

Operator's Manual

MC 1050 / MC 1050 RC



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1. General information

1.1. Changes

The text and graphic sections of this operator's manual have been prepared with considerable care and attention. Please address any comments regarding the design of this manual or errors in content to your MOBA supplier. We will be happy to respond to useful ideas and suggestions for improvement.

1.2. Liability disclaimer

In order to maintain our competitive advantage, it may be necessary to make changes/modifications in the product and/or operating procedures which may deviate from information contained in this operator's manual without prior notice. As manufacturer, MOBA assumes no liability for:

damages directly or indirectly attributable to faults, omissions in the operator's manual or discrepancies between the descriptions in the operator's manual and the weighing system,

violations of patent rights through unauthorized use of the contents of this operator's manual by third parties.

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1.3. Copyright

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2. Work performed on the weighing system

2.1. Electrical work

Work on the vehicle electrical system may be performed by trained, qualified personnel only. The minus terminal of the vehicle battery must be disconnected during electrical installation work. In order to reduce system disruptions to a minimum, it is important to ensure a good electrical connection between the vehicle and housing chassis of the individual components. Do not use unoccupied terminals for other connections or equipment.

2.2. Welding

Before beginning welding operations, the minus pole of the vehicle battery must be disconnected. To the extent possible, all electronic components should be dismantled or disconnected from the power supply prior to welding. Electrical arc welding generates extremely strong currents that can destroy electronic components. Place the minus electrode of the welding tool in the immediate vicinity of the point that is to be welded.

Remove paint from the mounting point and the part that is to be welded on. All welds must be primed and painted after welding. Protect flammable parts from exposure to sparks. Never look directly into the arc without proper eye protection.

2.3. Cleaning

In order to ensure proper system function, weighing cells, the connection box and electronic components **must never** be cleaned with a high-pressure sprayer.

2.4. Packing and storage

The products have been carefully packed to provide sufficient protection during shipment. The packing and the products should be inspected for damage upon arrival.

Damaged equipment must not be put into operation !

Damaged cables and plugs represent a safety risk and must not be used !

Please contact your MOBA supplier in the event that component damage is detected.

Equipment components that are not to be installed and operated immediately must be protected against exposure to moisture and dirt.

3. Safety measures

3.1. Warning:

Please read the operator's manual carefully and completely prior to installing, servicing or operating the equipment. If you have questions, contact your MOBA supplier.

3.2. Safety precautions:

The safety precautions recommended here correspond to basic guidelines for the installation and operation of electrical systems. They may be applied to all applications in which MOBA equipment is used.

3.3. Installation:

Use only original MOBA cables when installing the equipment. Plugs may not be removed from cables, as they are protected by a moisture seal which would be destroyed upon removal. Ensure that safety screws on plug connections are firmly tightened. Further instructions for the installation of equipment and sensors are contained in the enclosed data sheets and operator's manuals.

3.4. Wiring and cable connections:

Wiring and cable connections must conform to the instructions contained in this manual. The capacity ratings of all leads and connection terminals must be sufficient for the electrical current required by the system. All connections must conform to applicable VDE and national/local regulations.

3.5. System stability:

This equipment unit has been designed and appropriately tested for industrial use. However, microprocessor technology poses certain specific requirements with respect to installation. Please observe the following installation instructions, as failure to do so may result in later disruptions of operation.

Ensure correct polarity of all connections.

Avoid exceeding or falling below the prescribed voltage limits. Protect equipment with appropriate fuses or circuit breakers.

Cable diameters must be sufficient for the voltage/current required by the system.

Use the shortest cable lines possible (avoid loops)

Install load, control and measurement lines in separate circuits, if possible.

Suppress interference in safety and relay coils

Connect shielded lines to ground on one side only (equipment side).

Do not connect other equipment directly to the power supply terminals.

Do not use unoccupied connection terminals for other connections or equipment.

3.6. Maximum voltages:

Do not exceed the maximum permissible voltages. The maximum voltage between any two electrical circuits and ground is limited, unless otherwise specified, to the maximum input or supply voltage value. Connection terminals or plugs must be equipped with appropriate circuit breakers.

