

Sensors, Energy Harvesting and Opto Solutions

APC Hero provides a comprehensive range of high quality standard and custom sensor solutions, together with energy harvesting products.

Sensors are used in an endless number of applications to monitor and control many properties such as temperature, humidity, pressure, flow, position, vibration, etc.; they also play an essential role in today's Internet of Things (IOT).



Libelium delivers a powerful, modular, easy to program open source sensor platform for the Internet of Things; with over 80 sensors to enable system integrators to implement reliable Smart Cities and M2M solutions with minimum time to market.

Libelium's versatile platform allows implementation of any wireless sensor network which includes:

- Smart cities
- Smart water
- Smart environment
- Smart agriculture
- Smart metering
- Smart security
- Smart parking
- Ambient control
- Radiation control



INNOVATIVE SENSOR TECHNOLOGY

Innovative Sensor Technology (IST) is a world-class manufacturer of component level thin-film, which include:

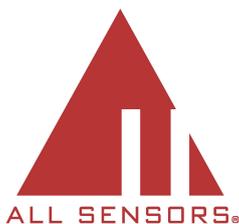
- RDT temperature sensors
- Capacitive humidity sensors
- Mass flow sensors
- Conductivity sensors

IST offers both standard and custom sensors to satisfy various applications and also manufacture a broad portfolio of calibrated modules.



TT Electronics OPTEK Technology has designed and manufactured fully integrated and tested optoelectronic solutions for over 40 years. Their extensive portfolio of standard and custom solution include:

- Optocouplers
- Optoisolators
- Hybrids (GaAIAs LED's, photodiodes, photodiode arrays, phototransistors and VCSELs)
- Fibre optics
- Component devices (GaAIAs/ GaAs LEDs, photodarlington, photodiodes, photologic detectors, phototransistors and VCSELs)
- Reflective sensors
- Slotted switches



All Sensors is a leading manufacturer of MEMS piezoresistive pressure sensors and pressure transducers. Their pressure sensors are specially designed for low pressure measurement, high accuracy and reliability.

All Sensors manufacture four types of pressure sensors:

- Basic output (uncompensated)
- mV output (compensated)
- Amplified
- Digital

Absolute, barometric, differential and gauge pressure sensors are available ranging from 1/4 in H₂O to 150psi.

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Farsens designs and manufactures wireless battery free sensors, employing the energy from a UHF RFID reader to provide the necessary power to communicate with, and power the sensor.

Sensors currently available include:

- Ambient and contact temperature
- Barometer and absolute pressure
- Deformation and strain gauge
- Light
- Load cell
- Magnetometer
- Relative humidity
- Acceleration
- Orientation/displacement/vibration
- Switch open and close



ELT SENSOR designs and manufactures a comprehensive range of high quality CO₂ sensor modules and transmitters based on NDIR technology. All sensors are available in a small package, with the T-110 series taking the prize for being the world's smallest. The sensors are ideal for air quality control, process control, safety, and agricultural applications.



SiliconReef was established with a mission to create products and solutions capable of optimising self-sufficiency in the management of environmental energy harvesting, by developing high-performance, low-power integrated circuits. The first product to be released is a Solar Energy Harvesting IC providing a complete power management solution.

