

version 1.11.1

User's Guide



AUTOMATIC POULTRY SCALES

Bat2 Full



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1. Introduction

The poultry scale Bat2 is designed for automatic weighing of live poultry. Weighing takes place automatically; the weight is automatically stored into the memory after the poultry enters the weighing platform. The scales memory allows for storing weighing results continuously for one year including gender differentiation. All records in the memory can be viewed afterwards directly on the scales display or it is possible to transfer them to a computer for further processing.

1.1. Basic Features of Scales

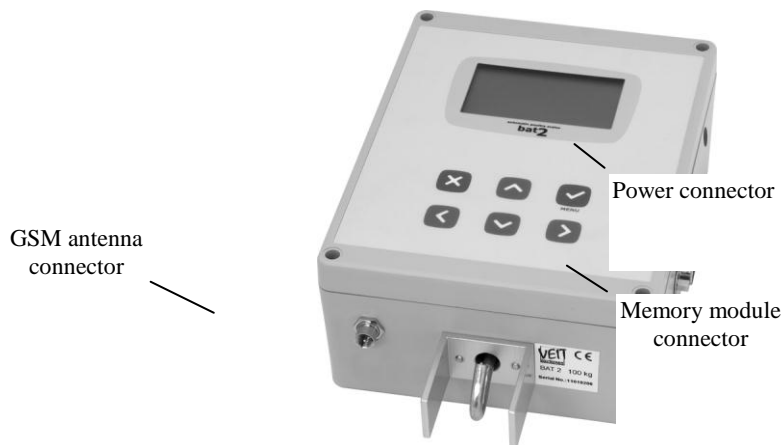
- Graphical display with clear display of results.
- Help on the display can be chosen in several languages.
- Weight display can be selected in kilograms and pounds.
- The memory capacity is up to 1 year of weighing.
- Each day, the number of weighed heads, the average weight, the standard deviation, CV, uniformity, daily increment, histogram, and up to 1,800 individual weighed samples including gender are stored into the memory.
- Automatic gender recognition.
- Transfer of data into a computer using a memory module.
- Sending statistics using SMS messages (automatically at midnight and at any time upon request).
- Communication via the RS-485 line
- Online measurement of the time course of weight for easy setup and diagnostics.
- Sharing the setup between more scales.
- Simple scales setup from a computer.

1.2. Scales Description

GSM antenna connector, RS-485 connector and hook for hanging plate or connector for floor platforms are placed in the lower part, which allows for putting on an anti-dust cover. On the right side of the scale there is a power connector and connector for plugging the memory module.

The scales design can vary according to the used weighing platform. When using a hanging plate there is a hook in the lower part of the scale, on which the plate is suspended. When using a floor platform there is a connector instead of the hook, into which a cable from the platform is connected.

The scales design with hook and GSM module is shown in the following picture:



The scales design with hook and RS-485 line is shown in the following picture:



The key functions are stated in the following table:

✓	The Enter key, enter the menu, confirm of the entered value
✕	The Esc key, leave the menu, cancel the entered value
➤	Change display during weighing, move the digit to the right when editing
➤	Change the displayed gender during weighing, move the digit to the left when editing
⬆	Change the weight in the histogram, change the day in the archive, increase the digit when editing
⬇	Change the weight in the histogram, change the day in the archive, decrease the digit when editing

1.3. Basic Technical Parameters

Weight capacity:	up to 100 kg according to the connected platform
Scale division:	selectable 0.001; 0.002; 0.005; and 0.010 kg/lb
Accuracy:	about 0.1 %
Temperature range:	-5 °C to 45 °C
Power:	6-9V power adaptor, 24V over RS-485 connector or 6V lead-acid battery
Power consumption:	about 150 mA

1.4. Factory Setup of the Scales

The scale is programmed from the factory for basic weighing as follows:

Identification Number

The identification number is set to 1.

Flocks

The memory does not contain any predefined flock.

Statistics

Histogram range:	± 40 %
Uniformity range:	± 10 %

GSM Module

The activity of the GSM module is disabled; the memory does not contain any phone number.

RS-485

Address:	2
Speed:	9600 Bd
Parity:	8-e-1
Reply delay:	0 ms
Silent interval:	50 ms

Scales

Margin above the target weight for females:	30 %
Margin below the target weight for females:	30 %
Margin above the target weight for males:	30 %
Margin below the target weight for males:	30 %
Filter:	12
Stabilization:	± 3 %
Stabilization time:	3
Use gain in automatic mode:	yes
Saving mode:	entering and leaving the scale
Units:	kg
Backlight:	on

1.5. Installation

1.5.1. GSM Module

If the scale is equipped with a GSM module, it is necessary to insert a working SIM card into the GSM module. The GSM module supports all types of SIM cards.

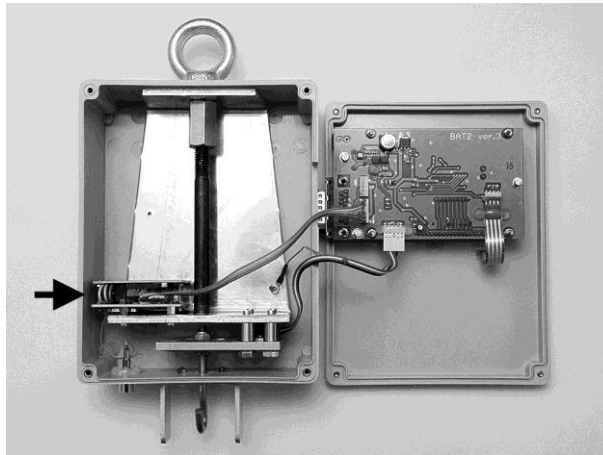
Before installation, first insert the SIM card into any mobile phone, disable entering the PIN code after turning on, set the correct number of the SMS message center of your operator and check proper sending and reception of SMS. To avoid possible problems, test sending and receiving of SMS when the SIM card is still in the phone.

Then you can install the SIM card into the GSM module in the scale.

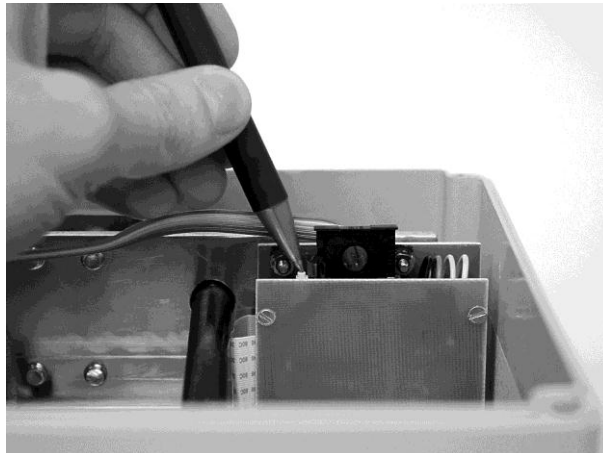
Disconnect the power cable and loosen the 4 screws on the front side:



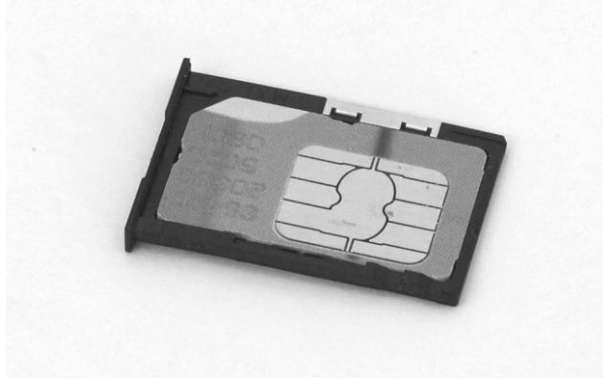
Open the front cover of the scale. The GSM module is placed on the left wall of the box:



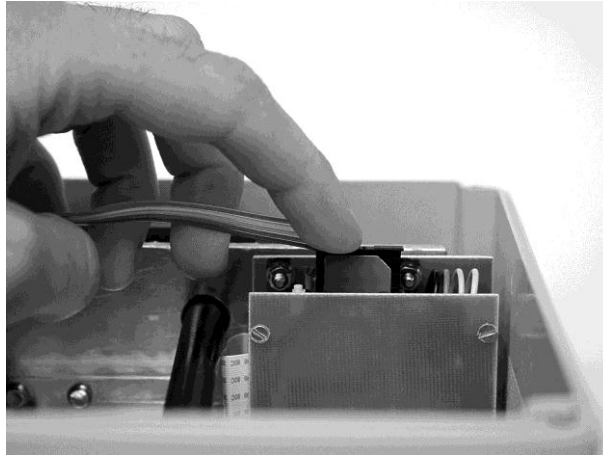
Press the yellow target in with a pen tip or another object with a tip, which releases the SIM cardholder:



Pull the SIM cardholder from the module and insert the SIM card into it:



Insert the holder with the SIM card back into the GSM module:



After the installation and turning on the scale, do not forget to correctly setup the GSM module, see Chapter 5.5.

1.5.2. Scales

Before installing the scale into a hall, it is necessary to stabilize the scale thermally and attempt to limit humidity condensation.

The scales design is adapted for suspending by the upper ring. The scale is best suspended on a hook screwed to a beam, possibly to the hall structure:



If the ceiling of the hall is too high, suspend a chain between the hook and the upper ring of the scale.

1.5.3. Weighing Platform

It is possible to connect either a hanging plate or a floor platform to the scale. The weighing platform is best placed between the feeder and the drinker, to a place where the poultry moves most.

Hanging plate

The hanging plate is suspended on the hook at the bottom of the scale:



The rod of the hanging plate is made from two parts, so it can be continuously vertically adjusted by inserting the individual parts into each other. For setting the correct length always properly tighten the screw on the rod:



Set the height so that the plate is as close to the ground as possible but does not touch the litter:



Floor Platform

The platform is connected to the scale using a cable and we install it directly on the ground into the litter:



1.5.4. Antenna and Powering

If the scale is equipped with a GSM module, screw the antenna into the connector:



Plug the power cable into the power connector and secure it, best by pulling through the upper ring, at the end:



If the scale is powered from battery, the battery should be kept properly charged. The battery life is about 15 days; the scale doesn't check if the batteries are charged.

1.5.5. RS-485 line

If the scale is equipped with a RS-485 line, plug the cable to the connector and secure by bolting. Wiring scheme of the connector is shown in the following table:

Pin	Meaning
1	+ 24 V: POWER
2	A: RS-485
3	B: RS-485
4	0 V: POWER
5	CGND: common GND
6	SHD: shielding

1.5.6. Calibration

If we do not use the weighing platform supplied with the scale, it is necessary to calibrate the scale after installation, see chapter 5.7.4.

1.6. Turning the Scale ON and OFF

The scale does not have a power switch, it is turned on and off by plugging the power source connector. After turning on the firmware version and identification number of the scale briefly show on the display. The scale should stay turned on during the whole time of weighing.

The scale is resistant to power failures, after the power is renewed, the scale is automatically resumed into the condition before the power failure and also all data in the scales memory are retained.

1.7. Language Settings

The scale allows for displaying help on the display in several languages that can vary depending on the scales version. If you want to change the language, turn off the scale, press and hold the key and turn the scale on again. After the second beep, release the key. The following menu is displayed:

Language

- ▶ English
- Deutsch
- Español

Use keys and to choose the required language and press the key. After choosing the language, the scale is restarted.

Note: each version of the scale can contain different number of languages.

2. Weighing

2.1. Quick Start of Weighing

The scale is set from the factory so that it is able to weigh immediately (with some compromises; see chapter 2.3 for detailed settings). If you want to start weighing immediately after installation of the scale, proceed as follows:

By pressing the key, enter the menu, choose the item *Start weighing* using arrows, and press the key. The following menu appears:

Use a predefined flock?

No Yes

Press the key, the following menu appears:

Use both genders?

No Yes

If you want to differentiate gender during weighing, press the key. If you do not want to differentiate gender, press the key. The following menu appears:

Starting day:

001

Cancel OK

Using arrows, enter the day number of weighing start (poultry age, for example 1 for day-old chicks) and press the key. The following menu appears:

Initial weight:

00,000 kg

Cancel OK

Enter the current weight of poultry as accurately as possible and press the key. If you chose using both genders, enter the current weight for females and males separately. The following menu appears:

Compare with another flock?

No Yes

Press the key. The following menu appears:

Start weighing now?

No Yes

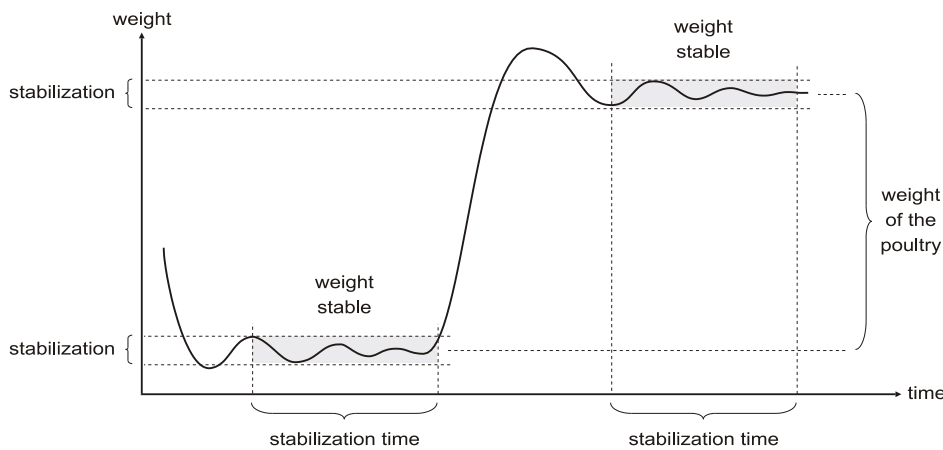
Press the key to start the weighing. In the following chapters, the scales control is explained in more detail.

2.2. Weighing Principle

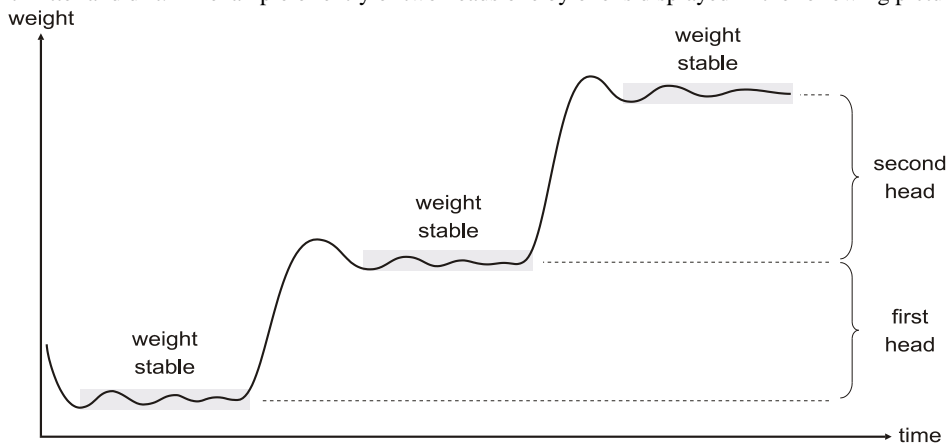
Weighing and its evaluation takes place completely automatically as individual heads enter and leave the weighing platform. The weighing platform is large, so even more heads can stand on it simultaneously.

