Totalcomp

Technical Manual

# M501/M503

## Medical scales

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# 1. PRECAUTIONS

**⚠ WARNING**

**DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.**

**⚠ CAUTION**

- **Permit only qualified persons to service the instrument**
- **Before connecting or disconnecting any components, remove the power.**
- **Failure to observe these precautions bodily harm or damage to or destruction of the equipment.**

- Follow the instructions in the instructions for use.
- Keep the operating instructions and the declaration of conformity in a safe place.
- Never leave the old man seat on the scale unsupervised.
- Ensure that the scale is standing firmly on a smooth, level surface.
- Do not drop the scale or subject it to violent shocks.
- When using the scale with a mains unit, ensure that the supply cable is routed in such a way as to exclude any type of tripping hazard.
- Use only the type of battery stated.
- Have scale serviced and re-calibrated on a regular basis.
- Have repairs carried out only by authorized persons.

# 2. INTRODUCTION

- The M501/M503 series medical scales, that amplifies signals from a load cell, converts it to digital data and displays it as a mass value.
- It is accurate, fast and versatile series of general purpose balances with % weighing functions and accumulation.
- All models with ECTAC(Class III) and conform 93/42/EC directive.
- Materials used according to REACH directive.
- Ergonomically optimized seat, comfortable, safe and reliable.
- Grasp the handrails in two ways: gross grip area, vertical grip area.
- Handrails with rubber material, comfortable and safe.
- Adjustable angle of instruments to meet the user reading.
- 4 transportation wheels with brake.
- Footrest foldable, when folded out with low distance to the floor.
- Each single armrest foldable.
- Bag for power supply fixed on the chair, when power supply not in use.
- Optional RS-232 interface, can connect computer and printer.

# 3. SPECIFICATION

## 3.1 Specifications

| **Model** | **M501/M503** |
|---|---|
| Maximum Capacity | 550lb |
| Readability | 0.1lb |
| Resolution | 1/5000 |
| Tare range | -549.9lb |
| Minimum Capacity | 2lb |
| Linearity ± | 0.02lb |

| **Common Specifications** | |
|---|---|
| Interface | RS-232 Output Optional |
| Stabilisation Time | 2 Seconds typical |
| Operating Temperature | 0°C - 40°C / 32°F - 104°F |
| Power supply (external) | 12V/500mA AC power adapter or 2000mAh Ni-MH batteries (optional, size AA) |
| Calibration | Automatic External |
| Calibration as per Directive 90/384/EEC | Class III medical approval |
| Medical product as per Directive 93/42/EEC | Class I |
| ADC | Σ-Δ |
| Display | 25 mm high 6 digits LCD with auto backlight and loading bar graph |
| Housing | Aluminium platform, ABS plastic indicator |
| Gross weight | M501:50lb/M503:110lb |

# 3.2 Load Cell Specifications

| **Model No(M501)** | **L6E3** |
|---|---|
| Rated Capacity (kg) | 50/100/150/200/250/300/500 |
| Sensitivity | 2.0±0.2 mv/v |
| Excitation Voltage | 5~12V |
| Material | Aluminum |
| Cable | 0.3~3m Φ 4mm |
| Input Resistance | 409Ω ±6 Ω |
| Out put Resistance | 350Ω ±3 Ω |
| Temperature Range | -35℃ ~ +70℃ |
| Safe overload | 150%F.S |
| Ultimate overload | 300%F.S |
| Error | ±0.0233%F.S |
| Creep (20min) | ±0.020%F.S |
| | |
| **Model No(M503)** | **H8C** |
| Rated Capacity (klb) | 1/1.5/2/2.5/3/4/5/7.5/10/20 |
| Sensitivity | 3.0±0.003(mv/v) 2.0±0.002(mv/v) |
| Excitation Voltage | 5~12V |
| Material | Alloy steel |
| Cable | 0.3~4m Φ 5mm |
| Input Resistance | 350Ω±3.5Ω |
| Output Resistance | 350Ω±3.5Ω |
| Temperature Range | -35～+70° C |
| Safe overload | 150%F.S |
| Ultimate overload | 300%F.S |
| Error | ±0.020%F.S |
| Creep (30min) | ≤±0.016%F.S |
| | |

# 4. INSTALLATION

## Unpacking

Carefully take the balance out of its package, make it sure its not damaged and all accessories are included.

