M1100

Packing & Grading Scale

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STANDARD SAFETY NOTICE FOR MAREL SCALES

All persons involved in the use and/or installation of this product should be aware of the following instructions.

Failure to follow these instructions or other safety instructions in the manual voids all warranties and may result in malfunction of the product, property damage, serious personal injury, or death.

WARNING

- ***The installation and use of this product must comply with all applicable national, state, and local codes.***
- ***Turn the electrical power off when servicing the scale.***
- ***Electrical installations and repairs must be performed by a licensed electrician, in accordance with manufacturer's specifications and national and local electrical codes.***
- ***There are no serviceable parts inside the housing. Do not open the housing as there is hazardous voltage inside.***

Do Not

pull at the upper frame inside the platform casing or the load cell may bend.

Do Not

drop the scale, e.g. from a table to the floor. The scale is a high-precision weighing instrument and is sensitive to shock.

ATTENTION!

Marel scales are Class I equipment and MUST have a protective earthing connection for safe operation.

ONLY USE A EARTHED MAINS CONNECTION

Power supply cords, color coding:

	International	**North-American**
Earth	Green/Yellow	Green or Green/Yellow
Neutral	Light Blue	White
Live	Brown	Black

Both Neutral and Live are fused.

Contents

Introduction

About this Guide

The *M1100 Packing & Grading Scale, User's Guide* contains operating instructions for the M1100 scale and describes in detail all basic functions the user should be familiar with.

The *M1100 Packing & Grading Scale, User's Guide* is divided into four chapters:

- Chapter 1 — Introduction
  Description of the M1100 scale, its controls and indicators.
- Chapter 2 — Basic Operation
  Operating instructions and a description of the basic functions.
- Chapter 3 — Advanced Functions
  Instructions in how to use the Setup Mode for more advanced functions.
- Chapter 4 — Battery Operation
  Instructions in how to operate the scale with battery power.

The guide also includes appendices with a list of error codes, printout examples, network connections, and technical specifications, a glossary and a comprehensive index.

Note: This guide describes all available functions on the M1100 scale. Please note that the scale is supplied with an adjustment lock which, if enabled, prevents the user changing certain calibration and configuration parameters. In this case the description of some functions may not apply to your scale.

A calibration instruction guide, *M1100 Packing & Grading Scale, Calibration Instructions*, is available upon request.

Conventions

To help you locate and interpret information easily, consistent typographical conventions are used in the *M1100 Packing & Grading Scale User's Guide:*

Type style	Used for
SMALL CAPITALS	The names of keys on the keyboard, for example, ENTER and TARE.
Initial Capitals	Displays and indicators. For example, Weight Display and Accept indicator.
◆	Indicates a procedure with only one step.

Improvement Recommendations

You can help improve this guide. If you find errors in the procedures or if you know of a way to improve the procedures in this guide, please let us know: Marel hf., Austurhraun 9, IS-210 Gardabaer, Iceland; tel (+354)-563-8000, fax (+354)-563-8001, attn. Service Center, email service@marel.com.

Warranty Information

Marel hf. will not warrant any equipment that has not been used according to specifications.

The M1100 Scale

About the Scale

The M1100 is an easy to operate, general-purpose packing and grading scale. The stainless steel enclosure is water-resistant (IP67) and easy to clean. The scale is available in three basic versions:

- An M1100 indicator mounted on high pillars on a PLx platform (xxxLx model). This version is also available with a battery option (xxBLx model).
- An M1100 indicator mounted on short pillars on a PLx platform (xxxSx model).
- An M1100 indicator with wall or table mountings (xxxNx model) that can be connected to most weighing platforms with a strain gage load cell.

Marine and land based M1100 scales

All three models are available either as motion compensated marine scales designed specially for use on board fishing vessels or as land based scales. All models can be used with weighing platforms of various sizes. See "Appendix D — Technical Specifications" on page 43 for more details on the different models.

Single or multiple range weighing

The scale is available with a multiple range capability. The availability of this option, however, depends on the platform type.

This user's guide applies to the marine scale (M1100-U2) and the land based scale (M1100-C2). Except for the marine calibration procedure (see page 16), both types are operated in exactly the same way.

Packing Memories

Up to fifteen packing memories and four units of weight

The operator can program the scale with up to fifteen target weights in so-called packing memories. Each target weight has its own definition of upper and lower weight limits. Up to four different units of weight (kg, g, lb, or oz) can be set for each target weight. The Config Display shows which of the target weight memories, 1 to 15, is in use.

Grading Memories

Five grading memories with nine different grades each

The scale also has five grading memories, each of which can be programmed with 9 different grades. The grading memories can be used in three ways, for normal, reverse, or positive grading (see "Grading Memory – Functions" on page 23 for more details).

Multiple Range Weighing

The scale can be set up with a multiple range weighing option. With this option the user can select to work with a fixed range or have the scale switch automatically between the two ranges.

Automatic change of weighing ranges

The automatic option is the scale's default setting. The scale then switches automatically from the lower range to the higher one when the weight on the platform exceeds the maximum capacity of the lower range. See "Multiple Range Operation" on page 21 for more details.

Initial Inspection

Prior to use, inspect the scale for damages incurred during shipment. If the scale has been damaged, contact Marel hf. or your local Marel service center immediately.

Installing the Scale

Before you apply power to the scale, check the following:

- Make sure that there are no foreign objects that can interfere with the platform's movements.
- The platform must be empty when you power-on the scale.
- The scale must be properly mounted on a stable, level and non-vibrating foundation (land based scales only).
- Use the built-in spirit level to level the scale platform (land based scales only).
- On scales with separate indicator and platform, make sure the cables between indicator and platform do not move during weighing. This ensures optimum performance.

Default Settings

On delivery the M1100 scale has the following default settings:[1]

- Zero tracking ON
- Automatic tare OFF
- Automatic recording OFF
- All memories are set to zero except the following:
  - Packing memory 1 is configured with upper and lower weight limits
  - Grading memory 1 is configured with lower grade limits for all nine grades.[2]

Communication

The following communication options are available for the M1100 scale:

- **CAN**. The M1100 is specially designed to operate in a networked environment (CANopen). When the scale is connected to this type of network, the network can supply the power.
- **RS-232**. The M1100 can communicate with external equipment using RS-232. Weighing results can be printed on an external label printer or the data can be transmitted to a PC for storing and further processing.

[1] See "Setup Mode Commands" on page 34 for detailed information on how to change these settings.
[2] See "Editing a Memory" on page 27 for instructions on how to change these limits and set up more memories.

Cleaning

Note: A thorough daily rinse of the scale is very important to help prevent corrosion and rust problems. Use clean cold water. Never rinse with seawater.

- Clean the scale with detergents approved for use in the food industry. Follow the manufacturer's instructions for use.

- Do not use excessively strong solutions of detergent.
  Base solutions corrode aluminum parts, for example load cells.
  The use of chlorine can cause rust spots to appear on the stainless steel.
- Do not use high-pressure jets on the M1100. Instead, use low water pressure or pour water over by hand.

Detergents

The acidity of detergents used on Marel equipment should preferably be pH 12-13.[3]

Strong base solutions are the main ingredients in most cleaning agents, for example potassium hydroxide (KOH) or caustic soda (NaOH). Because of its corrosive effects, caustic soda is not a desirable detergent for the M1100. If possible, use detergent solutions with KOH instead.

Always use detergents according to the detergent manufacturer's instructions.

Do not use a detergent containing sodium hypochlorite for daily cleaning. Sodium hypochlorite is a common ingredient in detergents, but as it contains chlorine it should be used with great care because of chlorine's corrosive effect on stainless steel.

Daily cleaning

- Use high alkaline foaming detergent**,** ph 1% 12-13, for regular daily cleaning. **Do not** use a detergent containing sodium hypochlorite for daily cleaning. The foaming detergent must be selected carefully and should contain some corrosion inhibitors and preferably potassium hydroxide (KOH) instead of sodium hydroxide (NaOH).
- Spray the detergent on all surface areas and leave to work for approximately 20 minutes. Rinse the detergent off.

[3] Marel has developed the detergent *Frima fip 6* in cooperation with Icelandic cleaning agents manufacturer Frigg hf. *Frima fip 6* is an alkaline foaming detergent suitable for use in all branches of the food industry and specially designed to minimize the damaging effect of a harsh wash-down environment on Marel's equipment.

