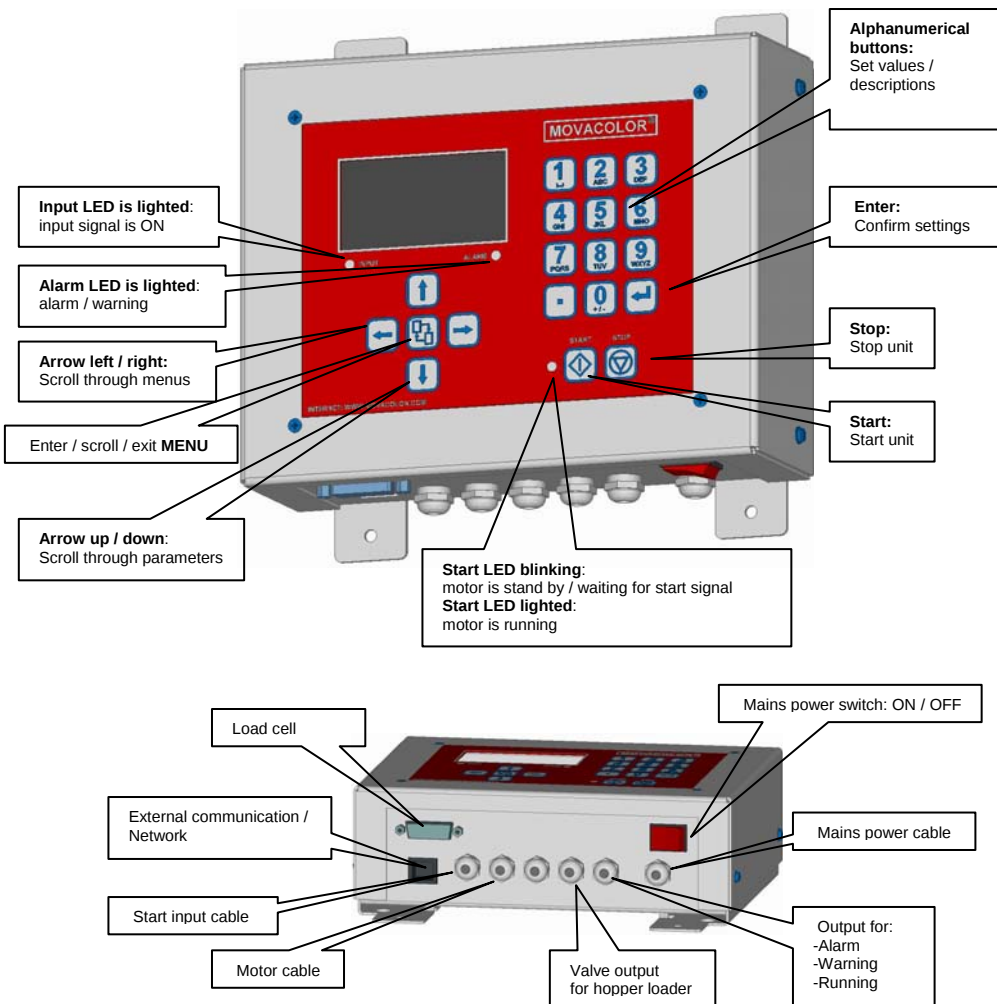


MC-BALANCE Quick Reference 3.1GB.01

Part 1: Operation Reference

For more detailed information please consult the User Manual



GENERAL

1. Terminal software version V0.08.
2. Operation software version V3.1, language version V3.1, production date July 2006.
3. Connect motor and load cell before switch on the controller.
4. All changes have to be confirmed with

START UP

Directly after switching ON the main power of the MC-Balance, the software versions will be displayed.

LOGIN <menu>

The MC-Balance has 3 user levels defined:

User Level	Access level
1. Operator	production settings / hopper loader settings
2. Tooling	same as operator & additional material calibrations / job functionality / weight check / consumption / alarm history / event log.
3. Supervisor	same as tooling & additional system configuration / alarm configuration / file management / load cell calibration.

Key lock: (un)locked. No changes can be made in the settings. The keyboard can be (un)locked by the supervisor.

