

Therapeutic And Personal Monitoring Devices



Healthcare

Diagnosis → treatment: healthcare device ecosystem

End-to-end view of Littelfuse-relevant medical segments

Healthcare ecosystem

Personal Monitoring



- CGM
- Insulin pumps
- Blood pressure monitors
- Wearable injectors

Therapeutic Devices



- Defibrillators
- Ventilators
- Injection pens
- Hearing aids

Diagnostic Devices



- MRI scanner
- CT scanner
- Xray
- Ultrasound imaging

Surgical Devices



- Surgery staplers
- Cautery pen/bipolar forceps
- Pulse field ablation
- Surgical lasers
- Endocutter/scissors



Healthcare market: segment growth & key trends

Connected, high-power-density and safety-critical systems driving Littelfuse content

\$190M TAM Personal Monitoring

14% CAGR

- Shifting to home care
- Remote monitoring
- Battery-powered devices
- Sensors, connectivity, and low-power electronics



Medical equipment
8% CAGR (2025–2030)

Connected, AI-enabled, and monitoring devices
grow fastest (10–15%+ CAGR)

Strong expansion of remote monitoring,
home care, and ambulatory solutions

Post-pandemic acceleration of automation,
robotics, and workflow efficiency

\$215M TAM Therapeutic Devices

7.6% CAGR

- High-energy delivery systems
- Precise and reliable power electronics
- Miniaturization & connectivity
- Implantable components



\$130M TAM Diagnostic Devices

6% CAGR

- Need for high-voltage and high-power systems
- Partially shifting to home care
- Increasing needs of portable devices



\$190M TAM Surgical Devices

8% CAGR

- Shift toward higher precision
- High-accuracy mechanics
- More sensors (motor & actuators)
- Increase of RF, laser, and ultrasound energy



Littelfuse solutions in high-growth medical segments

Power semiconductors, switches and sensors, and circuit protection

Monitoring/Tracking



- TMR Sensors
- C&K® Switches
- TVS Diode Arrays
- Resettable PolySwitch® Devices
- Protection IC (eFuse)

Littelfuse opportunities

Market attractiveness due to high barriers to entry, recurring revenue, & long-term visibility

High-voltage, high-frequency pulse power generation

Small-form-factor, resettable protection for battery-powered medical devices

Contactless, low-power TMR sensing for CGM and drug delivery systems

Small-form-factor, sealed (IP-rated) switches for surgical & portable devices

Diagnostic Devices



- Power Semiconductors
- C&K® Switches
- Circuit breaker, SSR
- Fuses, MOVs, TVS Diodes

Therapeutic Devices



- Power Semiconductors
- C&K® Switches
- Fuses
- MOVs
- TVS Diodes

Surgical Devices



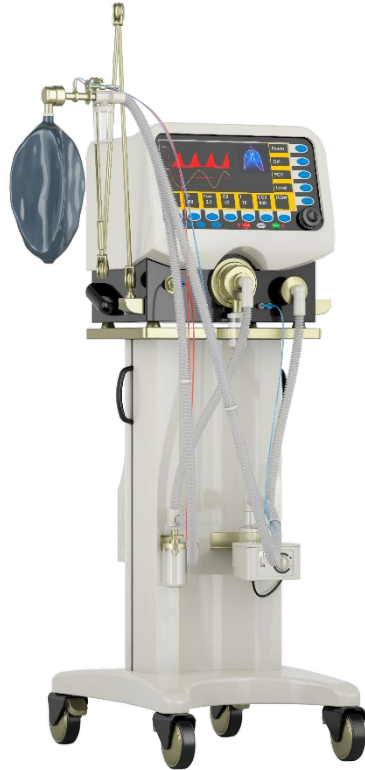
- Power Semiconductors
- C&K® Switches
- Sensors
- Fuses
- MOVs

Therapeutic Devices

Ventilator | Defibrillator | Injection Pen | Hearing Aid



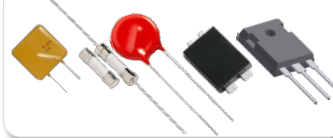
Littelfuse solutions for ventilator systems



1

Power Supply (AC-DC)