- Remove the weighing scale from the carton.
- Remove the protective covering. Store the packaging and to use if you need to transport the scale later.
- Inspect the scale and terminal for damage.
- Make sure all components are included

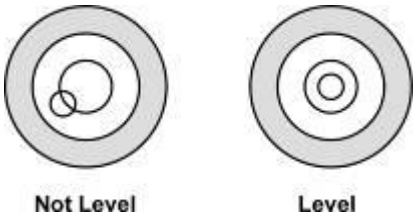
Accessories,

1. Balance
2. Adaptor
3. Product manual

## Level Adjusting

Place the scale on a table.

Check the water mark. If, bubble is not centre adjust the leveling feet until reach centre. Check the level when you change the location.

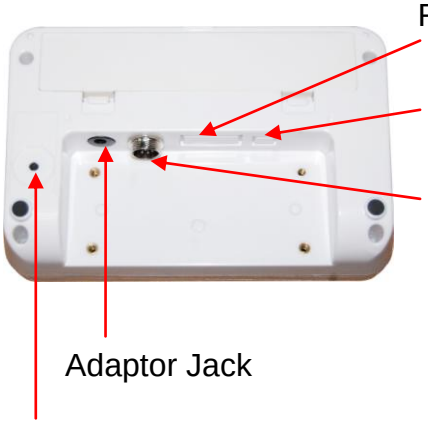



## Charging Battery

- To charge the battery insert the adaptor pin to jack, jack is locating rear side of the scale. Adaptor simply plug into the mains power. The scale no needs to be turned on.
- The battery should be charged for 12 hours for full capacity.
- In the display there is an indicator show the status of battery charging. When the scale is plugged into the mains power the internal battery will be recharged. If the indicator off, the battery has a full charge. If it is on, the battery is nearly discharged and if yellow, the battery is being charged.
- Do not use any other type of power adaptor than the one supplied with the scale.
- Verify that the AC power socket outlet is properly protected.

**Note: Please charge the battery before using the scale for the first time**

# Installation




- Place the scale on a table.
- Connect the adaptor pin in to the scale adaptor jack. Adaptor jack is locating, rear side of the scale.

- Adaptor connects into your AC power socket. Pluggable equipment must be installed near an easily accessible socket outlet with a protective ground/ earth contact.
- Turn on the On/Off key. If you want to turn off, press the key again.
- Display will be show the version number and will be starting self checking.
- After self checking, display will be come to normal weighing mode.
- **Warm-up time of 15 minutes stabilizes the measured values after switching on.**
- Calibrate with exact calibration weights, minimum 1/3 of the scale capacity want to use for calibration. For calibration see details in parameter.

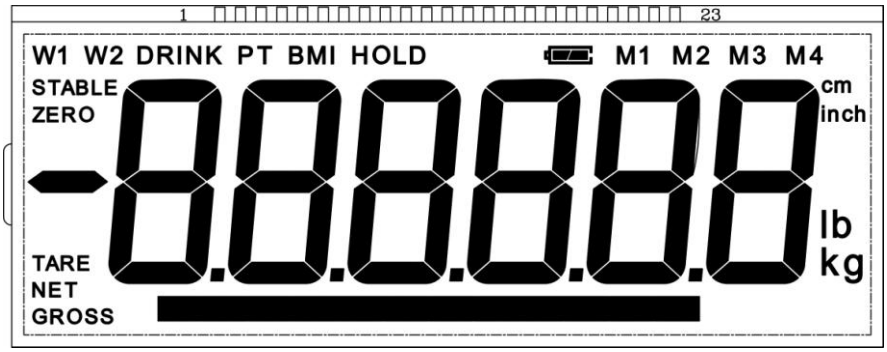
Then you can start your operation

# 5. DESCRIPTION

## Key Board


| | |
|---|---|
|  | Turns the scale power On / Off |
|  | Set to hold mode |
|  | Set to BMI mode / Enter into the menu |
|  | 1. Enter parameter settings<br>2. Choose menu block or options one by one<br>3. Increase the digital number |
|  | 1.Set the zero point for all subsequent weighing<br>2.Move digit left |
|  | 1.Tares the scale /<br>2.Escape from the menu |
|  | Change unit: kg / lb |