- To kill any remaining bacteria, it is necessary to finish the daily cleaning procedure by spraying a quarternary ammonium solution over the area and onto surfaces (after drying), using a 300 ppm active ingredient.
- Before you resume processing the next morning or after breaks, rinse the quarternary ammonium solution off surfaces in contact with the raw material using clean water.

Disinfectants

When choosing a disinfecting agent, please note that chlorine corrodes stainless steel. Chlorine is, however, an effective disinfectant, so occasional use of chlorine may be necessary to control the growth of microorganisms.

Marel recommends the following procedure:

- Use chlorine to disinfect once a week after performing the regular cleaning with a high alkaline foaming detergent.
- Make sure the strength of chlorine does not exceed 200 ppm.
- Spray the disinfectant on surfaces and leave to work for approximately 30 minutes.
- After disinfecting, carefully rinse the equipment.
- On days when chlorine is not used, use a disinfectant containing quarter ammonium compounds instead.
- Make sure the strength of quarter ammonium compounds does not exceed 750 ppm.

Note: Rotating different disinfectants (e. g. chlorine, peracid or acid-anionic) in your hygiene program may ensure more effective sanitation.

As chlorine evaporates very quickly, its disinfecting effects will fade soon after it is sprayed on the equipment. Letting chlorine stay on the equipment will not improve the disinfecting effect, but only damage the equipment. Quarter ammonium compounds are considerably more stable and are active for a much longer time. Therefore, the benefit of leaving them on the equipment for an extended period of time is much greater.

Training staff

It is important that new cleaning personnel receive proper training and are made aware of areas on the machinery which are difficult to clean.

Indicators and Controls

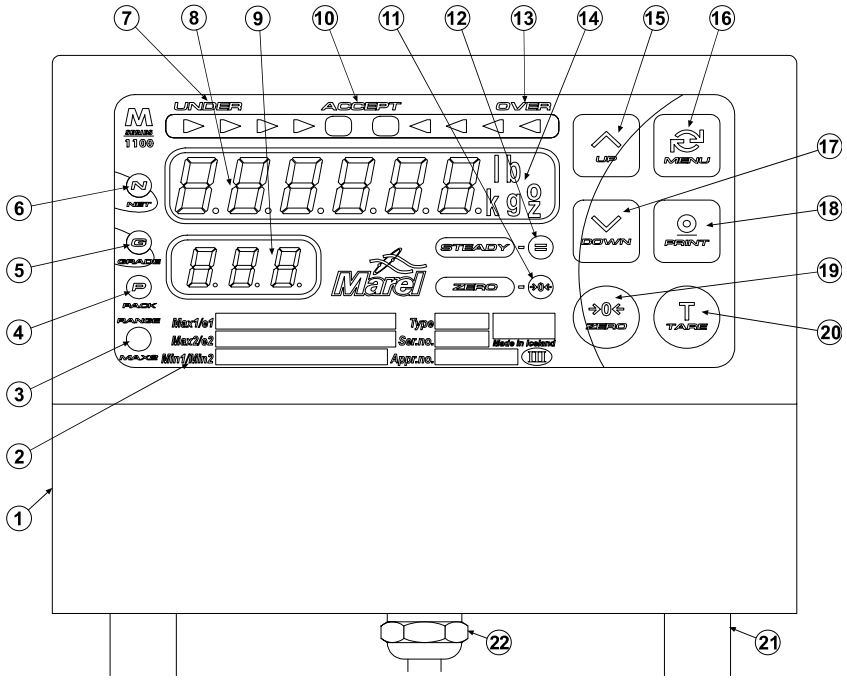
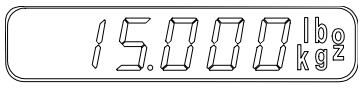


Figure 1 M1100 Indicator, front view.

1.	Top cover	13.	Over indicator
2.	Rating plate	14.	Unit of weight indicator
3.	Max2/Power down indicator	15.	Keyboard, UP arrow
4.	Packing indicator	16.	Keyboard, MENU key
5.	Grading indicator	17.	Keyboard, DOWN arrow
6.	Net indicator	18.	Keyboard, PRINT key
7.	Under indicator	19.	Keyboard, ZERO key
8.	Weight Display	20.	Keyboard, TARE key
9.	Config Display	21.	Mounting pillar / cable conduit
10.	Accept indicator	22.	Cable entry (serial RS-232) or
11.	Zero indicator		battery plug, optional
12.	Steady indicator		

Weight Display



The Weight Display shows the weight on the platform. If tare is in use, the net weight is shown. To the right on the display a lighted indicator shows the current unit of weight.[4]

Figure 2 The Weight Display

Zero and Steady Indicators

Figure 3 Indicators.

Below the Weight Display there are two indicators, Zero and Steady.

- The *Zero indicator* (green) lights up when the scale is at the zero point.
- The *Steady indicator* (green) lights up when the load indication is steady.

Config Display

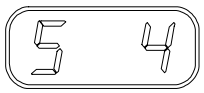


Figure 4 Config Display.

The Config Display is located below the Weight Display.

This display shows which packing memory or grading memory is currently in use. Use the UP and DOWN arrow keys to select a memory (see "Operation" on page 15).

The Config Display is also used to display

- configuration commands when the scale is in Setup Mode
- the blinking CAL message, "marine calibration required".

Weight Target

The Weight Target indicator is located above the Weight Display. This indicator consists of three parts, the *Under, Accept,* and *Over* indicators.

Figure 5 Weight Target indicator.

- The *Accept indicator* in the center lights up (green), if the weight on the platform is within the set weight limits.
- The *Under* and *Over indicators* (red) on either side of the Accept indicator light up if the weight is outside the weight limits. The deviation is shown in steps, the step between two lights being two scale divisions. A deviation of one division is indicated by two simultaneous lights.

[4] *Note!* Due to local restrictions in some market areas and limitations caused by scale capacity, all units may not be available.

The innermost arrows will light up first, but when the outermost arrows light up the deviation from the weight limit is equal to or greater than seven scale divisions.

Net Indicator

Figure 6 Net indicator.

The Net indicator lights up whenever tare is in use.

Grading Indicator

Figure 7 Grading indicator.

The Grading indicator lights up to show that the scale is in grading mode.

Packing Indicator

Figure 8 Packing indicator.

The Packing indicator lights up to show that the scale is in packing mode.

Max2 Indicator

Figure 9 Max2 indicator.

The Max2 indicator lights up

- on multiple range scales to show that the scale is in the higher weighing range
- on battery operated scales to show that the scale is in power down mode.

Arrow Keys

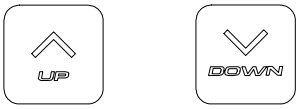


Figure 10 UP Arrow, DOWN Arrow.

The arrow keys are used to select packing or grading memories. They are also used to enter numerical values and to select menu items when the scale is in Setup Mode.

Menu Key

Figure 11 MENU key.

The MENU key is used to enter the menu where you set the packing weights (see "Edit Commands – Packing" on page 27) and the grade limits (see "Edit Commands – Grading" on page 29).

In Setup Mode the MENU key is used to return from submitting commands.

Print Key

Figure 12 PRINT key.

The PRINT key is used for recording and printing weight results. It is also used for entering commands and for confirming new settings.

Tare Key

Figure 13 TARE key.

The TARE key is used to set the tare. When you press this key with a weight on the platform, that weight is used as a tare, and the Weight Display will show a zero. The NET indicator lights up. The TARE key is also used to remove tare.

Note: The TARE key cannot be used when Preset Tare is in operation.

Zero Key

Figure 14 ZERO key

The ZERO key is used to take a new operational zero point, provided the operating zero stays within ±2% of max weight from the initial zero point.[5]

The operating zero is the reference point for all weighings, and therefore a correct operating zero is necessary to ensure accurate weighing results.

[5] If automatic zero tracking is set (by activating a software switch, see p. 34), the scale will automatically track small variations in the zero point. The maximum tracking rate is 0.5 divisions per second.

Basic Operation

Applying Power to the Scale

The scale does not have an On/Off switch because it is preferable to keep power on the scale at all times. Constant power generates heat that will prevent moisture from condensing in the scale.

