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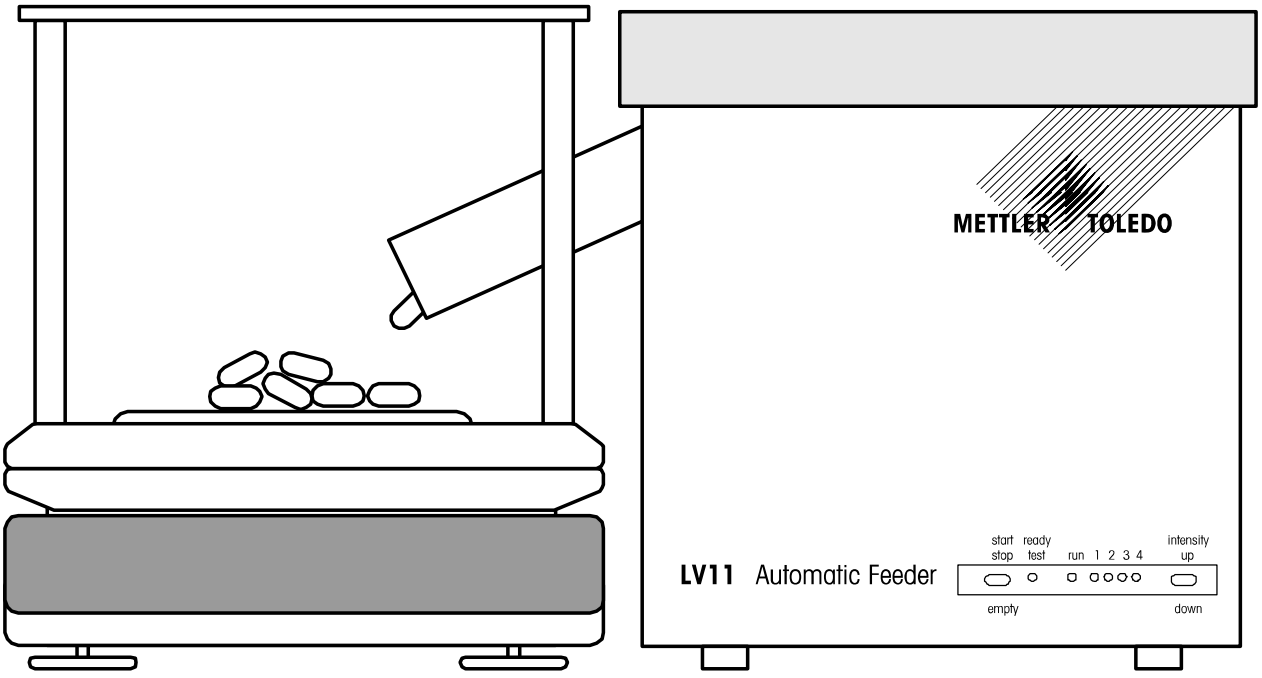
LV11 Automatic Feeder



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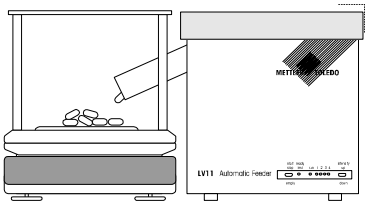
1 Introduction

The LV11 is an automatic feeder for small parts, particularly tablets and capsules, but also small mechanical parts. They are weighed individually on a balance or scale and statistically evaluated in an attached controller. The LV11 delivers a part to the balance/scale, stops automatically and then delivers the next part to the weighing instrument after receipt of the appropriate command. This process can be stopped at any time by a command. At the end of a sample, the feeder plate can be emptied or the feeder waits for the command for a further sample.

2 Operating modes

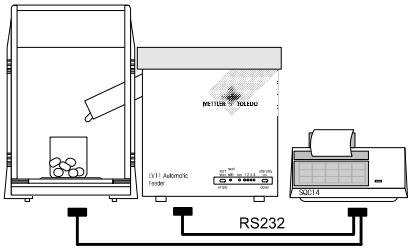
2.1 Operation via balance/scale connection



Connection to SQC15, SQC-AX, XP Waage, Remote AX, Remote XP

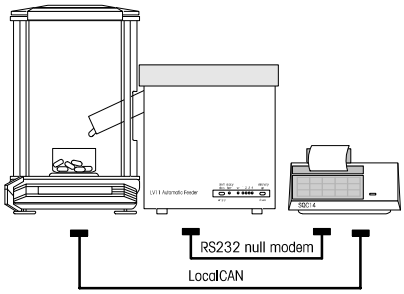
LV11 can be controlled by a METTLER TOLEDO balance with LocalCAN or RS232 interface. The program for the control must be available in the weighing instrument (e.g. SQC15 cassette, SQC-AX application, Statistics application in XP balance).