# Display




| DISPLAY | FUNCTION |
|---|---|
| **STABLE** | Indicator for Display stability |
| **ZERO** | Indicator for Zero display |
| **TARE** | Indicator for Tare display |
| **NET** | Indicator for Net weight |
| **GROSS** | Indicator for Gross weight |
| **Cm/inch** | Indicator for measuring units |
| **Lb/kg** | Indicator for weight units |
|  | Indicator for Charging status of battery<br>Voltage has dropped |
|  | Low Voltage |
|  | Fully Charged |

# 6. OPERATION

**Initial Start-up**

Warm-up time of 15 minutes stabilizes the measured values after switching on.

## 6.1 Power ON/OFF

Switch on the scale by pressing  . The display is switched on and the self test is started.
If you want to switch off press the key again.

## 6.2 Zero

Environmental conditions can lead to the balance exactly zero in spite of the pan not taking any strain. However, you can set the display of your balance to zero any time by pressing  key and therefore ensure that the weighing starts at zero.

## 6.3 Tare

The weight of any container can be tared by pressing  key so that with subsequent weighing the net weight of the object being weighed is always displayed.

- Load weight on the pan.
- Press  key. Zero is displayed, and tare is subtracted.
- Remove weight from the platform. Tared weight is displayed. It can set only one tare value. It can display with a minus value.
- Press  key. Zero is displayed, tare weight is cleared.

## 6.4 Hold function

Press "Hold" before load at the pan, so HOLD is active now. "Hold " and "------" appeared at the display.

After put load at the pan no indication until a stable non-zero weights is detected. During this period "----" is indicated. (no indication of unstable value).You will hear an acoustic beep, when stable weight is detected.

Indication of calculated HOLD-value with small "HOLD" in display as current version. The unit “kg” is displayed.

After unloading the pan the value is indicated for 10 Seconds. After that normal weight displaying is resumed.

Pressing “Hold”, while the HOLD-function is active, will cancel the HOLD-function.

## 6.5 BMI function

Press 

key in the weighing mode, display will show the last height “xxxxxx”, use 

key to shift the twinkling digit, and press 

key to increase the value, press 

key confirm it, display will enter into the BMI mode, “BMI” indicator will be shown, people stand on the platform, display will show the BMI value and the BMI bar graph, press 

key twice will turn back to normal weighing mode.

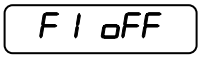
## 6.6 Precision*10

If you want to see more accurate weight value, press and hold  for 2 seconds, display will show one more decimal place, the last digit will twink for 5 seconds, then it will go back to normal weighing value automatically.

# 7. PARAMETERS

**Enter the Menu**

- Turn on the scale. Press 

key display will be shown 


**Choose the Menu**

- Press 

**,** it can choose menu block or options one by one.

**Enter the Selected Menu**

- Press 

, it can confirm which will be shown displayed.

**Enter in to TECH**

**Note: Before enter the tech menu, press calibration switch, which is locating below the scale**

- When display showed P1n, press 

and 

keys to enter the function

**Escape from the Menu**

- Press  key, it can escape from the menu to weighing mode.

# Parameter Block

| Menu | Sub Menu | Description |
|---|---|---|
| **F1 off** | **0/3/5/15/30** | Set auto off time:<br>Disable / 3 mins / 5mins / 15 mins / 30mins |
| **F2 bk** | **Bl on** | Set the backlight always on. |
| | **Bl off** | Set the backlight always off. |
| | **Bl au** | Set the backlight automaticly on. |
| **Tch** | **pin** | Enter the password |
| **P 1 spd** | Set A/D convert speed(7.5/15/30/60) | |
| **P 2 Cal** | desc | Decimal point |
| | Inc | increment |
| | cap | capacity |
| | cal | calibration |
| **P 3 pro** | **tri** | N.A |
| | **count** | To show the scale internal count |
| | **reset** | Reset the scale |
| | **setgra** | Set the gravity value |

