RSC-2SE

User and Installation Manual

RSC-2SE Ver 6.0

Scale Controller

Ag/MIS/UmGb-2625-07/18 Rev 1.2

116807

Munters

RSC-2SE Ver 6.0

User and Installation Manual

Rev 1.2, 03/2023

Software Version: N/A

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation.

Munters reserves the right to effect modifications to the apparatus in accordance with technical and legal developments.

Index

Chapter *page*

1 Introduction

1.1 Disclaimer

Munters reserves the right to make alterations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing an RSC-2SE!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the device, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters equipment.

1.3 Notes

Date of release: May 2021

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

2 RSC-2SE

Munters' RSC-2SE weighs chickens and turkeys on one or two platforms. The RSC-2SE weighs the birds automatically as they mount the platform within their living area.

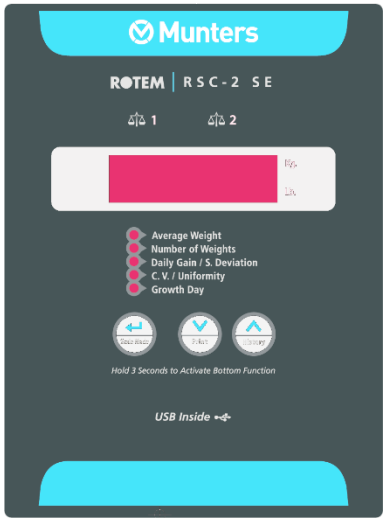
2.1 Key Features

- Weighing range according to the installed platform
- Precision per weighing: ± 0.2%
- Up to two platforms
- Up to one year data collection
- Up to 100 meter (300 feet) cable
- Minimum Weighing Time: 2 to 3 seconds
- Battery backup
- Automatic update of average
- Standard deviation, daily gain, CV, uniformity
- Standard remote communications
- Weight histograms are available with communications
- Direct printout to a serial printer

2.2 Operating Principles

- A simple menu and three user-friendly keys provide user access.
- Two indicator lights to identify the active platform.
- The RSC-2SE senses the change in weight when birds mount and dismount the platform. Changes within the acceptable range register as valid bird weights.
- Accumulations of debris taken out automatically.
- Multiple birds automatically register correctly as long as there is a small interval between them as they mount.
- The RSC-2SE automatically follows the birds as they grow, and updates its reference data regularly.

2.3 Control Panel



- **Scale Indicator Lights**: Identify the current platform. Values in the display pertaining to this platform.
- **Display**: Shows the current value. In some cases it shows an abbreviation describing the current value alternately with the value. To the right of the display are Lb (pound) and Kg (kilogram) indicators.
- **Menu**: The first menu item is Average Weight. When the indicator by this item is lit, the display shows the average weight for the indicated scale platform.
- **Keypads**: The 'Select' key navigates from item to item in the Menu. After you reach Growth Day it cycles back to Average Weight.

*NOTE You can edit the **Growth Day** with the Arrow keys. If you set the growth day to zero, the display flashes **CLEAR**; if you press the **Select** key at this point, the RSC-2SE resets to growth day 1 and erases data it has collected. If you change growth days, new data mixes with previously saved data.*

- **Advanced Functions**: Refer to Functions for additional features.

3Installation

The following sections describe how to install the RSC-2SE hardware and software.

- Installing the Unit
- Installing the USB Driver
- Installing ScaleNet
- Changing the Fuse
- Environmental Protection

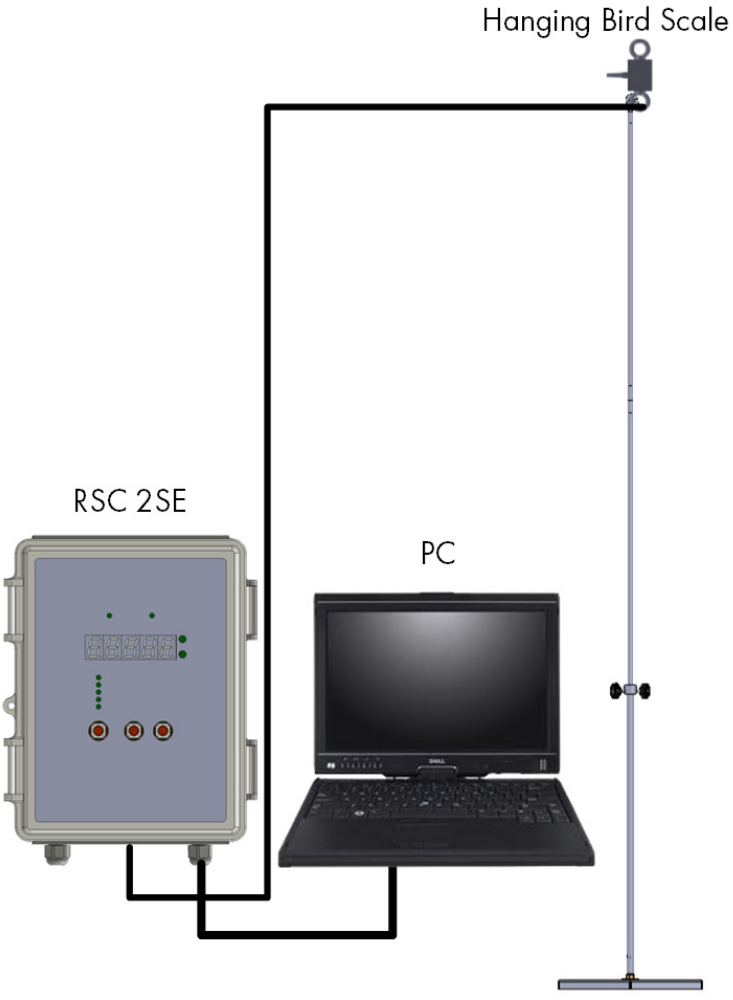


Figure 1: RSC-2SE Block Diagram

3.1 Installing the Unit

1. Mount the unit.
2. Wire the RSC-2SE to:

- Power Supply
- Computer (DB-9 connector)
- Bird Scales (Figure 2)