3.7. Circuit breakers:

The equipment is protected by built-in electronic circuit breakers which protect against pole reversal, voltage peaks and short-term voltage surges. The supply voltages specified in the technical data section may not be exceeded!

3.8. Configuration:

The equipment can be configured by the user. When configuring the system, the user is obliged to comply with the requirements of the system.

3.9. System monitoring unit:

In complex systems in which system malfunctions can result in injury to operating personnel or severe damage to the system, it is advisable to install an independent monitoring unit for process monitoring. This unit provides protection by issuing an alarm or shutting down the system in an emergency. An alarm built into the system control unit does not provide sufficient protection, as it is system-dependent.

3.10. Explosive hazard areas:

This equipment is not designed for use in explosive hazard areas.

3.11. Corrective action:

Before taking action to correct system faults, ensure that the equipment is completely disconnected from the power supply. Defective components should be inspected in a properly equipped testing area. Any attempt to correct faults in a component that is still installed in the system could endanger both personnel and the system itself. Ensure that the system is disconnected from the power supply before removing or replacing sensors built into the equipment.

3.12. Requesting help:

Please address all questions regarding installation and operation to your MOBA supplier.

Non-compliance with the above safety precautions can lead to component or system failure. Damages attributable to non-compliance with the above safety precautions are not covered by the manufacturer's warranty.

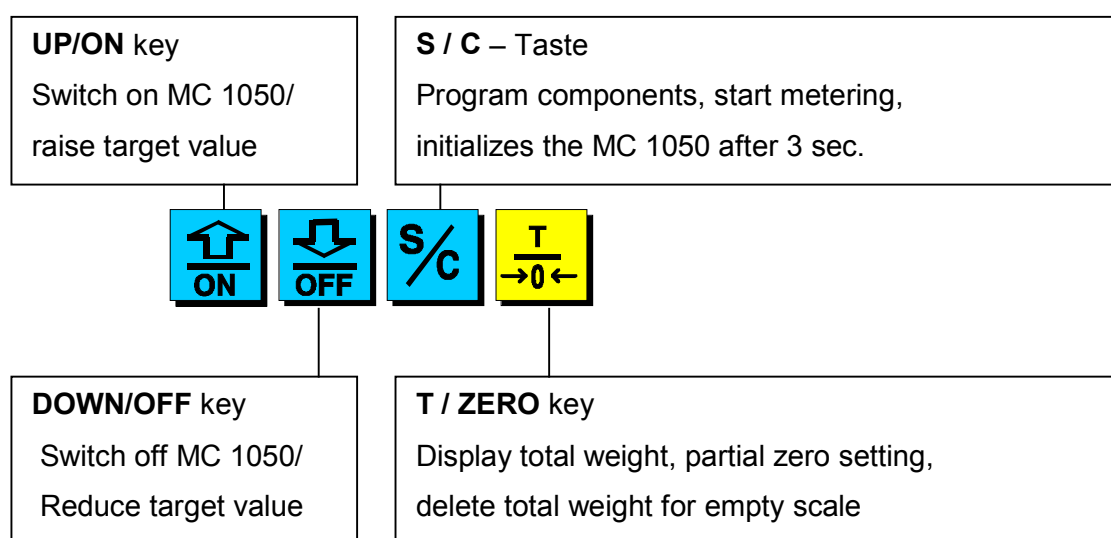
4. Introduction

The MC 1050 enables you to meter in or out a specific quantity of material. The MC 1050 automatically recognizes whether the operation in question involves input or output metering.

5. Operating the 1050

5.1. The function keys

The MC 1050 has a keypad with four function keys. These keys are used to initiate all functions: entering parameters, starting, interrupting and aborting the metering process and switching the unit on or off.



5.2. Switching the MC 1050 on and off

The MC 1050 is switched on by pressing the **UP/ON** key. The display shows the message **dc 1050** for 3 seconds.

The system is then in the weighing mode in which the actual weight of the weighing system is displayed. Parameters can be changed after a five-minute warm-up phase.

The MC 1050 is switched off by pressing the **DOWN/OFF** key.

