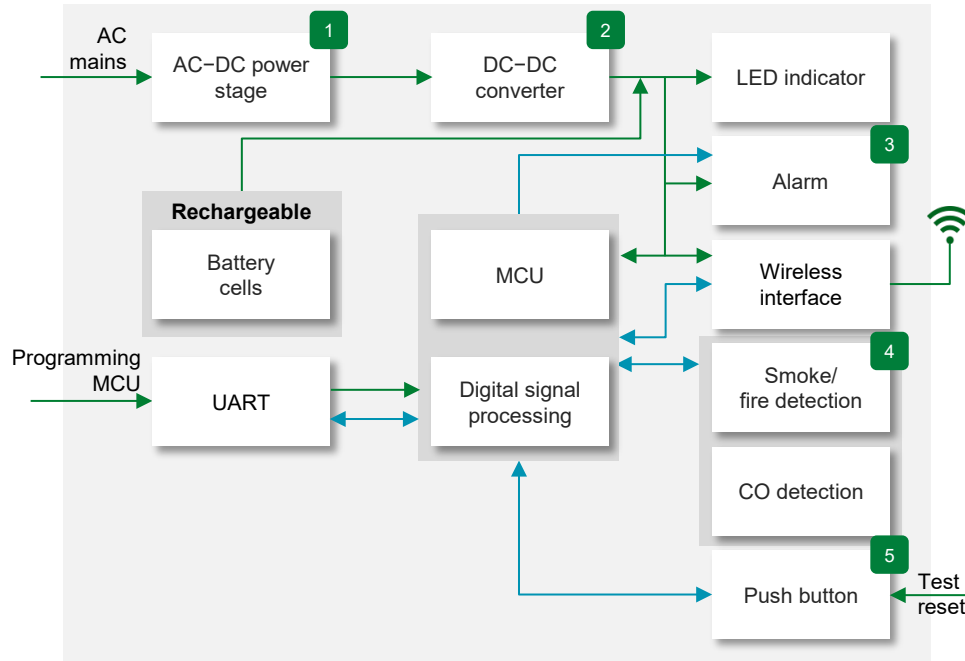
TRIAC/ SCR

- Designed for low-power AC loads
- Voltage rating: 600 V
- RMS on-state current: 1 A
- Low gate trigger current (direct control from MCU)

Test & Reset

Smoke and heat alarm functional block diagram

Click on the product series in the table below for more info



| | Technology | Function in Application | Product Series |
|---|----------------|---|------------------------------------|
| 1 | Fuse | Protects power stage from overcurrent events | 875, 263, 373, 392 |
| | MOV | Helps protect power unit from voltage surges and lightning events on AC lines | LA, Xtreme |
| 2 | TVS Diode | Protects sensitive electronic components from voltage transients | SMCJ |
| 3 | TRIAC/SCR | Triggers the output alarm | EC103M, LX5 |
| 4 | NTC | Senses temperature | KW, KT, USUG1000 |
| 5 | Tactile Switch | Tests and resets the device | KSC, KMT0 |

Legend:
 Power
 Data

Littelfuse solutions for fire alarm control panel



1

Power Module
Fuse, MOV, TVS Diode,
SIDActo[®] + MOV

3

C&K[®] Switches
Tactile, DIP, Slide

2

I/O Module
SSR, TVS Diode

4

Communication Module
TVS Diode Array, PESD

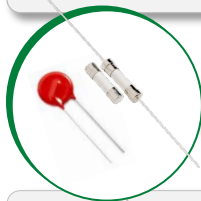
Fire alarm control panel

Ensuring reliable operation under electrical stress

Power input and system continuity

- Powered from AC mains
- Must remain operational during:
 - Surges
 - Faults
 - Brownouts

Power disturbances must not disable life-safety systems.



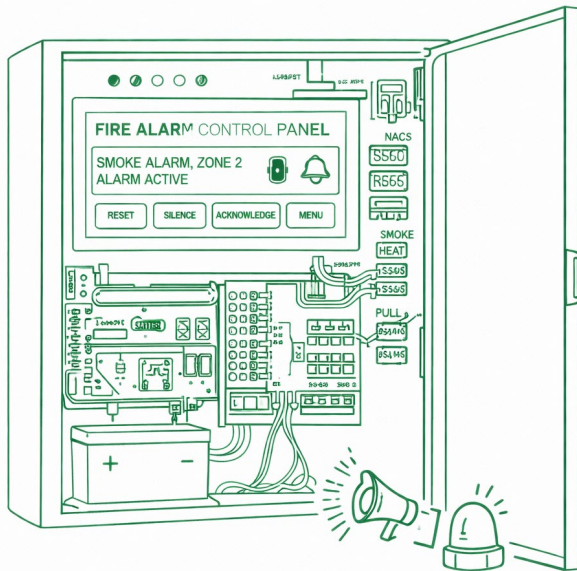
AC mains protection

Fuses

- Voltage rating: 250–600 VAC
- Current rating: 0.5 to 20 A
- Interrupt rating: >10 kA
- Temperature: –40 to 125 °C

MOV/TMOV

- 150 to 320 VAC MCOV
- Up to 20 kA surge (8/20 μ s)
- Thermally protected
- UL1449 compliant



Load switching and signal interfaces



Enabling safe switching and reliable signal interfaces

TVS Diode Array

- ESD protection
- I/O protection
- ± 5 – ± 15 V signal line
- 400–1500 V peak pulse power

Solid State Relay

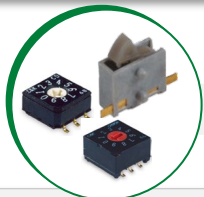
- Silent, wear-free switching
- No external MCU/control logic
- 2500 V_{RMS} I/O isolation
- Works in all existing 8 to 24 VAC house installations

Fire alarm control panel

Ensuring reliable operation under electrical stress

User interface

- Parameter configuration
- Communication options
- Mode selection
- Power control



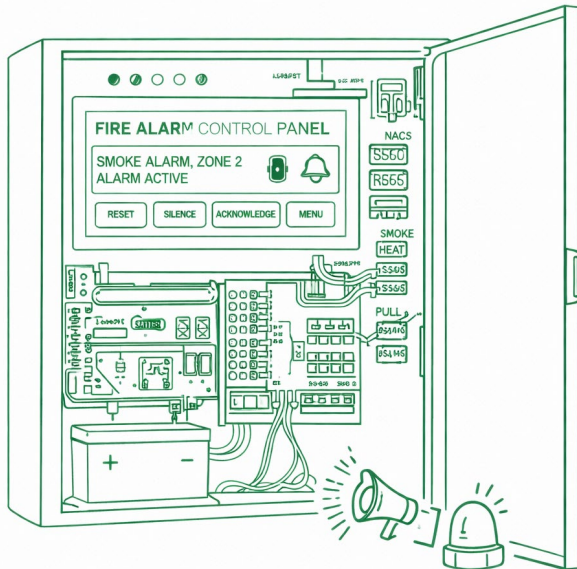
User interface

C&K® DIP Switch

- Miniature switches with robust metal casing
- Configurable
- Thru-hole & SMD versions
- IP54