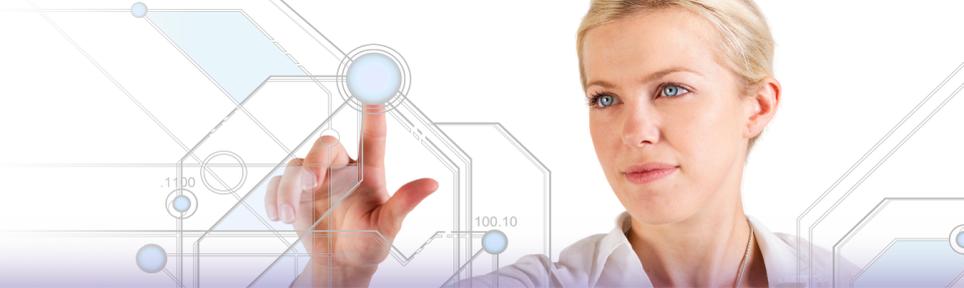


MSR Electronics, based in Switzerland, designs and manufactures stand-alone mini data loggers for a wide range of applications. With their wide range of measurement parameters (temperature, humidity, pressure, light and vibration), small size and large memory capacities, these data loggers provide an efficient solution for a multitude of measuring and monitoring tasks in industry and science.



Gas Sensing Solutions (GSS) produces market leading CO₂ sensors, integrating unique mid infra-red light source and detector technology into innovative optics and signal processing. Their COZIR range is the world's lowest power consuming NDIR CO₂ sensor, whilst the SprintIR range offer extremely fast responses.





Optoelectronics Solutions

Product / Technology

Features

Applications & Benefits

Infrared LEDs & Sensors



- GaAlAs/GaAs LEDs
- Photodarlington, photodiodes, photologic
- Phototransistors and VCSELs
- Plastic and metal packages

- Ease of application
- Highly reliable
- Design flexibility

Reflective Sensors



- Range 1mm to over 762mm
- Infrared or visible light source
- Focus or diffused
- Standard and custom solutions

- Motion or position sensing (near or passing the sensor)
- Non-contact
- Design flexibility filter

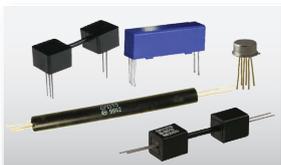
Slotted Switches



- Gap width 2mm to 32mm
- Infrared or visible light source
- Standard and custom solutions

- Object detection through a switch
- Non-contact
- Dust tolerance and ambient filter

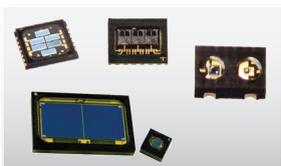
Optocouplers & Isolators



- Isolation voltages from 6kV to 50kV
- Creepage of 32mm and higher
- High dV/dt
- Hermetic and plastic packages

- High voltage isolation
- Medical: X-ray, MRI, defibrillator
- IGBT drive
- Separate low and high voltage systems

Hybrids



- GaAlAs LEDs, Photodiodes, Photodiode arrays, Phototransistors and VCSELs
- -40°C to +100°C temperature range
- Standard or custom frame SMT packages

- Optoelectronic die in SMT Package
- Small, compact size
- Multichannel possible
- Ideal for encoder applications

Fibre Optics



- 850nm Multimode transmitters and receivers
- Point source GaAlAs LEDs, integrated receivers, photodiodes, ST-connected components and VCSELs

- Copper to fibre media conversion
- Intra-system fibre optic link
- Video surveillance
- Industrial Ethernet equipment

High Reliability

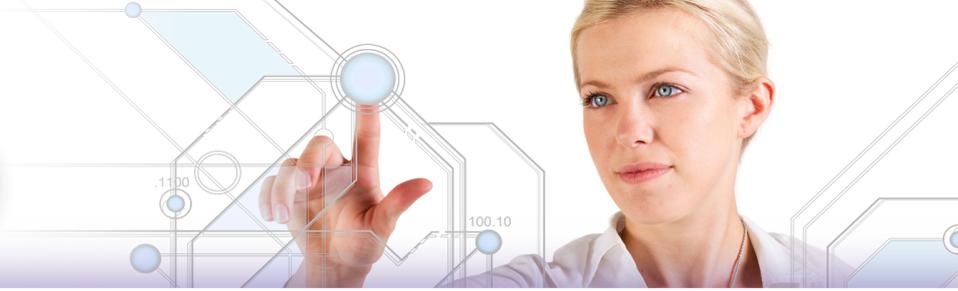


- Optoisolators
- Infrared emitting diode
- Hall effect sensor
- Reflective sensors
- Slotted switches