PolySwitch® Resettable Device, Fuse, MOV, Schottky Diode, MOSFET



2

Battery management unit

PolySwitch® Resettable Device, TVS Diode, TVS Diode Array



3

User interface

Switch, SSR



4

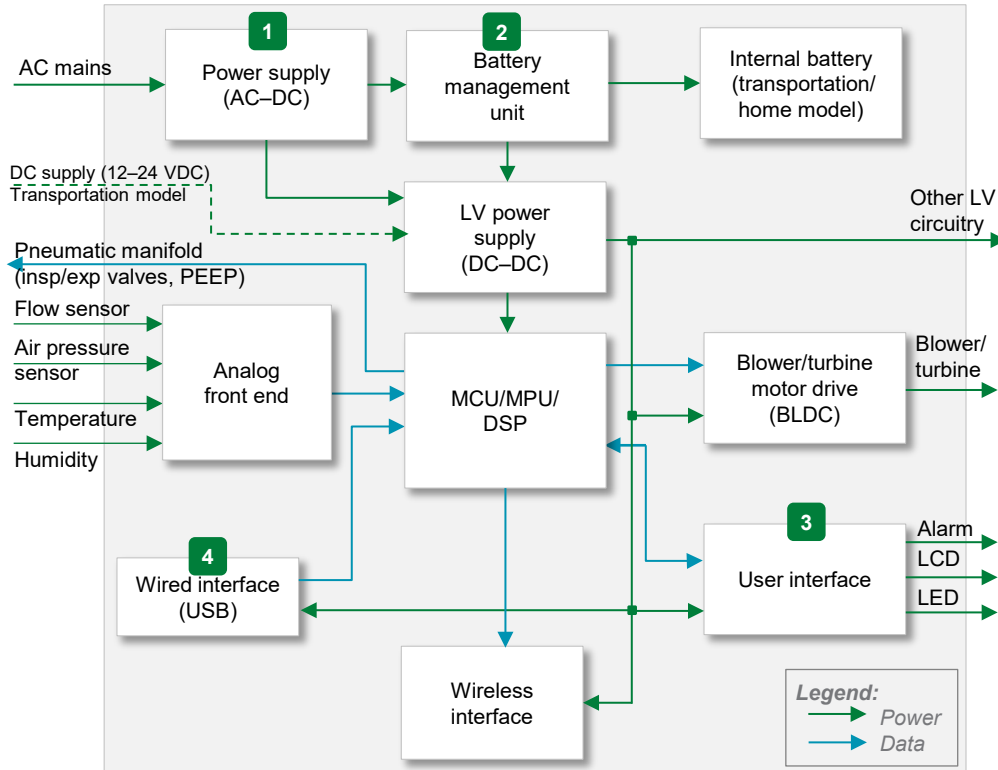
Wired interface

TVS Diode Array, Temperature Indicator, PolySwitch® Resettable Device



Ventilator block diagram

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



	Technology	Function in application	Product series
1	Fuse, Fuseholder, PolySwitch® Resettable Device	Protects power stage from overcurrent events	215, 150, LVR
	MOV	Protects from voltage surges, such as lighting and transients	UltraMOV
	TVS Diode	Protects from voltage transients	1.5SMC440A/CA, DFNAK05-400CA
	Schottky Diode	Rectification and blocking in power supply units	DST560S
	MOSFET	Switching Device for auxiliary power supply	X4 Class
2	PolySwitch® Resettable Device	Protect BMS MOSFET from high currents due to external shorts	2016L, 1206L
	TVS Diode Array	ESD protection for BMS	SP1006, SP1305, SP1001
	TVS Diode	Protects BMS from voltage transients	SMA6J28A, SMF, 1.5SMC
3	TVS Diode Array	Protects data lines & equipment from ESD and lighting	SP1103
	TVS Diode		SMF3.3A
	Switch	Navigation; on/off; feature selection	NP, KSC, KMR, M Rotary
4	Solid State Relay*	Isolation switch	CPC1017N, PLA134S
	TVS Diode Array	USB2.0/3.0	SP1250-01ETG, SP1224-01UTG, SP3522
	PolySwitch® Resettable Device	Overcurrent protection	Low Rho
	eFuse	Overcurrent/ overvoltage control	LS05006VPQ33, LS12052BD33

* CPC1017N & PLA134S isolation switch which can be used in multiple functions in a ventilator.

