

APPLICATION NOTE

Six things to you need to understand before purchasing a hand-held oscilloscope



Modern machinery is operating faster and performing more and more complex tasks, significantly improving productivity. While this improves operating metrics, it can present challenges for the technicians responsible for maintaining the equipment. To achieve higher performance levels, machines now use more sophisticated automation control technology, including devices like feedback sensors, digital logic controllers, I/O conditioning and safety interlock devices, all assembled together in a system with digital network communications. When problems go beyond the obvious, often a ScopeMeter® test tool is the only tool capable of capturing and measuring the complex analog and digital signals found in these systems.

Fluke has innovated new features that make it easy to capture, analyze complex signals and get answers needed to keep systems up and running. Whether upgrading an existing portable oscilloscope, or purchasing one for the first time, here are some things you need to know:

1 Newer digital electro-mechanical equipment

Motors, pumps, turbines and other types of electro-mechanical equipment are more digitized and more complex than ever before. Programmable Logic Controllers (PLCs) can now be programmed in the field, and many of the newest control devices include networking capabilities. This adds another dimension to troubleshooting in that it not only demands basic volts, ohms and amps measurements, but also an instrument capable of measuring analog or digital signal attributes such as amplitude, timing or frequency and capable of detecting any signal disturbances and distortion.

2 Complexity of signals/waveforms

Programmable automated controllers (PACs), PLCs and other industrial digital control devices produce complex signals that are difficult to capture and trigger on an oscilloscope. Indeed, identifying characteristics of signals can be a challenge and

even more difficult to determine the root cause of a failure, especially if the test tool is not able to capture and display a signal of interest. Fluke ScopeMeter Test Tools provide capabilities that help troubleshooting teams diagnose potential issues and uncover root cause in a straightforward manner. Connect-and-View™ triggering automates signal setup, trigger and capture, while a new Fluke innovation called IntellaSet™ technology adds a sophisticated onboard algorithm that analyzes the measured waveform, then intelligently displays critical measurements values associated with that waveform. As an example, when the measured waveform is a line voltage signal, the V ac + dc and Hz readings are automatically displayed for a sine wave V ac and Hz are displayed, for a dc power source, dc volts, and for a square wave VPeak-Peak and Hz. The ScopeMeter 125B can also help you successfully troubleshoot a range of industrial bus problems. With the 125B Bus Health function, a user can provide a health check on a specific bus communication between the control unit and a motor drive.

3 Difficulty capturing intermittent events

One of the most difficult faults to find and fix, intermittent events can be beyond frustrating, happening only once in a while. They can be caused by bad connections, dust, dirt, or simply broken wiring or connections, and can be particularly hard to find in digital signals involved in control systems. ScopeMeter Test Tools are designed to record for extended periods of time. Plus, a new automatic Event Detect feature found in the 120B series can quickly capture and identify random events that can cause system shutdowns or resets. Just set a threshold on a meter reading or scope trace, and deviations are tagged as events in the full recording but you no longer need to search through masses of data to track down intermittent events. Simply step from one tagged event to the next, all while still having access to the full data set. ScopeMeter Test Tools can take thousands of samples per minute. You can even trend measurements in real time on the screen, and with the Fluke Connect® mobile app capabilities, save measurements to a smartphone and upload to the cloud for sharing or analysis*.

4 Getting to root cause may require assistance

Given how difficult it can be to troubleshoot issues in the latest digitized controls for electro-mechanical equipment, getting to root cause may require additional brainpower from a colleague or manufacturer, or a more sophisticated analysis in software programs. The ScopeMeter 120B Series can communicate with smartphones as part of the Fluke Connect® platform of wireless test tools and software. Fluke Connect mobile app compatibility provides the ability to compare and contrast asset measurement data, communicate with subject matter experts and document test information. By being able to share and communicate, technicians can cut the time it takes to troubleshoot issues and return equipment to full operation.

*Not available on all models

5 Data storage and management can be a challenge

The Fluke ScopeMeter 120B Series Hand-Held Oscilloscopes are the first Fluke Connect-enabled, cloud-connected portable oscilloscopes. This connectivity opens up a new way of thinking about saving, storing and sharing your waveform and measurement data from the ScopeMeter Test Tool. In addition to opening up the potential of collecting important baseline data on normal operating conditions of electro-mechanical systems, data is stored securely in the cloud where it is always available and thus can be shared and managed. And, since measurement data can be associated with specific pieces equipment, there is no need to manually record in the field and then transcribe into an office computer. Such information can even be compared against other test instruments in the Fluke Connect family, including industrial infrared cameras, vibration meters and others.

6 Test tools you can rely on no matter what problem you face

When you get the call-out to inspect a failure, often you don't know what tests or measurements will be needed. Will it require just basic volts, ohms or current measurement or will you need to record data to troubleshoot illusive intermittent conditions or track down the source of signal disturbances disrupting communications? Which tools do you take with you? The ScopeMeter Test Tools combine the capabilities of an oscilloscope, multimeter and paperless recorder in an easy to use hand-held tool that has the benefit of being battery operated and rugged, making it possible to use anywhere even in harsh environments. Simplify and extend your troubleshooting arsenal with a ScopeMeter Test Tool.

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