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1 Introduction of the Fill Pac

The IND500x Fill Pac includes three major Applications:

- Advanced Auto Filling
- Basic Auto Filling
- Drum Filling

The Fill Pac is enabled through the use of an “application hardware key.” The key is inserted into a receptacle on the IND500x main board. It contains a specific code that enables access to the features and capabilities of this specific application solution.

Fill Application Selection

The table that follows introduces the different functions of these three Filling applications. Users need to select the suitable application based on their real scenarios.

Application	Function Description	Key Functions
Advanced Auto Filling	Advanced Auto Filling is the upgrade to the Basic Auto Filling. It is a specialized application solution focusing on the needs of users with material filling and/or dispensing requirements. These applications are typically fixed sequences where containers are repeatedly filled with materials from supply hoppers and then dispensed. The filling and dispensing processes are controlled by the same weighing system (as opposed to one for filling and a different one for dispensing). Enhanced features and built-in workflows will be provided.	Work Mode: Fill, Fill/Dump, Dose, and Dose/Refill; Tolerance Setting, SmartTrac, Action Log, Statistics, Material Table, Jog, AutoSpill Adjustment, Auxiliary Output, Manual Accept, Interlocks, Advanced Feed Alarm, Timer...
Basic Auto Filling	Basic Auto Filling is used to take control and start the filling until it reaches the target, and then it stops the filling. A single or two-speed feeding system is used to either add weight to or remove weight from the scale. The terminal monitors the change in weight and compares it to a previously entered target and other control parameters. It does not have auto-taring function and any other advanced settings, such as statistics, action log, auto-spill adjustment and so on.	Work Mode: Fill; Tolerance Setting, SmartTrac, Basic Feed Alarm...
Drum Filling	Drum Filling adds lance control and the associated setup selections to the optional Fill Application to provide a stand-alone solution for drum filling. Drum Filling only supports one material. During the filling process, the IND500x display includes the application-related operator feedback.	Work Mode: Manual, Top Fill; Tolerance Setting, SmartTrac, Lance Control, Drip Pan Control, Action Log, Statistics, Material Table, Jog, AutoSpill Adjustment, Auxiliary Output, Interlocks, Manual Accept, Advanced Feed Alarm, Timer...

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1.1 Access to Setup

After login with the correct access level by the Login softkey  in the Active Values page, the configuration of the IND500x Fill Pac terminal is accessed through the Application Settings softkey .

Access Level

Administrator



An Administrator has unlimited access to all areas of the operating and setup system. At the factory, the terminal is configured with a default account **Admin** and default password is **null** (no password). The Admin can't be deleted or renamed.

Supervisor



A Supervisor has full access to all features on operating level and limited access to the weight and measurement-related setup.

Operator



The operator has read access only (e.g. call targets, use tables, etc.) to standard operation and setup. At the factory, the terminal is configured with a default operator account with a username of **Operator**. The factory default password is **null** (no password). This default account has limited access to Setup. The Operator can be deleted or renamed on the setup.

For more information about access right, refer to the chapter User Security in the User Manual.

2 Application Entry

The App Entry softkey  in the Home Page provides the only way to run Applications.

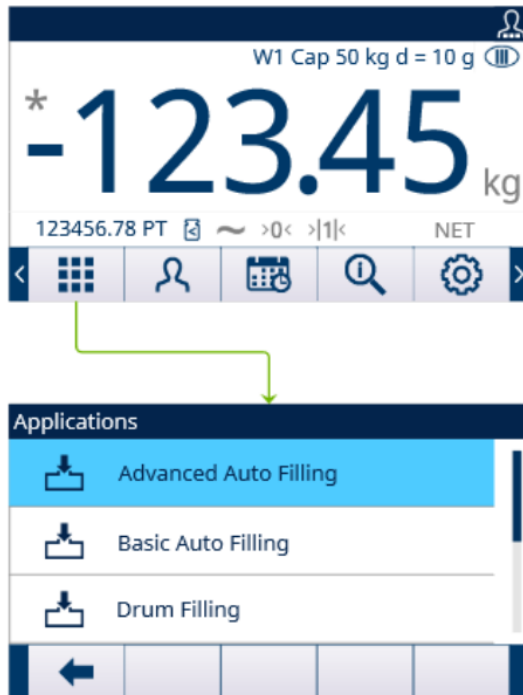







Figure 1: Enter Application via AppEntry

- 1 Press the App Entry softkey  in the Home Page.
 - ➔ The Applications page shows.
- 2 Move the focus with the UP and DOWN navigation keys (, ). Press the EXIT softkey  to go back to the Home Page.
- 3 To select a specific filling mode, press the ENTER key .
- ➔ The selected filling mode is enabled.

Attention The Operator can't switch Application during its running. All Operator changes only can happen within the application.

3 Advanced Auto Filling

Introduction

The Advanced Auto Filling is a specialized application solution focused on the needs of users with single material filling and/or dispensing requirements.

These applications feature typically fixed sequences where containers are repeatedly filled with materials from supply hoppers and then dispensed. The filling and dispensing processes are controlled by the same weighing system (as opposed to one for filling and a different one for dispensing).

Compared with Basic Auto Filling, Advanced Auto Filling is fully automatic and features more precise weight control of filling. It supports more functions and more work modes to satisfy diversified user demands.

Condition

To enable Advanced Auto Filling, the optional Fill Pac must be installed.







Function

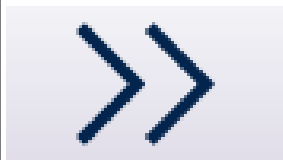
- IND500x supports 4 Advanced Auto Filling Work Modes including Fill, Fill / Dump, Dose, and Dose / Refill.
- Fill and Refill fall into Weigh-in cycle category, while Dose and Dump fall into Weigh-out cycle category.
- Advanced Auto Filling provides the ability to combine both a weigh-in and a weigh-out cycle into complete sequences.

Cycle Description		
Cycle		Description
Weigh-in	Fill	A fill cycle is defined as filling one material onto a scale, into a container on a scale or into a vessel such as a tank or hopper.
	Refill	A Refill cycle is defined as refilling the supply vessel when the supply vessel does not contain enough material for the required dose.
Weigh-out	Dump	In a dump cycle, all of the material that has been filled into a tank or vessel is completely emptied. Near the end of a dump cycle, the weight returns to within a small range of zero and the dump is completed.
	Dose	A dose cycle empties a preset target weight of material from the scale into a container. This cycle is repeated as multiple containers are filled with the same amount of material until the supply is depleted. At that time, the weigh vessel is refilled automatically or manually.

3.1 Softkeys and Icons





















Softkeys on Start-up Screen

Icon	Name	Icon	Name
	Exit to Home Page		Number of Cycles
	Material Table		Start
	Application Settings		Login

Icon	Name	Icon	Name
	Next Page	-	-







Application Settings Icons


This table lists all of the icons for Application setting.

Icon	Name	Icon	Name
	Refill		Advanced Settings
	Work Mode		Cycle Transition
	Material Table		Cycles
	Feed Settings		Container Tare
	Timing		Jog
	Interlocks		Tolerance Acceptance
	Feed Alarm		PAC Statistics
	Action Log		Overfill Adjustment
	Autospill Adjustment		Auxiliary Output
	Discrete Inputs		Discrete Outputs

Softkey Icons in Sequence

This table lists the softkeys that are shown within cycle sequence.

Icon	Name	Icon	Name
	Start		Stop
	Pause		Manual Accept
	Refill		Jog

Icon	Name	Icon	Name
	Dump / Dose	-	-

3.2 Configuration

This chapter provides information about how to configure the IND500x terminal's operating system with the Advanced Auto Filling functionality. Functions can be enabled, disabled, or defined by entering parameter values in specific setup screens.

The Application Settings list may vary when different Work Mode is selected.

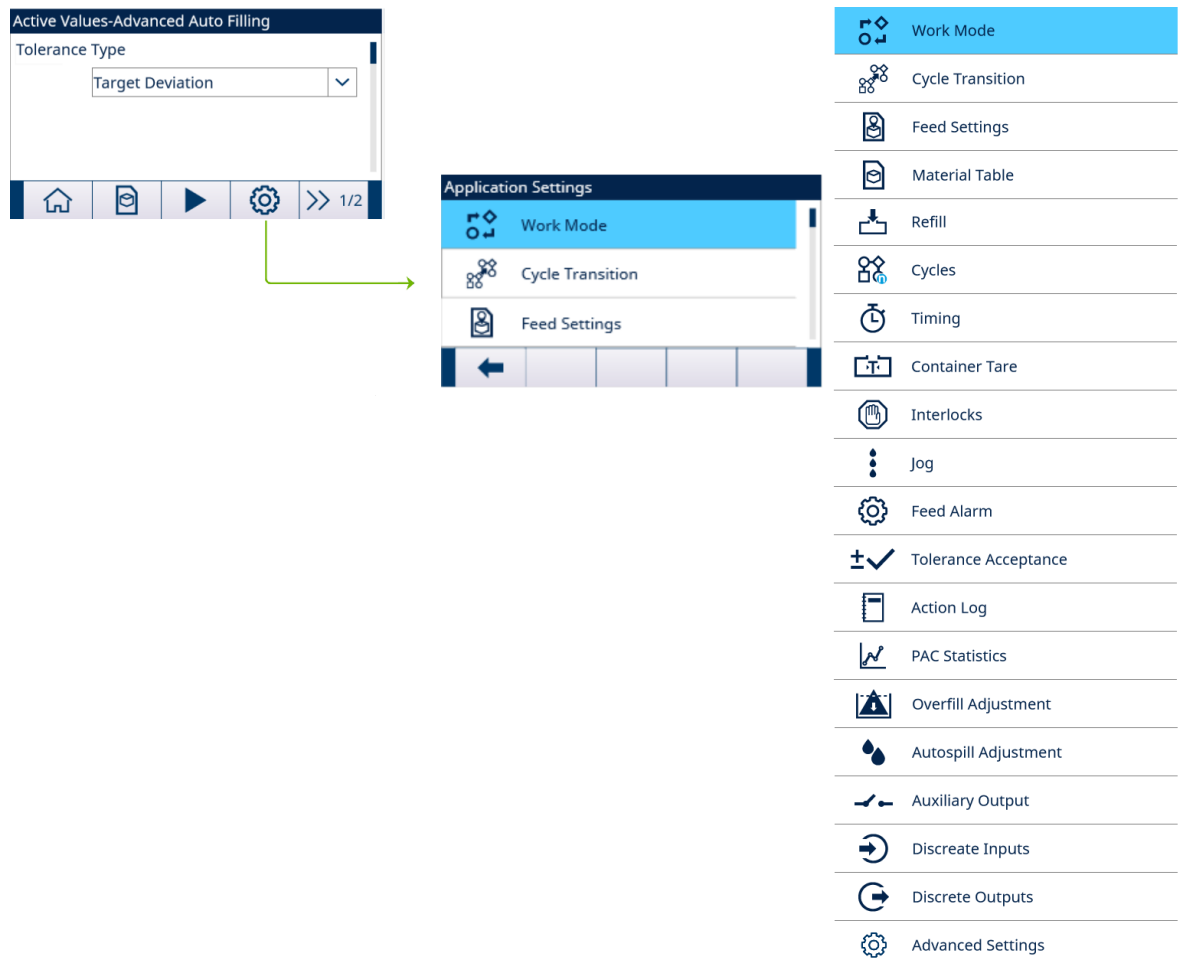


Figure 2: Application Settings

3.2.1 Start Filling with Active Target

- The Active Values – Advanced Auto Filling screen shows. Refer to [Application Entry ▶ Page 5].
- 1 Press the UP and DOWN navigation keys (▲▼) to select the specific field and set the Active Values.
 - Note** Tare configuration screens only show when **Cycle Tare** is **Enabled** or **Container Tare** is **Enabled**.
 - Note** When the **# of Feeds** value is set as 1, the **Feed** field does not show because this parameter won't be applied. See [Feed Settings ▶ Page 15]

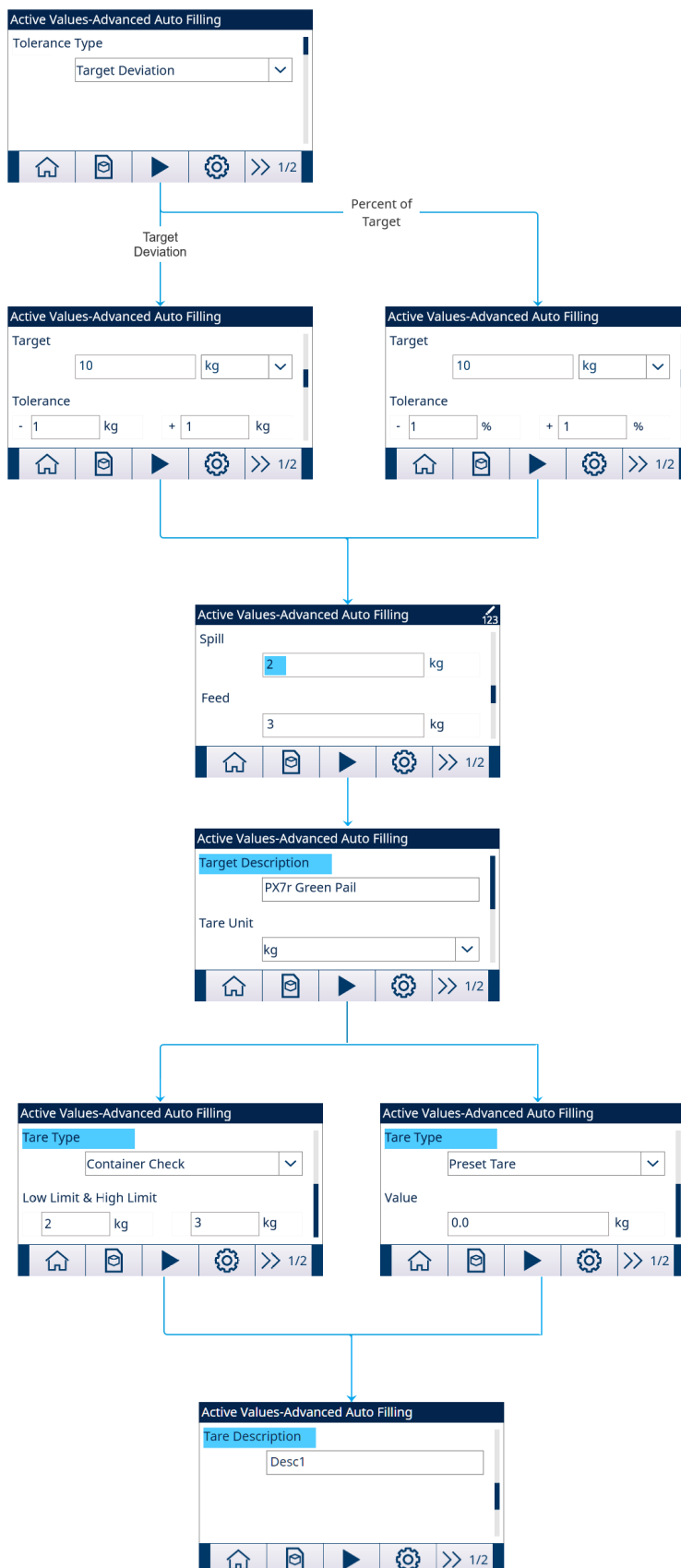




Figure 3: Active Values

- 2 Press the START softkey .
- ➔ Filling is started with Active Target.


3.2.2 Select Active Target Material from the Material Table

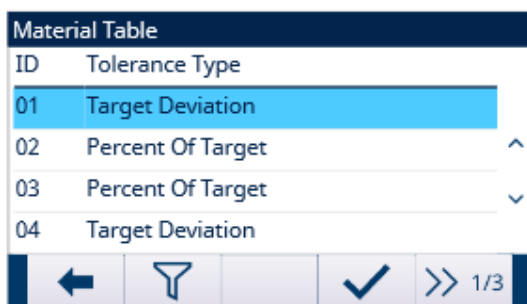
The Material Table can store a maximum of 199 Material records. See [Material Table ▶ Page 15]

The Operator can use the MATERIAL TABLE softkey  in the Application start-up screen to load a material record from the Material Table, while the Administrator or Supervisor can use this softkey to set the Material parameters.

List Selection







When ID of the Material Table record to be loaded is unknown, the List Selection mode is to be used.

- 1 Press the MATERIAL TABLE softkey  in the start-up screen.
 - ➔ The **Material Table** screen shows.




ID	Tolerance Type
01	Target Deviation
02	Percent Of Target
03	Percent Of Target
04	Target Deviation

Figure 4: **Material Table**

- 2 Press the FILTER OFF softkey .
- 3 In the Material Search page, use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all Material Table records.
- 4 Press the OK softkey 
 - ➔ The filtered material records show. Records are ordered by date and time with the most recent record shown last.
- 5 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted. In this screen, user also can press the FILTER ON softkey  to renew the search information, or press the FILTER CLEAR softkey  to clear the search information.
- 6 Press the OK softkey  to load the selected record from the list.
- 7 Press the Exit softkey  to return to the weighing operation screen without loading the record.
 - ➔ A material record is selected.

Quick Search

When ID of the Material Table record to be loaded is known, the Quick Recall mode is to be used.

- 1 In the **Material Table** screen, use the numeric keypad to enter the ID and then press ENTER key to load the record.
 - ➔ If the record is available, the data is loaded.
 - ➔ If the record is not found, a message "ID not found" shows.
- 2 Press the OK softkey 
 - ➔ A Material record is searched.

3.2.2.1 Set Parameters via Shared Data Server Connection or PLC Communication

Material record can be recalled from the memory table using the Shared Data Server commands.

- The Material record ID to be recalled is specified.
- 1 Log into the Shared Data server.
 - 2 Write the numeric ID (a three-digit value from 1 to 199) of the record to be recalled from Material Table to Shared Data field qc0190.