- Therefore, for initial start of the scale, simply plug the electrical cord into the nearest suitable power outlet. For a battery operated scale, attach the battery holder to the M1100 Indicator.

After power has been applied, the software version and the status of the Cal/Con event counters appear briefly on the Weight Display and a light test of the display is run. If the adjustment seal that prohibits modification of calibration and configuration parameters has been applied, the message LOC appears briefly on the Config Display.

The scale then sets the initial zero (the message -0- appears on the Config Display), returns to Operating Mode, and is ready for use.

Note: The event counters change whenever the configuration is modified and when the scale is calibrated. The counters can therefore be used to check if an unauthorized calibration has taken place.

Operation

The M1100 scale is very easy to use. The scale has up to fifteen packing memories, each of which can be programmed with the following information:

- Unit of weight (kg, g, lb, oz. lb and oz can be disabled)
- Lower weight limits
- Upper weight limits

The scale also has five grading memories, each with nine grades. The memories can be programmed with:

- Unit of weight (kg, g, lb, oz)[6]
- Lower grade limit
- Grading method (normal, reverse, positive).

To change from packing to grading (and vice versa)

♦ Use the arrow keys to scroll through the memories to change from packing to grading and vice versa.

The Packing and Grading indicators will light up to show which mode, packing or grading, is currently active.

Initial start of the scale

1. Plug in the scale.
2. The scale is now ready for simple weighing.
3. If, however, you wish to use the packing or grading memories, you must first
   - enter the settings for the packing or grading memories you intend to use, and then
   - select the appropriate memory with the arrow keys.

See "Editing a Memory" on page 27 for more details.

Marine Calibration

The motion compensation of the M1100 marine scale must be calibrated every once in a while to ensure the weighing results are accurate and stable.

IMPORTANT! For optimum marine calibration results, always calibrate the scale in the physical environment where it will be used for weighing, i.e. at sea and not on land or in the shelter of harbour.

Figure 15 Calibration message

The scale must be calibrated at initial start-up. After that the scale submits a warning, the message CAL flashes in the Config Display, whenever a calibration should be performed.

The scale must also be calibrated

- when the scale is unstable without the weighing platform being touched.

[6] Depending on platform size and market area.

- when the displayed weight is inaccurate, even when the scale has a correct zero.
- when the scale is unable to assume the initial zero point, even with an empty platform.

Tip

- It is a good maintenance rule to check the calibration routinely by placing a weight on the weighing platform to verify that the Weight Display shows a steady and accurate weight.

To calibrate the scale

1. Make sure the platform is empty.
2. Press the MENU and ZERO keys simultaneously to put the scale in Cal Mode.
   The Config Display shows: CAL
   The Weight Display shows: - - -
3. Wait until the scale asks for a reference weight.
   The Weight Display shows for example: Put 2kg[7]
4. Place the reference weight on the platform.
5. Press the PRINT key to start the calibration.
   The Weight Display shows = = = while the scale performs the calibration.
6. When the calibration is completed, the message Fit nn (where nn is a number between 0 and 99) appears on the Weight Display.
   Values above 25 indicate a poor calibration. In that case you must repeat steps 1 to 4 above.

   Note: The message Fit_ nn appears when a marine scale has been calibrated without the platform being in motion.

7. Remove the reference weight from the platform.
8. The Weight Display returns to zero and the scale is now ready for use.

[7] The unit and weight displayed in this message varies with the size of the scale's weighing platform.

Functions

The following sections are an overview of the basic M1100 functions the user should be familiar with:

- the Tare function, normal, automatic, and preset tare
- the Zero function
- using the multiple range weighing option
- selecting a packing memory
- recording a packing weight, manually and automatically
- selecting a grading memory
- using reverse grading
- using positive grading
- changing units of weight
- using different units of weight
- editing packing and grading memories.

Tare

Normal tare

Automatic tare

The scale has three tare functions, Normal Tare, Automatic Tare, and Preset Tare[8]. Normal and Automatic tare work in a similar way, except that Automatic Tare automatically compensates for the slightly different weight of trays or boxes that are placed on the platform.

This means that you can place different trays on the scale's platform without having to press the TARE key  every time you change trays – the Automatic Tare function will do that for you.

Preset Tare

Preset Tare, however, is different in that it is the user himself who enters a tare value of his own choice, instead of a weight detected by the scale. This method can be useful in certain situations, for example in packing systems where the weight of the packing material is known.

Preset Tare is only available in packing mode.

Tare in multiple range weighing

For details on how tare functions in multiple range weighing, see "Multiple Range Operation" on page 21.

[8] Preset Tare is only available in market areas where the function has been approved by the proper authorities.

Normal Tare

To enter Tare

1. Place a tray (the tare weight) on the platform, and press the TARE key.
2. The NET indicator lights up to show that a tare is in use, and the Weight Display shows zero.
3. Subsequently, the NET weight on the platform is shown on the Weight Display.

If tare is used, check the tare from time to time:

- Place a tray on the platform, and notice if the Weight Display returns to zero. If not, tare the scale again by pressing the TARE key.

To remove Tare

1. Empty the platform.
2. Press the TARE key.

   The Net indicator is turned off.

Direct sale to the public

Note: In some market areas the scale's tare function may be protected with a software switch.[9] This changes the way you work with tare:

- you must remove tare (see above) before you can set a new tare value that is lower than the current tare value.
- preset tare cannot be used.

Automatic Tare

To use automatic Tare

1. Turn application switch A02 on (see "The APP Command" on page 34).
2. Place a tray (the tare weight) on the platform, and press the TARE key (normal tare, see above).
   Use whichever weighing method that suits you to weigh or grade the contents of the tray.
3. Remove the tray, and place a new tray on the platform.
4. If the second tray is within ± 10% of the first tray, the weight of this tray will be automatically tared and the Weight Display will show zero.

Note: The Automatic Tare function can compensate for up to 10% or 30% variation in the tare. The limit is selected during the configuration of

[9] According to standard regulations on conditions for direct sale to the public.

the scale. The second tray you put on an empty platform will be tared automatically if it is within ± 10% of the weight set by the manual tare operation. For this function to work it is important that the scale is stable and with an empty platform before you place the second tray on the scale.

Preset Tare[10]

To use preset Tare

1. Select a memory by using the arrow keys and .
2. Press the MENU key for a few seconds.
3. Select the Pt command with the arrow keys.
4. Press PRINT . The memory's current weight limits are displayed on the Weight Display.
5. Press PRINT again. The first digit on the display starts to flash, indicating that it can be changed to a new value.
6. Use the UP/DOWN arrows to change the value for the weight limit digits. Press PRINT to activate each digit.

   Note: You must activate all digits (press PRINT six times) or no change will take place.

7. Press the MENU key to return to Edit Mode where you can select one of the other edit commands.
8. Press the MENU key a second time to return to Operating Mode.

Zero

To take a new operational zero point

1. Remove any weight from the platform.
2. Press the ZERO key .

   The Zero indicator lights up.

Tip

- If the ZERO key does not function, you may have to take a new initial zero by turning the power off and then on again, or by pressing the arrow, the MENU and ZERO keys simultaneously. (See "Zero Key" on page 13 for more details on the Zero function.)

[10] In order to use Preset Tare, the S12 software switch must be set to ON.

Multiple Range Operation

On multiple range scales there are three range options available:

- Auto (default): the scale switches automatically from one range to the other. The range of the weighing results on the Weight Display changes from low to high when the load on the platform exceeds the maximum capacity of the lower range, e.g. the load exceeds 15 kg on a 30 kg scale.

  When the scale switches to the high range, the Max2 indicator in the bottom left corner of the M1100 indicator lights up.

  Figure 16 Max2 indicator

  The scale remains in the higher range, even if the load on the platform becomes lighter again, until the scale has been steady on zero for a few seconds or until you press the ZERO key .[11]

Tare in multiple range weighing

Note: If you use Normal or Automatic tare with the Auto range and tare is set for the higher weighing range, the scale automatically cancels the tare when it switches to the lower weighing range.
If you use Preset tare with the Auto range, you can only use values up to Max1.
If you need to use tare in the higher weighing range, we recommend that you simply fix the scale in the higher range by selecting the USE Hi range option instead and that way avoid the automatic cancellation of tare.