For correct evaluation of weighing a special increment algorithm is used; the scale periodically reads the weight on the weighing platform and checks for the poultry that is entering and leaving the scale. In the following paragraphs, the weighing principle is described on entering the scale. The scale works the same during leaving the scale.

We assume that the weight of the scale is stabilized before any head enters the scale. If one or more heads enter the scale, first the weight increases, then the weight will oscillate and finally stabilize after a brief moment. The following picture shows an example of one head entering the scale:

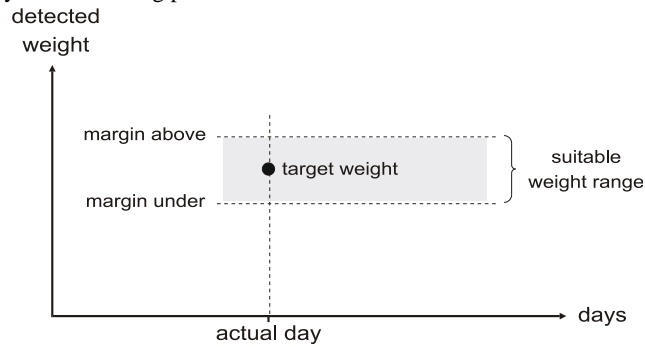


The difference between the two stabilized weights before and after the entry equals the weight of the head that entered the scale. Therefore, the absolute weight on the scale is insignificant; only the weight increment is measured. The scale thus reliably knows the entry of more heads one after another; the accuracy of weighing is not decreased even by gradual pollution of the scale with litter and dirt. An example of entry of two heads one by one is displayed in the following picture:



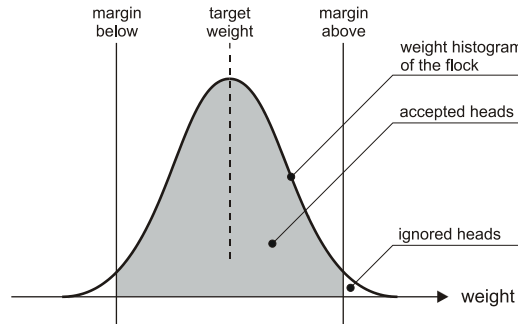
If the head leaves the platform immediately after entry and therefore the weight is not stabilized, the scale does not recognize the entry. The stabilization of weight is defined by parameters *Filter*, *Stabilization* and *Stabilization time* that define the filtration and maximum oscillation of weight for a specified period. If the oscillation during the specified time does not exceed the maximum limit, the weight is evaluated as stabilized. By entering various parameters, we can optimize the scales activity according to the placement of the platform, type and age of poultry, etc.

After a new entry is detected, the scale evaluates whether a valid weighing sample was obtained. This eliminates weighing two heads at the same time, possibly weighing only a partial entry, e.g. when only one leg of poultry is on the scale etc. The evaluation is based on the fact that we approximately know the target weight, i.e. the expected weight of poultry on the given day. Furthermore, we define margins above and below the target weight, which define the tolerance field of weights that are valid for the given day. The following picture describes the situation:

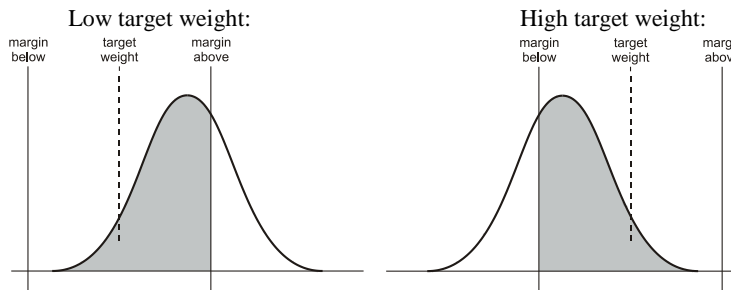


Heads, whose weight falls within the entered tolerance field, are considered as correctly weighed samples and the scale stores them into the memory. Both margins are entered in percents of the target weight.

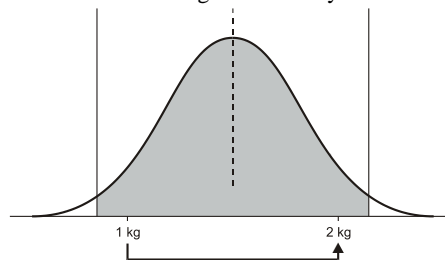
Correct definition of the target weight and tolerance field is essential for weighing accuracy. The target weight should correspond to the real average weight of the flock as much as possible and the tolerance field should contain maximum number of heads in the flock. When properly set, the scale is able to detect maximum number of heads and the number of ignored heads is minimal:



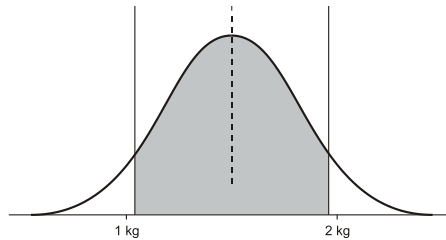
When the target weight or tolerance field is incorrect, heads that should be normally detected are ignored instead:



The tolerance field should not be wider than $\pm 33\%$ of the target weight. With too wide tolerance field, two light heads that jump on the scale simultaneously could be stored wrong as one heavy head:

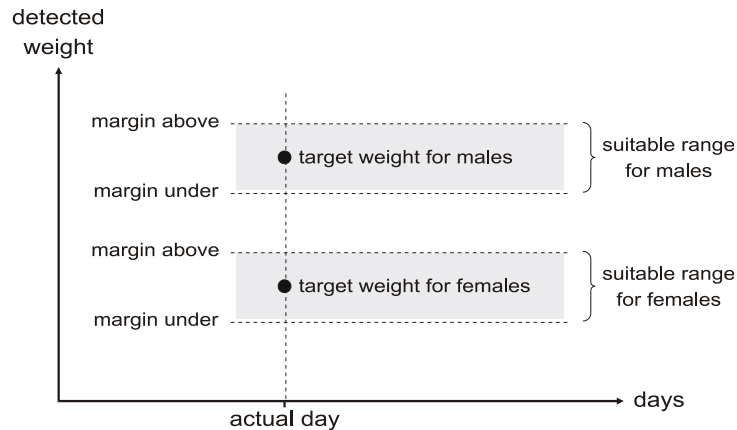


This error cannot occur with the tolerance field lower than $\pm 33\%$:



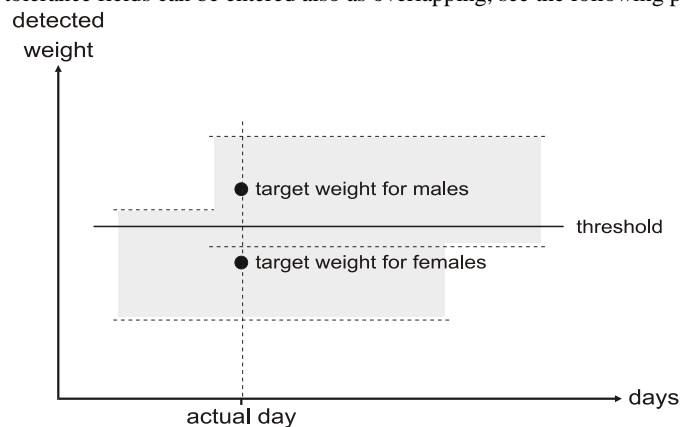
The tolerance field can be entered symmetrically or asymmetrically against the target weight.

The scale moreover allows for automatic evaluation of the gender of weighed heads, where the statistics are evaluated separately for males and females. When weighing both genders, we enter two target weights, one for females and one for males. Also the entered tolerance fields are two, separately for both genders. Weighing of both genders is shown in the following picture:



If the weight of the head falls into the zone for females, the head is stored as a female. If the weight falls into the zone for males, the head is stored as a male.

The target weights and tolerance fields can be entered also as overlapping, see the following picture:



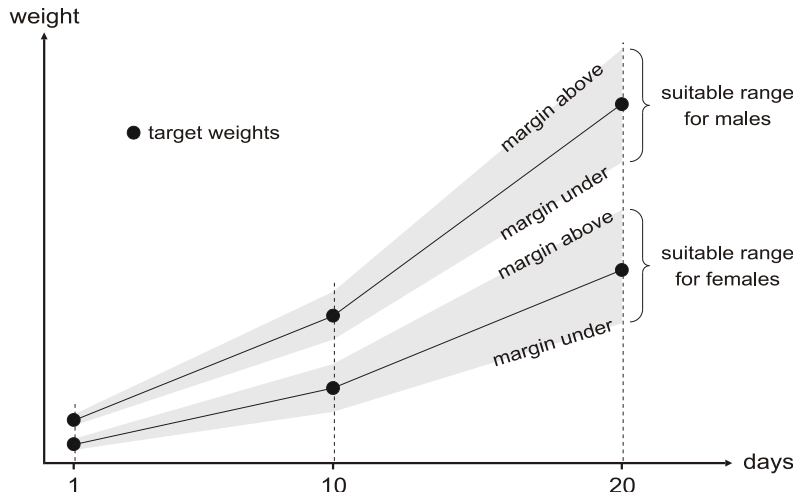
In this case, the limit of male and female differentiation is in the middle of the target weights for females and males.

This shows that exact determination of gender is possible only when the weights of both genders begin to differ substantially. If the target weights of both genders are too close, a lighter male can be incorrectly weighed as a female and, on the contrary, a heavier female as a male. Only narrowing the tolerance field, which leads to a higher number of weighing that fall outside the tolerance field and will therefore not be stored into the memory, can eliminate the overlap.

The target weight can be determined in three ways:

- The user enters a growth curve for the whole weighing
- The user enters only the weight at the beginning of weighing and the target weight for the following days is calculated automatically (automatic mode)
- Combination of both the growth curve and the automatic mode

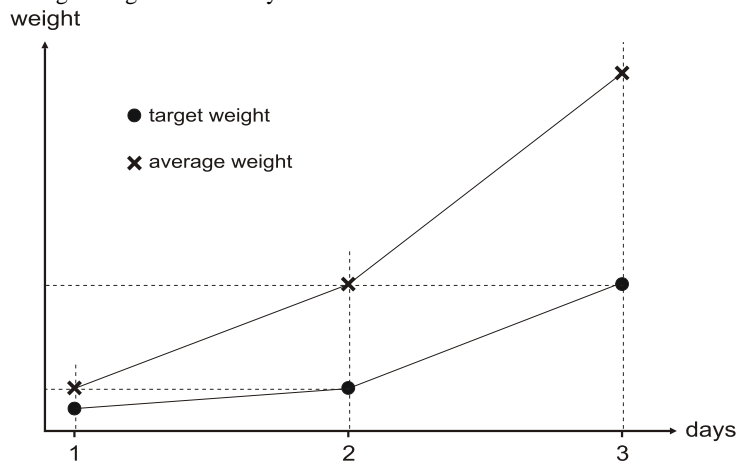
When using the growth curve, we enter the target values in the form of a table, where an exact target weight is defined to certain days. The target weight on other days is calculated as an interpolation from two surrounding days in the table. The growth curve is entered either together or separately for females and males. Weighing according to a growth curve is shown in the following picture:



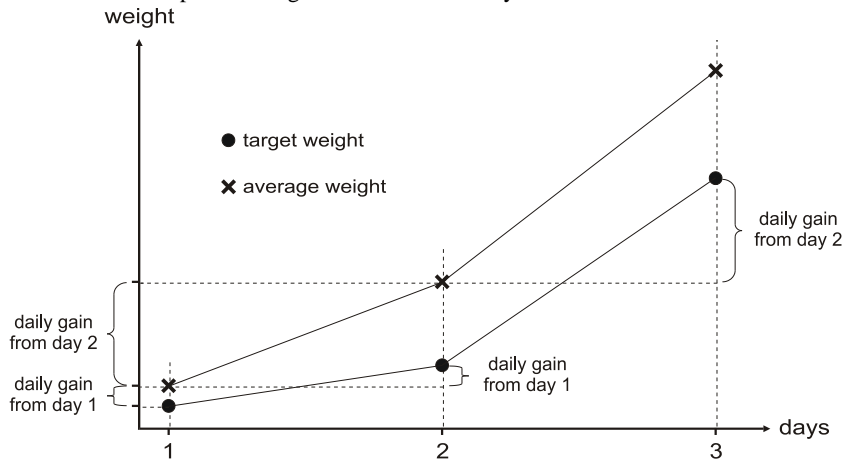
When using the growth curve, we must enter the growth curve before the weighing starts. If we see that the real growth starts to differ from the growth curve during weighing, we can correct the growth curve, but we lose all data that are stored in the memory by that.

In the automatic mode, we enter the target weight at the beginning of weighing only for the first day, either together or separately for females and males. On following days, the scale calculates the target weight automatically as an average weight from the last day or as the average weight plus daily gain from the last day. The daily gain is defined as the average weight from the actual day minus the average weight from the previous day. The scale therefore adapts automatically to the real growth of the flock, so it is not necessary to know and enter the growth curve for the whole time of weighing.

Principle of the automatic mode without use of gain is shown in the following picture. The average weight from the previous day is used as the target weight for next day:



The automatic mode with gain significantly improves adaptation during fast growth, for example in broiler flocks. In this mode, the target weight for the actual day is calculated as the average weight from the previous day plus the daily gain from the previous day, so the scale tries to predict the growth more accurately:



If the weighing is started according to the growth curve, but the growth curve is not defined for the whole weighing, the scale will switch to the automatic mode when the end of the growth curve is reached. For example, if the growth curve is defined only for days 1 to 5, the scale will weigh according to this curve from day 1 to day 5 and it will switch to the automatic mode on day 6 (the curve is not defined for day 6). The scale will keep weighing in the automatic mode until the weighing is stopped. Such a combination of the growth curve and automatic mode is useful when weighing poultry with high and instable growth at the beginning (for example broilers). It is difficult for the automatic mode to adapt to such instable growth during first days, so the growth curve helps to successfully start weighing. Then, after the growth is more stable, the scale can switch to the automatic mode and follow real growth of the flock.

Always at midnight, the current day is stored into the archive and a new day of weighing is started. At midnight, the scale also sends an SMS message with the statistics for the passed day to all defined phone numbers.

2.3. Checking Before Start of Weighing

After turning on, the scale is in the initial condition; weighing is stopped, only the date, time, and actual weight on the platform is shown on the display, e.g. as follows:

STOPPED	15.09.2004 17:28
Weight:	0,039

Before the start of weighing, check the current date and time in the upper right corner. If the date and time are not set properly, adjust it (see Chapter 5.1).

