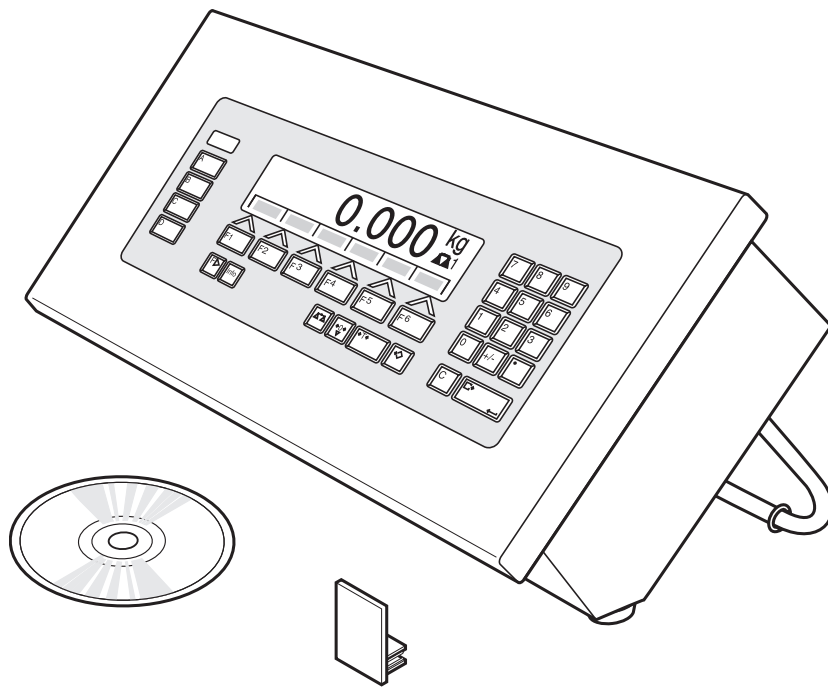# Operating instructions

METTLER TOLEDO MultiRange
ID7sx-Dos application software

METTLER TOLEDO

Contents

1   Safety precautions

The ID7sx... weighing terminal is approved for operation in zone 1 and 21 hazardous areas. It may only be used in areas in which the causes of static electricity build-up, which lead to propagating brush discharges, have been eliminated.

If the ID7sx... weighing terminal is used in hazardous areas, special care must be taken. The code of practice is oriented to the "Safe Distribution" concept drawn up by METTLER TOLEDO.

Competence   ▲ The weighing system may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Ex approval   ▲ No modifications may be made to the terminal and no repair work may be performed on the modules. Any weighing platform or system modules that are used must comply with the specifications contained in the installation instructions. Non-compliant equipment jeopardises the intrinsic safety of the system, cancels the Ex approval and renders any warranty or product liability claims null and void.

▲ The safety of the weighing system is only guaranteed when the weighing system is operated, installed and maintained in accordance with the respective instructions.

▲ Also comply with the following:
  – the instructions for the system modules
  – the regulations and standards in the respective country
  – the statutory requirement for electrical equipment installed in hazardous areas in the respective country
  – all instructions related to safety issued by the owner

▲ The explosion-protected weighing system must be checked to ensure compliance with the requirements for safety before being put into service for the first time, following any service work and every 3 years, at least.

Operation   ▲ Prevent the build-up of static electricity. Always wear suitable working clothes when operating or performing service work in a hazardous area.

▲ Do not use protective coverings for the device.

▲ Avoid damage to the system components.

Installation   ▲ Only install or perform maintenance work on the weighing terminal in the hazardous zone if the following conditions are fulfilled:
  – the owner has issued a permit ("spark permit" or "fire permit")
  – the area has been rendered safe and the owner's safety co-ordinator has confirmed that there is no danger
  – the necessary tools and any required protective clothing are provided (danger of the build-up of static electricity)

▲ The certification papers (conformity certificates, manufacturer's declarations) must be present.

▲ Use only cables for intrinsically-safe circuits in accordance with the applicable country-specific regulations and standards for the installation of a weighing system with the ID7sx… weighing terminal.

▲ Lay cables in such a way that they are protected from damage.

▲ Only route cables into the housing of the system modules via the earthing cable gland and ensure proper seating of the seals.

▲ If the ID7sx… weighing terminal is used in conjunction with an automatic or manual filling plant, all of the system modules must be equipped with a permanently wired emergency stop circuit, independent of the system circuit, in order to prevent personal injury or damage to other items of equipment.

Maintenance ▲ Always disconnect the system from the power supply before commencing maintenance work. Where certain inspections, tests or adjustments require the system to remain connected to the power supply, this work must be performed with particular care.

Service ▲ Service technicians must have attended a product-specific course of training for hazardous-duty equipment.

▲ Service work should be performed outside hazardous zones wherever possible. Service work includes dismantling an Ex device inside the hazardous area and moving it into the safe area.

▲ To avoid accident and injury, turn the weighing terminal off and wait for at least 30 seconds before connecting or disconnecting cables to/from the printed circuit board.

▲ Only use the parts or modules specified in the spare parts list as replacements.

2   Introduction and assembly

2.1   Introduction

ID7sx-Dos is an application software for the METTLER TOLEDO ID7sx... weighing terminal. You can utilise the functions of the ID7sx-Dos after inserting the dongle and loading the application software.

Scope of delivery

• Hardware dongle for installation in the ID7sx...

• CD-ROM with
  – Application software
  – ID/PC Expert: for installation of the software package

Documentation

The ID7sx... weighing terminal is provided with operating instructions and installation information for the original configuration of the weighing terminal. Please see these operating instructions for basic information on working with the ID7sx... weighing terminal.

These operating instructions contain additional information on installing and using the ID7sx-Dos application software.

2.2   Installing ID7sx-Dos

EXPLOSION HAZARD

The ID7sx... weighing terminal may only be opened by METTLER TOLEDO service technicians.

➜ To install the ID7sx-Dos application software, please contact METTLER TOLEDO Service.

3   Dispensing functions

With the ID7sx-Dos you can dispense liquid, pasty, powdery or grainy weighing samples in accordance with a specified target weight.
With the function keys the ID7sx-Dos makes the following functions available:

N	SUM	MAN	LIMIT	STOP	START
Enter item counter	Display and print total sum	Manual redispensing	Enter and print dispensing parameters	Interrupt or cancel dispensing process	Start dispensing process and print results of dispensing after the dispensing process is completed

➜ Select the function by pressing the function key.

Example

➜ Press the N key.
Then enter the start and stop value of the item counter manually with the keypad.

Note

When PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the N key.

When the function keys are otherwise allocated

➜ Press the FUNCTION CHANGE key until the function keys allocation displayed above appears.

CAUTION

Danger of injury when pressing keys which start and stop the dispensing system or control the valves!

➜ Before pressing these keys, make sure that no one is in the area of moving system parts.

3.1   Dispensing system

With feed valves or feed chutes controlled with coarse and fine feed, the dispensing sample is automatically infed up to the specified target value.
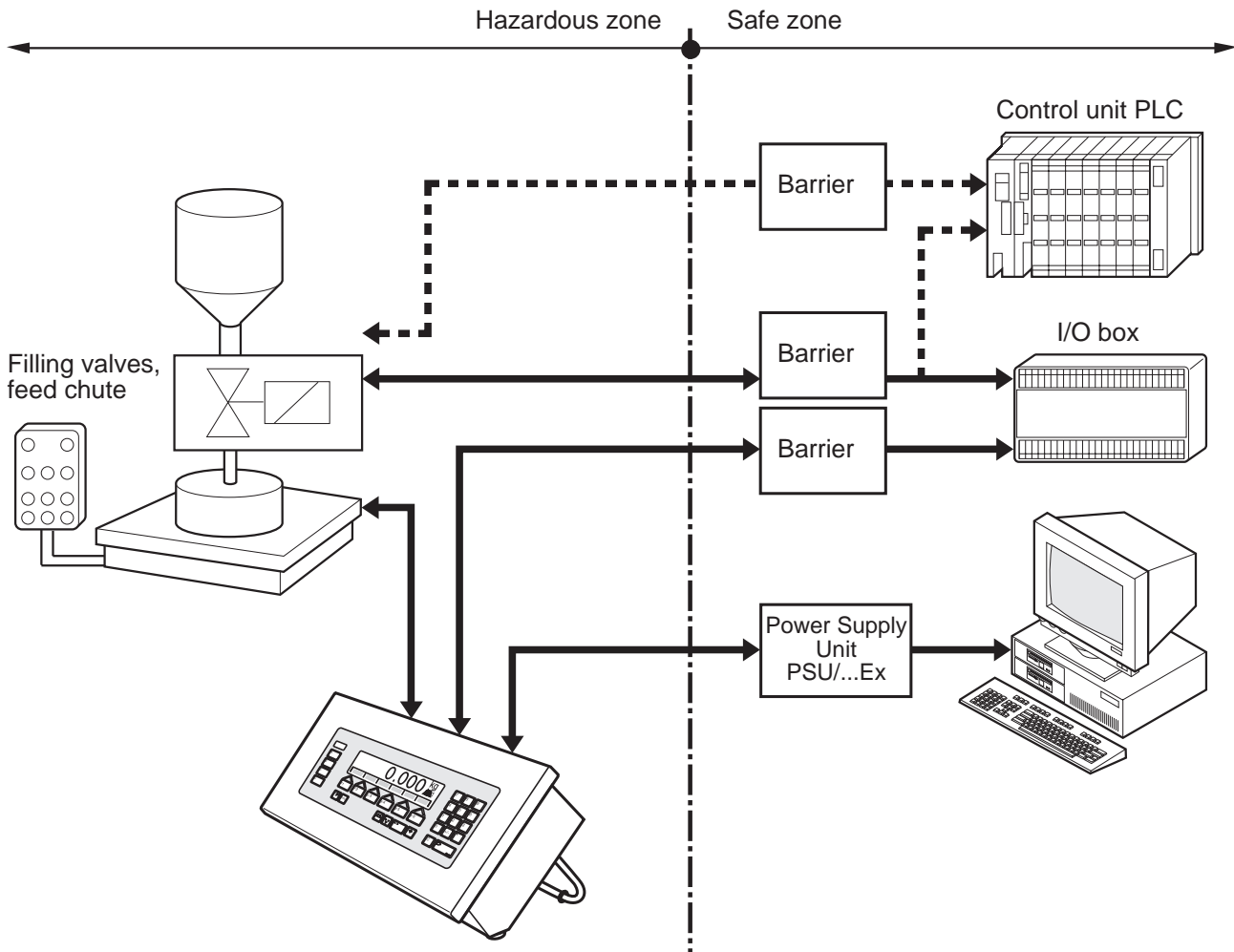
The control signals for the dispensing valves are transferred to an I/O box in the safe area via the 8 I/O-ID7sx interface. The I/O box controls the dispensing system either directly or via an additional external control unit (PLC).