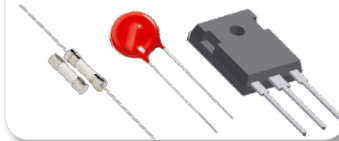
Littelfuse solutions for defibrillators



1

Power supply

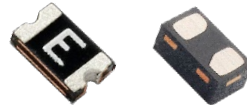
Fuse, MOV, MOSFET



2

Battery management unit

PolySwitch® Resettable Device,
TVS Diode Array



3

User interface

Tactile, Rotary Encoder, Rocker



4

Wired interface

PolySwitch® Resettable Device,
TVS Diode Array



5

High-voltage board

HV Diode, IGBT, Gate Driver



6

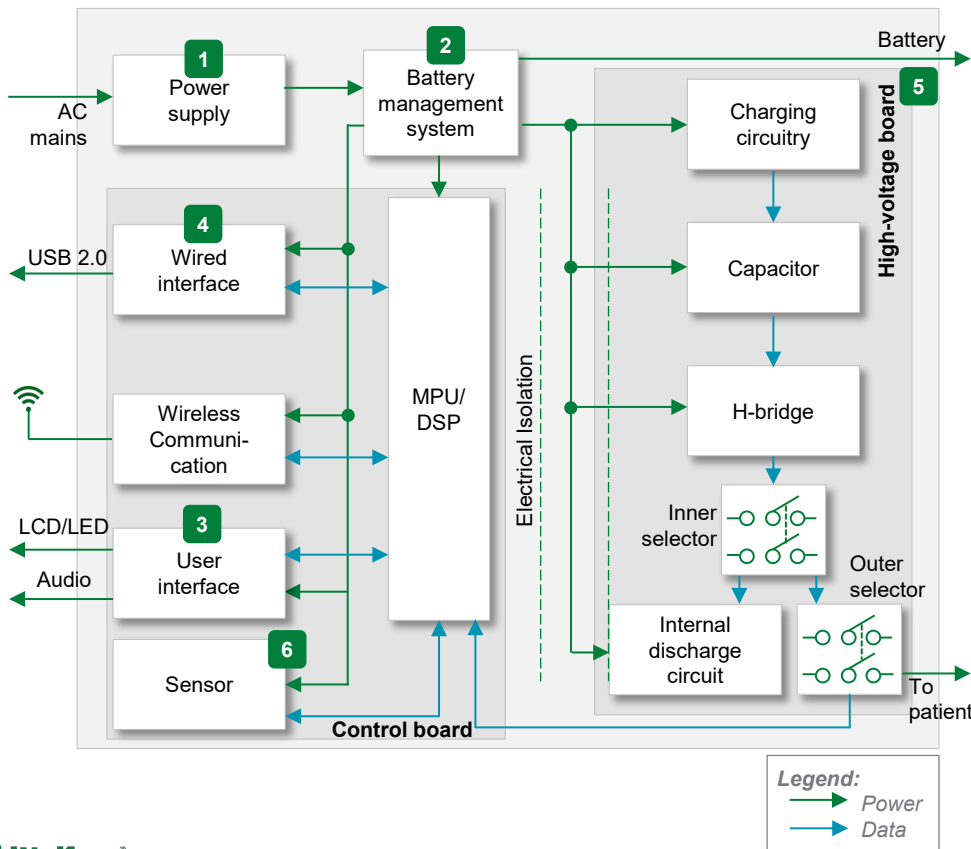
Sensor

Reed Switch, TMR, Switches



Defibrillator block diagram

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



	Technology	Function in application	Product series
1	Fuse	Protection against short circuit and overload conditions	313
	Varistor	Protection against severe surge transients	UltraMOV
	TVS Diode	Protects from voltage transients	1.5SMC440A/CA , DFNAK05-400CA
	Schottky Diode	Rectification and blocking in power supply units	DST560S
	MOSFET	Switching Device for auxiliary power supply	X4 Class
2	PolySwitch® Resettable Device	Protection against short-circuit and overload current conditions	nanoSMD , femtoSMD
	TVS Diode Array	Surge and ESD protection	SP11xx , SP1250
3	Various functional Switch	On-off, feature selection, set up, therapy delivery	NP , KSC , KMR , Rocker , Rotary
4	PolySwitch® Resettable Device	Protects 5 VDC power supply from overcurrent and overtemperature	Low Rho
	TVS Diode Array	Protects data lines and equipment from ESD and lightning	SP3019 , SP3400 , SP1250
5	HV Diode	Rectification/flyback energy recovery in HV capacitor charging circuit	Under development. Contact Sales.
	IGBT	Controls biphasic voltage waveform applied to patient	High-voltage IGBTs
	Gate Driver	Drives high-power IGBTs	IXD_604 , IXD_609
6	Reed Sensor, TMR, Detect Switch	Proximity sensor to detect the position of the handle	Custom sensor , TMR , Detect