2.2 LV11 controlled by SQC14



Balance with RS232 interface:

LV11 and balance are connected with a RS232 Y-cable (21900921).

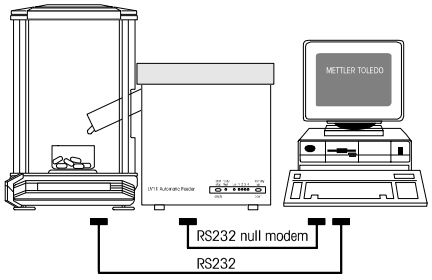


Balance with LocalCan interface:

Balance and SQC14 are connected with a LocalCan cable.

LV11 and SQC14 are connected with a RS232 null modem cable (21900576)

2.3 LV11 controlled by a PC



Freeweigh.Net test place module or FreeWeigh.Net Compact or LabX pro balance with LV11 AddOn

Balance connected to PC with RS232 cable (e.g. 11101051)

LV11 connected to PC with RS232 null modem cable (21900576)

For the integration into further PC systems the SICS commands are listed in section 3.3.

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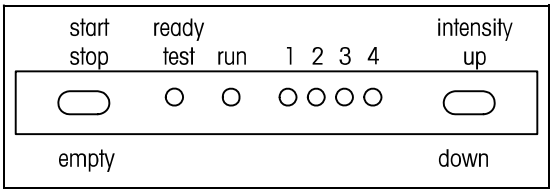
2.4 Meaning of the displays and keys

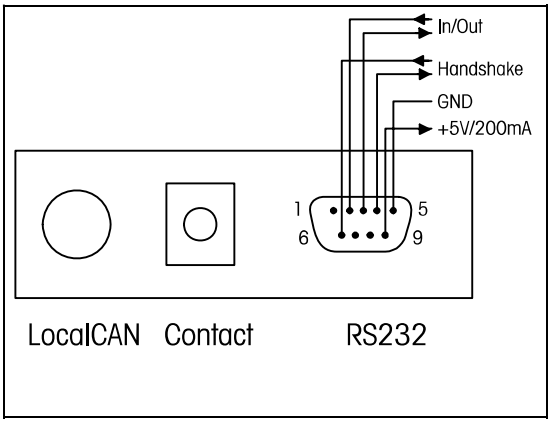


When the LV11 is switched on, an initialization (reset) runs for approx. 2 seconds. During this time, all LEDs light up. The instrument is then in the normal mode with pre-selected intensity level 2.

start/stop/empty	Press briefly --> switch vibratory action on/off Press and hold until all red LEDs light up --> switch on discharge
ready/test	Green LED lit up --> Instrument is switched on and ready for operation Green LED flashes --> Instrument is in test mode
run	Yellow LED lit up --> Vibratory action is switched on and the feeder plate vibrates Yellow LED flashes --> Light barrier is interrupted, dirty or faulty
1	Red LED lit up --> Lowest feed rate Red LED flashes --> Short circuit at start/stop/empty key
2	Red LED lit up --> Lower intermediate feed rate, default after switching on Red LED flashes --> Short circuit at intensity key
3	Red LED flashes --> Upper intermediate feed rate Red LED flashes --> Short circuit at contact socket
4	Red LED lit up --> Highest feed rate
intensity up/down	Press briefly --> Increase vibratory intensity by one level
	Press and hold --> Lower vibratory intensity by one level

3 Operation via the interface

3.1 Attachment of the control cable



The connection sockets for the control are located at the rear of the LV11. The LocalCAN connection can be used for the attachment of all METTLER TOLEDO balances/scales which have the appropriate command set. At the connection for a contact, a make contact (relay, foot switch, etc.) can be attached using a standard connector available from any electrical store. The connection for RS-232 is a 9-pin D-sub miniature socket, pin assignment as for IBM laptop and compatibles. For the attachment of a computer, a so-called laplink or null modem cable is needed.

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3.2 Interface parameters

LocalCAN: No transmission parameters can be set

Contact close <1 sec: On and off switching of the selected function
close >2 sec: Discharge
close >10 sec: Error message "Short circuit at contact socket "

RS232 9600 baud, no parity, 8 data bits, switchable to
2400 baud, even parity, 7 data bits.
software handshake Xon/Xoff switchable to Hardware handshake DSR/DTR.
(See section "Settings".)

