# EM SERIES
# Digital Platform Scale
# A&D Company, Limited

1WMPD4002222B

## 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**

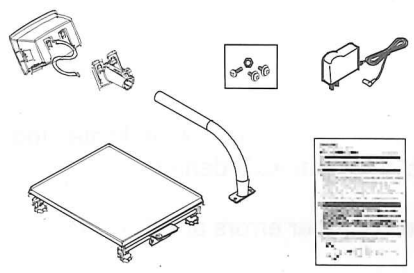
- ☐ The scale is a precision instrument. When installing the scale, consider the following conditions to get the most out of your scale.
  - Install the scale where it is not exposed to direct sunlight, where the temperature and relative humidity is stable and where there is no dust and draft.
  - Install 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

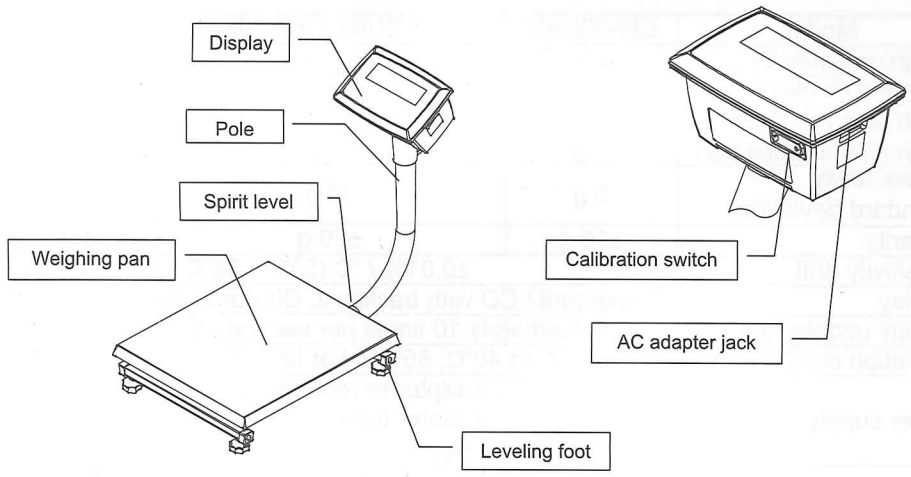
When unpacking, check whether all of the following items are included.
●The EM series scale ●screws and nut ●AC adapter ●Instruction manual



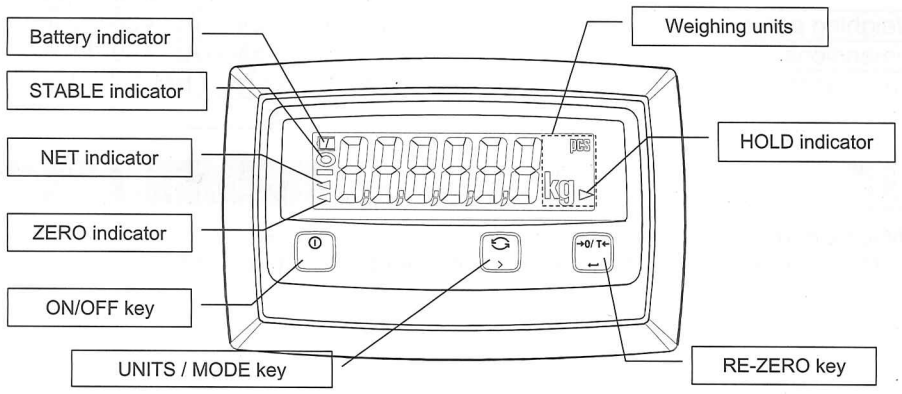
**Note:**
**Confirm the AC adapter type is correct for your local voltage and receptacle type.**

