KEMKRAFT ENGINEERING, INC.

INSTRUCTION MANUAL

360° RF INCLINOMETER
MODEL KEI-446

37689 SCHOOLCRAFT RD. LIVONIA MICHIGAN 48150 (313)462-6148

GENERAL DESCRIPTION

The KEMKRAFT Model KEI-446 360° RF Inclinometer is a precision test instrument which will display and record the steering wheel angle up to +/- 360 Degrees. This instrument allows you to take a snap shot of any steering wheel angle with reference to zero. This instrument also allows continuous dump of the steering wheel angle to a PC.

OPERATION

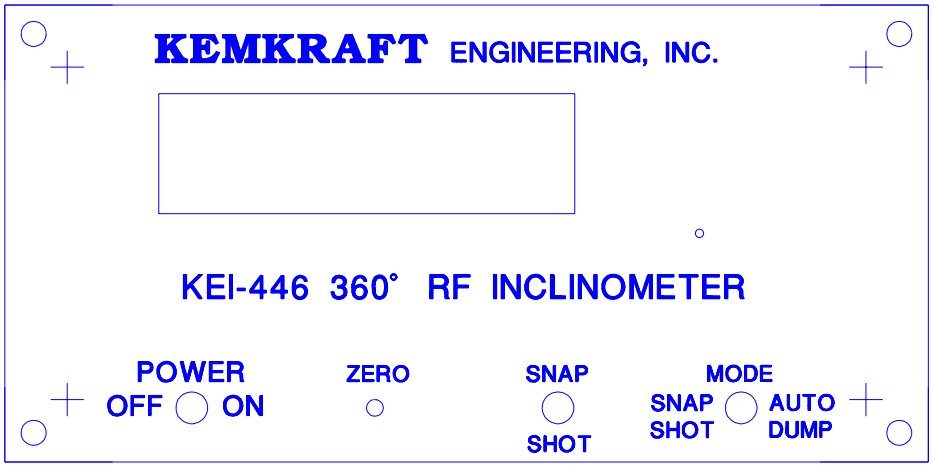
The KEI-446 360° RF Inclinometer consists of:

A.) KEI-446TX TRANSMITTER
B). KEI-446RX RECEIVER
C). KEI-446HD LED HEADS UP DISPLAY

The KEI-446TX Transmitter can be used in stand alone mode or can be used with the KEI-446RX Receiver and KEI-446HD Led Heads Up Display.

KEI-446TX TRANSMITTER

The 360° RF Inclinometer should be fully charged before use. If the unit is used extensively during the day it should be charged at night. A 12 VDC wall transformer is supplied that can be plugged into any 115VAC outlet.



Toggle the POWER switch, located on the front panel, to turn the unit on. The unit should display the following:

0.0

The KEI-446TX is always initially set to 0.0 during power up.

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Mount the mechanical fixture accurately onto the calibration stand.

Press the Zero Reference button. This button can accessed through a small hole located on the front panel. This prevents the accidental resetting of the zero reference during operation.

CONTINUOUS MODE:
Set the MODE switch located on the front panel, to AUTO DUMP. This allows continuous steering wheel angle display and also continuous RF transmitting of the steering wheel angle to the KEI-446RX receiver.

SNAP SHOT MODE:
Set the MODE switch located on the front panel, to SNAP SHOT. This allows the user to record a snap shot of the steering wheel angle. The unit should display the following:

XXsnpsht

This message shows the user how may steering wheel angle snap shots have been stored into memory. **Only during this screen can the user download and clear the memory of the saved steering wheel angles.**

Press the SNAP SHOT push-button ONCE to enter the SNAP SHOT mode. The unit will now continuously display the steering wheel angle, but will not transmit the display to the KEI-446RX receiver. The unit should display the following:

X.Xss

Press the SNAP SHOT push-button AGAIN and the unit will record the displayed steering angle. The unit should display the following:

X.XSS

The capitol SS tells you that this displayed angle has been recorded. This displayed angle will be added to the total snapshots, which are stored into memory, that can be downloaded later.

Press the SNAP SHOT push-button AGAIN and the unit will return to continuously displaying steering wheel angle.

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KEI-446RX RECEIVER:

Plug the supplied power/communication cable into the KEI-446RX and the other end in to the cigar lighter and RS-232 COM 1 port of a P.C.

Plug the KEI-446HD Led Heads Up Display into the KEI-446RX. This remote display unit allows the user to monitor the steering wheel angle from a convenient location. The KEI-446HD is optional and does not have to be plugged into the KEI-446RX receiver for the unit to operate correctly.

The KEI-446HD will display a "FAIL" if the RF signal is lost from the KEI-446TX transmitter.

Toggle the POWER switch located on the front panel, to the ON position.

Toggle the BUZZER switch located on the front panel, to the ON position. The buzzer will activate when the RF signal is lost from the KEI-446TX. This feature can be disabled by toggling the BUZZER switch to the OFF position.

DOWNLOADING DATA

The KEI-446 360° RF Inclinometer provides the user with 2 different ways to capture and download data.

Download Stored Data:

The first method is to use the KEI-446TX Transmitter in stand alone mode and record different steering wheel angles in the units memory for download to a PC.

1.) Connect the serial port, of the KEI-446TX to a PC COM 1 port using a 9 PIN serial cable. (User supplied).
2.) Run the supplied KEMKRAFT software "KEMLOAD.EXE". The software is supplied on a 3-1/2" Disk.
3.) Set the MODE switch to SNAP SHOT. The display will show how many angles have been stored in the units' memory.
4.) Press F5 (Start Receiving) on the KEMLOAD screen to begin downloading the steering wheel angles to the PC. When complete, the memory in the KEI-446TX is cleared.
5.) If the data is acceptable, it can be stored, by naming the file & storing it onto the PC hard drive.

Dump data Continuously:

The second method is to allow the KEI-446TX Transmitter to continuously dump the displayed steering wheel angle a.) out of its' own serial port or b.) out of the KEI-446RX receivers' serial port and to display it on a PC.

This method should be used when all displayed angles need to be stored for later data analysis.

1.) Set the MODE switch, on the KEI-446TX to AUTO DUMP. This will continuously dump the angle out of the KEI-446TX serial port and transmit the angle to the KEI-446RX receiver for continuos dump out of its' serial port.
2.) Connect the desired serial port the COM1 on a PC.
3.) Run the supplied KEMKRAFT software "KEMLOAD.EXE". The software is supplied on a 3-1/2" Disk.
4.) Press F5 (Start Receiving) on the KEMLOAD screen to begin downloading the steering wheel angles to the PC. The data will continue to dump until the KEI-446RX is turned off or the KEI-446TX transmitters MODE switch is toggled to SNAP SHOT mode.

CABLE CONNECTIONS ARE:

KEI-446 RS-232 (9 Pin) D-Type	COMPUTER COM1 (9 Pin) D-Type
Pin 2 (TxD)	Pin 2 (RxD)
Pin 3 (RxD)	Pin 3 (TxD)
Pin 5 (GND)	Pin 5 (GND)

WARRANTY AND SERVICE INSTRUCTIONS

KEMKRAFT Engineering, Inc. warranties this equipment against defects in workmanship and materials for a period of 90 days from the date of signature of release. We will, at our option repair or replace products which prove defective during the warranty period. No other warranty, expressed or implied , is given. KEI is not liable for consequential damages. Damages caused to the equipment as a result of improper us or abuse, or unauthorized modification of the instrument is not covered under this warranty.

For service contact:

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