C&K® Slide Switch

- Thru-hole & SMD versions
- Variety of actuators & terminations
- Epoxy terminal-seal compatible
- Customizable



Test & Reset button

- High mechanical life
- Reliable actuation over years



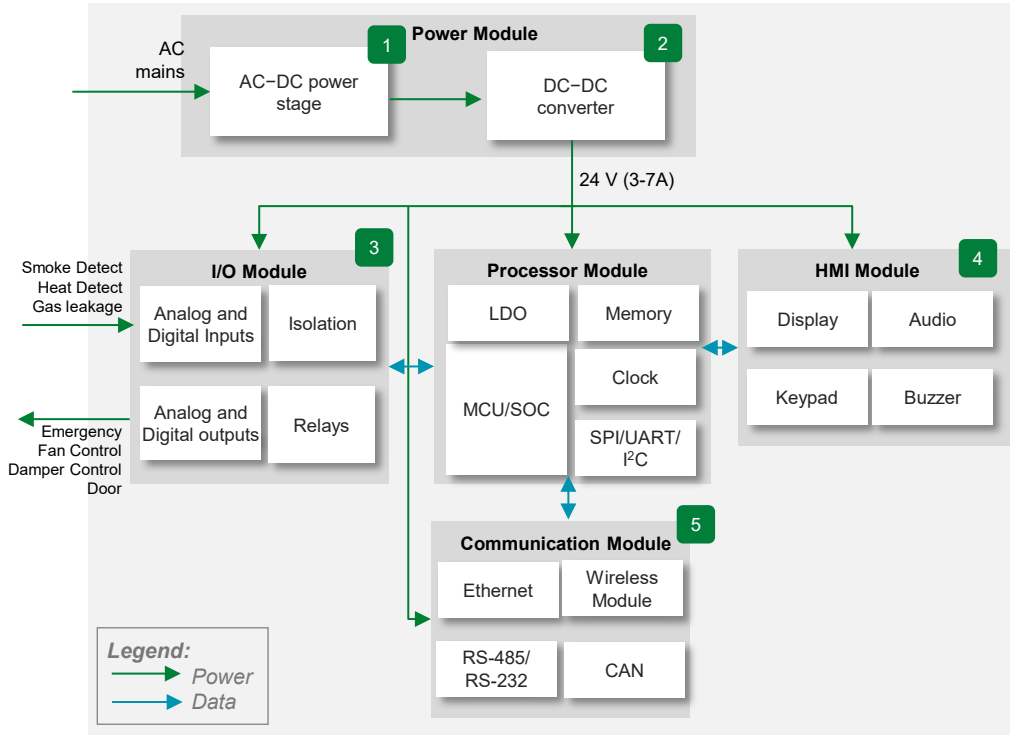
Test & Reset

C&K® Tactile Switch

- Ultra-low current consumption
- Operating life (1M cycles)
- IEC 60068-2-42 qualified
- Rugged sealing & resistance to corrosion

Fire alarm control panel functional block diagram

Click on the product series in the table below for more info



| | Technology | Function in Application | Product Series |
|---|-------------------|--|--|
| 1 | Fuse | AC mains input protection (overcurrent + surge) | 875, 807, 373 |
| | MOV | | Ultra MOV, C-III, TMOV |
| | SIDACTor® + MOV | | Pxxx0ME + V10E300P |
| 2 | TVS Diode | Protects 24 V distribution and downstream rails from transients, inductive kick, hot-plug spikes | SMCJ, SMDJ, SMF |
| 3 | Solid State Relay | Provides reliable switching for actuators (fan, damper, and door) | CPC1343G, CPC1601M |
| 4 | C&K Switch | Various functions (Keypad, Reset, power, and alarm silence) | KSC, KMT0, SDA, IDA, RTE, JS, 1000,L |
| 5 | TVS Diode Array | Protects ICs from ESD | SP3213 |
| | | USB 2.0/3.0 | SP3400, SP0201B |
| | | Ethernet/PROFINET | SP2525NUTG, SP3025-04HTG |
| | | RS232/RS485 | SM15/SP712 |

Security cameras and video doorbells



Littelfuse solutions for wired security cameras



1

Memory
TVS Diode Array

4

Power over Ethernet
Fuse, PPTC, TVS Diode Array

2

Motor drive
Solid State Relay

5

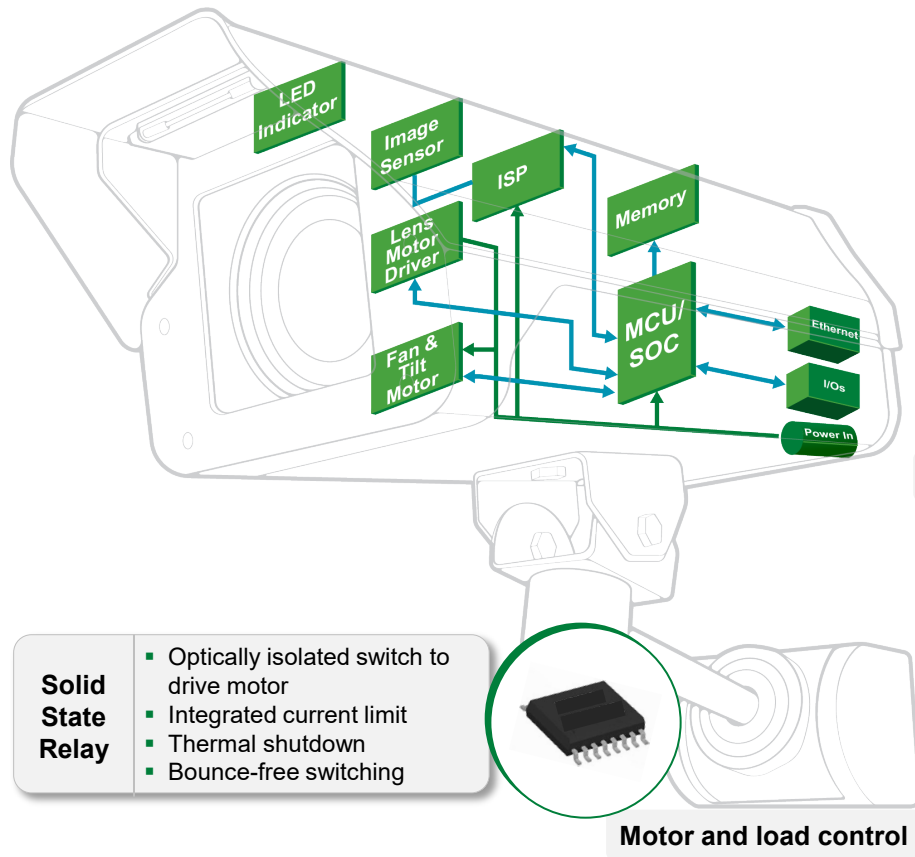
Power adapter
Fuse, MOV, TVS Diode

3

DC power input
Fuse, PPTC, TVS Diode

Security cameras: power, signal, and motor protection

Ensuring continuous operation, image integrity, and reliable control under electrical stress