Furthermore, it is useful to check whether the scale weighs correctly. Put a known weight on the platform and the weight increase shown on the display must correspond to the weight added. If the scale does not weigh correctly, calibrate it (see Chapter 5.7.4). Empty scale can show a non-zero weight (due to platform pollution etc.), so monitor only the increase of weight upon putting a weight on the platform.

Some other parameters can be set only with stopped weighing and cannot be changed during weighing. These are the settings of the histogram range and uniformity range (Chapter 5.4). Ensure that these parameters are set properly.

Finally, check if the scale is correctly set to weigh your type of poultry. We recommend using the following settings (see chapter 5 for more information):

Broilers

Use a predefined growth curve for first 4-5 days only. Then, the scale will switch into the automatic mode with gain, which allows the scale to adapt to the real growth of the flock. Use only one gender during weighing. It is recommended to use a correction curve (chapter 5.7.2).

Parents

Use the automatic mode without gain for the whole weighing. Use both genders during weighing.

Turkeys

Use the automatic mode without gain for the whole weighing. Use only one gender during weighing.

Set other parameters as follows:

Parameter	Broilers	Parents	Turkeys
Histogram range	± 40 %	± 25 %	± 40 %
Uniformity range	± 10 %	± 10 %	± 10 %
Margin above the target weight for females	30 %	15 %	30 %
Margin below the target weight for females	30 %	15 %	30 %
Margin above the target weight for males	30 %	15 %	30 %
Margin below the target weight for males	30 %	15 %	30 %
Filter	12	12	12
Stabilization	± 3 %	± 3 %	± 3 %
Stabilization time	3	3	3
Use gain in automatic mode	yes	no	no
Saving mode	enter and leave	enter and leave	enter and leave
Use correction curve	recommended	optional	optional

Keep in mind that these parameters are recommended as default. If you experience any problems, adjust the parameters to suit your needs.

If everything is set correctly, we can start weighing.

2.4. Weighing Start

If you want to start weighing, enter the menu by pressing the key, select item *Start weighing* and press the key. The following menu appears:

Use a predefined flock?
<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes

If you already have a predefined flock, according to which you want to weigh, press the key. If you want to enter parameters of weighing directly, without using of the flock, press the key.

When using a predefined flock, the flock must be already defined, see Chapter 5.3.

2.4.1. Weighing According to a Predefined Flock

If all weighing parameters are defined in a flock, choose the flock that you want to use from the list:

Choose a flock:

▶ 0: BROILERS

Cancel OK

Using arrows, choose the required flock and press the key. The following menu appears:

Starting day:

001

Cancel OK

Using the arrows, enter the day of start of weighing (for example 1 for day-old chicks) and press the key. All parameters set in the flock will be used during weighing.

2.4.2. Direct Entry of Weighing Parameters

If you want to enter all weighing parameters directly when the weighing starts, only the automatic mode can be used and it is not possible to limit weighing by time. The scale shows the following menu:

Use both genders?

No Yes

If you want to differentiate gender during weighing, press the key. If you do not want to differentiate gender, press the key. The following menu appears:

Starting day:

001

Cancel OK

Using arrows enter the day of start of weighing (for example 1 for day-old chicks) and press the key. The following menu appears:

Initial weight:

00,000 kg

Cancel OK

Enter exact current weight of poultry and press the key. If you chose using both genders, enter the current weight for females and males separately. The initial weight must be entered as accurately as possible, preferably according to manual weighing of several heads of both genders or according to an accurate growth curve of the poultry.

2.4.3. Additional weighing parameters

After selection of the predefined flock or after the parameters are entered directly, the following menu appears:

Compare with
another flock?

No Yes

If you want to compare average weight with a growth curve defined in another predefined flock, press the key and select the flock from a list. The selected flock must contain at least one growth curve. If you don't want to compare the results, press the key. The flock that is used for comparison can be changed later during weighing (see Chapter 2.6).

The following menu appears:

Start weighing now?

No Yes

If you want to start the weighing immediately, press the key and the weighing will start immediately.

If the hall is still empty, it is possible to set the scale to start the weighing automatically later on a specified date and time. If you want to start the weighing later, press the key. The following menu appears:

Date:

15.09.2004

Cancel OK

Using arrows enter the start date and press the key. The following menu appears:

Time:

07:28

Cancel OK

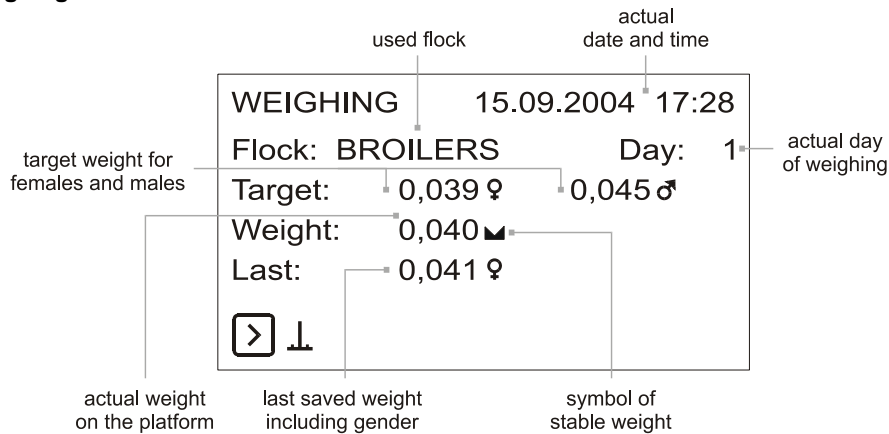
Using arrows enter the start time and press the key. Now the scale will wait till the specified date and time to start the weighing.

2.5. Monitoring the Weighing Course

During weighing, current day of weighing is always shown on the display. It is possible to switch between displaying the weighing status, statistics, histogram, and sample recorder for the current day using the key.

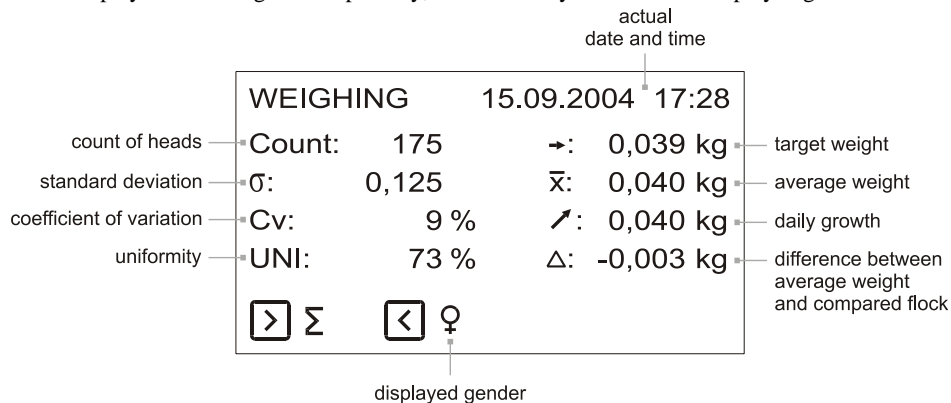
It is also possible to view the archive with results from older days, see Chapter 3.

2.5.1. Weighing Status



2.5.2. Statistics

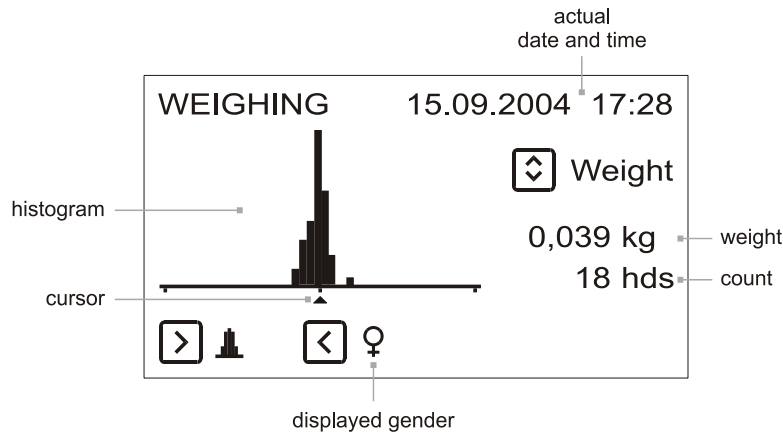
Statistics can be displayed for each gender separately; use the key to switch the displayed gender.



The flock used for comparison can be changed at any time (see Chapter 2.6).

2.5.3. Histogram

The histogram can be displayed for each gender separately; use the key to switch the displayed gender. Using the and keys move the weight cursor in the histogram.



Two outer columns on the left and right side contain the samples outside the histogram range. If the outer columns contain too many samples, it is necessary to increase the histogram range (see Chapter 5.4).

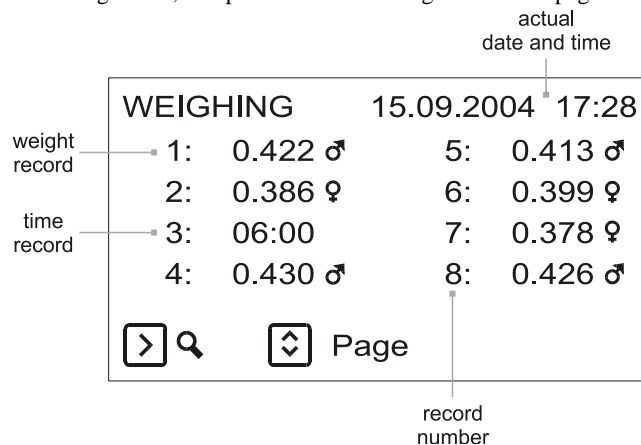
2.5.4. Sample Recorder

The following data are automatically stored into the sample recorder:

- Individual weighed samples including gender
- Time of day (beginning of each hour)

The recorder has a capacity of 1,800 records for each day. If the capacity of the recorder is exceeded (more than 1,800 heads weighed per day), the oldest sample is deleted and a new sample is stored in its place. The recorder therefore always contains the last 1,800 records.

The recorder is displayed for both genders; it is possible to list through individual pages using keys \uparrow and \downarrow .



2.6. Comparing with a theoretic growth curve

The scale can compare real results of weighing with a theoretical growth curve of the poultry. First, create a new predefined flock and define the theoretical growth curve in this flock (see Chapter 5.3). This flock will be used for the comparison.

The comparison can be changed anytime during weighing even when the weighing is stopped. After a new flock for comparison is selected, differences between the average and theoretical weight are recalculated automatically.

If you want to change the comparison, press the \checkmark key to enter the menu, choose *Compare* and press the \checkmark key. The following menu appears:

Compare with another flock?

No Yes

If you want to compare the average weight with a growth curve defined in some predefined flock, press the \checkmark key and select the flock. The selected flock must contain at least one growth curve. If you don't want to compare the results, press the \times key.

The difference between the average and theoretical weight is displayed during weighing even in the archive for all previous days.

2.7. SMS Messages

If the scale is equipped with a GSM module, it is possible to communicate with the scale via SMS messages. At the end of each day, the scale can send an SMS message with statistics of the finished day up to 5 predefined phone numbers. The SMS message with statistics can be sent only once per several days to save money and also at any time during the day upon request.

If the GSM module is logged into a GSM network and ready to communicate, an antenna symbol is displayed in the lower right corner during weighing. After the scale is turned on, the logging in can last for several seconds. If the scale is not set for reply upon request, the GSM module is switched on only during midnight and the antenna symbol is not displayed.

2.7.1. SMS Message Format

Statistics

The message with statistics has the following format:

SCALE 1 DAY 83 10.12.2005 FEMALES: Cnt 75 Avg 3.789 Gain 0.012 Sig 0.286 Cv 8 Uni 80 MALES: Cnt 21 Avg 4.566 Gain 0.005 Sig 0.169 Cv 4 Uni 100

Individual symbols in the message have the following meaning:

Symbol	Meaning
SCALE	Identification number of the scale
DAY	Weighing day number and date
FEMALES	Statistics for females
MALES	Statistics for males
Cnt	Number of weighed heads
Avg	Average weight
Gain	Daily gain
Sig	Standard deviation
Cv	Coefficient of variability
Uni	Uniformity

If gender is not differentiated during weighing, the message contains only one statistics.

Command for sending actual statistics

If you want the scale to send the actual statistics immediately to your mobile phone, send a message with the text *STAT* to the phone number of the scale. The scale sends the stat message in return. If a phone number checking option is enabled in the scale, the number of your phone must be stated in this list, otherwise the scale will not reply (see Chapter 5.5.1).

Command for sending older statistics from archive

If you want the scale to send the statistics from some older day immediately to your mobile phone, send a message with the text *STAT X* (where *X* means the day number) to the phone number of the scale. For example, message *STAT 26* returns statistics from day 26.

2.8. Weighing Pause

If you want to suspend weighing, enter the menu by pressing the key, select item *Pause weighing* and press the key. Weighing is suspended now, so no new samples are stored into the memory.

If you want to resume weighing, enter the menu by pressing the key, select item *Continue weighing* and press the key.

If the scale is weighing according to a predefined flock and a time limitation option has been enabled, the scale switches into the pause automatically according to the time set in the flock. In this case, it is possible to resume weighing at any time manually by selecting the menu *Continue weighing*.

2.9. End of Weighing

After the weighing has been finished, it is necessary to stop weighing manually in the scale. Enter the menu by pressing the key, select item *Stop weighing* and press the key. The following menu appears:

Really stop
weighing of the flock?

No Yes

If you want to end the weighing, press the key. After the end of weighing the results of the current day are stored into the archive. Once the weighing is ended, it is impossible to resume flock weighing and continue. It is always necessary to start a new weighing.

After the end of weighing all data remain stored in the archive until the weighing is started again, see Chapter 3.

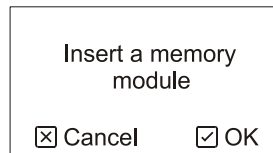
2.10. Data Copying

All data stored in the memory of the scale can be copied into the memory module. Using the memory module it is possible to copy complete settings of the scale into another scale (see Chapter 5.9) or transfer the records to a computer for further processing (see Chapter 4.6).

Before plugging the memory module into the scale, power the scale off by pulling the power connector. Plug the memory module into the scale:



Then turn on the scales. By pressing the key enter the menu, select item *Copy data*, and press the key. The following menu appears:



The memory module is already inserted in the scales, therefore press the key and the records begin to be copied into the memory module. The copying lasts for about 3 minutes and the copying progress is indicated on the display. The result of copying is also shown on the display.

3. Processing the Results in the Scale

The archive in the scales memory contains records and statistics for all days of weighing. Each day in the archive contains the statistics, histogram, and up to 1,800 last stored samples for the given day.

The archive capacity is 370 days of weighing. If the weighing lasts longer, the oldest day is deleted and a new day is stored in its place. The archive therefore always contains the last 370 days; with a longer weighing the days from the beginning of weighing can be lost.