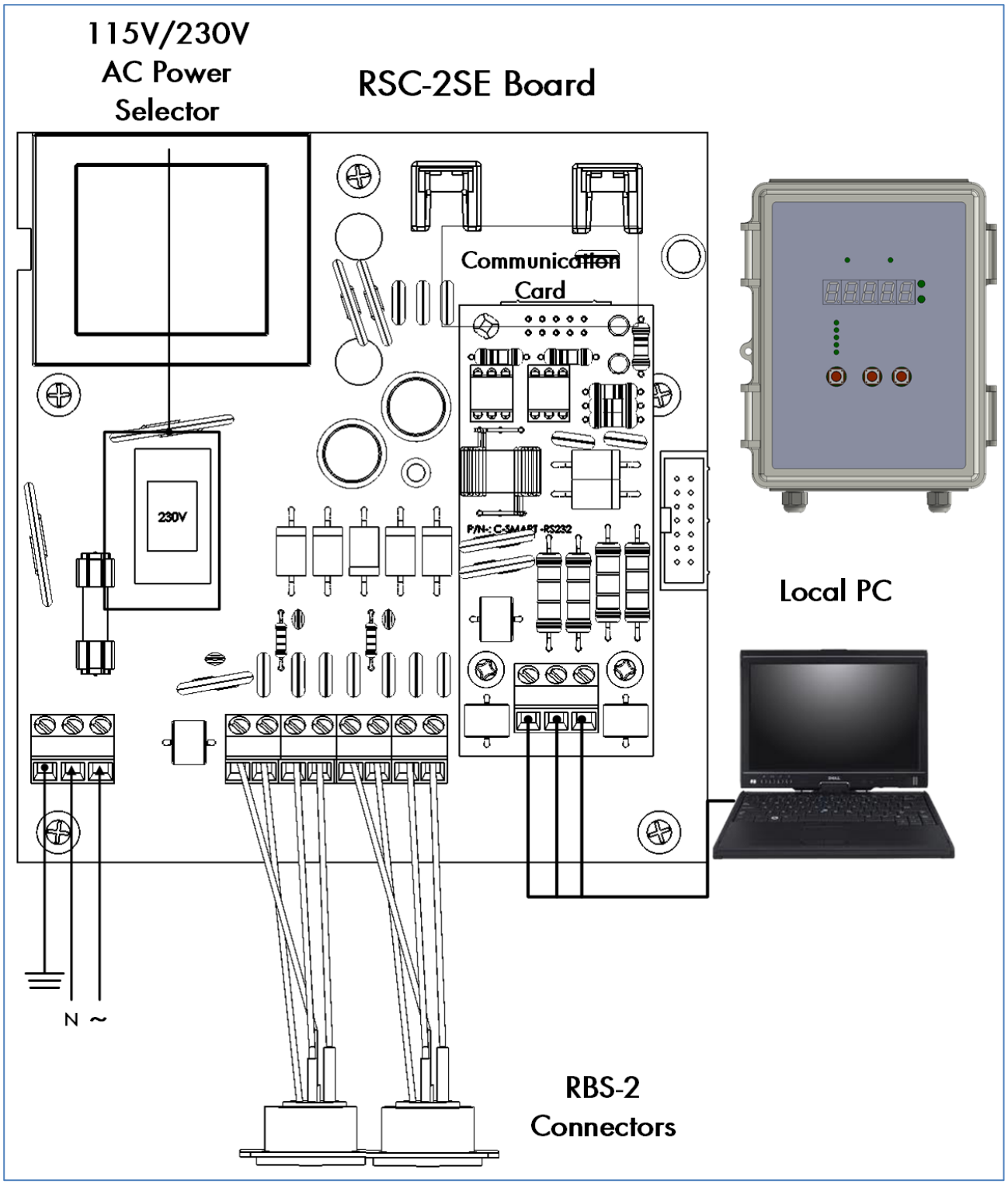


Figure 2: RSC-2SE Center Wiring Diagram

3. Open the unit and select the required voltage, 115 or 230 volts.
4. Apply power.

All LEDs briefly light up.

NOTE By default the unit is set to 230 volts.

NOTE To connect the RSC-2SE to a PC requires a communication card (outlined in Figure 1) (P/N P-RSC2SE-RS232) and ScaleNet installed on the PC.