Solid State Relay

- Optically isolated switch to drive motor
- Integrated current limit
- Thermal shutdown
- Bounce-free switching

Motor and load control

Key system functions

- Image capture and processing
- Motor control (tilt/zoom)
- PoE/Ethernet or DC power input
- High-speed data
- Memory and storage

Critical electrical risks

- ESD on high-speed interfaces
- DC rail faults affecting image sensors and MCUs
- Inductive stress from motors
- System resets due to signal integrity issues

TVS Diode Array

- ESD/transient protection
- Multiple rail-to-rail protections
- Low capacitance
- Small footprint (0201)
- Low leakage current

Signal and data protection

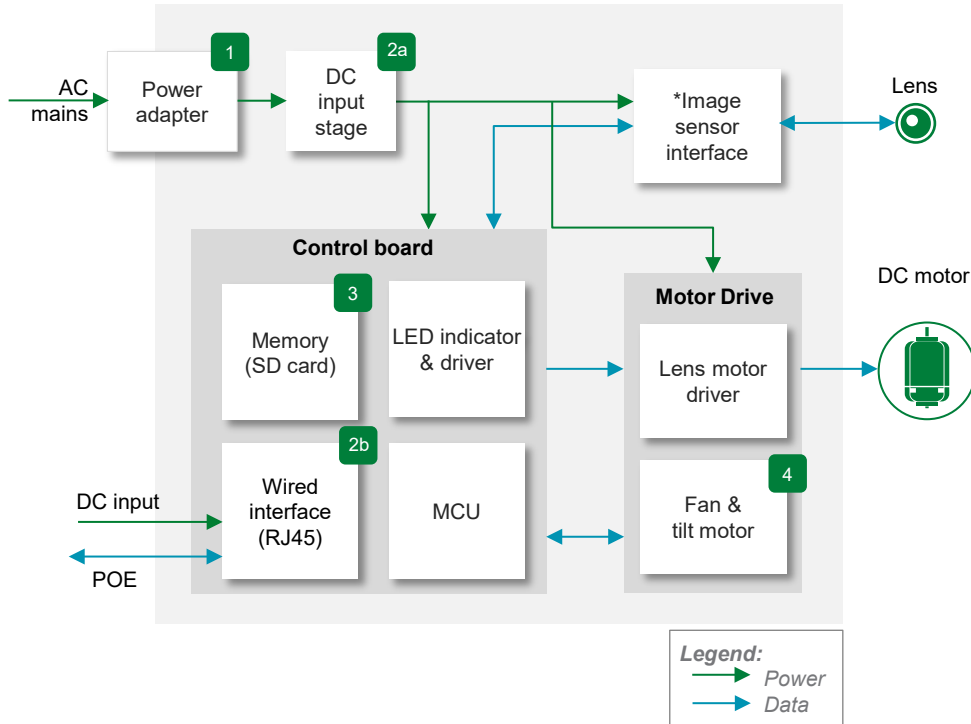
PPTC + TVS Diode

- Resettable overcurrent + transient protection on DC rail
- Surface mount
- UL/IEC qualified

DC input protection

Wired security camera functional block diagram

Click on the product series in the table below for more info



| | Technology | Function in Application | Product Series |
|----|-------------------------------------|--|---|
| 1 | Fuse | Protects the power stage from overcurrent events | 875 , 807 , 373 |
| | MOV | Protects power units from voltage transients and lightning | TMOV* , LA , UltraMOV |
| | TVS Diode | Protects power units from voltage transients | P6KE , P6SMB |
| 2a | Fuse, PolySwitch® Resettable Device | Protects the power stage from overcurrent events | 461 , 449 , picoSMD |
| | TVS Diode | Protects sensitive electronic parts in the power stage from voltage transients | 5.0SMDJ/ 5.0SMDJ-FB |
| 2b | Fuse, PolySwitch® Resettable Device | Protects the power stage from overcurrent events | 461 , 449 , picoSMD |
| | TVS Diode Array | Protects sensitive electronic parts from voltage transients | SRV05-4HTG , SP0504SHTG |
| 3 | TVS Diode Array | Protects memory cards from user-induced ESD event | SP1006 |
| 4 | Solid State Relay | Optically isolated switch to drive motor | CPC1560 , CPC1561B |


* TMOV is the recommended solution to comply with the new IEC 62368-1 standard

Littelfuse solutions for wired doorbell cameras



1

Memory
TVS Diode Array



4

Power supply unit
Fuse, TVS Diode, Solid State Relay



2

Wireless interface
Polymer ESD Suppression



5

Doorbell chime
Solid State Relay



3

User interface
TVS Diode Array



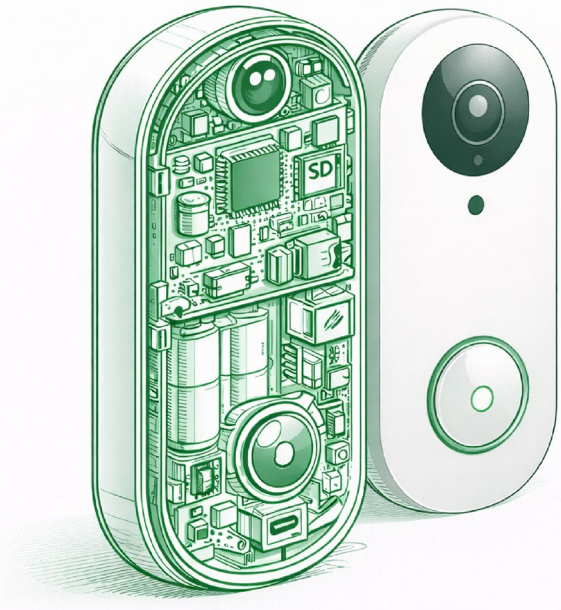
6

Charging port
Fuse, PPTC, TVS Diode, MLV, NTC



Wired doorbell camera: system overview

Input power protection, signal integrity, & reliable chime control

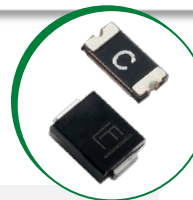


Key system functions

- Battery management & charging
- Wireless communication
- Doorbell chime activation
- User interaction (pushbutton/audio)