For changing to an other user level, enter the LOGIN menu and fill in the password (4 numerals) and confirm.

Login for Operator is 0000. The passwords for the other two user levels are defined by the supervisor.

When entering a wrong password, user level will be set automatically to operator level.

In OPERATOR LEVEL the following menus are available:

PRODUCTION / HOPPER LOADER / LOGIN.

PRODUCTION <menu>

The following parameters can be seen in the production screen, depending on operation or settings, (made in supervisor mode):

Injection molding

Prod Job: Name of the production Job
Set speed: Rotating speed of the motor [RPM mode]
Dos. Time: Dosing time (sec.) [Timer mode]
Material: Name of material calibration
Color%: Color amount (%)
Shot wth: Shot weight (gr.)

Extrusion

Prod Job: Name of the production Job
Set speed: Rotating speed of the motor [RPM mode]
Max. tach: Maximum tach voltage (V)
Material: Name of material calibration
Color%: Color amount (%)
Ext. cap: Maximum extruder capacity (kg/hr)

Test: Select Test, select YES and confirm . The unit will run with the set parameters.

Test time in extrusion mode is 30 seconds.

Production (Motor On/Off)

Press to start production, the question appears **Fill cylinder? YES/NO**. YES means that the dosing cylinder will be filled. Press to stop production. When the unit is started, the actual production data will be shown.

The start LED blinks when the unit is waiting for an input signal. The unit is dosing if the Start LED lights continuously.

Regulation mode: AUTO / MANUAL. In the MANUAL mode can be run with fixed RPM. The regulation is frozen.

HOPPER LOADER <menu>

The following parameters can be seen in the production screen, depending on operation or settings (made in supervisor mode):

In this menu all the hopper loader parameters can be set.

ME hopper loader (Movacolor hopper loader operated by compressed air)

ME system : Enable / disable ME hopper loader. (On / Off)
ME fill time: Fill time (sec.) after the weight is above the hopper fill weight (CONFIG.) again (0,0-99,9 sec.)
ME alarm time: Alarm time (sec.) Time between hopper empty weight (CONFIG) and start of alarm, alarm time > fill time. (1,0-99,9 sec.)
ME alarm mode: ME hopper loader is ON / OFF during fill alarm.
Manual fill: Yes = start filling immediately; No = Stop filling immediately.

MV hopper loader (Movacolor hopper loader operated by vacuum)

MV system: Enable / disable MV hopper loader. (On / Off)
MV fill time: Fill time (sec.) (0,0-99,9 sec.)
MV empty time: Empty time (sec.) of MV loader before the next cycle. (0,0-99,9 sec.)
MV fill cycles: Number of additional fill cycles after the weight is above the hopper fill weight again (0-99)
MV alarm cycles: Number of total fill cycles until fill alarm appears if hopper weight stays too low. (0-99)
MV alarm mode: MV hopper loader is ON / OFF during fill alarm.
Manual fill: Yes = start filling immediately; No = Stop filling immediately.

Part 2: Installation Reference MC-Balance

For more detailed information please consult the User Manual

GENERAL INFORMATION

Use the equipment only for what it is designed for. The metering of dry additives!
Before switching on the unit for the first time, ensure that the main power voltage being applied is between 80 and 260Vac.
Always switch off the Movacolor control cabinet and disconnect from electrical power before performing maintenance.
The  symbol certifies that the machine conforms to the European Union regulations on minimum safety standards.
Make sure all parts are securely fixed to your extruder or injection molding machine.

LOGIN <menu> *supervisor level*

The MC-Balance has 3 operation / user levels defined:

User level	Default code	Access
Operator	0000	production settings / hopper loader settings / weight check / consumption / alarm history.
Tooling	1111	same as operator & additional material calibrations / job functionality.
Supervisor	2222	same as tooling & additional system configuration / alarm configuration / file management / load cell calibration.

Password forgotten: Consult user manual.

Entered the wrong password, user level will be set automatically to **operator** level.

Key lock: The key board can be (un)locked here. User level will be set automatically to **operator** level.

CONFIGURATION <menu> *supervisor level*

For initial setup the MC-Balance controller needs to be configured in the SYSTEM menu once. Depending on the settings, some parameters will be (in)visible in case they are not relevant.

