

# STEELMAN®

## MAGNETIC DIGITAL ANGLE METER OPERATOR'S MANUAL



**CAUTION:** To reduce the risk of injury, user must read and understand this operator's manual. Save these instructions for future reference.

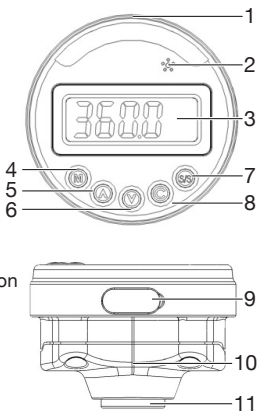
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## MAIN FEATURES

- Digital angle value readout
- +/- 2° ( rotating 90° at speed of 30°/sec)
- CW and CCW operation
- Buzzer and LED indicator for the 9 pre-set target angles
- 250 data memory for recall and angle auditing
- Auto power off after approximately 2 minutes idle
- AAA regular and rechargeable batteries are compatible

1. LED indicator
2. Buzzer
3. LCD readout
4. Pre-set target angle selection button
5. Up button
6. Down button
7. Start / Setting button
8. Power On / Reset button
9. Communication port
10. Battery Compartment
11. Magnet



# SPECIFICATIONS

ALL MODELS	
ANGLE ACCURACY *1	STYLE B
	$\pm 2^{\circ}$ FOR $90^{\circ}$ ROTATION @ $30^{\circ}/\text{SEC}$
DISPLAY RANGE	0~999.0°
RESOLUTION	0.1°
TARGET MEMORY	9 SETS
TARGET RANGE	1~360.0° (INCREMENT 1°)
DATA MEMORY SIZE	250
PC CONNECTIVITY *2	YES
BRIGHT LED	6 LED (1RED + 5 GREEN)
BUTTON	5
BATTERY *3	AAA X 2
OPERATING TEMPERATURE	-10°C ~ 60°C
STORAGE TEMPERATURE	-20°C ~ 70°C
HUMIDITY	UP TO 90% NON-CONDENSING
DROP TEST	1 M
VIBRATION TEST *4	10G
ENVIRONMENTAL TEST *5	PASS
ELECTROMAGNETIC COMPATIBILITY TEST *6	PASS

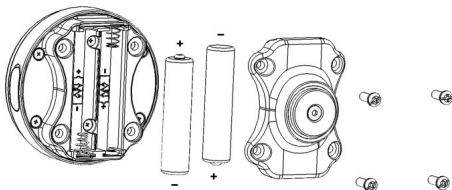
## NOTE:

1. The accuracy of the readout is guaranteed from 0.0° to 360.0° and the test speed is 30°/sec. maintaining accuracy, calibrate the meter at regular intervals (1year recommended)
2. Use a special designed cable (accessory) to upload record data to PC.
3. Two AAA batteries (Toshiba carbon-zinc R03UG battery)
4. Horizontal and vertical test
5. Environmental test:
  - Dry heat
  - Cold
  - Damp heat
  - Change of temperature
  - Impact (Shock)
  - Vibration
  - Drop
6. Electromagnetic compatibility test:
  - Electrostatic discharge immunity (ESD)
  - Radiation susceptibility (RS)
  - Radiation emission (RE)

# BEFORE USING THE METER

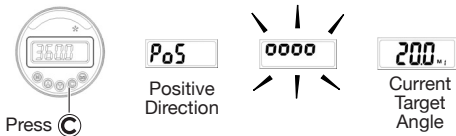
## BATTERY INSTALLATION

1. Loosen the screws of the battery cap.
2. Insert 2 AAA batteries matching the +/- polarities of the battery to the battery compartment.
3. Fasten the screws of the battery cap.



## POWER ON

Gently press **C** to power on.



## NOTE:

First the **Pos** or **nEG** will be displayed. Then the LCD shows **0000**. It indicates the meter is under resetting process. Once the resetting process is completed, the target angle will be displayed. For example **200 m** is shown.



**CAUTION:** During resetting process, never vibrate or shake the meter. Keep it still.

## AUTO POWER OFF

The meter will auto power off after 2 minutes being idle for power saving.



**CAUTION:** During communication period ( **SEnd** appears) the auto power-off function is disabled.

## ZERO RESET

1. Press **C** to zero reset the meter



Press **C**

2. Always press **C** to zero reset the digital angle meter before use.



**CAUTION:** During resetting process, never vibrate or shake the meter. Keep it still. If **Er4** is displayed, refer to “ERROR MESSAGE” section.

## HARDWARE RESET

1. To do a hardware reset, use a pin to press the reset button located in the hole on the back of the meter.
2. Removing the batteries will also reset the meter.
3. If the meter does not work properly, please do a hardware reset.

## ERROR MESSAGES

### LOW VOLTAGE INDICATOR

If the battery voltage is too low, the meter will display a battery symbol and then turn off. Replace batteries.

### ER4

If the meter does not reset successfully, **Er4** will be shown. Press **Ⓢ** to do a zero reset again. During the reset process the meter must remain still. Never vibrate or shake the meter. Keep it still.