Critical electrical risks

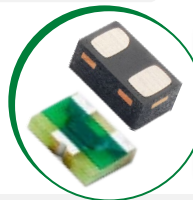
- Battery charging (USB protection)
- ESD on pushbutton, microphone, & antenna
- Chime switching reliability under load



PPTC + TVS Diode

- Protects from high discharge currents & voltage transients
- SMD package
- IEC compliant

Battery protection



TVS Diode Array + Polymer ESD

- Protects memory, Wi-Fi chipset against ESD events
- Low profile (0201)
- Low leakage current
- Ultra-low capacitance

Signal & interface protection

Solid State Relay

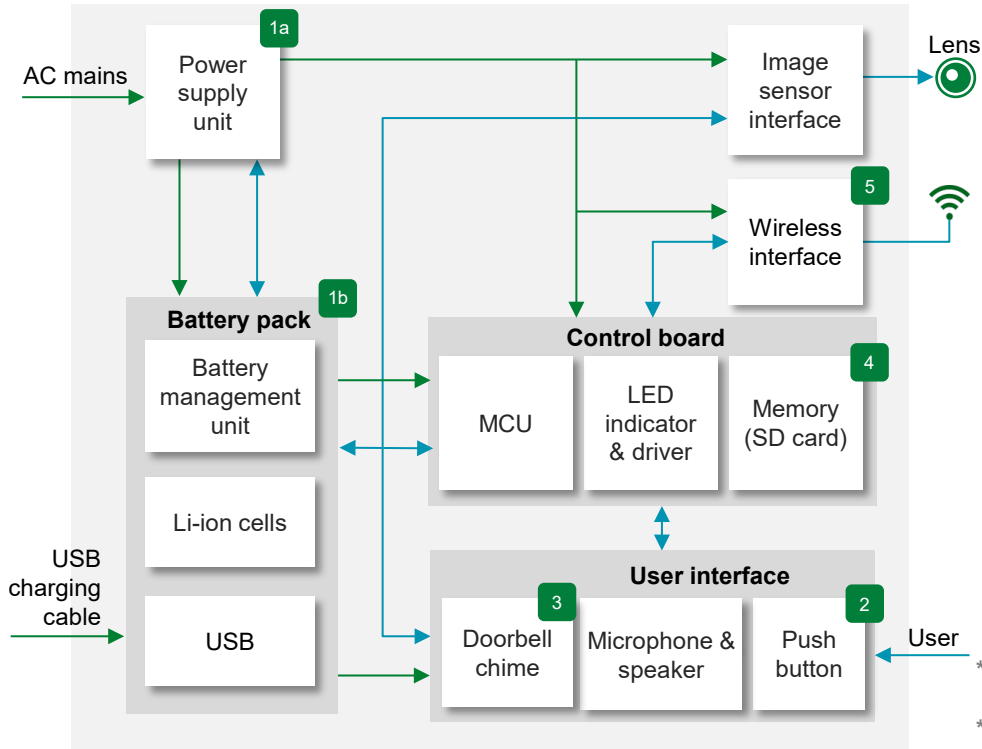
- Dual-purpose switch between chime and camera
- Normally closed, 60 V, 1.84 A_{RMS} self-actuating
- Compact package



Chime & load switching

Wired doorbell camera functional block diagram

Click on the product series in the table below for more info



Legend:
 Power
 Data

| | Technology | Function in Application | Product Series |
|------|-------------------------------------|---|--------------------------------------|
| 1a | Fuse | Protects the power stage from overcurrent events | 443, 449 |
| | Solid State Relay | Optically isolated switch | PLB190 |
| | TVS Diode | Protects sensitive electronic parts from voltage transients | 4_0SMDJ24A |
| 1b* | Fuse, PolySwitch® Resettable Device | Protects from high discharge currents due to external shorts | 469, 449, 1206L450SL |
| | TVS Diode | Protects sensitive electronic parts from voltage transients | SMBJ |
| | MLV | ESD protection for data lines | MLA |
| | NTC | Temperature monitoring of battery packs during charging & discharging cycles | KC |
| 2 | TVS Diode Array | Protects memory card from user-induced ESD events | SP1006 |
| 3** | Solid State Relay | Optically isolated switch functions as a dual-purpose switch between chime and camera | LCB710, CPC2501M |
| 4 | TVS Diode Array | Protects memory cards from user-induced ESD events | SP1006 |
| 5*** | Polymer ESD Suppressor | Protects the Wi-Fi chipset from user-induced ESD events | PGB10603, PGB10402 |

* In some applications, a micro-USB port is provided for charging removable Li-Ion batteries. The rechargeable battery is built in and gets power from the main power stage

** This is found in European markets where SSR is used to cut off vampire power and as an energy harvester switch to transfer power to the image sensor only a few times an hour, following privacy regulations

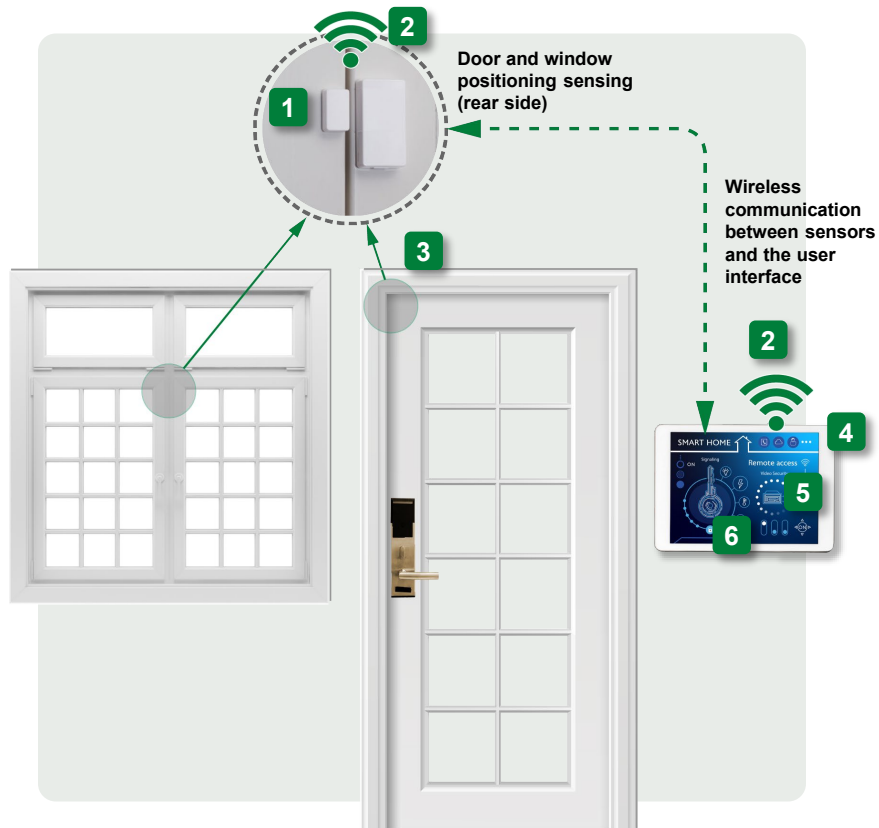
*** This is recommended for compact designs where clearance between the antenna and the casing is < 2 mm

