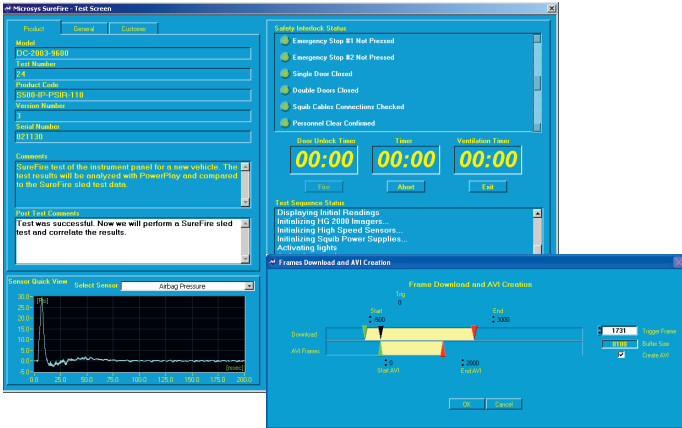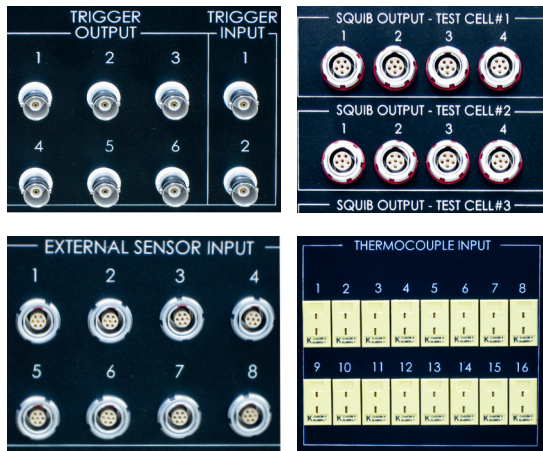# SureFire™ System

- Squib firing and sensor data acquisition
- High-speed camera control
- Comprehensive safety management
- Analysis and report generation
- Database integration

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# SureFire™ System



Multi-window user interface



Detailed view of connections



SureFire works with the Microsys PowerPlay software to view and analyze your sensor data and images

## A Complete Occupant Safety Test Solution

The SureFire system is a complete solution for airbag deployment, as well as for testing of inflators and pretensioners. SureFire performs squib firing, data acquisition, camera control, safety management, database integration, analysis and reporting. SureFire is a mobile system designed to be flexible, easy to use, and upgradeable.

## Flexible Software

SureFire performs repetitive testing in an automatic mode but also makes it easy to quickly modify test parameters for the flexible needs of engineering testing. SureFire's interactive test mode allows you to manually check the operation of the entire test system. SureFire's test profiles allow for easy reuse and modification of all test setup information.

## Configurable System

SureFire can be configured to test any type of occupant safety component and can also be used for impactor and drop tower testing. In fact, one SureFire system can manage as many as three test cells simultaneously. SureFire's modular design means you can configure SureFire for your needs today, and upgrade in the future.

## Analysis & Reporting

SureFire integrates seamlessly with the Microsys PowerPlay analysis & reporting software. With PowerPlay it's easy to create presentation quality AVI movies with up to 9 camera views. Synchronize video and sensor data. Apply SAE J211 filters. Generate customized test reports and distribute test results along with the free PowerPlay LE software.

## Sensor Data Acquisition

SureFire uses 16 bit data acquisition with 8 pole butterworth anti-alias filters and automatic offset correction to ensure accurate measurement of pressure sensors, load cells, as well as squib voltage and current readback.

## Squib Firing

SureFire can fire as many as 8 squibs with fully adjustable current or voltage pulses. SureFire measures squib resistance before and after the test using a 4-wire measurement technique to eliminate the effects of the cable resistance.

## High Speed Camera Integration

SureFire directly controls the high-speed cameras, retrieves and saves image data, and automatically creates AVI movies. Eliminating the need for a separate camera control application makes you more productive.

**Microsys SureFire** is a fully automated system for testing airbags, inflators, instrument panels, seats, pretensioners and other pyrotechnic devices.

### Flexible Lighting Solutions
Microsys offers multiple lighting solutions including tungsten-halogen and HMI. Both lighting technologies can operate at extended temperatures which permits operation inside temperature chambers. Light stands can be floor mounted or suspended from the ceiling, depending on the application.

### Safety Comes First
SureFire monitors all facility equipment including emergency stop switches, door sensors and locks, exhaust fans and warning lights. SureFire has both hardware and software interlocks with the facility equipment to ensure the safety of operators.

### Database Integration
SureFire maintains all test setup information in its own Access database, and can integrate with customer databases for traceability and quality management.