- 3 Write X to qc0190 X (X is the desired record ID).
- 4 Write a 11 to Shared Data field qc0189.
 - ➔ Terminal recalls the record ID written to qc0190 from the Material Table, and load active Target Material with the record of that ID in the Material Table.

3.2.2.2 Recall Material Table Record via ASCII Input Connection

- A port is set as ASCII Input. (Path: Setup>Communication>Connections)

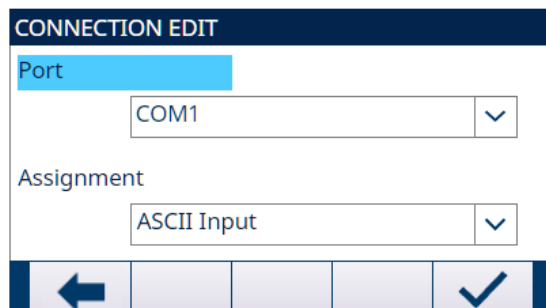



Figure 5: Connection Edit

- Input Assignment is set as Material ID. (Path: Setup>Communication> Templates> Input)
- Send value to the Port assigned with ASCII Input.
 - ➔ Terminal uses incoming value as an ID lookup in the Material Table, and load active target Material with the record of that ID in the Material Table.

3.2.3 Configure the Number of Cycles

If the function Track Cycles is enabled (see [Cycles ▶ Page 21]), the Number of Cycles softkey  becomes available on the start-up screen to program the number of cycles to be tracked.

Number of Cycles allows programming of a certain number of fill cycles before an operator message is shown indicating the number of cycles is complete. New cycle is not allowed if Cycles Remaining equals to 0, unless reset.

- 1 Press the **Number of Cycles** softkey  in the start-up screen.
- 2 Enter the desired value in the field **# of Cycles**.

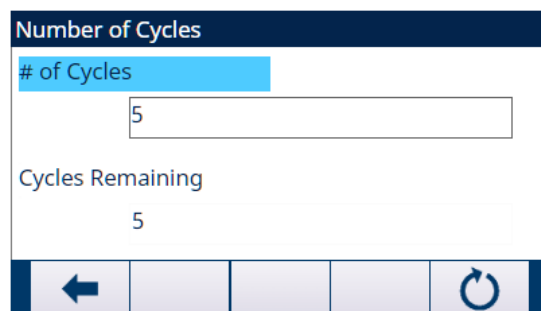


Figure 6: Number of Cycles



- ➔ The initial value of **Cycles Remaining** is the same as **# of Cycles**.
- ➔ The **Number of Cycles** is configured.

3.2.4 Application Settings

3.2.4.1 Set Work Mode

Four different Work Modes are supported in Advanced Auto Filling:

- Fill
- Fill/Dump
- Dose

- Dose/Refill
- 1 In the start-up screen of Advanced Auto Filling, press the SETUP softkey .
 - 2 In the Application Settings page, select  **Work Mode**.
 - ➔ The **Work Mode** screen displays.
 - 3 Select the desired **Work Mode** in the dropdown menu.

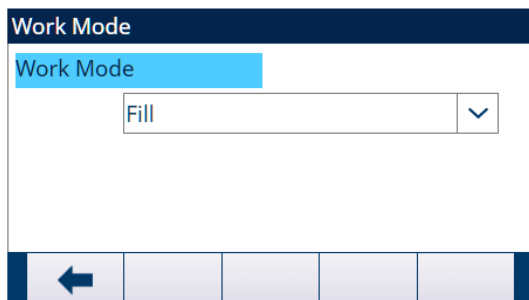


Figure 7: **Work Mode**


- ➔ The **Work Mode** is set.

3.2.4.2 Cycle Transition


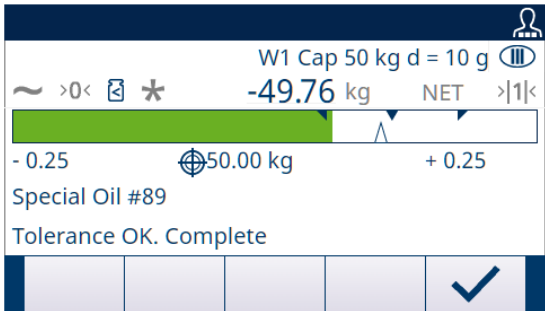

The Advanced Auto Filling can be programmed to continue between the Fill, Dose and Dump cycles automatically or semi-automatically.

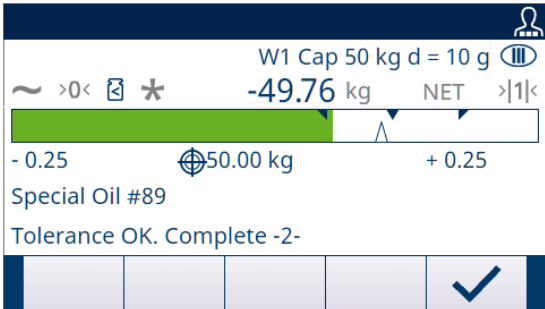
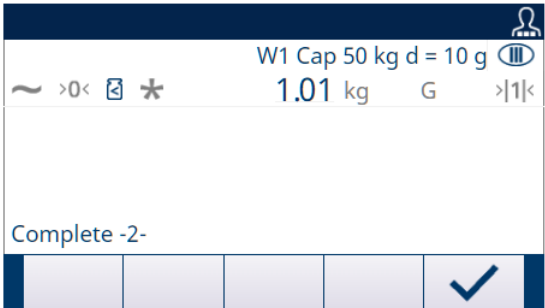
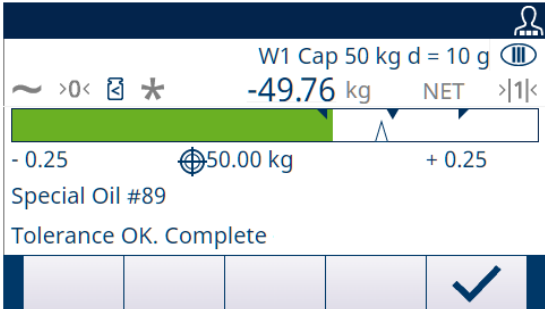
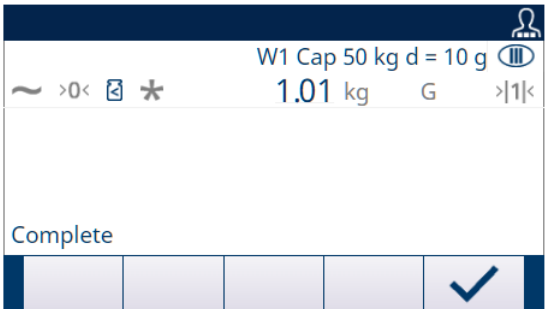
In different Work Modes, different parameters are to be set.

- A Work Mode is selected. See [Set Work Mode ▶ Page 11]

- 1 Select  **Cycle Transition** in the Application Settings screen.
- 2 To set the parameters for a specific **Work Mode**, refer to the table that follows.
 - ➔ These parameters affect how the sequence operates.

Parameters	Options	Effect
Cycle Tare Before Weigh-In	Enabled	<ul style="list-style-type: none"> • This feature provides a trigger to perform an automatic tare during the sequence such as before a filling cycle. • The sequence operates automatically without operator intervention.
	Disabled	<ul style="list-style-type: none"> • Tare can still be taken manually before a fill cycle. <p>Note: Automatically Tare before a dose is mandatory, and not controlled by this parameter.</p>
Clear Tare After Weigh-In	Enabled	Tare is cleared at the end of a weigh-in cycle.
	Disabled	Tare is not cleared at the end of a weigh-in cycle.

Parameters	Options	Effect
Weigh-in Transition	Automatic	<p>This selection determines what will happen at the conclusion of the Fill and Refill cycle. This Setting will not be visible if weigh-in cycle is not involved in Work Mode.</p> <ul style="list-style-type: none"> Fill  <ul style="list-style-type: none"> Refill 
	Semi-automatic	<p>Holds at the Send of Weigh-in cycle and must be acknowledged before continuing.</p> <ul style="list-style-type: none"> Fill  <ul style="list-style-type: none"> Refill 
Clear Tare after Dose	Enabled	Tare taken during the dose cycle is cleared at the end of the Dose cycle and the gross weight is shown.
	Disabled	Tare taken during the dose cycle is not cleared at the end of the Dose cycle

Parameters	Options	Effect
Supply Material Conservation	Enabled	This selection is shown only in Dose/Refill Work Mode. In the case of insufficient material for a full dose, it provides the ability to empty the supply vessel as a partial dose, refill the supply vessel and then complete the Dose cycle.
	Disabled	The function does not work.
Weigh-out Transition	Automatic	<p>This selection determines what will happen at the conclusion of the Dump and Dose cycle. This Setting will not be visible if weigh-out cycle is not involved in Work Mode.</p> <ul style="list-style-type: none"> Dose  <ul style="list-style-type: none"> Dump <p>After Empty Delay timeout</p> 
	Semi-automatic	<ul style="list-style-type: none"> Dose  <ul style="list-style-type: none"> Dump <p>After Empty Delay timeout</p> 

Parameters	Options	Effect
Loop Work Mode	Enabled	Repeat the whole work mode after the work mode cycle is finished.
	Disabled	Not repeat the work mode after the cycles in a Work Mode is finished.

3.2.4.3 Feed Settings

Records in Feed Settings can't be added or deleted.

For the Work Mode of Fill, Fill/Dump, Dose, and Dose/Refill, only one record is available for editing in the Feed Settings screen.

- 1 Select  **Feed Settings** in the Application Settings screen.

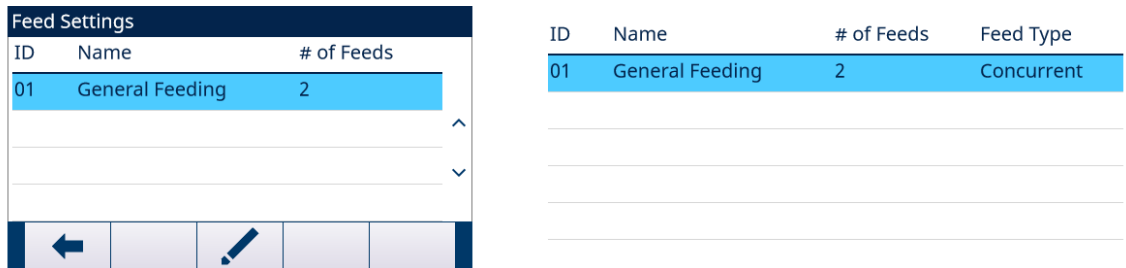


Figure 8: **Feed Settings**

- 2 In the **Feed Settings** page, press the EDIT softkey  to edit the existing Feed record.

ID	Material ID in Material Table
Name	Material name
# of Feeds	1: Only Feed 2: Fast Feed and Feed
Feed Type	This parameter is only applicable in two-speed system. For one-speed control it is meaningless. Only when the # of Feeds value is set as 2, the field Feed Type shows. In a two-speed system (for instance, Fast Feed/ Feed), it determines the relationship between outputs (signal-controlled external equipment such as valves and agitators). <ul style="list-style-type: none"> • Concurrent: During Fast Feed cycle, both Fast Feed and Feed are On. • Independent: During Fast Feed cycle, only Fast Feed is On. For one-speed system, only use Feed output for filling.



3.2.4.4 Material Table

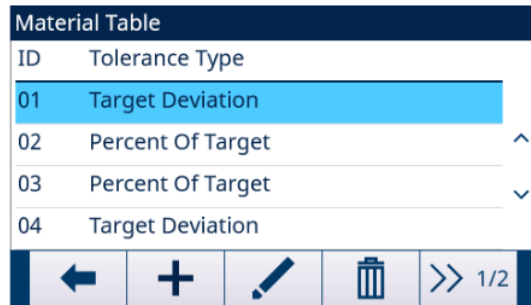
The Material Table is used to quickly select the filling tasks. As a combination of Target Table and Tare Table, user can add, edit, or delete items within the table.

Only the roles of Administrator and Supervisor are authorized to edit the Material Table pages. The role of Operator does not have the access right.

Edit or Add A Material Record

- Access Level: Administrator/Supervisor

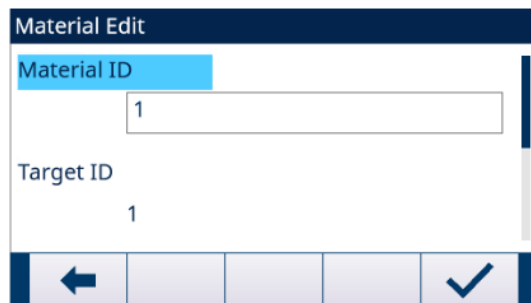
1 Press the EDIT softkey  to open the setup screen for editing a record or press the ADD softkey  to open the setup screen to create a new table record.



ID	Tolerance Type
01	Target Deviation
02	Percent Of Target
03	Percent Of Target
04	Target Deviation

Figure 9: **Material Table**


2 Enter a **Material ID**.

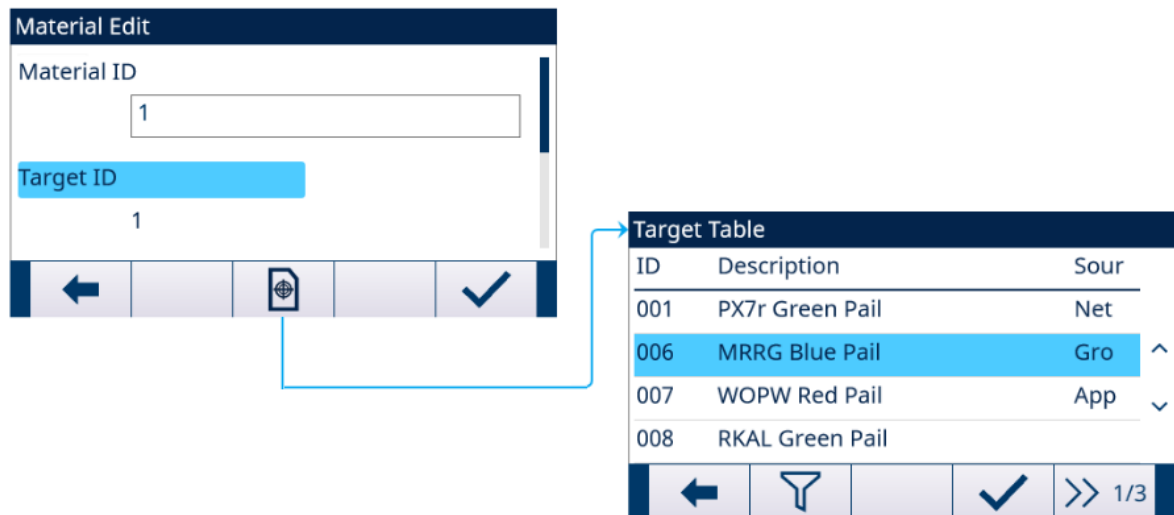


Material ID: 1

Target ID: 1

Figure 10: **Material ID**

3 In the **Material Edit** page, when Target ID is highlighted, press the TARGET TABLE softkey  to open the **Target Table** page and select a Target record or add a Target record. See [Configure the Target Table ▶ Page 17]



Material Edit


Material ID: 1

Target ID: 1

Target Table

ID	Description	Sour
001	PX7r Green Pail	Net
006	MRRG Blue Pail	Gro
007	WOPW Red Pail	App
008	RKAL Green Pail	

Figure 11: **Material Edit - Target Table**

4 In the **Material Edit** page, when **Tare ID** is highlighted, press the TARE TABLE softkey  to open **Tare Table** page and select a Tare record or add a Tare record. The **Tare Table** is used to store all the Tare information. The **Tare Table** here is a shared table, which is concurrently used in different applications.

Tare configuration only shows when **Cycle Tare** [see [Cycle Transition ▶ Page 12]] and **Container Tare** [see [Container Tare ▶ Page 24]] are **Enabled** at the same time. See [Configure the Tare Table ▶ Page 20]

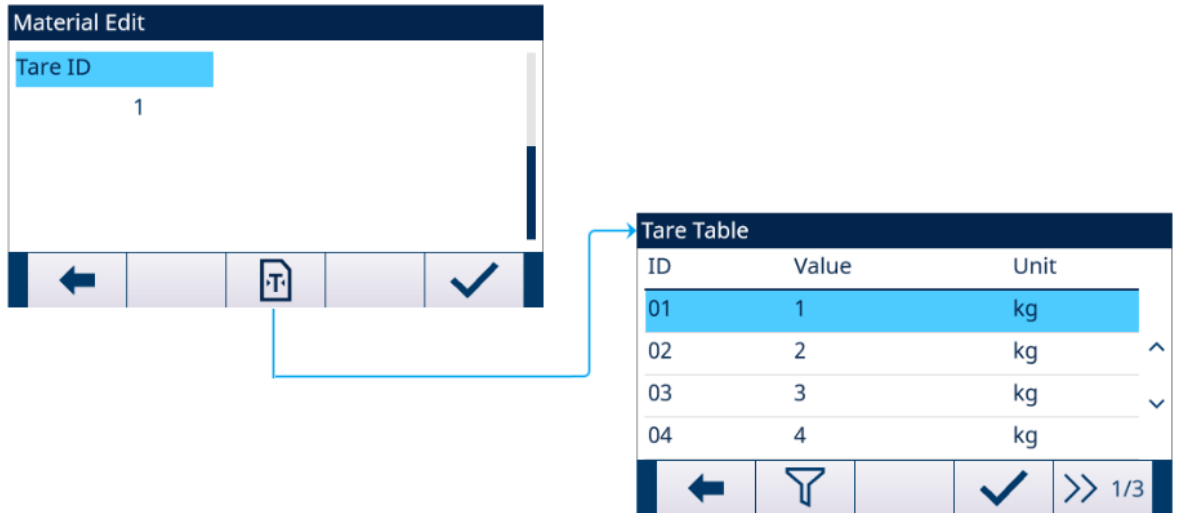


Figure 12: **Material Edit - Tare Table**

➔ The **Material Table** parameters are set.

