



# High-Speed Help

The TroubleShooter LE digital video camera offers high speeds at a lower price. BY MICHELLE BANGERT, SPECIAL PROJECTS EDITOR

Producing an easy-to-use camera with extensive features is important, but it will never reach the target audience if it is way out of their price range.

John J. Foley, co-founder and executive vice president of Fastec Imaging Corp. (San Diego), says the TroubleShooter LE camera offers “simplicity, ease of use, a reasonable price” and is “rugged, good-looking, with a wonderful personality.”

The TroubleShooter LE, a handheld high-speed digital video camera, can record up to 500 frames per second and then play them back immediately on its built-in screen. Production and maintenance engineers can immediately see where problems are occurring and make appropriate adjustments to the production line.

Fastec has been in the market since 2004 with their TroubleShooter cam-

◀ This high-speed camera can see the area where the problem is occurring, and then play it back in slow motion. Source: Fastec Imaging Corp.

era, a more high-end, portable, high-resolution camera. About two years ago, a new sensor came to market that allowed Fastec to develop a new camera at a price point that makes sense for their customers, Foley says. This camera was the TroubleShooter LE.

“The big deal about it is that it is a handheld point-and-shoot camera that is relatively inexpensive—very inexpensive compared to other high-end cameras,” Foley says.

The TroubleShooter LE is unique in the high-speed camera world, Foley says, because it is handheld, point and shoot, with a large built-in screen, battery powered with an eight-hour runtime, and the Compact Flash download does not require a PC. The 250 fps model is \$5,900 and the 500 fps model is \$6,900.

“To my knowledge, there is no other high-speed camera in the world that has this set of characteristics,” Foley says.

Though it is not the company’s top-of-the-line camera, the LE aims to help most companies get what they need at a price they can afford.

Though the camera has many features, Fastec wanted operators to figure it out without a lot of fuss. When trying to solve a problem, operators do not want to drag out equipment and set up lights. No

## SPECIFICATIONS

- ▶ **Models:** TroubleShooter LE 250 and TroubleShooter LE 500 (Monochrome and Color).
- ▶ **Sensor:** CMOS array, 8-bit monochrome resolution, 24-bit color resolution.
- ▶ **Shutter:** 1X, 2X, 3X, 4X, 5X, 10X and 20X the recording rate.
- ▶ **Recording Modes:**
  - **Manual:** Begins recording when the record button is pushed. Continues to record and store images in memory until the stop button is pushed.
  - **Trigger:** Begins recording when the record button is pushed. Continues to record and store images in memory until an external trigger signal is received.
- ▶ **Playback Modes:** The adjustable trigger position determines how many frames are stored before and after the trigger signal is received.
- ▶ **Single step mode plus auto playback at 1, 2, 3, 4, 5, 10, 15, 25, 30, 50, 60, 125 and 250 frames per second, forward and reverse.**
- ▶ **Display:** Built-in 5-inch digital, color LCD.
- ▶ **Operator Controls:** Power On/Off, Function Select/Change, Record, Stop, Download.
- ▶ **I/O Connectors:** DC Power, USB 2.0 Port, Compact Flash, Trigger-In, Sync-In, Sync-Out, Video-Out.
- ▶ **Trigger Input:** Contact closure or standard TTL signal, 3 to 30 VDC.
- ▶ **Mounts:** C-mount lens mount, 1/4-20 tripod mount.
- ▶ **Power Supply:** Rechargeable Battery Pack (included) or 110/220 VAC adapter (included).
- ▶ **Size and Weight:** 19 cm W x 12 cm H x 6 cm D; 0.8 kg with Battery Pack.

additional lighting is necessary because the camera is light sensitive.

When facing a product jam, operators will try to see the problem. This high-speed camera can see the area where the problem is occurring, and then play it back in slow motion. Seeing the problem is 85% of the battle, Foley says. "If they can see it, they can fix it." Then the images can be downloaded to a computer. It also is specifically designed—and protected—for factory operations. "Things get dropped," Foley says. "If you drop this guy, it'll bounce. It's protected in a rubber boot, and has a good grip and good feel on it."

The camera could make a useful addition to a field service kit, Foley says. "It helps field service engineers find the problem, and, most important from the customer standpoint, fix the problem that much faster."

The features have not gone unnoticed. Foley says there has been a tremendous amount of interest in the product, which began shipping late last year.

The product fills a niche that may have previously been solved using other methods: small companies may have been using trial and error to fix problems, as cameras may have been out of their budget. Larger companies may have been using some of the more expensive, \$20,000 to \$40,000 cameras, but only buying one for the plant or buying one to share among plants.

A potential limitation is the maximum frame rate of 500 per second, Foley says. For applications requiring more, Fastec's standard TroubleShooter has 1,000 and up. However, Foley says, "500 frames per second is fast enough for 99% of applications."

Having more may not necessarily be better, though, as each application is different. Instead of clamoring for the latest, greatest developments, Foley says the main question should be "Can you see what you need to see to fix the problem?" If so, the camera is a good fit.

"We in the high-speed industry become our own worst enemies in a way," Foley says, as companies are able to produce higher and higher resolutions on faster and faster cameras for their customers.

"[Customers] want to have a camera with a billion pixels running at



**The TroubleShooter LE, a handheld high-speed digital video camera, can record up to 500 frames per second and then play them back immediately on its built-in screen. Source: Fastec Imaging Corp.**

the speed of light," Foley says. But for many applications, this may be overkill. "Why pay for something you don't need?" he asks.

Thus, Fastec's approach has been to go for the broader market.

"This particular camera is targeted at machinery diagnostics and troubleshooting of high-speed operations, crossing many industry lines," Foley says. It is targeted at field service engineers for the companies that make this

machinery and maintenance technicians that use the machinery.

"We wanted to develop an easy-to-use, affordable high-speed camera for the field service engineers and factory maintenance technicians who are responsible for keeping these high-speed lines running smoothly," Foley says. "Since the vast majority of production and packaging lines run at less than 1,000 parts or pieces per minute, we determined that 500 fps is plenty fast enough to stop the action at probably 90% of the companies in our target segments. This meant that we could develop a smaller, less expensive camera."

#### TECHNOLOGY CONTACT

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