Smart Access Control

Smart Locks + Door/Window Sensors



Littelfuse solutions for wireless door/window sensors with a control panel

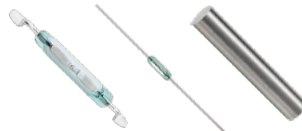


1 Door and window positioning sensing (rear side)

2 Wireless communication between sensors and the user interface

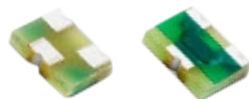
1 Position sensing

Reed Switch, Magnetic Actuator, TMR



2 Wireless communication

Polymer ESD Suppressor



3 Tamper detection

Detect Switch



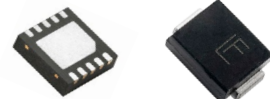
4 Button input

Tactile Switch



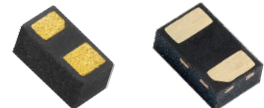
5 Input protection

Protection IC (eFuse), TVS Diode



6 User interface

TVS Diode Array



Silent, reliable switching for smart access control

Smart Locks

- User authentication
- Motorized locking mechanism
- Wireless communication

Littelfuse enables:

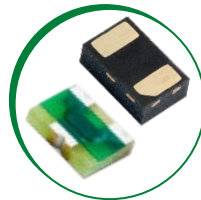
- ESD protection
- Switches for reset/user authentication
- Protection for motor drive interface



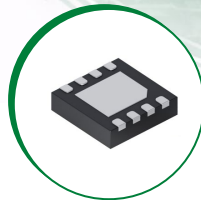
Reed Switches
(Simple open/close detection)



TMR Switch
(Position sensing)



TVS Diode & Polymer ESD
(ESD protection)



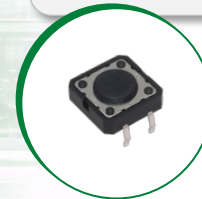
Solid State Relay
(Isolation switch)

Door/Window Sensors

- Open/close detection
- Forced entry detection
- Tampering detection

Littelfuse enables:

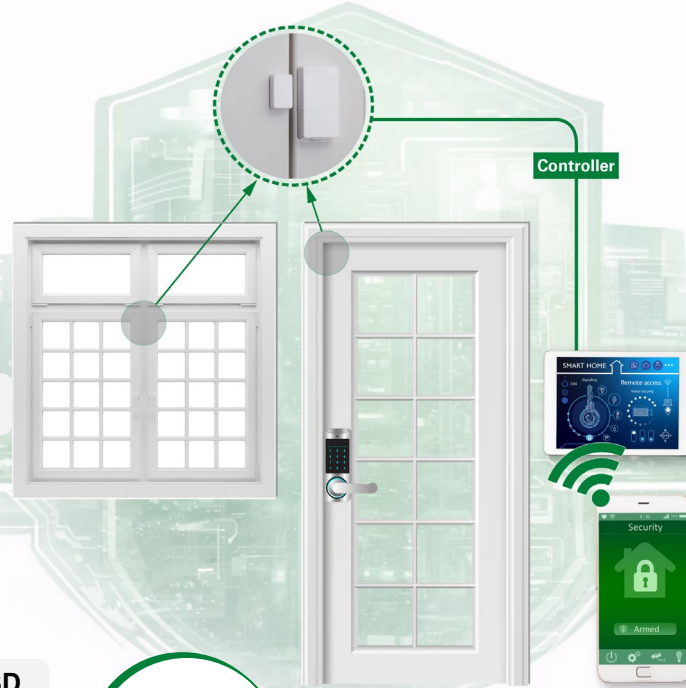
- Stable magnetic sensing over product lifetime for accurate detection
- Detects cover removal or forced separation
- Mechanical tampering sensing



Tactile switch
(User interface)

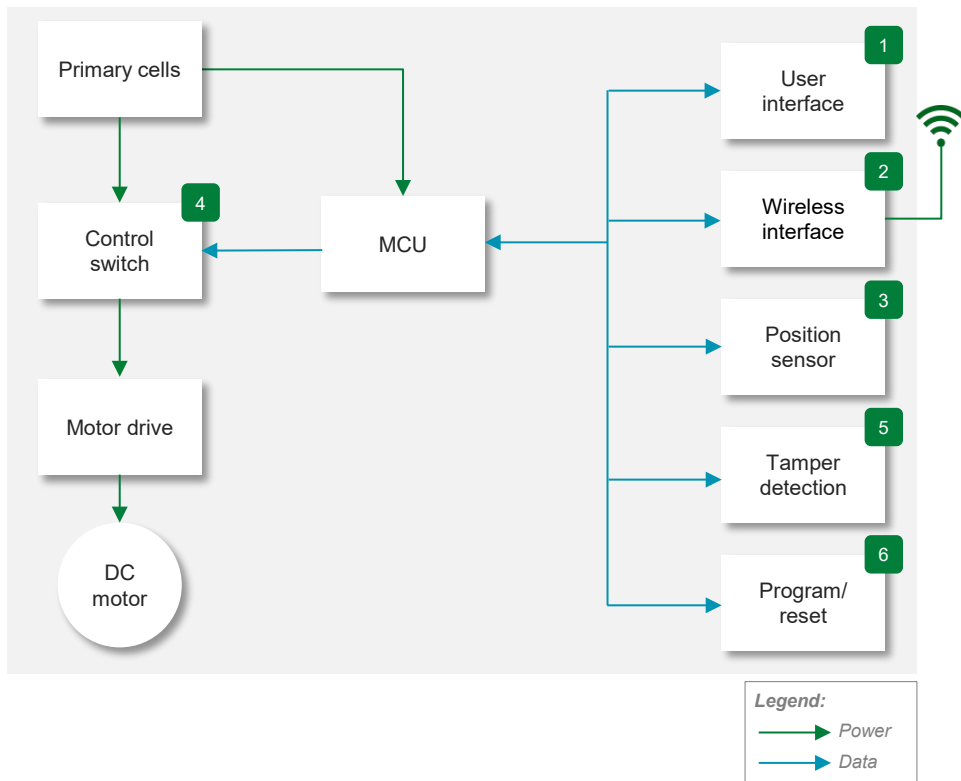


Detect Switch
(Mechanical tampering)