5.3. Setting the zero point

The zero point is set using the software. The MC 1050 offers two zero-setting options.

5.3.1. Total zero setting

Because it is impossible to guarantee a totally tension-free vehicle setup, the display may show a residual weight value even when the scale is empty. When all loads have been removed from the scale, this residual weight can be suppressed by pressing and holding the **T/ZERO** key for three seconds. The display then shows: “———”. When the key is released, the display shows: **t: 0**, indicating that the weighing system tare has been set.

5.3.2. Partial zero setting

This function is useful when, for example, there is a certain quantity of feed in the vehicle to which a certain quantity of feed (e.g. 20 kg) is to be added and this quantity is not programmed as a component.

For this purpose, the system must be in the weighing mode (displaying a weight value, e.g. **t 1200**). The **T/ZERO** key is pressed briefly, and the display shows: **0 0**. Feed is metered in until the display reads: **0 20** (kg). The actual current weight in the vehicle can then be displayed by pressing the **T/ZERO** – key again: **t: 1220**.

5.4. Metering

5.4.1. Programming target values

In order to change the target value for input or output metering, the current target value is first displayed by pressing the **S/C** key, e.g.: **Co: 1000**

The new value is then entered using the **DOWN / UP** keys.

5.4.2. Starting the metering process

The target value for input or output metering is displayed by pressing the **S/C** key, e.g.:

Co: 1000

If the weight of the feed mixing vehicle changes as the result of input or output, an input or output metering process is automatically initiated, depending upon the direction of change,

e.g. input metering for weight increase: **CA: 1000**

or output metering by weight decrease: **SC: 1000**

The sensitivity level which controls the start of the metering process is changed using the metering bandwidth (see Section 6.7, Setting the metering bandwidth, page 3).

During metering, the residual weight of the target value moves toward 0 kg. The display always shows the remaining amount to be metered. An acoustical signal (horn) is emitted at intervals once 85% of the programmed target value has been metered. The frequency of the signal increases as metering progresses.

When all but 2% of the target value has been metered, a constant tone indicates that the metering process has effectively ended. Final completion of metering is determined when the weight ceases to change or after no more than 5 seconds. The horn is switched off and the total weight is displayed.

5.4.3. Interrupting the metering process

If the feed mixing vehicle needs to be moved during a metering process, the **S/C** key can be pressed during metering. The remaining quantity is saved to memory and all places on the display begin to blink. Metering is restarted by pressing the same key again.

5.4.4. Aborting the metering process

To abort the metering process, press and hold the **S/C** key for 3 seconds. The system then displays the total weight.

5.5. Large-screen display

The MC 1050 is equipped with a separate connection socket for an additional large-screen display (LA06).

6. System parameters

6.1. Default mode

The default mode of the MC 1050 is the weighing mode in which the current weight reading is displayed. After the unit is switched on by pressing the **ON** key and the starting message "**dc 1050**" has been displayed for 3 seconds, the system automatically shifts to the weighing mode. In order to ensure stable parameter settings, parameters should not be changed until after the 5-minute warm-up phase has elapsed.

6.2. Setting the weight resolution increment

The unit is delivered with a weight resolution setting of 5 kg. This means that the weight is displayed in increments of 5 kg.

The MC 1050 offers five weight resolution options in addition to the automatic resolution mode. Depending upon the weighing range, resolutions of 0.1 kg, 0.2 kg, 0.5 kg, 1.0 kg or 10.0 kg (weighing range 5-13), or 1 kg, 2 kg, 5 kg, 10 kg and 100 kg (weighing range 14-27) can be selected. The system switches automatically between the two groups of options depending upon the weighing range.

In addition to the fixed weight display increments, the weight display can also be automatically adjusted to the current weight.

The following display increments apply in the automatic weight resolution mode:

Current weight in kg/lbs	Resolution in kg/lbs
0... 9999	1
10000...16000	2
16001...24000	5
24001...32000	10
32001...80000	100

In some situations, it may be advisable to switch off the automatic resolution feature and set a single resolution increment for the entire weighing range.