ID	Tolerance Type	Target	Unit	+Tolerance	-Tolerance	Spill	Fine	Totalization Type	Target Description	Tare Value	Unit	Low Limit	High Limit	Tare Description
01	Target Deviation	10	kg	0.5	0.5	1	2	Net Weight	PX7r Green Pail	1	kg	0	0	Desc1
02	Percent Of Target	11	kg	0.5	0.5	1	2	Gross Weight	MRRG Blue Pail	2	kg	0	0	Desc2
03	Percent Of Target	10	kg	0.5	0.5	1	2	Gross Weight	WOPW Red Pail	0	kg	2	5	Desc3
04	Target Deviation	10	kg	0.5	0.5	1	2	Net Weight	PX7r Green Pail	3	kg	0	0	Desc3

Figure 13: **Material Table** Parameters

- 5 Press the OK softkey to accept the modifications or additions to the **Material Table**.
 - 6 Press the EXIT softkey to return to the previous page without saving modifications or additions.
 - 7 Press the DELETE softkey to delete a material record in the list.
 - 8 Press the TRANSFER softkey to generate **Material Table** reports to any connection with a Reports assignment.
 - 9 Press the RESET softkey to clear all configuration change records.
- ➔ The **Material Table** is configured.

3.2.4.4.1 Configure the Target Table

The Target Table is configured under the Material Table screen.

Load A Target Record from the Target Table

List Selection

- 1 In the **Material Edit** page , when Target ID is highlighted, press the TARGET TABLE softkey .

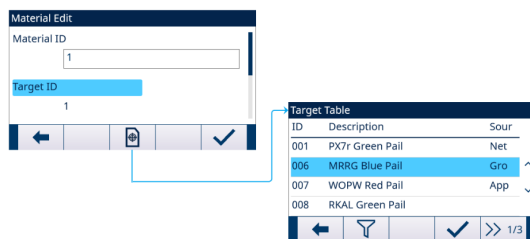








Figure 14: **Material Edit - Target Table**

➔ The **Target Table** screen shows.




Figure 15: **Target Table**



- 2 Press the FILTER OFF softkey .
- 3 In the Filter Settings page, use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all Material Table records.
- 4 Press the OK softkey .
 - ➔ The filtered target records show. Records are ordered by date and time with the most recent record shown last.
- 5 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted. In this screen, user also can press the FILTER ON softkey  to renew the search information, or press the FILTER CLEAR softkey  to clear the search information.
- 6 Press the OK softkey  to load the selected record from the list.
- 7 Press the EXIT softkey  to return to the weighing operation screen without loading the record.
 - ➔ A target record is selected.

Quick Search

When ID of the Target Table record to be loaded is known, the Quick Recall mode is to be used.

- 1 In the **Target Table** screen, use the numeric keypad to enter the ID and then press ENTER key to load the record.
 - ➔ If the record is available, the data is loaded.
 - ➔ If the record is not found, a message "ID not found" shows.
- 2 Press the OK softkey .
 - ➔ A Material record is searched.








Create or Add A Target Table Record


- Access Level: Administrator/Supervisor
- 1 Press the EDIT softkey  to open the setup screen for editing a record or press the ADD softkey  to open the setup screen to create a new table record.

Parameters Setting for Target Record

Parameter	Options	Definition or Effect
ID	-	<ul style="list-style-type: none"> • ID is the record's serial number identifier. • It is unique to replace an existing record with a particular ID number. It must be deleted first, and then a new record can be created with that number entered in the ID field. • IND500x can store a maximum of 199 ID records.
Source	Net Weight	Net Weight is selected as data source for weight comparison.
	Gross Weight	Gross Weight is selected as data source for weight comparison.

Parameter	Options	Definition or Effect
Tolerance Type	Target Deviation	<ul style="list-style-type: none"> Target Deviation is measured as an absolute weight value, in the same units as the target value itself. For example, if a target of 100 kg is selected, positive and negative deviations of 5 and 2 kg, respectively, might be defined in the target record, and (unless they are changed) these values will remain fixed regardless of any change to the target value.
	Percent of Target	<ul style="list-style-type: none"> Percent of Target is measured as a relative value, expressed as a percentage of the target value. In this case, if the target is 100 kg, and the positive and negative tolerances are 5% and 2%, the tolerance band will remain proportionate to the target value even if the target value is changed. Thus, if the record is modified with a new target of 200 kg, the positive and negative tolerances remain 5% and 2%, and represent 10 kg and 4 kg respectively.
Target	-	The desired measured value for a weighing. Unit: g/kg/lb/t/ton/oz
Tolerance	-	Depending on the Tolerance Type selected, the two tolerance fields, - and +, accept an entry of an absolute weight value, or of a percentage to be applied to the target value.
Spill	-	<ul style="list-style-type: none"> Spill is a measure of the amount of material that will be delivered after the feed is cut off. It is empirically determined, and entered here as an absolute weight value. This material must be accounted for in configuring a target, or the result of a filling operation will be consistently above target.
Feed	-	<ul style="list-style-type: none"> In two-speed filling operations, the Feed value determines when the Fast Feed output is turned off in order to bring the operation to a 'soft stop' and avoid over-running the target. If the # of Feeds is set as 1, this value will be invalid and will be hidden on the ACTIVE VALUES page. This value is based on empirical observation of the behavior of the filling system, but it should be small enough to enable the rapid completion of the fill, but not so small that the fast feed stops too late and over-runs the target.
Description	-	This field allows each target record to have a descriptive identifier. This can be a useful aid when selecting from a list that includes multiple targets, and may note the material involved or the type of vessel into which the feed will be made.
Totalization Type	Net Weight	The Net Weight converted to the unit in the target setting is added to Total.
	Gross Weight	The Gross Weight converted to the unit in the target setting is added to Total.
	Disabled	Totalization for all transactions involving each target in the table will not be tracked.

- Press the UP and DOWN navigation keys ( ) to move the focus to the field name to be edited or inserted.
- Press the ENTER key to select a field value to edit or insert.
- Use the numeric keypad to edit or enter the desired value.
- Press the OK softkey  to accept the modifications or additions to the Target Table.
- Press the EXIT softkey  to return to the previous page without saving modifications or additions.
- Press the DELETE softkey  to delete a target record in the list.
- Press the TRANSFER softkey  to generate Target Table reports to any connection with a Reports assignment.
- Press the RESET softkey  to clear all configuration change records.

10 Press the EXIT softkey  to return to the Target Table page.


➔ The **Target Table** is configured.

3.2.4.4.2 Configure the Tare Table

The Tare Table is configured under the Material Table screen.

Load A Target Record from the Tare Table

List Selection

1 In the **Material Edit** page, when Tare ID is highlighted, press the TARE TABLE softkey .

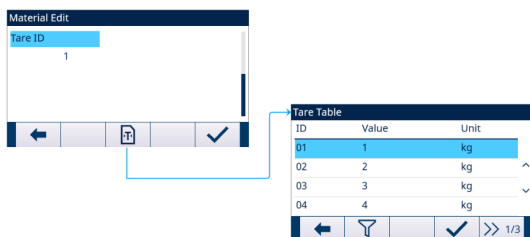


Figure 16: **Material Edit - Tare Table**

➔ The **Tare Table** screen shows.

ID	Value	Unit
01	1	kg
02	2	kg
03	3	kg
04	4	kg

Figure 17: **Tare Table**



2 Press the FILTER OFF softkey .

3 In the Filter Settings page, use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all **Tare Table** records.

4 Press the OK softkey .

➔ The filtered tare records show. Records are ordered by date and time with the most recent record shown last.

5 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted.

In this screen, user also can press the FILTER ON softkey  to renew the search information, or press the FILTER CLEAR softkey  to clear the search information.

6 Press the OK softkey  to load the selected record from the list.

7 Press the EXIT softkey  to return to the weighing operation screen without loading the record.

➔ A tare record is selected.

Quick Search

When ID of the Tare Table record to be loaded is known, the Quick Recall mode is to be used.

1 In the **Tare Table** screen, use the numeric keypad to enter the ID and then press ENTER key to load the record.

➔ If the record is available, the data is loaded.



➔ If the record is not found, a message "**ID Not Found**" shows.

2 Press the OK softkey .

➔ A tare record is searched.









Create or Add A Tare Table Record

■ Access Level: Administrator/Supervisor

1 Press the EDIT softkey  to open the setup screen for editing a record or press the ADD softkey  to open the setup screen to create a new table record.


Parameters Setting for Tare Record

Parameter	Options	Definition or Effect
ID	-	Identification number for the active rec
Unit	<ul style="list-style-type: none"> • g • kg • lb • t • ton • oz 	Units of measure for the tare (tare record units can be any available primary unit)
Tare Type	Preset Tare	-
	Container Check	Identifies a container type by using upper and lower control limits in the Tare Table and an algorithm. This ensures "handling" of correct container type in a production process.
Value	-	Preset tare value
Low Limit	-	Used for Container Tare Checking.
High Limit	-	Used for Container Tare Checking.

- 2 Press the UP and DOWN navigation keys ( ) to move the focus to the field name to be edited or inserted.
 - 3 Press the ENTER key to select a field value to edit or insert.
 - 4 Use the numeric keypad to edit or enter the desired value.
 - 5 Press the OK softkey  to accept the modifications or additions to the **Tare Table**.
 - 6 Press the EXIT softkey  to return to the previous page without saving modifications or additions.
 - 7 Press the DELETE softkey  to delete a tare record in the list.
 - 8 Press the TRANSFER softkey  to generate **Tare Table** reports to any connection with a Reports assignment.
 - 9 Press the RESET softkey  to clear all configuration change records.
 - 10 Press the EXIT softkey  to return to the **Tare Table** page.
- ➔ The **Tare Table** is configured.

3.2.4.5 Refill

Refill configuration is only available when Work Mode is set as Dose / Refill. See [Set Work Mode ▶ Page 11]
The way the IND500x refills the supply vessel can be specified.


- 1 Select  **Refill** in the Application Settings screen.
- 2 Select the **Refill Mode** as **Automatic** or **Manual**.
 - ➔ In **Automatic** mode, the IND500x performs the refilling under the direction of the operator.
 - ➔ In **Manual** mode, the IND500x does not control the refilling.
- 3 Set value and unit for **Refill Low Threshold**.
 - ➔ **Refill Low Threshold** is used to guarantee the minimum material pressure of the supply vessel. When **Gross Weight** is \leq **Refill Low Threshold**, **Refill** is launched before **Dose**.
- 4 Set value for **Refill High Threshold**.

3.2.4.6 Cycles

This feature is used to track the number of cycles completed and then trigger an operator message when the programmed number of cycles have been met. At this point, additional Filling cycles are prohibited until the # of Cycles has been reset. See [Configure the Number of Cycles ▶ Page 11]

The Cycles setup page provides a selection to enable or disable tracking based on the number of cycles run. One complete "cycle" is determined based on the Work Mode selected.

Work Mode	Description	Complete "Cycle" Criteria
Fill	Fill container on scale to target. Filled container is removed by other equipment.	Each successfully completed Fill cycle triggers the cycle counter.
Fill/Dump	Fill vessel to target then dump all material until empty.	Each successfully completed Dump sequence triggers the cycle counter.
Dose	Supply vessel is filled by other equipment. Weigh-out to Dose target multiple times.	Each successfully completed dose cycle triggers the cycle counter.
Dose/Refill	Weigh-out to target is fulfilled in multiple times. If supply vessel material is under Low Limit after weight-out cycle, refill supply vessel to upper Limit.	Each successfully completed dose cycle triggers the cycle counter.

- 1 Select  **Cycles** in the Application Settings screen.
- 2 Select to Enable or Disable the **Track Cycles** function.

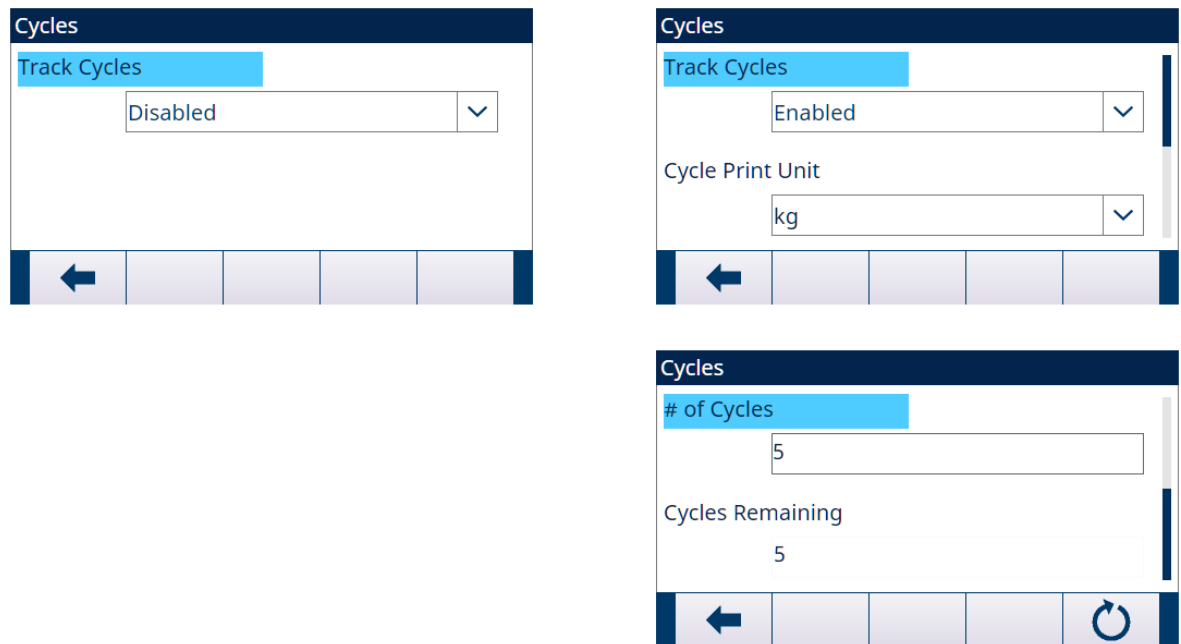




Figure 18: **Cycles**

- 3 If the **Track Cycles** function is **Enabled** , set the **Unit** used in Cycle-triggered Demand Print and the **# of Cycles**.
 - ➔ The **# of Cycles** set in this page is the same as the one set through the **Number of Cycles** softkey  in the Application start-up screen.
 - ➔ The RESET softkey  in this page is used to clear the **# of Cycles** value set.

3.2.4.7 Timing

Timing parameters are related to the sequence steps in Work Mode. Application display shows Timing is counting down when Timing works (e.g., Start Delay).

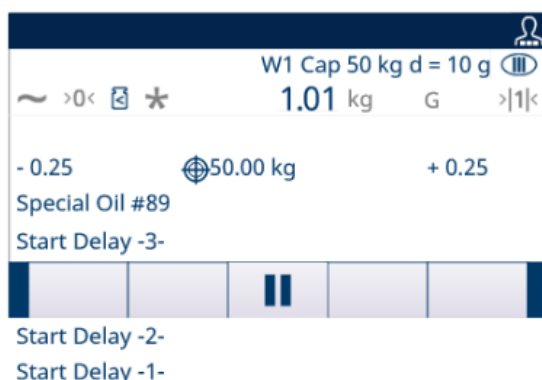





Figure 19: Timing

- 1 Select  **Timing** in the Application Settings screen.
- 2 To set the **Timing** parameters, refer to the below table.

Parameter	Description
Start Delay	<ul style="list-style-type: none"> • Only related to Fill and Dose. • Delay the start of the cycle after the Start softkey  is pressed. • Values from 0 to 999 seconds can be entered. • If a Start Delay is programmed, the Start Delay Output (if programmed) turns "On" during the Start Delay time.
Inhibited Time	<ul style="list-style-type: none"> • When Filling or Dosing switches from Fast Feed cycle to Feed cycle, a mechanical impact or falling material impact works on Scale, and the weight during this interval is unbelievable. Delay Inhibited Time defines time before target comparison. • Values from 0 to 999 seconds can be entered.
After Weigh Delay	<ul style="list-style-type: none"> • Used for Tolerance Check and only related to Fill, Refill, and Dose. • Delay the tolerance test at the end of a weigh cycle. This could be used to allow pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels. During the delay, terminal counts down the remaining delay time. • Values from 0 to 999 seconds can be entered. • If an After Weigh Delay is enabled, the After Weigh Delay Output (if programmed) turns "On" during the delay time.
After Empty Delay	<ul style="list-style-type: none"> • Only related to Dump. • Starts when the gross weight on the scale falls below the Heel Weight value. The Feed Output remains "On" until the After Empty Delay times out. The combination of the After Empty Delay and Heel Weight provides control so that the Dose or Dump feeders don't run continuously when the weigh vessel does not completely empty during the Dump cycle. The same function is used when insufficient material is detected at the start of a Dose cycle and the Dump softkey  is pressed. • Values from 0 to 999 seconds can be entered.
Weigh-in Complete	<ul style="list-style-type: none"> • Used only to designate an amount of time that the Complete: Fill / Complete: Refill Output is turned On after the completion of the Weighing (Fill, Refill). • When the weigh-in transition is set to Semi-automatic, the Complete: Fill Output remain On while the sequence is holding, until the operator acknowledges by pressing the OK softkey. • Values from 0 to 99 seconds can be entered.