## 2. DESCRIPTION OF EACH PART

**EM series (Common for all models)**




**Display and symbols**

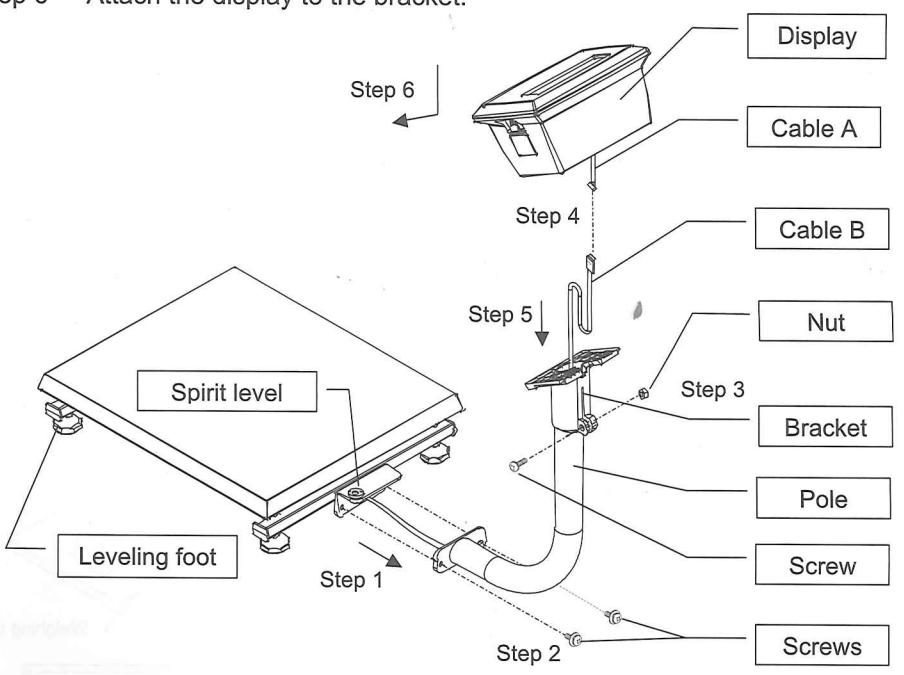



| | |
|---|---|
| STABLE ○ | Turns on when the weight value is stable. |
| NET ◀ | Turns on when the NET weight is displayed. ( The tare operation is in progress. ) |
| ZERO ◀ | Turns on when the scale shows zero. |
| HOLD ▶ | Turns on when the scale hold the weight. |
| Weighing units kg pcs | "kg": Basic weighing mode in kg. "pcs" (pieces): 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

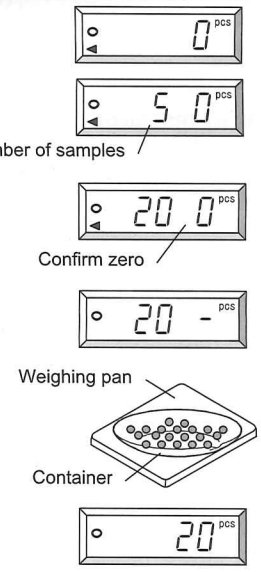
- ☐ Adjust the level of the scale, using the leveling feet. Confirm that the bubble of the spirit level is in the center of the level.
- ☐ The best installation conditions are: stable temperature (-10℃ to 40℃) and relative humidity ( less than 85% ), solid and level surface, no drafts or vibration, no 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 30 kg :100g, capacity of 60 kg :200g, capacity of 150 kg:500g
  If not, the display shows " Lo ut " and returns to the display of step 5. Increase the number of samples (step 3) and try again.

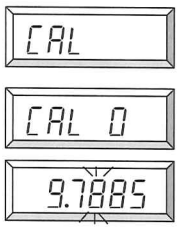
# 6. CALIBRATION

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:**

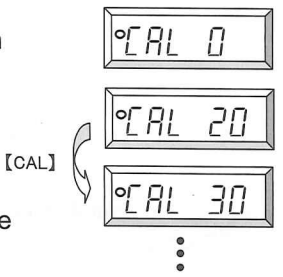
□ Before calibration using a weight, set the gravity acceleration value.

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 0". Go to step 4.
To compensate the gravity acceleration value, press the【UNITS/MODE】key to display the gravity acceleration value (example "9.7885"). Go to step 7.

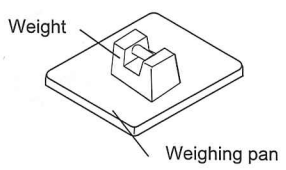



**Calibration using a weight** (from step 3)

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 and displays "CAL 20". If you do not need SPAN calibration, turn the power off.




