



Taking the Measure - BBB (Borrow)

Calibration: A Technician's Guide by Mike Cable

Reviewed by Nick Sands

Calibration is one of the basic skills for the control system technician, yet little has been written about how to perform or manage calibrations. This gap in the control library is now filled by *Calibration: A Technician's Guide*. Mike Cable, currently a validation manager at Argos Therapeutics, started as an electronics technician in the Navy Nuclear Power Program followed by more than 10 years with Process Solutions, providing service like instrument qualification for pharmaceutical companies. Mike is also a Level 3 Certified Control System Technician.

Cable starts by defining calibration and related terms such as tolerance, accuracy, zero and span. The purpose of calibration is to ensure the instrument's measurements are accurate. If the device under test and the standard differ by more than an allowable tolerance, the zero or span may need to be adjusted. The calibration standard may need to be traceable back to a national standard, especially for instruments classified as critical. Typical documentation would include calibration procedures, with various sections and a place to record the results of calibration, most importantly the as-found and as-left readings.

After addressing the basics, Cable gives more detailed considerations for calibrating types of instruments. Thermocouples, like other devices, can be field calibrated, perhaps using a temperature bath, or bench calibrated. The calibration can be done on a single device, such as a transmitter, or through a complete instrument loop. Pressure devices are similarly calibrated. Pressure gages may have several adjustments for the mechanical linkage.

Level and flow measurements come in a range of technologies. Level transmitters may have suppressed or elevated zeros. Differential pressure transmitters may be calibrated in the same way as pressure transmitters, but capacitance meters and ultrasonic meters require other methods. Flow meters can be field calibrated if facilities exist, such as a master meter or bucket test capability. Magmeter transmitters can be calibrated with the right equipment, but it is often necessary to have flowmeter calibrations performed by vendors.

The final chapters cover the calibration of I/P transducers, control valve positioners, and some analytical equipment like pH and conductivity meters. As with the other equipment, the principles of operation are explained and tips on calibration are given.

Calibration: A Technician's Guide rings true. It clarifies the things that people know and do, and provides some explanation as to why. The book is short, about 110 pages, and extended with example specifications, procedures and tables. While it may be a necessary reference for some, it is worth borrowing to read for almost everyone (BBB). ISA.org sells Cable's book for \$69 (member price).