- USE Lo: the cale is fixed in the lower weighing range and cannot exceed the maximum capacity for that range.
- USE Hi: the scale is fixed in the higher weighing range. The Max2 indicator lights up.

To change the weighing range

1. Press the MENU key for a few seconds.
2. Press the arrow keys and to display the rES command on the Config Display.
3. Press PRINT to display the currently active weighing range.
4. Press PRINT a second time. The range value starts to blink, and you can now use the arrow keys to select a different value.
5. Press PRINT to confirm your selection, and press the MENU key to return to Edit Mode where you can select one of the other edit commands.
6. Press the MENU key a second time to return to Operating Mode.

[11] The scale does not switch to the lower range **unless** a zero operation is performed, either by automatic zero tracking (application switch AD 1 is ON) or by pressing the Zero button.

Packing Memory – Functions

Figure 17 Packing indicator

When the packing function is active, the Packing indicator lights up and the active packing memory number is displayed on the Config Display.

You can change from packing to grading mode by using the arrow keys. The packing indicator is turned off and the grading indicator lights up when you reach the first grading memory.

To select a packing memory

- Use the arrow keys and to scroll to the packing memory you wish to select.
  The new memory is active as soon as its number, 1 to 5, appears on the Config Display.

The scale is now ready to start weighing.

When you have selected a packing memory, the following will happen while the scale is weighing:

- The *Accept indicator* lights green if the weight on the platform is within the specified limits.
- The *Over* and *Under indicators* on either side of the Accept indicator light red if the weight is over or under the set limits.
- The *Steady indicator* lights green when the weight on the platform is stable.

You may want to record a weight that is within limits (Accept) and stable (Steady). The recording is not stored in the scale itself, but is sent via the scale's communication port to a remote PC or a label printer.

There are two ways of recording the weight on the platform, manual or automatic.

To record a weight manually

1. Watch the Accept and Steady indicators.
2. When the indicators light up, press the PRINT key to record.
3. The message rEC (Recording in progress) appears on the Config Display as long as the recording is in progress.
4. If you try to record the same weight again (double recording), a flashing no appears on the display.
   Press the MENU key to remove the message.

This message (no - Invalid recording attempt) also appears, if you try to record an unstable or out-of-range weight.

To record a weight automatically

1. Enable this option by turning on the A03 application switch (see page 34).
2. The scale will automatically record the last stable and within limits weight on the platform when you remove the weight from the platform.

Grading Memory – Functions

Figure 18 Grading indicator

When the grading function is active, the Grading indicator lights up and the number of the selected grading memory is shown on the Config Display.

You can change from grading to packing mode by using the arrow keys. The grading indicator is turned off and the packing indicator lights up when you reach the first packing memory.

For each grading memory you can:

- select a unit of weight (kg, g, lb, oz)
- specify the lower limits for nine different grades (Lo 1... Lo 9)
- select one of the three grading methods, nEt (normal grading), rE. (reverse grading) or POS (positive grading)
- automatically record weighings in reverse and positive grading. To use this option you must enable the A03 application switch (see page 34).

Grading Limits

Grading limits can be set to show either ascending or descending order. In ascending order Grade 1 will contain the lightest piece, and reversely, in a descending order Grade 1 will contain the heaviest pieces.

The scale uses the relationship between Lo 1 and Lo2 to determine which order is used.

Example 1, ascending order:

You wish to specify grade limits for three grades, 1-3:

grade 1 = 100-200 g
grade 2 = 200-300 g
grade 3 = 300-400 g

You set the grade limits in the following way:

Lo 1 = 100 g
Lo2 = 200 g
Lo3 = 300 g
Lo4 = 400 g
Lo5 to Lo9 = 0.

Weights between 100 and up to 200 (200 not included) are graded into grade 1, and weights between 200 and up to 300 (300 not included) into grade 2. In order to use grade 3 you must specify the lower limit for grade 4, even if grade 4 will not be used at all. Otherwise, all weights of exactly 300 g or more will end up in grade 9.

Example 2, descending order:

You wish to specify grade limits for three grades, 1-3:
grade 1 = 300-400 g
grade 2 = 200-300 g
grade 3 = 100-200 g

You set the grade limits in the following way:
Lo 1 = 400 g
Lo2 = 300 g
Lo3 = 200 g
Lo4 = 100 g
Lo5 to Lo9 = 0.

To record a weight manually

1. Watch the Steady indicator.
2. When the indicator lights up, press the PRINT key to record.
3. The message rEC (Recording in progress) appears on the Config Display as long as the recording is in progress.
4. If you try to record the same weight again (double recording), a flashing no appears on the display.
   Press the MENU key to remove the message.

This message (no - Invalid recording attempt) also appears, if you try to record an unstable weight.

To record a weight automatically (reverse and positive grading)

1. Enable this option by turning on the A03 application switch (see page 34).
2. The scale will automatically record the weight of items as they are removed from the platform (reverse grading) or placed on the platform (positive grading).

Normal grading:

Using this method you place an item on the platform and the grade will appear on the Config Display.

To use normal grading

1. Use the arrow keys and to scroll to the grading memory you wish to use.
   The grading memory is active as soon as its name appears on the Config Display.

2 Select a grading method (nEt).

3 Specify grade limits for one or more grading memories (see "The Lo1 Command" on page 30 for more details).

The scale is now ready to start weighing.

When you have selected a grading memory, the grade, if the weight is equal to or above grade limit Lo 1, is displayed on the Config Display as shown below:

Figure 19

Grading memory 1, grade 3.

Figure 20

Grading memory 5, grade 4.

Figure 21

Grading memory 1, no grade (weight is below limit Lo1 or no grade is defined).

Reverse grading:

This method is practical when you are working with, for example, a tray full of goods you wish to sort by weight. With reverse grading you can place the tray on the scale, and then remove one item from the scale at a time. The grade for each item will be displayed on the Config Display, and you can now place the graded item in the appropriate bin.

To use reverse grading

1 Select grading memory and grading method. (rE).

2 Place all items to be graded on the platform.

3 Remove one item at a time from the scale, and the grade number for each item appears on the Config Display.[12]

To stop using reverse grading

♦ Change the grading method by:

– changing to a memory that does not have reverse grading specified as a grading method **or** by

– remaining in the same memory and selecting a new grading method.

[12] Reverse grading is active as long as the net weight on the platform is positive.

Positive grading:

Using this method you can place one item at a time in a tray on the weighing platform, automatically record the weighings, and display each item's grade on the Config Display.

To use positive grading

1. Select grading memory and grading method (P05).
2. Place a tray on the platform and place the items in the tray, one by one.
   The grade number for each item appears on the Config Display.

To stop using positive grading

- Change the grading method by:
  - changing to a memory that does not have positive grading specified as grading method **or** by
  - remaining in the same memory and selecting a new grading method.

Unit of Weight

The unit of weight can be different for each packing or grading memory. When you change to a new memory with a new target weight, the weight on the Weight Display will be in the unit of weight set for the new target weight. The unit of weight is displayed to the right on the Weight Display.

Example:

The target weight in packing memory 1 is in kilograms and the weight in memory 5 is in pounds. When you switch from memory 1 to memory 5, the unit of weight changes from kg to lb.

IMPORTANT! Watch the Zero indicator when the scale is in use. The Zero indicator should light up when the platform is empty.
If not, you must re-zero the scale by pressing the ZERO key. In case of an unsuccessful re-zeroing with the ZERO key, you must take a new initial zero by turning the power off and then on again, or by pressing the arrow, the MENU and ZERO keys simultaneously.

Editing a Memory

By using the edit commands described in the following sections you can enter new settings for the packing and grading memories or change the existing settings.

Edit Commands – Packing

The edit commands for the packing memories are listed in the table below. The commands are described in detail in the following sections.

Table 1 Edit commands – Packing.

Command:	Description:
Un	*Unit.* To set the unit of weight for the target weight; kg, lb, g, or oz.
Lo	*Lower limit.* To set the lower weight limit. Weighing results above this value are accepted.
Hi	*Higher limit.* To set the upper weight limit. Weighing results below this value are accepted.
rES	*Resolution (range).* To select single or multiple weighing range.
Auto	*Automatic selection.* Automatic selection of weighing range.
USE Lo	*Use Low.* Use lower weighing range; lower capacity.
USE Hi	*Use High.* Use higher weighing range; higher capacity.
Pt	*Preset Tare.* Preset Tare enabled.