Explanation of the parameters:

Language:	Standard language is English. On request also different languages are available.
Motor type:	LT is Low Torque motor and HT is High Torque motor
Cylinder type:	Type of dosing cylinder / feed screw (see manual for all types)
Material type:	Type of material, normal granules (NORMAL) and micro granules (MICRO)
CAL dev:	Calibration deviation, Maximum allowed deviation during material calibration.
Control mode:	Gravimetric mode (GRAVI) or Rotating mode (RPM)
Prod. Mode:	select, extruder (EXT) or injection molding (INJ)
Input mode:	Type of input signal. Relay, Timer or Tacho (only with extruder)
Input filter:	After this number of cycles the Relay signal is steady (standard=3). Only used with relay
Fill. System:	Filling system, ME or MV
Hopper fill:	When the material weight in the hopper is below this value (800gr.), the filling starts
Hopper Empty:	When the material weight in the hopper is below this value (700gr.) this alarm appears.
Deviation alarm:	Deviation % setting with reference to the maximum deviation alarm.
Jobs enabled:	Enable / disable production job functionality
Auto start:	Enable / disable auto startup after Voltage dip or main power has been switched OFF.
Master reset:	Reset alarm history (ALARMS) / material calibrations (MATER.) / production jobs (JOBS) or all of these resets together (ALL)
IP:	IP-address for use in a network environment
Name:	Give a name or figures for individual identification (for use in network)
Start user:	User level to start up with, when switching on the controller's main power
Tooling password:	Password for Tooling user level, 4 numerals, default 1111
Supervisor password:	Password for Supervisor user level 4 numerals, default 2222
Date:	Actual date (dd / mm / yy)
Time:	Actual time (hh / mm / ss)

LOAD CELL <menu> *Supervisor level*

In this menu it is possible to perform a load cell calibration. (500gr. Calibration weight required)

Always perform a load cell calibration after the machine is installed, with an empty hopper, the motor and hopper lid mounted.

Make sure that the controller is ON for at least 15 minutes and the system must be stable during calibration.

Go to the LOAD CELL CALIBRATION menu.

Follow the screens.

WEIGHT CHECK <menu> *Tooling / Supervisor level*

The following parameters will be shown in this menu:

Weight:	Actual weight on the weighing scale.
Object:	Object weight.
Zero:	Zero YES / NO the object weight.

If the Object weight is not corresponding with the real weight, perform a load cell calibration.

CALIBRATION <menu> *Tooling / Supervisor level*

The MC-Balance can be started in mainly two ways:

1) Start the unit **without** pre-calibration of material.
After pressing the START button the unit starts dosing on a speed that is based on default curves which are pre-programmed in the controller.

2) Start the unit **with** pre-calibration of material.
After pressing the START button the unit starts dosing on a speed that is based on calibrations made by the user which are stored in the controller

A material calibration can be made as follows:

AUTOMATIC, Calibration (complete curve) based on the internal reference curves

Configure the controller in control mode GRAVI.

Go to the CALIBRATION menu.

Enter your production parameters, follow the screens and start calibrating.

It is possible to stop  during the calibration (for example to refill the hopper). To continue select YES and confirm. To stop, select NO and confirm.

After saving you will automatically go to the PRODUCTION menu and stored calibration is automatically selected.

PRODUCTION <menu> *Tooling / Supervisor level*

The following **EXTRA** parameters are displayed in the production screen when logged in as **Tooling / supervisor** (depending on configuration):

Extrusion

Ext. cap: Maximum extruder capacity (kg/hr). This value will be coupled to the max. tacho voltage.

Max. tacho: This value (Volts) will be coupled to Ext. cap. (kg/h)

Set tacho: Automatic tacho voltage take over from tacho generator by selecting YES/NO and confirm or enter tacho voltage manually at Max. tacho.

After changing back to operator mode these settings (excl. set tacho) are displayed but can not be changed.