Parameter	Description
Weigh-out Complete	<ul style="list-style-type: none"> Used only to designate an amount of time that the Complete: Dose / Complete: Dump Output is turned On after the completion of the Weigh-out (Dump or Dose). When the weigh-out transition is set to Semi-automatic, the Complete: Weigh-out Output remains on while the sequence is holding, until the operator acknowledges by pressing the OK softkey. Values from 0 to 99 seconds can be entered.

3.2.4.8 Container Tare

Container Tare configuration is only available when Fill is involved in the Work Mode.

- 1 Select  **Container Tare** in the Application Settings screen.
- 2 Select to Enable or Disable **Container Tare** function.


Application Case

Production lines usually use several different container types (e.g. with different sizes). The container types are linked to a specific production process. Using the wrong container (e.g. a too small size) can lead to an overflow. Container Tare function ensures that the correct container is placed in the production line.

- **Container Tare is Enabled.**
- A Tare ID, with **Low Limit** and **High Limit** values, is enabled in a **Material Table** record.
- In a weigh-in cycle (Fill), put an empty container onto the scale.
 - ➔ Before filling starts, weight of the empty container is evaluated with **Container Tare** checking to confirm that the correct container is put on the scale.

3.2.4.9 Interlocks

The IND500x provides OK to Weigh-in and OK to Weigh-out interlock signal control. These signals can be used to prevent the start of a weigh-in or weigh-out cycle if required containers or control measures are not in place.

- 1 Select  **Interlocks** in the Application Settings screen.
- 2 In the **Interlocks** page, select to Enable (by One-Time Detection or Continuous Monitoring) or Disable the **OK to Weigh-in** and **OK to Weigh-out** function.

One-Time Detection: Filling starts upon one-time signal input.

Continuous Monitoring: Filling operates upon continuous signal input. When the signal stops, the filling task is paused.

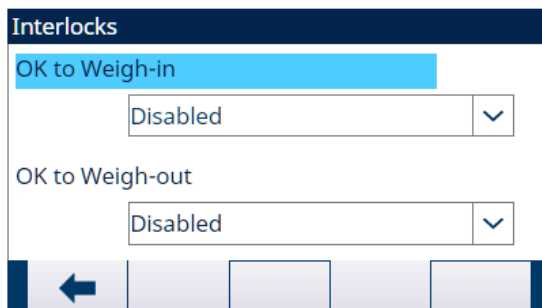


Figure 20: Interlocks

- 3 If **OK to Weigh-in** or **OK to Weigh-out** is **Enabled**, make sure that the related Weigh-in discrete input or Weigh-out discrete input is "On".

- ➔ If the **Interlocks** function is **Enabled** and the required discrete input signal is not present, an error message shows and the sequence is paused.

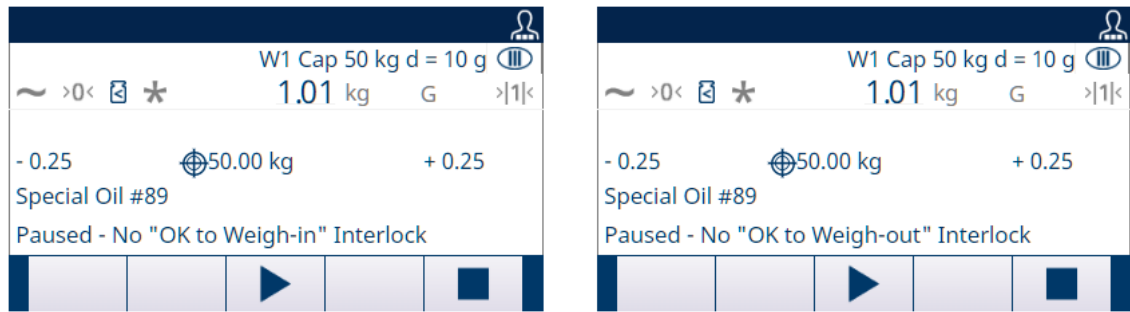


Figure 21: No **Interlocks** Discrete Input

- ➔ Operator must press the START / RESUME softkey to retest the **Interlocks** again, or press the STOP softkey to stop the **Work Mode**.
- ➔ The sequence will not continue until the problem is fixed and the interlock input is received by the terminal.

3.2.4.10 Jog

If the programmed spill value is too large and the Feed output turns off too soon, the final weight will not be within tolerance. In this case, the Jog function can be used to manage under-fill and slowly feed additional material to reach the tolerance value.

- 1 Select **Jog** in the Application Settings screen.

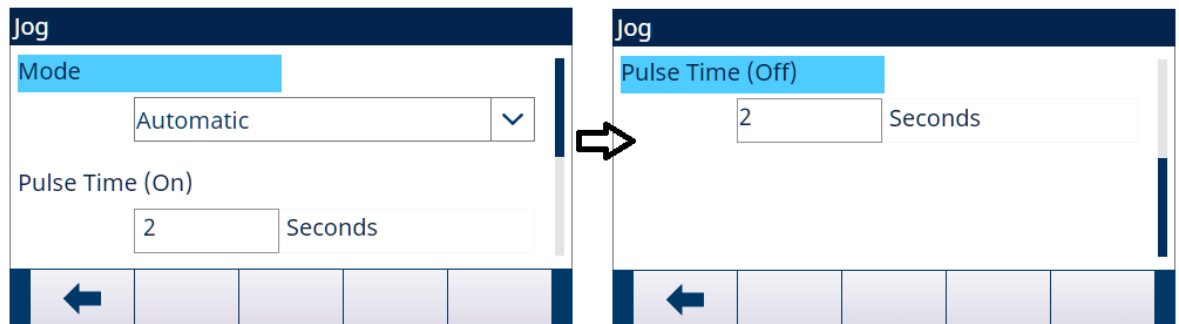


Figure 22: **Jog**

- 2 To set the **Jog** parameters, refer to the below table.

Parameter	Options	Effect
Mode	Disabled	The Jog function does not work.
	Automatic	When a weight is below the low tolerance range, the Jog function is initiated automatically and repeats until the weight is within tolerance.
	Manual	<ul style="list-style-type: none"> • This procedure is performed manually by pressing the Jog softkey or by programming a discrete input as a jog function. • Each time the manual Jog function is initiated, it runs one pulse on/off cycle. • The Jog softkey is to be pressed multiple times to reach the lower tolerance level.
Pulse Time (On)	-	This parameter controls how long the jog pulse stays "On" in seconds.
Pulse Time (Off)	-	<ul style="list-style-type: none"> • This parameter controls how long of a pause is between jog pulses in seconds. • In manual Jog mode, the Jog softkey will not work again until this time expires.

3.2.4.11 Feed Alarm

Feed Alarm function is used to ensure that a change in weight occurs over a period of time. Feed Alarm could indicate process issues such as a hole in the receiving vessel, clogged delivery valve, etc.

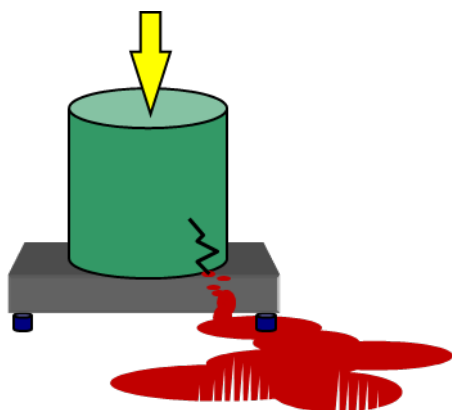



Figure 23: Feed Alarm

- 1 Select  **Feed Alarm** in the Application Settings screen.
- 2 To set the **Feed Alarm** parameters, refer to the below table.

Parameter	Description
Initial Feed Timeout	<ul style="list-style-type: none"> • Only applicable to Fill and Dose cycle. • If Fast Feed and Feed are both involved in the filling, terminal checks weight change during both Fast Feed and Feed. • If the weight change (Initial Feed Weight Changed) fails to reach the set Target value in specified time interval (Initial Feed Timeout), the Feed Alarm is triggered.
Initial Feed Weight Changed	<ul style="list-style-type: none"> • The minimum Initial Feed Weight Changed • For Fill cycle, if weight < Round (initial weight + Initial Feed Weight Changed), then Alarm. • For Dose cycle, if weight > Round (initial weight - Initial Feed Weight Changed), then Alarm • If the weight change (Initial Feed Weight Changed) fails to reach the set Target value in specified time interval (Initial Feed Timeout), the Feed Alarm is triggered.
Unit	g/kg/lb/t/ton/oz
Dump Timeout	Applicable to Dump cycle.
Dump Weight Changed	<ul style="list-style-type: none"> • The Minimum Dump Weight Changed • In a Dump Cycle, assuming Initial Feed Timeout as 2.0 s, Initial Feed Weight Changed as 2 kg, and initial weight when dumping starts as 6 kg. then if the weight is still > 4 kg in 2 seconds, then Alarm.
Refill Timeout	Applicable to Refill cycle.
Refill Weight Changed	<ul style="list-style-type: none"> • The minimum Refill Weight Changed • In a Refill Cycle, assuming Initial Feed Timeout as 2.0 s, Initial Feed Weight Changed as 2 kg, and initial weight when feeding starts as 4 kg. then if the weight is < 6 kg in 2 seconds, then Alarm.
Process Timeout	<ul style="list-style-type: none"> • Fill: Monitors the time for Fill. • Dose: Monitors the time for Dose. • Dose/Refill: Monitors the time for Dose. • Fill/Dump: Monitors the time for Fill/Dump.

3.2.4.12 Tolerance Acceptance

The IND500x provides various controls based on Tolerance Acceptance: The Advanced Auto Filling can be programmed to abort the current cycle if an out of tolerance condition is determined or it can allow the operator to determine if an out of tolerance weight condition is to be accepted or not.

Setup

The parameters to be set for Tolerance Acceptance are defined as below:

Parameter	Options	Effect
Manual Accept	Disabled	<ul style="list-style-type: none"> The cycle automatically aborts when an Out of Tolerance condition is determined. The number of cycles is not consumed.
	Enabled	<ul style="list-style-type: none"> An Out of Tolerance message shows and the operator must either accept the Out of Tolerance weight or reject it. If accepted, the cycle continues. If rejected, the cycle aborts.
	Auto Continue	Even if Out of Tolerance condition is determined, the next cycle continues directly.
Zero Tolerance Value	-	<ul style="list-style-type: none"> This sets the weight value that the weight must be within (from gross zero) to start a Fill cycle. Zero Tolerance Value should be smaller than the value of (Target - Spill). This field only shows when Cycle Tare Before Weigh-In is Disabled, and Work Mode includes Fill.
Heel Weight	-	<p>Indicate the amount of material that might remain in the weigh vessel when it is considered empty. For example, material left below the level of the outlet in a tank or stuck to the sides of a hopper.</p> <ul style="list-style-type: none"> When Dump cycle is involved in Work Mode (Fill/Dump), and the gross weight falls below this value, the After Empty Delay timer starts. After the timer the Fast Feed and Feed Outputs are turned off. Not applicable to the Work Mode Fill. In the Work Mode Dose, this value is added to the Dose target value to determine if there is sufficient material for another Dose cycle. In the Work Mode Dose/Refill, when Gross Weight is \geq (Low Threshold + Heel Weight), another Dose can be done.

Other Features Related to Tolerance Acceptance

- Jog
- Overfill Adjustment
- Tolerance Check

The table that follows explains how these features work.

Manual Accept	Out of Tolerance	Operation
Enabled	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press the Tolerance Acceptance softkey $\pm\checkmark$. Press \checkmark to continue next cycle or press \times to abort the cycle. Tolerance OK after Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark (added into Cycle Count In Tolerance) to continue next cycle or press \times (added into Cycle Count Out of tolerance - rejected) to abort the cycle.
	Under Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Tolerance Acceptance message shows directly. Press \checkmark to continue next cycle or press \times to abort the cycle. Manual Jog <ul style="list-style-type: none"> Press the Tolerance Acceptance softkey $\pm\checkmark$. Press \checkmark to continue next cycle or press \times to abort the cycle. Tolerance OK after Manual Jog <ul style="list-style-type: none"> Press \checkmark (added into Cycle Count In Tolerance) to continue next cycle or press \times (added into Cycle Count Out of tolerance - rejected) to abort the cycle. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Press \checkmark to continue next cycle or press \times to abort the cycle.
Disabled	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark to confirm the adjustment. Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Tolerance Acceptance message shows directly. Press \checkmark to confirm that cycle will be aborted.
	Under Tolerance	<ul style="list-style-type: none"> Manual Jog <ul style="list-style-type: none"> Press \checkmark to confirm the Manual Jog. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Press \checkmark to confirm that cycle will be aborted.
Auto Continue	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark to confirm the adjustment. Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Next cycle starts directly.
	Under Tolerance	<ul style="list-style-type: none"> Manual Jog <ul style="list-style-type: none"> Press \checkmark to confirm the Manual Jog. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Next cycle starts directly.

3.2.4.13 Action Log

When Fill Pac is installed, the IND500x provides the ability to log certain actions that occur during the weigh-in and weigh-out cycles into an Action Log.

The Alibi memory and Action Log can exist simultaneously. In certain applications where the Alibi memory is required, the Action Log file cannot be used. It is also possible to program an Action Log Output connection that sends each record out a programmed port as the action is logged. Action Log Output connection can be assigned in a Connection in Setup>Communication>Connection.

Action Log is Enabled in the  Action Log screen in Application Settings.

File Structure

The file is an encoded binary file and each record in the Action Log file is 9 bytes long. Approximately 150,000 records can be stored in the log file.

Each record includes:

- Date and time stamp fields
- An action code.
- Check digit



This log file can then be viewed at the terminal, and this log file as well as its .csv format file **act_log1.csv** can be exported via FTP or shared data server using the 1K Xmodem protocol.

Logged Actions

Each action is recorded by its action code. If enabled, the following actions are logged when they occur.

Action Code	Logged Action	Action Code	Logged Action
1	Start Fill Cycle	10	Out of Tolerance
3	Start Dose Cycle	11	Accept Out of Tolerance
4	Start Dump Cycle	12	Reject Out of Tolerance
5	Start Refill Cycle	13	Auto Continue Out of Tolerance
6	Cycle Paused	14	Start Manual Jog
7	Cycle Resumed	15	Overfill Adjustment
8	Cycle Aborted	23	Partial dose (Supply Material Conservation)
9	Tolerance OK	-	-

Search Action Log

- 1 In the **Action Log** page, press the View Table soffkey .
 - ➔ The **Action Log** Search page shows.
- 2 Use the Search Field 1 selection box and the associated data fields to enter specific search information to limit the search.
- 3 Press the Search soffkey .
 - ➔ **Action Log** Search View page shows.

Print Action Log

It is not possible to print the whole Action Log file at once, but each record can be printed as it occurs if a connection is configured (in setup at Communication > Connections) with an assignment of Print Proxy Output. Each record provides the date, the time and the Action log text, and is 40 characters long.

A sample of this print is shown below:

- 04-Aug-2020 11:06:25 Start Fill Cycle
- 04-Aug-2020 11:07:25 Cycle Paused
- 04-Aug-2020 11:08:25 Cycle Aborted

3.2.4.14 Pac Statistics

Pac Statistics determines whether the Advanced Auto Filling will track statistics during the Work Mode cycle.

- Pac Statistics can be viewed, printed, exported by FTP or by serial port or Ethernet using the 1K Xmodem protocol and the Parameter server.

- The Pac Statistics data exist in a file and is updated each time a new cycle is completed or aborted and new information is available. The file is named "**Pacstat1.txt**" and is located in the RAM:/ folder of the IND500x.
- Pac Statistics is Enabled in [View/Transfer/Reset Pac Statistics](#) screen in Application Settings.

The statistical information available includes:

Statistic	Description
Total weight	Total Weight of latest 50 Records.
Maximum weight	The largest weight of all weighments
Minimum weight	The smallest weight of all weighments
Medium weight	The final weight most often reached
Average weight	The mathematical average of all weighments
Standard deviation	The standard deviation of all weighment values
Minimum cycle time	The shortest weigh cycle time
Maximum cycle time	The longest weigh cycle time
Average cycle time	The mathematical average of all cycle times
Total cycle time	Statistical total cycle time
Cycle Count-in tolerance	The total number of weighments that were in tolerance
Cycle Count Out of Tolerance - accepted	The number of out of tolerance weighments that were accepted
Cycle Count Out of Tolerance - rejected	The number of out of tolerance weighments that were rejected
Cycle Count aborted	The number of cycles that were aborted
Out of Tolerance – Auto Continued	The total number of weighments that were automatically continued This occurs when <ul style="list-style-type: none"> • Manual Accept is Auto Continue • Weighment Out of Tolerance • Jog Mode Disabled or Manual Overfill Adjustment Disabled

View/Transfer/Reset Pac Statistics

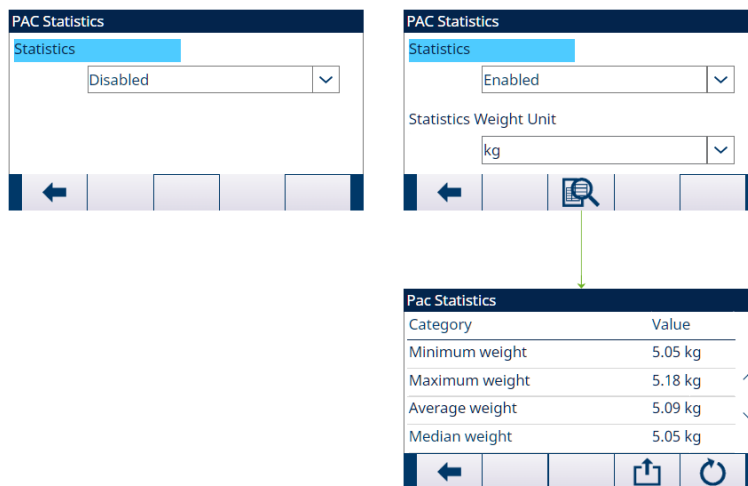


Figure 24: Pac Statistics

- 1 Press the VIEW TABLE softkey . The **Pac Statistics** list is shown.
- 2 Press the TRANSFER softkey to transfer the **Pac Statistics** to any connection with a Reports assignment.
- 3 Press the RESET softkey to clear the **Pac Statistics**.

