BLACOH™
SURGE CONTROL

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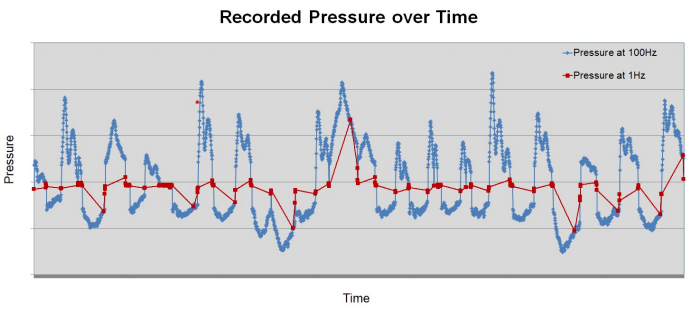
Protect your system from damage. Accurately monitor for water hammer or pressure spikes and be able to react quickly.

SURGEWAVE™
TRANSIENT MONITORING SYSTEM

ABOUT SURGEWAVE TRANSIENT MONITORING SYSTEM

Blacoh's patented SurgeWave ™ Transient Monitoring System solves the need for pipeline operators to detect and record transient pressure events. The system is unique in that it employs a system of dynamic pressure transducers and digital technology to monitor pipelines for indefinite periods of time. When a transient such as a pressure spike or water hammer event is detected, the system activates a high speed data recorder to record the event at 100x/second.

SURGE DETECTION EXAMPLE



What Is Transient Pressure?

Often referred to as "surge" or "water hammer," a transient pressure is a wave phenomenon that accompanies a rapid change of fluid velocity in a pipeline. It can be caused from a sudden start/stop of a pump or the closing of a valve, and is often heard as a large bang in the pipes (water hammer). These pressure variations can be positive or negative and can have a magnitude several times the normal or maximum operating pressure, resulting in severe system damage. The duration of the transient event can be anywhere from several hundredths of a second to a few minutes. Blacoh's patented SurgeWave™ Transient Monitoring System makes it possible for a user to capture these pressure fluctuations, address the pressure loads and ultimately protect their pipeline systems.

BENEFITS

- ✓ Instantly detect and record transient pressures up to 100 times per second.
- ✓ Receive graphical analysis of recorded data.
- ✓ Obtain truer pressure data than typical pressure detection devices
- ✓ Compare pressures at various locations within the system

SurgeWave™ protected by United States Patent Nos. 7,219,553 & 7,357,034

SURGEWAVE™

— TRANSIENT MONITORING SYSTEM —

FEATURES

- High speed data recorder instantly detects and records transient pressures up to 100 times per second
- Capable of capturing positive and negative pressures
- Provides graphical analysis of recorded data

MONITOR EXPENSIVE EQUIPMENT

- Actuated Valves, Pressure Reducing Valves, Pressure Relief Valves, Pump Control Valves, Air/Vacuum Valves, Check Valves
- Pump Suction/Discharge, Constant/Variable Speed
- Back Flow Preventers

EASY INSTALLATION

- Portable and easy to install in any pipeline transporting fluid
- Wireless communication via WiFi(Guardian) or cellular (Defender)
- Precise time correction via GPS enables users to compare data from multiple units

ASSISTS OPERATORS IN FINDING

- Leaks and ruptures
- Faulty or insufficiently placed air valves
- Faulty valve actuators
- Faulty or inadequate pumps
- Poor pipeline management procedures
- Electrical failures
- Pulsations or oscillations from unstable pressure

SurgeWave GUARDIAN™

Perfect for remote locations where cellular service is limited, data is stored locally on an internal USB drive. Multiple inputs are provided for large piping networks with plug in cables for quick setup. Power consumption is very low, making the GUARDIAN ideal for solar powered applications.

- Integral WiFi communication to laptop
- Data stored locally to USB drive
- Up to 8 inputs, 2 output relays
- Plug in transducer cables
- Power: 160 mA @ 12 VDC

Components

Laptop with software	WiFi antenna
Pelican storage case	GPS antenna
Pressure transducer *	12V battery cable
Transducer cable *	AC adaptor
Mounting feet	Spare fuse

*sold separately

SurgeWave DEFENDER™

Designed for locations with cellular service, the DEFENDER is ready to go with hard wired cable connections. All system data is stored on remote cloud servers and can be accessed anytime from anywhere via the Blacoh Surge website or mobile app.

- Cellular communication to web/mobile app
- Data stored to cloud servers
- 2 inputs
- Hard wired transducer cables
- Power: 500 mA @ 12 VDC

Components

Pressure transducer *	Cellular antenna
Transducer cable *	AC adapter

*sold separately

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