



**Homeland  
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**U.S. Department of Homeland Security**



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems, and provides those results along with other relevant equipment information to the emergency responder community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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# Summary

## Laser Aiming Devices for EOD Disrupters

(AEL reference number 02EX-02-TLPB)

Laser aiming devices for explosive ordnance disposal (EOD) disrupters are sighting mechanisms used by bomb technicians to quickly and accurately aim a disrupter at a target.

To provide responders with information on currently available laser aiming devices for EOD disrupters, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic conducted a comparative assessment of these devices for the System Assessment and Validation for Emergency Responders (SAVER) Program in June 2012. Detailed findings are provided in the *Laser Aiming Devices for Explosive Ordnance Disposal (EOD) Disrupters Assessment Report*, which is available by request at <https://www.rkb.us/saver>.

### Assessment Methodology

Prior to the assessment, seven responders with experience using laser aiming devices with EOD disrupters were chosen from various jurisdictions to participate in a focus group. The group identified evaluation criteria and recommended product selection criteria and possible scenarios for assessment.

After identifying evaluation criteria, the focus group assigned each criterion to one of five SAVER categories, and then assigned a weight for its level of importance. Once the criteria were weighted, the five SAVER categories were assigned a percentage value to represent the level of each category's importance relative to the other categories.

Based on the focus group's recommendations and market research, the following devices were selected for assessment:

- FLS-2000 (Green), Meredith Instruments;
- FLS-2000 (Red), Meredith Instruments;
- SL-600PL Multi-Shot Green Laser Boresighter (Green), Concept Development Corp.;
- K2020 (Green), Ideal Products Inc.;
- K2001 (Red), Ideal Products Inc.; and
- Cobra Sight™ Laser Aiming System (Red), API Technologies Corp.



Five certified EOD technicians served as evaluators for this assessment. All evaluators had at least 11 years of experience using laser aiming devices.

During the assessment, evaluators rated the laser aiming devices based on evaluation criteria established by the focus group. The assessment was separated into two phases: the specification assessment and the operational assessment. Evaluators assessed the systems based on vendor-provided information during the specification assessment. Hands-on experience using the devices during two scenarios served as the basis for the operational assessment. Evaluators determined the effect of different materials on the visibility of the beam as well as the quality of the beam in daylight during the variable lighting conditions scenario. The disrupter shot scenario allowed evaluators to determine the accuracy of shots.

## Assessment Results

Table 1 displays the composite assessment scores as well as the category scores for each laser aiming device. Higher scores indicate a more favorable rating by evaluators. The advantages and disadvantages of each device, as identified by evaluators, are listed in table 2. To view how each device scored against the evaluation criteria assigned to the SAVER categories, see table 3. For specifications, see table 4.

According to evaluators, green lasers tend to be more intense and visible than red lasers, even in full sunlight. All of the assessed products were small and lightweight and used standard, easily obtainable batteries. Additionally, each device can be mounted on different disrupters of the same barrel diameter as a standard 12 Gauge PAN Disrupter™.

Responder agencies considering the purchase of a laser aiming device should review the detailed findings in the *Laser Aiming Devices for Explosive Ordnance Disposal (EOD) Disrupters Assessment Report* and carefully consider each device's overall capabilities and limitations in relation to their jurisdiction's operational needs. All reports in this series, as well as reports on other technologies, are available in the SAVER section of the Responder Knowledge Base (RKB) website, <https://www.rkb.us/saver>.

SAVER Category Definitions	
<b>Affordability</b>	groups criteria related to life-cycle costs of a piece of equipment or system.
<b>Capability</b>	groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform or assist the responder in performing one or more relevant tasks.
<b>Deployability</b>	groups criteria related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.
<b>Maintainability</b>	groups criteria related to the maintenance and restoration of a piece of equipment or system to operational condition by responders.
<b>Usability</b>	groups criteria related to the quality of the responders' experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.

**Table 1. Laser Aiming Devices for EOD Disrupters Assessment Results**

Product	Composite Score	Affordability (26% Weighting)	Capability (22% Weighting)	Deployability (17% Weighting)	Maintainability (9% Weighting)	Usability (26% Weighting)
FLS-2000 (Green)	4.6	4.8	4.0	4.6	4.0	5.0
FLS-2000 (Red)	4.5	4.4	4.2	4.8	4.0	4.7
SL-600PL Multi-Shot Green Laser Boresighter (Green)	4.0	3.4	4.2	3.6	4.1	4.6
K2020 (Green)	3.9	3.6	3.5	4.1	3.9	4.2
K2001 (Red)	3.5	3.4	3.4	3.9	3.2	3.4
Cobra Sight™ Laser Aiming System (Red)	3.4	2.4	4.1	3.8	3.1	3.5