The archive can be viewed during weighing and also after the end of weighing. After the end of weighing the archive remains in the memory until a new weighing is started, when the old archive is deleted and a new archive is being created.

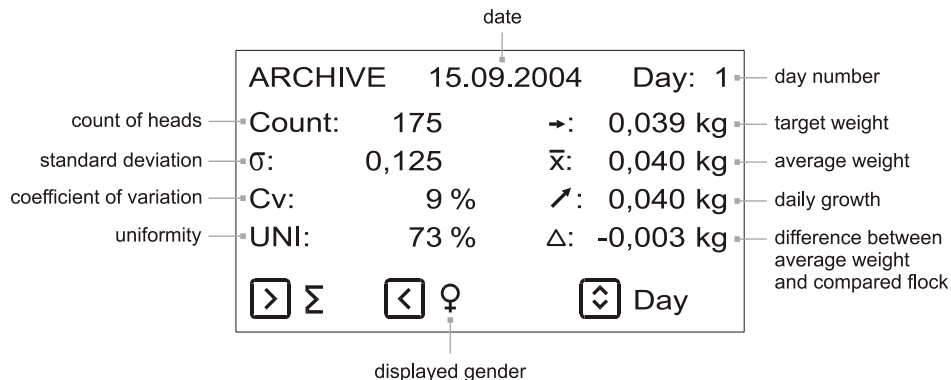
If you want to view the archive, enter the menu by pressing the key, select item *Archive* and press the key.

It is possible to switch between individual days of weighing using arrows and . By holding the key longer, you skip to the last day in the archive. By holding the key longer, you skip to the first day in the archive.

If genders have been differentiated during weighing, switch the displayed gender by the key.

Using the key switch between displaying the statistics, histogram, and sample recorder. The display in archive is similar to the display during weighing.

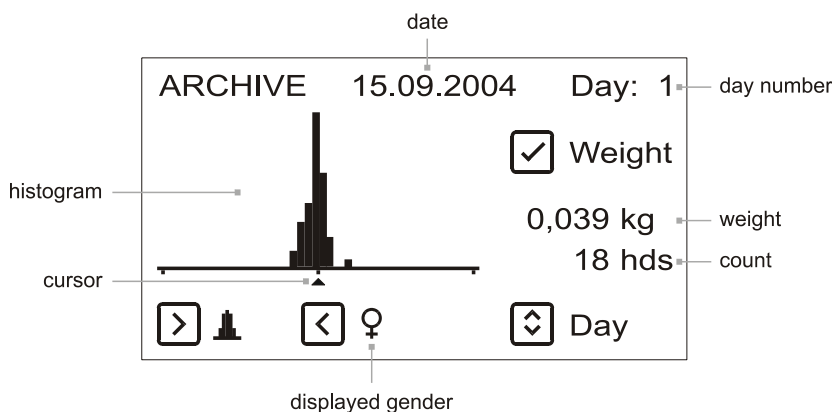
3.1. Statistics



The flock used for comparison can be changed at any time during weighing even when the weighing is stopped (see Chapter 2.6).

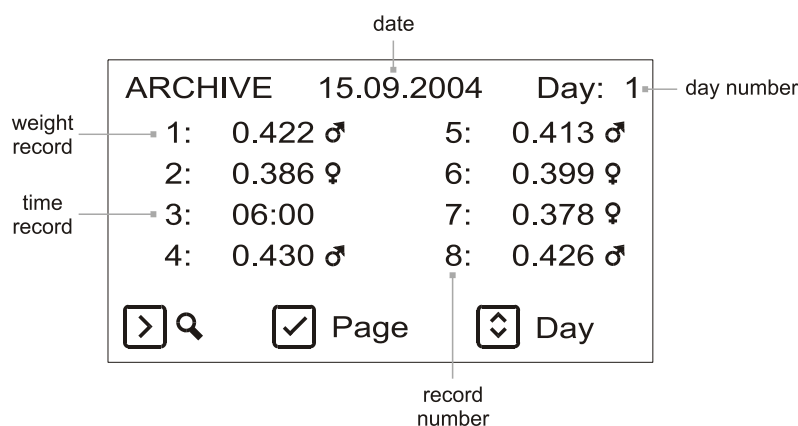
3.2. Histogram

By pressing the key, the cursor in the histogram moves to the right, by holding the key longer, the cursor moves to the left.



3.3. Sample Recorder

By pressing the key it is possible to move the displayed page forwards, by holding the key longer, the pages are moved backwards.



Return from the archive to the menu by pressing the key

4. Processing Data on a Computer

The supplied software allows for simple and comfortable processing of data provided by the scales. Besides viewing the results of weighing, the software also allows for setting the scales from the computer, export and printing of results, remote data collection on your PC via SMS etc.

4.1. Computer Requirements

The supplied software can run on any computer with installed operating system MS Windows 95/98/Me/NT/2000/XP. If export into the Microsoft Excel program is used, Microsoft Excel must be correctly installed in the computer. The computer must have at least one USB port free.

4.2. Scales Communication with the Computer

Data can be transferred to a computer in several ways:

- Using a memory module: If you want to transfer the results of weighing into the computer, the data from the scale are first copied into the memory module. The memory module is then brought to the computer, where it is plugged into a memory module reader, and the data are downloaded into the computer. Similarly, also when setting the scales from the computer, the settings are transferred to the scales from the computer using the memory module. The scale therefore does not have to be carried to the computer or vice versa.
- Using GSM communication: the scales can send an SMS with daily statistics to a GSM modem connected to the computer.
- Using communication over RS-485 line: monitoring, setup and full commanding of the scales can be done comfortably from the computer over the RS-485 line.

4.3. Installation

Before the first use it is necessary to install the software and drivers to the computer. The installation should be done in the following order:

- Insert the installation CD into the drive
- Install the software
- Leave the CD in the drive
- Connect the memory module reader to the computer and install the drivers
- Connect the GSM modem to the computer and install the drivers. If you don't have the GSM modem, skip this step.
- Connect a USB-RS485 converter and install the driver. If your scales are not connected over the RS-485 line, skip this step.

The steps mentioned above are described in the following chapters.

4.3.1. Software Installation

Before the first use it is necessary to install the software to the computer. It is installed from the supplied CD that is inserted into the drive in the computer. If an automatic CD start is enabled in the computer, the installation program starts automatically after a while. If your computer does not support automatic starting of CD, it is necessary to start the program *Setup.exe* in the folder *Software* on the CD manually.

After the installation program starts, the following window appears:



After clicking the *Next* button in every window, the installation takes place automatically.

Note: The program is installed by default to drive C: into the folder *Program Files\Bat2*.

4.3.2. Connection of the Reader to the Computer

Insert the installation CD into the drive, wait until the installation software starts and then quit the installation. Now connect the reader to a free USB port:



After a short while, Windows will detect a new device and then ask for a driver. Choose searching the driver on a CD and finish the installation. Complete installation of the driver can take several minutes.

4.3.3. Connection of the GSM modem to the Computer

If your package contains also a GSM modem, insert the installation CD into the drive, wait until the installation software starts and then quit the installation. Insert a working SIM card into the GSM modem. If the modem is powered from the mains, connect it to the mains. Then connect the modem to a free USB port in the PC. The GSM modem must be connected directly to the computer; you cannot use any USB hub. After a short while, Windows will detect a new device and then ask for a driver. Choose searching the driver on a CD and finish the installation. Complete installation of the driver can take several minutes.

4.3.4. Connection of the USB-RS485 converter to the Computer

If your package contains also a USB-RS485 converter, insert the installation CD into the drive, wait until the installation software starts and then quit the installation. Connect the converter into a free port in the PC. After a short while, Windows will detect a new device and then ask for a driver. Choose searching the driver on a CD and finish the installation. Complete installation of the driver can take several minutes.

4.4. Program Start

If you want to start the program, click the *Start* button, select folder *Programs*, and here folder *Bat2*. There is the icon of the program with title *Bat2*, click this icon and the program will start after a moment.

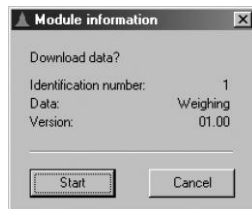
If the program is started for the first time, it will first ask for the language, in which it will communicate. Select the required language from the list and click *OK*.

4.5. Language Setup

If you want to change the language, you can choose it in the menu *Options / Language*. After changing the language, close the program and restart it.

4.6. Reading Data from the Memory Module

If you want to read all data from the memory module into the computer, plug the module into the reader and choose menu *Scale / Read data*. The following window appears:



If *Online* is stated near item *Data*, the module contains diagnostic data from online weighing (see Chapter 5.10). Check whether the identification number of the scales corresponds and click the *Start* button. Reading of records lasts several minutes. After all data are read, the program asks for the title of the file, into which the data are saved on the drive, and the content of the read file is displayed in the program.

Note: The size of the created file can be up to 9 megabytes.

Note: reading data using GSM or RS-485 is described in chapters 4.16 and 4.15.

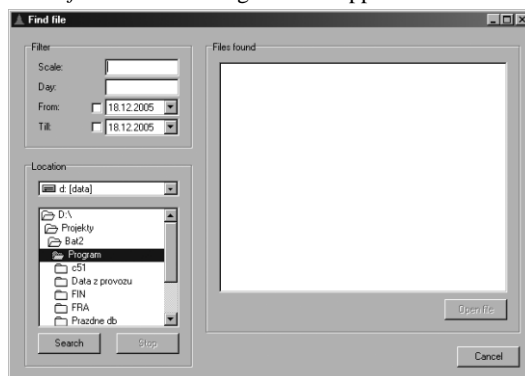
4.7. Opening an Existing File

If you want to open an already existing file, select item *Open* in menu *File*. A window with the list of all stored files so far appears. Choose the file from the list that you want to open and click on *Open*. The selected file opens and its content is displayed in the main window of the program. One file contains always one weighing.

Display of the results varies according to whether the file contains normal weighing or diagnostic online weighing. The display is explained in the following chapters.

4.8. Searching for the Files

The software allows for searching of files according to specified conditions, such as scale number, day and date of weighing. In menu *File* choose item *Find file*. The following window appears:



First, enter conditions for the search in the *Filter* box. Meaning of the items is explained in the following table:

Item	Meaning
Scale	Identification number of the scale (optional)
Day	Number of the weighing day (optional)
From	Start date of the time period (optional if unchecked)
Till	End date of the time period (optional if unchecked)

In the *Location* box, choose location on the hard disk where the files should be searched. Then click the *Search* button to start searching; the list on the right side will be filled with files matching the entered conditions. After the search is finished, choose one file in the list and click *Open file* to open the selected file.

4.9. Viewing the Weighing Results

The file content is sorted into several tabs, where the following is displayed:

Tab	Content
Report	Report with statistics from all days for the selected gender
Samples	All stored samples of the selected gender for the selected day
Statistics	Statistics of the selected gender for the selected day
Histogram	Histogram of the selected gender for the selected day
Day activity	Activity of the selected gender during the selected day
Total activity	Activity of the selected gender during the entire weighing

Growth curve	Growth curve during the entire weighing
Setup	Settings of the scale
Information	Information about the open file

All displayed charts can be zoomed in, zoomed out and moved.

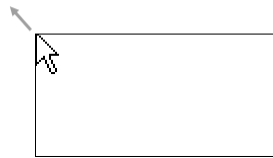
If you want to zoom in a certain part of the chart, click the left mouse button on the upper left corner of the required cutout, hold the button and move to the lower right corner of the cutout. Release the button here and the selected cutout is magnified to the entire chart.

The situation is displayed in the following picture:



If you want to return to the original scale and therefore display the entire chart, click the left mouse button, hold it, and move a bit to the left and up. Release the button and the chart scale resets to the initial value.

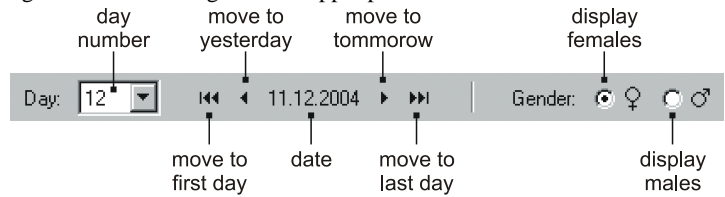
The situation is displayed in the following picture:



If you want to move the magnified chart, click and hold the right mouse button. If you now move the mouse, the chart will scroll together with the mouse cursor. In this way you can move the chart horizontally and vertically and view the chart gradually.

4.9.1. Selection of Displayed Day and Gender

The displayed day and gender can be changed in the upper part of the window:



If the file contains only one gender, the part for gender change is not displayed.

4.9.2. Report

In the tab *Report*, there are all statistic values for all weighing days for the selected gender:

Day	Date	Count	Average	Daily gain	St. deviation	Cv [%]	UNI [%]	Compare	Difference
1	15.3.2005	27	0.046	0.046	0.005	11	59	0.048	-0.002
2	16.3.2005	218	0.048	0.002	0.005	11	59	0.059	-0.011
3	17.3.2005	198	0.059	0.011	0.006	10	75	0.078	-0.019
4	18.3.2005	683	0.075	0.016	0.010	14	48	0.098	-0.023
5	19.3.2005	892	0.091	0.016	0.013	15	43	0.117	-0.026
6	20.3.2005	992	0.109	0.018	0.016	14	46	0.151	-0.042
7	21.3.2005	845	0.128	0.019	0.018	14	48	0.186	-0.058
8	22.3.2005	909	0.145	0.017	0.022	15	43	0.220	-0.075
9	23.3.2005	894	0.163	0.018	0.025	15	43	0.255	-0.092
10	24.3.2005	973	0.186	0.023	0.027	14	46	0.289	-0.103
11	25.3.2005	1067	0.212	0.026	0.033	15	41	0.340	-0.128
12	26.3.2005	1132	0.238	0.026	0.039	16	38	0.391	-0.153
13	27.3.2005	1086	0.271	0.033	0.042	15	41	0.441	-0.170
14	28.3.2005	1223	0.312	0.041	0.048	15	41	0.492	-0.180
15	29.3.2005	1276	0.362	0.050	0.056	15	39	0.543	-0.181
16	30.3.2005	1286	0.414	0.052	0.063	15	41	0.607	-0.193

In the top right part of the window, you can select a theoretical growth curve that you want to compare with the average weight. After the curve is selected, additional columns *Compare* and *Difference* are shown in the table. These columns contain theoretical weight and a difference between the average and theoretical weight for the given day. For more details about the growth curves definition, see Chapter 4.13.

