

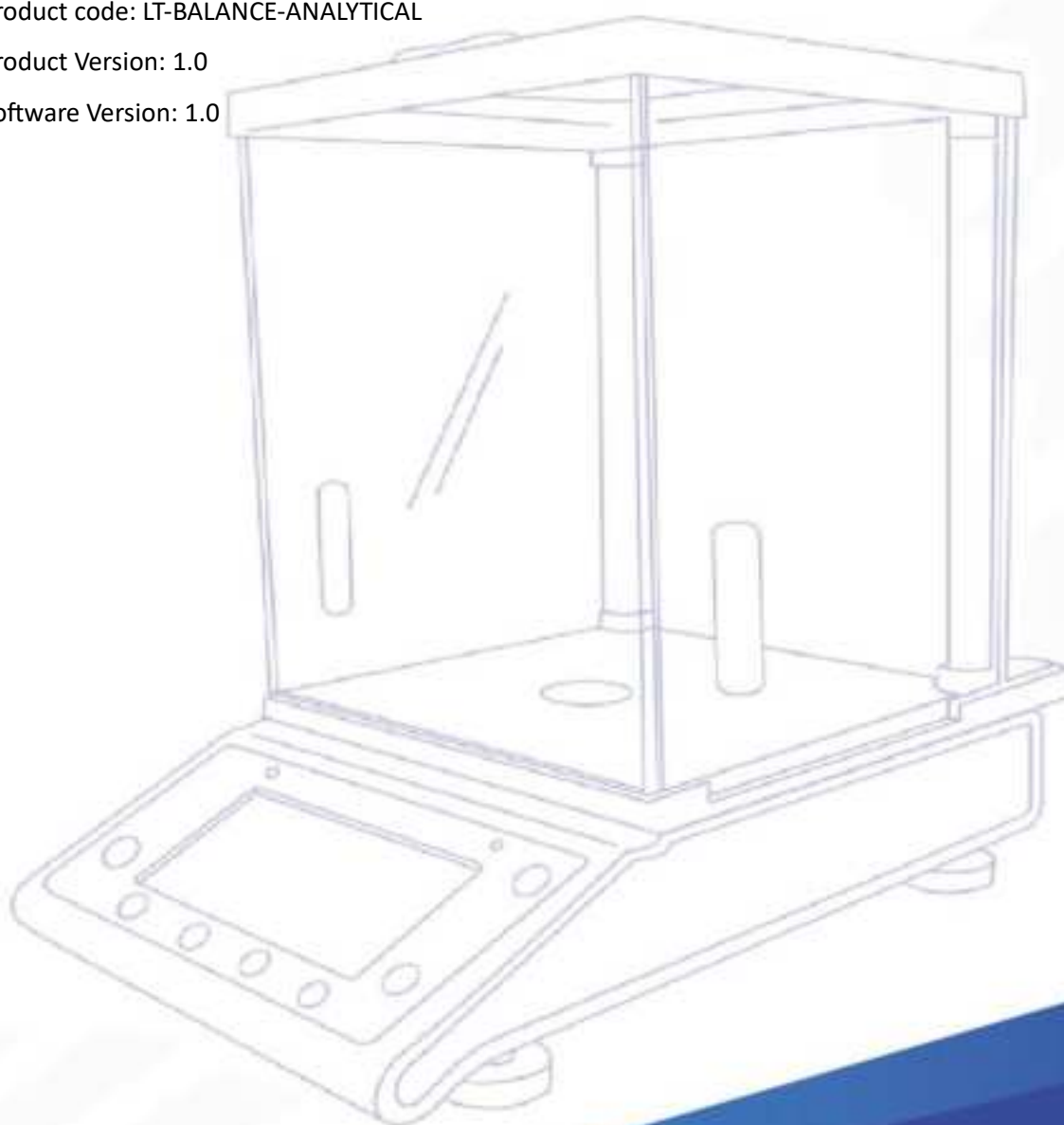
ANALYTICAL BALANCE USER MANUAL

Manual Version: 1.0.A

Product code: LT-BALANCE-ANALYTICAL

Product Version: 1.0

Software Version: 1.0



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1. Overview

The Ossila analytical balance allows users to measure out small masses accurately and repeatedly. With our analytical balances being able to measure down to as low as 10 mg the weighing out of the smallest quantities of materials and the counting of small components is possible with this system.