Single range scales

Multiple range scales

Note: To edit a memory, you must first select the memory you wish to edit.

To edit a memory

1. Select a memory by using the arrow keys ⌃ and ⌄.
2. Press the MENU key ⊡ for a few seconds. The first available editing command appears on the Config Display.
3. Select a command with the arrow keys ⌃ and ⌄.
4. Follow the instructions for each command in the following sections.

The Un Command (Unit of weight)

Use the Un command to set the unit of weight:

1. Select a memory by using the arrow keys and .
2. Press the MENU key for a few seconds.
3. Select the Un command with the arrow keys.
4. Press PRINT to display the currently active unit of weight (the unit indicator to the right on the Weight Display lights up).
5. Press PRINT a second time. The unit indicator starts to blink, and you can now use the arrow keys to select a different unit.
6. Press PRINT to confirm your selection, and press the MENU key to return to Edit Mode where you can select one of the other edit commands.
7. Press the MENU key a second time to return to Operating Mode.

Note: When you change the unit of weight, the contents of the Lo and Hi limits are also converted.
For example, Lo=5 kg changes to 11.025 lb, 5 g to 0.015 lb, etc.

The Lo and Hi Commands (Lower/Higher limit)

Use the Lo and Hi commands to set the lower and upper weight limits:

8. Select a memory by using the arrow keys and .
9. Press the MENU key for a few seconds.
10. Select the Lo or the Hi command with the arrow keys.
11. Press PRINT. The memory's current weight limits are displayed on the Weight Display.
12. Press PRINT again. The first digit on the display starts to flash, indicating that it can be changed to a new value.
13. Use the UP/DOWN arrows to change the value for the weight limit digits. Press PRINT to activate each digit.

    Note: You must activate all digits (press PRINT six times) or no change will take place.

14. Press the MENU key to return to Edit Mode where you can select one of the other edit commands.
15. Press the MENU key a second time to return to Operating Mode.

Edit Commands – Grading

For each grading memory you can specify a unit of weight and 9 lower grade limits, Lo 1 to Lo9. The following table lists the edit commands for the grading memories.

Table 2 Edit commands – Grading.

Command:	Description:
Un	*Unit.* To set the unit of weight for the grades; kg, lb, g, or oz.
Lo 1 -Lo9	*Lower grade limit.* To set the lower grade limit. Weighing results equal to or above this value are accepted.
Grd	*Grading method.* To select a grading method.
nEt	*Net weight grading.* Normal grading.
rE.	*Reverse grading.* Grading of decreasing weights. Optional recording.
POS	*Positive grading.* Grading of increasing weights. Optional recording.
rES	*Resolution (range).* To select single or multiple weighing range.
Auto	*Automatic selection.* Automatic selection of weighing range.
USE Lo	*Use Low.* Use lower weighing range; lower capacity.
USE Hi	*Use High.* Use higher weighing range; higher capacity.

Single range scales

Note: To edit a memory, you must first select the memory you wish to edit.

To edit a memory

1. Select a memory by using the arrow keys ⌃ and ⌄.
2. Press the MENU key ☰ for a few seconds. The first available editing command appears on the Config Display.
3. Select a command with the arrow keys ⌃ and ⌄.
4. Follow the instructions for each command in the following sections.

The Un Command (Unit of weight)

Use this command to set the unit of weight for the selected grading memory. Follow the procedure described in "The UN Command" on page 28.

The Lo 1 Command (Lower Grade Limits)

The lower grade limits are set as follows:

1. Select a memory by using the arrow keys ⇧ and ⇩.
2. Press the MENU key for a few seconds.
3. Select a grade limit (Lo 1 to Lo9) with the arrow keys.
4. Press PRINT. If available, the memory's current grade limits are displayed on the Weight Display.
5. Press PRINT again. The first digit on the display starts to flash, indicating that it can be changed to a new value.
6. Use the UP/DOWN arrows to change the values of the grade limit digits. Press PRINT to activate each digit.
7. Press the MENU key to return to Edit Mode where you can select one of the other grade limits.
8. Press the MENU key a second time to return to Operating Mode.

Note: You must activate all digits (press PRINT six times) or no change will take place.

Note: When you change the unit of weight, the contents of the grade limit (Lo 1 to Lo9) is also converted.
For example, Lo 1=5 kg changes to 11.025 lb, 5 g to 0.010 lb, etc.

The Grd Command (Grading Method)

Use this command to select a grading method for the selected memory.

1. Select a memory by using the arrow keys ⇧ and ⇩.
2. Press the MENU key for a few seconds.
3. Select the Grd command with the arrow keys.
4. Press PRINT. The currently active grading method, nEt, rE. or POS, is displayed on the Weight Display.
5. Press PRINT again. The grading method starts to flash, indicating that it can be changed to a new value.
6. Use the UP/DOWN arrows to change the grading method.

7 Press PRINT to confirm your selection.

8 Press the MENU key to return to Edit Mode where you can select one of the other grading commands.

9 Press the MENU key a second time to return to Operating Mode.

Advanced functions

Setup Mode

The Setup Mode gives access to the more advanced functions of the M1100 scale, for example various service commands.

To enter the Setup Mode

- Press the ZERO key and the TARE key simultaneously.

A message, CodE, prompting for a password (see "Password" on page 34) appears on the Weight Display. When you have entered the password, the first available command, APP, appears on the Config Display.

While in Setup Mode, the keys function as described in the table below:

Table 3 Function of Keys in Setup Mode.

Key:	Function:
DOWN arrow	Move to the next item on the current level.
UP arrow	Return to previous item on the current level.
PRINT key	Confirm an entry, run a command, enter a sub-menu, or record and print weighing results.
MENU key	Return to a previous menu or exit the Setup Mode.

Password

Entering the Setup Mode requires a password. Until the correct password has been entered, the message CodE is shown on the Weight Display. The Setup Mode password is fixed and is entered as described below:

To enter the password

1. Press the PRINT key once.
2. Press the DOWN arrow four times.
3. Press the UP arrow once.

The keys must be pressed in this order. If you enter an incorrect password, start again by pressing the PRINT key.

Setup Mode Commands

The Setup Mode commands are listed in the following table.

Table 4 Setup Mode commands.

Command:	Description:
APP	*Application switches* To change the status of the application switches.
Ad1	*A/D converter 1* To show the direct reading of A/D converter 1.
Ad2	*A/D converter2* To show the direct reading of A/D converter 2. Only on marine scales.
Out	*Output* To print information on the calibration.
C id	*CAN ID* To view and/or modify CAN Ids.

The following sections provide detailed descriptions of the Setup Mode commands.

The APP Command (Application switches)

Use this command to turn the application switches ON or OFF. There are eight application switches available:

- A01 Zero tracking (see "Zero Key" on page 13)
- A02 Automatic tare ("Automatic Tare" on page 19)
- A03 Automatic recording
- A04 Extended mode, fifteen packing memories

- A05 Response A
- A06 Response B
- A07 Optimize grading for accuracy (ON) [13]
  Optimize grading for speed (OFF)
- A08 Reserved for special functions
- A09 Special functions
- A 10 Transmission A
- A 11 Transmission B
- A 12 Disable power-down mode, battery operated scales only
- A 13 - A 16 Special functions[14]

1. When you have selected the command with the arrow keys, press PRINT to display the switches.
2. Switch A0 1 appears on the Config Display and the current status (On/Off) is displayed above on the Weight Display.
3. Press PRINT again. The status indicator starts to flash and can now be changed with the arrow keys.
4. Press PRINT to confirm the change.
5. Press the MENU key to return to the top of the Setup Menu.
6. Press the MENU key a second time to return to Operating Mode.

The Ad1 and Ad2 Commands (A/D Converters)

These commands display the direct value of the A/D converter readings shown on the Weight Display.

1. Select the command with the arrow keys, and press PRINT to submit.
2. Return to the Setup Menu by pressing the MENU key.

[13] Due to local restrictions in some market areas, switches 5 through 7 may not be accessible by the user.
[14] More information on the application switches is available in *M1100 Packing & Grading Scale, Calibration Instructions*.