4.9.3. Samples

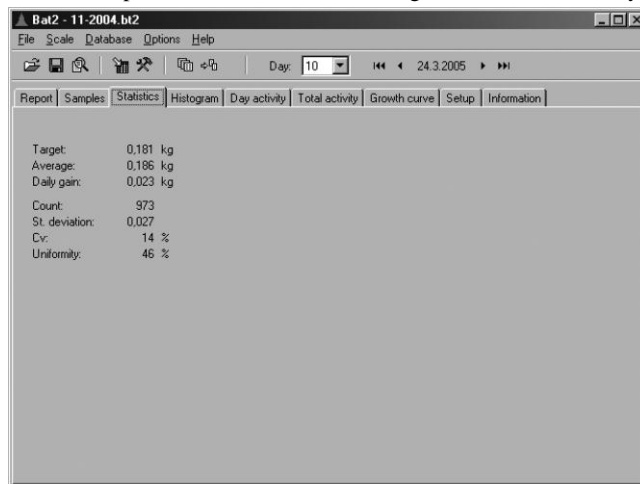
In the tab *Samples*, there are all samples stored in the recorder for the current day:

Sample	Hour	Weight
1	19	0.048
2	19	0.050
3	20	0.046
4	21	0.044
5	21	0.044
6	22	0.049
7	22	0.043
8	22	0.045
9	22	0.052
10	22	0.051
11	22	0.044
12	23	0.044
13	23	0.048
14	23	0.045
15	23	0.053
16	23	0.033
17	23	0.046
18	23	0.051
19	23	0.034

Each record contains a number and hour, when the record was stored. Each day can contain maximally 1,800 records. If the number of the last sample in the table is equal to 1,800, samples from the beginning of the day can be lost from the table.

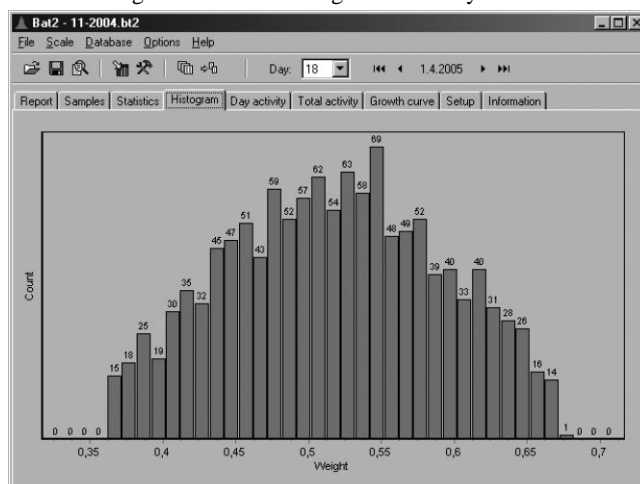
4.9.4. Statistics

In the tab *Statistics*, there are the complete statistics of the selected gender and selected day:



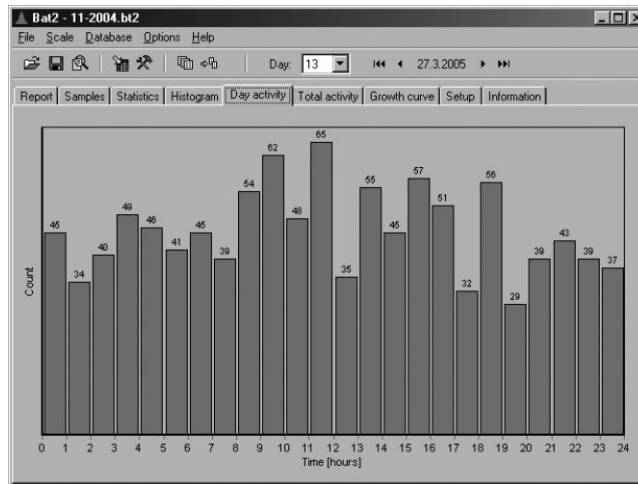
4.9.5. Histogram

In the tab *Histogram*, there is the histogram of the selected gender and day:



4.9.6. Daily Activity

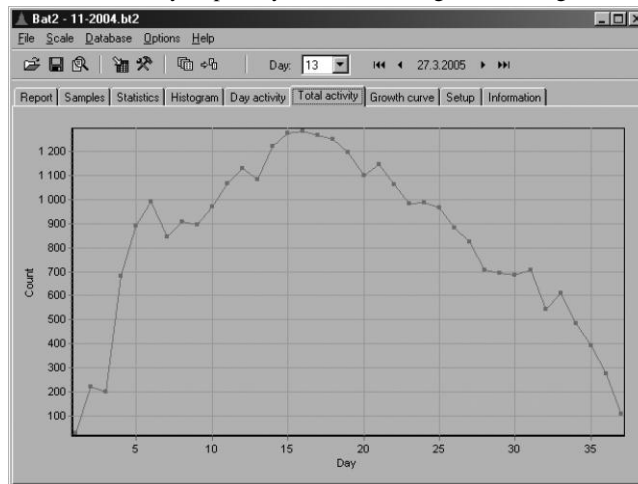
In the tab *Day activity*, there is the activity of poultry of the selected gender during the displayed day:



The column height corresponds to the number of weighed heads during the given hour.

4.9.7. Total Activity

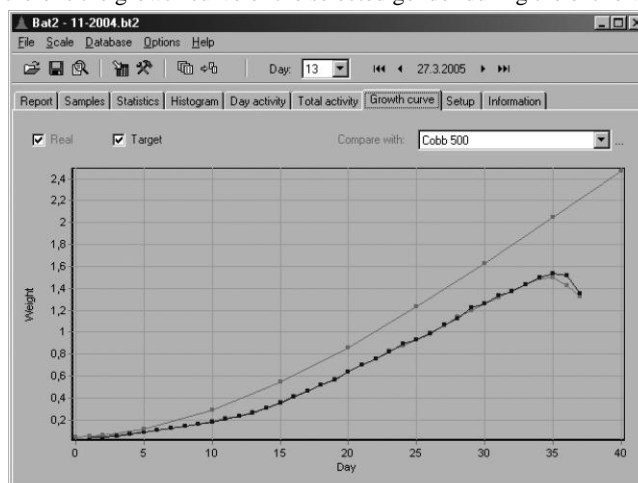
In the tab *Total activity*, there is the activity of poultry of the selected gender during the entire weighing:



The total number of weighed heads in individual days of weighing is displayed in the chart.

4.9.8. Growth Curve

In the tab *Growth curve*, there is the growth curve of the selected gender during the entire weighing:

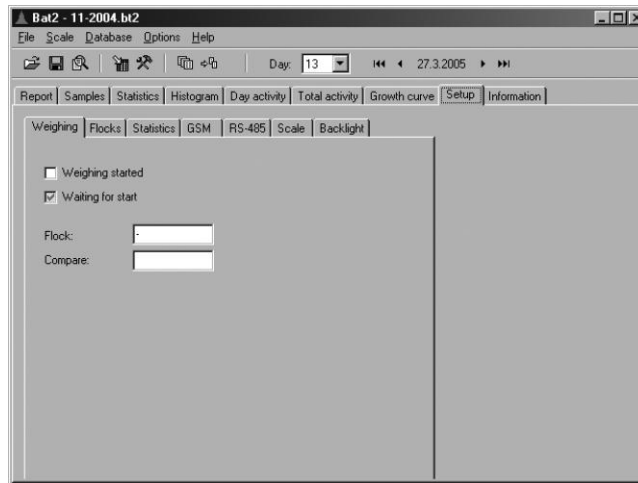


The option *Real* displays or hides the real growth curve, i.e. the curve created from average weights of individual days. The option *Target* displays or hides the curve of target weights of individual days.

In the top right part of the window, you can select a theoretical growth curve that will be displayed in the graph for comparison. For more details about the growth curves definition, see Chapter 4.13.

4.9.9. Settings

In the tab *Setup* there is the complete setup of the scales at the moment of copying of data from the scale to the memory module:



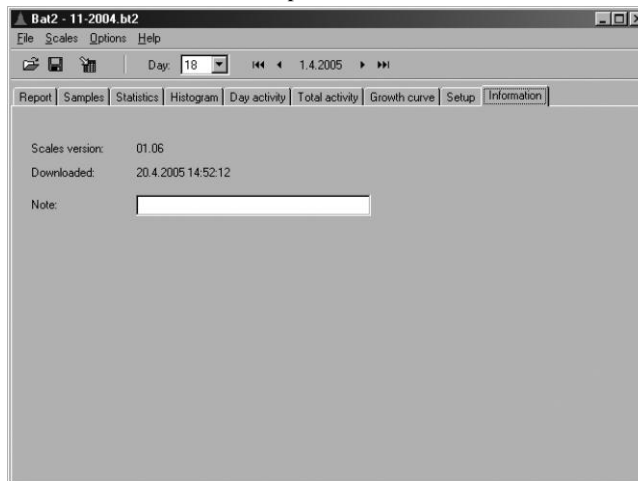
The meaning of individual tabs is in the following table:

Tab	Content
Weighing	Information about the weighing condition
Flocks	Settings of predefined flocks
Statistics	Statistics settings
GSM	GSM module settings
RS-485	RS-485 line settings
Scale	Scales settings

More about scales settings and the meaning of individual items in Chapter 4.16.

4.9.10. Information

In the tab *Information*, there is information about the open file – version number and date of data reading:



You can enter a note for the open file to the *Note* field. After entering the note, it is necessary to save the file in menu *File / Save*.

4.10. Viewing the Results of Online Weighing

When displaying online weighing, only the table and chart of weighing course, scales settings, and information about the file are displayed.

4.10.1. Table

In the tab *Online table*, there is the table with records from online weighing for the selected day:

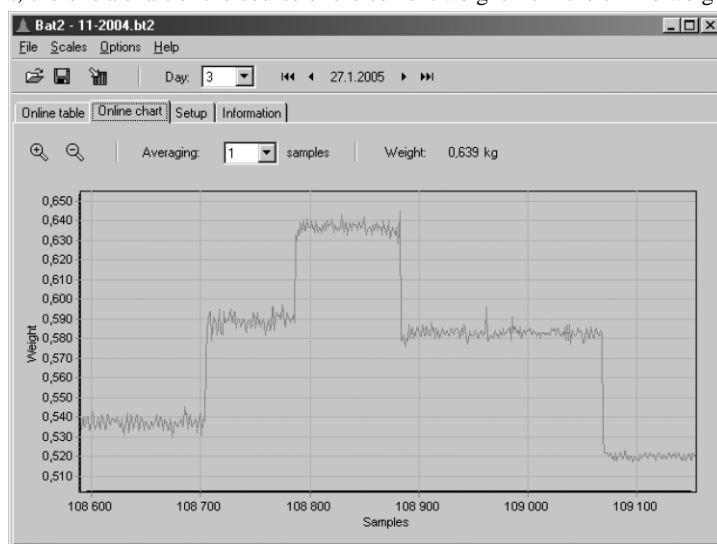
Sample	Hour	Weight	Stable	Saved
17	14	0,047	1	0
18	14	0,037	1	0
19	14	0,02	1	0
20	14	0,011	1	0
21	14	0,396	0	0
22	14	1,11	0	0
23	14	1,292	0	0
24	14	1,036	0	0
25	14	0,99	0	0
26	14	0,994	0	0
27	14	0,954	1	1
28	14	0,995	1	0
29	14	0,996	1	0
30	14	0,987	1	0
31	14	0,993	1	0
32	14	1,004	1	0
33	14	1,037	1	0
34	14	0,984	1	0
35	14	1,002	1	0

If value 1 is in column *Stable*, the scale was stable at the given moment. If value 1 is in column *Saved*, during normal activity the scales would store the sample into the memory at that moment.

Note: If the memory was completely filled during online weighing, the day and hour do not have to correspond to reality.

4.10.2. Chart

In the tab *Online chart*, there is a chart of the course of the current weight from the online weighing for the selected day:



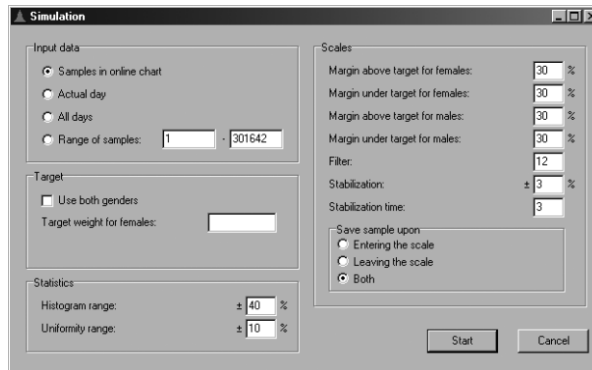
You can change averaging of the curve in the upper part of the window. If the records were measured using filter 1, the selected averaging corresponds with the filter.

4.10.3. Simulation

Using simulation it is possible to check if the scales properly detect heads entering the weighing platform and if the detected weight is accurate enough. Records measured during online weighing are used for the simulation.

Simulation in the software runs the same algorithm as is used in the scales, so the results of the simulation are the same as if the weighing ran directly in the scales. The calculations in the simulation take only several seconds, so you can change the saving parameters, repeat the simulations several times and find the ideal parameters for your specific situation very quickly.

If you want to optimize the scale using simulation, first set the filter in the scale to 1 and start the online weighing. After finish of the weighing, read the online records into your computer and select menu *File / Simulation*. The following window appears:



First select the area of records that you want to use during simulation. If you want to check the accuracy of detected weight, zoom the online chart to one entry and select *Samples in online chart*. If you want to check total number of detected heads during one day, select *Actual day*.

Next, enter target weight for the actual day and all saving parameters that will be used during simulation.

Start the simulation by clicking the *Start* button. After the simulation is finished, a new window with results (statistics and histogram) will be displayed.

You can repeat the simulation several times with different parameters. Remember the parameters that achieve the best results, enter them into the scale and try in regular weighing.

4.11. Export to Excel

If you have Microsoft Excel installed in the computer, you can export the following data to it:

- Table with statistics report
- Table with samples from the recorder
- Table of histogram for the selected day
- Table of daily activity during the day
- Table of total activity during the entire weighing
- Table of the growth curve during the entire weighing
- Table with records from online weighing

If you want to export the data, select in menu *File / Export to Excel* the chosen type of export. During export the program Excel starts and the data begin to be exported to it. After the end of export, it is possible to work with the data in Excel in the usual manner.

Note: Export of the table with online weighing can take a longer time.

4.12. Printing

The program allows for printing the following data:

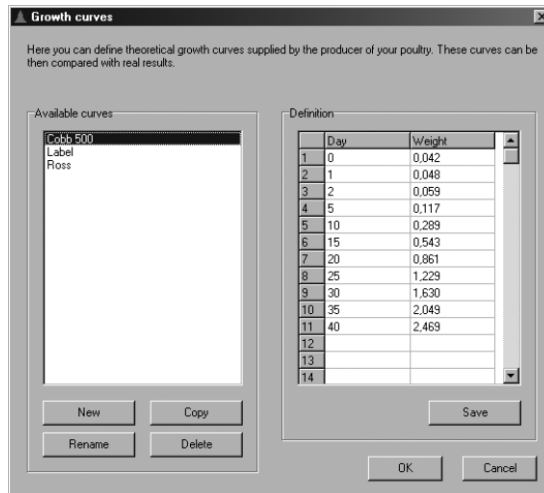
- Table with statistics report
- Table with samples from the recorder
- Chart of histogram for the selected day
- Chart of daily activity during the day
- Chart of total activity during the entire weighing
- Chart of the growth curve during the entire weighing
- Chart of online weighing

If you want to print the data, select in menu *File / Print* the chosen type of printout. Before printing, the print preview window shows first; clicking the printer icon in the preview window starts the actual printing.