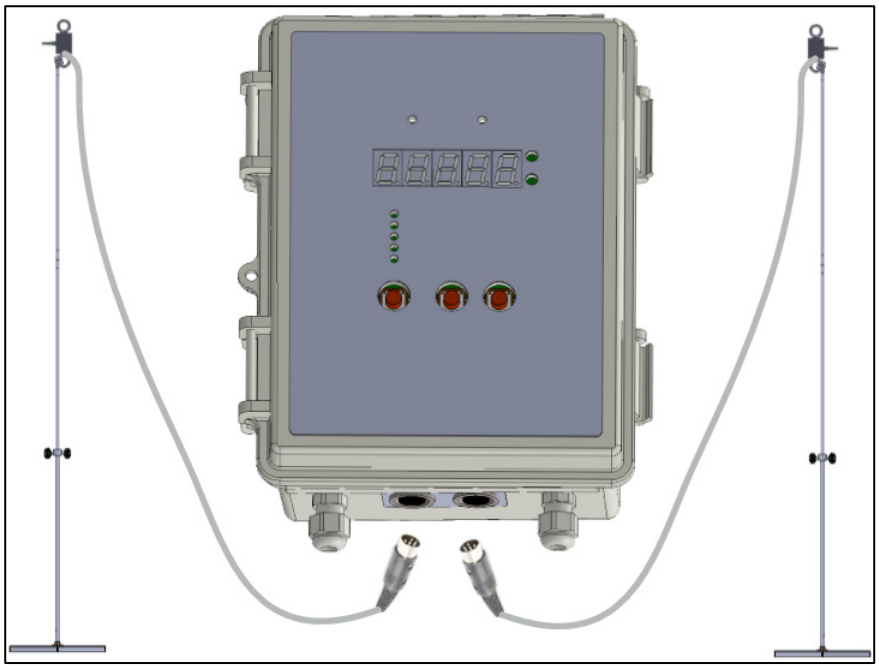


Figure 3: RSC-2SEr Connection to the HRBS (example)

3.2 Installing the USB Driver

The following procedure details how to install R-USB Driver version 5.00. This driver must be installed **before** plugging in the USB cable between the host computer and the R-USB plug.

1. Ensure that the USB cable is disconnected from Communicator before installing the driver.
2. On the CD, go to . . .:\RSC-2SE\Rotem USB Driver 5.4.24.
3. Click the exe file.
4. Follow the instructions.
5. Restart the computer.
6. Connect the supplied USB cable from the computer to the RSC unit.

*NOTE If older versions of the driver exist on the computer, the installation program must delete them. Click **Yes** if prompted.*

3.3 Installing ScaleNet

1. On the CD go to . . . \RSC-2SE\ScaleNet 1.0.19\Full.
5. Click SETUP.EXE .
2. Follow the instructions.
3. Restart the computer.

NOTE For details on using the ScaleNet program, refer to Communication program For RSC-2.pdf, found on the CD.

3.4 Changing the Fuse

The RSC-2SE comes supplied with a spare fuse.

To change the fuse:

1. Disconnect the power.

WARNING! *DO NOT CHANGE THE FUSE WHEN THE UNIT IS CONNECTED TO A POWER SOURCE!*

2. Open the unit.
3. Remove the plastic fuse cover.
4. Remove the fuse.
5. Put the new fuse in place.

CAUTION *The fuse must be 315 mA/250 VAC.*

3.5 Environmental Protection

Recycle raw materials instead of disposing as waste. The controller, accessories and packaging should be sorted for environmental-friendly recycling. The plastic components are labeled for categorized recycling.

4Main Menu

The following sections describe the RSC-2SE functions.

- Average Weight
- Number of Weights
- Daily Gain/Standard Deviation
- CV/UniformityGrowth Day

4.1 Average Weight

The average weight shown is the average of birds weighed since midnight. The average weight in the display pertains to the indicated weighing platform.

Whenever the RSC-2SE acquires a new bird weight, it flashes this weight several times before continuing to show the average weight. A flashing display indicates the latest bird's weight; a steady display indicates an average weight.

4.2 Number of Weights

This shows the number of birds weighed on the indicated weighing platform.

4.3 Daily Gain/Standard Deviation

By default, this parameter shows the weight gained since the previous day. Press the Up Arrow for the standard deviation (SD) of the average weight, Down Arrow to show daily gain.

Standard Deviation is a scientific measure of how even the bird weights are. For more information on Standard Deviation, refer to Standard Deviation, page 24.

4.4 CV/Uniformity

Coefficient of Variation (CV) is another scientific measure of how even the bird weights are. It is related to Standard Deviation.

Uniformity is the usual way evenness of bird weights is measured. Press the Up Arrow for Uniformity and the Down Arrow for Coefficient of Variation.

For more information on the CV, refer to CV, page 25.

4.5 Growth Day

The Growth Day is the age of the birds for the indicated platform. You can have different growth days for each weighing platform.

You can adjust the growth day with the arrow keys to a maximum of 730.

- If you change the growth day without clearing previous history, old history mixes with new data. To prevent corrupting your data while reviewing history use the History function; do not simply move the growth day back.
- If your birds weigh differently, adjust the reference weight manually to approximately the weight of your birds to start collecting bird weights.

To set the growth day to 1:

1. Select **Growth Day**.
2. Press the **Down** arrow until 0 appears.
3. Press **Select**.

Clear and 1 appear.

4. Press the Up arrow until Yes appears.
5. Press **Select**.

The growth day is set to 1. All history data is erased.

*NOTE **Day 0**: You can set the 1st growth day to be 0. For example, if a flock arrives late in the day and setting the growth day to 1 would be inaccurate, set the growth day to 0.*

To set the growth day to 0:

1. Select **Growth Day**.
2. Press the **Down** arrow until 0 appears.
3. Press **Select**.

dAv and 1 appear.

4. Press the down arrow until 0 appears.
5. Press **Select**.

Sure and no appear.

6. Press the Up arrow until Yes appears.
7. Press **Select**.

The growth day is set to 0.

NOTE The system does not accept any weight data on Day 0.

5 Advanced Functions

The following sections describe the RSC-2SE advanced functions. Each description is followed by a series of frequently asked questions regarding that function.