3.2.4.15 Overfill Adjustment

In certain applications, a Manual adjustment of an overfill condition is desirable while the final filled container (final weight) is still on the scale.

Overfill Adjustment is applicable to Fill, but not applicable to Dose, Dump, and Refill.

Overfill Adjustment is Disabled or set as Manual in the  Overfill Adjustment screen in Application Settings.

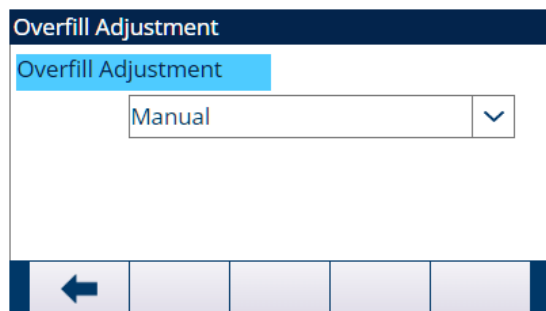


Figure 25: Overfill Adjustment

- If Overfill Adjustment is set as Manual and the final weight is over the upper tolerance limit, the operator is prompted to make a manual adjustment to the material and an OK softkey shows. After the manual adjustment, the operator must acknowledge the completion of the adjustment by pressing the OK softkey, the tolerance is then tested again.
- If Overfill Adjustment is Disabled, an **Out of Tolerance** condition occurs when the final weight is beyond the upper tolerance limit.

3.2.4.16 Autospill Adjustment

If the final weight of a weigh-in cycle or weigh-out cycle repeatedly fails to reach the exact target value, the Autospill Adjustment feature can be used to calculate a new spill value continuously to improve the accuracy of the process.

The number of cycles to average and a percentage of error to apply are programmable in the setup mode. After re-calculation, the new spill value can be kept in the active target record. Alternatively, a programmable option permits the value to be stored in the permanent Target Table record.

Averaging the error over several cycles and taking a smaller percentage of adjustment will provide a more accurate result over a period of time. For quicker results, fewer cycles can be averaged and a higher percentage of the error can be applied.

Setup

Autospill Adjustment is Enabled in the Autospill Adjustment screen in Application Settings.

The table that follows explains the items to be defined for Autospill Adjustment feature.

Configuration Item	Options	Description
Autospill Adjustment	Enabled	Selects to enable or disable the Autospill Adjustment.
	Disabled	
Cycles Averaged	-	<ul style="list-style-type: none"> • A value between "1" and "9" can be entered as the number of successful cycles to be averaged for a spill adjustment. • This parameter determines how many cycles should be averaged to determine the adjustment to the spill value. After an adjustment, this number of cycles must be run again before another adjustment is made.
Adjustment Factor	-	<ul style="list-style-type: none"> • A value between "1" and "99" percent can be entered as the adjustment factor for the spill adjustment. • This parameter determines what percentage of the calculated error will be applied to the spill value. For example, if the error is determined to be 0.1 kg after averaging 3 cycles, and the adjustment factor was programmed as 50%, then the spill value would be adjusted by 50% of the error or 0.05 kg.
Update Table	Enabled	Save adjusted spill values into the Target Table.
	Disabled	The adjusted spill values are only saved in the active target record.

3.2.4.17 Auxiliary Output

A separate Auxiliary Output signal can be **triggered by weight threshold (gross weight)** in either the weigh-in cycle or the weigh-out cycle (but not both) and **terminated on weight or time duration**. This signal can be used as a **control** for external devices such as a **mixer** or **heater** or **other device** adding additional control to the process.

The Auxiliary Output signal is configured in the Auxiliary Output screen in Application Settings to activate within a programmed weight range or for a certain amount of time after passing a programmed weight threshold.

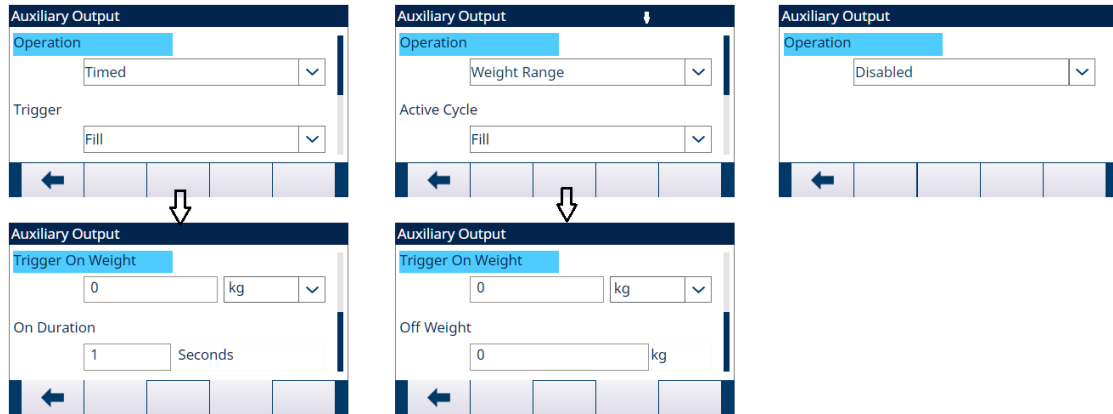


Figure 26: Auxiliary Output

The configuration items for Auxiliary Output are defined in the table that follows:

Configuration Item	Options	Description
Operation	Disabled	Auxiliary Output is Disabled.
	Timed	Auxiliary Output operates based on time.
	Weight Range	Auxiliary Output operates based on the weight within a certain weight range.
Active Cycle	Up to Work Mode selected	<ul style="list-style-type: none"> • Fill Options: None / Fill • Fill/Dump Options: None / Fill/Dump • Dose Options: None / Dose • Dose/Refill Options: None / Dose/Refill
Trigger On Weight	-	<ul style="list-style-type: none"> • This is the weight value that will trigger the start of the Auxiliary Output. • A value between "0" and scale capacity can be entered as the trigger point to turn on the Auxiliary Output.
Weight Unit	-	g/kg/lb/t/ton/oz
Off Weight	-	This value determines the weight that turns the Auxiliary Output off. When used in a Fill or Refill cycle, this value must be greater than the trigger weight. If used in a Dump or Dose cycle, this value must be less than the trigger weight.
On Duration	-	<ul style="list-style-type: none"> • This value determines how long the Auxiliary Output remains on. • A value between "0" and "999.9" seconds can be entered.

Operation

Auxiliary Output starts working after the Active Cycle is really working.









- For Fill, it starts working when Feed is really working.
- For Refill, it starts working when Refill is really working.
- For Dose, it starts working when Feed is really working.
- For Dump, it starts working when Dump is really working;



If a new cycle is started before the Auxiliary Output completes its cycle, the Auxiliary Output will be turned off.





3.2.4.18 Configure Discrete I/O

3.2.4.18.1 Input

In some circumstances, it is necessary to perform filling tasks without pressing buttons on the terminal's front panel. This is achieved by configuring discrete inputs which correspond to the corresponding softkeys, so that filling can be controlled by remote devices.

Input Assignment Selections			
Input	Effect	Input	Effect
Start/Resume	<ul style="list-style-type: none"> The Start Input for a Work Mode is equivalent to Start/Resume softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Start/Resume softkey in Filling softkey directly. 	OK Key	Duplicates the function of the console OK key  .
Pause/Abort	Equivalent to Pause softkey  or Abort softkey  .	No Key	Duplicates the function of the console No key  .
Silence Alarm	Turns the alarm output off.	Refill	<ul style="list-style-type: none"> A Refill Input to launch Refill cycle Equivalent to Refill softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Refill softkey directly.
OK to Weigh-in (Fill / Refill)	An input signal used to Indicate it is OK to begin and continue the weigh-in cycle	Dump	<ul style="list-style-type: none"> A Dump Input to launch Dump cycle Equivalent to Dump softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Dump softkey directly.
OK to Weigh-out (Dump, Dose)	An input signal used to indicate it is OK to begin and continue the weigh-out cycle	Manual Accept	<ul style="list-style-type: none"> Manual Accept Input determines to reject or accept the out of tolerance. Equivalent to Tolerance Acceptance softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Tolerance Acceptance softkey directly.

Input Assignment Selections			
Input	Effect	Input	Effect
Jog	If manual jog is selected, this procedure is performed manually by pressing the weigh-in MANUAL JOG soffkey  or the weigh-out MANUAL JOG soffkey  provided or by programming a discrete input as a jog function.	-	-

- 1 Press the SETUP soffkey  in the start-up screen of Advanced Auto Filling.
- 2 In the Application Settings screen, select  **Discrete Inputs**.
- 3 In the **Discrete Inputs**, press the EDIT soffkey  to open the setup page for editing an existing input assignment or press the ADD soffkey  to add a new discrete input assignment.

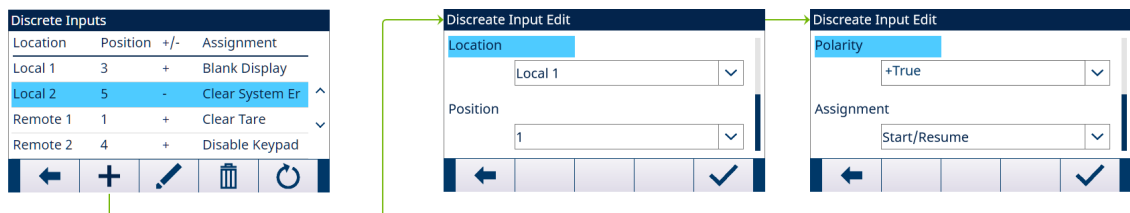



Figure 27: Discrete Inputs





- 4 Enter the input assignment address.
 - Location:** This field defines the Input is local or remote.
 - Position:** This field defines position of the discrete input option assigned to a function.
- 5 Select the **Polarity** as **+True** or **-True**.
- 6 To select an input assignment, refer to the table **Input Assignment Selections**.
- 7 Press the OK soffkey  to confirm the entry.

3.2.4.18.2 Output

Output Assignment Selections			
Output	Effect	Output	Effect
Ready	<ul style="list-style-type: none"> When this status output is "On", it indicates the system is ready and a new cycle can begin. Only one of the three status outputs (Ready, Running, Holding) will be on at one time. 	Tolerance OK	Indicates the final fill (Fill or Dose) weight is within tolerance.
Alarm	Alarm can be trigger by: <ul style="list-style-type: none"> Starting weight invalid Autotare Fault Process Timeout Initial Feed Timeout Refill Timeout Dump Timeout Parameter Invalid Parameter Logic Error Material not enough 	Over Zone	Indicates the final fill (Fill or Dose) weight is over tolerance.
Auxiliary Output	Used as a separate output control signal based on weight or time.	Under Zone	Indicates the final fill (Fill or Dose) weight is under tolerance.

Output Assignment Selections			
Output	Effect	Output	Effect
After Weigh Delay	When "On", indicates the After weigh delay timer is counting down.	Running	<ul style="list-style-type: none"> When this status output is "On", it indicates a Work Mode is running. Only one of the three status outputs (Ready, Running, Holding) will be on at one time.
Start Delay	When "on", indicates the Start Delay timer is counting down.	Holding	<ul style="list-style-type: none"> When Weigh-in transition or Weigh-out transition is Semi-automatic, terminal holds at the end of Weigh-in cycle or Weigh-out cycle or each material feed and must be acknowledged before continuing When this status output is "On". it indicates the sequence is in a holding state or a paused state. Only one of the three status outputs (Ready, Running, Holding) will be on at one time.
Complete: Cycles	<ul style="list-style-type: none"> When this output is "On", indicates Track Cycles is Enabled and the number of programmed cycles has been completed (Cycles Remaining <1). If Weigh-in/out transition is Semi-automatic, output is "on" when the cycle is Holding until operator presses OK. If Weigh-in/out transition is Automatic, output is "on" for the amount of time programmed in the Weigh-in Complete in Timing Setting. 	Fast Feed(For 2-speed only)	<ul style="list-style-type: none"> For Fill cycle with Feeds Solution 2, this output is not used in a one-speed fill weigh-in cycle. It turns "On" during the fast speed of a two-speed fill weigh-in cycle. For Dose cycle, this output is not used in a one-speed dose weigh-out cycle. It turns "On" during the fast speed of a two-speed dose weigh-out cycle.
Complete: Fill	<ul style="list-style-type: none"> If Weigh-in transition is Semi-automatic, output is "On" when the cycle is Holding until operator presses OK. If Weigh-in transition is Automatic , output is "On" for the amount of time programmed in the Weigh-in Complete in Timing Setting. 	Feed	<ul style="list-style-type: none"> For Fill cycle with Feeds Solution 2, this output turns "On" during a one-speed fill weigh-in cycle or during the slower speed of a two-speed fill weigh-in cycle. For Dose cycle, this output turns "On" during a one-speed dose weigh-out cycle or during the slower speed of a two-speed dose weigh-out cycle. This output turns on during Jog

Output Assignment Selections			
Output	Effect	Output	Effect
Complete:Dose	<ul style="list-style-type: none"> If Weigh-out transition is Semi-automatic, output is "On" when the cycle is Holding until operator presses OK. If Weigh-out transition is Automatic, output is "On" for the amount of time programmed in the Weigh-out Complete in Timing Setting. 	Dump	This output turns "On" during the Dump weigh-out cycle.
Complete:Dump	<ul style="list-style-type: none"> If Weigh-out transition is Semi-automatic, output is "On" when the cycle is Holding until operator presses OK. If Weigh-out transition is Automatic, output is "on" for the amount of time programmed in the Weigh-out Complete in Timing Setting. 	Refill	This output turns "On" during the Refill weigh-in cycle.
Complete:Refill	<ul style="list-style-type: none"> If Weigh-in transition is Semi-automatic, output is "On" when the cycle is Holding until operator presses OK. If Weigh-in transition is Automatic, output is "On" for the amount of time programmed in the Weigh-in Complete in Timing Setting. 	-	-

- 1 Press the SETUP soffkey  in the start-up screen of Advanced Auto Filling.
- 2 In the Application Settings screen, select  **Discrete Outputs**.
- 3 In the **Discrete Outputs**, press the EDIT soffkey  to open the setup page for editing an existing output assignment or press the ADD soffkey  to add a new discrete output assignment.

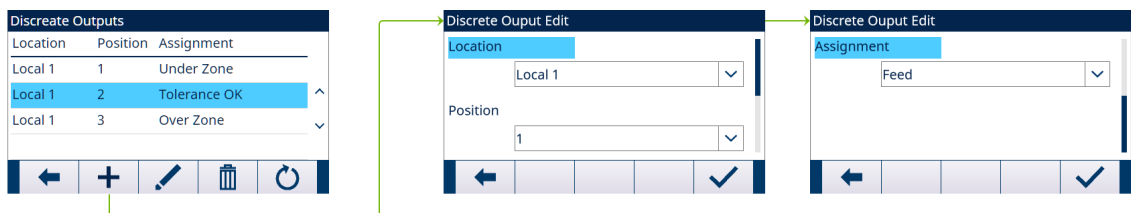



Figure 28: **Discrete Outputs**

- 4 Enter the output assignment address.
 - Location:** This field defines the Output is local or remote.
 - Position:** This field defines position of the discrete output option assigned to a function.
- 5 To select an output assignment, refer to the table **Output Assignment Selections**.
- 6 Press the OK soffkey  to confirm the entry.

3.2.5 Advanced Settings

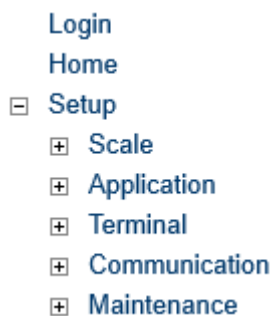


Figure 29: Advanced Settings Menu

3.2.5.1 Configure Communication

Four output templates are programmed for Advanced Auto Filling. When Fill, Number of cycles, Dose or Dump operation is completed, a Demand Print is triggered.

- 1 Select Advanced Settings in the Application Settings screen.
- 2 To find the Connections branch, follow the path: Setup>Communication>Connections.
- 3 In the **CONNECTIONS VIEW** page, press the ADD softkey to create a new connection assignment.
- 4 Press the UP and DOWN navigation keys to select or highlight a connection assignment in the list to be edited and press the EDIT softkey to open the setup page for editing.
- 5 Select the **Port**, and the option **Demand Output** in the field **Assignment**.
- 6 To select the Demand Print Trigger and the Template, refer to the table that follows.

Category	Demand Print Trigger	Template
Fill	Trigger 4	Template 6 <pre> Fill Cycle 37 of 500 Material XP-50 Start: 16:37:13 14/Mar/2015 Finish: 16:37:35 14/Mar/2015 Target: 5.000 lb Net Delivered: 4.998 lb ***** </pre>
Number of cycles	Trigger 7	Template 10 <pre> Total of 55 cycles complete Finish: 16:38:52 14/Mar/2015 Total material: 26.540 lb ***** </pre>
Dose	Trigger 6	Template 8 <pre> Dose Cycle 13 of 55 Material XP-10 Dose Start: 16:52:35 14/Mar/2015 Finish: 16:52:49 14/Mar/2015 Target Weight: 1.000 lb Net Delivered: 1.000 lb ***** </pre>

Category	Demand Print Trigger	Template
Dump	Trigger 5	Template 7 <pre> Dump Cycle 42 of 500 Start: 16:37:46 14/Mar/2015 Finish: 16:38:05 14/Mar/2015 Start Weight: 5.008 lb Finish Weight: 0.008 lb Net Delivered: 5.000 lb ***** </pre>

3.3 Operation

This chapter states the specific operation sequence in different Work Modes by giving examples.