3.3 SICS command set of the LV11

The following SICS **commands (in boldface)** are recognized and acknowledged (normal font) at the CAN and the RS interface if any type of device is attached to these interfaces. (Char "_" = space). All commands must be closed with CR and LF.

LV01 **Reset (LV11 returns to normal mode, all parameters are reset)**
LV01_A Reset executed (also after switching on)

LV02_X **Set intensity X. X may be between 1 and 4.**
LV02_X_A Command "Set intensity" executed
LV02_L Command "Set intensity" understood, parameter faulty
LV02_I Command "Set intensity" not executable as previous process has not been completed.

LV03 **Vibrate until passage through the light barrier has been detected (LV11 in vibrate mode)**
LV03_B Command understood (vibratory action starts)
LV03_A Command executed (light barrier passage, vibratory action has stopped)
LV03_I Command not executable as previous process has not been completed or command ended by timeout of 90 seconds.

LV04 **Vibrate until a stop or reset command is sent or the stop key has been pressed**
LV04_B Command (vibratory action starts)
LV04_I Command not executable as previous process has not been completed.

LV05 **Discharge (LV11 in discharge mode)**
LV05_B Command understood (discharge started)
LV05_A Discharge ended (90 seconds after last passage through light barrier)
LV05_I Command not executable as previous process has not been completed.

LV06 **Stop (LV11 returns to normal mode)**
LV06_A Stop executed

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LV21 Request MT-SICS version of the interface

LV21_A_"X1"_"X2"_"X3"_"X4"_"X5" , where

X1 = MT-SICS level
X2 = Version number of the command set MT-SICS level 0
X3 = Version number of the command set MT-SICS level 1
X4 = Version number of the command set MT-SICS level 2
X5 = Version number of the command set MT-SICS level 3

LV22 Request identification

LV22_A_"LV11" LV11 instrument

LV23 Request software number and type definition

LV23_A_"X1_X2_X3" where

X1 = Software version of the operating system
X2 = Software version of the LV11
X3 = Settings of S4 (decimal value 0-15 corresponding to the binary DIP switch setting)

The LV90 command has been implemented to ensure strings can be transferred from the RS interface to the CAN interface and vice versa.

LV90_"X1" Transfer of the string X1 from the CAN to the RS interface

LV90_A String has been sent

LV90_"X1" Transfer of the string X1 from the RS to the CAN interface (only if CAN fitted)

3.4 W commands of the LV11

These commands are used for the control of older METTLER TOLEDO controllers and should not be used with recent developments. The W commands are recognized by the LV11 only if the RS interface is the only one active. All W commands as well as activities of the keys start/stop or intensity and the contact socket are always acknowledged with SICS commands.

W_128_100_0_100_128_100_0	Vibrate at intensity level 1 until passage through the light barrier
W_160_100_32_100_160_100_32	Vibrate at intensity level 2 until passage through the light barrier
W_192_100_64_100_192_100_64	Vibrate at intensity level 3 until passage through the light barrier
W_224_100_96_100_224_100_96	Vibrate at intensity level 4 until passage through the light barrier
W_128_1000_0	Discharge (duration 90 seconds)
W_128_100_0	Stop

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4 Putting into operation and servicing

If you operate the instrument properly and with care, it will always provide you with good service. To ensure this is the case, please read through these operating instructions carefully.

Before switching on for the first time, the rubber links between the feeder plate and cover must be removed. The chute must be fitted to the two clamping bolts at the lateral opening and be pushed in as far as it will go. The LV11 Automatic Feeder is now ready for operation.

The correct line voltage is set in the factory for every country and is shown on the documentation supplied.

The basic setting of the vibration is selected so that most parts can be delivered without any problems. For very small or large parts, this setting can be adjusted.

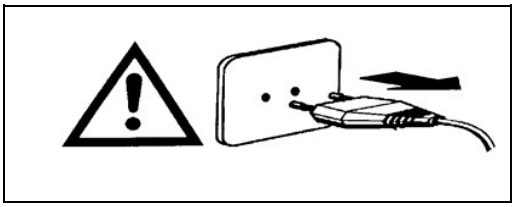
The parameters of the RS-232 interface are set for connection to METTLER TOLEDO peripherals.

If one of these settings needs to be changed, the instrument must be opened.

4.1 Test mode

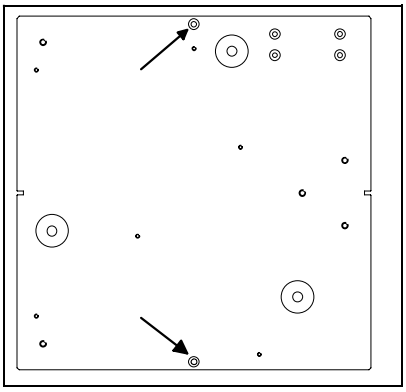
A test mode is available to adjust the feeding of parts singly to the balance. To enter this mode, press and hold the left key when switching on until the display appears. The LV11 commences delivery until a part passes through the light barrier. It then stops for one second and then continues delivery until the next passage through the light barrier. By briefly pressing the right key, you can now select the rate so that the parts fall onto the balance singly. To quit the test mode, press the left key briefly.