- Weighing
- Printing
- History
- Scale Calibration
- Time Update
- Parameters

5.1 Weighing

If you **press and hold** **Select** for 2 or 3 seconds, the RSC-2SE switches into weighing mode, and indicates this by showing **SCALE** in the display for several seconds. To correctly use this feature, be sure to keep the scale empty during this time, since the RSC-2SE automatically calibrates the weight to be considered as zero weight.

After the zero weight appears in the display, you can weigh objects just as you would on a typical bathroom or grocery scale. To return to bird weighing mode, press the Select key briefly.

To use the Scale:

1. Keep the scale empty and steady. Start with the usual average weight in the display.
2. If you have more than one weighing platform, wait until the Scale Indicator lights for the scale platform you wish to use.
3. Press and hold **Select** until SCALE appears in the display. Then release the key.
4. Wait until the display returns to zero, all the while keeping the scale weighing platform empty and steady.
5. Weigh objects as desired by placing them on the platform. Their weight appears in the display.
6. To return to normal operation, briefly press **Select**. ESC will appear momentarily in the display.

5.1.1 WEIGHING QUESTIONS

- **Will the other weighing platform continue to weigh birds while this platform is in special weighing mode?**

  No.
- **How heavy an object can I weigh?**

  This depends on the particular weighing platform. The small stainless steel chicken platform can weigh up to 50 pounds (25 kilograms); the larger stainless

steel turkey platform can weigh up to 100 pounds (50 k kilograms). Review the specifications for the hanging platforms.

- **How accurate are the scales?**

  All scale platforms have 0.2% basic accuracy.

- **Can I calibrate the scales?**

  Yes. Each platform must be individually calibrated prior to use using the calibration procedure described later in this manual.

5.2 Printing

The RSC-2SE can print data indirectly through a Munters Multiplexer or Communicator. This connection is best performed by a qualified technician.

1. To print indirectly through a Multiplexer or Communicator, place the jumpers in the MUX position. Connect the printer to the Multiplexer or Communicator.

2. To start printing, **press and hold Down Arrow**. **–Prn-** displays momentarily followed by **F-day** alternating with **1**. This indicates First Day to Print is day 1.

3. If you wish, adjust the first printing day (indicated by F-day) with the arrow keys. Printing will start with data from this day continuing until the current growth day.
   - You cannot adjust the first printing day past the current growth day.

4. Press the Select key to start printing. While printing, **-Prn-** flashes in the display. When finished, the flashing **-Prn-** disappears.

5.2.1 PRINTING QUESTIONS

- **I started a long printout but have changed my mind. How do I stop it?**

  Turn power off to the RSC-2SE.

- **Why does the display show F-day instead of F-DAY for first day?**

  The display is a red five digit, seven segments suited to showing numbers, such as average weight. This is as close as it can come to showing letters. An uppercase D would look like a zero. However, the word displays are remarkably clear and easy to understand.

- **What is 9600, N, 8, 1?**

  These have to do with RS-232 communication settings as defined by international standards. A qualified technician will understand them, as well as further questions, such as: What is RS-232?

5.3 History

Use the History function to review data from previous growth days. You can review all data (Average Weight, Uniformity, etc.) for each growth day in the past without affecting scale operation.

1. Press and hold **Up Arrow** until –HIS- appears in the display briefly. Be sure to observe the momentary –HIS- indication, since the display will return to the average weight for today without any other indication.

2. Use the Select, Up and Down arrow keys as you would during normal operation to review data. For example,

- To review data on day 10, move to the Growth Day main menu using the Select key. Then adjust the growth day using the arrow keys.
- Press Select to choose a particular item, such as Uniformity.
- To review historical data for a different growth day, move to the growth day item again with the Select key and repeat steps 2.1' and 2.2'.

3. To exit history mode, press and hold the Select key until –Esc- appears briefly in the display.

5.3.1 HISTORY QUESTIONS

- **Does the RSC-2SE continue to weigh birds while in History Mode?**

  Yes, it continues to operate normally in the background.
- **How can I tell that the RSC-2SE is in History mode?**

  The RSC-2SE briefly displays –HIS- when it switches into history mode.

  The display stops flashing new weights as they are acquired. You can see whether new weights are being acquired by watching the Number of Weights for the current growth day.

NOTE In normal operation, the RSC-2SE briefly flashes each new bird weight before continuing to display the average weight.

- **You cannot go to Growth Day zero.**
- **You cannot go past the current Growth Day.**
- **When you press and hold Select again, it will show –ESC- instead of SCALE. However:**
  - If you were in history mode, you will exit it.
  - If you were not in history mode, you will enter SCALE mode. Press Select again in this case to return to normal operation.
- **What is the best way to tell the RSC-2SE is in History mode?**

  Carefully watch for the brief –HIS- display when the RSC-2SE switches into history mode.
- **How can I view Histograms?**

  You can view Histograms at a personal computer using Munters Scale Center software. The software provides other important features as well.

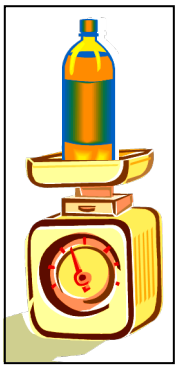
  The printed data, when sent to a serial printer, will display the histograms as well.

5.4 Scale Calibration

Upon installation, each weighing platform should be calibrated. Allow a minimum 10 minute warm up time after turning on power before calibration.

1. Obtain a precision weight of about 5 to 10 pounds (2 to 5 kilograms). The minimum calibration weight is 1 pound (500 grams).

NOTE A low-cost precision weight may be easily obtained at most grocery stores. Purchase a suitable beverage (such as a 2 liter soft drink, gallon of milk), and weigh it on the government certified scales at the checkout. Most grocery store cashiers will gladly sell and weigh a precision weight for you.