The Out Command (Output)

This command is used to print information on the calibration:

1. Select the command with the arrow keys, and press PRINT.
   The output is sent to an attached printer or PC.
2. Press the MENU key to return to the Setup Mode.
3. Press the MENU key a second time to return to Operating Mode.

The following is an example of a printout from the Out command:

M1100:	U2-3.10 / CAL=2 / CON=2
App:	1000 0000 0000 0000
Cap:	15.000 kg
Res:	Single
CS:	5 kg
C0:	601495
C2:	840888
Gain:	2.088615e-05 kg/cnt
g-adj:	1.00000
Set:	0000 0000 0000 1000
aP:	10.0
aZ:	5.0
aY:	0
aX:	0
bP:	10.0
bZ:	5.0
bY:	0
bX:	0

The Cid Command (CAN ID)

Use this command to view and set the CAN identification number if the M1100 scale is (to be) connected to other equipment via a CAN connection:

1. Select the command with the arrow keys, and press PRINT to display the current ID on the Weight Display.
2. Press PRINT again. The first digit to the right on the display starts to flash, indicating that it can be changed to a new value.
3. Use the UP/DOWN arrows to change the value for the ID number. Press PRINT to activate each digit.

> **Note:** You must activate all digits (press PRINT six times) or no change will take place.

4. Press the MENU key to return to Setup Mode.
5. Press the MENU key a second time to return to Operating Mode.

Battery Operation

About the Battery

The M1100 scale can be used with a battery[15]. Alkaline batteries size D (IEC LR20) are recommended. Rechargeable batteries can also be used, but normally with reduced operating time.

Figure 22 Warning: danger of explosion.

WARNING! When using rechargeable batteries:

- **Do not** use NiMH type batteries, as they can release hydrogen gas with danger of explosion.
- **Never** use a combination of alkaline and rechargeable batteries and **do not** mix different types of rechargeable batteries.

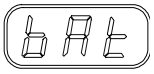


Figure 23 Warning: battery power low.

Using a set of four alkaline batteries provides operating power for approximately 250 hours of continuous usage, which equals six weeks if used eight hours a day, five days a week.[16] When the battery power gets low, a blinking warning, bAt, appears on the Config Display. The scale is still functional, until the power reaches its lowest operational point, which is when the scale will shut down.

WARNING! Batteries may contain toxic chemicals. Therefore, they should be disposed of in an environmentally safe way at the appropriate locations.

[15] The battery option is only available for pillar models.
[16] Land based scales. For marine scales the operating time is 170 hours.

Saving Battery Power

- Battery operated M1100 scales are equipped with a power saving feature that puts the scale in "power down mode" when it has been inactive for 30 minutes. In power down mode, the batteries will last up to one year.
- You can put the scale manually in power down mode by pressing the MENU key and the DOWN arrow simultaneously.
- This feature helps preserve the batteries, but you should nevertheless **remove** the batteries if the scale is not to be used for an extended period of time (more than a couple of months).

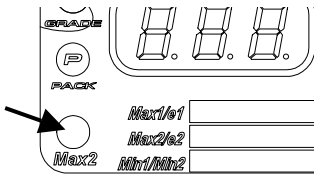


Figure 24 The Power down mode indicator

The Max2 indicator in the bottom left corner of the M1100 Indicator blinks while the scale is in power down mode.

To bring the scale back from power down mode

♦ Press any key on the keyboard.

Note: Set switch A 12 to ON, if you do not wish to use the power down feature.

Appendices

Appendix A — Error codes

Error code:	Description:	Action:
E-03	ADC overrange	Reduce the weight on the platform
E-04	ADC underrange	Increase the weight on the platform
E-05	Unstable weight (initial zero)	Stabilize the scale
E-06	Weight outside range (initial zero)	Make sure the platform is empty
E-08	Operation in progress (initial zero)	Wait until completed
E-11	Invalid initial zero	Remove or reduce the weight on the platform
E-13	Program failure (checksum)	Contact your Marel agent
E-14	ADC not responding	Contact your Marel agent
E-15	W&M setup checksum failure	Contact your Marel agent
E-23	24 V power voltage too high	Provide correct voltage
E-25	Low voltage to load cells	Check load cell
E-81	Invalid static marine calibration. Fit value too high	Repeat calibration
E-82	Invalid static marine calibration. Calibration weight not detected	Repeat calibration
E-84	Marine static calibration not allowed	Scale requires motion
E-91	Invalid marine calibration. Fit value too high	Repeat calibration
E-92	Invalid marine calibration. Calibration weight not detected	Repeat calibration
E-93	Invalid initial zero	Make sure the platform is empty

Note: If the error persists contact Marel hf. or your local Marel agent for assistance.

Appendix B — Response Times, Transmission Rates and Printouts

Reports are printed via the RS-232 interface, at 4800 Baud, using 8 data bits and no parity. The scale transmits XON and XOFF characters. Reception of XON and XOFF is not supported.

- Manual/Automatic/Continuous Printout:

```
1.278 kg P1 yyyyy
 160. g  P2 yyyyy
2.045 lb G3 yyyyy
  5.6 oz P4 yyyyy
 2.76 kg G5 yyyyy
(2.76 kg xx)yyyyy
```

or when application switch A04 is ON:

```
1.278 kg p01 yy-yyyy
 160. g  p02 yy-yyyy
2.045 lb g01 yy-yyyy
  5.6 oz p04 yy-yyyy
 2.76 kg g05 yy-yyyy
(2.76 kg xxx)yy-yyyy
```

where
x = packing or grading memory number
y = computer code (type, checksum and sequence number)

- Response times and transmission rates:
  The tables below show the available response times for M1100 scales.

#A5 [17] Response A	#A6 Response B	Response mode	Response time	
OFF	OFF	Variable fast response	~ 0.5 seconds variable	4.9 Hz
ON	OFF	Fast response	~ 0.5 seconds	4.9 Hz
OFF	ON	Medium response	~ 0.9 seconds	2.4 Hz
ON	ON	Slow response	~ 1.2 seconds	1.2 Hz

#A10 Transmission A	#A11 Transmission B	Output mode
OFF	OFF	No continuous printout
ON	OFF	Event-driven printout
OFF	ON	Fixed-rate printout
ON	ON	No continuous printout

- Printout from the Out command; example:

```
M1100:  U2-3.10 / CAL=2 / CON=2
App:    1000 0000 0000 0000
Cap:    15.000 kg
Res:    Single
CS:     5 kg
C0:     601495
C2:     840888
Gain:   2.088615e-05 kg/cnt
g-adj:  1.00000
Set:    0000 0000 0000 1000
aP:     10.0
aZ:     5.0
aY:     0
aX:     0
bP:     10.0
bZ:     5.0
bY:     0
bX:     0
```

[17] In some market areas switches #A5 and A6 may not be available. In such cases their function is selected during installation.

Appendix C — CAN Connections

The M1100 scale offers the option of CAN connections to other equipment, hoppers for example. Use of the CAN connections is described below.

To view CAN network status

1. Press the MENU key and the UP arrow simultaneously.
2. The current CAN status is displayed on the Weight Display:

- PrE n **Preoperational mode**. The CAN module has not been started from the master.
- OP n **Operational mode**. The CAN module has been started from the master.

  A **steady** n to the right in the display indicates that the CAN bus is active and in order.

  A **blinking** n indicates that
  a) the scale's CAN bus is not connected to the CAN network or
  b) there is no other CAN module on the network.

3. Press the MENU key to return to Operating Mode.

Note: The CAN network cannot be used on battery operated scales.