The analytical balance consists of a high precision sensing element with a weighing pan available for placing samples on to. The pan is housed within a shielded draft guarded glass chamber which can be accessed from the top of sides by the user. In addition, the sensitive sensing elements are protected by a draft shield around the pan. Allowing for measurements to be protected from disturbances cause by the external environment.

Our analytical balance come in a range of maximum capacities and have the option for either external calibration or internal calibration depending upon the users needs. The system can also be operated in several measurement modes, including, weighing, density determination, and parts counting. In addition, the analytical balance has an RS232 connector at the back for external communication allowing measurements to be logged on an external computer or printed out.

Users can undertake a measurement by simply zeroing the system via the tare button, samples are then placed onto the pan, the draft shield doors are closed, and the measurement is allowed to stabilise. Users can then adjust the amount of parts or materials they have on the pan until it reaches the desired amount.



2. EU Declaration of Conformity (DoC)

We

Company Name: Ossila BV

Postal Address: Biopartner 3 building, Galileiweg 8

Postcode: 2333 BD Leiden

Country: The Netherlands

Telephone number: +31 (0)71 3322992

Email Address: info@ossila.com

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product: Analytical Balance (LT-BALANCE-ANALYTICAL-100/120/200/220-I/E)

Serial number: LT-BALANCE-ANALYTICAL-120-E-XXXX

Objects of declaration:

Analytical Balance 120g Capacity Internal Calibration (LT-BALANCE-ANALYTICAL-120-I)

Analytical Balance 100g Capacity External Calibration (LT-BALANCE-ANALYTICAL-100-E)

Analytical Balance 220g Capacity Internal Calibration (LT-BALANCE-ANALYTICAL-220-I)

Analytical Balance 200g Capacity External Calibration (LT-BALANCE-ANALYTICAL-200-E)

The object of declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

Signed:



Name: Dr James Kingsley

Place: Leiden

Date: 01/07/2024

Производител: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.
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3. Safety

3.1 Warning

- **Devices with applied bias or current should NOT be left unattended, as a power failure may result in board damage or device damage (and potentially hazardous situations).**
- **Only use the unit with the supplied 12 VDC power adapter.**
- **Ensure the balance is placed on a flat level surface free from vibration.**
- **The unit should be operated in a suitable environment free of vibration, air flow, and temperature fluctuations.**

3.2 Use of Equipment

This Analytical Balance is designed to be used as instructed, and in the following environmental conditions:

- Indoors in a laboratory environment (pollution degree 2)
- Altitudes up to 2000 m
- Temperatures of 10°C to 30°C; relative humidity of 20% - 80% (non-condensing).

The analytical balance is supplied with a power adapter and a power cord for the country of purchase (in accordance with European Commission regulations and British Standards). Use of any other electrical power cables or adaptors is not recommended.

3.3 Hazard Icons

The following symbols can be found at various points throughout this manual. Note and read each warning before attempting any associated operations associated with it:

Table 3.1 Hazard warning labels used in this manual.

Symbol	Associated Hazard
	General warning or caution, which accompanying text will explain
	Electrical shock
	Inhalation

3.4 General Hazards

Before installing or operating the Analytical balance, there are several health and safety precautions which must be followed and executed to ensure safe installation and operation.

WARNING: Improper handling when operating or servicing this equipment can result in serious injury or death. Read this manual before operating or servicing this equipment.



- i. **DANGER:** DO NOT use the Analytical balance in the presence of an explosive atmosphere.