4.13. Definition of growth curves

All growth curves used in this software can be defined in one place. Once defined, a growth curve can be compared with real results of weighing to get a difference between the average weight of the flock and the theoretical weight. The growth curves can be also simply used in predefined flocks in the scale.

If you want to define the growth curves, select menu *Scale / Growth curves*. The following window appears:



If you want to create a new growth curve, click *New* and enter a name of the curve. Then, define the growth curve in the table on the right side and click *Save*.

To rename a growth curve, select it in the list, click *Rename* and enter a new name.

If you want to create new growth curve and use the definition from another curve, select the source curve in the list, click *Copy* and enter a name of the new curve. The new growth curve will contain the same definition as the source curve.

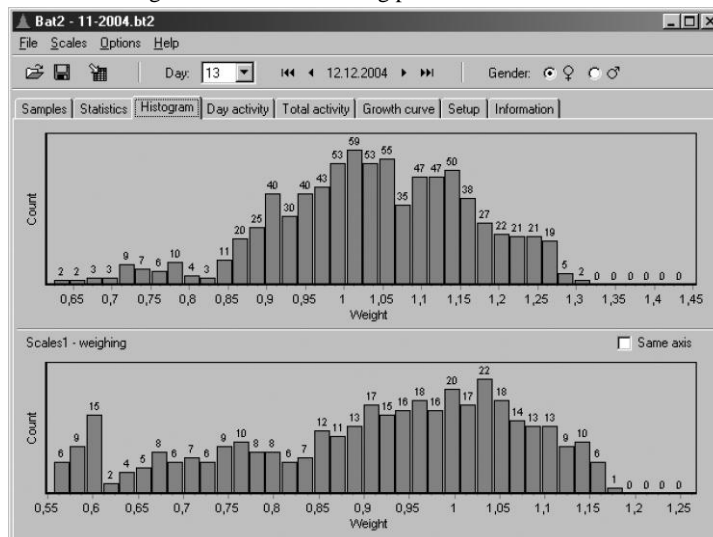
To delete a growth curve, select the curve and click *Delete*.

4.14. Comparing Two Files

It is possible to quickly and easily compare two weightings stored in two files in the program. First open the first file; the data from this file are displayed in a regular manner. Then select menu *File / Open for comparison* and select the second file that you want to compare with the first open file. The data from the second file will always display in individual tabs next to or under the data from the first file so that a simple comparison is possible. The data of the second file are always marked with the name of the file or text *Comparison*. It is possible to compare the following data:

- Statistics: The statistics of the second file is displayed next to the statistics of the first file
- Histogram: Chart of histogram of the second file is displayed under the chart of the first file. By option *Same axis* set the same scale of axis with both charts.
- Daily activity: The chart of daily activity is displayed under the chart of the first file.
- Total activity: Courses of total activity from both files are displayed in one chart.
- Growth curve: Courses of the growth curve from both files are displayed in one chart.

Example of comparison of two histograms is in the following picture:



A change of day or gender occurs in both open files at the same time.

Note: If the open file contains online weighing, a second file cannot be opened.

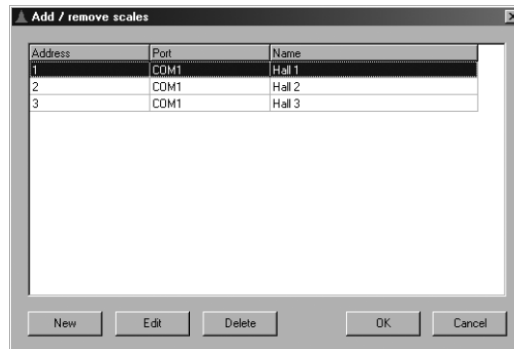
4.15. Communication over RS-485 line

All scales in the halls can be connected to a computer using an RS-485 line. Once connected, each scale can be monitored and fully operated from the PC. Additionally, all parameters can be set from the PC and all results can be read to the PC.

If you want to operate scales connected to the PC, select menu *Scale / RS-485 scales*.

4.15.1. Scale Definition

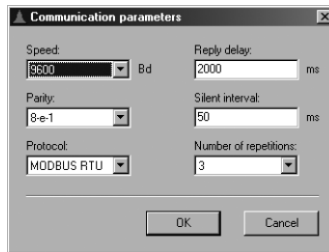
Before you start working with the RS-485 scales, you have to define a list of all scales that are connected to the PC. Select menu *Options / Add/remove scales* to show a list of defined scales:



For each scale, define its address, number of serial port and name of the scale. Click *OK* when all scales have been defined.

4.15.2. Communication Parameters

All scales connected to the PC must share the same communication parameters. The same parameters must be set in the PC as well. Select menu *Options / Communication parameters*. The following window appears:

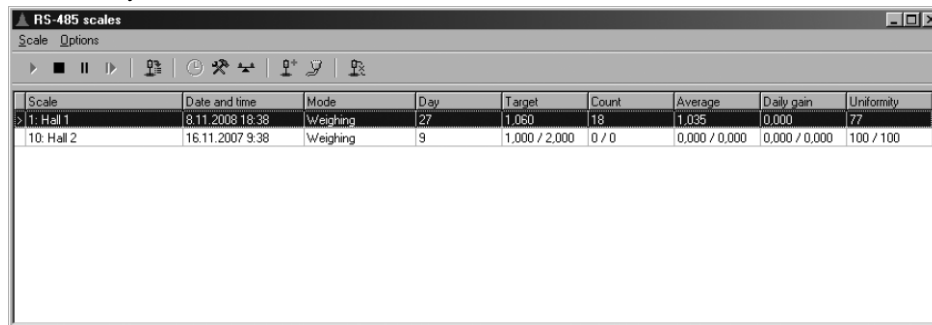


Items *Speed*, *Parity*, *Protocol* and *Silent interval* must be set the same as in all the scales. Meaning of other items is the following:

- *Reply delay*: maximum time that the PC will wait for a reply from the scale
- *Number of repetitions*: Number of retries when a communication error occurs

4.15.3. Monitoring of the Scales

If all scales have been defined and correct communication parameters have been set, all scales are monitored automatically and a current state of all scales is shown in the main window:



4.15.4. Operating the Scales

To start, pause or stop weighing of any scale in the list, select menu *Scale* and the corresponding item.

4.15.5. Reading Data

To read the weighing results, select the scale in the list and select menu *Scale / Download results*. All data will be saved into a *bt2* file, similarly to reading data from the memory module. In the results read over the RS-485 line, individual weightings and daily activity is missing.

4.15.6. Scales Setup

The following parameters can be set in menu *Scale*:

Menu *Set date and time*: set day and time in the scale to current PC time.

Menu *Scale setup*: settings of all scale parameters.

Menu *Compare*: setup of comparison of results with a theoretical growth curve.

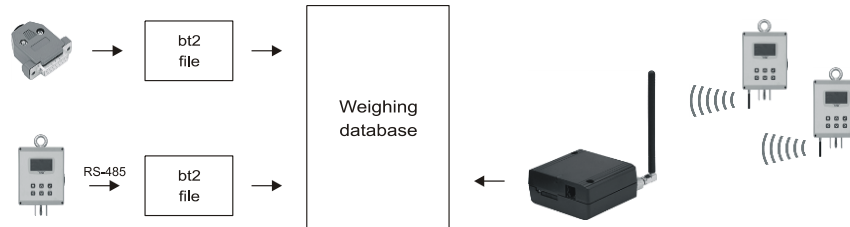
4.15.7. Communication Errors

Select menu *Options / Communication errors* to show number of errors during the communication. When the error rate is too high, change communication parameters and check the cables.

4.16. Weighing database

The weighing database serves for well-arranged archiving of statistics from all weighing made. The database contains all statistics in one table, so it is possible to work with them very quickly. When searching older records, it is not needed to search in many files with individual weighing. Statistics from all weighing are simply accessible in the weighing database.

Inserting of records into the database is described on the following picture:



Statistics can be inserted into the database in several ways:

1. Using the memory module, transfer data from the scale into the computer and create a file with the *bt2* extension. This file contains all data from one weighing, i.e. statistics, histograms, individual samples etc. It is possible to copy the statistics from this file to the weighing database.
2. If the GSM modem is used, it is possible to receive SMS with daily statistics from all scales. Every SMS is automatically decoded and inserted into the weighing database.
3. If the scale is connected to the PC over the RS-485 line, read the data to the PC and save it as a file with the *bt2* extension, the same as when reading data from the memory module. It is possible to copy the statistics from this file to the weighing database.
4. It is also possible to insert records manually by hand. For example, the database can contain statistics from manual weighing.

4.16.1. Showing the weighing database

If you want to show the weighing database, choose menu *Database / Show weighing database*. The following window appears:

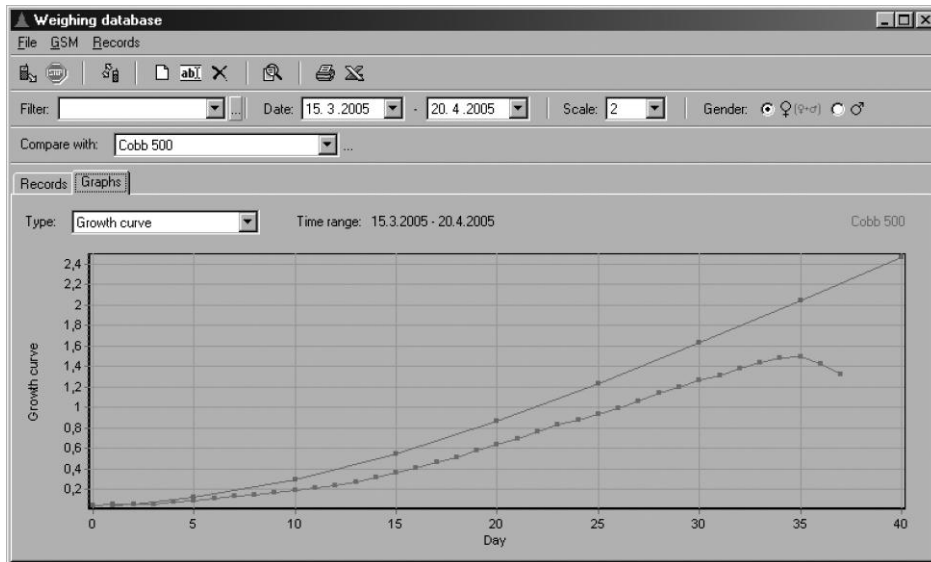
Date	Scale	Day	Count	Average	Gain	Std. dev.	Cv	Uni	Compare	Difference	Note
6.4.2005	2	23	983	0,828	0,068	0,117	14	48	1,082	-0,254	
7.4.2005	2	24	987	0,878	0,050	0,130	15	44	1,155	-0,277	
8.4.2005	2	25	968	0,930	0,052	0,130	14	47	1,229	-0,299	
9.4.2005	2	26	883	0,997	0,067	0,133	13	49	1,309	-0,312	
10.4.2005	2	27	823	1,061	0,064	0,151	14	48	1,389	-0,328	
11.4.2005	2	28	705	1,140	0,079	0,149	13	51	1,470	-0,330	
12.4.2005	2	29	694	1,198	0,058	0,171	14	48	1,550	-0,352	
13.4.2005	2	30	686	1,264	0,066	0,160	13	52	1,630	-0,366	
14.4.2005	2	31	708	1,318	0,054	0,180	14	52	1,714	-0,396	
15.4.2005	2	32	542	1,377	0,059	0,186	13	55	1,798	-0,421	
16.4.2005	2	33	611	1,437	0,060	0,197	14	51	1,881	-0,444	
17.4.2005	2	34	485	1,485	0,048	0,215	14	44	1,965	-0,480	
18.4.2005	2	35	394	1,500	0,015	0,243	16	41	2,049	-0,549	
19.4.2005	2	36	275	1,426	-0,074	0,256	18	28	2,133	-0,707	
20.4.2005	2	37	108	1,322	-0,104	0,220	17	37	2,217	-0,895	

The *Records* page contains a table with individual records in the database sorted by date. Each record in the database is uniquely identified by:

- Date and number of the weighing day
- Identification number of the scale

Each record contains all statistic values of the day except of histogram and individual samples. If males and females are weighed separately, the records contain statistics for both genders. Records inserted into the database today are displayed using a bold font. It is also possible to filter the records for easier work, see chapter 4.15.2. It is also possible to compare the results with a theoretical growth curve, see chapter 4.15.3.

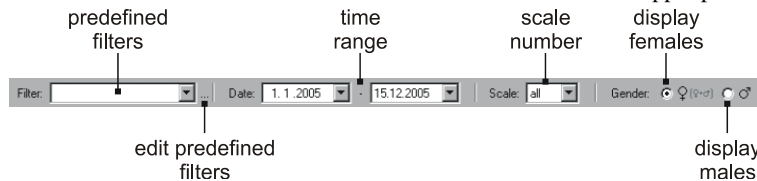
The *Graphs* page contains graphs of all statistic values during the weighing:



If you want to display the graph, first you need to select a scale number and time period in the filter (see chapter 4.15.2). The selected time range has to be continuous, i.e. the day number should be increasing. If the time range is not continuous, the graph is finished with the last day of the continuous section. In the growth curve graph, it is possible to display a theoretical growth curve for comparison, see chapter 4.15.3.

4.16.2. Filtering the records

Records in the database can be filtered according to the date, identification number of the scale and gender. It is possible to create predefined filters for faster and more comfortable work. Filters can be set in the upper part of the window:



Setting the filter

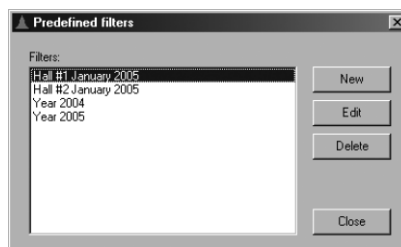
Meaning of the items is described in the following table:

Item	Meaning
Filter	Selection of the predefined filter (explained further)
Date	Displayed time range
Scale	Displayed scale number
Gender	Displayed gender (if the weighing contains only one gender, choose females)

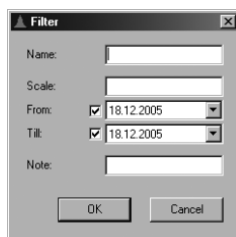
Predefined filters

For easier and faster work with filters, it is possible to create predefined filters. After choosing the predefined filter from the list, time range and scale number from the predefined filter is selected.