Appendix D — Technical Specifications

Manufacturer:	Marel hf.
Indicator Type:	M1100-U2, marine scale; 2 defines the software application. M1100-C2, land based scale; 2 defines the software application.
Enclosure:	Designed for washdown; AISI 316 stainless steel; degree of protection exceeds IP67.
Accuracy Class:	(III)
Maximum number of verification scale intervals:	7500, according to Directive 90/384 EEC and EN45501 (depends on environment and the composition of load cell/platform modules).
Maximum tare effect:	-Max
Load Cell Excitation:	
Voltage:	4.7 Vdc ±5%
Characteristics:	Direct Current
4 or 6 wire systems:	6 wire system using excitation voltage sensing (3 Ω max). Optional 4 wire system (0.2 Ω max).
Rated minimum input impedance of Load Cells:	Min 85 Ω, or four 350 Ω load cells.
Maximum input range:	70 mV
Minimum signal voltage for dead load:	–70 mV
Maximum signal voltage for dead load in case of "added dead load":	60 mV
Minimum input voltage per scale interval (v.s.i):	0.6 μV/e
Maximum influence of temperature on the span drift:	4 ppm/°C

Specification of interfaces:	RS-232 bi-directional interface, 4800 Baud, 8 data bits and no parity. XON/XOFF. CAN (Controller Area Network) Bus Interface (ISO 11898).
Operating temperature range:	Min –10° C, Max +40° C
Display and indicators:	
Weight Display:	Six red digits, seven segment LED, 14 mm high (0.6 inch).
Config Display:	Three red digits, seven segment LED, 10 mm high (0.4 inch).
Unit of Weight Indication:	Four red, back-lit indicators, kg, g, lb and oz.
Weight Target Indicator:	Four red UNDER arrows, a green ACCEPT light and four red OVER arrows.
Grade Indicator:	Red grading light.
Pack Indicator:	Red packing light.
Status Indicators:	Green ZERO light Red NET light Green STEADY light
Power Requirements:	1. 110-230 VAC 0.16-0.1 A internal power supply 2. 12-24 VDC 0.1 Amax CAN network 3. 2-10 VDC 0.2 Amax battery operation
Battery:	
Type:	Alkaline size D (IEC LR20)
Operating time, 20°C:	Marine scale: 170 hours (w/four size D alkaline batteries) Land scale: 250 hours (w/four size D alkaline batteries) Power down mode: up to 1 year (w/four size D alkaline batteries)
Capacity and Resolution:	The table below shows the weighing range of the M1100 indicator. The indicator can be configured to operate as a single or multiple range scale that changes from a low to a high range with the load on the platform. Example: Max1 = 3 kg, e = 1 g (low weighing range, high resolution) Max2 = 6 kg, e = 2 g (high weighing range, low resolution)

Single range

Metric Units		Avoirdupois Units			
Max	e =d	Max	e =d	Max	e =d
300 g	0.1 g	(0.6 lb)	-	9.6 oz	0.005 oz
600 g	0.2 g	(1.5 lb)	-	24 oz	0.01 oz
1500 g	0.5 g	3 lb	0.001 lb	48 oz	0.02 oz
3000 g	1 g	6 lb	0.002 lb	96 oz	0.05 oz
6000 g	2 g	15 lb	0.005 lb	240 oz	0.1 oz
3 kg	1 g	6 lb	0.002 lb	96 oz	0.05 oz
6 kg	2 g	15 lb	0.005 lb	240 oz	0.1 oz
15 kg	5 g	30 lb	0.01 lb	480 oz	0.2 oz
25 kg	10 g	50 lb	0.02 lb	800 oz	0.5 oz
30 kg	10 g	60 lb	0.02 lb	960 oz	0.5 oz
60 kg	20 g	150 lb	0.05 lb	2400 oz	1 oz
150 kg	50 g	300 lb	0.1 lb		
300 kg	100 g	600 lb	0.2 lb		
600 kg	200 g	1500 lb	0.5 lb		
1000 kg	500 g	2000 lb	1 lb		
1500 kg	500 g	3000 lb	1 lb		
2000 kg	1 kg	4000 lb	2 lb		
3000 kg	1 kg	6000 lb	2 lb		
4000 kg	2 kg	8000 lb	5 lb		
6000 kg	2 kg	15000 lb	5 lb		

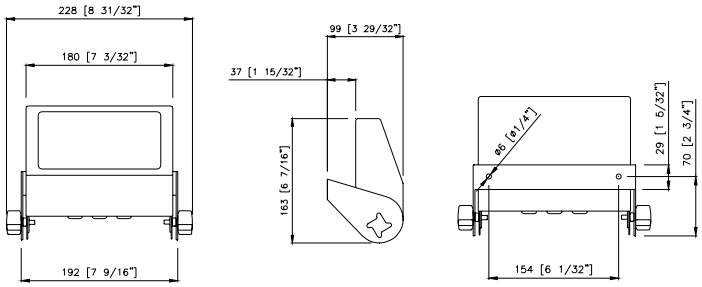
Multiple range

Metric Units		Avoirdupois Units			
Max1/Max2	e =d	Max	e =d	Max	e =d
300 / 600 g	0.1 / 0.2 g	(0.6 / 1.5 lb)	-	9.6 / 24 oz	0.005 / 0.01 oz
600 / 1500 g	0.2 / 0.5 g	(1.5 / 3 lb)	-	24 / 48 oz	0.01 / 0.02 oz
1500 / 3000 g	0.5 / 1 g	3 / 6 lb	0.001 / 0.002 lb	48 / 96 oz	0.02 / 0.05 oz
3000 / 6000 g	1 / 2 g	6 / 15 lb	0.002 / 0.005 lb	96 / 240 oz	0.05 / 0.1 oz
3 / 6 kg	1 / 2 g	6 / 15 lb	0.002 / 0.005 lb	96 / 240 oz	0.05 / 0.1 oz
6 / 15 kg	2 / 5 g	15 / 30 lb	0.005 / 0.01 lb	240 / 480 oz	0.1 / 0.2 oz
15 / 25 kg	5 / 10 g	30 / 50 lb	0.01 / 0.02 lb	480 / 800 oz	0.2 / 0.5 oz
15 / 30 kg	5 / 10 g	30 / 60 lb	0.01 / 0.02 lb	480 / 960 oz	0.2 / 0.5 oz
30 / 60 kg	10 / 20 g	60 / 150 lb	0.02 / 0.05 lb	960 / 2400 oz	0.5 / 1 oz
60 / 150 kg	20 / 50 g	150 / 300 lb	0. 5 / 0.1 lb		
150 / 300 kg	50 / 100 g	300 / 600 lb	0.1 / 0.2 lb		
300 /600 kg	0.1 / 0.2 kg	600 / 1500 lb	0.2 / 0.5 lb		
600 / 1000 kg	0.2 / 0.5 kg	1500 / 2000 lb	0.5 / 1 lb		
600 / 1500 kg	0.2 / 0.5 kg	1500 / 3000 lb	0.5 / 1 lb		
1500 / 2000 kg	0.5 / 1 kg	3000 / 4000 lb	1 / 2 lb		
1500 / 3000 kg	0.5 / 1 kg	3000 / 6000 lb	1 / 2 lb		
3000 / 4000 kg	1 / 2 kg	6000 / 8000 lb	2 / 5 lb		
3000 / 6000 kg	1 / 2 kg	6000 / 15000 lb	2 / 5 lb		

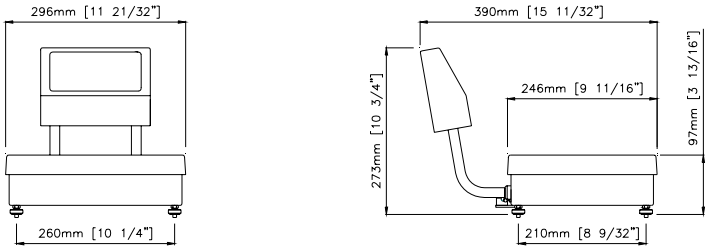
	Metric Units		Avoirdupois Units			
	Max	e =d	Max	e =d	Max	e =d
	600 g	0.1 g	(1.5 lb)	-	24 oz	0.005 oz
	1500 g	0.2 g	(3 lb)	-	48 oz	0.01 oz
	3000 g	0.5 g	6 lb	0.001 lb	96 oz	0.02 oz
	6000 g	1 g	15 lb	0.002 lb	240 oz	0.05 oz
High res, Single range	6 kg	1 g	15 lb	0.002 lb	240 oz	0.05 oz
	15 kg	2 g	30 lb	0.005 lb	480 oz	0.1 oz
	25 kg	5 g	50 lb	0.01 lb	800 oz	0.2 oz
	30 kg	5 g	60 lb	0.01 lb	960 oz	0.2 oz
	60 kg	10 g	150 lb	0.02 lb	2400 oz	0.5 oz
	150 kg	20 g	300 lb	0.05 lb		
	300 kg	50 g	600 lb	0.1 lb		
	600 kg	100 g	1500 lb	0.2 lb		
	1000 kg	200 g	2000 lb	0.5 lb		
	1500 kg	200 g	3000 lb	0.5 lb		
	2000 kg	500 g	4000 lb	1 lb		
	3000 kg	500 g	6000 lb	1 lb		
	4000 kg	1 kg	8000 lb	2 lb		
	6000 kg	1 kg	15000 lb	2 lb		

