LM80 laser transmitter
Demonstration procedure

Measurement made easy

Introduction

The following LM80 demo procedure is developed for simple customer demonstration. The demonstration should not be longer than 35 minutes in duration.

Demo package includes

— LM80 with portapack (includes 2 x 9 V DC batteries), pointer and dust tube
— LCD2 hand-held communication device
— RS232 null modem cable
— Installation & Operation Manual
— Pelican 1520 carrying case

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Demonstration procedure

Note. Ensure you have new batteries loaded in the portapack (PPK) before beginning the demonstration. A set of new batteries (2 x 9 V DC) provide power for up to 45 minutes of continuous demonstration.

1. Mount the PPK (portapack) on the LM80 laser transmitter.

2. Explain the dust tube and built-in flange function.

3. Connect the LCD2 (hand-held device) and turn the PPK on / off switch to the ON position.

4. Show the LCD2 display screen and explain how the laser measures distance (Time of Flight [TOF] Pulsed Laser technology).

5. Explain all of the available options to communicate with the LM80 Laser transmitter:
   —ABB's LCD2 hand-held communication device (preferred)
   —Desktop PC / laptop
   —Handheld computer device with Palm OS or Pocket PC (PDA)

6. Point the LM80 to different points on the floor or walls (indoor) and observe the distance change on LCD2 display. Explain the two (2) major advantages of ABB's laser technology:
   —Measures any surface at any angle with a narrow beam (make statement for opaque liquids)
   —Virtually no beam divergence (<0.2°), therefore capabilities to measure in very restricted spaces (for example, silos with internal structures) and small foot-prints at long distances (for example, posi-)

7. If there are windows in the room, aim the laser through a window to an outside object (for example, a car) and explain the how the laser can measure uniquely through a site glass (an example of non-contact and non-intrusive level measurement in an enclosed reactor vessel).

8. Explain the following three (3) features of ABB Lasers for measurement in light/moderate dust:
   —Laser pulse detection
   —Color compensation
   —Filtering system

9. Demonstrate the filtering system which includes the Buffer and Keep. Explain how these programming modes work together. Then link this explanation to how the laser can ignore and still measure with agitator blade rotation or an aggregate feed stream. This can be demonstrated by simply passing your hand back and forth through the laser beam.

10. Demonstrate the two (2) SPST relays. Explain that these independent relays can be used for pump / valve control and as a hi/lo level switch.

    To demonstrate relays:
    —Using the LCD2 hand help communicator, scroll to the main menu and select option 2 'Relay Settings'.
    —Activate the relay A or B test option. You will then hear the click of the mechanical relay which is acknowledged on the LCD2 display as closed or open.

11. Give the LM80 Laser transmitter to the customer, guide her / him to measure any distance at any angle. Make a point of how easy it is to use the laser for level / distance measurement.

    Benefits are:
    —The ABB laser is **already calibrated at the factory (no calibration is required)** and all that must be done is to set the 4 & 20 mA set points which can be easily accomplished at the customer's maintenance shop, **that eliminates the need for any setup and calibration on TOP OF THE SILO!**
    —The installation of a laser transmitter takes just a few minutes, due to the fact that the laser is not an application sensitive technology (unlike Ultrasonic and Through Air Radar units). Reiterate that the ABB laser does not have the traditional technology limitations and is considered a unique product due to:
      – narrow beam,
      – measures any surface at any angle
      – can be installed almost anywhere

Unique LM80 features / definitions

Color Compensation

This built-in software capability of the LM80 automatically compensates for color differences in materials that are being measured. For example, light colored mediums such as PVC pellets, have very good reflective properties. Therefore, they provide a very strong return signal. Whereas dark mediums, such as coal, absorb more light and in turn has a weaker reflective capability. The LM80 automatically distinguishes between this material color difference to provide an accurate and reliable measurement! Other laser manufacturers have a manual and cumbersome means of dealing with this issue.

Last Pulse Detection

A user can select this mode of operation to select the very last return signal as the true level. This feature becomes essential in applications that involve agitator blades, dust clouds or passing objects.

Filtering System

This is also a user selectable mode in order to adapt the LM80 to a wide variety of applications. For example, some applications may require rapid level tracking (rock crushers or aggregate process hoppers). On the other end of the spectrum, an inventory silo has a very infrequent or slow moving level. However, in both of these examples, the LM80 filtering system can provide accurate and reliable level measurement. The filtering system is made up to two (2) adjustable parameters:

BUFFER and **KEEP**

These two (2) parameters work together to provide optimum performance in just about any level application. The BUFFER stores the reading coming from the LM80. The BUFFER size can be set anywhere between 1 and 30 (Default = 8). KEEP continuously checks the 'stored' reading (BUFFER) and selects only the LONG-EST readings. KEEP can also be set anywhere between 1 and 30 (Default = 2).

For example, if KEEP = 1, only the single (1) longest reading is selected for output. However if KEEP = 2, then the two (2) longest readings are selected and averaged for output.
By selecting different BUFFER and KEEP sizes, the end-user can adapt the laser to most any application demand.

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