- 100% test and inspection
- TX, TXV, B, S and ESA level classifications
- ITAR registered with MLA
- US QML certified

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Sensor Capability Overview

Sensor/Technology		Range	All Sensors	ELT	ESS	Farsen	GSS	IST	MSR	SiliconReef	Additional Information
Acceleration	Data Logger	0 to ±200g							●		3-axis up to 1600 measurements/sec
	Single axis capacitive Hi-Rel	0 to ±20g			●						Suitable for space and aerospace applications
Battery-Free (RFID)	Acceleration (3 axis)	0 to ±16g				●					Kineo-A3DH
	Pressure and Temperature	0 to 30bar				●					Fenixvortex-P331
	Light	0 to 100 (QUAL)				●					Shadow-L1085
	Switch Monitor	1 or 32				●					X1-SXX and X32-02BH
	Temperature and RH	-20 to 120°C				●					Hygrofenix-H221
	Temperature Contact	-50 to 300°C				●					Pyros Series
	Magnetometer	±4 to ±16gauss				●					Magneto-M3MDL
	Resistance Meter	10Ω to 10MΩ				●					Rmeter-MA10
Load cell	0 to 900kgf				●					Atlas Series	
Conductivity	2 and 4 electrodes	0.1 to 200mS/cm						●			Integrated temperature sensor
Data Logger	Acceleration (3 axis)	0 to ±200g							●		3-axis up to 1600 measurements/sec
	Air Pressure	0 to 14bar							●		also 0 to 2000mbar range 1/s to every 12 hours
	Fluid Pressure	0 to 30bar							●		External sensor also 0 to 3000mbar range 20/sec
	Light	0 to 65,000lx							●		Max sensitivity 500nm 1/s to every 12 hours
	Relative Humidity	0 to 100%							●		Storage rate 1/s to every 12h
	Temperature	-55 to 125°C							●		Storage rate 1/s to every 12h
Energy Harvesting	Solar Li-ion Charger	5V USB								●	Solar, battery and wall plug
	UHF RFID Tag	EPC C1G2				●					1.2V, 1.8V and 2.5V regulated output
Gas Flow	MF Modules	0 to ±300 SLPM			●						I ² C, SPI or Analogue interface
	CTA MF Elements	0 to 5l/min						●			High temperature possible (450°C), also custom
Gas Sensing	CO ₂	0 to 100%		●			●				Small size and ultra low power versions
Humidity	Elements	0 to 100% RH						●			Optimise for, oil, drew pt, white goods, weather
	Modules (RH and Temp)	0 to 100% RH						●			±1.8% RH, 0.2°C, I ² C interface
Liquid Flow	Thermal MF	40 x 4 x 3.8mm						●			Non-contact suitable for aggressive liquids
Pressure	Custom	0 to 1000bar			●						Custom packages - Analogue & Digital interface
	PCB - Absolute	0 to 11bar	●		●						Ratiometric, SPI, TWI interface (various packages)
	Barometric	600mbar to 2bar	●		●						SPI/TWI interface (various packages)
	Differential	0 to 150psi	●								Ratiometric, SP, TWI I ² C interface (various packages)
	Gauge	0 to 150psi	●		●						Ratiometric, SP, TWI I ² C interface (various packages)
	Capsules	0 to 1000bar			●						Medium isolated SPI/TWI interface
Temperature	Transmitter	0 to 1000bar			●						Analogue & Digital (SPI/TWI) interface
	Platinum (RTDs)	-200°C to 1000°C						●			Wire, FlipChip and SMD versions
	Nickel (RTDs)	-60°C to 300°C						●			Wire and SMD versions
	Semiconductor	-50°C to 150°C				●		●	●		Digital, Analogue and Ratiometric outputs
Custom	-200°C to 1000°C						●			Platinum or Nickel	