**Table 2. Laser Aiming Devices for EOD Disrupters Advantages and Disadvantages**

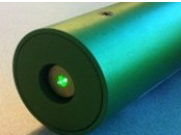





Product	Advantages	Disadvantages
 <p><b>FLS-2000 (Green)</b> Composite Score: 4.6</p>	<ul style="list-style-type: none"> <li>• Available for purchase in red or green</li> <li>• Well designed, easily fits on barrel</li> <li>• Easy activation</li> <li>• Great value</li> <li>• Accurate</li> <li>• Easy-to-see laser</li> </ul>	<ul style="list-style-type: none"> <li>• Limited low-end operating temperature</li> <li>• Lack of sealed housing</li> <li>• Not dust or water resistant</li> <li>• No warranty documentation included with purchase</li> </ul>
 <p><b>FLS-2000 (Red)</b> Composite Score: 4.5</p>	<ul style="list-style-type: none"> <li>• Available for purchase in red or green</li> <li>• Well designed, easily fits on barrel</li> <li>• Easy activation</li> <li>• Great value</li> <li>• Accurate</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of sealed housing</li> <li>• Not dust or water resistant</li> <li>• No warranty documentation included with purchase</li> </ul>
 <p><b>SL-600PL Multi-Shot Green Laser Boresighter (Green)</b> Composite Score: 4.0</p>	<ul style="list-style-type: none"> <li>• Easy activation</li> <li>• Long battery life</li> <li>• Easy battery replacement</li> <li>• Easy-to-see laser</li> </ul>	<ul style="list-style-type: none"> <li>• Bulky</li> <li>• Difficult to get on and off the disrupter barrel</li> <li>• No warranty documentation included with purchase</li> <li>• Not water resistant</li> </ul>
 <p><b>K2020 (Green)</b> Composite Score: 3.9</p>	<ul style="list-style-type: none"> <li>• Dust and water resistant</li> <li>• Easy battery replacement</li> <li>• Easy-to-see laser</li> </ul>	<ul style="list-style-type: none"> <li>• Limited operating temperature range and unknown storage temperature range</li> <li>• Unknown maximum battery life</li> <li>• Two-piece design</li> </ul>
 <p><b>K2001 (Red)</b> Composite Score: 3.5</p>	<ul style="list-style-type: none"> <li>• Lightweight</li> <li>• Inexpensive</li> <li>• Small</li> </ul>	<ul style="list-style-type: none"> <li>• Use of thumb screw affected aim point</li> <li>• Two-piece design</li> <li>• Unknown battery life and temperature ranges</li> <li>• Battery replacement requires an Allen wrench</li> </ul>
 <p><b>Cobra Sight™ Laser Aiming System (Red)</b> Composite Score: 3.4</p>	<ul style="list-style-type: none"> <li>• Intersecting lines made targeting flat surfaces in low light easy</li> <li>• Robot version available</li> <li>• Uses AA batteries and has long battery life</li> <li>• Loaner available</li> <li>• Warranty covers normal wear and tear</li> </ul>	<ul style="list-style-type: none"> <li>• Poor aiming point on non-flat surfaces</li> <li>• High cost</li> <li>• Difficult to calibrate</li> <li>• Shifted on barrel after shots</li> <li>• Requires attachment of a separate battery pack</li> </ul>

Table 3. Laser Aiming Devices for EOD Disrupters Criteria Ratings<sup>1</sup>

KEY							
Least Favorable	➔	Most Favorable					
		FLS-2000 (Green)	FLS-2000 (Red)	SL-600PL Multi-Shot Green Laser Boresighter (Green)	K2020 (Green)	K2001 (Red)	Cobra Sight™ Laser Aiming System (Red)
<b>Affordability</b>							
Value							
<b>Capability</b>							
Beam properties							
Interoperability							
Battery life							
<b>Deployability</b>							
Deployment							
Environmental							
Size							
<b>Maintainability</b>							
Durability							
Calibration							
Battery replacement							
Customer service							
Warranty							
<b>Usability</b>							
Beam quality							
Accuracy							
Activation							
Laser color							

Note:

<sup>1</sup> Averaged criteria ratings for each assessed product are graphically represented by colored and shaded circles. Highest ratings are represented by full green circles.

**Table 4. Laser Aiming Devices for EOD Disrupters Specifications<sup>1</sup>**

Specifications	FLS-2000 (Green)	FLS-2000 (Red)	SL-600PL Multi-Shot Green Laser Boresighter (Green)	K2020 (Green)	K2001 (Red)	Cobra Sight™ Laser Aiming System (Red)
MSRP	\$395	\$395	\$570	\$425	\$290	\$2,600
Beam characteristics	Single dot	Single oval	Single dot	Single dot	Single dot	Two intersecting lines
Battery type	One CR123A	One CR123A	One CR123A	One CR123A	Two G13-A	Two AA
Battery life	5 hours	30 hours	10 hours	Minimum 1 hour	Unknown by vendor	8 hours
Operating temperature	50°F to 104°F	14°F to 113°F	32°F to 95°F	45°F to 95°F	Unknown by vendor	14°F to 118°F
Storage temperature	-4°F to 122°F	-4°F to 122°F	32°F to 95°F	Unknown by vendor	Unknown by vendor	14°F to 118°F
Sealed housing	No	No	Yes	Yes	Yes	Yes
Water resistant	No	No	No	Yes	Yes	Yes
Size	6.5 x 1.5 inches	6.0 x 1.5 inches	9.0 x 2.0 inches	6.0 x 1.5 x 2.0 inches	4.1 x 1.5 inches	2.5 x 1.3 x 2.2 inches (laser) 5.0 x 1.5 x 2.5 inches (battery box)
Weight	12.0 ounces	11.0 ounces	12.0 ounces	11.2 ounces	4.2 ounces	2.8 ounces
Customer support availability	Phone and e-mail: Monday thru Friday, 9:00 a.m. to 4:00 p.m. Mountain time	Phone and e-mail: Monday thru Friday, 9:00 a.m. to 4:00 p.m. Mountain time	Phone and e-mail: Monday thru Friday, 7:00 a.m. to 3:30 p.m. Mountain time	Phone and e-mail: Monday thru Thursday, 6:15 a.m. to 4:45 p.m. Eastern time	Phone and e-mail: Monday thru Thursday, 6:15 a.m. to 4:45 p.m. Eastern time	Phone and e-mail: Monday thru Friday, 9:00 a.m. to 5:00 p.m. Eastern time

Notes:

<sup>1</sup> Information was provided by manufacturers and has not been independently verified by the SAVER Program.

F = Fahrenheit

MSRP = manufacturer's suggested retail price