Littelfuse solutions for auto-injectors or drug delivery pens



1

Dose dialing

Detect Switch



2

Activity detection

Tactile Switch, Detect Switch,
Reed Switch, TMR Switch



3

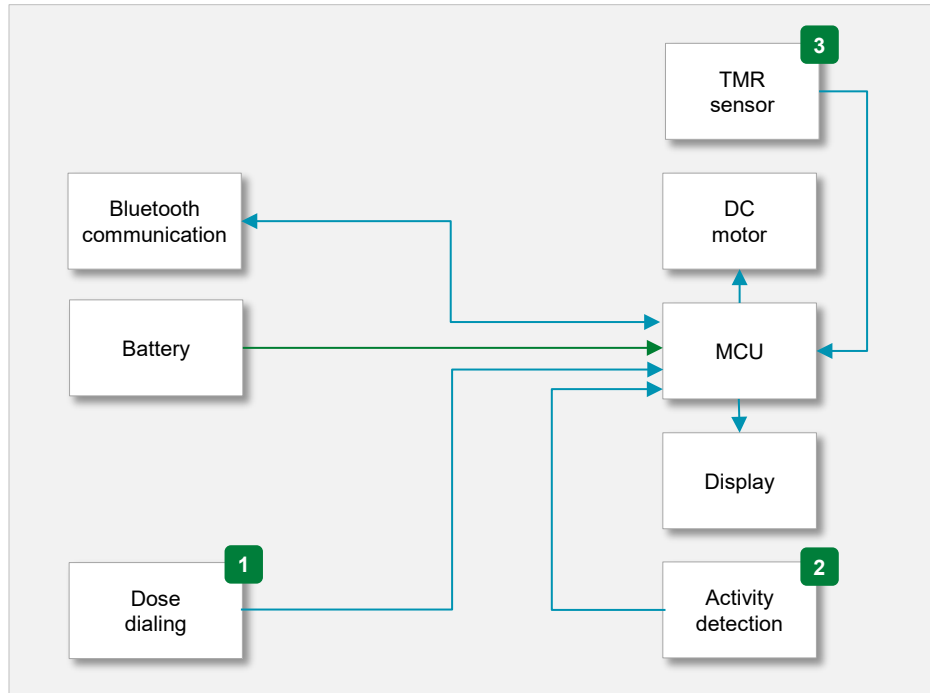
Plunger position sensor

TMR Sensor



Auto-injector or drug delivery pen block diagram

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



	Technology	Function in application	Product series
1	Detect Switch	Detects position of the dose dial	HDT , FDSD , FDSE
2	Tactile/Detect Switch	Activity detection (cap removal, skin contact, etc.)	NanoI , KMT0 , HDT , FDSD , FDSE
3	Plunger Position Sensor (TMR)	Plunger position sensing	LF21173TMR , LF21177TMR
	Liquid Volume Measurement	Under development; contact sales	Under development; contact Sales.