3.3.1 Work Mode – Fill

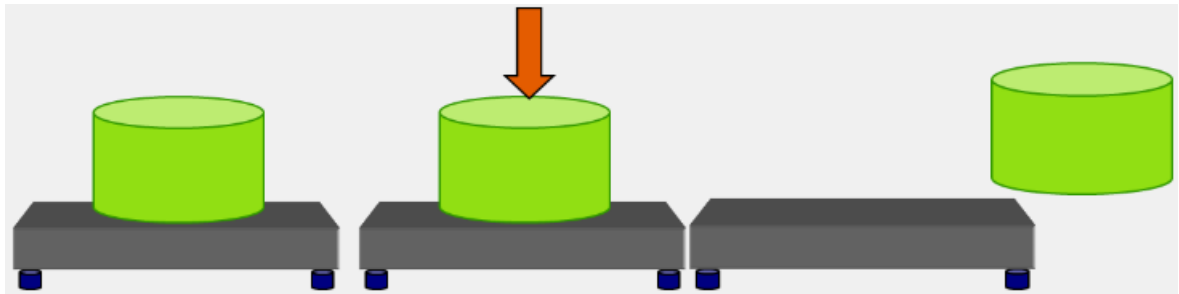



Figure 30: Work Mode - Fill

Overview

In this cycle, an empty container is usually placed on a weighing platform and then filled while on the platform. This is typically a simple sequence that uses a 1 - or 2 - speed feeding mechanism to fill the container. The filling of the container is controlled by the IND500x Advanced Auto Filling, but replenishing of the supply is not.

Example sequence:

1. Put container on scale.
2. Press the Fill Start softkey . (Tare is taken automatically. Container Tare is an option.)
3. Container is filled to target.
4. Results are printed.
5. Container is removed by others.

Available features:

- Higher precision
- Container Tare
- OK to Weigh-in (fill) Interlock
- Timing [Start Delay, After Weigh Delay (for Tolerance Check)]
- Cycle Track
- Auto or Manual Jog
- Overfill Adjustment
- Auxiliary Output
- Autospill Adjustment


Configuration

This section lists a specific setup for the Fill cycle. For a complete list and explanation of all setup parameters for IND500x Advanced Auto Filling, see the Chapter [Configuration ▶ Page 8].



Configuration	Value	Configuration	Value
Work Mode	Fill	Active Target Material	Active Target Value, Tare Value, etc.

Configuration	Value	Configuration	Value
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-in : Enabled
Input	Start/Resume Pause/Abort	Jog	Mode: Automatic Pulse Time (On): 2.0s Pulse Time (Off): 2.0
Cycle Transition	Cycle Tare before Fill = Enabled Clear Tare After Fill = Enabled Weigh-in Transition = Automatic Loop Work Mode = Disabled	Feed Alarm	Disabled by setting Timeout = 0
Material Table	Material record is added.	Tolerance Acceptance	Manual Accept: Enabled Zero Tolerance Check: Disabled
Cycles	Track Cycles = Disabled	Pac Statistics	Disabled
Timing	Start Delay: 3 Inhibited Time: 3 After Weigh Delay: 3 Weigh-in Complete: 4	Overfill Adjustment	Manual
Container Tare	Disabled	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-

Operation

- 1 Press the Start/Resume softkey  or trigger a discrete input to run Fill.
- 2 Terminal checks **Start Delay**. **Start Delay** is counting down per second until **Start Delay** = 0.
 - ➔ **Start Delay** output becomes "On" when **Start Delay** counts down until 0.
- 3 Terminal detects Input OK to Weigh-in Interlock signal.
- 4 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.
- 5 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
 - *If Source Weight < (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
 - *If (Target - Feed - Spill) ≤ Source Weight < (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
 - *If Source Weight ≥ (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
 - *When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 6 Terminal does Tolerance Check.
 - ➔ If (Target - (-Tolerance)) ≤ Source Weight ≤ (Target + (+Tolerance)), message Tolerance OK shows.
- 7 After Weigh-in Complete timeout, terminal Clears Tare and shows a dedicated display ready for another filling.
- 8 Container can be removed by others.

Exception in Step 6:

- 1 If Source Weight < Target - (-Tolerance), terminal starts Auto Jog automatically.
 - ➔ Feed Output is pulsed on and off continuously according to Jog setting, while Fast Feed Output is "Off".
- 2 If Source Weight > Target + (+Tolerance), terminal shows status Manual Adjust.
- 3 Do **Overfill Adjustment** manually and press OK softkey  to confirm the result. Or directly press Tolerance Acceptance softkey  to accept or reject the result.

3.3.2 Work Mode – Fill / Dump

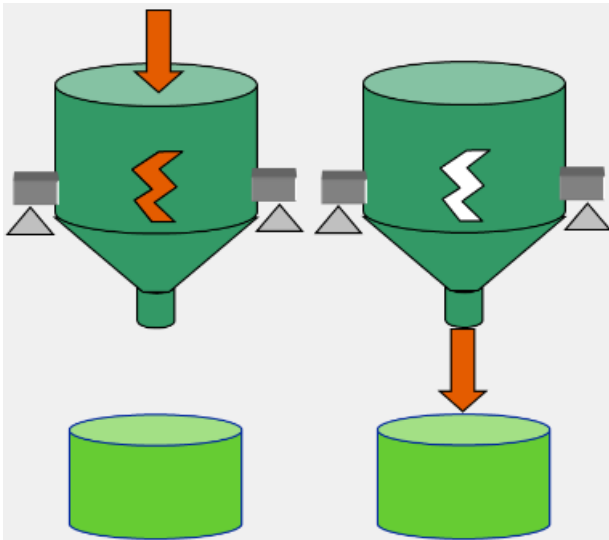




Figure 31: Work Mode - Fill/Dump

Overview

In this cycle, fixed vessel or hopper is used to hold material and supply vessel is the scale. The vessel or hopper is filled to target and then completely emptied. This sequence uses a 1 - or 2 - speed feeding mechanism for Fill and 1-speed mechanism for Empty. Both Fill and Empty of vessel are controlled by the IND500x Advanced Auto Filling.

Example sequence:

1. Press the Fill Start softkey .
2. Vessel is tared to net zero (depending on cycle tare setting and container tare setting).
3. Vessel is filled to target.
4. Results are printed.
5. Press Dump Start softkey  (this step not required for Automatic Weigh-out Transition).
6. Vessel is completely emptied.
7. Results are printed.

Available features:

- OK to weigh-in (fill) interlock
- OK to weigh-out (dump) interlock
- Timing (Start Delay, After Weigh Delay, After Empty Delay)
- Cycle Track
- Automatic sequence tare
- Zero tolerance check
- Heel weight
- Auto or Manual Jog
- Overfill Adjustment
- Auxiliary Output
- Tolerance checking
- Autospill Adjustment


Configuration

This section lists a specific setup for the Fill/Dump cycle. For a complete list and explanation of all setup parameters for IND500x Advanced Auto Filling, see the Chapter [Configuration ▶ Page 8].



Configuration	Value	Configuration	Value
Work Mode	Fill/Dump	Active Target Material	Active Target Value, Tare Value, etc.
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-in: Enabled
Input	Start/Resume Pause/Abort	Jog	Mode: Automatic Pulse Time (On): 2.0s Pulse Time (Off): 2.0

Configuration	Value	Configuration	Value
Cycle Transition	Cycle Tare before Fill = Enabled Clear Tare After Fill = Enabled Weigh-in Transition = Automatic Weigh-out Transition = Automatic Loop Work Mode = Enabled	Feed Alarm	Disabled by setting Timeout = 0
Material Table	Material record is added.	Tolerance Acceptance	Manual Accept: Enabled
Cycles	Track Cycles = Disabled	Pac Statistics	Disabled
Timing	Start Delay: 3 Inhibited Time : 3 After Weigh Delay: 3 Weigh-in Complete: 4 Weigh-out Complete: 4	Overfill Adjustment	Manual
Container Tare	Disabled	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-

Operation

- 1 Press the Start/Resume softkey  or trigger a discrete input to run Fill.
- 2 Terminal checks Start Delay. Start Delay is counting down per second until Start Delay = 0.
➔ Start Delay Output becomes "On" when Start Delay counts down until 0.
- 3 Terminal detects Input OK to Weigh-in Interlock signal.
- 4 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.
- 5 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
*If Source Weight < (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
*If (Target - Feed - Spill) ≤ Source Weight < (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
*If Source Weight ≥ (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
*When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 6 Terminal does Tolerance Check.
➔ If (Target - (-Tolerance)) ≤ Source Weight ≤ (Target + (+Tolerance)), message Tolerance OK shows.
- 7 Terminal Clears Tare and starts Dump.
- 8 When Gross Weight < Heel Weight, After Empty Delay starts.
- 9 When After Empty Delay counts down to 0, Weigh-out Complete countdown starts.
- 10 After Weigh-out Complete timeout, terminal Clears Tare and shows a dedicated display ready for another Fill / Dump cycle.
- 11 Container can be removed by others.

Exception in Step 6:

- 1 If Source Weight < Target - (-Tolerance), terminal starts Auto Jog automatically.
➔ Feed Output is pulsed on and off continuously according to Jog setting, while Fast Feed Output is "Off".
- 2 If Source Weight > Target + (+Tolerance), terminal shows status Manual Adjust.
- 3 Do **Overfill Adjustment** manually and press OK softkey  to confirm the result. Or directly press Tolerance Acceptance softkey  to accept or reject the result.

3.3.3 Work Mode – Dose

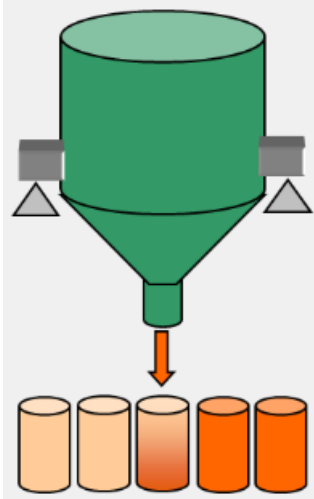



Figure 32: Work Mode - Dose

Overview

In this cycle, fixed supply vessel is the scale. Vessel fills multiple containers placed by others. Container Tare can't be used because containers being filled are not on the scale. This sequence uses 1 – or 2 – speed Dose. Weigh-out from vessel (dosing) is controlled by IND500x Advanced Auto Filling, but replenishment of supply material monitored is not controlled by IND500x Advanced Auto Filling.

Example sequence:

1. Put container under fixed supply vessel.
2. Press the Start softkey .
3. Vessel is tared to net zero.
4. Container is filled to target.
5. Results are printed.
6. Remove container.

Available features:

- OK to Weigh-out (Dose) interlock
- Timing (Start Delay, After Weigh Delay)
- Cycle Track
- Automatic sequence tare
- Auto or Manual Jog
- Auxiliary Output
- Autospill Adjustment
- Heel Weight


Configuration

This section lists a specific setup for the Dose cycle. For a complete list and explanation of all setup parameters for IND500x Advanced Auto Filling, see the Chapter [Configuration ▶ Page 8].






Configuration	Value	Configuration	Value
Work Mode	Dose	Active Target Material	Active Target Value, Tare Value, etc.
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-out: Enabled
Input	Start/Resume Pause/Abort	Jog	Mode: Manual Pulse Time (On): 2.0s Pulse Time (Off): 2.0
Cycle Transition	Clear Tare After Dose = Enabled Weigh-out Transition = Automatic Loop Work Mode = Disabled	Feed Alarm	Disabled by setting Timeout = 0
Material Table	Material record is added.	Tolerance Acceptance	Manual Accept: Enabled Heel Weight: 20 kg
Cycles	Track Cycles = Disabled	Pac Statistics	Disabled

Configuration	Value	Configuration	Value
Timing	Start Delay: 3 Inhibited Time: 3 After Weigh Delay: 3 Weigh-out Complete: 4	Overfill Adjustment	Disabled (Overfill Adjustment is not applicable to Dose)
Container Tare	Disabled (Supply vessel is tared to net zero)	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-

Operation

- 1 Press the Start/Resume softkey  or trigger a discrete input to run **Dose**.
- 2 Terminal checks Gross Weight \geq (Heel Weight + Target). Terminal checks Start Delay. Start Delay is counting down per second until Start Delay = 0.
 - ➔ Start Delay Output becomes "On" when Start Delay counts down until 0.
- 3 Terminal detects Input OK to Weigh-out Interlock signal.
- 4 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.
- 5 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
 - *If Source Weight $<$ (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
 - *If (Target - Feed - Spill) \leq Source Weight $<$ (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
 - *If Source Weight \geq (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
 - *When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 6 Terminal does Tolerance Check.
 - ➔ If (Target - (-Tolerance)) \leq Source Weight \leq (Target + (+Tolerance)), message Tolerance OK shows.
- 7 After Weigh-out Complete timeout, terminal Clears Tare and shows a dedicated display ready for another dosing.
- 8 Container can be removed by others.

Exception in Step 6:

- 1 If Source Weight $<$ Target - (-Tolerance), terminal shows the Manual Jog status.
- 2 Press Jog softkey  to do Manual Jog. Terminal starts Manual Jog one time.
- 3 When the Source Weight is in tolerance, press OK softkey  to confirm the result. Or directly press the Tolerance Acceptance softkey  to accept or reject the result.
- 4 If Source Weight $>$ Target + (+Tolerance), press OK softkey  to accept the result or press Cancel softkey  to reject the result.

3.3.4 Work Mode – Dose / Refill

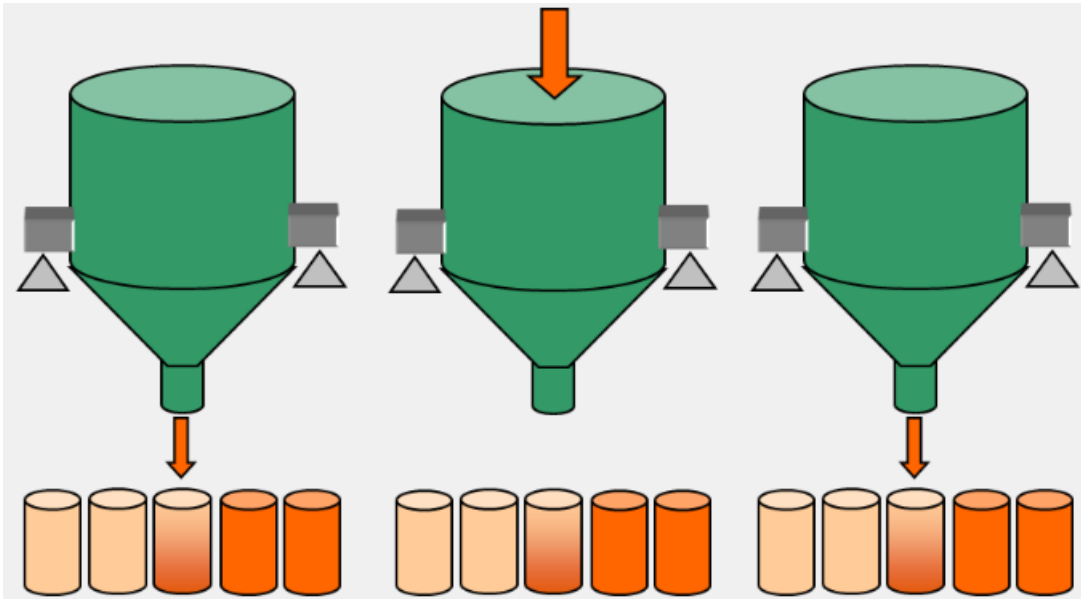



Figure 33: Work Mode - Dose/Refill

Overview

In this cycle, refillable fixed supply vessel or replaceable supply vessel is the scale. Vessel fills multiple containers placed by others. This sequence uses 1 – or 2 – speed Dose and 1 - speed Refill. Weigh-out from vessel (dosing) is controlled by the IND500x Advanced Auto Filling. Replenishment of supply material is also controlled or prompted manually by IND500x Advanced Auto Filling.

Example sequence:

1. Put container under weigh/supply vessel.
2. Press the Dose Start softkey .
3. Supply vessel is tared to net zero.
4. Container is filled to Dose target.
5. Results are printed.
6. Remove container.
7. Tare is cleared.
8. Vessel is refilled to high threshold of Refill setting or operator is prompted to replace supply vessel.
9. Supply vessel is tared to net zero.
10. Container is filled to Dose target.

Available features:

- OK to Weigh-in (Refill) interlock
- OK to weigh-out (Dose) interlock
- Timing (tart Delay, After Weigh Delay)
- Automatic sequence tare
- Heel Weight
- Auto or Manual Jog
- Tolerance Check
- Auxiliary Output
- Autospill Adjustment
- Overfill Adjustment
- Cycle Track


Configuration

This section lists a specific setup for the Dose/Refill cycle. For a complete list and explanation of all setup parameters for IND500x Advanced Auto Filling, see the Chapter [Configuration ▶ Page 8].


Configuration	Value	Configuration	Value
Work Mode	Dose/Refill	Active Target Material	Active Target Value, Tare Value, etc.