Step 5 Place a calibration weight on the pan with the same value (kg) as displayed on the weighing pan.
【CAL】
To change the displayed value.
【UNITS/MODE】
To calibrate with the weighing capacity. ("CAL F")

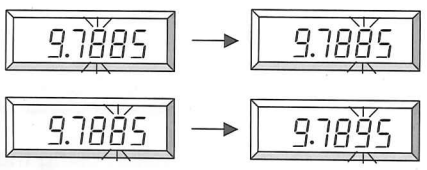



Step 6 Wait for the STABLE indicator to turn on. Press the【RE-ZERO】key. The scale calibrates SPAN, displays "End" and returns to the weighing mode. Remove the weight. The display shows zero automatically.

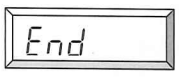

**Gravity acceleration correction** (form step 3)

Step 7 Change the gravity acceleration value using the following keys.

【UNITS/MODE】
To shift the blinking digit.
【RE-ZERO】
To increase the value of the blinking digit by one.



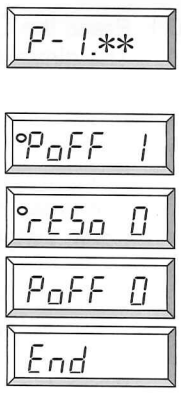

Step 8 Press and hold the【UNITS/MODE】key and press the【RE-ZERO】key. Then, release the【UNITS/MODE】key. "End" is displayed and the new value is stored.




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.
" ○ " indicates the current setting.
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 "End", the next item is displayed.

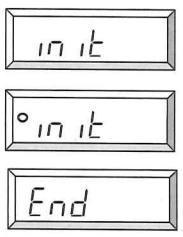



| Item | Parameter | Description | |
|---|---|---|---|
| Auto power-off function "PoFF" | 0 | Auto power-off disabled | Turns the power off automatically after 5minutes of stable condition. |
| | ■ 1 | Auto power-off enabled | |
| ※Depending on your location Selecting Units "Unit" | 【RE-ZERO】 | The STABLE indicator indicates that the unit is selected and can be used for weighing. | |
| | 【UNITS】 | Units are displayed in turn, as shown below: g → kg → lb → oz → lb oz → pcs | |
| Display resolution "rESo" | ■ 0 | Normal(1/3000) | Changes "d", minimum display |
| | 1 | High(1/6000 or 1/7500) | |
| | 2 | Higher(1/12000or1/15000) | |
| Zero tracking function "trc" | 0 | Zero tracking disabled | Tracks the zero drift |
| | ■ 1 | Zero tracking enabled | |
| Decimal point "Pnt" | ■ 0 | Dot ( . ) | Selects a decimal point type |
| | 1 | Comma ( , ) | |
| Serial interface Baud rate "bPS" | 0 | 2400 bps | When the optional EM-03 serial interface is used. |
| | 1 | 4800 bps | |
| | ■ 2 | 9600 bps | |
| Serial interface Data bits / parity "btPr" | ■ 0 | 8 bits / Non parity | |
| | 1 | 7 bits / EVEN | |
| | 2 | 7 bits / ODD | |
| Serial interface Data output mode "Prt" | 0 | Stream mode | |
| | ■ 1 | Command mode | |
| | 2 | Not used | |
| | 3 | Auto-print ± data mode | |
| | 4 | Auto-print + data mode | |
| Backlight "Lit" | ■ 0 | Auto | "Auto": The backlight turns off automatically after 3 seconds of stable condition |
| | 1 | Always on | |
| | 2 | Always off | |
| Hold function "Hold" | ■ 0 | Hold disabled | Hold the averaged weight. The display will not show Stable indicator. |
| | 1 | Hold enabled | |
| Initialization "init" | Restores the setting to the factory setting values. Read "7.1. Initialization" | | |

■ Factory setting

## 7.1. Initialization

Step 1 Follow the function setting procedure to display " init".
Step 2 Press the【RE-ZERO】key. The STABLE indicator turns on.
Step 3 Press the【UNITS/MODE】key. The scale displays "End". The function settings have restored to the factory setting values.