All valves are closed immediately in case of an overload or underload of the weighing platform.

The 8 digital inputs and outputs of the 8 I/O-ID7sx interface can be assigned the input/output functions available via software as desired. However, the recommended I/O assignments are preset for the basic functions, such as "Above level" and "Below level with nozzle control", see Section 8.1.

The ID7sx-Dos can be remote controlled with "electronic fingers". These electronic fingers trigger various keys via interface commands on the terminal, see section 5.1.

Please note that the accuracy of the filling results and the filling speed are not only dependent on the scale, but also on the other system parts, and in particular on the filling device itself (valves, feed chutes etc.). Only the optimum co-ordination of all components with each other produces the best filling results.

3.2 Dispensing process

Dispensing is carried out in 5 consecutive steps:

- **Automatic tare** – Automatic taring of the container and dispensing start
- **Coarse feed** – Dispensing with coarse feed up to the coarse/fine-feed switch-over point (limit 1)
- **Fine feed** – Dispensing with fine feed up to the switch-off point of the fine feed (limit 2)
- **Redispensing correction** – Redispensing correction of fine feed beyond limit 2
- **Redispensing** – If the weight value does not lie within the tolerance of the target value at the end of dispensing, automatic or manual redispensing up to the target value
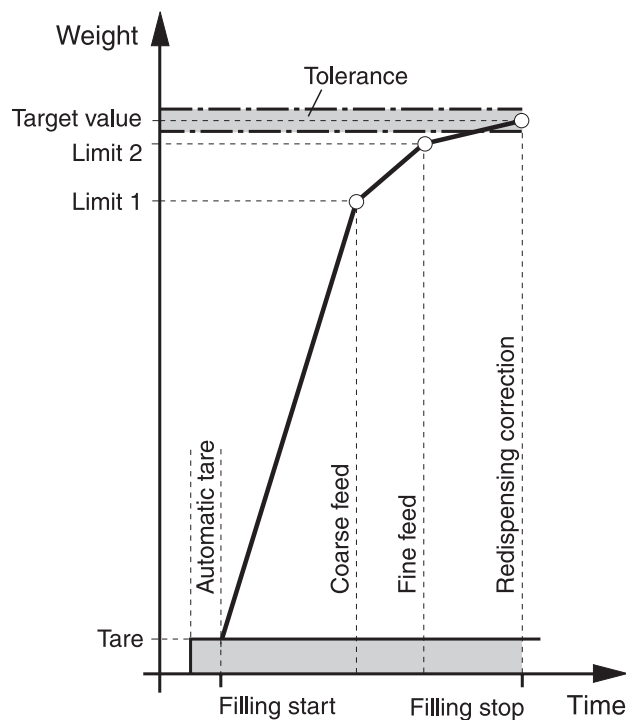
If no limits are entered, the ID7sx-Dos automatically determines Limit 1 and Limit 2 in a learn mode, see page 20. The target weight is then exactly reached already during the first dispensing.

To optimize the dispensing process, Limit 2 is automatically adjusted with the same component during the next dispensing process, see REDISP. CORRECTION block on page 16.

If the container is underfilled, manual or automatic redispensing can be carried out depending on the settings in the master mode.

3.3   Enter dispensing parameters

Enter numerically   1. Press LIMIT key.

2. Enter target weight and confirm with ENTER.

3. Specify limits: enter LIMIT 1 and LIMIT 2 and confirm with ENTER.
   To automatically determine the limits, press ENTER without making an entry.

4. Specify tolerance: enter TOL and confirm with ENTER.

5. If tare checking is to be used, specify tare values TMIN and TMAX and confirm with ENTER.

Notes

• With the FUNCTION CHANGE key the weight unit for inputting the limits can be selected.

• The entry can be corrected one character at a time with the CLEAR key.

• If LEARN MODE OFF is set in the mastermode, Limit 1 and Limit 2 **must** be specified, and if the 3rd switch-off point is also activated (see section 4.1.7), Limit 0 as well.

• If PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.

• If ANALOG OUTPUT ON is set in the master mode, the throughput preflow (with additionally activated 3rd shutoff point), throughput coarse feed and throughput fine feed **must** be specified.

Copy constants   1. Enter number of target memory: 1 … 999.

2. Press LIMIT key.

Note
If PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the LIMIT key.

3.4   Dispensing

The dispensing type is dependent on the application set in the master mode:

• ABOVE LEVEL: Dispensing above the filling level (without filling lance)

• BELOW LEVEL: Filling lance below the filling level

• BELOW BUNGHOLE: Filling lance below the bunghole

Notes

• For sequence charts of the individual applications, see section 8.2.

• The desired function for each of the eight inputs and outputs can be set in Master mode under INTERFACE -> COM4 -> 8 I/O -> CONTROL INPUTS / CONTROL OUTPUTS.

3.4.1 Display of dispensing state

The display shows the dispensing state with texts and a 3-digit code, e. g.:

Text	Code	Meaning
READY FOR DISPENSING	010	Dispensing parameters loaded
COARSE FEED	040	Dispensing with coarse feed
FINE FEED	050	Dispensing with fine feed
DISPENSING OKAY	101	Target value achieved
UNDERFILLED	084	Target value not achieved
OVERFILLED	111	Target value exceeded
EVALUATING	070	Evaluation of dispensing results

Notes

- The dispensing states are listed in application block 361, see section 5.1.
- If STATUS INDICATOR WITH DELTATRAC is set in the master mode, the display also shows the DeltaTrac as an analog weigh-in aid.
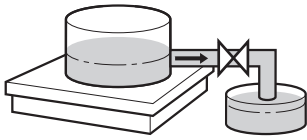
3.4.2 Dispensing
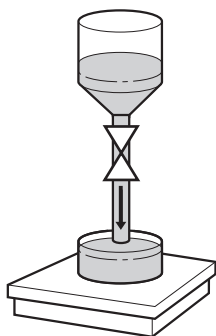
During dispensing the filling container on the weighing platform is filled from a supply vessel.

1. Enter dispensing parameters, see section 3.3.
   The display shows READY FOR DISPENSING.

2. Place empty filling container on the weighing platform.

3. Press START key.
   The display shows the following: weight value, dispensing status and DeltaTrac. When the dispensing process is completed, the display indicates whether the weight value lies within the tolerance limits (DISPENSING OKAY) or outside (OVERFILLED, UNDERFILLED).
   The dispensing result is printed.

4. Relieve weighing platform.
   If ACKNOWLEDGE ON is set in the master mode, the dispensing process is acknowledged and the display shows READY FOR DISPENSING.

3.4.3 Dispensing

During dispensing the filling container is dispensed from a supply vessel on the weighing platform.

1. Enter dispensing parameters, see section 3.3.
   The display shows READY FOR DISPENSING.

2. Place filled supply vessel on the weighing platform.

3. Press START key.
   The display shows the following: weight value with negative sign, dispensing status and DeltaTrac.
   When the dispensing process is completed, the display indicates whether the weight value lies within the tolerance limits (DISPENSING OKAY) or outside (OVERFILLED, UNDERFILLED).
   The dispensing result is printed.

4. Relieve weighing platform.
   If ACKNOWLEDGE ON is set in the master mode, the dispensing process is acknowledged and the display shows READY FOR DISPENSING.

3.5 Interrupt dispensing process

Same container

1. Press STOP key.
   The dispensing process is interrupted.

2. To continue the dispensing process, press START key.

New container

1. Press STOP key twice.
   The dispensing process is cancelled.

2. Place a new container on the weighing platform.

3. If TOTALIZING ON is set in the master mode, the sum can be displayed with the SUM key.

4. To continue the dispensing process, press START key.

3.6 Cancel or end the dispensing process

By pressing key on weighing terminal

➔ Press STOP key twice.
   The dispensing process is cancelled or ended when the dispensing process is completed.

By external signal

➔ Cancel dispensing process via a pulse at the input of the 8 I/O-ID7sx interface which is assigned the CANCEL function. The ID7sx-Dos is then in the state READY FOR DISPENSING (010).

Note

If TOTALIZING ON, CORRECT DISPENSINGS is set in the master mode, cancelled dispensing processes can be added to the sum by pressing the SUM key when CONTINUE WITH START is displayed.

3.7   Redispensing

If, for example, the weight value is briefly exceeded, the fine feed is switched off too early and the current weight value (actual value) is below the target value.

During redispensing the fine feed is opened in intervals until the target value is reached. Depending on the setting in the master mode, redispensing is carried out manually or automatically, see section 4.1.2.
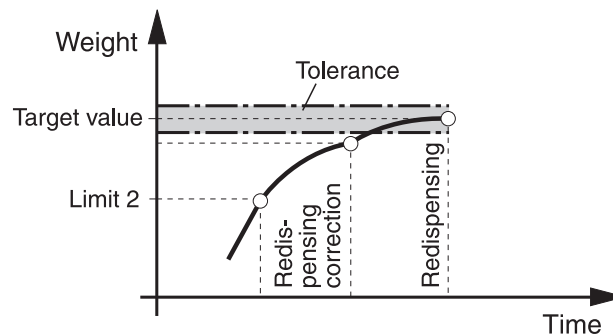
Manual redispensing

Prerequisite

MANUAL REDISPENSING is set in the master mode.

➔   When the display shows MANUAL, press and hold down the MAN key.
    The fine feed is switched on in pulses as long as the key is pressed and until the target value is reached.

3.8   Manual recorrection

If MANUAL CORRECTION ON is set in the master mode, the display shows MANUAL CORRECTION after the actual-target comparison if the final weight lies outside the tolerances.

➔   Recorrect manually and confirm correction with START key.