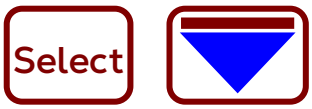


2 liters soft drink
(gallon of milk,

Government
certified grocery

CAUTION Keep the platform empty of birds and steady during the calibration process.

2. **Press and Hold Simultaneously** the Select and Down Arrow keys when the scale indicator for the appropriate platform is lit.



3. **CAL-1** or **CAL-2** appears in the display, depending on which platform you are calibrating. Release the Select and Down Arrow keys.

*NOTE If you are adding a second platform, or the desired scale indicator light never lights, refer to the **Parameters** section below. A platform for calibration is selected by pressing **up** or **down** buttons. You will need to enter a calibration number initially to make the RSC-2SE recognize the platform and start switching between the two. This number does not need to be accurate.*

4. Press **Select**. The display starts flashing **CAL-1** or **CAL-2**. During this period the RSC-2SE is calculating the tare, so it is particularly important not to disturb the platform in any way during this period.

5. The display shows 1.00 and the appropriate scale indicator light flashes. Place the precision weight on the platform and adjust the value in the display using the arrow keys until it registers the correct weight.

6. Press **Select**. The display will start flashing the weight you entered. During this period it is calibrating to your precision weight, so it is particularly important not to disturb the platform in any way.

7. After several seconds, the display shows **Good** if the test is successful. **ERR-3** if the test fails and **ERR-4** if the weight tested is too small. Press **Select** to return to normal operation.

5.4.1 SCALE CALIBRATION QUESTIONS

- **Do I need to clean the weighing platform prior to calibration?**

  No. The calibration procedure uses the same 'change in weight' principle that is used during normal bird weighing. As long as you do not change the amount of debris on the platform, its presence will not affect calibration.

- **Will the other platform continue to operate normally while I calibrate this one?**

  No. During calibration all normal weighing operations stop.

- **I want to calibrate Scale 2, but only the Scale 1 indicator light is on.**

This is normal. By factory default, the RSC-2SE uses scale platform 1 only. To start using scale platform 2, you need to signal the RSC-2SE that it has another platform by entering a 'calibration number' other than 0 in the Calibration Parameter. See the Parameters section below. A platform for calibration is selected by pressing **up** or **down** buttons.

- **How often should I calibrate the scales?**

  Munters recommends calibration once a year.

- **I see a calibration factor number on my scale platform. What is this?**

  This is a factory calibration number for the platform. You can enter it manually into the calibration number as described in the Parameters section below for a quick approximate calibration.

5.5 Time Update

The RSC-2SE has an internal battery backed clock. You can use this to schedule bird weighing for particular hours of the day in the Parameters section.

To set the clock:

1. Press and hold simultaneously **Select** and **Up Arrow** until the time appears in the display in hh:mm format.
2. The hour will be flashing. To adjust it, use the Up and Down Arrow keys.

NOTE The hour is in 24-hour format. For example, 5:00 PM will show as 17.00.

3. When finished adjusting the hour, press **Select**. The minutes will start flashing.
4. Adjust the minutes using the arrow keys. You can press and hold an arrow key to move more quickly.
5. When finished adjusting the minutes, press **Select**. Using the arrow keys, select the appropriate day of the week.
6. Press **Select**. The display briefly shows –ESC- and returns to normal operation.

5.6 Parameters

The RSC-2SE has many parameters with which you can customize for your needs. While viewing the parameters, each parameter will display its value alternately with a brief acronym to identify the parameter. You can adjust the parameter with the arrow keys.

To adjust the parameters:

1. Press and hold simultaneously both arrow keys until the first parameter, rEF-1, flashes in the display alternately with its value.
2. To adjust the parameter, use the up and down arrow keys.
3. When finished adjusting the parameter, press **Select** to move to the next parameter.
4. If you are finished adjusting all parameters of interest, continue pressing the Select key until you get past the last one. The RSC-2SE will display –ESC- briefly after the last parameter and return to normal operation.

Table 1: Parameter Table

Parameter	Description	Minimum	Default	Maximum
rEF-1	Scale 1 Reference Weight	0	0.10lb/.045 kg	66.00 lb/29.94 kg
rEF-2	Scale 2 Reference Weight	0	0.10lb/.045 kg	66.00 lb/29.94 kg
CAL-1	Calibration Number, Scale 1	0	2200	10000
CAL-2	Calibration Number, Scale 2	0	0	10000
Unit	Weight Unit, 0→ Kg, 1 → Lb	0	0	1
Range Low	Minimum Acceptance Range, %	10	20	45
Range High	Minimum Acceptance Range, %	10	20	45
Baud	Communication Baud Rate	1200	9600	9600
Pc.1	Bird Scale 1 Identification Number for Communication	0	0	255
Pc.2	Bird Scale 2 Identification Number for Communication	0	0	255
PASS	Password	0	0	9999
StA-1	Scale 1 Weighing Start Hour	0	00:00	24:00
End 1	Scale 1 Weighing End Hour	0	24:00	24:00
StA-2	Scale 2 Weighing Start Hour	0	00:00	24:00
End 2	Scale 2 Weighing End Hour	0	24:00	24:00
Accur	Minimum Number of Stable Weight Samples	3	7	10
unF.Pr	Uniformity Percentage Range	5	10	20
OFF-d	Set days for weighing	None	None	Days
Curve	Select weighing mode	No	No	t-brE

5.6.1 PARAMETER QUESTIONS

- **I accidentally went past the parameter I wanted. How do I back up?**

  You cannot back up. If you missed the parameter, you need to go through all the parameters until ESC and start again.

