

***KEMKRAFT* ENGINEERING, INC.**  
MODEL KEI-200A SPC DIGITAL INCLINOMETER

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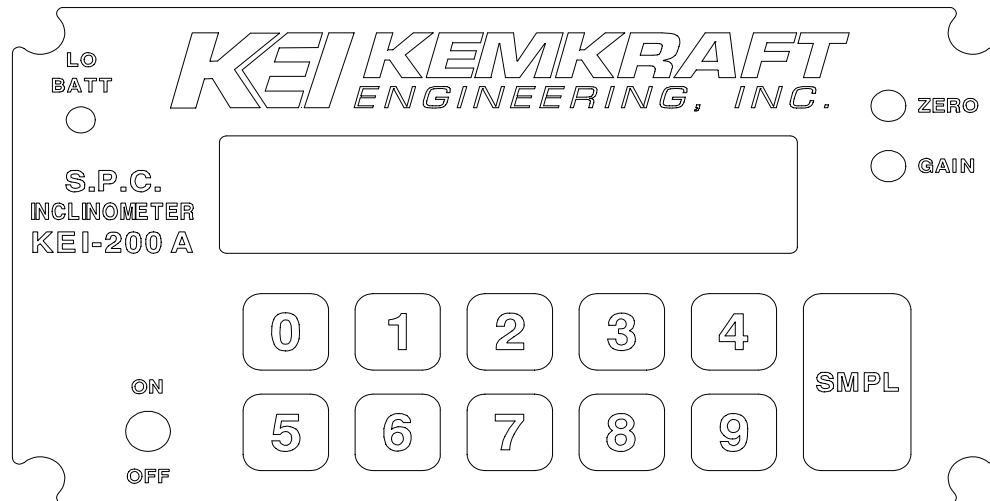
**INSTRUCTIONAL MANUAL**

**SPC DIGITAL INCLINOMETER  
MODEL KEI-200A  
W/ INTERNAL BARCODE**

**REVISION DATE:  
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# **KEMKRAFT ENGINEERING, INC.**

## **MODEL KEI-200A SPC DIGITAL INCLINOMETER**



### **OPERATION PROCEDURE:**

- This unit should be calibrated **once a week minimum**. Refer to the **Calibration Procedure** of this manual.
- The Inclinometer should be fully charged before use. If the unit is used extensively during the day it should be charged at night.
- Turn on the power switch, located on the front panel.
- The unit will first display a 2 second Intro Message of DATE/TIME & Firmware version.
- The unit should display the MAIN MENU as follows:

**0=SETUP    1=RUN  
2=DOWNLOAD**

- Setup should be performed and set to the users parameters before use:

### **KEI-200A SET UP PROCEDURE**

**Press 0** - From the Main Menu to enter Setup Mode. The unit should display as follows:

**0=CLOCK    1=CONFIG  
2=SET PASSWORD**

**Press 0** - To set the DATE and TIME (time is 24 hr mode):  
Press sample key to continue.

**Press 1** - To setup Configuration for:

- **CFG Aligmnt M. #** : The operator will be prompted for a machine number before collecting data.
- **CFG 1 / 2 Run Test**: The operator will set the test for a run 1 run test or 2 run test.

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- **CFG IR XFER MODE:** This enables the I.R. transfer mode. ( Optional I.R. Transmitter and receiver required.)
- **Veh. Tire Size:** The operator will be prompted for a tire size code before collecting data.
- **Vehicle Type:** The operator will be prompted for a vehicle type code before collecting data
- **CFG Crown Offset:** This sets whether the crown offset is + or -.
- **Crown Angle=XX.X:** This is the crown of the road in degrees.
- **Max SmpIs/Run XXX:** This sets the maximum number of samples taken during a test run. The min. is 1 and max. is 250. Default is 100 samples.
- **CFG Barcode Scan:** The operator will be prompted to scan a barcode or manually enter a VIN number before collecting data.  
**\*\*SCANNER SETUP\*\*:** Press "9" to trigger scanner for re-programming. **Scanner is setup at the factory, press sample to continue.**

**Press 2-** To Set a Password for the configuration menu. This password is required to make any changes to the configuration menu.

To turn the password protection **OFF** for the configuration menu, the user has to set the password again and when the user is prompted to enter a new password press the sample button. This will disable the password protection.

\* **Note :** Backlight will automatically turn off 1-2 min. after the last keystroke. To reactive press any numeric key.

## **KEI-200A AUDIT PROCEDURE**

**Press 1** - To enter Run mode. The unit should display as follows:

XX.Xdeg    XXXsmpI  
    avg    XXXavct

**XX.Xdeg** displays the degree angle value up to a max. of +/-17.5 deg.

**smpI:** is the sample counter and indicates the amount of samples stored into the units memory. Maximum samples: 250

**avg:** is the abbreviation for average and will display the average value of the sum of the samples taken when the SAMPLES button is depressed.