When job function is enabled (in configuration menu) the following parameters will be displayed:

Prod Job: Name of the production Job (For a Job list, press <Enter> for 2 seconds)

Save Job: Save Job into the Job list

Following data will be stored with a JOB, depending on the configuration:

Configuration settings: Control mode / Prod. mode / Input mode

Production settings: Job description / Shotwth. / color% / dos.time / Ext. cap. / Max. tacho / RPM

Material calibration

For a Material calibration list, go to Material and press  for 2 seconds. The material descriptions can be made in the tooling or supervisor level.

Regulation mode: Auto/Manual (this function is only visible when the unit is started)

This function allows to switch from automatic control (Gravimetric) to manual control (RPM).

Save data (this function is only visible when the unit is started)

With this function the actual data (RPM) can be stored. A material description needs to be entered to store the actual data.

After startup with the stored material description, the unit will run with the stored RPM.

ALARMS <menu> Supervisor level

Display of the alarm history.

Press   to scroll to the stored alarms.
The alarm history can be reset by the supervisor.

When a problem occurs using the MC-Balance, the display will indicate an error code and description. Also the alarm LED lights up.
Together with the displayed error an output contact can be switched.

To reset an alarm / warning during production press Stop  or / and menu .

Free programmable errors can be configured to an **Alarm or Warning**.

Warning: Warning output is ON, but the dosing unit continues running (24VDC contact)
Alarm: Alarm output is ON and the **dosing unit stops running** (Potential free contact)

For setting the free programmable outputs into alarm or warning, enter the ALARMS menu. First the alarm history will be shown. The alarms and warnings will be stored in here. The alarm history can be reset by **master reset ALARMS** in CONFIGURATIONS menu.

When you press the menu  button again you will enter the alarm configuration menu.

Here you can set the alarm- or warning output with   and confirm.

Error code	Alarms / Warnings . Free programmable	Description
00	Low hopper level	Material is below the hopper empty weight, set in Configuration menu
01	Maximum deviation exceeded	The deviation of the material output is higher than the set value in CONFIGURATIONS menu
Warnings. Non adjustable		
02	Filling system unable to load material	Fill system is not working correct
03	Maximum RPM exceeded, change dosing tool for higher capacity	Calculated motor speed is too high
05	Calibration, no weight change	No weight change while calibrating
07	Minimum motor speed < 0,1 RPM	Calculated motor speed is too low
Alarms. Non adjustable		
08	Motor connection failure:	Motor not connected / Motor or connection damaged
09	Parameters damaged	Check configuration parameters
10	Parameters set to factory defaults	Check parameters
11	Load cell calibration set to factory defaults	Recalibrate the load cell
12	Job and curve database initialized	Jobs and Materials are reset
13	Load cell connection failure	Load cell connection is not correct

All warnings are self eliminating except Error code 05. It is possible to push the warnings away, but when the error remains, it will be back after 60 seconds.

CONSUMPTION <menu> Tooling/ Supervisor level

The following parameters will be shown in this menu:

Cons.: Consumption (total quantity of dosed material in kg.) only when hopper loader is selected.
Reset: Reset YES / NO to zero.

FILES <menu> Supervisor level

In this menu you can search for files and delete or rename them.

When you enter the file manager menu, you can select two file types: Material (material calibrations) or Jobs (Production jobs).
After confirming, you will enter the file list. You can search for files and delete or rename them.

Search: character and  = The files that start with that specific character will be shown.

Search:  and  = Display all files

Search:   = Scroll through the files.

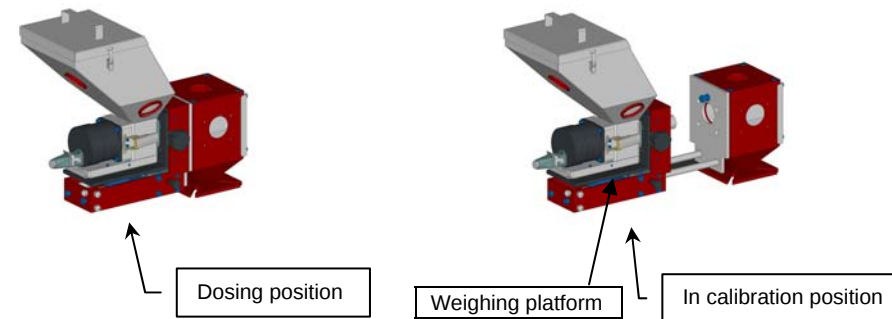
  = DELETE or RENAME a file. File will be deleted or renamed after confirming with <Enter>.

