The 6B11 and 6B11HV are single-channel isolated signal-conditioning modules which accept the outputs from thermocouple, millivolt, voltage and process current signals. Unlike conventional signal conditioners, the 6B11 and 6B11HV are complete microcomputer-based data acquisition systems. A major advantage of the onboard microcontroller is its ability to be remotely reconfigured for various sensor types and input ranges.

Synchronized Sampling

The synchronized sampling command allows data to be sampled simultaneously from all 6B11, 6B11HV, 6B12, 6B12HV modules and all 6B50 boards in a 6B Series system. Each module or board stores the data in a separate register within its microcontroller and can access the data with a separate command.

Software Configuration

The 6B11 and 6B11HV linearize and compensate J, K, T, E, R, S and B thermocouples. Additionally, these modules also digitize millivolt and voltage ranges from ±15 mV to ±5 V as well as 0 to ±20 mA process current inputs. Software is used to configure the 6B11 and 6B11HV modules for address, input range, baud rate, data format, checksum status and integration time. All programmable parameters are stored in the nonvolatile memory of the module.

Inside the 6B11 and 6B11HV

Each analog input signal is conditioned and scaled by a programmable-gain amplifier and digitized by a 16-bit integrating converter under microprocessor control. The digitized value is passed serially across a magnetically isolated barrier (1500 V rms - Model 6B11; 2500 V rms - Model 6B11HV) and clocked in by a custom controller chip. The on-board microprocessor then converts the data into engineering units as determined by the channel parameters. In between conversions, the microprocessor auto zeros the offset and gain by monitoring the on-board temperature and compensating for reference drift. Cold junction compensation (CJC) is also performed at this stage. The 6B11 and 6B11HV use compensation factors to ensure the highest accuracy possible.