3.9   **Totalize automatically**

To automatically totalize dispensing processes with the same dispensing samples, an item counter can be specified which determines the number of dispensing processes. When the item counter reaches its stop value, the dispensing system stops automatically.

Prerequisite

TOTALIZING ON is set in the master mode.

1. To set the item counter:
    – Press N key.
    – Enter start value of item counter and confirm with ENTER.
    – Enter stop value of item counter and confirm with ENTER.

2. Carry out 1st dispensing process, see section 3.4.

3. Relieve weighing platform.

4. Carry out additional dispensing processes, see step 2.
    When the item counter reaches its stop value, the dispensing system stops automatically.

5. To display and print the total sum, press the SUM, ENTER key sequence.

6. To carry out additional dispensing processes with the same dispensing sample, e. g. after redispensing the supply vessel, repeat steps 1 to 3.
    When doing so, make sure that the item counter continues to count.
    – or –
    To carry out dispensing processes with a different dispensing sample, or to end totalizing, press the SUM, CLEAR key sequence.

Notes

• If TOTALIZING ON, CORRECT DISPENSINGS is set in the master mode, cancelled dispensing processes can only be added to the total sum by pressing the SUM key when CONTINUE WITH START is displayed.

• If PASSWORD BLOCK ON is set in the master mode, a personal code must be entered after pressing the SUM and N keys.

3.10   Recall application-specific information

Information on dispensing can be recalled with the following key combinations:

INFO, N	Display item counter.
INFO, SUM	Display current weight sum.
INFO, LIMIT	Display current dispensing parameters.
INFO, fixed target number, LIMIT	Display stored dispensing parameters.
INFO, CODE A	Factory setting: Display item number.
INFO, CODE B	Factory setting: Display order number.
INFO, CODE C	Factory setting: Ident C.
INFO, CODE D	Factory setting: Ident D.

Notes

- If several pieces of information are called up with a key, the display switches after the time set in Master mode under TERMINAL -> DISPLAY DURATION-> INFO MESSAGES expires. It is also possible to switch between these pieces of information with the CLEAR key.

- No information can be displayed during the dispensing process (dispensing valves open).

4   Settings in the master mode

4.1   PAC master mode block

4.1.1   Overview of the PAC master mode block

The following system settings can be entered in this block:

Block					
APPLICATION	**ABOVE LEVEL**	BELOW LEVEL	BELOW BUNGHOLE		
ZERO ZONE					
AUTOMATIC TARE	**AUTOMATIC TARE ON**	AUTOMATIC TARE OFF			
REDISP. CORRECTION	**REDISP. COR-RECTION ON**	REDISP. COR-RECTION OFF			
FIXED TARGET	CLEAR ALL TARGET V.	LOAD FIXED TARGET			
REDISPENSING	**AUTOM. REDISPENSING**	MANUAL REDISPENSING			
TOTALIZING	TOTALIZING ON	**TOTALIZING OFF**			
STATUS INDICATOR	**WITH DELTATRAC**	WITHOUT DELTATRAC	WITH BIG WEIGHT		
PASSWORD BLOCK	PASSWORD BLOCK ON	**PASSWORD BLOCK OFF**			
PAC START KEY	**PAC START KEY ON**	PAC START KEY OFF			
OPERATING MODE	NON AUTOMATIC	**AUTOMATIC**			
MANUAL CORRECTION	MANUAL COR-RECTION ON	**MANUAL COR-RECTION OFF**			
OUTPUT 2	**OUTPUT 2 OFF**	MATERIAL AGITATION	REMAINING QUANTITY	FILL QUANTITY	SCALE SWITCHOVER / 3RD SHUTOFF POINT
LEARN MODE	**LEARN MODE ON**	LEARN MODE OFF			
MONITOR DISPENSING	MONITOR DIS-PENSING ON	**MONITOR DIS-PENSING OFF**			
ACKNOWLEDGE	**ACKNOWLEDGE ON**	ACKNOWLEDGE OFF			
COARSE FEED	**COARSE**	COARSE AND FINE			
START TIMER					
END TIMER					
PREDISPENSING					
PRINTING CYCLE					
SINGLE FEED OPERATION	SINGLE FEED OPERATION ON	**SINGLE FEED OPERATION OFF**			
OUTPUT 7	**IMPULSE ON START**	ON AT STATUS X YYY			
FREEWEIGH-MODE	FREEWEIGH-MODE ON	**FREEWEIGH-MODE OFF**			
ANALOG OUTPUT	ANALOG OUTPUT ON	**ANALOG OUTPUT OFF**			
RESET PAC					

Legend
- Blocks on a **grey** background are described in detail in the following.
- Factory settings are shown in **bold** print.
- Blocks which only appear under certain conditions appear with a **dotted** outline.
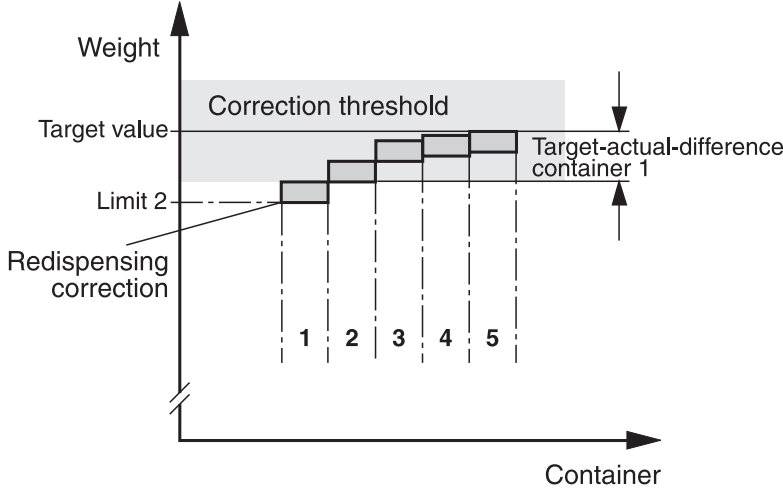
4.1.2   Settings in the PAC master mode block

APPLICATION	Select application
ABOVE LEVEL	Dispensing above the filling level (factory setting)
BELOW LEVEL	Filling with dispensing lance below the dispensing level

NOZZLE CONTROL	Switch nozzle control on or off. Factory setting: NOZZLE CONTROL OFF
	Nozzle control requires a corresponding configuration of the 8 I/O-ID7sx interface.
	Addition settings with NOZZLE CONTROL ON:
	
	• DRIP PAN – working with or without drip pan control
	  Factory setting: DRIP PAN OFF
	
	• EVALUATION POSITION:
	
	    – NOZZLE MIDDLE (factory setting)
	    – NOZZLE TOP

BELOW BUNGHOLE	Filling with dispensing lance below the bunghole
NOZZLE CONTROL	Switch nozzle control on or off. Factory setting: NOZZLE CONTROL OFF Nozzle control requires a corresponding configuration of the 8 I/O-ID7sx interface. Addition settings with NOZZLE CONTROL ON: • DRIP PAN – working with or without drip pan control Factory setting: DRIP PAN OFF
Comments	• Take terminal diagram and terminal assignment of 8 I/O-ID7sx interface into account, see section 8.1. • For example sequence charts for the three applications, see section 8.2.

ZERO ZONE	Adjust weight monitoring while lowering the filling nozzle with the below level application
	If the current weight value exceeds the threshold ZERO, the filling nozzle is moved back to the starting position. The cause may be poor positioning when the filling nozzle, e. g. scrapes the container rim or runs into the cover.
ZERO	Enter threshold weight value of the zero zone

AUTOMATIC TARE	Switch automatic taring before dispensing on or off
	Factory setting: AUTOMATIC TARE ON

REDISP. CORRECTION	Switch redispensing correction on or off
	The redispensing correction function optimizes the switch-off point of the fine feed (limit 2).
	If REDISP. CORRECTION ON is set, the target-actual difference is determined for each container and multiplied by a FACTOR.
	Target-actual difference x correction factor = Δ
	Limit 2 is automatically corrected by the value Δ when dispensing the next container:
	Example: For a target-actual difference of 10 g and a factor of 0.5, limit 2 is corrected by 5 g.
	Factory setting: REDISP. CORRECTION ON
FACTOR	Correction factor by which the target-actual difference is multiplied. The result is the value Δ by which limit 2 is corrected.
	Possible values: 0.1 … 0.9 (factory setting: 0.5)
CORREC. THRESHOLD	The correction threshold specifies the target-actual difference up to which the redispensing correction corrects limit 2.
	• Possible values: 0 … 99 in multiples of the tolerance (Factory setting: 0, i. e. limit 2 is corrected for all actual values)
	• Limit 2 is not corrected when TOTALIZING ON is set and after at least 10 consecutive dispensings the actual value lies outside the correction threshold for the first time. This value is considered a freak value. If during the next dispensing the actual value lies outside the correction threshold, limit 2 is automatically corrected. If in the process limit 2 $\leq$ limit 1, then the learn mode is automatically activated.

FIXED TARGET	Save dispensing parameters for various components in target memories protected against power failure
CLEAR ALL TARGET V.	Clear all target memories.

LOAD FIXED TARGET	1. Enter FIXED TARGET NO. memory number: 1 … 999.
	
	2. Enter article designation NAME, e. g. M8 SCREW.
	
	3. Enter TARG target weight.
	
	4. If OUTPUT 2 = 3RD SHUTOFF POINT: Enter switchover point preflow/coarse feed LIMIT 0.
	
	5. Enter coarse/fine feed switchover point LIM 1.
	
	6. Enter switch-off point of fine feed LIM 2: LIMIT 1 $\leq$ LIMIT 2.
	
	7. Enter tolerance TOL in the displayed unit.
	    – Minimum tolerance: 1 digit
	    – Maximum tolerance: target weight; with DeltaTrac: 10 % of target weight
	    – Target weight + tolerance $\leq$ maximum load
	
	8. Enter lower limit of permissible tare range TMIN.
	
	9. Enter upper limit of permissible tare range TMAX: TMIN $\leq$ TMAX.
	
	10. If ANALOG OUTPUT = ON and OUTPUT 2 = 3rd SHUTOFF POINT:
	Enter THROUGHPUT PREFLOW.
	If ANALOG OUTPUT = ON:
	Enter THROUGHPUT COARSE FEED and THROUGHPUT FINE FEED
	
	11. End entry: Confirm memory number without entry with ENTER.

REDISPENSING	Set automatic or manual redispensing
	Factory setting: AUTOMAT. REDISPENSING
AUTOMAT. REDISPENSING MANUAL REDISPENSING	Possible entries: • PULSE DURATION During the pulse duration the fine feed is opened. Possible values: 1 … 99 times a measuring cycle (factory setting: 5) • PULSE PAUSE During the pulse pause the fine feed is closed. Possible values: 0 … 99 times a measuring cycle (factory setting: 5)

TOTALIZING	Switch automatic totalizing on or off
	If TOTALIZING ON is set, the dispensings to be totalized can be selected. Factory setting: TOTALIZING OFF
CORRECT DISPENSINGS	Only totalize dispensings within the tolerances. Cancelled dispensings can be added to the total sum with the SUM key in the CONTINUE WITH START state.
ALL DISPENSINGS	Totalize all dispensings.

