Calibrating Fieldbus Transmitters ? ? ?

- Yes, it is easy !
Calibrating Field-bus transmitters in easy way

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What is calibration in Field-bus terminology

• Terminology differs between conventional and digital instrument calibration.

• Traditionally in metrology the word calibration means that the instrument under test is being compared against more accurate instrument and may include trimming or adjusting the instrument to show again correct readings.

• In Field-bus terminology the word calibration means that the instrument is being configured or checked.

• This controversy creates lot of confusion within C & I field.
Why to calibrate Field-bus Instruments?

• The primary reason for calibrating is that even the best instruments drift and lose their ability to give accurate measurements.

• Drift makes the calibration necessary.

• Environment conditions, elapsed time and type of application can all affect the stability of an instrument.

• Even instruments of the same manufacturer, type and range can show varying performance. One unit can be found to have good stability, while another performs differently.
Other reasons for calibration

• To maintain the credibility of measurements, which directly affects the productivity of the process and the plant.

• To maintain the quality of process instruments at a good-as-new level.

• Safety and environmental regulations.

• ISO9000, other quality systems and regulations (e.g. FDA).

• ISO9000 and ISO14000 can assist in guiding regular, systematic calibrations, which produces uniform quality and minimizes the negative impacts on the environment.
The operation of Conventional transmitters

Conventional transmitters

• Analog one-way signal
• Only one variable
• A pair of cable to each instrument
• Conversion of mA signal to digital for I/O subsystems
The operation of Field-bus transmitters

Field-bus transmitters

• Digital two-way signal

• Huge amount of information is transferred

• Several instrument in one bus cable (multi-drop)

• No conventional I/O systems needed

• Open standard – Instruments from any manufacturer can be in the same Field-bus
Field-bus transmitters must also be calibrated

- The main difference between a Field-bus transmitter and conventional transmitters is that the output signal is a fully digital Field-bus signal.

- Changing the output signal does not change the need for periodic calibration.

- Although modern Field-bus transmitters have been improved compared to older transmitter models and some manufacturers give assurance of drift-free instruments, it does not eliminate the need for calibration.

- Calibrator is needed to measure (generate) input + a way to read the digital output.
The principles of calibrating Field-bus transmitters

In brief:

• Generate accurate process input

• Read FF output

• Document results

• Trim (adjust) if required

• Calibration CANNOT be made remotely e.g. from the control system, etc.
Conventional way of calibrating Field-bus transmitters

- Minimum two persons often required

- Various measuring instruments and devices needed like calibrator(s), Field-bus communicator, multimeter

- Manual documentation of calibration

- Doesn’t work for stand-alone transmitters

  Time consuming and sets requirements for the manpower, it is also prone to errors due to multiphase tasking
It is easy to calibration Field-bus transmitters

In year 2006 Beamex launched and introduced the first revolutionary MC5 Field-bus Calibrator to the markets. It is still the only existing product in this field.

The product is a combination of a multifunction process calibrator and a Field-bus configurator, which can be used with both industrial standards Foundation Field-bus H1 and Profi-bus PA. It also houses HART configuration and calibration facility.

In 2009 the World’s first IS Field-bus Calibrator for potentially explosive environments (IS) was launched with the same features as the non IS version.
It is easy to calibrate Field-bus transmitters

Instrument Calibration

Calibrating Field-bus transmitters sets high requirements for the equipment to be used.

The transmitters are having a good accuracy of 0.025% of FS and the instrument to be used in calibration must have preferably 5 times greater accuracy than the unit under test.

Beamex® MC5 Field-bus Calibrator can manage this job well, the accuracy reached starting from 0.005% FS both in field use or in the workshop environment with a calibration test bench.
Calibrating Field-bus transmitters with the Beamex® MC5 Field-bus Calibrator

1. Make connections
   (live segment or stand-alone)
   - View/edit instrument configurations
   - Verify the instruments during commissioning

2. Calibrate and document automatically
   - Simulate or generate the input and read the digital output of the Field-bus instrument
Calibrating Field-bus transmitters with the Beamex® MC5 Field-bus Calibrator

3. Trim (adjust) if required and perform As Left calibration automatically or manually

4. Upload calibration results to calibration software and print the calibration certificate
Calibrating Field-bus transmitters with the Beamex® MC5 Field-bus Calibrator

Benefits in brief

- Multifunction Calibrator + Field-bus communicator
- Single tool to be carried to the field
- Easy to use and reduces time used for calibration
- Automatic documentation of results
- Improving the processes and profitability
THANK YOU

www.beamex.com
www.waaree.com

rajeshpanchal@waaree.com