### ER5

**Er5** Shows that the meter does not work functionally, please do a hardware reset. Refer to Shows that the meter does not work functionally, please do a hardware reset. Refer to "HARDWARE RESET (page7)".

### ER--

If the meter rotates too fast, **Er--** will be shown. Press **Ⓢ** to zero reset the meter.

## OPERATION

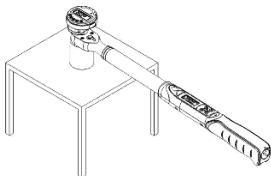
### QUICK START GUIDE

1. Press **Ⓢ** to power on.
2. Press **Ⓜ** to cycle through saved memory.
3. Press **Ⓢ** **Ⓢ** to set target angle.
4. Press **Ⓢ/S** to start the angle measurement.
5. Start rotation.



- When approaching target angle, the green LEDs will begin to light up, and the buzzer will begin beeping. As the LEDs light up the beeping will get faster up to target. Once target angle is reached, the red LED will light up and the buzzer will make a constant tone.
- Now press **(M)** to record angle or press **(C)** to clear or press **(S/S)** to count from current angle.

## STEP 1: PUT METER ON THE WRENCH



## STEP 2: POWER ON THE METER AND RESET

- Press **(C)** to power on the meter or reset it.
- The current target angle will be shown.
- Make sure the direction of rotation is desired. If a different direction is needed refer to "CHANGE ANGLE DIRECTION".



Pos

Positive  
Direction



200°

Current  
Target  
Angle

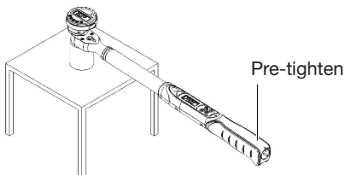
### STEP 3: SET TARGET ANGLE

1. Press **(M)** to select the pre-set target angle (**M1~M9**)
2. Or press **(▲)** or **(▼)** to modify the current target angle. Note that the target angle will be saved automatically with the current **M** number.



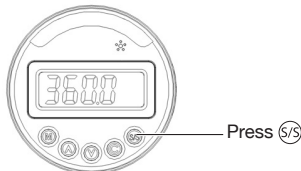
### STEP 4: PRE-TIGHTEN WRENCH

Hold the wrench to pre-tighten the screw. (Eliminate the backlash of the wrench)



### STEP 5: START TO MEASURE ANGLE

Press **(S/S)** to start the angle meter and immediately pull your wrench.



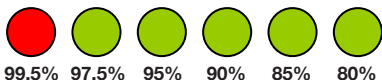
## STEP 6: STOP AND WAIT FOR LCD FLASHING

As the angle meter does not move for a few seconds, the LCD screen will be flashing and the current angle is displayed on screen. It also means the meter stops calculating the angle.





### NOTE:

1. There are 6 LEDs to indicate the current angle reaching 80%, 85%, 90%, 95%, 97.5% and 99.5% of target angle.



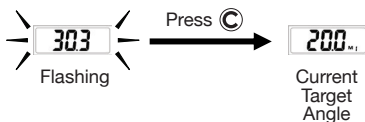
2. There is also a buzzer to indicate the reaching level of target angle. Beeping tone means the angle reached over 80% and long tone means it reached over 99.5% of target angle.

((...(((...  ...)))...)) ➡ **OVER 85%**

(((((((((...  ...))))))))) ➡ **OVER 99.5%**

## STEP 7: CLEARANCE VALUE OR CALCULATING ANGLE AGAIN OR SAVE ANGLE RECORD

1. Pressing **(C)** will clear the current angle.



2. Pressing **(S/S)** will calculate angle again from current angle.

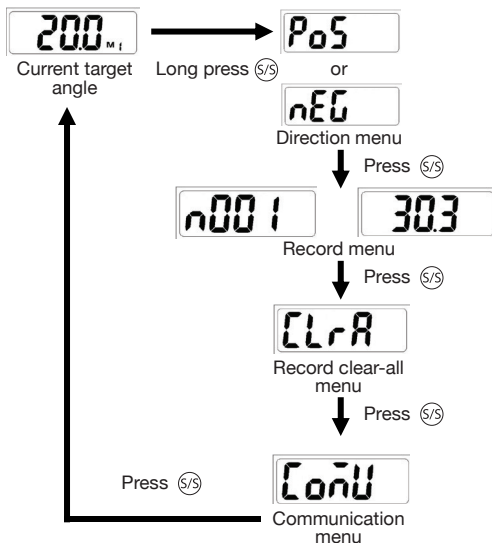


3. Pressing **(M)** will record the current value and then clear the current value.



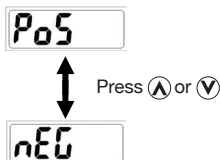
## SETUP MENU INTRODUCTION

From the current target angle screen, long press  $\text{S/S}$  to go into setup menu. Continuously press  $\text{S/S}$  to visit the direction menu, record menu, record clear-all menu, and communication menu. Finally press  $\text{S/S}$  again to skip out the setup menu and go back to the current target angle screen.