The resolution is selected using code number **15**. The MC 1050 must be in the weighing mode. Then the **S/C** key is pressed and held for 3 seconds and code number **15** is entered with the **UP / DOWN** keys:

The selection is acknowledge by pressing the **S/C** key. If the automatic resolution feature is activated, the display shows: **Inc :— —**

The two bars indicate automatic resolution depending upon the actual current weight.

The resolution can be set as followings using the **UP / DOWN** keys:

Weighing range (5-13)	Weighing range (14-27)
—.— kg/lbs(automatic)	— — kg/lbs (automatic)
0.1 kg/lbs	1 kg/lbs
0.2 kg/lbs	2 kg/lbs
0.5 kg/lbs	5 kg/lbs
1.0 kg/lbs	10 kg/lbs
10.0 kg/lbs	100 kg/lbs

If, for example, the resolution increment of 5 kg is selected, the weight will be displayed in 5-kg increments: **Inc :5**

The setting process ends when the **S/C** key is pressed. The weight is displayed with the selected resolution and – if the automatic resolution feature is activated – depending upon the actual weight.

6.3. Setting the overload limit

The function protects the weighing system by displaying an alarm in the form of a blinking code message when a programmed weigh limit (max. 100% of the nominal load capacity) is exceeded. The alarm code is:

O C A P

The weight limit is programmed by pressing and holding the **S/C** key and selecting code number **13** using the **UP/ON** key and acknowledging the entry with the **S/C** key. The display shows the value, e.g.:

A: 0

This indicates that the weight limit function is deactivated. A desired weight limit can then be programmed using the **UP / DOWN** keys. The programmed value can be deleted by pressing the **T/ZERO** key, which also deactivates the weight limit function.

The maximum total weight specified for this weighing system. The value can then be changed by up to 100% using the **UP / DOWN** keys.

The operation is ended by pressing the **S/C** key. The system then displays the actual current weight.

6.4. Setting the weight filter factor

The weight filter factor is set by pressing and holding the **S/C** key and entering code number **14** for weight filtering using the **UP/ON** key. The entry is acknowledge by pressing the **S/C** key. The display shows the selected factor, e.g.:

F: 5

The filter factor can be adjusted using the **UP / DOWN** keys to a value between **0** and **15**. The setting procedure is ended with the **S/C** key is pressed.

The factor does not influence weighing precision. Depending upon the setting selected, it results in weaker or stronger filtering of the weight value.

6.5. Setting the metering bandwidth

This value specifies the weight change value at which the MC 1050 automatically recognizes the start of a metering process (input or output metering).

Code number 16 for the metering bandwidth is entered using the **UP/ON** key after pressing and holding the **S/C** key for 3 seconds. The entry is acknowledged by pressing the **S/C** key. The display shows the value, e.g.:

F: 50

The value can be adjusted using the **UP / DOWN** keys to a value between 0 and 100 kg. The setting process is ended by pressing the **S/C** key.

6.6. Operating hours counter

Unit operating time is recorded. The system records a number of different time intervals which can be displayed in succession by entering code **72**.

The code is entered by pressing the **UP/ON** key and then selecting with the **DOWN/OFF** – key. The various operating times are then displayed in succession by repeatedly pressing the **S/C** key.

Operating hours since the unit was first switched on (**A**)



Operating hours since the counter was last reset (following maintenance) (**b**)



Next maintenance due (in hours)(**U**)



Date and time of calibration



Date and time of recalibration



6.7. Activating, deactivating the horn

The horn is activated or deactivated by entering code **118** (standard).

The desired option is selected with the **UP/ON** or **DOWN/OFF** key:



HUPE 0 : Horn function off

HUPE 1 : Horn function on The

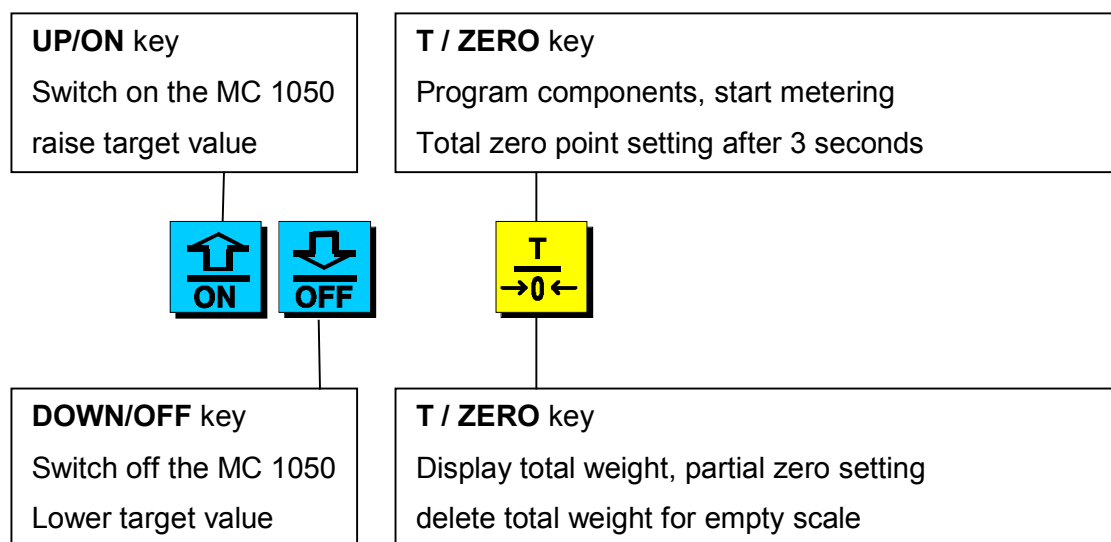
selection is acknowledged by pressing the **S/C** key.

7. Optional feature – remote control operation of the MC1050 RC - 04-50-07310



7.1. The keys

The remote control unit is equipped with a 3-key pad. These keys are used to activate the following functions: setting target values, starting/interrupting metering, switching the unit on/off.



7.2. Switching the MC 1050 on and off

The **remote control operates only** when the MC 1050 has been switched on **first** using the UP/ON key **on the MC 1050**. The display then shows the start message

dc 1050

for 3 seconds.

The system is then in the weighing mode in which the current actual weight of the weighing system is displayed.

The remote control unit ceases to function when the MC 1050 has been switched off using the DOWN/OFF key on the MC 1050!

7.3. Total zero setting

Because it is impossible to guarantee a totally tension-free vehicle setup, the display may show a residual weight value even when the scale is empty. When all loads have been removed from the scale, this residual weight can be suppressed by pressing and holding the **T/ZERO** key for three seconds. The display then shows: “———”. When the key is released, the display shows: **t: 0**, indicating that the weighing system tare has been set.

7.4. Partial zero setting

This function is useful when, for example, there is a certain quantity of feed in the vehicle to which a certain quantity of feed (e.g. 20 kg) is to be added and this quantity is not programmed as a component.

For this purpose, the system must be in the weighing mode (displaying a weight value, e.g. **t 1200**). The **T/ZERO** key is pressed **briefly**, and the display shows: **0 0**. Feed is metered in until the display reads: **0 20** (kg). The actual current weight in the vehicle can then be displayed by pressing the **T/ZERO** – key again: **t: 1220**.

7.5. Programming target values

The system must be in the weighing mode. In order to change the target value for input or output metering, the current target value is first displayed by pressing the **T/ZERO** key twice, e.g.:

Co: 1000

The new value is then entered using the **DOWN / UP** keys.

7.6. Starting the metering process

The system must be in the weighing mode.

The target value for input and output metering is displayed by pressing the **T/ZERO** key twice, e.g.:

Co: 1000

If the weight of the feed mixing vehicle changes as the result of input or output, an input or output metering process is automatically initiated, depending upon the direction of change,

e.g. input metering for weight increase:

CA: 1000

or output metering by weight decrease:

SC: 1000

7.7. Aborting the metering process

To abort the metering process, press the **T/ZERO** key once. The system then displays the total weight.

7.8. Changing batteries

If the keypad on the remote control unit fails to work properly, the cause is usually a weak battery. To replace the battery in the remote control unit, remove the rear panel of the case (Phillips head screws on the rear). Use type A23 – 12V batteries (ensure correct poling!).

