

SATS

Situational Awareness Threat Sensor



HIGH PERFORMANCE PHOTONIC SYSTEMS

Threat Sensor for High Power Microwave Threat Detection

SA Photonics has developed a state-of-the-art Situational Awareness Threat Sensor (SATS) for high power microwave (HPM) threat detection. SATS can be used to detect previously undetectable HPM attacks and capture data from HPM attacks for characterization. Having almost no metal in the probe means that SATS can measure the effectiveness of HPM active denial systems without introducing any field distortion. SATS supports detection of pulsed RF carriers and wideband impulse signals and has an exceptionally high damage threshold.

SATS consists of a passive sensor probe coupled with a powerful processing unit that can support multiple sensors. The sensor probe detects high-energy signals and transfers them via fiber optic cable to the processing unit, which determines the threat energy threshold crossing levels (TCLs) and computes specific information about the threat signals.

An advanced SATS for HPM is critical for the protection of aircraft, ground vehicles and electronic counter measures/intelligence systems. Specific HPM risks which can be mitigated using SATS include global positioning systems, navigation systems, weapons systems, control systems, ground installations, and flight simulators. SATS can measure field strength and modulation extremely accurately, making it a great choice for calibrating HPM test ranges.

About SA Photonics

SA Photonics specializes in the design, development and test of complex, rugged systems for the military and for commercial industry. Military hardware designed by SA Photonics personnel is flying on over 20 satellites and on every F/A-18 E/F and Joint Strike Fighter jet aircraft. Commercial hardware designed by SA Photonics personnel is installed in almost every major semiconductor fabrication facility in the world and is installed in the telecommunications backbones of more than 15 nations worldwide.

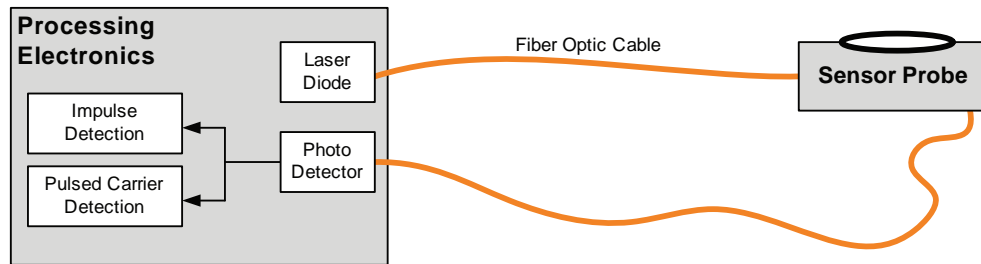
Our products and technologies include world-class solutions to problems in coherent communications, advanced photonics-based RADAR systems, fast steering mirror sense and control systems, compact high power fiber lasers, underwater imaging and communications, RADAR threat warning systems, high-power high-frequency microwave sensors, wide field of view conventional and digital night vision systems, head-mounted displays, fiber optic gyros, space-qualified optical switches, laser-based shipboard defense, reconfigurable thermal networks, LIDAR systems and photonics-based signal distribution systems.



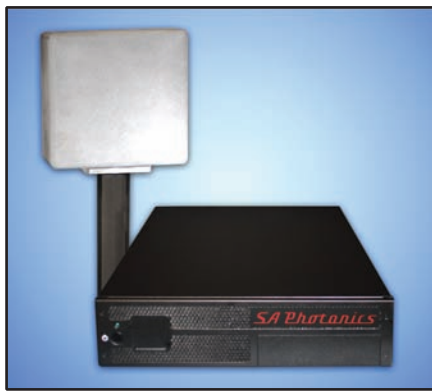
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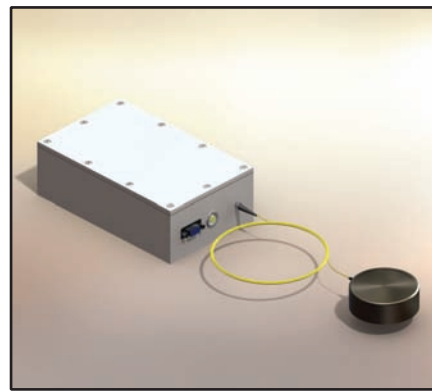
The SATS sensor probe is small, lightweight, and includes no active electronics, allowing for high-power signal detection to occur without damage to the system. SATS has a very wideband operation that can detect pulsed carriers or high-energy impulses, and supports operation between 0-10 GHz. Additionally, SATS is easily programmable so that appropriate detection thresholds can be set for any situation.



Functional Block Diagram



Phase I Brassboard System



Phase II Prototype Concept

SATS has been able to meet or exceed all customer specification shown in the table below:

Category	Parameter	Brassboard Performance	SATS Platform Capability
General	Threat Sensing Modes	- Pulsed RF Carrier - Wideband Impulse	- Pulsed RF Carrier - Wideband Impulse
	Maximum Detection Field Density	> 10 W / cm ²	> 25 W / cm ²
	Damage Threshold	> 60 W / cm ²	> 100 W / cm ²
	Simultaneous Threat Threshold Crossing Levels	2	Numerous
	Pre-TCL Event Data Viewing Window	100 μsec	10+ msec
	Post-TCL Event Data Viewing Window	1000 μsec	10+ msec
Pulsed RF Carrier Threat Detection	Carrier Frequency Detection Range	0.1 - 10 GHz	0.1 - 10 GHz
	Instantaneous Dynamic Range	35 dB	> 60 dB
	Pulse Detection Rise / Fall Time	30 nsec	< 5 nsec
High Energy Impulse	Minimum Threat Impulse Width	1 nsec	< 1 nsec
	Instantaneous Dynamic Range	30 dB	> 60 dB