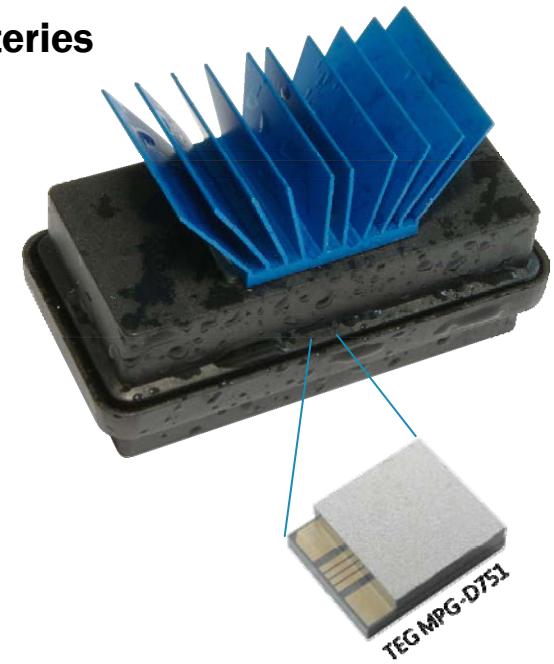
Sealed wireless MOTE - sensing without batteries



The TE-Power MOTE is a packaged & sealed, autonomous wireless sensor. It is based on Micropelt's TE-Power NODE platform and powered by the MPG-D751 Thermo-Electric Generator (TEG), which converts heat into electrical energy.
The sealed housing offers a good protection against dust and humidity and is ideal to be used for all indoor and outdoor conditions.
The TE-Power MOTE is equipped with the Texas Instruments MSP430 ultra-low power microcontroller and CC2500 2.4 GHz transceiver.

Thermal Energy Harvesting

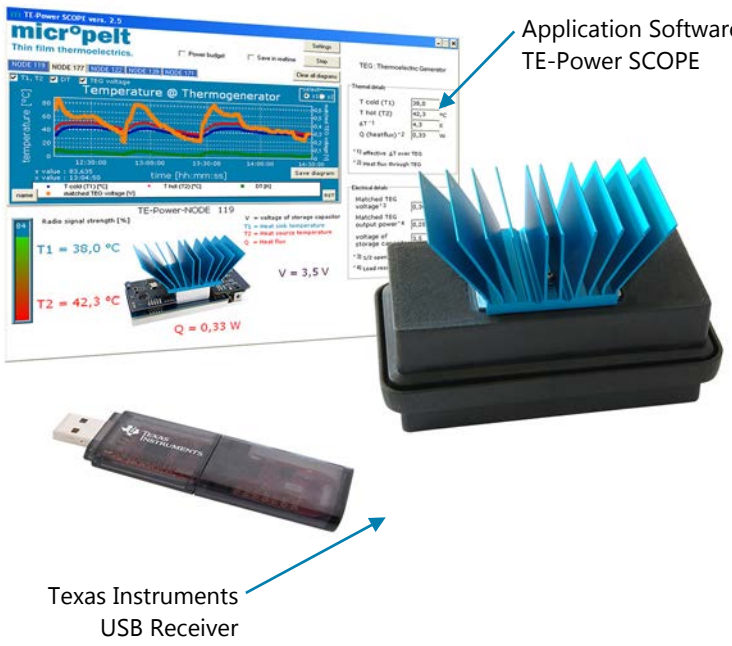
The TE-Power MOTE can power from a vast range of waste heat sources: like friction/motion, electrical current, heating, air-conditioning, fire, pipes with hot/cold fluid, machines, motors, etc..

Hot side temp [°C] against 25 °C ambient	Power [mW]	mAh / year (**3 V**)	AA batteries / year (**1.5 V** / 2000 mAh)
50	0.7	1.600	2
80	3.8	8.700	9
100	19.5	16.200	16

** incl. 78% efficiency DC/DC booster*

Wireless

A 2.4 GHz radio link communicates the measurements data to the TE-Power SCOPE PC software.
The system is prepared to adopt different network protocols within the 2.4 GHz frequency band, like Zigbee. The current implementation is based on TI's "simpliciTI" RF network protocol.



Main features

- Eliminate battery (replacement)
- Operates from waste heat or cold
- Starts operating from low delta-T
- Completely sealed housing
- Ideal for indoor/outdoor applications
- Software for thermal / power analysis and temperatures monitoring

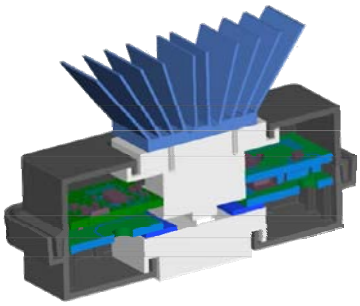
Applications

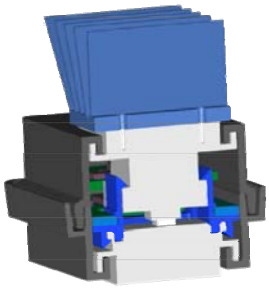
- Wireless Sensor Networks (WSN)
- Industrial Process Monitoring
- Condition Monitoring / Predictive Maintenance
- Infrastructure and Facilities
- Circuit breakers
- Transportation
- Motors, bearings and moving parts
- Intelligent Data Loggers
- Active RFID
- Automated Meter Reading (AMR)
- Smart Grid
- Building Automation and HVAC

TE-Power MOTE

Micropelt's TE-Power MOTE is a fully sealed wireless sensor system. Custom-specific requirements and changes can be supported. That includes mechanical adaptations (e.g. housing, dimensions) or electrical modifications (e.g. radio, sensors, software).

Custom design & engineering





Features Overview	Parameter	Value
Dimensions	Max. Dimensions housing W x L	37 mm x 71 mm
	Total height incl. standard heatsink	44.5 mm
	Height without heatsink	25.5 mm
General	Operating temperature	
	hot side	max. 105 °C
	ambient air	max. 85 °C
	Thermo-generator chip	MPG-D751
Connection to heat source	Bolt screw mount	2x M3 bolt screws
Power management		
	Output supply voltage	2.4 V fixed, regulated
	Storage capacitor	100 µF capacitor
Wireless		
	System supply voltage	2.4 V DC
	Microcontroller	TI MSP 430-F2274
	Wireless device	TI CC2500
	Wireless USB receiver	TI EZ430-F2500
	Wireless protocol stack	Proprietary / TI Simplicity
	Topology	Unidirectional star network
	Payload	13 byte
	Active cycle (collect, compute, transmit)	2 ms
	Signal acquisition:	
	Temperature, hot & cold side	2x TI TMP102 on I^2C
Alternative configuration	Fluid version	SAE connection