STATUS INDICATOR	Set display of dispensing state on ID7sx-Dos
WITH DELTATRAC	The dispensing state is displayed with text, a 3-digit code and the DeltaTrac, see section 3.4.1 (factory setting).
WITHOUT DELTATRAC	The dispensing process is displayed with texts and a 3-digit code.
WITH BIG WEIGHT	During the dispensing process the BIG WEIGHT display is switched on. Dispensing states such as READY FOR DISPENSING or DISPENSING OKAY continue to be displayed, and the display switches over to the normal weight display for this purpose.
	The following possibilities are also available for all settings: • NOT ENLARGED (factory setting): When the weighing platform is ready for dispensing, the display shows READY FOR DISPENSING. • ENLARGED: When a target memory has been recalled, the memory designation appears in the display in the ready for dispensing state. For manually entered dispensing parameters, READY FOR DISPENSING appears.
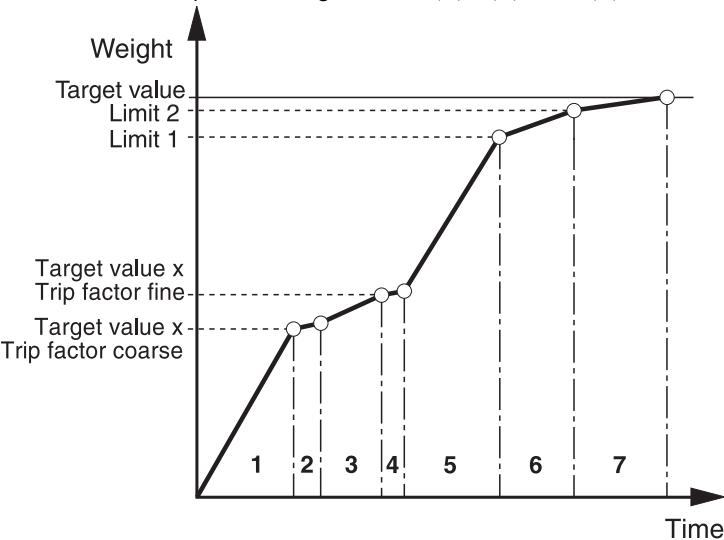
PASSWORD BLOCK	Switch password block on or off
	Protect SUM, N and LIMIT keys with the personal code which also protects the master mode, see "Master mode" chapter in the operating instructions and installation information for the ID7-… weighing terminal. Factory setting: PASSWORD BLOCK OFF

PAC START KEY	Switch locking of the START key on or off
	If PAC START KEY OFF is set, the START key is locked and the dispensing process can only be started via an external switch and the 8 I/O-ID7sx interface. This prevents double operation with external operating elements (e. g. footswitch or key). Factory setting: PAC START KEY ON

OPERATING MODE	Set operating mode with certified weighing platforms
NON AUTOMATIC	The dispensing process does not run automatically and the permissibility of the weight values must be monitored by the operator.
AUTOMATIC	The dispensing process runs automatically (factory setting).
Comments	• Different national tolerances are taken into account. • For calibration reasons, the operating mode can only be switched over in the non-certified mode of the weighing platform.

MANUAL CORRECTION	Switch manual recorrection on or off
	When MAN. CORRECTION ON is set, the final weight can be manually recorrected, e. g. in the case of incorrect dispensing, see section 3.8. Factory setting: MAN. CORRECTION OFF
Comments	• You can read whether dispensing lies within the tolerance limits at the outputs which are assigned the signals GOOD DISPENSING and POOR DISPENSING. • Manual correction is only possible for non-certified weighing platforms. • If REDISPENSING is set to AUTOMATIC, the MANUAL CORRECTION only becomes active in the case of overfilling (underfilled containers are automatically redispensed). If REDISPENSING is set to MANUAL, the MANUAL CORRECTION becomes active in the case of underfilling and overfilling.

OUTPUT 2	Control various additional devices via output 2
OUTPUT 2 OFF	OUTPUT 2 is not actuated (factory setting).
MATERIAL AGITATION	Control of an agitator during or after dispensing; for additional settings, see section 4.1.3.
REMAINING QUANTITY	Remaining quantity: Control of an emptying device on the filling container; for additional settings, see section 4.1.4.
FILL QUANTITY	Fill quantity: Control of a refilling valve during subtractive weighing; for additional settings, see section 4.1.5.
SCALE SWITCHOVER	Control of a signal which enables switching over between 2 weighing platforms; for additional settings, see section 4.1.6.
3RD SHUTOFF POINT	Control of a third valve; for additional settings, see section 4.1.7.
Comment	To read or set the status of output 2, see application block 359 in section 5.1.

LEARN MODE	Switch Learn mode on or off
	If LEARN MODE ON is set and the dispensing parameters are entered without limits or limit 2 ≤ limit 1, the ID7sx-Dos determines the valve switch-off points limit 1 and limit 2. If LEARN MODE OFF is set, limit 1 and limit 2 must be entered manually. Factory setting: LEARN MODE ON • The coarse feed is opened (1) in the learn mode up to the value (target value x trip factor coarse feed) and the redispensing correction determined (2). Then the fine feed is opened (3) during the number of measuring cycles specified with the trip factor fine feed and its redispensing correction determined (4). Then limit 1 and limit 2 are calculated in dependence on the target value. Following this filling is carried out up to the target value (5), (6) and (7).
TRIP FACTOR COARSE	The trip factor coarse feed determines when the coarse feed is switched off in the learn mode. • Possible values: 0.1 … 0.9 (factory setting: 0.5). • With high pressures and pulse forces or large mass feeds, reduce the trip factor.
TRIP FACTOR FINE	The trip factor fine feed specifies how long the fine feed is open in the learn mode. The larger the trip factor fine feed, the more accurately the fine feed run-on can be determined. Possible settings: TRIP FACTOR FINE FEED = 0.1 … 0.9 (Factory setting: 0.5) The value 0.1 is equal to 5 measuring cycles, 0.5 is equal to 25 measuring cycles and 0.9 is equal to 45 measuring cycles.
Comments	• If SINGLE FEED OPERATION ON is set, limit 1 is set to zero in the learn mode. • TRIP FACTOR COARSE and TRIP FACTOR FINE are available as application blocks (blocks 363 to 367).

MONITOR DISPENSING	Switch monitor dispensing on or off
	Dispensing monitoring monitors the weight increase in each measuring cycle. If MONITOR DISPENSING ON is set and the weight value exceeds or drops below the SENSITIVITY value, dispensing monitoring is activated. Factory setting: MONITOR DISPENSING OFF

SENSITIVITY	AABBCCDDEEFF – Response behavior of dispensing monitoring as a 12-digit number
	Possible settings:
	
	• WEIGHING-IN – Dispensing monitoring during weighing-in
	
	• SUBTRACTIVE WEIGH. – Dispensing monitoring during subtractive weighing
	
	Response behavior of dispensing monitor
	AA AA = 00 digit:
	       Dispensing monitoring is activated when the weight increase per measuring cycle **drops below** the corresponding value (DD, EE or FF) (minus monitoring).
	       The corresponding valve (preflow, coarse or fine feed) is automatically switched off. The display alternately shows MONITOR DISPENSING and CONTINUE WITH START. The dispensing process can be ended with the STOP key or continued with the START key.
	       AA = 01 digit:
	       Dispensing monitoring is activated when the weight increase per measuring cycle **exceeds** the set value (DD, EE or FF) (plus monitoring).
	       The corresponding valve (preflow, coarse or fine feed) is automatically switched off. Dispensing is first continued when the weighing platform is stabile.
	BB Switch-on value of dispensing monitoring: weight increase per measuring cycle for which dispensing monitoring is activated after starting or interrupting the dispensing process: 00 … 99 digit (factory setting: 03)
	CC Number of measuring cycles during which the dispensing monitor pauses and the weight increase takes place: 01 … 99 (factory setting: 10)
	DD Weight increase per measuring cycle for the fine feed:
	       01 … 99 digit (factory setting: 01)
	EE Weight increase per measuring cycle for the coarse feed:
	       01 … 99 digit (factory setting: 01)
	FF Weight increase per measuring cycle for the preflow:
	       01 … 99 digit (factory setting: 01)

Comments	• In the case of valve or material sluggishness increase the value BB. • In the case of uneven material feed increase the value CC. • With an increased material flow, increase the values DD, EE and FF (minus monitoring). • In application block 361 the dispensing state minus or plus monitoring is available, and the response behaviour is available in application block 362, see section 5.1.

ACKNOWLEDGE	**Switch acknowledgement of the next dispensing process on or off**
	After completing one dispensing process, the next dispensing process can be started with or without acknowledgement. Acknowledgement is triggered with the following actions: • Weight change > 30 digit • Pressing the START key • Interface command $\boxed{A_{\lfloor}W|3_{\lfloor}5_{\lfloor}2|\_|1}$ or $\boxed{A_{\lfloor}W|3_{\lfloor}0_{\lfloor}6|\_|\$|\$|9}$, see section 5.1 • Signal at the input of the 8 I/O-ID7sx interface which is assigned the function ACKNOWLEDGEMENT.
ACKNOWLEDGE ON	Moving the weighing platform by at least 30 digit or pressing the START key in the DISPENSING OKAY state results in the READY FOR DISPENSING state. The next dispensing process is started with the START key (factory setting).
ACKNOWLEDGE OFF	After the dispensing process is completed and the START is pressed, the next dispensing process is started immediately. READY FOR DISPENSING is not displayed.