Configuration	Value	Configuration	Value
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-out: Enabled
Input	Start/Resume Pause/Abort	Jog	Mode: Manual Pulse Time (On): 2.0s Pulse Time (Off): 2.0
Cycle Transition	Clear Tare After Dose = Enabled Supply Material Conservation = Disabled Weigh-out Transition = Automatic Loop Work Mode = Disabled	Feed Alarm	Disabled by setting Timeout = 0
Refill	Refill Mode = Automatic	Tolerance Acceptance	Manual Accept: Enabled Heel Weight: 20 kg
Material Table	Material record is added.	Pac Statistics	Disabled
Timing	Start Delay: 3 Inhibited Time: 4 After Weigh Delay: 3 Weigh-out Complete: 4	Overfill Adjustment	Disabled (Overfill Adjustment is not applicable to Dose)
Container Tare	Disabled (Supply vessel is tared to net zero)	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-






Operation

- 1 Press the Start/Resume softkey  or trigger a discrete input to Run Dose.
- 2 Terminal detects Gross Weight \geq (Heel Weight + Target). Terminal checks Start Delay. Start Delay is counting down per second until Start Delay = 0.
 - ➔ Start Delay Output becomes "On" when Start Delay counts down until 0.
- 3 Terminal detects Input OK to Weigh-out Interlock signal.
- 4 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.
- 5 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
 - *If Source Weight $<$ (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
 - *If (Target - Feed - Spill) \leq Source Weight $<$ (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
 - *If Source Weight \geq (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
 - *When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 6 Terminal does Tolerance Check.
 - ➔ If (Target - (-Tolerance)) \leq Source Weight \leq (Target + (+Tolerance)), message Tolerance OK shows.
- 7 After Weigh-out Complete timeout, terminal Clears Tare and shows a dedicated display ready for another dosing.
- 8 Container can be removed by others.

Exception in Step 2

- 1 Terminal detects Gross Weight $<$ Heel Weight + Target.
 - ➔ Terminal checks Supply Material Conservation is Disabled.
 - ➔ Terminal shows Page for Refill.
- 2 Press Fill softkey  to start Refill. Terminal clears tare and starts Refill until Gross Weight \geq Refill High Threshold.
- 3 As soon as Gross Weight \geq Refill High Threshold, terminal checks After Weigh Delay.

Exception in Step 6:

- 1 If Source Weight < Target – (-Tolerance), terminal shows the Manual Jog status.
- 2 Press Jog softkey  to do Manual Jog. Terminal starts Manual Jog one time.
- 3 When the Source Weight is in tolerance, press OK softkey  to confirm the result. Or directly press the Tolerance Acceptance softkey  to accept or reject the result.
- 4 If Source Weight > Target + (+Tolerance), press OK softkey  to accept the result or press Cancel softkey  to reject the result.

4 Basic Auto Filling

Basic Auto Filling is used to take control and start the filling until it reaches the target, and then it stops the filling.







A single or two-speed feeding system is used to either **add** weight to or **remove** weight from the scale. The terminal monitors the change in weight and compares it to a previously entered target and other control parameters.

Compared with Manual Filling, Basic Auto Filling features automatic filling process control by I.O.

Basic Auto Filling is available only when the optional Fill Pac is installed.






4.1 Softkeys

Softkeys on Start-up Screen

Icon	Name	Icon	Name
	Exit to Home Page		Target Table
	Application Settings		Next Page
	Start		Login

Application Settings Icons

This table lists all of the icons for Application setting.

Icon	Name	Icon	Name
	Target Operation		Advanced Settings
	Target Table		Discrete Inputs
	Discrete Outputs	-	-

Note To learn about function of the softkeys for Application running, please refer to the IND500x **User Manual**.

4.2 Configuration

This chapter provides information about how to configure the IND500x terminal's operating system with the Basic Auto Filling functionality. Functions can be enabled, disabled, or defined by entering parameter values in specific setup screens.

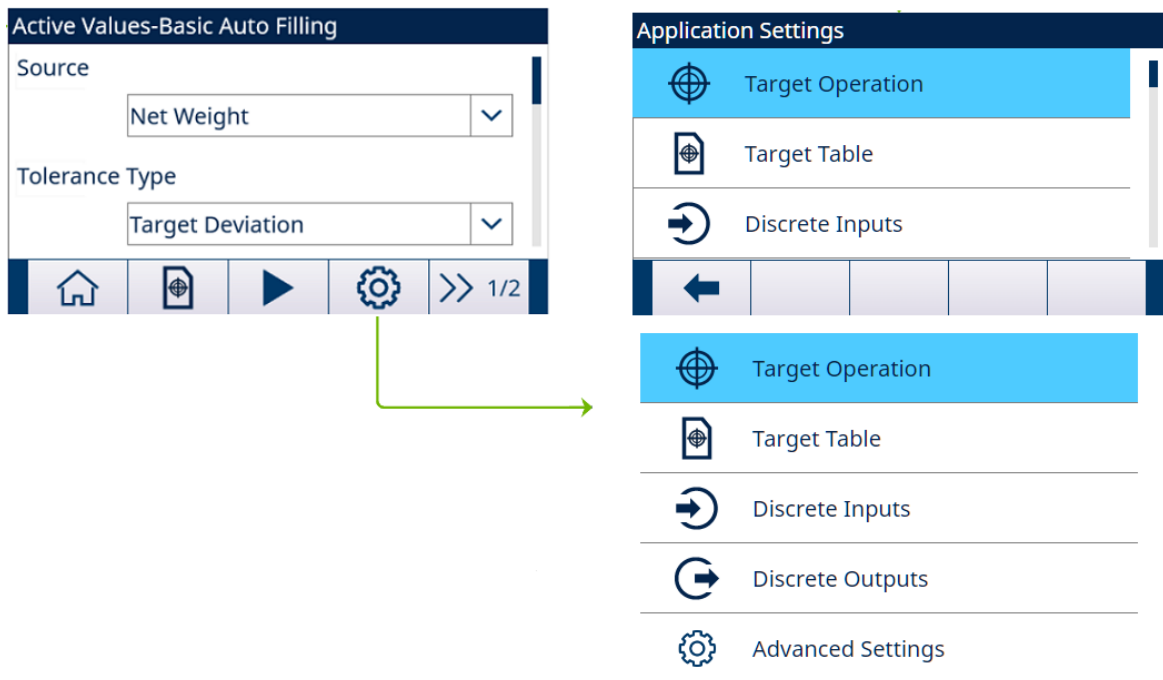


Figure 34: Application Settings

4.2.1 Start Filling with Active Target



Figure 35: Active Values - Basic Auto Filling

- The Active Values – Basic Auto Filling screen shows. Refer to [Application Entry ▶ Page 5].
- 1 Press the UP and DOWN navigation keys (▲▼) to select the specific field and set the Active Values. For definition of each parameter, see [Configure the Target Table ▶ Page 49].



Figure 36: Active Values

- 2 Press the START softkey (▶).
- ➔ Filling is started with Active Target.

4.2.2 Configure the Target Table



Figure 37: Start-up Screen

Load A Target Record from the Target Table

List Selection

- 1 Press the TARGET TABLE softkey (📄) in the start-up screen.

➔ The **Target Table** screen shows.

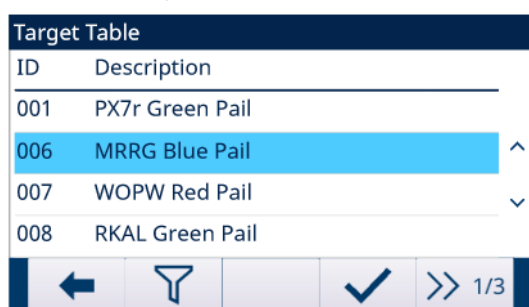









Figure 38: **Target Table**



- 2 Press the FILTER OFF softkey .
- 3 In the Filter Settings page, use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all Material Table records.
- 4 Press the OK softkey .
 - ➔ The filtered target records show. Records are ordered by date and time with the most recent record shown last.
- 5 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted. In this screen, user also can press the FILTER ON softkey  to renew the search information, or press the FILTER CLEAR softkey  to clear the search information.
- 6 Press the OK softkey  to load the selected record from the list.
- 7 Press the EXIT softkey  to return to the weighing operation screen without loading the record.
 - ➔ A target record is selected.

Quick Search

When ID of the Target Table record to be loaded is known, the Quick Recall mode is to be used.

- 1 In the **Target Table** screen, use the numeric keypad to enter the ID and then press ENTER key to load the record.
 - ➔ If the record is available, the data is loaded.
 - ➔ If the record is not found, a message "ID not found" shows.
- 2 Press the OK softkey .
 - ➔ A Material record is searched.









Create or Add A Target Table Record

- Access Level: Administrator/Supervisor
- 1 Press the EDIT softkey  to open the setup screen for editing a record or press the ADD softkey  to open the setup screen to create a new table record.

Parameters Setting for Target Record

Parameter	Options	Definition or Effect
ID	-	<ul style="list-style-type: none"> • ID is the record's serial number identifier. • It is unique to replace an existing record with a particular ID number. It must be deleted first, and then a new record can be created with that number entered in the ID field. • IND500x can store a maximum of 199 ID records.
Source	Net Weight	Net Weight is selected as data source for weight comparison.
	Gross Weight	Gross Weight is selected as data source for weight comparison.

Parameter	Options	Definition or Effect
Tolerance Type	Target Deviation	<ul style="list-style-type: none"> Target Deviation is measured as an absolute weight value, in the same units as the target value itself. For example, if a target of 100 kg is selected, positive and negative deviations of 5 and 2 kg, respectively, might be defined in the target record, and (unless they are changed) these values will remain fixed regardless of any change to the target value.
	Percent of Target	<ul style="list-style-type: none"> Percent of Target is measured as a relative value, expressed as a percentage of the target value. In this case, if the target is 100 kg, and the positive and negative tolerances are 5% and 2%, the tolerance band will remain proportionate to the target value even if the target value is changed. Thus, if the record is modified with a new target of 200 kg, the positive and negative tolerances remain 5% and 2%, and represent 10 kg and 4 kg respectively.
Target	-	The desired measured value for a weighing. Unit: g/kg/lb/t/ton/oz
Tolerance	-	Depending on the Tolerance Type selected, the two tolerance fields, - and +, accept an entry of an absolute weight value, or of a percentage to be applied to the target value.
Spill	-	<ul style="list-style-type: none"> Spill is a measure of the amount of material that will be delivered after the feed is cut off. It is empirically determined, and entered here as an absolute weight value. This material must be accounted for in configuring a target, or the result of a filling operation will be consistently above target.
Feed	-	<ul style="list-style-type: none"> In two-speed filling operations, the Feed value determines when the Fast Feed output is turned off in order to bring the operation to a 'soft stop' and avoid over-running the target. This value is based on empirical observation of the behavior of the filling system, but it should be small enough to enable the rapid completion of the fill, but not so small that the fast feed stops too late and over-runs the target.
Description	-	This field allows each target record to have a descriptive identifier. This can be a useful aid when selecting from a list that includes multiple targets, and may note the material involved or the type of vessel into which the feed will be made.
Totalization Type	Net Weight	The Net Weight converted to the unit in the target setting is added to Total.
	Gross Weight	The Gross Weight converted to the unit in the target setting is added to Total.
	Disabled	Totalization for all transactions involving each target in the table will not be tracked.

- 2 Press the UP and DOWN navigation keys ( ) to move the focus to the field name to be edited or inserted.
 - 3 Press the ENTER key to select a field value to edit or insert.
 - 4 Use the numeric keypad to edit or enter the desired value.
 - 5 Press the OK softkey  to accept the modifications or additions to the Target Table.
 - 6 Press the EXIT softkey  to return to the previous page without saving modifications or additions.
 - 7 Press the DELETE softkey  to delete a target record in the list.
 - 8 Press the TRANSFER softkey  to generate Target Table reports to any connection with a Reports assignment.
 - 9 Press the RESET softkey  to clear all configuration change records.
 - 10 Press the EXIT softkey  to return to the Target Table page.
- ➔ The **Target Table** is configured.

4.2.3 Configure Target Operation

- 1 Press the SETUP soffkey  in the Active Values – Basic Auto Filling screen.



Figure 39: Start-up Screen

- 2 In the Application Settings screen, select **Target Operation**.
- 3 In the **Target Operation** screen, select to Enable or Disable the **Latching** function and select the **Feed Type**.

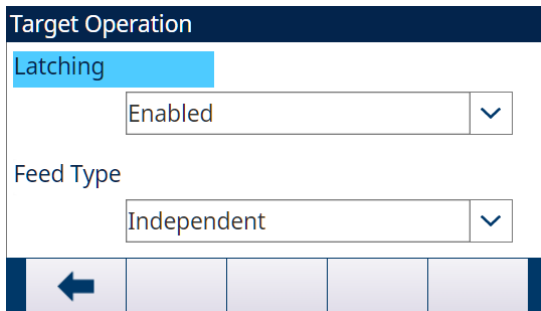



Figure 40: **Target Operation**

- ➔ **Latching Enabled:** When the target is reached, the output feeds remain off (or latched) until a start command is used, either by the START soffkey , or by a discrete input. **Latching is Enabled** by default.
 - ➔ **Latching Disabled:** When the target is reached, the output feeds will not remain off (or latched), but will be turned on as soon as weight is below (target - spill) again.
 - ➔ **Feed Type – Concurrent:** During Fast Feed cycle, both Fast Feed and Feed are on.
 - ➔ **Feed Type – Independent:** During Fast Feed cycle, only Fast Feed is on.
- 4 When the **Latching** function is enabled, set the **Process Timeout** value in the next page. The **Process Timeout** value is used to monitor the time for filling.
- ➔ **Target Operation** is configured.

4.2.4 Configure Discrete I/O



In some circumstances, filling tasks are necessary to be performed without pressing buttons on the terminal's front panel, but controlled by remote devices by configuring discrete inputs or outputs.

- 1 Press the SETUP soffkey  in the Active Values – Basic Auto Filling screen.



Figure 41: Start-up Screen

- 2 In the Application Settings screen, select **Discrete Inputs** or **Discrete Outputs**.

- 3 In the **Discrete Inputs** or **Discrete Outputs** page, press the EDIT softkey  to open the setup page for editing an existing input or output assignment or press the ADD softkey  to add a new discrete input or output assignment.

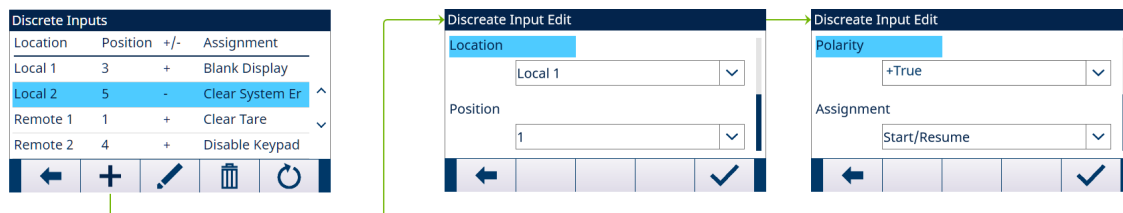


Figure 42: Discrete Inputs

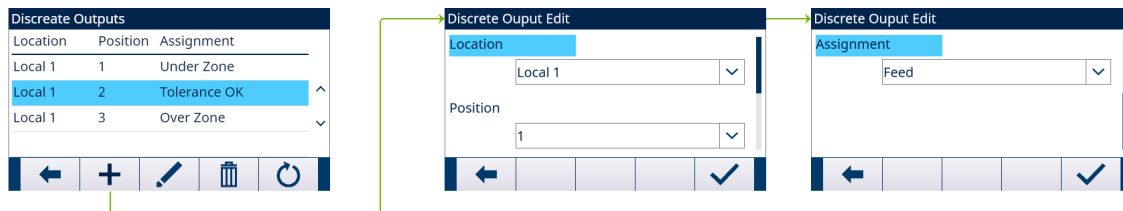








Figure 43: Discrete Outputs

- 4 To select an input or output assignment, refer to the table **Input and Output Assignment Selections**.

Input Assignment Selections	
Input	Effect
Start/Resume	<ul style="list-style-type: none"> The Start Input is equivalent to START/RESUME softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Setting parameter directly. PLC Command 119 Pressing START/RESUME softkey in Filling directly.
Pause/Abort	Equivalent to PAUSE softkey  or ABORT softkey  .
Silence Alarm	Turning the alarm output off.

Output Assignment Selections	
Output	Effect
Fast Feed	This output is not used in a one-speed fill weigh-in cycle. It turns "on" during the faster speed of a two-speed fill weigh-in cycle.
Feed	This output turns "on" during a one-speed fill weigh-in cycle or during the slower speed of a two-speed fill weigh-in cycle.
Tolerance OK	Active after Tolerance check.
Over Zone	When a new Target comparison starts, all Tolerance check Output (Tolerance OK , Over Zone, Under Zone) will be reset.
Under Zone	
Alarm	After Smart 5 is confirmed, Alarm can be trigger by: <ol style="list-style-type: none"> Process Timeout Invalid Parameter Parameter logic error Any other scenarios like Tare Failed because of Motion.

- 5 Press the OK softkey  to confirm the entry.
- 6 In the **Discrete Inputs** or **Discrete Outputs** page, press the DELETE softkey  to delete a specific input or output assignment and press the CLEAR softkey  to clear the entire table.
- ➔ The **Discrete I/O** is configured.

4.3 Operating A Filling Process

An operation example is given to explain in detail the operation of Basic Auto Filling.

SmartTrac™, in a graphic display, provides the user with an additional indication of progress of the comparison between weight and the target weight.

- The Basic Auto Filling is enabled.



Figure 44: Start-up Screen

- 1 In the Active Values – Basic Auto Filling screen, load a configured target record from the Target Table, or create a target record. See [Configure the Target Table ▶ Page 49]
- 2 Assume the parameters are set as below: See [Configure Target Operation ▶ Page 52]
Target = 50 kg
Spill = 0.5 kg
Feed = 1 kg
Latching: Enabled
Feed Type: Independent
- 3 Press the START/RESUME softkey ▶. The START/RESUME and PAUSE softkeys show only when the function **Latching** is **Enabled**.
 ➔ The terminal starts the filling process.