Littelfuse solutions for hearing aid



1a

Volume control

Tactile Switch, Slider for control



1b

Power On/Off

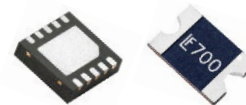
Tactile Switch



2

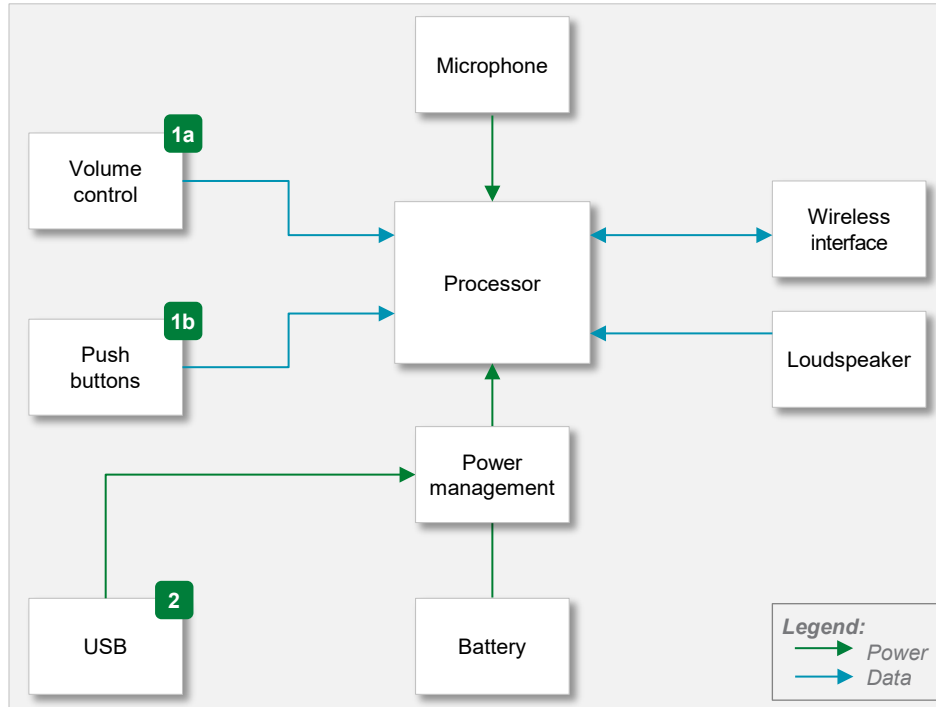
USB

eFuse OR PolySwitch® Resettable Device



Digital hearing aid block diagram

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



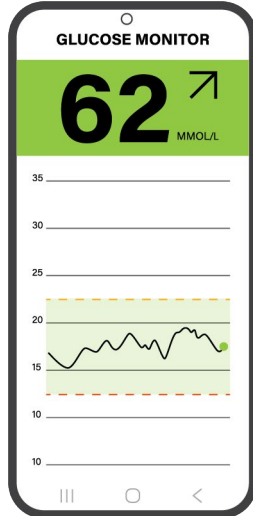
	Technology	Function in application	Product series
1	Switch	Volume management; power on-off; feature selection	NanoT , KXT , KMT0 , KMT2 , PTS
	Protection IC (eFuse) (USB-C) OR PolySwitch® Resettable Device	Integrated overcurrent and overvoltage protection	LS0504EDD12
2		Protects battery from short circuits or overcurrent events	Low Rho

Personal Monitoring

Continuous Glucose Monitor (CGM) |
Blood Pressure Monitor | Wearable Injector | Insulin Pump



Littelfuse solutions for Continuous Glucose Monitor (CGM)



1

Magnetic device activation

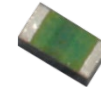
TMR Switch



2

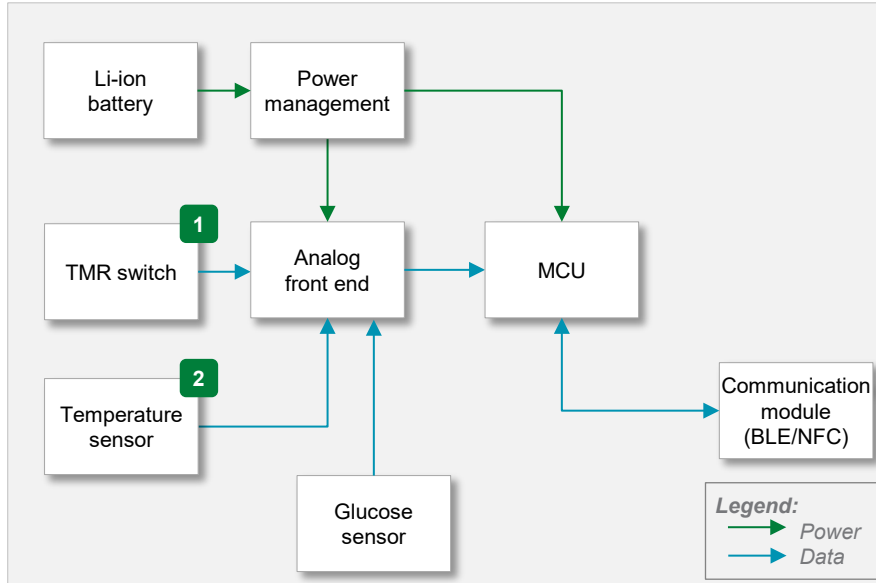
Temperature detection

Thermistor



Continuous Glucose Monitor (CGM) block diagram

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



	Technology	Function in application	Product series
1	TMR Switch	Provides a digital signal to a microcontroller that wakes up the full circuitry	LF21173TMR
2	Thermistor	Monitors the temperature corrections in the blood glucose measurements	503-KR , 603-RB , 1206-LR