COARSE FEED	**Set valves during coarse feed**
COARSE	Open coarse feed up to limit 1 (factory setting).
COARSE AND FINE	Open coarse and fine feed up to limit 1 simultaneously.

START TIMER	**Set delay time between the start of the dispensing process and opening of the coarse feed**
TIME	Possible values: 0 … 999 seconds (factory setting: 0)
Comments	• When the start timer is activated, the display shows the time remaining. • The start timer can be interrupted or cancelled with the STOP key. • During the delay time, a digital output at the 8 I/O-ID7sx interface can be set to high. This signal can, for example, be used for pregasing when dispensing fruit juices.

END TIMER	Set delay time between stabilization of the weighing platform after the end of dispensing and evaluation of the weighing data
TIME	Possible values: 0 … 999 seconds (factory setting: 0)
Comments	• When the end timer is activated, the display shows the time remaining. • The stop timer can be interrupted or cancelled with the STOP key. • During the delay time, a digital output at the 8 I/O-ID7sx interface can be set to high. This signal can, for example, be used for regasing when dispensing fruit juices.

PREDISPENSING	Set time for predispensing
	The fine feed valve is actuated before each opening of the coarse feed.
TIME	Possible values: 0 … 999 seconds (factory setting: 0)
Comments	• Predispensing can be interrupted or cancelled with the STOP key. When limit 1 is reached, predispensing is automatically cancelled. • When predispensing is activated, the display shows the time still remaining.

PRINTING CYCLE	Enter number of dispensings after which the dispensing result is automatically printed or a corresponding data string is transmitted
	Possible values: 1 … 99 (factory setting: 1)

SINGLE FEED OPERATION	Switch single feed operation on or off
	If SINGLE FEED OPERATION ON is set and the target value of the specified LIMIT is dropped below, dispensing is then only carried out with fine feed. This also enables smaller quantities to be dispensed without switching over the dispensing system (valves, pumps). Factory setting: SINGLE FEED OPERATION OFF
LIMIT	Enter threshold value for single feed operation.

OUTPUT 7	Activation of the output which is assigned the function OUTPUT 7 at the 8 I/O-ID7sx interface
IMPULSE ON START	OUTPUT 7 is briefly switched on during the start-up of the ID7sx-Dos (factory setting).
ON AT STATUS X YYY	Enter up to 30 dispensing states for which OUTPUT 7 is switched on. X is the serial number (1 ... 30), YYY is the code for the various dispensing states (000 ... 254), see application block 361 in section 5.1. To end the input of the dispensing states, press ENTER without making an entry.

FREEWEIGH-MODE	Switch freeweigh-mode on or off
	If FREEWEIGH-MODE ON is set, the weight data are recorded and visualized with the computer program. When the START key is pressed in the READY FOR DISPENSING state, the ID7sx-Dos transmits the string $\boxed{K}\boxed{F}\boxed{\_}\boxed{I}$ to the serial interface, however without starting the dispensing process. The dispensing process must be started with the $\boxed{A}\boxed{W}\boxed{3}\boxed{5}\boxed{2}\boxed{\_}\boxed{1}$ interface command, see section 5.1. Factory setting: FREEWEIGH-MODE OFF
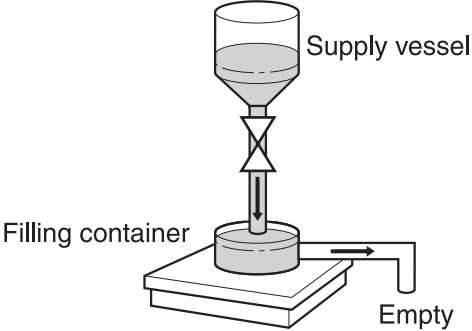
ANALOG OUTPUT	Output throughput via application block 366
	If ANALOG OUTPUT ON is set, a weight value within the range of 0 kg (throughput = 0) to the maximum load of the weighing platform (throughput = 99) which corresponds to the throughput (0 to 99%) is output in application block 366 while the preflow, coarse feed or fine feed is being opened. The size of the throughput can be entered manually with the LIMIT key or with an interface via the application blocks 322 to 347 or 323_001 to 323_999. Factory setting: ANALOG OUTPUT OFF
Note	An external analog output connected to a PLC, for example, can be operated with the weight value available in application block 366, or the values supplied by application block 366 are used to control the respective flow-through quantity directly.

RESET PAC	Reset all functions to the factory settings	
	Block	**Factory setting**
	APPLICATION	above level
	AUTOMATIC TARE	on
	REDISP. CORRECTION	on; factor = 0.5; correction threshold = 0
	REDISPENSING	autom. redispensing; pulse duration 5 s; pulse pause 5 s
	TOTALIZING	off
	STATUS INDICATOR	with DeltaTrac; not enlarged
	PASSWORD BLOCK	off
	PAC START KEY	on
	OPERATING MODE	automatic
	MANUAL CORRECTION	off
	OUTPUT 2	output 2 off
	LEARN MODE	on; trip factor coarse feed = 0.5; trip factor fine feed = 0.5
	MONITOR DISPENSING	off; sensitivity 00 03 10 01 01 01; weighing in
	ACKNOWLEDGE	on
	COARSE FEED	coarse
	START TIMER	0 s
	END TIMER	0 s
	PREDISPENSING	0
	PRINTING CYCLE	1
	SINGLE FEED OPERATION	off
	OUTPUT 7	impulse on start
	FREEWEIGH MODE	off
	ANALOG OUTPUT	off
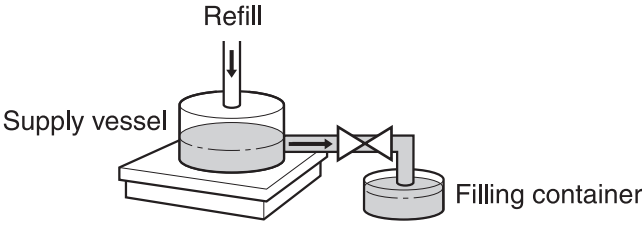
4.1.3   Material agitation

MATERIAL AGITATION	Switch agitator in dependence on weight and time
LIMIT 1, LIMIT 2, TARGET VALUE	LIMIT 1, LIMIT 2 or TARGET VALUE are reference quantities for the material agitation. Possible settings:
WEIGHT + TIME	• WEIGHT: Enter switch-on value as difference to the reference quantity. • TIME: Enter switch-on time between 0 … 9999 seconds; The dispensing process is interrupted during the switch-on time.
PERCENT	• SWITCH-ON VALUE: Enter switch-on value relative to the reference quantity: 0.1 … 0.9. • SWITCH-OFF VALUE: Enter switch-off value relative to the reference quantity: 0.1 … 0.9.
WEIGHT VALUE	• ON: Enter switch-on value as difference to the reference quantity. • OFF: Enter switch-off value as difference to the reference quantity.
Comment	The corresponding values are available in the application blocks 354 … 358, see section 5.1.

4.1.4   Remaining quantity

REMAINING QUANTITY	Set remaining quantity during weighing-in
	If the gross weight of the filling container exceeds a specified WEIGHT after a dispensing process, the output of the 8 I/O-ID7sx which is assigned the OUTPUT 2 function is set to HIGH. The filling container is automatically emptied and the display shows EMPTY. When the WEIGHT is reached, OUTPUT 2 is set to LOW again.
WEIGHT	Enter absolute switch-on value of the remaining quantity as the weight value.
Comments	• The next dispensing process can only be started with the START key if output OUTPUT 2 is set to LOW. • With the STOP key output OUTPUT 2 can be manually set to LOW. • The absolute switch-on value is available in the application block 356, see section 5.1.
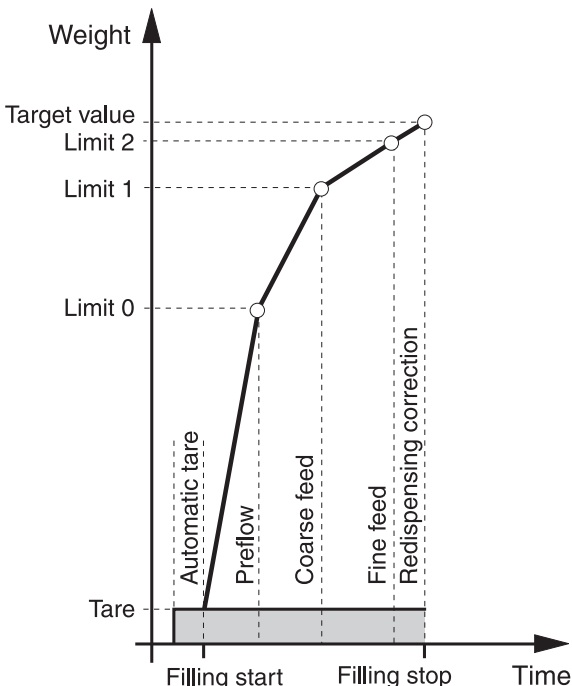
4.1.5   Fill quantity

FILL QUANTITY	Set fill quantity control during weighing-out
	If the gross weight of the supply vessel undershoots a specified ALARM VALUE after a dispensing process, the output of the 8 I/O-ID7sx which is assigned the OUTPUT 2 function is set to HIGH. The supply vessel is automatically refilled and the display shows REFILL. When the specified weight value FILL QUANTITY is reached, output OUTPUT 2 is set to LOW.
ALARM VALUE	Enter absolute switch-on value of fill quantity control as weight value.
FILL QUANTITY	Enter absolute switch-off value of fill quantity control as weight value.
Comments	• The next dispensing process can only be started with the START key if output OUTPUT 2 is set to LOW. • With the STOP key output OUTPUT 2 can be manually set to LOW. • The ALARM VALUE is available in the application block 356, the FILL QUANTITY in application block 357, see section 5.1.