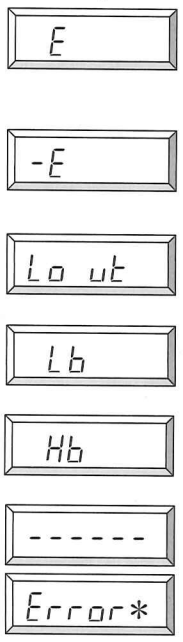



# 8. MAINTENANCE

## 8.1. Notes on Maintenance

□ Do not disassemble the scale. Contact your local A&D dealer if the scale needs service or repair.
□ Use the original packaging for transportation.
□ The scale is not waterproof. Ensure no water is allowed inside the scale.
□ Use the scale under the specified operation conditions: Temperature of -10 ℃ to 40℃, relative humidity of less than 85% without condensation.
□ The rechargeable battery naturally self-discharges without usage. Do not leave the battery for more than 30 days in storage and charge the battery periodically.

## 8.2. Error Display




Indicates that an object beyond the weighing capacity has been placed on the weighing pan.
Remove the object.

Indicates that the weight sensor received strong force upward. There is a possibility that the weight sensor or internal circuit have a failure.

Indicates that the sample weight is too light to set the unit.
Increase the number of samples.

Indicates that the battery is depleted. Charge the battery.
It takes approximately 8 hours to charge in full.

Indicates that the voltage of the AC adapter is too high.
Use the specified AC adapter.

Check the Load Cell cable connection.
( See 3.1. Setting up the Scale )
The internal circuit may have a failure. ("＊"indicates the error number.) Contact the local A&D dealer.

If the errors described above can not be released or other errors are displayed, contact the local A&D dealer.

# 9. SPECIFICATIONS

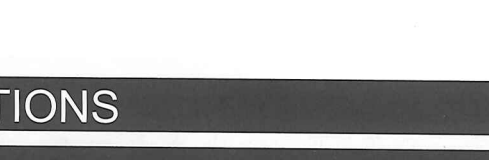
## 9.1. Specifications

| Model | EM-30KAM | EM-60KAM / EM-60KAL | EM-150KAL |
|---|---|---|---|
| Weighing capacity | 30 kg | 60 kg | 150 kg |
| Minimum display "d" | 10 g | 20 g | 50 g |
| With high resolution | 5 g | 10 g | 20 g |
| With higher resolution | 2 g | 5 g | 10 g |
| Repeatability (Standard deviation) | 5 g | 10 g | 20 g |
| Linearity | ±10 g | ±20 g | ±50 g |
| Sensitivity drift | ±0.01% / ℃ (5℃ to 35℃) | | |
| Display | 7-segment LCD with backlight, Character height of 26 mm. | | |
| Display update rate | Approximately 10 times per second ( Without EM-03 ) | | |
| Operation conditions | -10℃ to 40℃, 85%RH or less, No condensation | | |
| Power supply | AC adapter or rechargeable battery Confirm the AC adapter type is correct for your local voltage and receptacle type. | | |
| Battery life | Approximately 200 hours at 25℃ (Backlihgt off) | | |
| | Approximately 70 hours at 25℃ (Backlihgt on) | | |
| Weighing pan size | EM-KAM: 300x350mm / EM-KAL: 400x500mm | | |
| Dimensions | EM-KAM: 300x560x450mm / EM-KAL: 400x710x750mm | | |
| Mass (approximately) | EM-KAM: 4 kg / EM-60KAL: 7kg / EM-150KAL: 9.5kg | | |
| Calibration weight | 30 kg | 60 kg | 150 kg |

## 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: 1bit
Data bits: set " btPr "
Terminator: CRLF (CR: 0Dh, LF: 0Ah )




Example of output data:
□ Weight data "kg"
□ Unstable weight data "kg"
□ Counting data "pcs"
□ Out of weighing range "kg"

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | T | , | + | 0 | 0 | 1 | 2 | 3 | . | 4 | 5 | | k | g | CR | LF |
| U | S | , | + | 0 | 0 | 1 | 2 | 3 | . | 4 | 5 | | k | g | CR | LF |
| Q | T | , | + | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | P | C | CR | LF |
| O | L | , | + | 9 | 9 | 9 | 9 | 9 | . | 9 | 9 | | k | g | CR | LF |

Header | Separator | DATA | Unit | Terminator

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

| | | |
|---|---|---|
| Q | CR | LF |
| Z | CR | LF |

Reply to the command
□ If the received command is not for the EM series scale.

| | | |
|---|---|---|
| ? | CR | LF |