- ii. **WARNING:** Emergency Power Disconnect options: Use the power cord as a disconnect method. Ensure that the power outlet for this cord is easily accessible by the user.



- iii. **CAUTION:** Ensure power supply used with the system adheres to local mains voltage before connecting the system.



- iv. **CAUTION:** Make sure the mains cable is free from damage before use of the system.

3.5 Servicing

If servicing is required, please return the unit to Ossila Ltd. The warranty will be invalidated if:

- Modification or service has taken place by anyone other than an Ossila engineer.
- The unit has been subjected to chemical damage through improper use.
- The unit has been operated outside the usage parameters stated in the user documentation associated with the unit.
- The unit has been rendered inoperable through accident, misuse, contamination, improper maintenance, modification, or other external causes.

3.6 Health and Safety – Installation



- i. Place the machine on a solid, level surface, free from vibration and temperature extremes.
- ii. Refer to the specifications section or to the label on the power adapter for electrical requirements.
- iii. The machine is not to be used in a hazardous atmosphere.

3.7 Health and Safety – Operation



- i. **CAUTION:** If weighing hazardous materials the unit should be operated within a suitable containment environment to ensure protection of the user.

3.8 Health and Safety – Servicing



Servicing should only be performed by an Ossila engineer. Any modification or alteration may damage the equipment, cause injury, or death. It will also void your equipment's warranty.

4. Unpacking

4.1 Packing List

The items included with the Analytical Balance are:

- The Analytical Balance unit
- Detachable display
- Power adapter with a power cord (specific for country of operating).
- Weighing pan and draft shield
- Lint free glove
- User manual

4.2 Damage Inspection

Examine the components for any evidence of shipping damage. If damage has occurred, please contact Ossila directly for further action.

5. Specifications

The Analytical Balance specifications are shown in **Table 5.1**.

Table 5.1. Analytical Balance specifications

	Model Number			
	ANALYTICAL- 120-I	ANALYTICAL- 100-E	ANALYTICAL- 220-I	ANALYTICAL- 200-E
Capacity	120g	100g	220g	200g
Calibration Method	Internal	External	Internal	External
Readability	0.1 mg			
Repeatability	±0.2 mg			
Linearity	±0.2 mg			
Stabilization Time	8s			
Warmup Time	30-60 minutes			
Weighing Units	g, mg, oz, ct			
Piece Counting Reference Quantities	5, 10, 20, 50, 100			
Piece Counting Minimum Weight	10 mg			
Weighing Pan Size	ø 80 mm			
Net Weight	5 kg			
Ambient Conditions	+10°C to +30°C 20 to 85% Relative Humidity (non-condensing)			
Power Supply	DC9V 2.2A/ AC 110-220V 50Hz			
Communication Interface	RS232C (DB9 pin Terminal) Pin 2 – Receive Data Pin 3 – Transmit Data Pin 5 – Signal Ground			
Baud Rate	1200 / 2400 / 4800 / 9600			
Parity	8 bits, no parity / 1 stop bit / 1 start bit			

6. Installation

6.1 Finding an Installation Location

Before unpacking the instrument, you should identify a suitable location to install the unit. You should look out for the following when finding a suitable location for the analytical balance:

1. A firm and level surface should be used for placing the balance onto
2. Avoid places where there may be extremes of heat or large variations in temperature over time. Locating it away from radiators, AC units, or windows is ideal
3. Avoid locations where large drafts are present, keeping the unit away from doors, windows, fans, or extraction units.
4. Avoid locations where there may be excessive vibrations, locate the table away from regions where people are walking or from equipment that can produce loud noise and/or vibrations.
5. Avoid build up of static discharge on or around the equipment as this could potentially damage the sensing element.
6. Ensure the environment it is placed within is not damp, does not have high humidity, and has few sources of vapours and dust.

