1. INTRODUCTION

This manual describes how the EM Series Digital Platform Scales work. Please read this manual completely before using the scale.

1.1. Precautions

CAUTION

- The scale is a precision instrument. When installing the scale, consider the following conditions to get the most out of your scale.
  - Install the scale where it is not exposed to direct sunlight, where the temperature and relative humidity is stable and where there is no dust and draft.
  - Install the scale on a solid and level surface which is free from vibration.
  - The scale is not waterproof. Do not use it where it will get wet.
  - Do not disassemble the scale. Do not open the case to repair or modify it. That may cause a fire or damage to the scale. Damage caused under such conditions will void the warranty.
  - If the scale malfunctions, stop using it immediately. Contact the local A&D dealer.

1.2. Features

- Three weight display resolutions are available, normal (1/3000), high (1/6000 or 1/7500), and higher (1/12000 or 1/15000).
- Two weighing platform sizes are available. The EM-KAM has a smaller pan and the EM-KAL has a larger pan.
- As a power source, either the AC adapter or internal rechargeable battery can be used.
- The counting function easily counts the number of objects of the same weight.
- The optional EM-03 serial interface can transmit the weight value to a personal computer or a printer.

1.3. Unpacking

When unpacking, check whether all of the following items are included:
- The EM series scale
- Screws and nut
- AC adapter
- Instruction manual

Note: Confirm the AC adapter type is correct for your local voltage and receptacle type.

2. DESCRIPTION OF EACH PART

EM series (Common for all models)

Display
Pole
Leveling foot
Weighing pan
Calibration switch
AC adapter jack

Display and symbols

- Battery indicator
- STABLE indicator
- NET indicator
- ZERO indicator
- HOLD indicator
- UNITS/MODE key
- ON/OFF key
- STABLE indicator
- NET indicator
- ZERO indicator
- HOLD indicator
- Weighting units

- kg: Basic weighing mode in kg.
- pcs: Counting mode which determines a unit weight (the weight of one piece) from the known pieces of samples and calculates how many pieces are on the weighing pan using the unit weight.

Battery indicator

Changes as the battery capacity decreases as shown to the left.

3. INSTALLATION

3.1. Setting up the Scale

Step 1: Pass the cable B through the pole.
Step 2: While taking care not to pinch the cable, secure the pole to the weighing platform, using two screws.
Step 3: Secure the bracket to the pole, using a nut and screw.
Step 4: Connect cable A to cable B.
Step 5: Bundle the excess cable and insert it into the pole.
Step 6: Attach the display to the bracket.

The following options are available for the EM series:
- EM-03 RS-232C serial interface
- EM-12 Adjustable bracket
- EM-13 Stabilizing foot (for EM-30KAM, -60KAM)

For other options, please visit the A&D website (http://www.aandd.co.jp/).

3.2. Installing the Scale

- Adjust the level of the scale, using the leveling feet. Confirm that the bubble of the spirit level is in the center of the level.
- The best installation conditions are: stable temperature (-10°C to 40°C) and relative humidity (less than 85%), solid and level surface, no drafts or vibration, no direct sunlight.
- Do not install the scale where there may be static electricity or sudden changes in temperature.

4. BASIC WEIGHING OPERATION

Step 1: Press the [ON/OFF] key to turn the power ON.
- The display shows " - - - " if there is something placed on the weighing pan or the scale is unstable.
Step 2: Press the [UNITS/MODE] key to select "kg" (kg mode).
Step 3: When the display doesn't show zero, press the [RE-ZERO] key.
Step 4: When a tare (container) is used, place the container on the weighing pan and press the [RE-ZERO] key to set the display to zero.
- Scale weighing range = weighing capacity - tare weight
Step 5: Place the object to be weighed on the weighing pan or in the container. Wait for the STABLE indicator to turn on and read the value.
Step 6: Remove the objects from the weighing pan.
Step 7: Press the [ON/OFF] key to turn the power OFF.
- When the auto power-off function is enabled, the scale turns off automatically after 5 minutes of stable condition and Error displayed.

5. COUNTING MODE

Step 1: Press the [UNITS/MODE] key to select "pcs".
Step 2: Press and hold the [UNITS/MODE] key to enter the sample unit weight storing mode.
- (The figure on the left is the number of samples.)
Step 3: To change the number of samples, press the [ON/OFF] key. It may be set to 5, 10, 20, 50 or 100.
Step 4: If necessary, place a container on the weighing pan and press the [RE-ZERO] key. Confirm that the right side of the number of samples shows zero.
Step 5: Place the correct number of samples on the weighing pan or in the container. In this example, place 20 pieces of samples.
Step 6: Confirm that the STABLE indicator is turned on. Press the [UNITS/MODE] key to calculate and store the unit weight.
- The scale is set to count object with this unit weight.
- The unit weight is stored in memory, even if the power is turned off.