8. Appendix

8.1. Technical data

Operating voltage: 12 Volt DC, approx. 8 W

Weighing range: 0 to 99999 kg

Total system precision:

Weighing error +/- 1% of displayed weight or 1 digit

Resolution: 500,000 d (internal)

Weight display resolution increments, depending on selected weighing range:
0.1, 0.2, 0.5 and 1.0 kg or. 1,2,5 and 10 kg - programmable

Display: 6-place LED display, character height 56 mm

Output: for large-screen or supplemental display

Keypad: 4-key pad

Zero point setting: Zero point setting with the **T/ZERO** key

Peripheral equipment: Horn **12V/1A**
Large-screen display, LA06, 6-play LED display

Operating temperature range: - 10 °C to + 60 °C

Housing: Anodized aluminum housing with quick-mounting device

Safety class: IP 54

Dimensions: 330 mm * 185 mm * 77 mm

Weight: ca. 3300 g

Options : Connection terminal for additional weighbars

Weighbars: 350 Ohm, max. 2mV/V

Technical data subject to change without notice !

8.2. Parameter limits

The values listed in 'parentheses are default values which are automatically set in the system as delivered.

Display code	Meaning	Value
INC : 5	Weight display resolution increment	1,2,5,10,100 kg (5 kg)
CO: 0	Output or input component	0...9999 kg (0 kg)
A 13288	Overload limit	0...nominal capacity +100% (nom. cap.)
F : 0	Weight filtering factor	0...15 (4)

8.3. System messages

The following system messages are displayed when errors/malfunctions occur:

Message	Description
ERROR 1	Memory module: EEPROM is defective (All important system data are stored here).
ERROR 2	Memory module: No EEPROM found!
ErrVAL	Raw weight reading is smaller than 100. A/D converter defective. Communication from A/D converter to processor defective. Short circuit in the weighing signal line. Defective weighbar.
ErrADC	No weight reading received from the A/D converter. Communication from A/D converter to processor defective.
SE_32	The message SE_32 displayed after system start shows the number of hours until the next scheduled maintenance.
SErVIC	The message SErVIC displayed after system start indicates that equipment maintenance is due.

System messages are acknowledged by pressing a key. The program continues to run.

8.4. Additional functions available via code number

The following additional functions can be activated in the initialization mode (press and hold the **S/C** – key for 3 seconds, enter code number using the **UP / DOWN** keys and select by pressing the **S/C** key):

Code number	Function
13	Set overload limit
14	Set weight display filter factor
15	Set weight display resolution increment
16	Set metering bandwidth
70	Display software version
71	Real-time clock
72	Display operating hours counter
118	Activate/deactivate horn

8.5. Troubleshooting

- *The unit cannot be switched on (no display on MC 1050).*

- a) Check power supply.
- b) Disconnect the weighbar plugs one after the other. If the display appears after disconnection of a weighbar, replace the weighbar.
- c) If steps a) or b) do not correct the problem, notify your service technician.

- *The unit cannot be programmed.*

- a) Switch off the unit for about 3 seconds. Then switch on again, press the **S/C** key and enter a value using the **DOWN / UP** keys.
- b) If step a) does not correct the problem, notify your service technician.

- *The weight reading fluctuates significantly although the feed mixing wagon is at a standstill.*

- a) Tighten the weighbar plugs (transition resistance).
- b) Remove all weighbar plugs and check for moisture. If necessary, dry the plugs before replacing and tightening them.
- c) Disconnect the weighbar plugs one after the other. If the reading fluctuation ceases after disconnection of a weighbar, replace the weighbar.
- d) If steps a), b) or c) do not correct the problem, notify your service technician.

8.6. Connections



Weighbar	LA06/CAN	RS232/ALARM	Power
A Usign -	1 UBatt +	1 UBatt +	A +12V DC (br)
B UBatt +	2 CAN +	2 RxD	B 0V (bl)
C Usign +	3 UBatt -	3 Ubatt -	
D GNDA	4 DATA	4 TxD	
E CHASSIS	5 CLOCK	5	
	6 ENABLE	6 ALARM +	
	7 CAN -	7 ALARM -	

8.7. Declaration of conformity