6.2 Checking Parts for Damage

Once a suitable location is identified you should open the packaging that the unit comes in and carefully remove each part. You should verify that each part is free of damage and that all items are present. The following items should come with the analytical balance:

1. Balance
2. Display Unit
3. Weighing Pan
4. Weighing Pan Support
5. Draft Ring
6. Bottom Sheet
7. Power Plug
8. User Manual

6.3 Removing Transport Screw

Before assembling the unit you should remove the transport securing screw, this is located on the underside of the balance (see **Figure 6.1**).



Figure 6.1 The transportation screw can be found on the bottom of the unit and should be removed before setting up the system.

6.4 Installing Parts

After removing the transportation screw, place the unit in the desired location and install the following components:

1. Install the bottom sheet on the unit.



2. Place the weighing pan support into the central hole.



3. Place the weighing pan onto the support.



4. Install the draft shield around the pan.



5. Connect the display unit to the main body.



6.5 Levelling the Balance

Once the balance has had all components installed you should then place it in the position you will be using it and then level it. Using the target spirit level at the rear right of the unit and the two adjustable feet at the rear level the system so that the bubble in the level is centred. This should be checked regularly in case the system has been moved.

6.6 Connecting the Power Supply

Before plugging in the power supply check that the plug is suitable for the mains voltage for the country of use and that the plugs output matches the voltage and current requirements for the system. Once checked plug the system in and turn on the power to the system. Press the ON button. The system should be left for one hour before being used to allow components to reach a steady state temperature. The balance will have a countdown timer start as soon as it is turned on indicating when it is ready to use.

Once ready, the user should undertake a system calibration.

7. Operation

7.1 User Interface

Figure 7.2 shows the front panel of the spin coater, with a description of the functionality of each button.

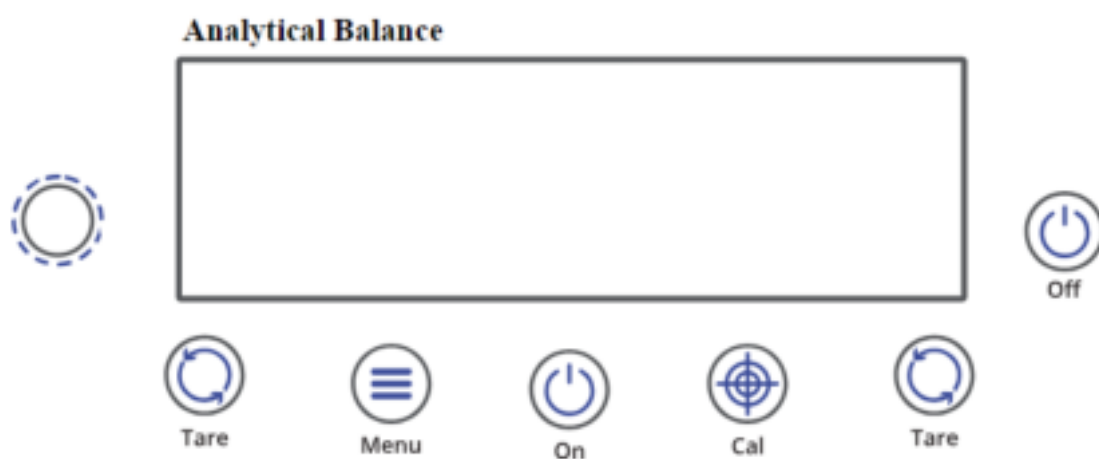


Figure 7.1. Analytical Balance screen and keypad.



The 'On' button is used to power on and off the system



The 'Tare' button is used to zero the scales before measuring



The 'Cal' button is used to perform a calibration of the balance



The 'Menu' button is used to switch between weighing modes



The 'Set' button (available on certain models) is used to confirm selections within the weighing modes menu



The 'Print' button (available on certain models) is used to send data through the RS232C connection to a connected peripheral.

7.2 Settings

Table 7. 1 shows all the available settings options for the analytical balance. To enter the settings menu to update any of the values you must first turn the unit on and allow the unit to finish the warm-up countdown. When the unit display the initial zero reading you should then press 'Set' and then 'Print' the display will then show the first menu item C1.