Note
- The total weight of samples should be more than shown below, regardless of the number of samples.
- Weighing capacity of 50 kg: 100g, capacity of 60 kg: 200g, capacity of 150 kg: 500g
- If not, the display shows "Lo w" and returns to the display of step 5. Increase the number of samples (step 3) and try again.
6. CALIBRATION

This function adjusts the scale for accurate weighing. Calibrate the scale when it is first used, when it has been moved, when the ambient environment has changed or for regular calibration.

**Note:**
- Before calibration using a weight, set the gravity acceleration value.  

**Step 1:** Press the [ON/OFF] key to turn the power on.
**Step 2:** Press the Calibration switch to display “CAL”.  
**Step 3:** To perform a calibration using a weight, press the [RE-ZERO] key to display “CAL”. Go to step 4.
To compensate the gravity acceleration value, press the [UNITS/MODE] key to display the gravity acceleration value (example “3.885”). Go to step 7.

**Calibration using a weight (from step 3)**

**Step 4:** Confirm that nothing is placed on the weighing pan and the STABLE indicator is turned on.
Press the [RE-ZERO] key. The scale calibrates the zero point automatically. Displays “CAL” and returns to the weighing mode. Remove the weight. The display shows zero automatically.

**Gravity acceleration correction (form step 3)**

**Step 7:** Change the gravity acceleration value using the following keys.
- To shift the blinking digit: [RE-ZERO]
- To increase the value of the blinking digit by one: [-]

**Step 8:** Press and hold the [UNITS/MODE] key and press the [RE-ZERO] key. Then, release the [UNITS/MODE] key. “CAL” is displayed and the new value is stored.

For further information on calibration, contact the local A&D dealer.

7. FUNCTION SETTING

**Step 1:** Press the [ON/OFF] key to turn the power off.
**Step 2:** Press and hold the [RE-ZERO] key and press the [ON/OFF] key. The software version is displayed. “**” indicates the software version number.
**Step 3:** Press the [UNITS/MODE] key to display the first item.
**Step 4:** Change the item or parameter using the following keys. [UNITS/MODE] ⇒ To display the next item.
[RE-ZERO] ⇒ To increase the parameter value by one.
**Step 5:** When the parameter is changed, the STABLE indicator is turned off. Press the [UNITS/MODE] key to store the change. After “CAL”, the next item is displayed.

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**9. SPECIFICATIONS**

**9.1 Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>EM-30KAL</th>
<th>EM-60KAL / EM-60KAL</th>
<th>EM-150KAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighing capacity</td>
<td>30 kg</td>
<td>60 kg</td>
<td>150 kg</td>
</tr>
<tr>
<td>Minimum display</td>
<td>10 g</td>
<td>20 g</td>
<td>50 g</td>
</tr>
<tr>
<td>High resolution</td>
<td>5 g</td>
<td>10 g</td>
<td>20 g</td>
</tr>
<tr>
<td>With high resolution</td>
<td>2 g</td>
<td>5 g</td>
<td>10 g</td>
</tr>
<tr>
<td>Repeatability (Standard deviation)</td>
<td>5 g</td>
<td>10 g</td>
<td>20 g</td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.1%</td>
<td>±0.2%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Display</td>
<td>7-segment LCD with backlight, Character height of 26 mm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display update rate</td>
<td>Approximately 10 times per second (Without EM-03 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation conditions</td>
<td>-10°C to 40°C, 35%RH or less, No condensation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>AC adapter or rechargeable battery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery life</td>
<td>Approximately 200 hours at 25°C (Backlight on)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighing pan size</td>
<td>EM-KAM, 300x350mm / EM-KAL: 400x700mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>EM-KAM: 300x500x450mm / EM-KAL: 400x710x750mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass (approximately)</td>
<td>EM-KAM: 4 kg / EM-60KAL: 7 kg / EM-150KAL: 9.5 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration weight</td>
<td>30 kg</td>
<td>60 kg</td>
<td>150 kg</td>
</tr>
</tbody>
</table>

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**9.2. Serial Interface**

EM-03 Serial Interface is available for the EM series as an option.

- This interface allows the scale to be connected to a printer or a personal computer.

**Baud rate:** 2400, 4800, 9600 bps
**Start bit:** 1 bit **Stop bit:** 1 bit **Data bits:** 8 bits **Parity:** None **Terminator:** CrLr (Crc: 0HDh; Lrc: 0Ah)

**Example of output data:**
- **Weight data kg**
- **Unstable weight data kg**
- **Counting data “pcs”**
- **Out of weighing range “kg”**

**Command list**
- **“Q” command:** Command to request the current weight value.
- **“Z” command:** Same operation as the RE-ZERO switch.

**Reply to the command**
- (if the received command is not for the EM series scale).

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