Littelfuse solutions for blood pressure monitors



1

USB

PolySwitch® Resettable Device OR eFuse



2

Battery Management

PolySwitch® Resettable Device



3

Keypad

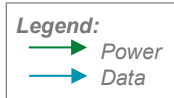
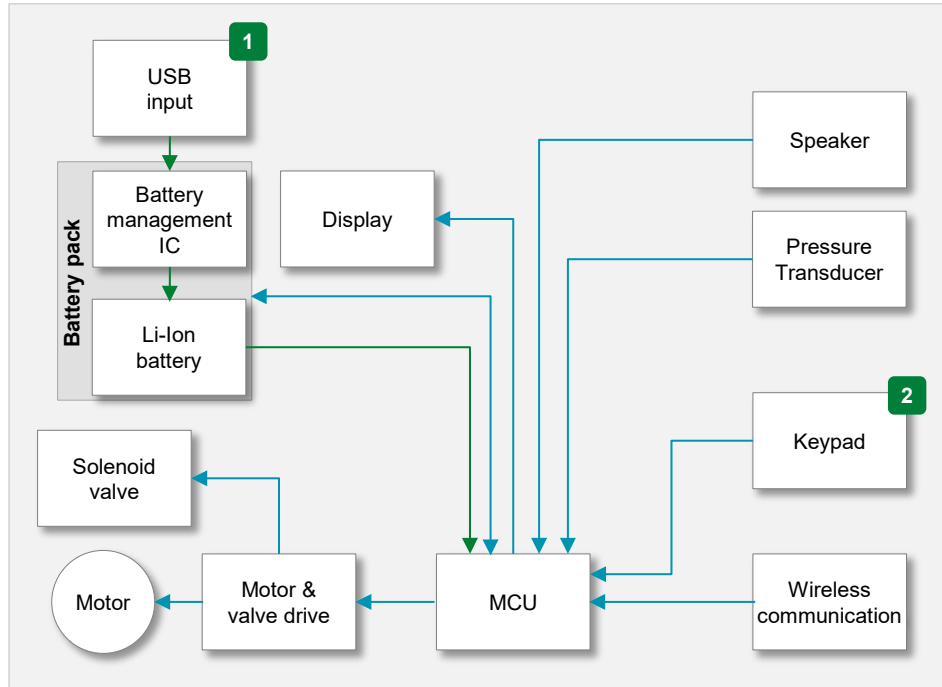
Tactile Switch, Detect Switch



Note: Battery chemistry may vary by model. USB input protection and PolySwitch® Resettable Device devices are only required in rechargeable versions using USB charging (e.g., Li-ion battery designs).

Blood pressure monitor block diagram

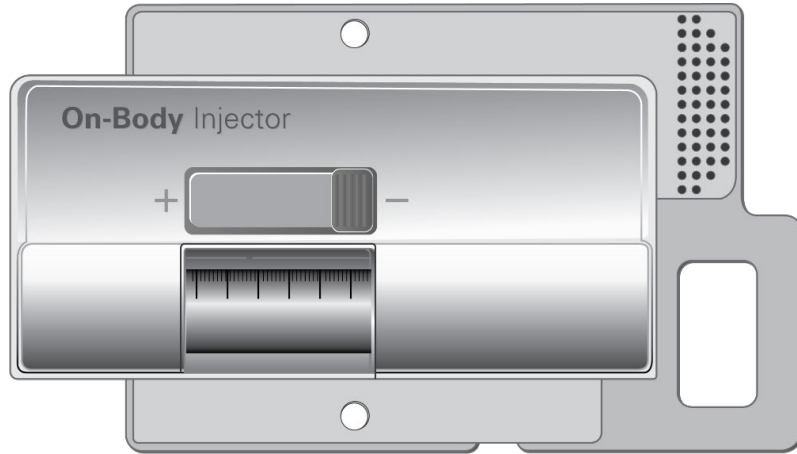
Click on the product series in the table below for more info



	Technology	Function in application	Product series
1	Protection IC (eFuse) (USB-C)	Integrated overcurrent and overvoltage protection	LS0504EDD12
	PolySwitch® Resetable Device (for USB Type A or B)	Protects against over-current and over-temperature	Low Rho
2	PolySwitch® Resetable Device	Resettable overcurrent protection	0402L
3	Switch	Power on-off; navigation; feature selection	NanoT , KMT2 , KMR , HDT , KMT0

Note: Battery chemistry may vary by model. USB input protection and PolySwitch® Resetable Device devices are only required in rechargeable versions using USB charging (e.g., Li-ion battery designs).

