INNOVATIVE ELECTRONICS

Electronic Block Monitor
Series 4100
a FIRMS® modular component

"Quality by Design, Satisfaction by Performance"

FEATURES:

- **Rack Mount Construction**
  Quick, simple installation
- **Microprocessor Based**
  Minimum parts, simple design
- **Two 4-20ma Transmitters**
- **One Rs-232 Interface**
- **Remote Program Setup**
- **Patented Design**

System Overview

The Electronic Block Monitor is a microprocessor based, Traveling Block monitoring system designed to monitor, display and transmit, real time block position and speed information. By receiving pulses from a shaft encoder installed on the drawworks drum, the Block Position Monitor calculates the position of the traveling block at a rate of more than 40 times a second. This data is then processed and displayed and made available for data logging via two 4 to 20 MA, loop powered transmitters and one RS232 interface for transmitting data to a remote computer.

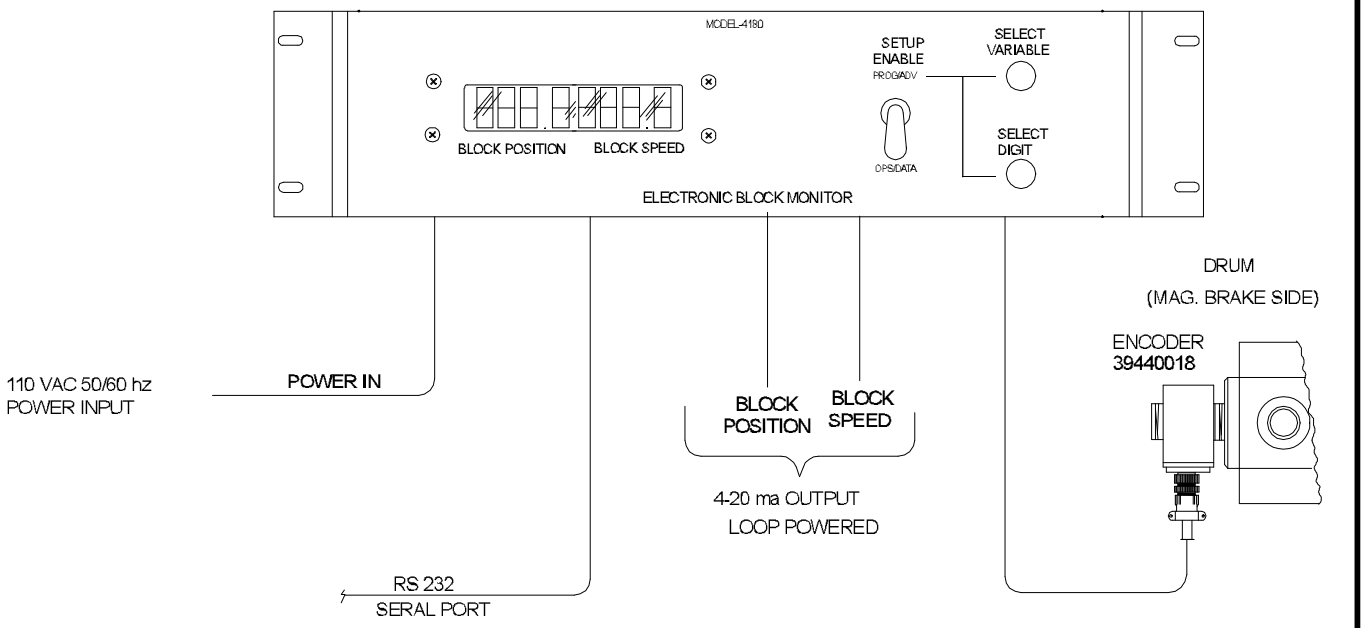
All of the EBM's operator controls for system setup and operation are easily entered by three switches on the front panel. However, there is an additional setup control accessible via the RS232 interface if needed. Once the Drilling Rigs parameters data have been entered into the user friendly step through the program menu there is one calibration verification step and the EBM is ready for operation. The unit is designed for quick and easy installation and setup with no additional equipment required to make it operational.

Operation

Once initialized, the EBM controller receives signals from the Block Position Sensor. These signals are input via two intrinsically safe barriers to the Interface Control PCB, converted to serial port data, then sent to the Micro-Controller PCB for processing. The Micro-Controller then makes available real time block position and speed data to the front panel display, the 4 to 20 MA, loop powered transmitters and the RS232 interface.

During normal operation the EBM provides block information for data logging or chart recording applications. With a high sample rate, a high resolution encoder to check the exact position of the Drawworks Drum, and exact Rig parameter database the Electronic Block Monitor maintains a high level accuracy. The EBM has a built-in self test routine. If any of the values received by the Micro-Controller are incorrect, the self test routine forces the system to generate an error code message that is displayed on the front panel LCD and transmitted via the RS232 interface making maintenance easier.

TYPICAL BASIC SYSTEM



Position Sensor

The relationship between the linear movement of the wire line and the angular position of the drawworks drum is predictable, repeatable and can be calculated using the diameter and the length of the drum and the size of the wire line. By adding the number of lines strung, the operating relationship between the angular position of the drawworks drum and the traveling block can be established.

The block position encoder sensor is directly driven by the main drive shaft of the drawworks drum. It provides, to the computer, a value that represents the angular position of the drawworks drum.

Additional Information

The Electronic Block Monitor is designed to be rack mounted. The EBM can interface with the Innovative Electronics **FIRMS®** (**F**ully **I**ntegrated **R**ig **M**anagment **S**ystem), the crown TV system, rig computer systems, logging computer systems, and can be programmed to provide anti-collision capability for the RBS, Automatic Pipe Racker, or Iron Roughneck. An auto-drilling option is also available. The EBM can be supplied in various configurations depending on requirements. Systems are available with or without cables and/or junction boxes, for permanent installation or for moving from site to site. These components can be combined with other Innovative Electronics packages for complete consoles containing both hydraulic and electronic gauges and instruments.

For Additional Information Contact:

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