EVENT LOG Tooling / Supervisor level

The history of events or setting changes will be logged in this menu.

Optional:

Slide mechanism for material calibrations on the machine.



MC-Balance F.A.Q and Trouble shooting

GENERAL

The following variables may influence the accuracy and repeatability of the system:

1. Material properties. Easy flowing, non-sticky and non-static material that comes in the form of small regular shaped granules or powder can be dosed very accurate and regular.
2. Periodical cleaning of the dosing cylinder and seals is necessary for proper operation.
3. Extreme vibrations and shocks can have negative influence on system performance.
4. Vacuum or overpressure in the neckpiece caused by driers or hopper loaders.

Besides the variables mentioned so far, with injection molding the shot to shot accuracy depends on the shot time in combination with granule size and weight. If relatively big and heavy granules have to be dosed in a very short time, it will influence the shot accuracy and repeatability, because if only a few granules are dosed during the shot, one granule more or less makes a big difference on the total shot weight.

System is NOT starting up when switched ON by main power switch

1. Main fuse inside the controller can be blown

Color variations

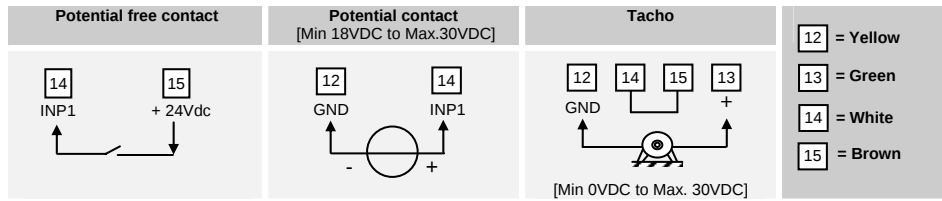
1. Unstable relay or tacho signal.
2. Bridging or rat holing of the material inside the hopper can happen if the material is not free flowing.
3. Bridging or rat holing of the material inside the hopper can happen if the material is extremely static.
4. Extremely static material can contaminate the dosing cylinder.
5. In case of water cooled neckpiece, check if there is material build up around the dosing cylinder and the water cooled pipe. Check also the water supply to the neckpiece.

Weighing is not correct

1. Check if transport protection is removed.
2. Weighing platform is touched by something that influences the weighing.
3. Hopper loader tubes are not fixed in the right way.
4. Safety bolts are not free / touching the frame.

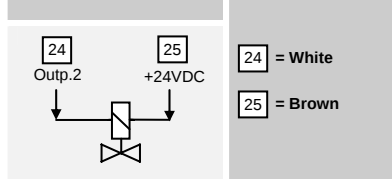
ELECTRICAL INSTALLATION

Input signal to the MC-Balance can be made in the following ways, in accordance with the configuration.

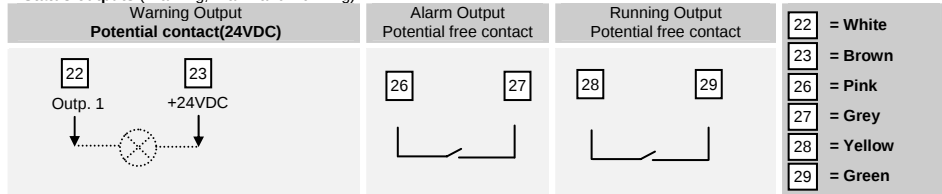


Optional:

Hopper loader system
Valve output (24VDC)



Status outputs (Warning, Alarm and Running)



The numbers **xx** can be found on the printed circuit board

MECHANICAL INSTALLATION

- All mechanical parts are pre-assembled, making installation quick and simple.
- Remove transport protection (under side of the load frame) before installation!
- Install the neckpiece directly on top of the entrance of the production machine.
 - Make sure that the complete unit is mounted horizontally leveled (water level) and fixed securely.
 - Assure proper grounding to control cabinet, neckpiece and dosing unit
- Connect the unit to the neckpiece by turning curled knob clockwise.
- Mount the controller vibration free and conform specified temperatures.