Smart lock block diagram

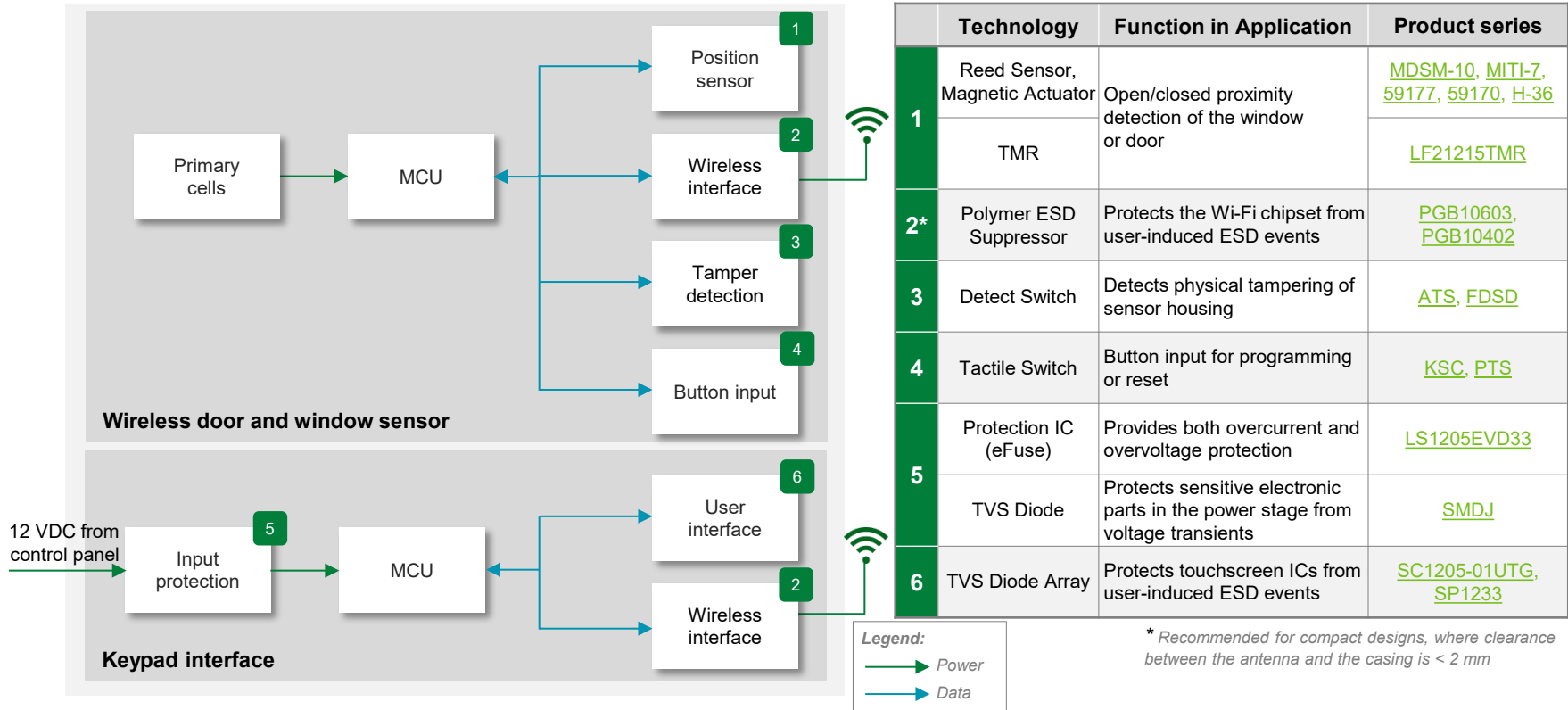
Click on the product series in the table below for more info



| | Technology | Function in Application | Product series |
|----|--------------------------------|---|---|
| 1 | TVS Diode Array | Protects touchscreen ICs from user-induced ESD events | SC1205-01UTG , SP1233 |
| 2* | Polymer ESD Suppressor | Protects the Wi-Fi chipset from user-induced ESD events | PGB10603 , PGB10402 |
| 3 | Reed Switch, Magnetic Actuator | Detects door closure prior to engaging the deadbolt | MDSM-10 , MITI-7 , H-36 |
| | TMR | Detects the position of the door handle | LF32115TMR |
| 4 | Solid State Relay | Switches the lock ON and OFF electronically | LCB717 , LCA717 , LBA710 |
| 5 | Reed Switch | Detects magnetic tampering | 59166 |
| | Detect Switch | Detects physical tampering of lock housing | ZMA , FDSD |
| 6 | Tactile or Slide Switch | Button input for programming and reset | KSC , PTS , KMR2 , JS |

Wireless door/window sensors with keypad

Click on the product series in the table below for more info




Smart Thermostat

Protection, sensing, and connectivity for intelligent HVAC control



Littelfuse solutions for smart thermostats

 Click on the product series in the table below for more info



1

24 V input protection
Fuse, PPTC, TVS Diode



3

Communication interfaces
TVS Diode Array, Polymer ESD, MLV, TVS Diode



2

Battery protection
PPTC, Protection IC, MLV, TVS Diode



4

Sensors and switches
Tactile Switch, Slide Switch, NTC, PIR Sensor



Smart thermostat systems

Protection, sensing, and connectivity for intelligent HVAC control

24 V HVAC input protection

- Protects against surge and miswiring
- Handles electric stress from HVAC systems



24 VAC Input Protection

Fuse OR PPTC

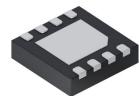
- Overcurrent protection
- SMD form factor
- UL/IEC qualified
- Resettable option available (PPTC)

TVS Diode

- Voltage transient protection
- Compact form factor
- Excellent clamping capability

Solid State Relay

- Silent, wear-free switching
- No external MCU/control logic
- 2500 V_{RMS} I/O isolation
- Works in all existing 8 to 24 VAC house installations