Littelfuse solutions for wearable injectors



1

Dose delivery detection

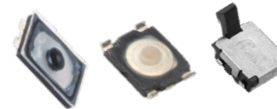
Detect Switches



2

Activity detection

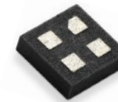
Tactile Switch, Detect Switch



3

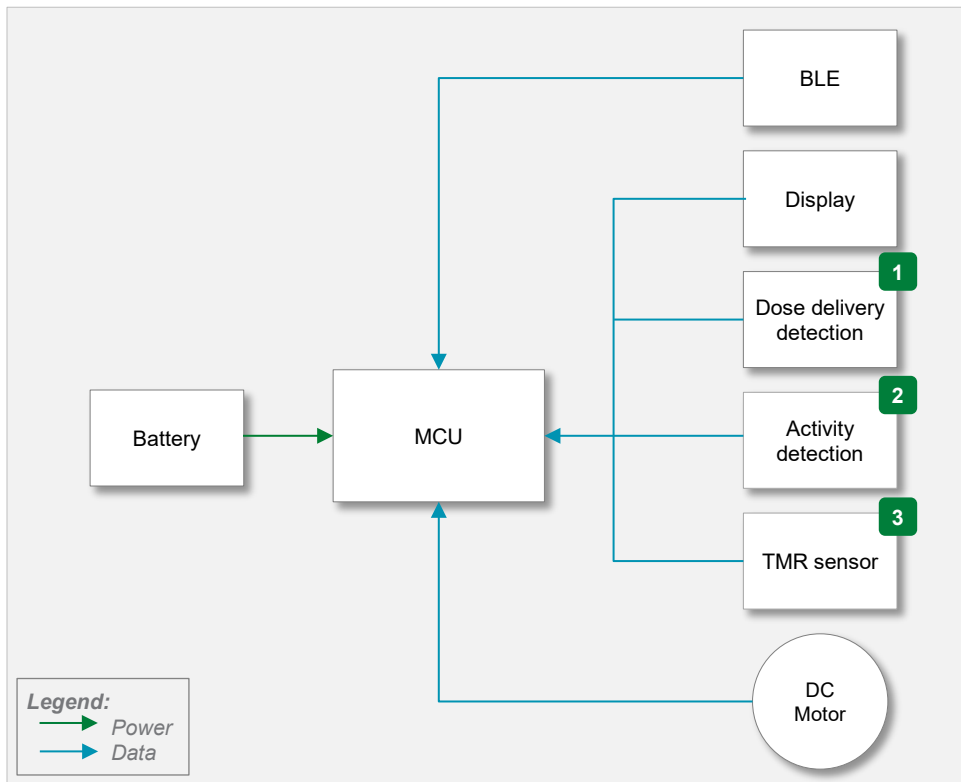
Plunger position sensor

TMR Sensor



Wearable injector block diagram

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



	Technology	Function in application	Product series
1	Detect Switch	Detects the position of the dose dial	HDT , FDSD , FDSE
2	Tactile/Detect Switch	Activity detection (cap removal, skin contact, etc.)	NanoT , KMT0 , HDT , FDSD , FDSE
3	Plunger Position Sensor (TMR)	Plunger position sensing	LF21173TMR , LF21177TMR
	Liquid Volume Measurement	Under development; contact sales	Under development; contact sales

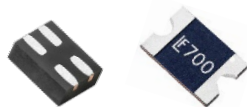
Littelfuse solutions for insulin pumps



1

Power management

eFuse, PolySwitch® Resettable Device



3

Keypad

Tactile Switch, Detect Switch



2

Battery management

TVS Diode Array



4

Plunger position sensor

TMR Sensor



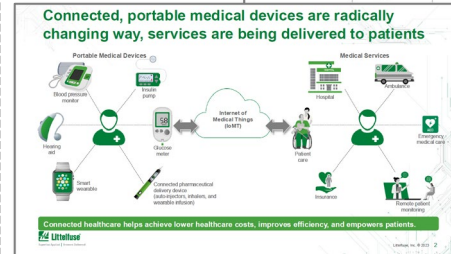
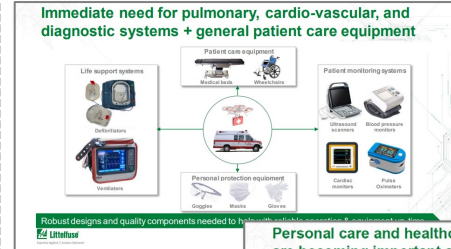
Note: Battery chemistry may vary by model. USB input protection and PolySwitch® Resettable Device devices are only required in rechargeable versions using USB charging (e.g., Li-ion battery designs).

