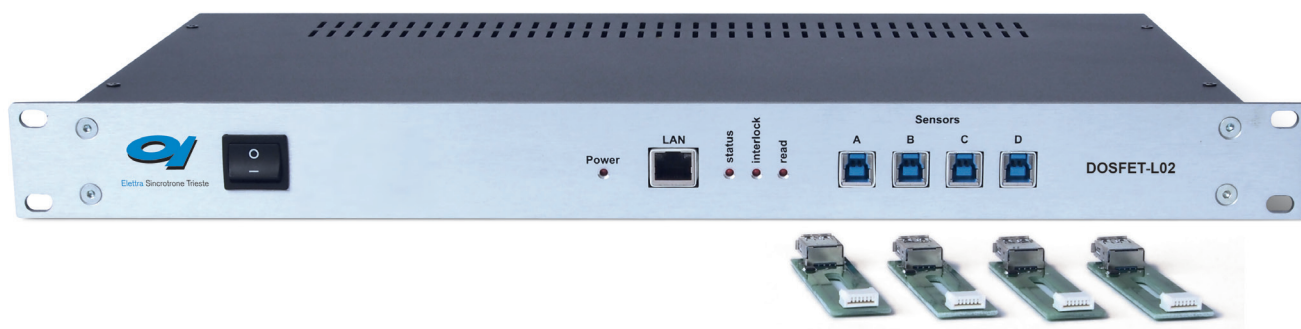


## DOSFET-L02

Real-time radiation dose monitoring



## HIGHLIGHTS

FEATURE	BENEFIT
On-line dosimetry system	Real-time monitoring of radiation dose deposition Dose measurement in remote and inaccessible locations
Exchangeable RADFET sensors	Dosimeters with different sensitivities available Measurement of sub-mGy to kGy doses
4-wire sensing	Immunity to changes in cable and connector resistance System can be installed outside the radiation zones (tested with cable lengths of up to 100 m)
Thermometers on dosimeter mounts	Real-time temperature monitoring (<0.1 °C relative/0.5 °C absolute)
Programmable bias voltage (0–30 V)	Dosimeter sensitivity adjustable to individual application
Ethernet–TCP/IP interface	Easy integration into existing control systems

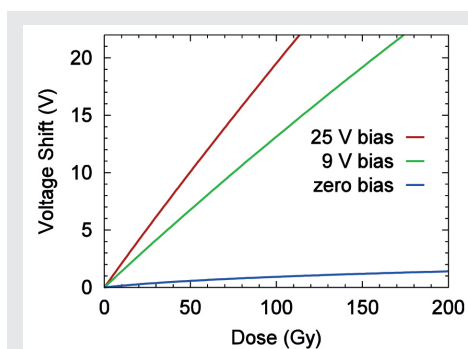
## APPLICATIONS

- Particle accelerators
- Nuclear industry

## HOW DOES IT WORK?

The **DOSFET-L02** measures the changes to the electrical characteristics of the RADFET transistor by injecting a constant current of 490  $\mu\text{A}$  between the source and the drain electrodes. The voltage needed to drive this current is a measure of the total ionizing dose the RADFET has received. It can range from few volts for an unirradiated dosimeter to 30 V or more after severe irradiation.

The **DOSFET-L02** simultaneously reads up to four connected dosimeters.

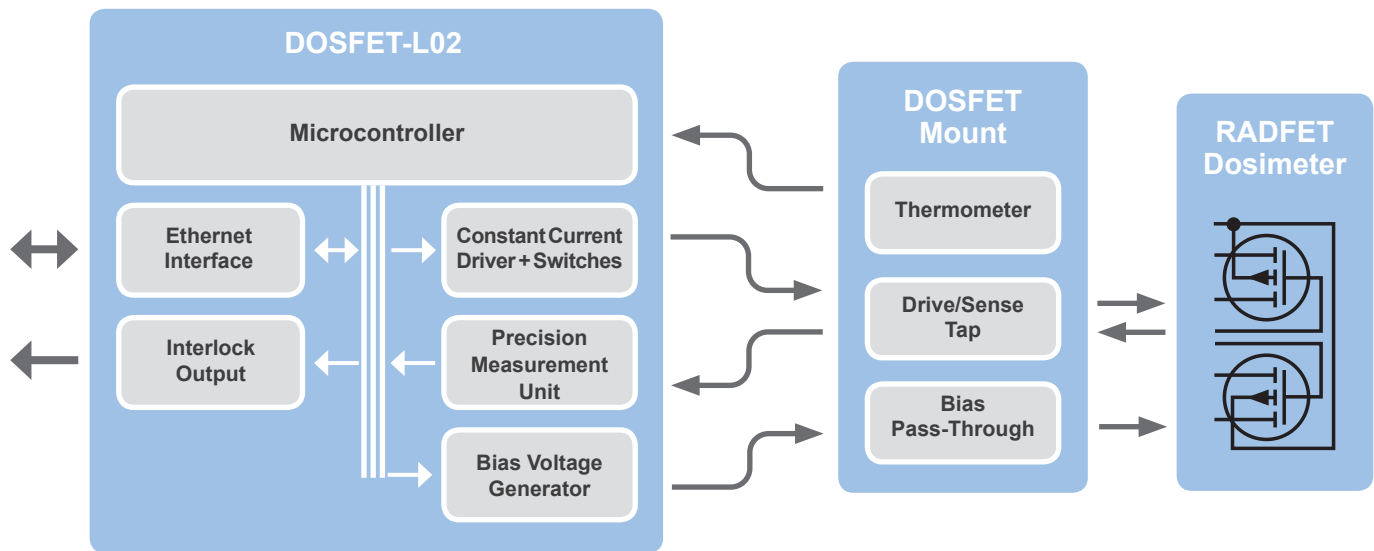


Calibration curves for a specific dosimeter type at different bias voltages

## RADFET: Radiation-Sensing Field-Effect Transistor

RADFETs are susceptible to ionizing radiation due to the insulating oxide layer separating the gate electrode from the semiconductor. Under irradiation, electrons are removed from this layer and leave behind a positively charged region. The positive charge remains trapped in the oxide layer for many years. By screening the electric potential of the gate electrode, this positive charge changes the electrical characteristics of the transistor.

## DOSFET-L02 BLOCK DIAGRAM



## SPECIFICATIONS

Channels	4
Dosimeter type	2 p-RADFETs per channel
Readout current	490 $\mu$ A
Readout voltage	up to 26.7 V
Readout voltage noise	<60 $\mu$ V (typ.)
ADC resolution	24 bit
Thermometer accuracy	$\pm 0.5$ °C absolute (rms), <0.01 °C relative
Bias voltage	0–30 V, adjustable in steps of 230 mV, each channel can be grounded individually
Communication	Ethernet, TCP/IP
Interlock output	potential free contact
Form factor	1 rack unit (19-inch)
Dimensions	482 x 260 x 44 mm
Weight	3000 g

## DELIVERABLES

- DOSFET-L02
- DOSFET mount (4 pieces), holder for RADFET dosimeters
- USB cables, 4 pieces, 5m long each
- DOSFET Data Logger, command line tool to access and configure the DOSFET-L02 directly via TCP/IP (BSD license)
- DOSFET Updater, tool for updating the DOSFET-L02 firmware (GPL license)
- TANGO device server
- **Optional:** RADFET dosimeters

## Contact us!

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