When in this menu you can navigate between the different options by pressing the 'Tare' key. This will go from C1 to C8 and cycle back to C1 again.

When you have reached the desired settings option, you can change the value by pressing the 'Print' button. This will cycle through the settings values.

To confirm the new settings value press 'Tare' this will navigate to the next settings option.

To save the updated values press the 'On' button, the display will show the word 'SAVE' to confirm the saved changes press the 'Tare' button. The unit will return to weighing mode and display the current weight value.

Table 7.1 Settings options and corresponding settings values for the analytical balance

Settings Option	Setting Value	Description
C1: Calibration Mode	C1 – 0*	Internal weights calibration
	C1 – 1	External weights calibration
C2: Reference Quantity	C2 – 0	10
	C2 – 1	20
	C2 – 2	50
	C2 – 3	100
	C2 – 4	1000
C3: Zero Point Correction	C3 – 0	No zero-point tracking
	C3 – 1	0.1 mg (0.01 mg) tracking
	C3 – 2	0.2 mg (0.02 mg) tracking
	C3 – 3	0.3 mg (0.03 mg) tracking
	C3 – 4	0.4 mg (0.04 mg) tracking
	C3 – 5	0.5 mg (0.05 mg) tracking
	C3 – 6	Factory settings mode
C4: Baud Rate	C4 – 0	1200
	C4 – 1	2400
	C4 – 2	4800
	C4 – 3	9600
C5: Data Output	C5 – 0	Output on stable measurement
	C5 – 1	Via remote command
	C5 – 2	Continuous data output
	C5 – 3	Output on pressing 'Print'
C6: Button Sound	C6 – 0	On
	C6 – 1	Off
C7: Motor Rotation*	C7 – 0	Rotate motor for internal weights
	C7 – 1	Do not rotate motor for internal weights
C8: Anti-Interference	C8 – 0	Low anti-interference
	C8 – 1	Medium anti-interference
	C8 – 2	High anti-interference
	C8 – 3	No anti-interference

* Only available for units with internal calibration

7.3 Calibration

Calibration should be carried out in the following situations:

- When first commissioning the system
- When the system is moved to a different location
- If there is a change in room temperature of more than 1.5°C since the last calibration

Users should also consider periodically recalibrating at least once a week to ensure the system remains as accurate as possible.

7.3.1 Internal Calibration

Models with internal calibration have a set of weights within the system which can be measured via an automated process. Here reference weights are lowered onto the weighing pan internally via a motor. The system then performs the necessary calibration process and then the motor lifts the reference weights off the weighing pan. The balance automatically performs the calibration process under the following conditions:

- When the system is first powered on
- If there is a temperature change of more than 1.5°C since the previous calibration
- If the time since the previous calibration is more than 2 hours

During the automated calibration process the unit should not be moved and the draught shield should remain closed.

In addition to the automated process there is the option to undertake a one-button calibration with internally calibrated scales. To do this ensure that the calibration mode settings value is set to C1 – 0. The user should then press 'Cal' and the display will show the calibration target weight which should be 100 g. Press 'Cal' again and the system will undergo the calibration process. This will involve the following:

- The word 'CAL . . .' will be displayed on the unit
- The internal motor will turn slowly lowering the test weight
- The word 'CAL . . dn' will be displayed to indicate the test weight is being lowered
- The system will wait until a stable weight is reached
- The word 'CAL . . up' will be displayed indicating the test weight is being raised
- The word 'CAL .End' will show to indicate the calibration process is finished
- The internal motor will turn off and the system will return back to weighing mode

7.3.2 External Calibration

For systems without internal calibration weights or for users of internal calibration systems who have the calibration mode setting set to C1 – 1 the calibration process requires the use of an external weight. Users should have a certified weight as close to the maximum capacity of the system.

To undertake an external calibration the users should press the 'Cal' button, the display will then show the word 'CAL 100' users can press the 'Tare' button to switch to the 200g calibration process if they wish to calibrate using this weight. Once the desired calibration weight is selected users should then press the 'Cal' button again.