4.1.6   Weighing platform switchover

SCALE SWITCHOVER	Switch back and forth between two weighing platforms
MANUAL	Manual switching via a pulse of the input at the 8 I/O-ID7sx interface which is assigned the function SCALE.
AUTOMATIC	Switch over automatically.
WEIGHING-IN	If ACKNOWLEDGEMENT OFF is also set, and the output which is assigned the function COMPLETE DISPENSING is linked with the input which is assigned with START, the filling process and scale change occur automatically. To prevent valves from opening when no container is on the scale, the tare monitoring function must be used in this setting. Separate dispensing parameters can be entered for both weighing platforms. This enables the control of two dispensing systems. For weighing platform 1 the dispensing parameters must be saved to target memory 1, and for weighing platform 2 to target memory 2. If the same dispensing parameters are to be used for dispensing on both weighing platforms, target memory 1 and 2 may not be assigned.
SUBTRACTIVE WEIGH.	This function enables the quasi continuous dispensing from two supply vessels standing on weighing platforms 1 and 2. If the entered gross weight value WEIGHT is dropped below, the valves are closed, the stabilization of the weighing platform is waited for and the other weighing platform selected. The interrupted dispensing process is ended from the second container. With this alternative only one parameter set can be used.
Comments	• Output OUTPUT 2 shows which weighing platform is currently active during the dispensing process: LOW = weighing platform 1, HIGH = weighing platform 2. • The correct weighing platform number automatically appears on the printout. • The weight value WEIGHT required during WEIGHING OUT is available in the application block 356, see section 5.1.

4.1.7   3rd shutoff point

3RD SHUTOFF POINT	Control of a third valve
	Dispensing systems with three valves have a third shutoff point (limit 0), operated via the output which is assigned the function OUTPUT 2. Preflow filling occurs up to limit 0 (switchover point for preflow/coarse feed).
Comments	• The learn mode is automatically switched off an all 3 limits must be manually entered.
	• Limit 0 may not be entered greater than limit 1.

5   Application blocks

In the following description, the application blocks are shown in the syntax for the MMR command set. When used with the SICS command set, please observe the SICS conventions, see Operating instructions for ID7sx.... weighing terminal.

5.1   PAC application blocks

No.	Content	Format	
301	Pac version	Response:	`A B _ I D 7 s x - D O S _ _ V x . x x _`
302	Program number	Response:	`A B _ I P Y 4 - 0 - 0 x x x _`

305	Keypad entry or read-in barcode	Response:
		Write:
		Comment:
			`A B _ Entry`
			`A W 3 0 5 _ $ $ Entry`
			Entry = Text_20, number or weight value

306	Electronic finger	Response:
		Write:
			`A B _ K e y s _ _ _ _ 1 - 1 2 , 2 3 - 4 7`
			Trigger keys for the electronic finger
			`A W 3 0 6 _ $ $ Number (1 ... 12; integral)`
			Each number is assigned a key:
			1: N key
			2: SUM key
			3: CODE A key
			4: MAN key
			5: LIMIT key
			6: CODE B key
			7: STOP key
			8: CODE C key
			9: START key
			10: CODE D key
			11: CLEAR key
			12: ENTER key
			Correct triggering of the key is confirmed with a beep tone.
			Recall target memory
			`A W 3 0 6 _ $ $ Number`
			Number: 22: Display current dispensing parameters
			23_001 ... 23_999 or 23 ... 47:
			Call up target memory 1 ... 999 or 1 ... 25

310	Item counter	Response:	`A B _ Number_4`
311	Start value item counter	Response: Write:	`A B _ Number_4` `A W 3 1 1 _ Number_4`
312	Stop value item counter	Response: Write:	`A B _ Number_4` `A W 3 1 2 _ Number_4`
313	Sum net weight	Response:	`A B _ Weight value _ Unit`

No.	Content	Format	
314	Sum gross weight	Response:	`A B _ Weight value _ Unit`
315	Correction factor for redispensing correction	Response: Write:	`A B _ Factor (0.0 … 0.9; step size 0.1)` `A W 3 1 5 _ Factor (0.0 … 0.9; step size 0.1)`
316	Weight value (actual value) of last filling	Response:	`A B _ Weight value _ Unit`
317	Target – actual difference of last filling	Response:	`A B _ Weight value _ Unit`

318 … 321	Identification data Code A … Code D	Response:
		Write:
		Comment:
			`A B _ Name (text_20) _ , Identification (text_20)`
			`A W 3 x x _ Name (text_20) $ $ Identification (text_20)`
			xx = 18 … 21;
			corresponds to the application blocks 094 … 097

322	Current dispensing parameters	Response:	`A B _ Name (text_20) _ , _`
			`Target weight (weight value) _ Unit _ , _`
			`Limit 0 (weight value) _ Unit _ , _`
			`Limit 1 (weight value) _ Unit _ , _`
			`Limit 2 (weight value) _ Unit _ , _`
			`Tolerance (weight value) _ Unit _ , _`
			`Tare min (weight value) _ Unit _ , _`
			`Tare max (weight value) _ Unit _ , _`
			`Throughput preflow (number_2) _ , _`
			`Throughput coarse feed (number_2) _ , _`
			`Throughput fine feed (number_2)`

		Write:	`A W 3 x x _ Name (text_20) $ $`
			`Target weight (weight value) _ Unit $ $`
			`Limit 0 (weight value) _ Unit $ $`
			`Limit 1 (weight value) _ Unit $ $`
			`Limit 2 (weight value) _ Unit $ $`
			`Tolerance (weight value) _ Unit $ $`
			`Tare min (weight value) _ Unit $ $`
			`Tare max (weight value) _ Unit $ $`
			`Throughput preflow (number_2) $ $`
			`Throughput coarse feed (number_2) $ $`
			`Throughput fine feed (number_2)`

		Comment	xx = 22
323_001 … 323_999	Target memory 1 … 999	Response: Write: Comment:	equal to 322 equal to 322 xx = 23_001 … 23_999
323 … 347	Target memory 1 … 25	Response: Write: Comment:	equal to 322 equal to 322 xx = 23 … 47
348	Mean value $\bar{x}$	Response:	`A B _ Weight value _ Unit`

No.	Content	Format	
349	Standard deviation s	Response:	`A┊B` `_` `Weight value` `_` `Unit`
350	Minimum x$_{Min}$	Response:	`A┊B` `_` `Weight value` `_` `Unit`
351	Maximum x$_{Max}$	Response:	`A┊B` `_` `Weight value` `_` `Unit`

352	Start/Stop of dispensing	Response:
		Write:
		Comment:
			`A┊B` `_` `x`
			`A┊W┊3┊5┊2` `_` `x`
			Start: x = 1, Stop: x = 0

353	Zero threshold value of zero zone	Response: Write:	`A┊B` `_` `Weight value` `_` `k┊g┊_` `A┊W┊3┊5┊3` `_` `Weight value` `_` `k┊g┊_`

354	Relative switch-on value for output 2	Response:
		Write:
		Comment:
			`A┊B` `_` `Factor (0.0 ... 0.9; step size 0.1)`
			`A┊W┊3┊5┊4` `_` `Factor (0.0 ... 0.9; step size 0.1)`
			only for output 2 = material agitation

355	Relative switch-off value for output 2	Response:
		Write:
		Comment:
			`A┊B` `_` `Factor (0.0 ... 0.9; step size 0.1)`
			`A┊W┊3┊5┊5` `_` `Factor (0.0 ... 0.9; step size 0.1)`
			only for output 2 = material agitation

357	Absolute switch-off value for output 2	Response:
		Write:
		Comment:
			`A┊B` `_` `Weight value` `_` `Unit`
			`A┊W┊3┊5┊7` `_` `Weight value` `_` `Unit`
			with material agitation, fill quantity

358	Switch-on time for output 2 in seconds	Response:
		Write:
		Comment:
			`A┊B` `_` `Number_4`
			`A┊W┊3┊5┊8` `_` `Number_4`
			only for output 2 = material agitation

359	Status of output 2	Response: Write:	`A┊B` `_` `Code (Number_4)` , e. g.: **Code** **Meaning** 0000 Output 2 off 0001 Remaining quantity 0002 Fill quantity 0003 Scale switchover – manual 0004 3rd shutoff point – absolute weight value 0006 Scale switchover – automatic 0013 Material agitation – target value – percent 0014 Material agitation – target value – weight value 0015 Material agitation – target value – weight + time 0023 Material agitation – limit 1 – percent 0024 Material agitation – limit 1 – weight value 0025 Material agitation – limit 1 – weight + time 0033 Material agitation – limit 2 – percent 0034 Material agitation – limit 2 – weight value 0035 Material agitation – limit 2 – weight + time `A┊W┊3┊5┊9` `_` `Code (Number_4)`
360	Items poor (items outside tolerance)	Response:	`A┊B` `_` `Number_4`

No.	Content	Format
361	Dispensing state	Response: `A B _ Code (Number_3)` , e. g.:

Code   Meaning
000   Basic or switch-on state
005   Material agitation, weight + time, output 2 = HIGH
010   Ready for dispensing (dispensing parameters loaded)
020   Zero monitoring
022   Overload or underload during redispensing
030   Taring with automatic tare
037   Display WRONG TARE
040   Coarse feed on
042   Coarse feed off with STOP key
044   Below level application cancelled: Wait until nozzle is up
046   Learn mode: Coarse feed off through overload or underload
050   Fine feed on
052   Fine feed off with STOP key
056   Fine feed off through overload or underload
060   Fine feed off: Wait until nozzle is up
070   Dispensing ended: Evaluation of the dispensing results
072   Dispensing ended: Intermediate stop with STOP key
074   Redispensing: During the pulse duration fine feed off with STOP key
075   Redispensing: During the pulse duration fine feed on
076   Redispensing: During the pulse pause fine feed off
078   Redispensing: During the pulse pause fine feed off with STOP key
084   Display UNDERFILLED
085   Display OVERFLOW SUM REACHED
087   Display END VALUE REACHED
088   Display of net weight sum
090   End timer running
101   Display DISPENSING OKAY
111   Display OVERFILLED
130   Empty during remaining quantity
140   Redispensing for fill quantity
150   Preflow on
152   Preflow off with STOP key
235   Coarse feed off through overload or underload
242   Learn mode: Coarse feed off
245   Learn mode: Fine feed on
246   Learn mode: Fine feed off through overload or underload
250   Learn mode: Fine feed off with STOP key
253   Monitor dispensing: Positive monitoring
254   Monitor dispensing: Negative monitoring

Write: `A W 3 6 1 _ 0 0 0`   Reset to basic state. In the process the current dispensing parameters are deleted and impermissible steps may be carried out, e. g. deleting the sum when TOTALIZING ON is set.