If you want to add, edit or delete a predefined filter, choose menu *Records / Predefined filters*. The window with all existing predefined filters appears:



Click *New* to create a new predefined filter. The following window appears:



Meaning of the items is explained in the following table:

Item	Meaning
Name	Name of the predefined filter
Scale	Identification number of the scale (optional)
From	Start date of the time period (optional if unchecked)
Till	End date of the time period (optional if unchecked)
Note	Note

Enter all values and click *OK*.

If you want to edit a filter, choose it from the list and click *Edit*. If you want to delete a filter, choose it from the list and click *Delete*.

4.16.3. Comparing with a theoretical growth curve

Results from all scales can be compared with growth curves that are defined in the list of growth curves (menu *File / Growth curves*, more in chapter 4.13).

If you want to compare the results with some growth curve, select the curve from the *Compare with* list in the top part of the window. After the curve is selected, additional columns *Compare* and *Difference* are shown in the table. These columns contain theoretical weight and a difference between the average and theoretical weight for the given day. The selected growth curve is also displayed in the growth curve graph.

4.16.4. Inserting records into the database

Copying records from the open file

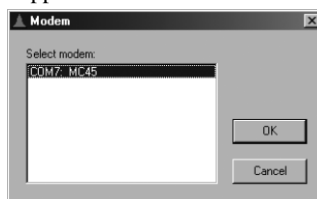
If you want to insert a record from a file into the database, open the file and choose menu *Database / Add to weighing database*. Choose days you want to insert and click *OK*. If the record already exists in the database, the software will ask if you want to overwrite it. After the copying is finished, a new predefined filter corresponding to the copied records can be created.

Receiving records via the SMS

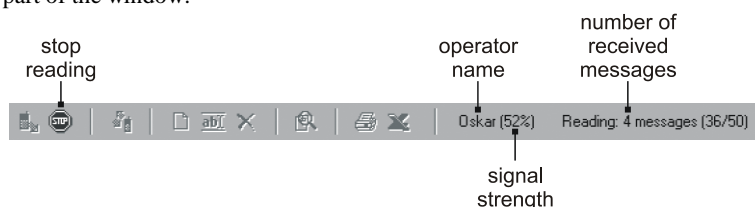
If the GSM modem for PC is used, it is possible to receive the SMS with statistics from the scales into the computer. All received SMS are decoded and the statistics contained in the SMS is inserted into the database. Thanks to the GSM modem, all scales can be monitored remotely from your office.

The SMS can be received either automatically each midnight or anytime upon request.

If you want to receive the midnight SMS, first set all scales to send the midnight SMS to the phone number of the GSM modem connected to the computer. If you want to read all messages from the GSM modem, connect the GSM modem to the mains and to the computer and wait several minutes, until all the messages are read into the GSM modem. Then choose menu *GSM / Start reading SMS*. The following menu appears:



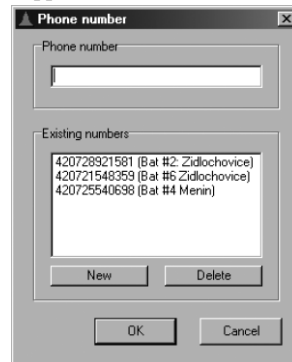
Select the GSM modem from a list of all installed modems and click *OK*. During reading the SMS, there is a status displayed in the upper part of the window:



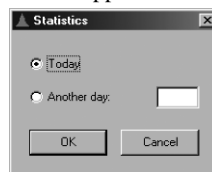
All received SMS are immediately decoded and inserted into the database. If the record already exists in the database, the software will ask if you want to overwrite it. After all the messages are read, finish the reading by choosing the menu *GSM / Stop reading SMS*.

If you want to check the actual statistics or the midnight SMS from some scale was not received, it is possible to send a request to the scale. After receiving the SMS with the request, the scale should immediately send the actual statistics from the

selected day. This statistics is then inserted into the database. If you want to send the request to some scale, choose menu *GSM / Request statistics*. The following window appears:



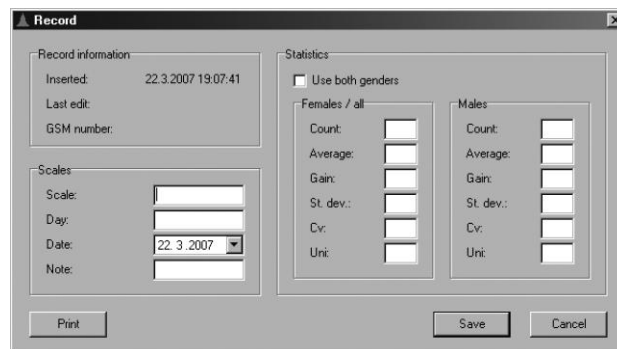
Enter a phone number of the scale into the *Phone number* box or select a number from the list below. Click the *New* button to add a new phone number to the list. Click the *Delete* button to delete the selected number from the list. After the phone number is entered, click *OK*. The following window appears:



Choose day from which the statistics should be read and click *OK*. The software sends the SMS with request, waits for reply and inserts the statistics into the database. If the record already exists in the database, the software will ask if you want to overwrite it. If there is no reply received, you need to finish the reading manually by choosing menu *GSM / Stop reading SMS*.

Manual inserting of records

Choose menu *Records / Insert new record* to insert a new record into the database manually. The following window appears:



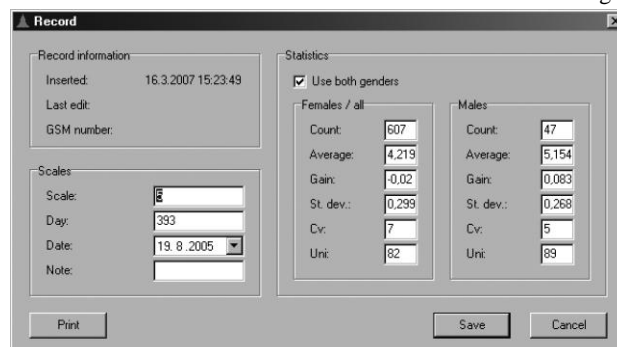
Enter all values and click *Save*.

4.16.5. Editing and deleting the records

Each record in the database can be edited or deleted.

Editing the record

Chose the record you want to edit and choose menu *Records / Edit record*. The following window appears:



Enter all values and click *Save*. Click the *Print* button to print the record.

Deleting the record

Chose the record you want to delete and choose menu *Records / Delete record*.

4.16.6. Printing records and graphs

Choose menu *File / Print / Report* to print the table with records. Choose menu *File / Print / Graph* to print the displayed graph. Before printing, the print preview window shows first, the actual printing is started by clicking the printer icon in the preview window.

4.16.7. Exporting the records

Choose menu *File / Export to Excel* to export the table with records. During export the program Excel starts and the data begin to be exported to it. After the end of export, it is possible to work with the data in Excel in the usual manner.

4.16.8. Searching for files

It is possible to search for the files directly from the database, similarly as in chapter 4.8. Choose menu *File / Find file*, the search window will contain data from the selected record in the database. The search should find the file corresponding to the record in the database.

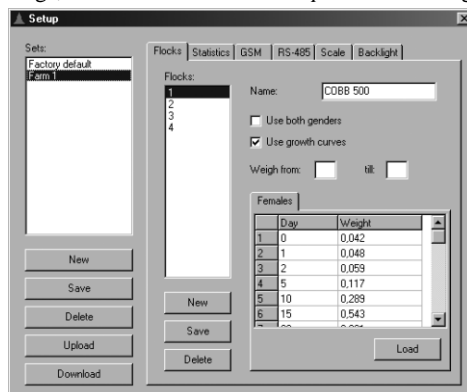
4.17. Scales Setup from the Computer

Setting the scales from the computer saves the operator complicated browsing of the menu directly in the hall. On a computer it is possible to create several sets of settings comfortably that you can store into the scales by a simple click of the mouse.

The settings are transferred to the scales using the memory module, similarly to data transfer from the scales to the computer. Reading of scales settings into the scale is described in Chapter 5.9.

Note: all scales connected to the PC over the RS-485 line can be set from the PC without the memory module (see Chapter 4.15.6).

If you want to work with scales settings, choose menu *Scale / Setup*. The following window appears:



The list of all created sets of settings is displayed in the upper left part. In the lower left part there are buttons for work with sets. In the right part there is the content of the selected set.

4.17.1. Creating a New Set

If you want to create a new set, click the *New* button. In the open window enter the title of the new set and click on *OK*. In the set list, a set with the entered name will appear.

4.17.2. Editing Set Parameters

The content of the selected set is displayed in the right part of the window. The set parameters are divided into tabs in the same manner as in the scales menu. The titles of all items also correspond to items in the scales menu. A detailed explanation of individual items of settings is explained in Chapter 5.

Flock Settings

In the tab *Flocks*, there is the complete flock setup. In the upper left part there is the list of created flocks in the set. In the lower left part there are buttons for work with flocks. The content of the currently selected flock is displayed in the right part.

If you want to create a new flock, click the *New* button and enter the number of the new flock in the range 0 to 9. The newly created flock will be added to the flock list and will be filled with default parameters.

If you choose *Use growth curves*, the table the growth curve definition is displayed in the lower part, as in the scales. Enter individual days gradually from the top of the table. The growth curve definition can be loaded from a list of growth curves by clicking on the *Load* button.

If you choose using without the growth curves, the fields for entering weight at the weighing start are displayed in the lower part.

When using both genders this table or field is displayed for both genders separately.

After entering all parameters it is necessary to save the flock by clicking the *Save* button.

The selected flock can be deleted from the set by clicking the *Delete* button and subsequently by confirming the query.

Statistics Settings

In tab *Statistics*, you can set parameters of statistics during weighing.

GSM Module Settings

The tab *GSM* serves for setting the GSM module in the scale. Enter the phone numbers gradually into the upper field.

Scales Settings

In tab *Scale*, it is possible to set the scales parameters.

4.17.3. Deleting a Set

If you want to delete some set from the list, select it in the list and click the *Delete* button. After confirming the query the set is deleted.

4.17.4. Saving a Set into the Memory Module

If you want to save some set into the memory module, choose it in the list, plug the memory module into the reader and click the *Upload* button. Before the set is saved, you have to choose number of version of the scale. Saving the set into the module takes several seconds.

4.17.5. Creating a Set from the Memory Module

If you want to create a set in the program from the settings contained in the memory module, plug the memory module into the reader and click the *Download* button. Enter the title of the new set. The program creates a new set with the specified title, and the settings from the memory module will be copied into this set.

4.18. Copy of the Memory Module

If any problems appear in the program or scale, it is possible to read the entire content of the memory module, save it to a hard disk and send to technical support that can diagnose and solve the problem.

If you want to copy the content of the module to a disk, select in menu *Scale* item *Save module to file*. Enter the file name, into which the module content will be stored and click the *Save* button. After reading the entire content of the memory module, send the file to the technical support at the producer address. The file size is 2 megabytes and has an extension *bin*.

The file with the copy can be read in the program similarly as if it was stored in the memory module. Select in menu *Scale* item *Load module from file* and choose the file that you want to read. Furthermore, the reading takes place just as during reading of data from the memory module (see Chapter 4.6).

5. Scales Settings

5.1. Date and Time

Date and time can be changed only if weighing is stopped.

If you want to change the current date and time, enter the menu by pressing the key, select item *Setup*, and press the key. Furthermore, select item *Date and time* and press the key. The following menu appears:

Date:

15.09.2004

Cancel OK

Using arrows enter the current date and press the key. The following menu appears:

Time:

07:28

Cancel OK

Using arrows enter the current time and press the key.

Note: use format *DD.MM.YYYY* for date, where *DD* means day, *MM* month and *YYYY* year. For time, use 24 hours format.

5.2. Identification Number

Each scale contains an identification number, which is used for scale identification in a large set of scales. The set identification number is displayed on the display for checking upon start up.

If you want to change the identification number of the scale, enter the menu by pressing the key, select item *Setup*, and press the key. Then select item *Identification number* and press the key. The following menu appears:

Identification number:

001

Cancel OK

Using arrows enter the new identification number in range 1 to 32767 and press the key.

5.3. Predefined Flocks

Using predefined flocks it is possible to predefine all poultry parameters that are used when starting weighing. Once defined flock can be therefore simply used upon repeated weighing. It is possible to store up to 10 predefined flocks into the scale.

A predefined flock can be also used for a definition of a theoretical growth curve, which can be then compared with real results (see Chapter 2.6).

If you want to work with flocks, enter the menu by pressing the key, select item *Setup*, and press the key. Furthermore, select item *Flocks* and press the key. The menu that serves for work with flocks appears.

5.3.1. Creating a New Flock

If you want to create a new predefined flock, select in the menu item *New flock* and press the key. The following menu appears:

Flock number:

0

Cancel OK

Using arrows enter the number of the flock in the range 0 to 9 and press the key. The following menu appears:

Flock name:

Cancel OK

If you want to name the flock, enter the flock title using arrows and press the key. The flock title can be empty. The following menu appears:

Use both genders?

No Yes

If you want to differentiate gender in the flock, press the key. If you do not want to differentiate gender, press the key. The following menu appears:

Use growth curves?

No Yes

If you want to weigh according to a growth curve, press the key. If you want to use the automatic mode, press the key.

Use of Growth Curve

If you selected differentiating of genders, it is necessary to enter two growth curves for both genders separately. If you chose not to differentiate genders, it is enough to enter only one growth curve.

The growth curve is entered in the form of a table, where the target weight is specified for individual days:

<input checked="" type="checkbox"/> Move	Day	Weight
<input checked="" type="checkbox"/> Add	1	0,039
<input checked="" type="checkbox"/> Change	10	0,176
<input checked="" type="checkbox"/> Delete	20	0,714
<input checked="" type="checkbox"/> Quit		

Using keys and move between days in the table.

By pressing the key add a new day into the table. The scale first asks about the number of the day and then about the target weight for the given day. The target weight does not have to be specified for each day of weighing; the target weight for the missing days will be calculated during weighing from two surrounding days.

By pressing the key you can change the target weight of the selected day.

By pressing the key and subsequent confirmation by the key it is possible to delete the selected day from the table.

If all days are entered in the table, end the editing of the growth curve by pressing the key. The following menu appears:

Save changes?

No Yes

By pressing the key the performed changes in the growth curve are stored. If genders are differentiated in the flock, it is necessary to enter the growth curve also for males after finishing the growth curve for females.

Use of Automatic Mode

When using the automatic mode, only the initial weight at beginning of weighing needs to be specified:

Initial weight:

00,000 kg

Cancel OK

Using arrows enter the weight at the beginning of weighing of the flock and press the key. The entered weight must correspond to the day that you enter when starting weighing. If you use gender differentiation, the scales will ask for the initial weight for females and males separately.

After entering the growth curves or initial weights, this menu appears:

Limit the weighing
by time?

No Yes

Weighing can be limited only to a certain part of the day, which can help you to select the most suitable moment for weighing. The entered time section is used for all days of weighing. Outside the entered time of weighing the scales switch into the pause mode, in case of need it is possible to resume weighing prematurely, see Chapter 2.8.