7.4 Basic Operation

7.4.1 Turning On

After plugging the system in the 'On' button icon should appear in the top left corner of the display. To turn the system on press the 'On' button, the balance will start up and will enter a warmup mode with a countdown until the system is ready to use.

When the system begins to display the weight, it is ready to use.

7.4.2 Standby Mode

To enter standby mode, press the 'On' button. The display will clear and the 'On' button icon will remain in the top left corner. When starting up from standby mode the system will not undergo a warmup cycle.

7.4.3 Zeroing the Scale

Before weighing a sample the scales should be zeroed in order to obtain the most accurate weight value to do this ensure that the draft shield is closed and the weight is stable. When the weight readout is constant press the 'Tare' button. The taring process will take a few seconds and once done the display will read 0.0000g.

7.4.4 Sample Weighing

To weigh a sample the scales must first be zeroed using the tare function. When the scales read zero place the sample of the pan and close the draft shield. You should then wait for the weight readout to be stable, when this occurs a circle icon should appear to the left of the weight readout.

Exceeding the total maximum stated load of the scales should be avoided. If the total weight of the samples exceeds the maximum load the scales will display an 'E'. If this occurs immediately remove the items from the balance.

7.4.5 Selecting Units

To cycle through available units, press the 'Mode' button. The order of units is as follows.

- Grams (g)
- Ounce (oz)
- Carat (ct)
- Milligrams (mg)

7.5 Advanced Weighing Features

7.5.1 Parts Counting

Before performing a parts count an average weight must be determined. Before weighing you should check and set the reference parts value, this can be done via the settings menu and updating the menu item C2 Reference Quantity value (see Section 7.2 Settings for more information).

Once the reference value is selected you will need to set the weighing mode to pieces, this can be done by pressing the 'Mode' button until the word 'Pcs' is shown at the top of the display. Tare the scale and then place the reference quantity of parts you wish to count on the scales. Once the measured value is stable press the 'Set' button to save the reference weight.

Items can now be placed upon the scale and the system will automatically display the number of parts based upon the measured weight and the average weight of the reference parts. You can toggle between displaying the number of parts and the total weight by pressing the 'Mode' button.

7.5.2 Percentage Determination

To enable percentage determination, press the 'Mode' button until the percentage symbol is shown at the top of the display. Tare the scales and then place the weight which you wish to correspond to 100% of the weight onto the scales. Once the value is stabilised press the 'Set' button and the display should now show 100%.

Remove the reference weight and place the items you wish to determine the weight percentage of. You can toggle between the displayed percentage and the weight of the sample by pressing the 'Mode' button.

8. Maintenance

8.1 Cleaning

- Brush or vacuum away and loose samples or powders from the weighing chamber.
- Any spilled goods should be cleaned up immediately.
- Do not use aggressive cleaning products. Use a cloth dampened with a mild soap or detergent, ensuring no liquids enter the unit. Polish any residue with a dry soft cloth.

8.2 Repair and Service

Servicing and repairs should be carried out by Ossila. If the unit is faulty, please return it to Ossila. We will promptly quote to repair any faults that occur outside the 2-year warranty period. Parts subject to normal wear and tear.

8.3 Storage Conditions

The Analytical Balance should be kept in dry conditions; away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the instrument.

9. Troubleshooting

Table 9.1. Troubleshooting guidelines for the Analytical Balance

Problem	Possible cause
Display screen is not bright	• The balance is not switched on • The main power cable is not plugged in or faulty. • The power supply has been interrupted
The weight value is not stable	• Draught or air movement • Table or floor vibrations • Weighing pan in contact with another object • Electromagnetic and/or static interference
The weight value is inaccurate	• Unit has not been correctly zeroed • The calibration is no longer valid • The balance is no longer level • Large temperature variance • Insufficient warm up time given • Electromagnetic and/or static interference