

Magnetometer Model MR3

(3-axis quadrature-cycling magnetoresistive sensor)

After turning on, the left half of the screen shows the actual values of the magnetic flux density components X,Y,Z including polarity, with range +/-1999.99 milligauss and resolution 0.01 milligauss (=1nT). The larger font number at the top is the magnitude (square root of the sum of squares of X,Y,Z). The right half shows the "peak hold" values (highest/lowest flux densities that had been previously displayed) in a similar format. After the meter is turned on, spurious values for these peak hold numbers may be present because of turn-on transients. To use the peak hold function properly, press the second blue pad (RESET ALL PEAK HOLD). This returns all peak hold registers to whatever the displayed value of the flux density is at that time. Later, the highest and lowest values of X,Y,Z, and magnitude can be displayed. The meter can be powered either by a 6V (center positive) adapter, or by internal batteries (4 x AA alkaline). A battery indicator is on the display. Whenever the adapter is plugged into the side of the meter, the batteries are disconnected from the circuit.

There are 3 sensors in the cube. These X,Y,Z sensors each measure a signal proportional to the magnetic flux density x cosine of the angle between the flux density direction and the X,Y, or Z sensor directions, respectively. Proportionality to the cosine is better than 1 part in 10,000. The center of each sensor is 5mm inside the cube, directly back from each of the dots marked on the cube for X,Y, and Z. The sensing direction of each is also marked by an arrow. All four white surfaces of the cube are true to these directions within 1° or 1/10° of arc, depending on which option was selected when ordering.

Scaling accuracy of the fields are +/- 0.5% of the reading for X,Y, and Z (no additional error is present in the magnitude displayed). Maximum zero error (which is the reading in true zero field) is +/- 0.5 milligauss for X,Y, and Z. However, if the ZERO (TARE) button is pressed, the present values of X,Y, and Z are subtracted from all future readings, like a tare function on a weight scale. The original +/-0.5 milligauss readings return after turning the meter off and on again. At any time, a new tare can be effected, and pressing ZERO (TARE) does not affect the numbers stored in the peak hold registers.

If the meter has been previously configured by connecting to a computer and using the free AlphaApp software, it will begin storing the X,Y,Z and magnitude values when DATA CAPTURE is pressed. A floppy disc icon will appear during data recording. The reason for configuring the meter is principally to determine how frequently to record X,Y,Z and magnitude. The internally saved data can later be exported, such as to a spread sheet. The meter does not need to be tethered to a computer to record, but if tethered, it can instead write directly to the computer memory.

In some instances, both the highest and lowest values of X,Y, and Z and magnitude need to be determined during a defined sampling period (like 24 hours). Instead of recording a large amount of data and using a spread sheet to find these min/max numbers, the peak hold function can be queried to find them quickly on the meter display. To do this, first press RESET ALL PEAK HOLD to start the sampling period. (It does not matter if ZERO (TARE) has been previously pressed). From that moment, the meter will save the highest and lowest of the displayed X,Y,Z, and magnitude numbers, as they were displayed on the left half of the screen. Nominally, the largest value of magnitude, and the farthest-from-zero values of X,Y,Z (whether these values are positive or negative) will display on the right side of the screen. If PEAK HOLD DISPLAY MODE is then pressed once, a "+" sign will appear on the upper left of the screen and the peak hold magnitude will remain the same, but the displayed X,Y,Z peak hold values may change. Now they will be the most positive (algebraically) values. For example, if during a test period the maximum positive value of X was 300.04 milligauss and the maximum negative value was -322.47, then the peak hold for X would display -322.47 before the PEAK HOLD DISPLAY MODE was pressed, but it will display 300.04 after it was pressed once. If pressed again, a "-" sign will appear in the upper left screen, and X will display -322.47 again. In this third peak hold mode, the peak hold magnitude will generally be lower than in the first two modes. (Remember that magnitude is never negative.) A third press will return peak hold to nominal, and no information will be erased, no matter how many times the mode is cycled. The backlight does not affect any other functions.

This meter has a one year warranty and is manufactured by AlphaLab, Inc., 3005 South 300 West, Salt Lake City, UT 84115. www.trifield.com tel. 801-487-9492.