If you want to weigh always for the entire day, press the key and the time limiting will not be used.

If you want to weigh only during a certain part of the day, press the key. The following menu appears:

Weigh from:

00 hours

Cancel OK

Using arrows enter the time, from when weighing should begin on each day and press the key. The following menu appears:

Weigh till:

23 hours

Cancel OK

Enter the time when weighing should stop on each day and press the key.

5.3.2. Editing an Existing Flock

If you want to change the parameters of an already existing flock, choose the item *Edit flock* and press the key. The following menu appears:

Choose a flock:

▶ 0: BROILERS

Cancel OK

By arrows select the required flock and press the key. Editing of flock parameters is the same as when creating a new flock in Chapter 5.3.1. It is impossible to edit a flock, according to which the scales weigh right now.

5.3.3. Deleting a Flock

If you want to delete an already existing flock, select in the menu item *Delete flock* and press the key. The following menu appears:

Choose a flock:

▶ 0: BROILERS

Cancel OK

By arrows select the required flock and press the key. It is impossible to delete a flock, according to which the scales weigh right now.

5.3.4. Deleting All Flocks

If you want to delete all existing flocks, select in the menu item *Delete all flocks* and press the key. After confirming the query with the key, all predefined flocks will be deleted from the memory. The flocks can only be deleted with stopped weighing.

5.4. Statistics

With statistics it is possible to set the histogram range and uniformity range. Both these parameters must be set before starting weighing; they cannot be changed during weighing.

By pressing the key enter the menu, select item *Setup* and press the key. Then select item *Statistics* and press the key. The following menu appears:

Histogram range:	
± 040 %	
<input checked="" type="checkbox"/> Cancel	<input checked="" type="checkbox"/> OK

Using arrows enter the histogram range as ± percentage of the target weight on the given day and press the key. The following menu appears:

Uniformity range:	
± 010 %	
<input checked="" type="checkbox"/> Cancel	<input checked="" type="checkbox"/> OK

Using arrows enter the uniformity range as ± percentage of the target weight on the given day and press the key.

5.5. SMS Messages

If you want to change the settings of sending SMS messages, by pressing the key enter the menu, select item *Setup* and press the key. Then select item *GSM* and press the key. The menu that serves for work with SMS messages appears.

5.5.1. Settings

If you want to set the conditions of transmitting and receiving SMS messages, select in the menu item *Settings* and press the key. The following menu appears:

Use GSM communication?	
<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes

If the scale contains a GSM module and you want to use it, press the key. The following menu appears:

Send statistics at midnight?	
<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes

If you want that the scale to automatically send statistics to all entered numbers at midnight, press the key. The following menu appears:

Period:	
01 days	
<input checked="" type="checkbox"/> Cancel	<input checked="" type="checkbox"/> OK

Enter a period of days per one midnight SMS. If you enter 1, the SMS will be sent daily; if you enter 7, the SMS will be sent once a week etc. If you do not want to send statistics automatically, press the key. The following menu appears:

Send data upon request?	
<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes

If you want the scale to reply to all given requests, press the key. If you do not want the scale to reply to the requests, press the key. If you pressed the key, the following menu appears:

Check numbers?

No Yes

If you want that the scale to reply only to requests sent from preset phone numbers, press the key. The scale will thus be protected against abuse from unknown users. If you want the scale to reply to requests sent from all phone numbers, press the key.

5.5.2. Phone Numbers

It is possible to define up to 5 phone numbers, to which SMS messages with statistics will be sent at midnight. If protection against abuse is also set, the scale will only reply to requests sent from these defined phone numbers.

If you want to define the phone numbers, select item *Numbers* and press the key. The following menu appears:

Phone number:

420720568325 _ _ _

Cancel OK

Using arrows enter the phone number in the international format without initial zeroes. An example of phone numbers is in the following table:

Country	Entered number
Czech republic	420123456789
France	33123456789
Germany	49123456789

If the number is shorter than 15 characters, enter the number from the left and leave spaces at the end. After entering the number press the key.

You can enter up to 5 phone numbers. If you want to end entering, press the key. The scales will display the number of entered numbers for checking.

5.6. RS-485 line

If the scale is equipped with a RS-485 line and you want to change its parameters, press the key to enter the menu, select *Setup* and press the key. Then select *RS-485* and press the key. The menu that serves for work with the RS-485 line appears.

Parameters set in the scale should correspond to parameters set in the PC or other control system.

5.6.1. Address

Each scale connected to the RS-485 network must have a unique network address (don't confuse with an identification number of the scale). Two scales with same addresses will cause the communication to fail. If possible, it is recommended to set the address the same as the scale identification number.

If you want to change the address, select menu *Address* and press the key. The following menu appears:

Address:

002

Cancel OK

Enter the address in range from 1 to 247 and press the key.

5.6.2. Communication speed

If you want to change the communication speed, select menu *Speed* and press the key. The following menu appears:

Speed:

▶ 9600 Bd

Cancel OK

Choose the required speed using arrows and press the key.

5.6.3. Parity and stop bits

If you want to change parity and number of stop bits, select menu *Parity* and press the key. The following menu appears:

Parity:
▶ 8-e-1
 Cancel OK

Choose the required value using arrows and press the key.

5.6.4. Communication Protocol

If you want to change type of the communication protocol, select menu Protocol and press the key. The following menu appears:

Protocol:
▶ MODBUS RTU
 Cancel OK

Choose the required protocol using arrows and press the key.

5.6.5. Delays

The scale can be set to wait before a reply is sent, so the reply is send after the defined delay.

If you want to change the reply delay, select menu *Delays* and press the key. The following menu appears:

Reply delay:
0000 ms
 Cancel OK

Enter the delay in range from 0 to 9999 milliseconds and press the key. The following menu appears:

Silent interval:
050 ms
 Cancel OK

Enter the silent interval of the MODBUS RTU protocol and press the key.

5.7. Scales

If you want to change settings of the scale, enter the menu by pressing the key, select item *Setup* and press the key. Then select item *Scale* and press the key. The menu that serves for setting the scales appears.

5.7.1. Saving Parameters

Using saving parameters it is possible to affect the recognizing of entry on the platform and storing into memory. It is a limit above and below the target weight for both genders, filter, weight stabilization, type of automatic mode and saving mode.

Select *Saving parameters* in the menu and press the key. The following menu appears:

Margin above target
for females:
030 %
 Cancel OK

Using arrows enter the margin above the target weight for females in percentage of the target weight for the given day and press the key. The following menu appears:

Margin under target
for females:
030 %
 Cancel OK

Using arrows enter margin below the target weight for females and press the key. The following menu appears:

Margin above target
for males:
030 %
 Cancel OK

Using arrows enter the margin above the target weight for males and press the key. The following menu appears:

Margin under target
for males:

030 %

Cancel OK

Using arrows enter the margin below the target weight for males and press the key. The following menu appears:

Filter:

12

Cancel OK

Using arrows enter the filtration of the weight. The higher the filter, the more is the weight filtered. Higher filtration also means slower reaction on fast changes. The scale measures weight internally 8 times per second. The filter value means number of samples that are averaged, i.e. filter 1 means that the scale measures 8 times per second, filter 8 means that the scale measures once per second etc. After entering the value of filter press the key. The following menu appears:

Stabilization:

± **03.0** %

Cancel OK

Using arrows enter the maximum oscillation of weight in percentage of the target weight. The lower the value, the more accurate the weight of stored samples but the worse the stabilization of the scales. After entering the value of stabilization press the key. The following menu appears:

Stabilization time:

3

Cancel OK

Using arrows enter the stabilization time, i.e. the time, for which the scale must remain still so that the weight is stable. By extending the time of stabilization you achieve more accurate weight of stored samples but the worse the scale will stabilize. The time unit of stabilization is given by the filter value (for example filter 12 and stabilization time 3 gives total time of stabilization 4.5 seconds). After entering the stabilization time press the key. The following menu appears:

Use gain in
automatic mode?

No Yes

You can choose an algorithm used to calculate the target weight when using the automatic mode. If you choose *No*, the target weight is calculated simply as an average weight from yesterday. If you choose *Yes*, the target weight is calculated as an average weight plus daily gain from yesterday, so the scale tries to predict the correct target weight more accurately.

Since there is no daily gain for the first day of weighing (daily gain is zero), the scale calculates the gain as the average weight minus target weight. This “synthetic” gain is used only for calculation of the target weight for the second day of weighing.

Keep in mind that the gain in automatic mode should be used only when weighing poultry with high and monotonous gains, such as broilers. When weighing poultry with almost steady weight with possible weight oscillations (such as turkeys or parents), don’t use this option. The oscillations in average weight would lead to even higher oscillations in target weight, which could cause the scale to get lost after several days of weighing.

After the algorithm is selected, the following menu appears:

Save sample upon:

▶ Entering the scale

Cancel OK

Using arrows select the required saving mode. There are 3 modes available:

Item	Meaning
Entering the scale	The scale is detecting only poultry entering the scale. The sample is stored during entering the scale.
Leaving the scale	The scale is detecting only poultry leaving the scale. The sample is stored during leaving the scale.

Both	The scale is detecting both entering and leaving the scale. The sample is stored during entering and leaving the scale.
------	---

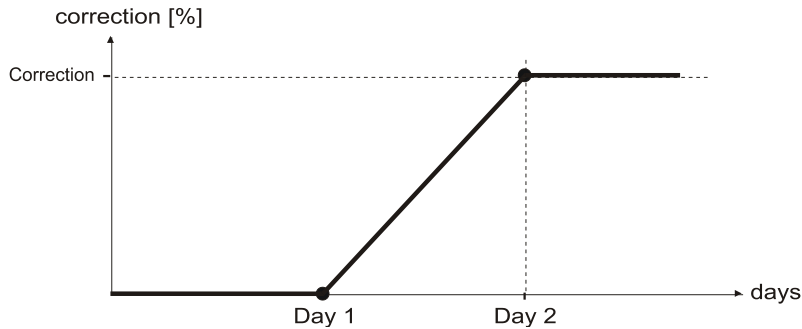
After the saving mode is selected, press the key.

After confirming the query the entered parameters will be stored.

5.7.2. Correction curve

It is common behavior during weighing that light birds are more active and use the scale more frequently than heavy birds that tend to ignore the scale. In this case, average weight indicated by the scale can be lower than real average weight of the flock.

Correction curve is used to increase the indicated weight so it better matches real average weight of the flock. The correction curve can be defined in menu *Correction curve*. Individual parameters of the curve are described in the following graph:



The parameters differ for various types of poultry and should be determined by a comparison of results from manual and automatic weighing. Typical parameters for broilers:

Day 1: 14
 Day 2: 30
 Correction: 5.0 %

5.7.3. Units

The scale can display weight either in kilograms or in pounds. The unit change does not modify scales calibration; it is only a change of unit display. If you want to change the units, select in the menu item *Units* and press the key. The following menu appears:

Units:

▶ kg

Cancel OK

Using arrows select the required units and press the key.

5.7.4. Calibration

If condensed humidity is visible on the scale, wait for drying of the scale. Then wait at least 1 hour for thermal stabilization of the scale. Then you can calibrate the scale.

If you want to change the weight division or calibrate a connected platform, select in the menu item *Calibration* and press the key. The following menu appears:

Division:

▶ 1

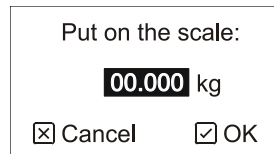
Cancel OK

Using arrows select the desired division, to which rounding of the last weight digit will take place and press the key. The following menu appears:

Empty the scale

Cancel OK

If you want to change the division of the scale only, press the key now. Only the new division will be stored into memory and calibration will not take place. If you want to perform also calibration, empty the weighing platform and press the . After measuring the zero point the following menu appears:



Put a known weight on the scale, using arrows enter the weight and press the key. After measuring the range and confirming with the key, calibration is finished. After confirming the query the calibration is stored.

5.8. Display backlight

The display backlight can be set permanently off, permanently on or automatic, when it turns off after 10 seconds of inactivity.

If you want to change the backlight mode, enter the menu by pressing the key, select item *Setup*, and press the key. Then select item *Backlight* and press the key. Using arrows select the requested backlight mode and press the key.

5.9. Reading Settings

The complete settings of the scale can be read from the memory module. If we have one scale correctly set, we can save records into the memory module that can be plugged into another scale and the settings can be read. The second scale will therefore be set identically as the first scale.

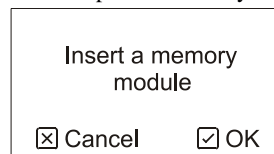
Similarly it is possible to set the scale comfortably on a computer, save the settings into the memory module and read the settings into all scales used (see Chapter 4.16).

The complete settings besides the following information is copied to the scale:

- Identification number
- RS-485 address
- Language
- Calibration

Settings can only be read with stopped weighing.

If you want to read settings from the memory module, first turn off the scale by disconnecting the power connector. Plug the memory module into the scale and then turn on the scale. By pressing the key enter the menu, select item *Setup* and press the key. Then select item *Read from module* and press the key. The following menu appears:



Press the key. The settings are copied from the module to the scale.

5.10. Online Weighing

For optimal settings, the scale contains a special diagnostic mode. In this mode the scale does not store the weighed samples into the memory, but the simple time curve of current weight on the scale. The measured curve can then be analyzed on a computer and setting of the scale can be optimized on the basis of these results.

Frequency of records is given by the filter value. Filter 1 means 8 stored samples per second, filter 12 means 1 sample per 1.5 seconds etc. Total memory capacity is 694 265 records. If the memory is full, the oldest record is deleted, and a new record is stored in its place. The memory thus contains always the last records.

Each record contains:

- Hour when it was stored
- Current weight on the scale
- Information about scales stabilization
- Information about sample storing

When viewing online weighing on a computer we therefore see when the scale was stabilized and when the scale stored the sample into the memory. This information can help us to optimize the saving parameters.

During online weighing the scale behaves as during normal weighing, with these differences:

- *ONLINE* instead of *WEIGHING* is displayed on the display.
- Only the weighing condition, statistics, and histogram are displayed during weighing. The sample recorder is inaccessible.
- Statistical data are calculated only for the current day; the archive in the menu is inaccessible.
- When using the automatic mode, the target weight is not updated at the beginning of another day. The originally set target weight remains for the entire time of weighing.
- When the scale is turned on and when starting online weighing the scale can block for up to several minutes. In this case wait till normal activity is resumed.

5.10.1. Start of Online Weighing

If you want to start the online weighing, enter the menu by pressing the key, select item *Setup* and press the key. Then select menu *Start online* and press the key. The scales will ask for all weighing parameters, see Chapter 2.4.

5.10.2. End of Online Weighing

Online weighing is ended in the same way as normal weighing; see Chapter 2.9.

5.10.3. Processing of Online Weighing

The results of online weighing can be viewed only on a computer, see Chapter 4.10.

6. Manufacturer

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