# 8. CALIBRATION

- Turn on the scale.
- Press F key at normal weighing mode, display will show "F 1 oFF"
- Press F key until display will show "tECH"
- Press BMI key to confirm display will show "P in "
- Press →0← U and BMI keys, display will show "P 1 SPd"
- Press F key， display show "P2 CAL"
- press BMI key, Display will show "dESC", press F key several times until display show "CAL", press BMI key into calibration, display will show "UnLoAd",
- When scale get stable, Press BMI key, display will show the calibration value, you can change the value by pressing →0← and F key, then press BMI key to comfirm.
- display will show "LoAd"
- Place the calibration weight on the platform, press BMI key after stable, display will show "PASS".
- Calibration will be finished, scale will start self test.

Note: If display show any error message, repeat the calibration.

# 9. BATTERY OPERATION

The Medical Scales can be operated from the battery if desired. The battery life is approximately 22 hours (without backlight).

When the battery needs charging a symbol on the weight display will turn on. The battery should be charged when the symbol is on. The scale will still operate for about several minutes after which it will automatically switch off to protect the battery.

To charge the battery simply plug into the mains power. The scale does not need to be turned on.

The battery should be charged for 12 hours for full capacity.

Just under the quantity display is an LED to indicate the status of battery charging. When the scale is plugged into the mains power the internal battery will be charged. If the LED is green the battery has a full charge. If it is Red the battery is nearly discharged and yellow indicates the battery is being charged.

As the battery is used it may fail to hold a full charge. If the battery life becomes unacceptable then contact your distributor.

Note: useless battery should be recycled, not throw away as rubbish of daily life.

# 10. MAINTENENCE

**⚠ WARNING**

**DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.**

**⚠ CAUTION**

- **Permit only qualified persons to service the instrument**
- **Before connecting or disconnecting any components, remove the power.**
- **Failure to observe these precautions bodily harm or damage to or destruction of the equipment.**

## 10.1. General

If the scale does not operate properly, find out the problem as possible. Determine whether the problem is constant or alternate. Be aware that problems can be caused by mechanical or electrical influences.

Check the following.

- Water
- Corrosive materials
- Vibrations or temperature or wind
- Physical damage

Check the scale cables for damage, and check all connections and connecters for any loose contact or incorrect connection

**Cleaning**

- Disconnect the power before cleaning.
- Use a cloth with mild suds and light cleaning agents.
- Make sure that fluid not able to get into the device.
- Use a clean and soft cloth for rub off.

## 10.2. Error Codes

| Error Code | Description | POSSIBLE CAUSES |
|---|---|---|
| Err 4 | Zero range exceeded, due to turning on or by pressing  | • Goods on the platform<br>• Overload, when zeroing the scale.<br>• Improper calibration<br>• Load cell problem<br>• PCB problem |
| Err 6 | A/D Count out of the range | • Platform not installed<br>• Load cell problem<br>• PCB problem |

## 10.3. Determine the Problem

Determine whether the problem is in the PCB or the Load Cell

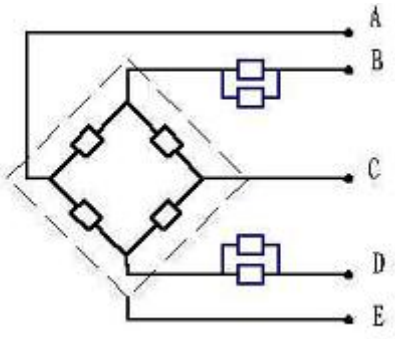
- Remove power from the system, and disconnect the load cell connection from the PCB
- Connect the PCB to a load cell simulator
- Reapply power and test the PCB
- If problem goes away, its source is probably in the Load cell. Check the wiring, connecter, load cell and mechanical components of the load cell.