No.	Content	Format	
362	Sensitivity of dispensing monitoring	Read: Write:	`A B _ Number_12` `A W 3 6 2 _ Number_12`
363	Trip factor coarse feed in learn mode	Read: Write:	`A B _ Factor (0.1 ... 0.9; step size 0.1)` `A W 3 6 3 _ Factor (0.1 ... 0.9; step size 0.1)`
364	Dispensing result: Gross weight	Response:	`A B _ Weight value _ Unit`
365	Dispensing result: Net weight	Response:	`A B _ Weight value _ Unit`
366	Transfer block for analog output	Response:	`A B _ Weight value _ Unit`
367	Trip factor fine feed in learn mode	Read: Write:	`A B _ Factor (0.1 ... 0.9; step size 0.1)` `A W 3 6 7 _ Factor (0.1 ... 0.9; step size 0.1)`

6   What to do if …?

Error / Display	Possible causes	Remedy
– EMPTY –	• Output 2 = Remaining quantity, container is automatically emptied	→ Wait until the container is empty
– REFILL –	• Output 2 = Fill quantity, container is refilled	→ Wait until the fill quantity is reached
– TARE –	• Automatic taring during start of dispensing process	→ Wait until scale is stabilized and tared
NOT ZERO	• Below-level dispensing: Nozzle has run dry	→ Prevent nozzle from running dry, acknowledge and restart
READY FOR DISPENSING	• Filling process may be started	→ Press START key
ENDVALUE REACHED	• Item counter has reached end-value	→ Recall sum and delete
MANUAL	• Underfilled, manual redispensing possible	→ Press MAN key until target weight is reached
LEARN MODE IS OFF	• Learn mode switched off and limit 1 and/or limit 2 not entered	→ Switch on learn mode or enter limit
LIMIT 2 TOO LARGE	• Value for limit 2 too large	→ Decrease limit 2
LIMIT 0 TOO LARGE	• Limit 0 greater than limit 1 entered	→ Enter limit 0 less than limit 1
LIM 2 EXCEEDS MAXLOAD	• Limit 2 is greater than the maximum load of the active weighing platform	→ Select limit 2 less than the maximum load of this weighing platform
MANUAL CORRECTION	• Container overfilled or underfilled	→ Manually remove or add dispensing product
MAX LIM	• Limit 1 or limit 2 too large	→ Decrease limit 1 or limit 2
MAX TOL	• Tolerance too large	→ Decrease tolerance
ZERO NOT ALLOWED	• Entered value smaller than 1	→ Increase value
CLEAR SUM	• Totalizing function switched on	→ Clear sum
MEMORY FULL	• Memory has reached maximum value	→ Clear sum
WRONG TARE	• Container on weighing platform outside entered tare limits	→ Place correct filling container on weighing platform
TMAX EXCEEDS MAXLOAD TMIN EXCEEDS MAXLOAD	• Entered tare limits above weighing platform maximum load	→ Decrease values for tare min. and tare max. accordingly

| Error / Display	Possible causes	Remedy
TMAX LESS THAN TMIN	• Maximum tare value is less than minimum tare value	➜ Increase max. tare value and decrease min. tare value
TOLERANCE INADMISS.	• Tolerance too small for weighing platform or too large for tolerance table	➜ Enter tolerance in permissible range
OVERFILLED	• Filling container overfilled	➜ Confirm or correct manually
UNDERFILLED	• Filling container underfilled	➜ Confirm or correct manually
CONTINUE WITH START	• Filling process interrupted with STOP key	➜ START key continues dispensing process, STOP key ends dispensing process
NO VALUE	• 0 was entered for a dispensing parameter	➜ Enter value greater than 0

7 Technical data

Dispensing functions	
Dispensing	• Controlling of coarse and fine flow of material feed for liquid, pasty and pourable weighing samples
	• Learn mode: automatic determination of dispensing parameters (coarse and fine feed)
	• Redispensing correction: Optimization of the fine-feed shutoff point (limit 2)
	• Tolerance check with automatic redispensing
	• Manual redispensing via keypad
	• Differentiation between below- and above-level dispensing
	• Control of elements of a below-level dispensing system
Dispensing parameters	• Entry of dispensing parameters either directly via keypad, by recalling from one of 999 fixed memories or via serial data interface
	• Input format: up to 8 places including decimal point
	• Tolerance input for certified scales $\leq$ national calibration regulations, for non-certified scales up to maximum target value
Tare functions	• Automatic tare compensation at start of dispensing
	• Tare monitoring in accordance with specified value
Memory	999 target memories for frequently dispensed components
Status display	Documentation of current dispensing process either with clear text or analog weigh-in aid DeltaTrac or BIG WEIGHT display
Item counter	Up to 9,999, start value and stop value can be set as desired
Totalizing	Net sum, gross sum, item counter, standard deviation, mean value, x_{min} and x_{max}
Sum memory	Up to 8 places including decimal point

8   Appendix

8.1   ID7sx-Dos and 8 I/O-ID7sx interface

8.1.1   System overview
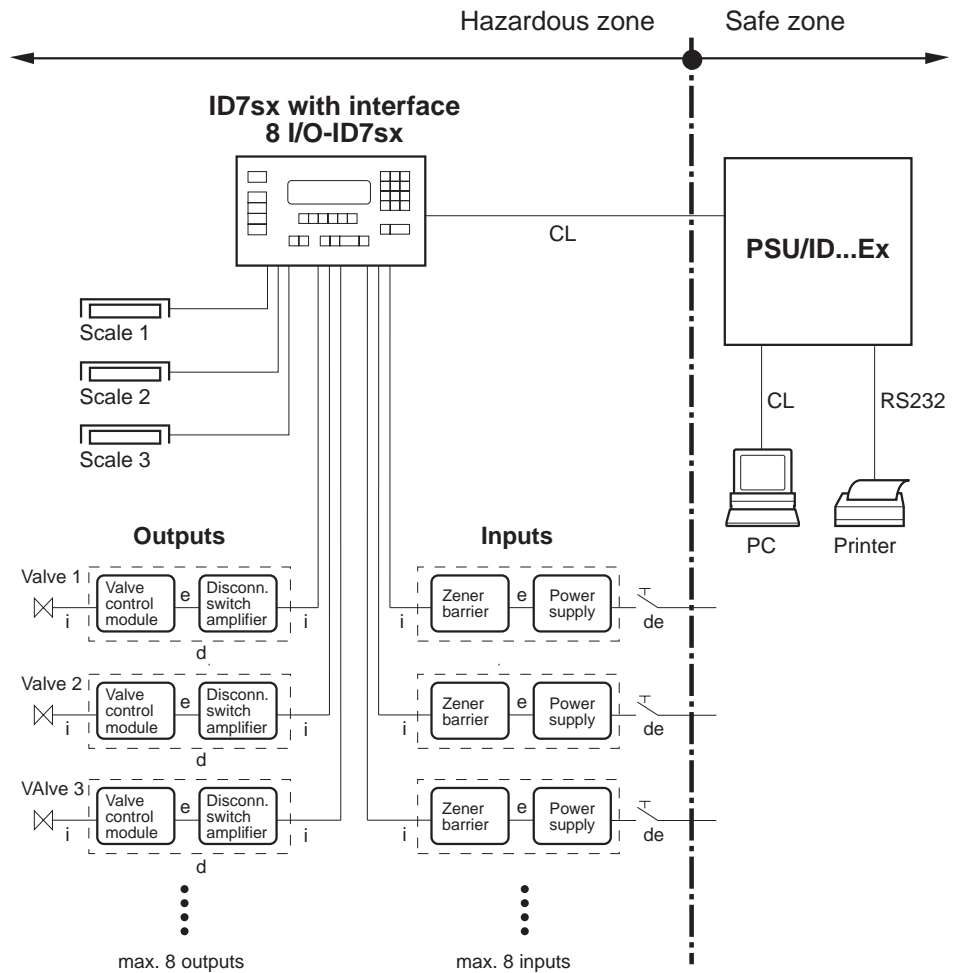
8.1.2   System data and requirements

Intrinsically-safe inputs

- Supply via an external power supply (rated voltage U_n = 12 to 24 V DC) and a Zener barrier

- Integrated 2.2 kΩ series resistor

- Safely electrically isolated

- Intrinsically-safe connection values, see terminal diagram 22006478

Intrinsically-safe outputs

- Supply via an external disconnection-switch amplifier
  (rated voltage U_n = 7 to 15 V DC)

- Integrated 2.2 kΩ collector resistor

- Point of activation: 2.8 mA < I < 6.1 mA / 7 to 15 V DC
  Point of deactivation: I < 0.5 mA

- Safely electrically isolated

- Intrinsically-safe connection values. See terminal diagram 22006478

Logical function of the inputs/outputs

- Function deactivated = logical "0" = not powered

- Function activated = logical "1" = powered

Cables

- Use Ex cables and Ex cable entries

- Insulation between intrinsically-safe circuits up to 60 V: at least 0.5 mm

- Observe cable capacity and inductivity

- Maximum connectable line cross-sections

  - without wire-end ferrule, rigid or flexible 0.2 mm^2 to 1.5 mm^2
  - with wire-end ferrule   0.25 mm^2 to 0.75 mm^2
  - AWG/kcmil   24 to 16

8.1.3   Terminal assignment of 8 I/O-ID7sx interface
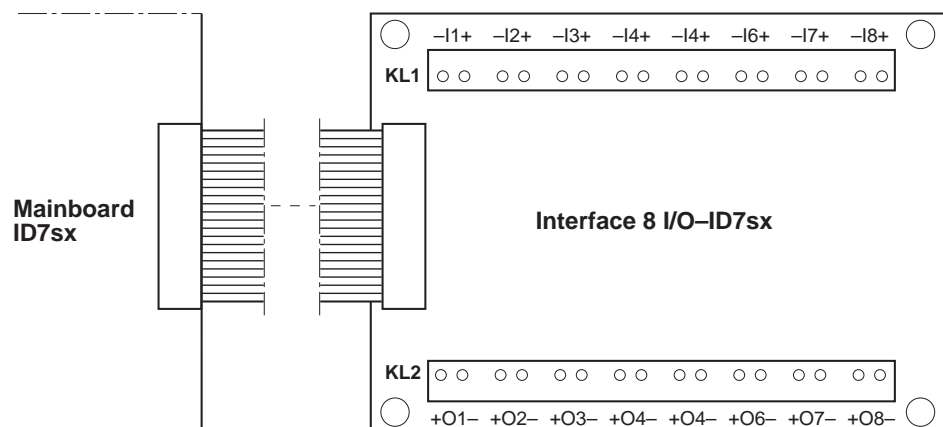
In the master mode of the 8 I/O-ID7sx interface, the inputs and outputs can be configured as desired.
The following standard assignments are configured for some applications.