- **I accidentally forgot to exit from Parameter mode after adjusting a parameter. I left the farm and am now at home. Must I go back to the RSC-2SE and exit parameter mode?**

  Actually the RSC-2SE waits for a little while and exits by itself. There is no need to go back to the RSC-2SE to exit in this case.

5.6.2 NON-CURVE PARAMETER DEFINITIONS

The following sections detail the Non-Curve and Curve parameters.

- **Ref-1**: Scale 1 Reference Weight. The RSC-2SE accepts bird weights that are within a limited range of the reference weight, typically ±30%. For example, if the current reference weight is 1.00 pounds, then by default weights greater than 0.70 and less than 1.30 pounds are accepted as valid.
    - After CLEAR, start with a reference weight of 0.100 pounds (0.048 kilograms). Manually edit the reference weight if needed.
    - If the reference weight was manually entered, retain it for the next 100 weightings.
    - After a new day, the reference tracks the current average weight after 512 weighs.
- **Curve mode FE**: The reference is from females' growth curve. This parameter cannot be manually altered.
- **Curve mode nn**: The reference is from males' growth curve. This parameter cannot be manually altered.
- **Ref-2**: Scale 2 Reference Weight. Same as Ref-1, except it applies to weighing platform 2.
- **CAL-1**: Scale platform 1 calibration factor.
- **CAL-2**: Scale platform 2 calibration factor.
- **Unit**: Pounds or Kilograms
- **Range**: Acceptance range. Defines the range around the average weight, birds that are weighed to be outside of this range (more or less than this percent) are rejected.
- **Baud**: Communication connection speed, typically 9600.
- **Pc.1**: Scale number of Scale 1 for personal computer communications. Each scale platform in a network of RSC2 scale systems must have its own number.
- **Pc.2**: Scale number of Scale 2 for personal computer communications.
- **PASS**: Password for access via communications.
- **Sta 1**: Start time for weighing scale1. You can limit weighing to a start hour.
- **End 1**: End time for weighing scale2. You can force the RSC-2SE to stop weighing at a particular hour.
- **Sta 2:** Same as Start 1, but for Scale 2.
- **End 2:** Same as End 1, but for Scale 2.
- **Accuracy:** Sets the minimum number of acceptable samples to establish a bird's weight.
- **Unf.Pr:** Uniformity limit in percent. Default uniformity limit is plus or minus 10% from the average.
- **OFF-d:** This parameter is an option for the grower to weigh every day or in cycles.
    - If set on **None**, the controller weighs every day.
    - If set on **cyc-2** through **cyc-6** the controller will show a list of numbers set. The weighing will be performed according to growth days. For example if set to 3, the list will be 1, 2, 3 and you will be asked to select yes/no for every number. Refer to the following table for details:

If set on days, the controller will show a list of the weekdays and a YES/NO weighing options for that day.

None	cyc-2	cyc-3	cyc-4	cyc-5	cyc-6	Days
ALL	d.1-Y/n	d.1-Y/n	d.1-Y/n	d.1-Y/n	d.1-Y/n	Sun-Y/n
	d.2-Y/n	d.2-Y/n	d.2-Y/n	d.2-Y/n	d.2-Y/n	Mon-Y/n
		d.3-Y/n	d.3-Y/n	d.3-Y/n	d.3-Y/n	Tue-Y/n
			d.4-Y/n	d.4-Y/n	d.4-Y/n	Wed-Y/n
				d.5-Y/n	d.5-Y/n	Thu-Y/n
					d.6-Y/n	Fri-Y/n
						Sat-Y/n

NOTE The current day in the cycle blinks and will help you determine the cycle day at any growth day. This is helpful when you reach a high growth day and want to know the cycle day.

5.6.3 CURVE PARAMETERS

The RSC-2SE has a growth curve for males and females. This function enables the scale to divide the different weighs of males and females according to the curves. There are six different curves to work with. The **Range** parameter is used to create the range around the male average weight and female average weight.

- Selecting a Curve
- Curve Reference Points
- Adjusting a Curve

5.6.3.1 Selecting a Curve

To select a curve:

1. Press both arrow keys.
2. Press **Select** until one of the following appears:
    - no (if no curve is currently in use)
    - curve name (if a curve is currently in use)
3. Press the **Up** arrow key until the required curve appears.
4. Press **Select**.
5. Press the **Up** arrow key to select **Yes**.

Sure appears.

6. Press **Select**.
    - Fe and Ref appear.
    - n n and Ref appear.

no	No curve
C-PUL	Pullet
C-brE	Breeder
C-bro	Broiler
t-gr1	Turkey group 1
t-gr2	Turkey group 2
t-brE	Turkey Breeder

NOTE For curve type C-bro, the RSC-2SE displays the male and female average.

- To exit the application press **Select** for a few seconds.

NOTE If LED lights up on Scale-1, you are viewing the female curve settings.

If LED lights up on Scale-2, you are viewing the male curve settings.