**avct:** is the abbreviation for average counter and will display the amount of averages stored into the units memory each time the AVERAGE button is depressed.  
Maximum Average count: 250

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**\*Press any key other than the sample key and the unit will return you to the Main Menu.**

Mount the mechanical fixturing accurately onto the vehicle steering wheel. Tests performed should be done on the flattest, smoothest road possible and starting and stopping points should be noted. Drive the vehicle at a slow, constant speed and at the starting point depress the SAMPLE button. The sample counter will automatically up count. **(When the sample button is pushed at the beginning of the first and second pass, a one second delay timer has been added 11-20- 93 to give the driver a second to straighten the vehicle.)** When the stopping point is reached, depress the SAMPLE button again and the sample taking will cease. Turn the vehicle around and drive at the same constant speed as was in the opposite direction. When the vehicle reaches the previous point that the SAMPLE button was pressed to stop the sampling, press the SAMPLE button again. The sample counter will automatically down count and stop when it reaches 000 SAMPLES. If the test was performed without any flaws, and the values taken you felt were accurate, you will be given the option to either save or not save the AVG value . This will display, in front of AVG, the average value of the sum of samples taken and also display in front of AVGCT the amount of averages saved for future uploading. When the tests are complete and averages have been stored into the units memory, the unit can than be turned off and taken to a computer that has a serial port.

\* **“Checksum Error”**- This message indicates that the memory checksum is invalid. The system will initialize the memory to default values after the operator has acknowledged the message.

## **RS-232-C SERIAL DOWNLOAD PROCEDURE**

**Press 2** - To enter the Download menu. The unit should display as follows:

**1 = Send 0 = Abort  
XXX AVRGS STORED**

Plug the interface cable supplied with the inclinometer into the side of the unit. Plug the 9 pin computer interface connector into the serial port of the computer. The Kemload32 Utility Program that was supplied with the inclinometer can be run by double clicking on the KEMLOAD32 Application. This will open a KEMLOAD Window on the computer. Set COMM port baud rate to 9600. Turn power on to the KEI-200A, from the main menu press 2, to put the unit in download mode. The display will now read, 1 = Send 0 = Abort, XXX AVRGS STORED. The average values are now ready for download to the computer..

**Data Xmitt'd OK ?**

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(0=No 1=Yes)

**PRESS 1.** If the data download O.K., **PRESS 0** to repeat the download procedure.

A file name should be assigned to that set of data by using the Save as... selection in the File menu.

### IR TRANSFER OPTION

The IR XFER option must be turned on in the config. menu under setup.

**Press 2** - To enter the Download menu. The unit should display as follows:

**1=SEND 0=ABORT  
XXX AVRGS STORED**

This transfer procedure requires that a KEI-200TX IR transmitter is attached to the serial port of the KEI-200A. This transfer also requires that a KEI-200RX IR Receiver is connected to a PC computer running WINKEMLOAD VER. 1.32.

Point the KEI-200A towards the KEI-200RX receiver and **PRESS 1.** After the KEI-200A has transmitted all the data the unit should display the follow menu.

**Data Xmitt'd OK ?  
(0=No 1=Yes)**

The KEI-200RX green XMIT OK LED will turn **ON** if the all the data was transmitted correct, **PRESS 1.** If the green XMIT OK LED does **NOT** light then **PRESS 0** and repeat procedure.

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### **CALIBRATION PROCEDURE:**

- Charge unit over night before calibrating.
- Install mechanical steering wheel fixture (with inclinometer permanently mounted onto it) onto a calibration stand that can be adjusted for 0 degrees and some other known value such as 5 or 10 degrees.
- Set the cal. stand to 0 degrees and adjust the ZERO control on the front panel of the inclinometer for 00.0 degrees.
- Set the cal. stand to eg. 10 degrees and adjust the GAIN control on the front panel of the inclinometer for 10.0 degrees.

Repeat the following two procedures until the values are stable.

### **WARRANTY AND SERVICE INSTRUCTIONS**

KEMKRAFT Engineering, Inc. warrants this equipment against defects in workmanship and materials for a period of 90 days from 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. Damage caused to the equipment as a result of improper use or abuse, or unauthorized modification of the instrument is not covered under this warranty.

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## **MODEL KEI-200A SPC DIGITAL INCLINOMETER**

### **Internal Barcode SCANNER**

The KEI-200AS was developed to allow the user to scan a Vehicle Identification Number (VIN) of the vehicle that is being audited. This allows the VIN to be stored along with the drive audit average for the vehicle. This information can be uploaded to a P.C. for S.P.C.

#### **OPERATION**

The KEI-200AS is designed with a barcode scanner built into the unit. Turn power on.

The unit should display the following:

**0=SETUP      1=RUN  
2=DOWNLOAD**

**Press 1** - To enter Run mode. The unit should display as follows:

**Scan the Barcode  
9=SCAN    S=ABORT**

**Press SMPL** - To enter the VIN number in manually.

Direct the scanner at the desired build sheet VIN and press "9". The scanner will emit a visible RED horizontal beam. This beam scans the bar-code. When the scanner has a good scan, the RED horizontal beam will stop and the unit will beep. The KEI-200AS should display the following:

**VIN   XXXXXXXXXX  
Save? 1=Yes 0=N0**

**Press 0:** To discard the scanned VIN number. The saved Drive Audit Data will not have a VIN number.

**Press 1:** To apply the scanned VIN number to the Drive Audit data.

The KEI-200A is now ready for a Drive Audit. (Refer to Operating Procedure.)