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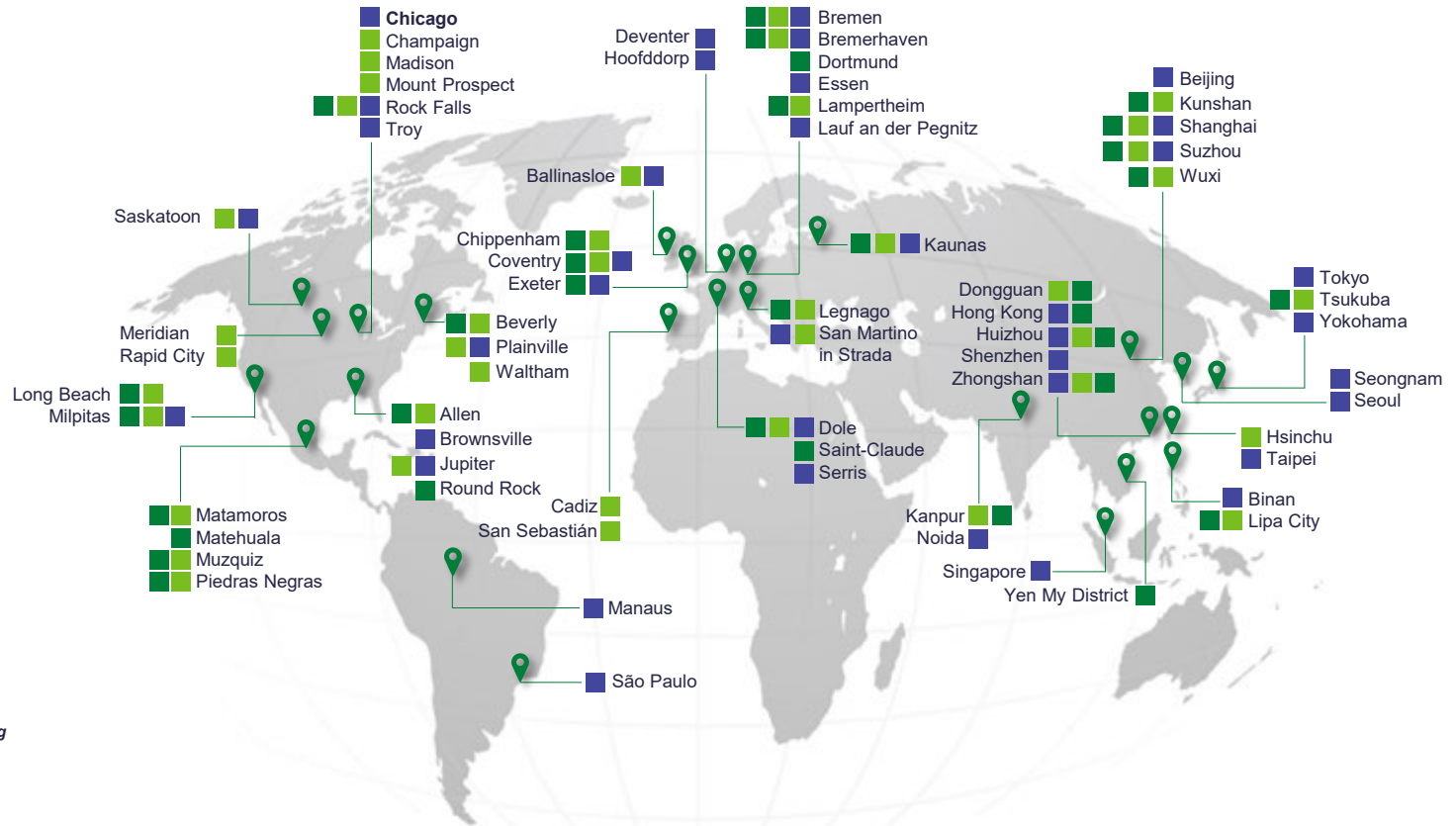


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