CASE STUDY

Reliable, Interference-Free Temperature Monitoring in Harsh MRI Environments: Luxtron® M-1100 Fiber Optic Solution

INDUSTRY	SOLUTION	APPLICATION
Medical	M1100 FOT converters and STB and custom medical probes	MRI

CHALLENGE

Medical system suppliers and researchers require dependable sensors to accurately measure patient and equipment and component temperatures in harsh electromagnetic environments. The challenge for MRI applications is measuring temperatures in the high magnetic fields, which is not possible with traditional metallic thermocouples or RTDs. Many of these medical applications require small and rugged non-metallic fiber optic temperature (FOT) probes.

Patients within MRI scanners require temperature monitoring if they are anesthetized or incapable of verbal response. During these procedures, sensors must be durable and require minimal calibration. They also should not interfere with the collected imaging scans.

SOLUTION

The Advanced Energy team proposed the Luxtron® M-1100 fiber optic temperature converter as a solution. The Luxtron M-1100 is designed for use in harsh EMI environments where other sensors fail and features an advanced light source and improved ultralow noise electronics. The advanced low-noise electronics and proprietary algorithms provide accuracies better than ±0.25°C. The M-1100 also requires no calibration and has a long useful lifetime. These factors make it ideal for use in medical applications.

The M-1100 paired with the STB probe (which has a biocompatible Tefzel® jacket) is particularly well suited for MRI machines where patient monitoring is crucial.

ADDITIONAL FEATURES

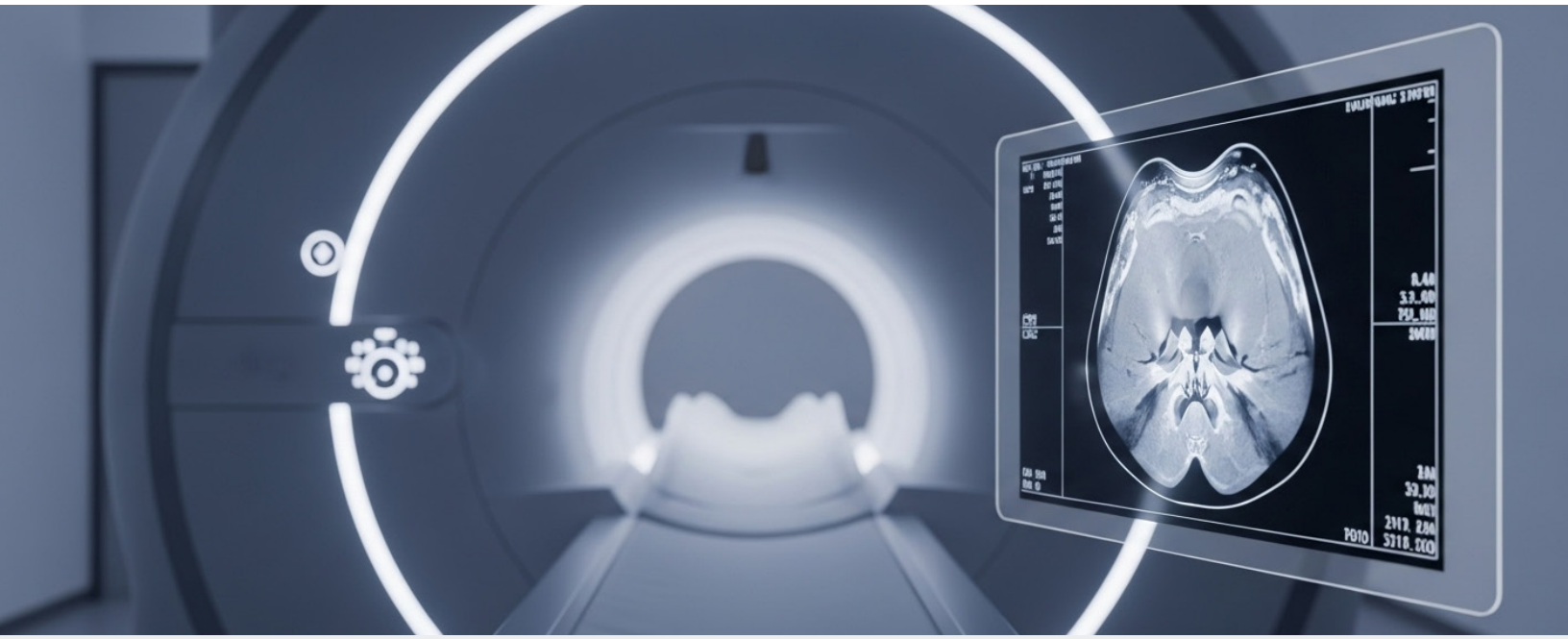
- Wide supported temperature range for R and D applications
- Low noise level with fast response rate
- Five channels in a single converter
- Flexible communication outputs
- EtherCAT® Interface (optional)
- Analog output

BENEFITS/ RESULTS

With extensive expertise in temperature measurement, Advanced Energy has optimized Luxtron fiber optic temperature monitoring solutions for maximum accuracy. The M-1100 is immune to electromagnetic interference from EMI, RF, high voltage, and microwave sources, which is critical for medical applications.

The end customer selected the Luxtron M-1100 because its non-metallic, non-magnetic probes enable the use of FOT technologies in environments with high magnetic fields. The FOT STB probes also show no signal in MRI images and FOT Instruments do not produce artifacts in the MRI images.

The Luxtron M-1100 stands out as a versatile and reliable fiber optic temperature monitoring solution that meets the demanding requirements of research, development, and medical environments. Its immunity to interference, compatibility with high magnetic fields, and non-disruptive presence in MRI imaging make it an ideal choice for precise and safe temperature measurement where conventional sensors fall short.



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