Rear Panel of SureFire System showing connections

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# SureFire™ System

## System Description

- SureFire is a fully mobile system to maximize flexibility and usefulness.
- All SureFire systems come with the popular SureFire control software featuring multiple test profiles, interactive system control, flexible meta data input and automatic testing.
- SureFire can be configured to control up to 3 independent test cells. Test cells may be for airbag deployment, inflator testing, impactor test, drop-tower, pretensioner testing, or similar.
- SureFire comes equipped with 2 isolated contact trigger inputs and 3 isolated contact trigger outputs. BNC connectors.
- Meta data input fields: up to 5 tabbed areas with up to 7 fields on each tab. Fields can be text entry or drop down selection list.
- SureFire integrates with Oracle, MS Access, or MS SQL Server databases for quality management and factory information systems.

## Data Acquisition

- Analog input channels are 16 bit resolution, 0.2% accuracy, over-voltage protection, automatic offset correction. Variable gain amplifiers automatically programmed by SureFire to optimize the sensor input range. Variable sample rate up to 1 MHz for a single channel. Built-in +10 VDC sensor excitation. Pre-trigger and post-trigger data acquisition up to 10 seconds. Sensor data storage formats include ISO-13499 and CSV. LEMO 1B connectors on all sensor channels.
- Anti-alias pre-sample 8 pole Butterworth filter per SAE-J211. Cut-off frequency 3.3 kHz or per customer request.
- Ambient temperature and humidity monitoring and recording; -5˚C to 55˚C, 1˚C accuracy, 0.1˚C resolution, 0 to 95% RH, 2% accuracy, 0.1% resolution.
- Integrated 16 bit long term temperature monitoring, maximum 8 channels. Ring-ended, teflon coated, type "K" thermocouples, -100˚C to 750˚C, 16 bit, 0.5˚C accuracy. Optional RTD version available. Configured by SureFire software for up to 24 hour monitoring duration and down to a 1 second measurement interval.

## Safety

- Available safety elements include 3 tier safety lights, emergency stop switches, fire pendant, door closure sensors, door locks, fire alarm monitor.
- All safety elements are continuously monitored and displayed by the SureFire. Firing is prevented if any safety elements are in a non-safe operating condition. Hardware safety interlocks disconnect the squib fire supplies in the event of an abort.
- Emergency stop switch monitoring module that checks the normally closed emergency stop switch for a contact failure or wiring fault.
- SureFire squib safety circuit disconnect the squib fire supplies during standby operation.
- Squib interface modules connect directly to the inflator and allow a short circuit across inflator even when inflator shorting pin is displaced.

## Squib Fire Supplies

- Software programmable 5 A, 40 V maximum output. Pulse duration adjustable from 10 µs to 30 s in 10 µs steps. Full electrical isolation. Constant current pulse output: typical rise time 5 µs, 10 mA resolution, 0.5% accuracy. Constant voltage pulse output: typical rise time 15 µs, 10 mV resolution, 0.5% accuracy. Squib output cables with LEMO 2B connectors come available in many lengths and rated for operation from -40˚C to +110˚C.
- High-speed squib voltage and current readback, 16 bit resolution, electrical isolation, over-voltage protection. Variable sample rate up to 1 MHz for a single channel.
- Integrated 4-wire resistance measurement, 0-100 Ohms, 0.01 Ohm resolution, 15 mA source current, short-circuit protected, pre and post test resistance measurement. Out of range measurement warnings are displayed by SureFire.

## Cameras & Lighting

- Lighting available in multiple technologies: 1 000 W tungsten-halogen, 3 200˚K color temperature, operating temperature: -40ºC to +110ºC including 10 m power cable. HMI lighting from 575 W to 4 000 W with boost mode, -40ºC to +90ºC extended temperature option.
- Light stands available as mobile floor mounts or overhead systems with sliding & telescopic light poles.
- Automatic light control with long-life solid-state control relays rated for operation from 100 VAC to 240 VAC.
- High-speed cameras and professional grade accessories such as lenses, tripods and cables are expertly selected.
- SureFire camera control software provides direct control over frame rate, image size, exposure, frame download, AVI creation, image save format and color correction. Allows multiple test profiles, interactive control mode, auto-test mode, auto-color correction, auto-AVI creation, multiple save locations. Video data storage formats include JPEG, TIFF and AVI.

## Basic System Dimensions & Physical

Power:
- 100 VAC, 20 A, 1-Ø, 60 Hz
- 110/120 VAC, 20 A, 1-Ø, 50/60 Hz
- 220/240 VAC, 10 A, 1-Ø, 50/60 Hz

Operating temperature/humidity:
- +5˚C to +30˚C, 5 to 80% RH @ 30˚C, non-condensing

Storage temperature/humidity:
- -25˚C to +50˚C, 5 to 50% RH @ 50˚C, non-condensing

Size:
- 61 cm (width) x 80 cm (depth) x 89 cm (height) not including computer monitor

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