Terminal assignment ABOVE LEVEL and BELOW LEVEL WITHOUT NOZZLE CONTROL applications

Terminal KL1	Standard assign-ment	Inputs from dispensing system	Meaning
I 1	IN 1	Nozzle	Signal with which the ID7sx-Dos carries out zero monitoring or before the start of the dispensing process, or waits with the evaluation until the nozzle is no longer in the liquid
I 2	IN 2	Start (PLC)	For starting dispensing
I 3	IN 3	Stop (PLC)	For stopping dispensing
I 4	IN 4	Confirm	Confirmation of underfilling/overfilling/acceptable dispensing
I 5	IN 5	Tare	Manual external taring
I 6	IN 6	Scale switchover	Manual switchover between several weighing platforms, e.g. for SCALE SWITCHOVER
I 7	IN 7	Cancel	Immediate cancelling of dispensing (emergency stop), then ID7sx-Dos returns to the basic status
I 8	IN 8	Lock keypad	When IN 8 is set to HIGH, the keypad of the ID7sx-Dos is locked

Terminal KL2	Standard assign-ment	Outputs to dispensing system	Meaning
O 1	OUT 1	Fine feed	For connecting fine feed valve/feed chute, etc.
O 2	OUT 2	Output 2	For various settings of OUTPUT 2, see section 4.1.2
O 3	OUT 3	Coarse feed	For connecting coarse feed valve/feed chute, etc.
O 4	OUT 4	Poor	Reporting of poor dispensing result (UNDERFILLED, OVERFILLED) or of another error status (WRONG TARE; NOT ZERO)
O 5	OUT 5	Acceptable	Reporting of acceptable dispensing result
O 6	OUT 6	End of dispensing	Filling completed
O 7	OUT 7	Start/output 7	Start pulse for external control for BELOW LEVEL WITHOUT NOZZLE CONTROL application or for settings of OUTPUT 7, see section 4.1.2
O 8	OUT 8	Ready	Ready to start dispensing

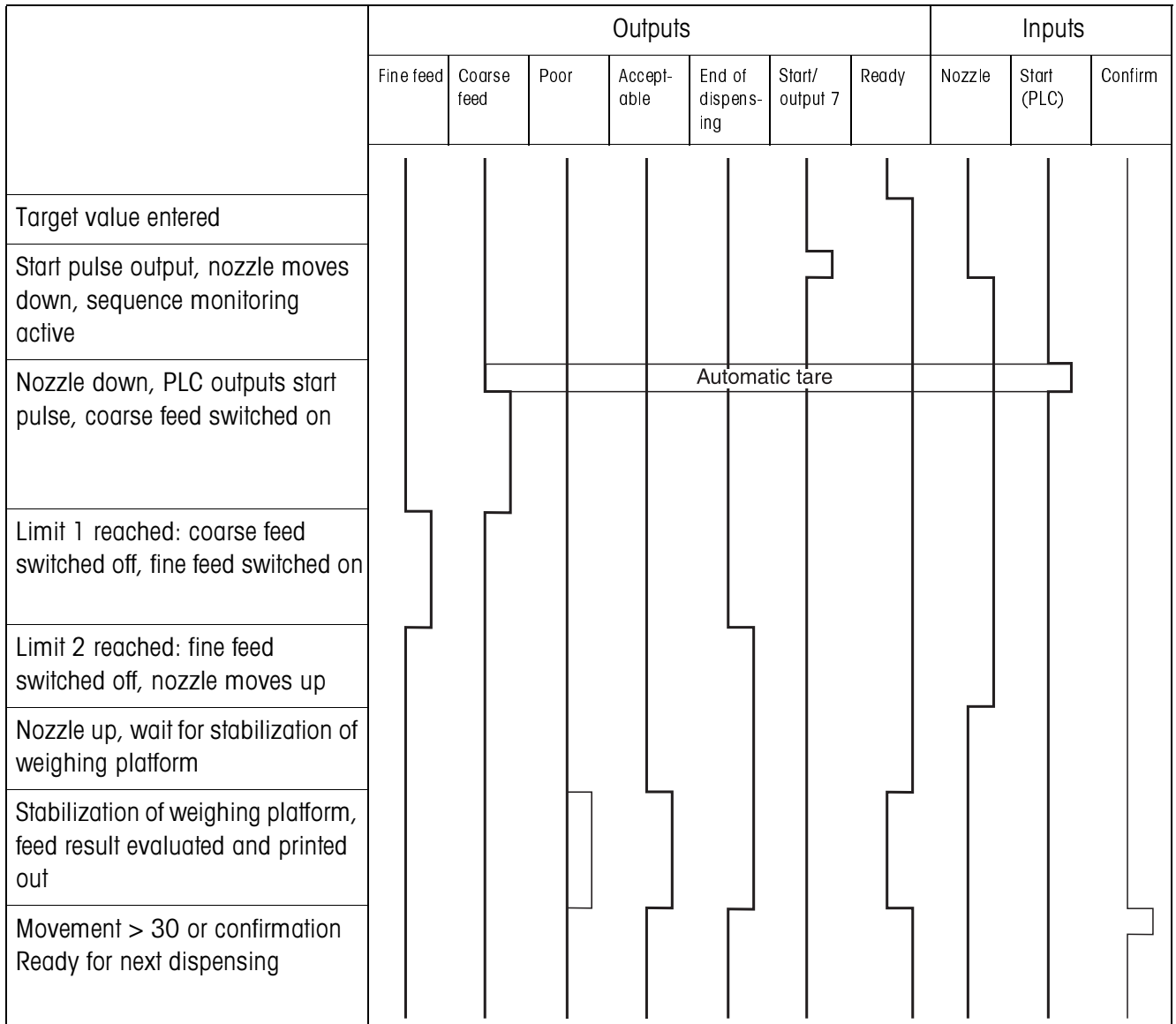**Terminal assignment BELOW LEVEL WITH NOZZLE CONTROL applications**

Terminal KL2	Standard assignment	Inputs from dispensing system	Meaning
I 1	IN 1	Nozzle up	Only with NOZZLE CONTROL ON: detection of basic nozzle position
I 2	IN 2	Nozzle down	Only with NOZZLE CONTROL ON: detection of bottom nozzle position
I 3	IN 3	Nozzle middle	Only with NOZZLE CONTROL ON: detection of middle nozzle position
I 4	IN 4	Drip pan back	Only with DRIP PAN ON: checking of retracted drip pan prior to lowering nozzle
I 5	IN 5	Start (PLC)	For starting dispensing
I 6	IN 6	Stop (PLC)	For stopping dispensing
I 7	IN 7	Cancel	Immediate cancelling of dispensing (emergency stop), then ID7sx-Dos returns to the basic status
I 8	IN 8	Lock keypad	When IN 8 is set to HIGH, the keypad of the ID7sx-Dos is locked

Terminal KL2	Standard assignment	Outputs to dispensing system	Meaning
O 1	OUT 1	Fine feed	For connecting fine feed valve/feed chute, etc.
O 2	OUT 2	Output 2	For various settings of OUTPUT 2, see section 4.1.2
O 3	OUT 3	Coarse feed	For connecting coarse feed valve/feed chute, etc.
O 4	OUT 4	Nozzle down	Move nozzle down
O 5	OUT 5	Nozzle up	Move nozzle up
O 6	OUT 6	Drip pan forward	Move drip pan unter nozzle
O 7	OUT 7	End of dispensing	Filling completed
O 8	OUT 8	Ready	Ready to start dispensing

8.2   Sequence charts

8.2.1   Below-level application

NOZZLE CONTROL OFF and DRIP PAN OFF

	Outputs							Inputs		
	Fine feed	Coarse feed	Poor	Accept-able	End of dispens-ing	Start/ output 7	Ready	Nozzle	Start (PLC)	Confirm
Target value entered										
Start pulse output, nozzle moves down, sequence monitoring active										
Nozzle down, PLC outputs start pulse, coarse feed switched on			Automatic tare							
Limit 1 reached: coarse feed switched off, fine feed switched on										
Limit 2 reached: fine feed switched off, nozzle moves up										
Nozzle up, wait for stabilization of weighing platform										
Stabilization of weighing platform, feed result evaluated and printed out										
Movement > 30 or confirmation Ready for next dispensing										

NOZZLE CONTROL ON and DRIP PAN ON

	Outputs					Inputs			
	Nozzle down	Nozzle up	Drip pan forward	Nozzle on	Correct nozzle	Nozzle up	Nozzle down	Nozzle middle	Drip pan back
Basic position: nozzle up and drip pan at front									
Start of dispensing: drip pan moves back									
Drip-pan limit switch reached: nozzle moves down									
Lower limit switch reached: nozzle stops, weighing platform is tared, dispensing procedure starts									
While coarse or fine feed is switched on: correct nozzle									
Limit 2 reached: nozzle moves up									
Middle position of nozzle: evaluation or refilling									
Nozzle moves back to upper end position									
Nozzle up: drip pan moves forward again									
Basic position: nozzle up and drip pan at front Ready for next dispensing									

8.2.2 Below-bunghole application

The same sequence charts apply to the below-bunghole application as for the below-level application, however the middle end position is moved to instead of the bottom end position.

8.2.3   **Above-level application**

	Outputs							Input
	Fine feed	Coarse feed	Poor	Accept-able	End of dispens-ing	Start/output 7	Ready	Acknow-ledge
Target value entered								
Start pulse output, coarse feed switched on								
Limit 1 reached: coarse feed switched off, fine feed switched on								
Limit 2 reached: fine feed switched off, wait for stabilization of weighing platform								
Stabilization of weighing platform, dispensing result evaluated and printed out								
Movement > 30 digit or acknowledgement Ready for next dispensing								

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