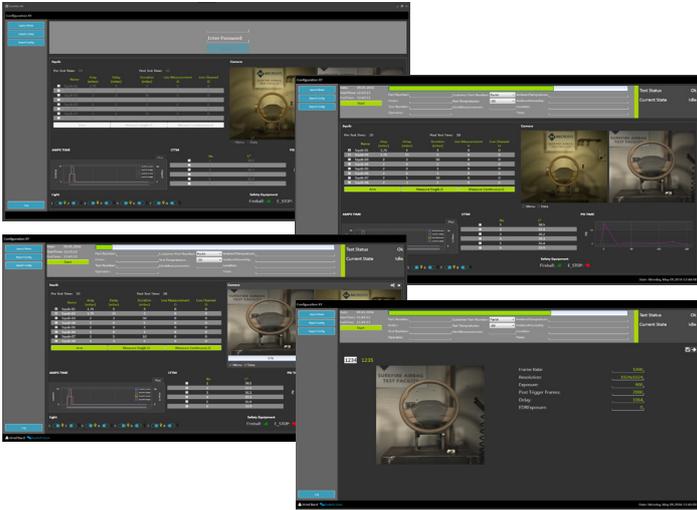




## SureFire™ G6 System

- Squib firing and sensor data acquisition
- High-speed camera control
- Comprehensive safety management
- Analysis and report generation with full database integration
- Blazingly fast video processing

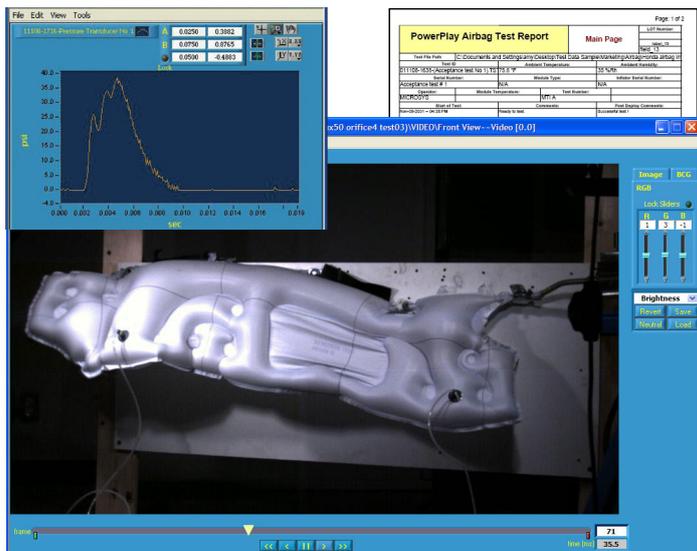
# SureFire™ G6 System



Multi-window user interface



Detailed view of connections



SureFire G6 works with the Microsys PowerPlay software to view and analyze your sensor data and images

## A Complete Occupant Safety Test Solution

For SureFire G6 we started with clean slate. By focusing on what is really important at any given time, the new user interface provides a clean, beautiful look that helps the operator take control for safer, faster operation. The SureFire G6 system is a complete solution for airbag deployment, as well as for testing of inflators and pretensioners. SureFire G6 performs squib firing, data acquisition, camera control, safety management, database integration, analysis and reporting. SureFire G6 is a mobile system designed to be flexible, easy to use, and upgradeable. The SureFire G6 hardware features improved self-diagnostic capabilities and auto-configuration. Reducing downtime and TCO.

## Flexible Software

SureFire G6 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 G6's interactive test mode allows to manually check the operation of the entire test system. Test profiles allow easy reuse and modification of all test setup information.

## Configurable System

SureFire G6 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 G6 system can manage as many as four or even eight test cells simultaneously. The modular design means you can configure SureFire G6 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. View synchronized 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 16bit 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 G6 can fire as many as 8 squibs with fully adjustable current or voltage pulses. SureFire G6 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 G6 directly controls the high-speed cameras, retrieves and saves image data, and automatically creates AVI movies. The new G6 system architecture supercharges the video download and processing so tests can be completed in a fraction of the time of earlier systems. The advanced video processing lets you complete more tests in less time.

**Microsys SureFire G6** 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 LED, tungsten-halogen and HMI. All lighting technologies can be configured to 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 G6 monitors all facility equipment including emergency stop switches, door sensors and locks, exhaust fans and warning lights. SureFire G6 has both hardware and software interlocks with the facility equipment to ensure the safety of operators.

### Database Integration

SureFire G6 maintains all test setup information in its own Access database, and can integrate with customer databases for traceability and quality management.



Rear panel of the SureFire G6 System showing connections

# SureFire™ G6 System

## Description

- SureFire G6 is a fully mobile system to maximize flexibility and usefulness
- All SureFire G6 systems come with the popular SureFire control software featuring multiple test profiles, interactive system control, flexible meta data input and automatic testing
- SureFire G6 can be configured to control up to 4 (optionally 8) independent test cells. Test cells may be for airbag deployment, inflator testing, impactor test, drop-tower, pretensioner testing, or similar
- SureFire G6 comes equipped with 1 isolated contact trigger input and 3 isolated contact trigger outputs via BNC connectors. Up to 3 inputs and 12 outputs are available optional
- Meta data input fields: Template based meta-data entry allows for a large variety of product and customer data to be recorded. 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 16bit resolution, 0.2% accuracy, with over-voltage protection and automatic offset correction. Variable gain amplifiers are automatically programmed by SureFire to optimize the sensor input range. Variable sample rates of 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 16bit 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 G6. 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 G6 squib safety circuit disconnects 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 10µs to 30s in 10µs steps. Full electrical isolation. Constant current pulse output: typical rise time 5µs, 10 mA resolution, 0.5% accuracy. Constant voltage pulse output: typical rise time 15µs, 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 read-back, 16bit resolution, electrical isolation, over-voltage protection. Variable sample rate up to 1 MHz for a single channel.
- Integrated 4-wire dual range resistance measurement, 0-10 Ohms, 0.001 Ohm resolution & 10-100 Ohms, 0.01 Ohm resolution, 8 mA to 15 mA adaptive current source, short-circuit protected pre and post test resistance measurement. Out of range measurement warnings are displayed by SureFire G6. Accuracy in the 0.5 to 100 Ohm range is better than 0.2%. Higher accuracy available as an option.

## Cameras & Lightening

- Lighting available in multiple technologies: 1 000W tungsten-halogen, 3200°K color temperature, operating temperature: -40°C to +110°C including 10m power cable. A variety of LED lights from 25W to 1000W, -40°C to +90°C 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 100VAC to 240VAC.
- High-speed cameras and professional grade accessories such as lenses, tripods and cables are expertly selected.
- SureFire G6 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 Requirements

### 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