If problem persists, its source is probably in the PCB. Check the PCB voltages, connecters, cables and function programs

## 10.4. Check the Load cell

- Remove power from the system, and disconnect the PCB from the Load cell
- Check the moisture, or foreign material inside.
- Make sure all leads are connected and correctly.
- Check load cell for proper input and output resistances

**Load Cell Connections**




**Signal + Green**
**Supply + Red**
**Signal - Black**
**Supply - White**
**Shield**

| Measuring Points | Resistance |
|---|---|
| Red (+ Exc) to White ( –Exc) | 420 ±20Ω |
| Green (+Sig) to Black ( –Sig) | 350Ω ±5Ω |

# 10.5. Check PCB Voltages

If the problem is in the PCB, use a multimeter to check the following voltages

### 10.5.1 AC Power

Check the AC power socket out put voltage.

- Voltage must be a -20% and +10% of the normal AC voltage.

### 10.5.2 Adaptor Voltage

Check the adaptor output cable connecter voltage

- Voltage must be minimum 9VDC and maximum 15VDC

### 10.5.3 PCB Input Voltage

Check the PCB input power connecter voltage

- Voltage must be minimum 9VDC in to the pin AD+

### 10.5.4 Check Battery Voltage and Charging Voltage

1. Check the Battery Voltage,
   - Voltage must be minimum 6VDC. If below the 6VDC connect the adaptor for charging
   - The battery voltage below the 5.5VDC, replace the battery and install new 6V/3.4Ah battery.

2. Check the Battery Charging Voltage;
   - Remove the battery connection terminals (Red and Black) from the battery.
   - Connect the power and turn on the scale
   - Voltage into the terminal minimum 6.5VDC

## 10.6 Trouble Shooting

| Problems | Possible cause | Common Solutions |
|---|---|---|
| Display is blank. No self test | Mains power is turned off. Power supply faulty or not plugged. Internal battery is not charged. On/Off switch problem | Check power is getting inside the scale and on/off switch is working. Verify the voltages, which is on the power labels. |
| Blank display after self test | Pan not installed. Unstable weight, load cell damaged | Check the pans are installed correctly. Try to turning on again. |
| OL or ------- | Maximum capacity exceeded. Load cell or mechanics damaged. Power supply faulty | Check the platform is installed correctly. Try to turn on the scale again. Do the calibration again |
| ------- or NULL displayed | Weight is on the platform is below permissible limit. Pan not installed correctly. Power supply faulty. Load cell or mechanism faulty | Check the platform is installed correctly. Try to turn on the scale again.<br>Do the calibration again |
| Display is unstable | Goods touching somewhere. Air variation or any vibrations. Temperature changed . Load cell or connections faulty. Power supply faulty | Check the scale is in acceptable location.<br>Check the connecters and load cell.<br>Check the power supply and battery |
| Weight value incorrect | Calibration error. Platform of load cell touching somewhere. Wrong weighing unit | Use accurate weight for to do the calibration<br>Check the pan and load cell is installed proper and touching.<br>Check the parameter settings.<br>Check the load cell and connecters |
| Can not use full capacity | Over load protection stoppers or transport locks are not removed. | Check the stoppers and locks under the platform.<br>Check the weighing unit and |

| | | |
|---|---|---|
| | Parameters are set incorrectly.<br>AD problem.<br>Load cell or mechanism damaged | parameter settings.<br>Check the load cell. |
| Platform Corner Weight different | Over load protection stoppers or transport locks are not removed.<br>Load cell or mechanism damaged | Check the stoppers and locks under the platform.<br>Use accurate weight for to do the calibration<br>Check the load cell. |
| Battery not charging | Mains voltage problem<br>Charging circuit problem<br>Battery Problem | Check the mains and adaptor.<br>Check the battery.<br>Check the charging circuit |

# 11. DISPOSAL

## Disposing of the device

Do not dispose of the device in domestic waste. The device must be disposed of properly as electronic waste. Follow the national regulations which apply in your case. For further information, contact our service department at: service@taiwanscale.com

## Batteries

Do not throw used batteries away in domestic waste. Dispose of batteries at collection points in the vicinity. When buying new batteries, select those low in harmful substances and containing no mercury (Hg), cadmium (Cd) or lead (Pb).