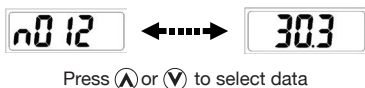
## CHANGE ANGLE DIRECTION

1. Visit the direction menu, press  $\Delta$  or  $\nabla$  to select the direction. **Pos** (Positive) means clockwise direction and **neg** (negative) is counter-clockwise direction.
2. After setting the direction, continuously press  $\text{S/S}$  to skip out on the setup menu and go back to the current target angle screen.



## VIEW ANGLE RECORD

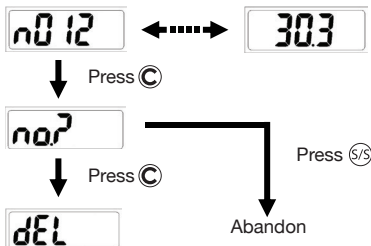
1. Visit the record menu, press  $\Delta$  or  $\nabla$  to select the data number and view it.



2. If no record exists, **nonE** will be shown.
3. Continuously pressing  $\text{S/S}$  will skip out the setup menu and go back to the current target angle screen.

## CLEAR A SINGLE RECORD

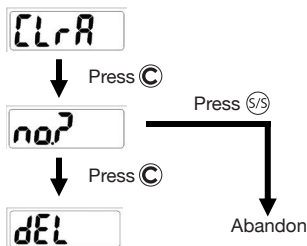
1. Visit the record menu.
2. Press  $\blacktriangle$  or  $\blacktriangledown$  to select the data number you want to delete.
3. Press  $\textcircled{C}$  twice to delete the current data.  
(  $\text{dEL}$  will be shown)



1. If press  $\textcircled{C}$  once,  $no?$  will be shown. If you want to abandon, just press  $\textcircled{S/S}$  to skip out this menu.
2. Continuously pressing  $\textcircled{S/S}$  will skip out the setup menu and go back to the current target angle screen.

## CLEAR ALL RECORDS

1. Visit the record clear-all menu.
2. Press **C** twice to delete the all record data.  
( **dEL** will be shown)



3. If press **C** once, **nor?** will be shown. If you want to abandon, just press **S/S** to skip out this menu.
4. Continuously pressing **S/S** will skip out the setup menu and go back to the current target angle screen.



# COMMUNICATION

## CONNECTING COMMUNICATION CABLE

Turn off power and then connect the accessory cable between the com port of PC and meter.



## UPLOADING RECORD DATA

1. Power on digital angle meter.
2. Visit communication menu ( **ConU** shows).  
Press **▲** or **▼** to start communication function.  
( **SEnd** Will be shown)
3. Use PC to start the up loader program.
4. In up loader program, first select the correct COM port NO.
5. Next, select the file path to select the uploaded data.
6. Finally, press “upload” button to transmit the records to PC.
7. The uploaded data is then shown on the column and saved in the \*.csv file. Use Microsoft Excel to view \*.csv file.

## MAINTENANCE AND STORAGE



**ATTENTION:** One year periodic recalibration is necessary to maintain accuracy. Please contact your local dealer for calibrations.



### **CAUTION:**

- Do not shake violently or drop meter.
- Do not leave this meter in any place exposed to excessive heat, humidity or direct sunlight.
- Do not use this meter in wet or rainy conditions.
- If this meter gets wet, wipe it with a dry towel as soon as possible.
- Do not use organic solvents, such as alcohol or paint thinner when cleaning the meter.
- Keep this meter away from magnets.
- Do not expose this meter to dust or sand as this could cause serious damage.
- Do not apply excessive force to the LCD panel.

## BATTERY MAINTENANCE

1. When the meter is not going to be used for an extended period of time remove the batteries.
2. Keep spare batteries on hand when going on a long trip or to cold areas.
3. Do not mix battery types or combine used batteries with new ones.
4. Sweat, oil and water can prevent a battery terminal from making electrical contact. To avoid this, wipe both terminals before loading a battery.

5. Dispose of batteries in a designated disposal area. Do not throw batteries into a fire.

## WARRANTY



**1 YEAR**

**LIMITED  
WARRANTY**

This STEELMAN® product is backed by a 1 Year Limited Warranty. This warranty covers manufacturer defects and workmanship. The warranty excludes misuse or abuse and normal wear and tear. Exclusion is not allowed in some states and may not apply. This warranty gives you specific legal rights, and you may have other rights, which vary from state to state.

For questions / comments, technical assistance or repair parts, please call toll free at: 1-855-706-1550  
(M-F 6am - 4:30pm PST)

Before sending a unit back for repair, an RMA (return materials authorization) number must be obtained and written on the outer shipping box. Please submit a ticket online at <http://www.steelmantools.com/contacts> to receive an RMA number. We will determine if the unit needs to come in for repairs or replacement. Warranty claims that cannot be processed through the point of purchase and any other product related questions should be addressed directly to JS Products.



# STEELMAN®

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