Dimensions:

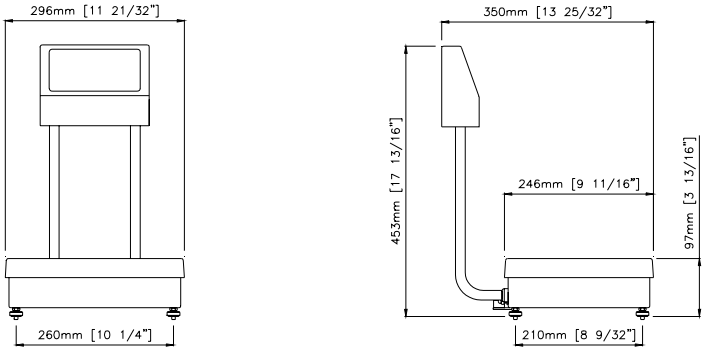
Model xxxNx



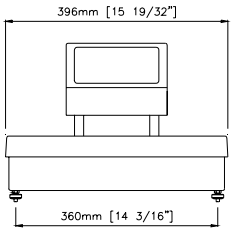
Model xxxSx
Platform PL2010

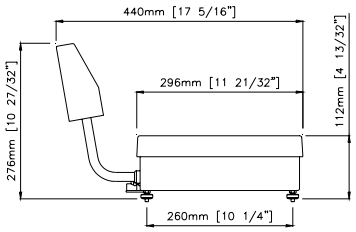


Model xxxLx
Platform PL2010
(model xxBLx with battery)

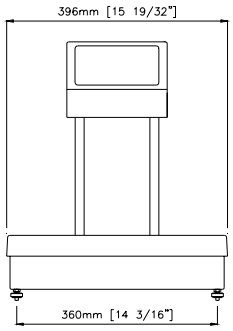


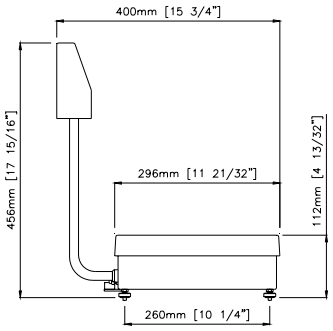
Model xxxSx
Platform PL3000



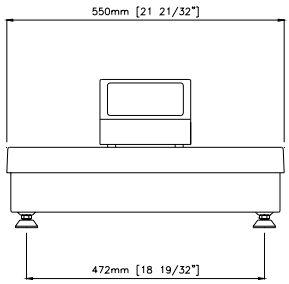


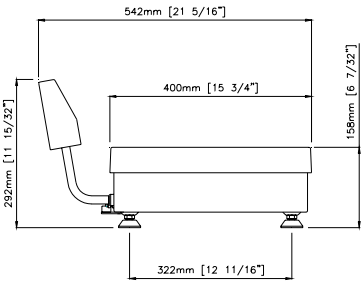
Model xxxLx
Platform PL3000
(model xxBLx with battery)



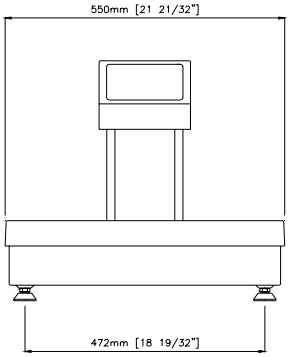


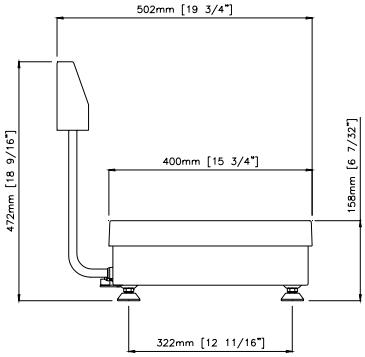
Model xxxSx
Platform PL4000



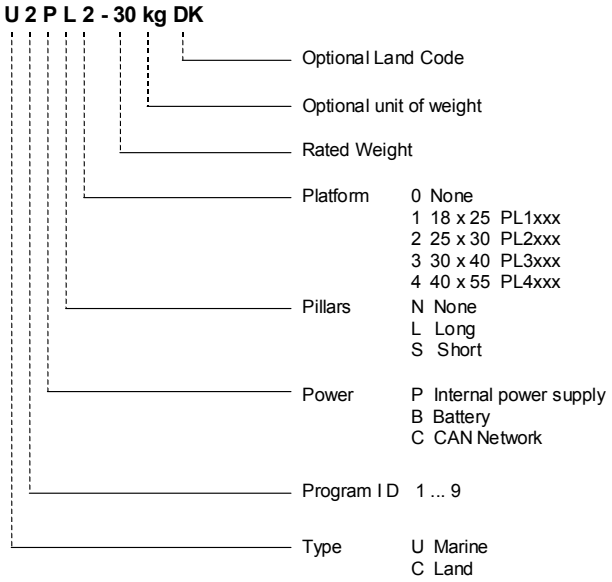


Model xxxLx
Platform PL4000
(model xxBLx with battery)





The M1100 Type and Model:
(M1100 U2PL2-30kg DK)



Glossary of Terms

Accept indicator
On the M1100 Indicator. Lights up with a green light, if the weight on the platform is within the set weight limits (only in packing mode).

Calibration
For marine calibration see *Motion compensation*.

Commands
See *Edit* and *Setup Mode commands*.

Config Display
A display on the M1100 scale that shows the current *packing or grading memory*. The display is also used to show configuration commands.

Edit commands
Used to revise the settings for the *packing or grading memories.*

Extended mode
An operating mode activated by setting application switch A04 to ON. The number of available packing memories increases from five to fifteen.

Grade limit
A lower limit is specified for each grade in a *grading memory.* No upper limit is specified, the lower limit of the following grade becomes the upper limit of the previous grade.

Grading memory
An area in the M1100 computer programmed with parameters used for the grading: unit of weight and lower grade limit.

Indicator
See *M1100 Indicator*.

Lower weight limit
A value indicating the minimum value for an acceptable weight.

M1100
The Marel M1100 Packing & Grading Scale, the marine or land based type.

M1100 Indicator
The display unit for the M1100 scale.

Max
The maximum value of a single range scale.

Max1
The maximum value of the lower range in a dual range scale.

Max2
The maximum value of the higher range in a dual range scale.

Motion compensation
A procedure for correcting the marine scale's weighing stability and accuracy while the platform is in motion.

Multiple range
On scales with two or more weighing ranges with different maximum capacities and different scale intervals for the same weighing platform, each range extending from zero to its maximum capacity.

Over indicator
On the *M1100 Indicator*. Lights up with an orange light, if the weight on the platform is above the set upper *weight limit* (only in packing mode).

Packing memory
An area in the M1100 computer programmed with parameters used for the packing: weighing unit, upper and lower *weight limits*.

Password
Used to limit unauthorized access to the Setup Mode where settings for the scale's setup can be changed.

Preset tare
A fixed tare value (see *Tare*) specified by the user.

Range
See *Weighing range*.

Resolution
The number of divisions in the total weighing interval.
Example: If the weighing interval is 15 kg and the division (e) is 5 g, the resolution is 1:3000.

Setup Mode commands
Used to change the setup settings for the M1100 scale.

Steady indicator
On the *M1100 Indicator*. Lights up with a green light, when the weight on the platform is stable.

Tare
The weight of the container on the platform and the allowance made for the container when weighing.

Weight limit
See *Upper* or *Lower weight limit*.

Under indicator
On the *M1100 indicator*. Lights up with a red light, if the weight on the platform is under the set lower *weight limit* (only in packing mode).

Upper weight limit
A value indicating the maximum value for an acceptable weight.

Weighing range
The range from zero to maximum capacity.

Weight Display
An M1100 display that shows the weight on the platform.

Weight Target
Consists of three indicators, the *Accept*, *Under*, and *Over* indicators (only in packing mode).

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