

SMT-9700

High-Resolution Non-contact Displacement Measuring System User's Manual

This apparatus, when installed and operated per the manufacturer's recommendations, conforms with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the member states relating to Electromagnetic Compatibility. Refer to the SMT-9700 Declaration of Conformity or contact Kaman Precision Products for details.



Description

Kaman's Model SMT-9700 is a non-contact, high-precision, analog position measuring system. The system operates on proprietary Pulse Width Modulation Circuitry. It is a lead free, RoHS compliant, CE Marked design. This system can be utilized for precision static and dynamic measurements of conductive targets. It is primarily for OEM use or where high resolution is of primary importance, and where the user can correct outputs with higher non-linearity.

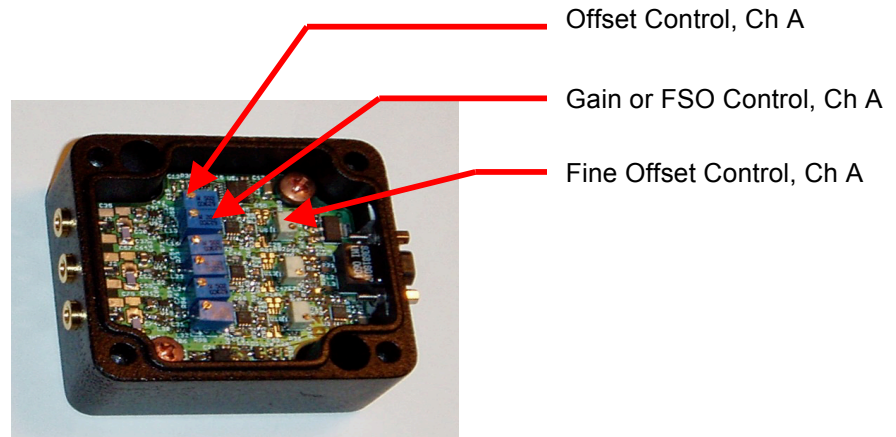
The SMT-9700 system consists of two subassemblies: sensor with integral cable, and signal conditioning electronics module. The sensors are connected to the electronics with push-pull MCX style coaxial connectors. It is available in 1, 2, or 3 channel configurations.

The SMT-9700 is specifically configured for each unique application. Refer to the calibration record supplied with each system for; sensor model, sensor cable length, target material, range, offset, and output. Output is an analog voltage with a maximum span of 10 VDC. Typical outputs are 0-10, ± 5 , ± 2.5 , etc. Connections to the SMT-9700 are shown below. Note the channel returns (pins 1, 4, and 8) are common and are not connected to Ground (pins 3 and 7).

I/O CONNECTIONS			
Pin #	Description	Wire Color	Notes
1	Ch 2 Return	Black	Sensor B
2	Ch 2 Out	Brown	Sensor B
3	Ground	Red	
4	Ch 1 Return	Orange	Sensor A
5	Ch 1 Out	Yellow	Sensor A
6	Vin	Green	+15 VDC
7	Ground	Blue	
8	Ch 3 Return	Violet	Sensor C
9	Ch 3 Out	Grey	Sensor C

Note that to maintain CE Marking of the SMT-9700, I/O cables are limited to 3 m or less in length.

The critical circuit voltages needed for operation of the SMT-9700 are internally regulated. Any single ended DC voltage power supply that can furnish +15 VDC at 50 mA can be used. For high-resolution applications, a linear power supply is recommended.



SMT-9700 Control Locations

A 3-channel configuration is shown above. Controls for channel B are in the same relative location in the center of the PCB. Controls for channel C are in the same relative location at the bottom of the PCB. For a single channel configuration, the center channel is used. For a dual channel configuration, the two outside channels are used.

Adjustment and Calibration

Factory calibration is standard with the SMT-9700. Actual performance data is provided in a calibration record sheet that is included with each unit. In the event a recalibration is necessary, the unit can be returned to the factory, or user calibration can be performed. For best results, the SMT-9700 should be powered on for a minimum of 15 minutes prior to adjusting the calibration.

A typical full-scale calibration is performed as follows:

1. Install the sensor in a micrometer calibration fixture and physically adjust the sensor to its minimum distance to the target. This is its offset distance, the point at which minimum desired output is obtained.
2. Adjust the Offset Control to obtain the desired output.
3. Move the target to its maximum distance from the sensor, based on desired sensor range.
4. Adjust the Gain Control until full-scale output (FSO) is obtained (10 VDC maximum).
5. Move the target back to the minimum distance and check output. Repeat steps 2-4 as necessary until no additional adjustment is required.
6. After installation of the sensor, the Fine Offset Control can be used to adjust the offset ± 100 mV without affecting the calibration performed in steps 2-4.