Broiler Curve: The Broiler curve has three specifications:

- Female average
- Male average
- Flock average

GD	C-PUL				C-bro				Growth Day	C-bre			
	Female		Male		Female		Male			Female		Male	
	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb		Kg	Lb	Kg	Lb
1	0.039	0.08	0.045	0.10	0.039	0.08	0.045	0.91	140	2.020	4.45	2.550	5.61
7	0.115	0.25	0.125	0.27	0.149	0.32	0.173	0.50	154	2.155	4.74	2.700	5.94
14	0.230	0.50	0.250	0.55	0.383	0.84	0.450	0.91	168	2.300	5.06	2.900	6.38
21	0.360	0.79	0.430	0.94	0.714	1.56	0.839	1.69	182	2.465	5.43	3.150	6.93
28	0.500	1.10	0.610	1.34	1.100	2.41	1.296	2.65	196	2.640	5.81	3.400	7.48
35	0.630	1.38	0.790	1.73	1.530	3.37	1.798	3.64	210	2.800	6.16	3.600	7.93
42	0.750	1.65	0.960	2.11	1.950	4.28	2.289	4.63	224	2.940	6.47	3.800	8.37
49	0.850	1.87	1.130	2.48	0	0	0	0	238	3.070	6.76	3.900	8.59
56	0.945	2.08	1.280	2.82	0	0	0	0	252	3.180	7.00	3.950	8.69
63	1.035	2.28	1.430	3.15	0	0	0	0	266	3.270	7.20	4.000	8.81
70	1.120	2.46	1.155	3.41	0	0	0	0	280	3.340	7.35	4.040	8.89
105	1.580	3.48	2.100	4.62	0	0	0	0	294	3.490	7.68	4.175	9.19
140	2.250	4.95	2.800	6.16	0	0	0	0	308	3.565	7.85	4.300	9.47
175	3.050	6.71	3.630	7.99	0	0	0	0	322	3.640	8.01	4.385	9.65
245	3.475	7.65	4.320	9.51	0	0	0	0	336	3.750	8.26	4.435	9.76
350	3.670	8.08	4.475	9.85	0	0	0	0	350	3.800	8.37	4.500	9.91

GD = Growth Day

GD	t-gr1				t-gr2				GD	t-bre			
	Female		Male		Female		Male			Female		Male	
	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb		Kg	Lb	Kg	Lb
1	0.070	0.15	0.075	0.16	0.070	0.15	0.075	0.16	1	0.065	0.14	0.065	0.14
7	0.140	0.30	0.150	0.33	0.140	0.30	0.150	0.33	7	0.130	0.28	0.130	0.28
14	0.310	0.63	0.400	0.88	0.310	0.68	0.400	0.88	14	0.280	0.61	0.410	0.90
21	0.640	1.41	0.790	1.74	0.640	1.41	0.790	1.74	21	0.500	1.10	0.730	1.60
28	1.005	2.21	1.290	2.84	1.005	2.21	1.290	2.84	28	0.820	1.80	1.160	2.55
35	1.530	3.37	1.900	4.18	1.530	3.37	1.900	4.18	35	1.220	2.68	1.680	3.70
42	2.140	4.71	2.700	5.94	2.140	4.71	2.700	5.94	42	1.540	3.39	2.310	5.08
49	2.830	6.23	3.650	8.04	2.830	6.23	3.650	8.04	49	1.990	4.38	3.050	6.71
56	3.590	7.90	4.700	10.35	3.590	7.90	4.700	10.35	56	2.480	5.46	3.890	8.56
63	4.400	9.69	5.880	12.95	4.400	9.69	5.880	12.95	63	2.940	6.47	4.940	10.88
70	5.270	11.60	7.250	15.96	5.270	11.60	7.250	15.96	70	3.410	7.51	5.990	13.19
91	7.570	16.67	11.190	24.64	7.570	16.67	11.190	24.64	91	4.850	10.68	9.460	20.83
105	9.000	19.82	13.890	30.59	9.000	19.82	13.890	30.59	105	5.870	12.93	12.290	27.07
119	10.310	22.70	16.560	36.47	10.310	22.70	16.560	36.47	140	8.240	18.15	17.180	37.84
133	11.410	25.13	19.100	42.07	11.410	25.13	19.100	42.07	175	10.280	22.64	20.140	44.36
154	12.640	27.84	22.450	49.44	12.640	27.84	22.450	49.44	210	12.320	27.13	23.100	50.88

5.6.3.2 Curve Reference Points

When the curve is enabled, the following parameters appear. Define the ranges for both male and female reference points:

- F L: Female minimum acceptance point. Defines the range below the female reference weight. Weighted birds that are below this band (reference weight minus this percentage) are rejected.
- F H: Female maximum acceptance point. Defines the range above the female reference weight. Weighted birds that are above this band (reference weight plus this percentage) are rejected.

- **nn L**: Male minimum acceptance point. Defines the range below the male reference weight. Weighted birds that are below this band (reference weight minus this percentage) are rejected.
- **nn H**: Male maximum acceptance point. Defines the range above the male reference weight. Weighted birds that are above this band (reference weight plus this percentage) are rejected.

5.6.3.3 Adjusting a Curve

You can change the curve points (both the growth day and target weights).

To change the curve points:

1. Press the **Select**, **Down**, and **Up** buttons simultaneously for three seconds.

The growth day and target weight appear on the screen.

- To change the growth day, press an arrow key when the growth day appears.
- To change the target weight, press an arrow key when the target weight appears.

2. Press **Select**.

The next growth day and target weight appear. Repeat as needed.

3. Press **Select** for three seconds to return to the main screen. Changes are saved.

6Technical Reference

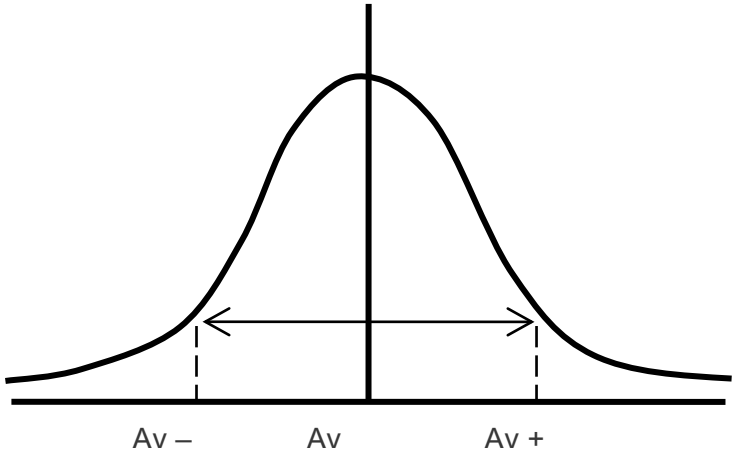
The following sections explain RSC concepts.