4.2 Opening the LV11



Cautionary note:

Before opening the instrument it is essential to disconnect the power plug!



Press side walls together a short way at the side and at the same time lift off the plastic cover.
Unscrew two screws (→) on the underside of the LV11.
Take out side walls. The side walls can be removed only if the **power plug is disconnected at the LV11**! The two side walls are fitted into each other and are easy to separate.

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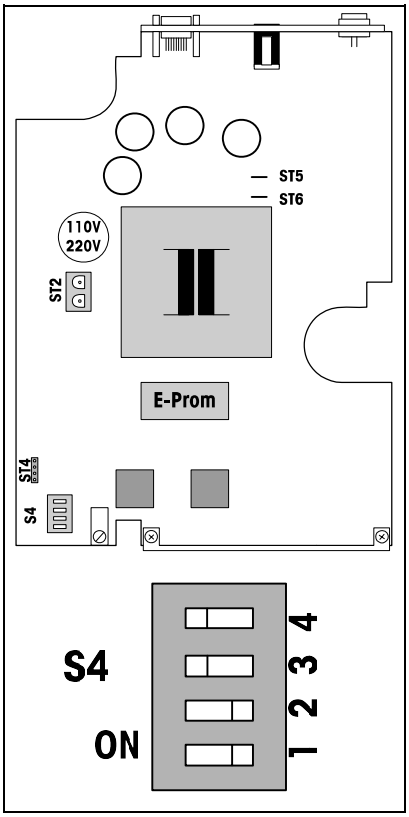
4.3 Settings



The LV11 basically recognizes 16 intensity values (0 to 15), which are assigned to the vibration levels (1 to 4). This assignment can be set through the switch setting of the DIP switches (S4/1 and S4/2) on the printed circuit.

		Vibration level					
S4/1	S4/2	1	2	3	4	Discharge	
0	0	1	4	8	13	15	Factory setting
1	0	0	2	4	6	10	Small parts
0	1	9	11	13	14	15	Large parts
1	1	2	5	7	10	12	Midsize parts

RS-232 interface

S4/3	RS protocol	
0	Hardware handshake DTR/DSR on	
1	Software Handshake Xon/Xoff on	Factory setting

S4/4	Interface parameters			
0	2400 baud	even parity	7 bits	
1	9600 baud	no parity	8 bits	Factory setting

4.4 Cleaning

Clean the housing regularly with a damp, soft cloth. Never use any corrosive solvents.
The feeder plate is made of stainless chrome steel and can be removed for cleaning as follows:

– Disconnect power plug

– Push side walls together a short way and simultaneously lift off the plastic cover.

– Detach feeder plate by jerking counter clockwise.

4.5 Changing the power line fuse

The fuse is located in the power switch combination.

For 230 V 160 L, 250 V
For 110V 315 L, 250 V

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5 Technical data

Use only indoors up to 2000 m above sea level.

Line voltage, power consumption	100-120V +/-10%, 200 mA or 220-240V +/-10%, 100 mA
Frequency	50/60 Hz
Temperature range/moisture	5 ... 31°C/80% rel. humidity 31 ... 40°C/80 ... 50% rel. humidity, linear decreasing
Overvoltage category	II
Pollution degree	2
Dimensions, weight	w x h x d = 225 x 260 x 225 mm / net 11.5 kg
Admissible part size	∅ 1 mm ... ∅ 33 mm

6 Spare parts and optional equipment

Available on request:

RS232 cable for connection to computer or to SQC14		1.8 m	21900576
RS232 Y-cable for connection to SQC14 and to balance		1.4 m	21900921
Connection of LocalCan balances	LC-LC03	0.3 m	239270
	LC-LC1	1 m	229161*
	LC-LC2	2 m	229115
	LC-LC5	5 m	229116
Chute			38460*
Door with opening, for AG balance			21900610
Door with opening, for AX balance			11100088
Door with opening, for XS/XP analytical balance			11106715
Door with opening, for XS/XP-precision balance with high draft shield			11132711

Power line fuse	for 230 V	T160 L, 250 V	commercial
Power line fuse	for 110 V	T315 L, 250 V	commercial

*=Included in the standard equipment

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