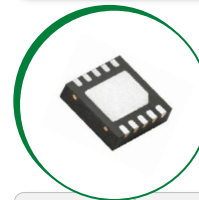


Isolate Control Switching



Battery Protection

- Prevents overcurrent and fault conditions
- Transient protection



Battery Protection

eFuse

- Integrated solution with
 - current limit protection
 - thermal shutdown
 - internal soft start
- 2.7 ~ 24 V, 5 A
- Low power dissipation

Smart thermostat systems

Protection, sensing, and connectivity for intelligent HVAC control

User interface

- Temperature selection
- Mode selection
- Reset, on/off



User interface

C&K® Tactile Switch

- SMD version
- Rugged sealing
- Waterproof and dust proof
- IP67
- Operating life (10M cycles)

C&K® Slide Switch

- Temperature adjustments
- Low profile
- SMD/Thru-hole versions
- Long life cycle
- Up to DP3T



ESD Protection

- Wi-Fi radios
- Bluetooth™
- Touch screen/user interface/display
- RF antenna



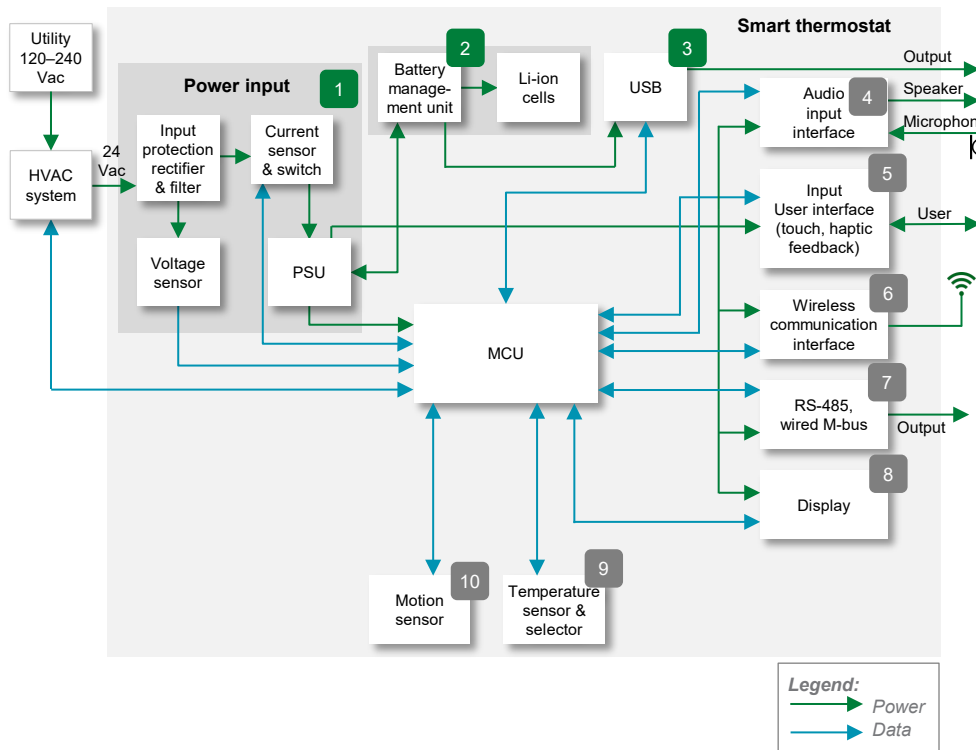
Enabling safe switching and reliable signal interfaces

TVS Diode Array

- ESD protection
- I/O protection
- ± 5 to ± 15 V signal line
- 400–1500V peak pulse power

Smart thermostat system

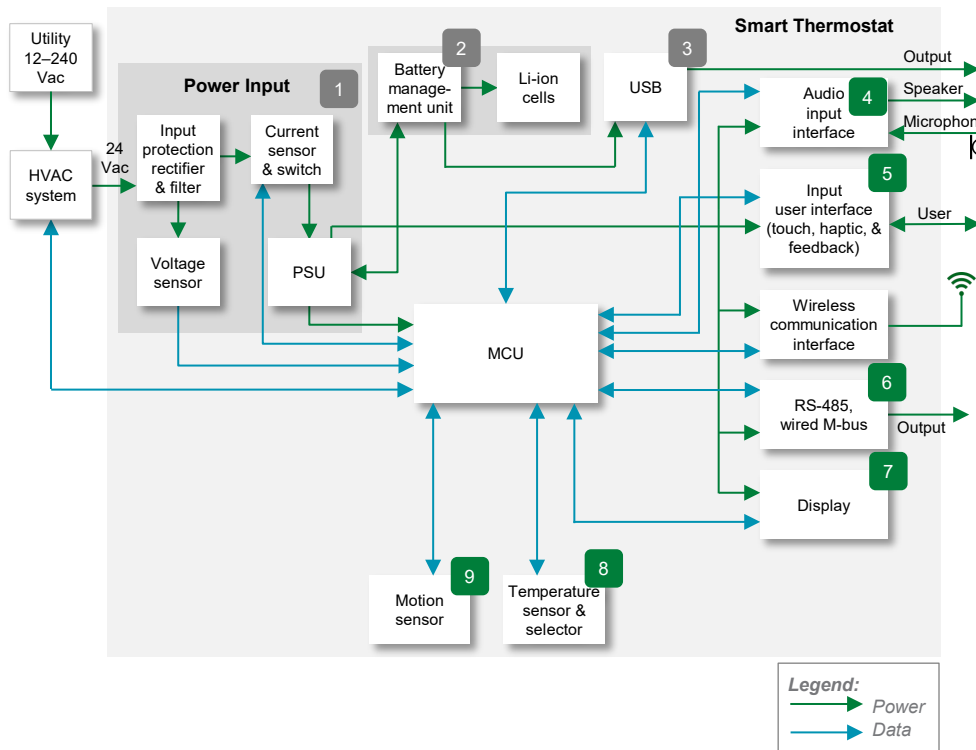
Click on the product series in the table below for more info



| Technology | Function in Application | Product Series |
|-------------------------------|-------------------------------|---|
| 1 | Fuse | Protects the battery and downstream components from inrush current 437 , 468 |
| | PolySwitch® Resettable Device | Protects the system from overtemperature and overcurrent events; prevents nuisance opening of the fuse 2920L |
| | TVS Diode | Protects sensitive electronic component from voltage transients SACB , SMAJ , SMF3.3 |
| | Solid State Latching Relay | Integrated power regulator protects the auxiliary power supply, and it simplifies the circuitry CPC1601M |
| | 2 | MLV, TVS Diode |
| PolySwitch® Resettable Device | | Protects battery from overcurrent and overtemperature events 1812L |
| Protection IC (eFuse) | | Provides reverse current blocking for power mux LS2405IDD23 |
| 3 | TVS Diode Array | Protects against ESD on high-speed data lines SP0201U , SP0201B |
| | PolySwitch® Resettable Device | Protects downstream components from overcurrent and overtemperature events 0402L |
| | Protection IC (eFuse) | Provides overcurrent, overvoltage, and overtemperature protection LS0505EVD22 , LS0504EVT233 |