- Standard Deviation
- CV
- Uniformity (Homogeneity or Evenness)
- Alarms List

6.1 Standard Deviation

The standard deviation is kind of the "mean of the mean," and often can help you find the story behind the data. A normal distribution of data means that most of the weights in a set of data are close to the "average," while relatively few examples tend to one extreme or the other.

If you looked at normally distributed data on a graph, it looks something like this:



The x-axis is the weight. The y-axis (the vertical one) is the number of weights for each value on the x-axis.

$$\sigma = \sqrt{\frac{\Sigma\ [x - \bar{x}]^2}{n - 1}}$$

σ = Standard Deviation
Σ = Sum of the square (X (weights) – Average weight)
$\bar{x}$ = Average Weight

Standard Deviation

n = Number of weights.

The smaller the standard deviation, the more uniform the flock's weight.

6.2 CV

The - Coefficients of Variation (CV) (shown in percentage) is calculated using the following formula:

CV = (standard deviation / Average) x 100

The CV is expresses the standard deviation as a percentage of the average weight. This term describes the variation among the recorded body weights accounting for the relative size of the birds. A 0.1 pound variation, for example, is more important for one week birds than for much larger 8 week birds.

6.3 Uniformity (Homogeneity or Evenness)

Counting birds with body weight within a range of either ±10% or ±15% of the average body weight gives the uniformity. The number of birds in this range is expressed as a percentage of the total number weighed. In Europe most managers use the ±10% range but the fact that different ranges are used sometimes causes confusion. This method of describing variation is easy to practice but it does not accurately account for all variation in the way that CV does.

The formula for Uniformity is:

Uniformity = (number of birds within ±10% of Average / Number of weights) x 100

6.4 Alarms List

- **Err-1**: Load cell-1 or load cell-2 are disconnected. Recheck wire connections and load cells color order.
- **Err-2**: Calibration numbers of both loading cells equals zero (0). Recalibrate the loading cells or feed the correct amount manually.
- **Err-3**: Calibration failed. Check if loading cell is disconnected.
- **Check polarity:** See if loading cell's readings drop when a weight is placed on the platform.
- **Err-4**: Calibration with a weight less than 100 grams.

7 Warranty

Warranty and technical assistance

Munters products are designed and built to provide reliable and satisfactory performance but cannot be guaranteed free of faults; although they are reliable products they can develop unforeseenable defects and the user must take this into account and arrange adequate emergency or alarm systems if failure to operate could cause damage to the articles for which the Munters plant was required: if this is not done, the user is fully responsible for the damage which they could suffer.

Munters extends this limited warranty to the first purchaser and guarantees its products to be free from defects originating in manufacture or materials for one year from the date of delivery, provided that suitable transport, storage, installation and maintenance terms are complied with. The warranty does not apply if the products have been repaired without express authorisation from Munters, or repaired in such a way that, in Munters' judgement, their performance and reliability have been impaired, or incorrectly installed, or subjected to improper use. The user accepts total responsibility for incorrect use of the products.

The warranty on products from outside suppliers fitted to Echo 2.0, (for example antennas, power supplies, cables, etc.) is limited to the conditions stated by the supplier: all claims must be made in writing within eight days of the discovery of the defect and within 12 months of the delivery of the defective product. Munters has thirty days from the date of receipt in which to take action, and has the right to examine the product at the customer's premises or at its own plant (carriage cost to be borne by the customer).

Munters at its sole discretion has the option of replacing or repairing, free of charge, products which it considers defective, and will arrange for their despatch back to the customer carriage paid. In the case of faulty parts of small commercial value which are widely available (such as bolts, etc.) for urgent despatch, where the cost of carriage would exceed the value of the parts, Munters may authorise the customer exclusively to purchase the replacement parts locally; Munters will reimburse the value of the product at its cost price.

Munters will not be liable for costs incurred in demounting the defective part, or the time required to travel to site and the associated travel costs. No agent, employee or dealer is authorised to give any further guarantees or to accept any other liability on Munters' behalf in connection with other Munters products, except in writing with the signature of one of the Company's Managers.

WARNING: In the interests of improving the quality of its products and services, Munters reserves the right at any time and without prior notice to alter the specifications in this manual.

The liability of the manufacturer Munters ceases in the event of:

- dismantling the safety devices;
- use of unauthorised materials;
- inadequate maintenance;
- use of non-original spare parts and accessories.

Barring specific contractual terms, the following are directly at the user's expense:

- preparing installation sites;
- providing an electricity supply (including the protective equipotential bonding (PE) conductor, in accordance with CEI EN 60204-1, paragraph 8.2), for correctly connecting the equipment to the mains electricity supply;
- providing ancillary services appropriate to the requirements of the plant on the basis of the information supplied with regard to installation;
- tools and consumables required for fitting and installation;
- lubricants necessary for commissioning and maintenance.

It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer.

Dismantling and assembly must be performed by qualified technicians and according to the manufacturer's instructions.

The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

Requests for technical assistance and spare parts can be made directly to the nearest Munters office.

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