Smart thermostat system

Click on the product series in the table below for more info



| Technology | Function in Application | Series | |
|------------|-------------------------|--|--|
| 4 | TVS Diode | Protects sensitive electronic component from voltage transients | SACB , SMAJ , SMBJ |
| 5 | TVS Diode Array | Protects downstream ICs from ESD events | SP0402U , SP0402B |
| | Polymer ESD | Protects downstream ICs from ESD events | PESD |
| 6 | Tactile Switch | Button inputs for selecting settings | KSC |
| | TVS Diode Array | Protects sensitive electronic components from voltage transients | SP712 |
| 7 | MLV, TVS Diode | Protects sensitive electronic components from voltage transients | MLA , SMF |
| | NTC | Detects ambient temperature | RB , DO-35 |
| 8 | Slide Switch | User-selected temperature adjustment | JS |

Additional information can be found at Littelfuse.com

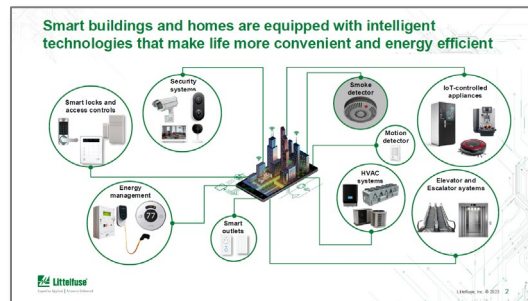
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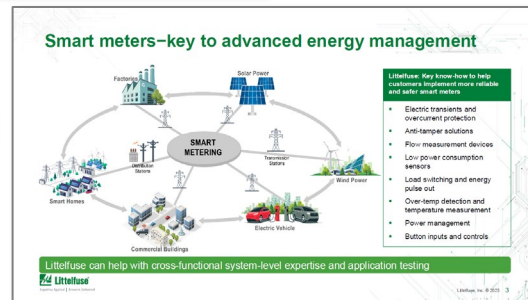
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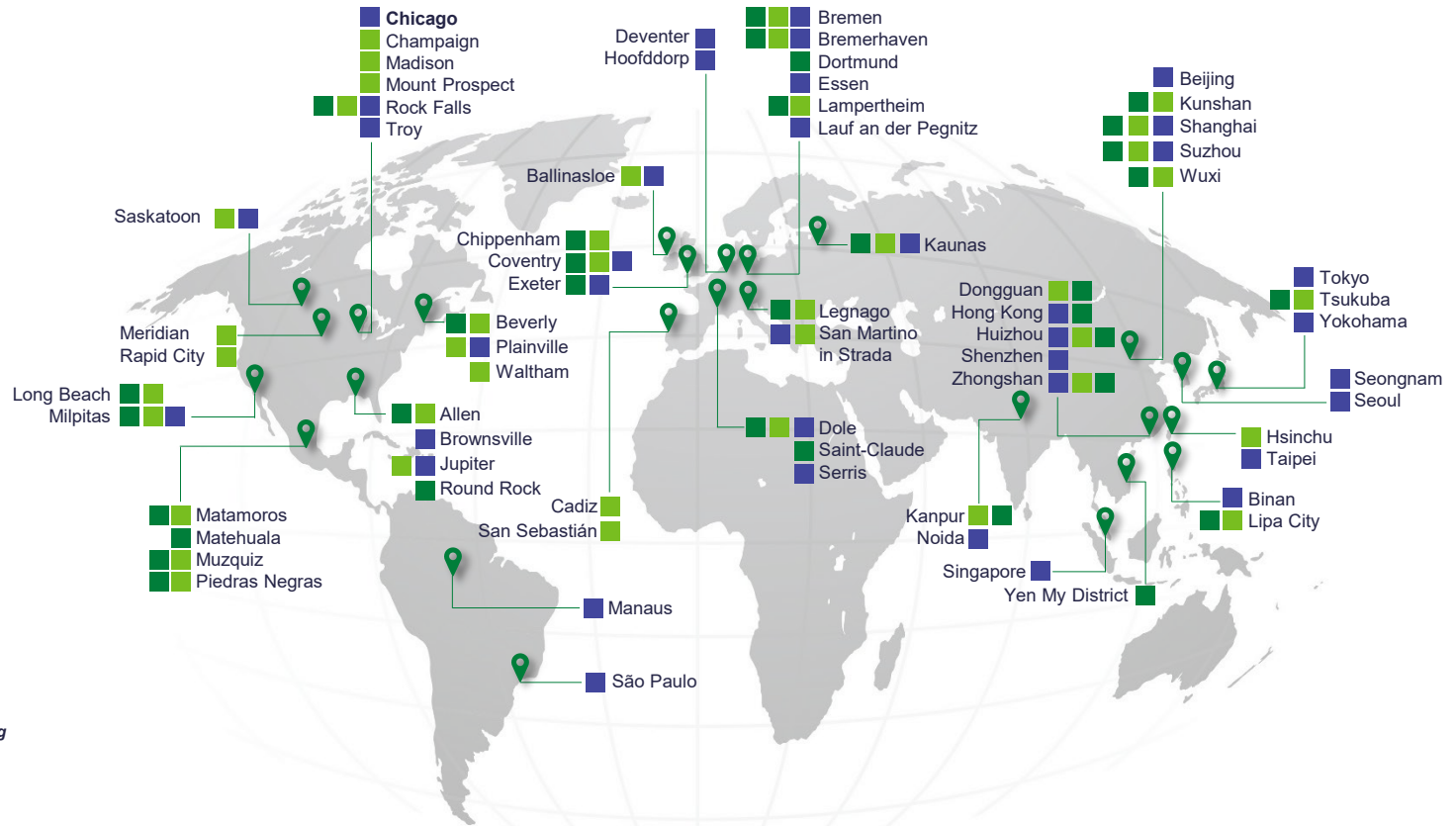
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 ■ R&D
 ■ Manufacturing

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Our global customer service team is with you to anticipate your needs and ensure a seamless experience.

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Our high-volume manufacturing is committed to the highest quality standards.



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