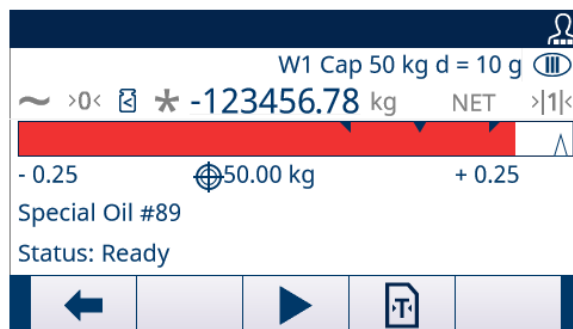
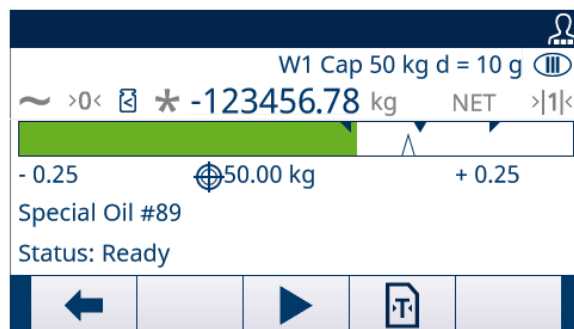
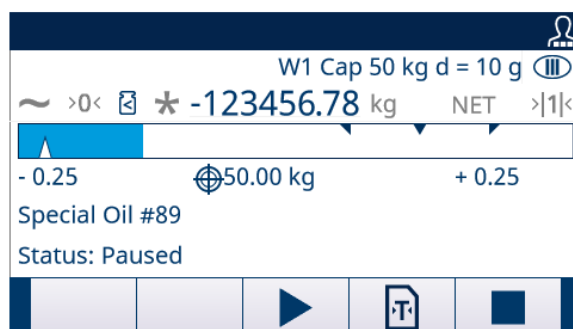
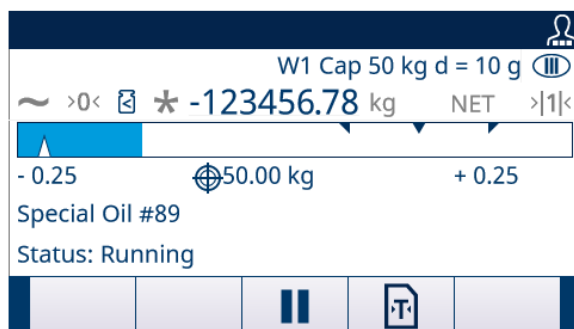
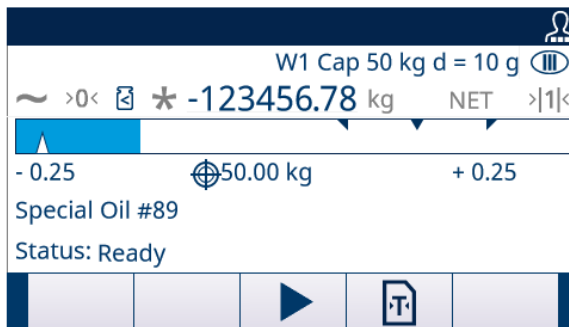



Figure 45: Filling Process








- 4 Fast Feed cycle starts first. When the filling reaches the threshold value 48.5 kg (Threshold value 1 = Target – Feed - Spill), Fast Feed cycle stops while Feed cycle starts operating.
 - 5 When the filling reaches the threshold value 49.5 kg (Threshold value 2 = Target – Spill), Feed cycle stops. The Spill amount is delivered into the vessel and the Target is reached.
 - 6 Press the START/RESUME softkey  to begin the next filling operation. If containers have to be changed after each cycle, the **Latching** function must be **Enabled**.
- ➔ A filling process is completed.

5 Drum Filling

The Drum Filling application for the IND500x adds lance control and the associated setup selections to the optional Fill Pac to provide a stand-alone solution for drum filling. Drum Filling only supports one material. During the drum filling process, the IND500x display includes the application-related operator feedback. To enable Drum Filling, the optional Fill Pac must be installed.















5.1 Softkeys and Icons









Softkeys on Start-up Screen

Icon	Name	Icon	Name
	Exit to Home Page		Number of Cycles
	Material Table		Start
	Setup		Login
	Next Page	-	-

Application Settings Icons






This table lists all of the icons for Application setting.

Icon	Name	Icon	Name
	Work Mode		Lance Control
	Lance Timing		Drip Pan Control
	Cycle Transition		Feed Settings
	Material Table		Cycles
	Timing		Container Tare
	Interlocks		Jog
	Feed Alarm		Tolerance Acceptance

Icon	Name	Icon	Name
	Action Log		PAC Statistics
	Overfill Adjustment		Autospill Adjustment
	Auxiliary Output		Discrete Inputs
	Discrete Outputs		Advanced Settings

Soffkey Icons in Sequence

In addition to the new soffkeys available at the home screen, there are also a few new soffkeys that are shown within cycle sequence.

Icon	Name	Icon	Name
	Start		Stop
	Pause		Manual Accept
	Jog	-	-

5.2 Configuration

This chapter provides information about how to configure the IND500x terminal's operating system with the Drum Filling functionality. Functions can be enabled, disabled, or defined by entering parameter values in specific setup screens.

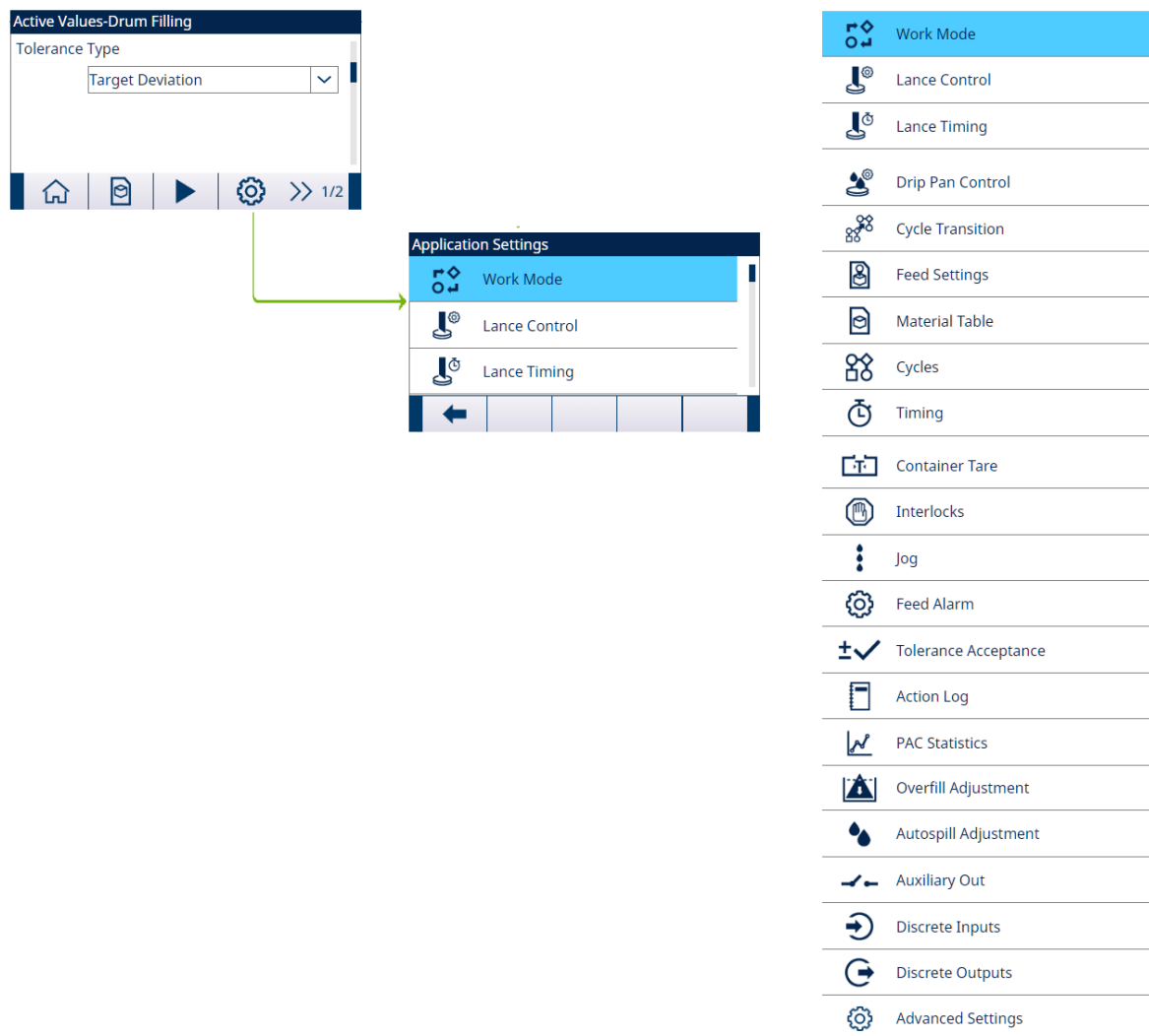


Figure 46: Application Settings

5.2.1 Start Filling with Active Target

- The Active Values – Drum Filling screen shows. Refer to [Application Entry ▶ Page 5].
- 1 Press the UP and DOWN navigation keys (▲▼) to select the specific field and set the Active Values. Tare configuration screens only show when **Cycle Tare** is **Enabled** or **Container Tare** is **Enabled**.

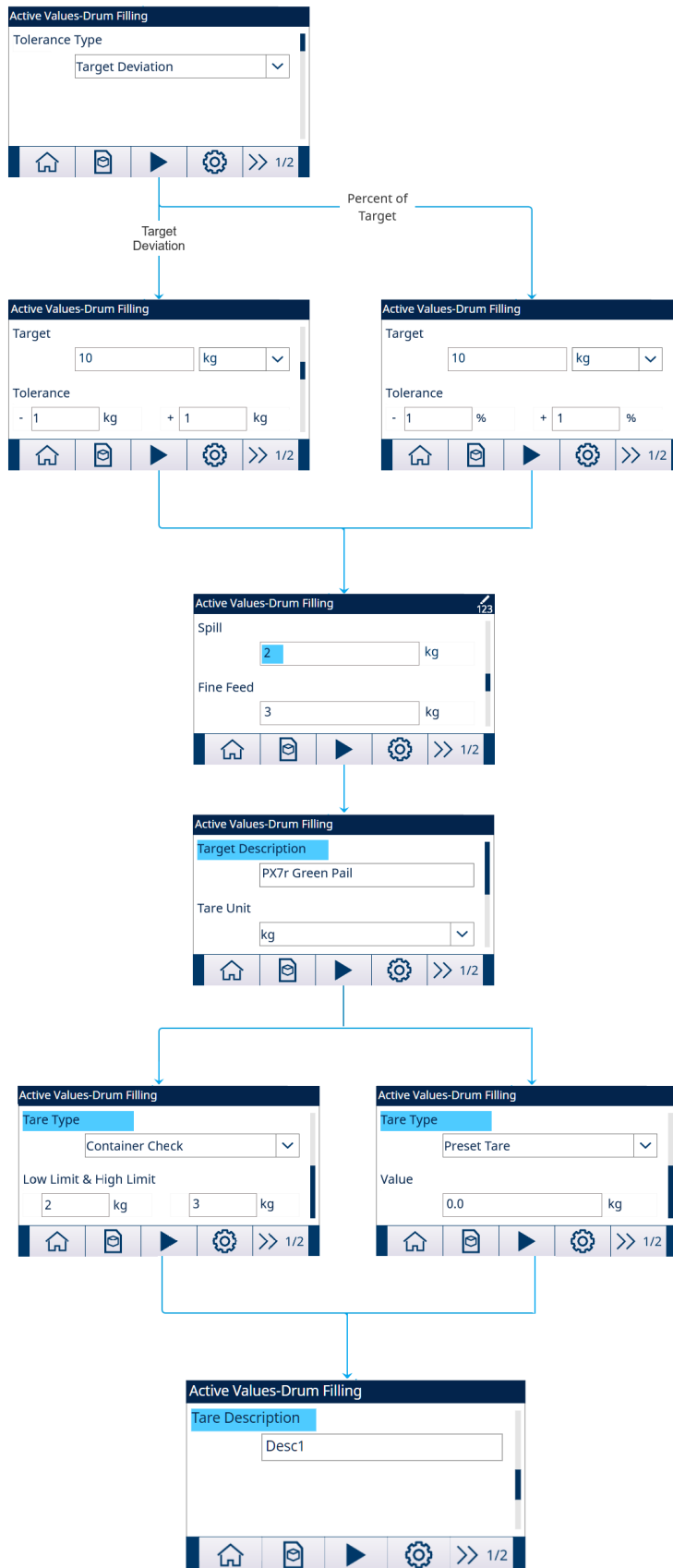




Figure 47: Active Values

- 2 Press the START softkey .
- ➔ Filling is started with Active Target.


5.2.2 Select Active Target Material from the Material Table

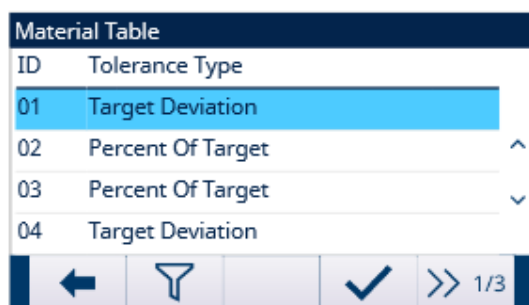
The Material Table can store a maximum of 199 Material records. See [Material Table ▶ Page 64]

The Operator can use the MATERIAL TABLE softkey  in the Application start-up screen to load a material record from the Material Table, while the Administrator or Supervisor can use this softkey to set the Material parameters.

List Selection







When ID of the Material Table record to be loaded is unknown, the List Selection mode is to be used.

- 1 Press the MATERIAL TABLE softkey  in the start-up screen.
 - ➔ The **Material Table** screen shows.




ID	Tolerance Type
01	Target Deviation
02	Percent Of Target
03	Percent Of Target
04	Target Deviation

Figure 48: **Material Table**

- 2 Press the FILTER OFF softkey .
- 3 In the Material Search page, use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all Material Table records.
- 4 Press the OK softkey .
 - ➔ The filtered material records show. Records are ordered by date and time with the most recent record shown last.
- 5 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted. In this screen, user also can press the FILTER ON softkey  to renew the search information, or press the FILTER CLEAR softkey  to clear the search information.
- 6 Press the OK softkey  to load the selected record from the list.
- 7 Press the Exit softkey  to return to the weighing operation screen without loading the record.
 - ➔ A material record is selected.

Quick Search

When ID of the Material Table record to be loaded is known, the Quick Recall mode is to be used.

- 1 In the **Material Table** screen, use the numeric keypad to enter the ID and then press ENTER key to load the record.
 - ➔ If the record is available, the data is loaded.
 - ➔ If the record is not found, a message "ID not found" shows.
- 2 Press the OK softkey .
 - ➔ A Material record is searched.

5.2.2.1 Set Parameters via Shared Data Server Connection or PLC Communication

Material record can be recalled from the memory table using the Shared Data Server commands.


- The Material record ID to be recalled is specified.
 - 1 Log into the Shared Data server.
 - 2 Write the numeric ID (a three-digit value from 1 to 199) of the record to be recalled from Material Table to Shared Data field qc0190.
 - 3 Write X to qc0190 X (X is the desired record ID).

- 4 Write a 11 to Shared Data field qc0189.
 - ➔ Terminal recalls the record ID written to qc0190 from the Material Table, and load active Target Material with the record of that ID in the Material Table.

5.2.3 Configure the Number of Cycles

If the function Track Cycles is enabled (see [Cycles ▶ Page 21]), the Number of Cycles softkey  becomes available on the start-up screen to program the number of cycles to be tracked.

Number of Cycles allows programming of a certain number of fill cycles before an operator message is shown indicating the number of cycles is complete. New cycle is not allowed if Cycles Remaining equals to 0, unless reset.

- 1 Press the **Number of Cycles** softkey  in the start-up screen.
- 2 Enter the desired value in the field **# of Cycles**.

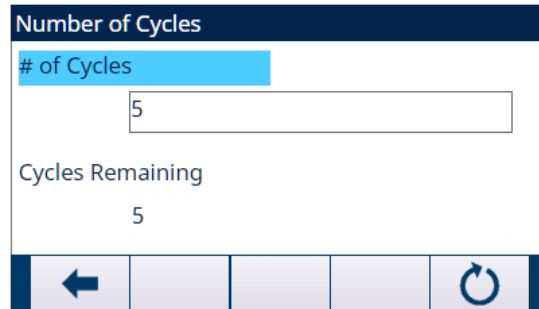


Figure 49: Number of Cycles



- ➔ The initial value of **Cycles Remaining** is the same as **# of Cycles**.
- ➔ The **Number of Cycles** is configured.

5.2.4 Application Settings

5.2.4.1 Set Work Mode

Two different Work Modes are supported in Drum Filling:

- Manual
- Top Fill

- 1 In the start-up screen of Drum Filling, press the SETUP softkey .
- 2 In the Application Settings page, select  **Work Mode**.
 - ➔ The **Work Mode** screen displays.
- 3 Select the desired **Work Mode** in the dropdown menu.

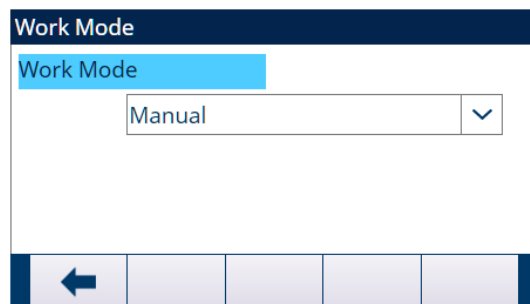


Figure 50: Work Mode

When the Drum Filling sequence begins, the steps that the terminal will follow are determined by the Work Mode selection.


The display will indicate the status of the filling cycle and provide operator information throughout the filling sequence. The target control operates the same as the Advanced Auto Filling.

A print can automatically be triggered at the end of the fill and accumulation of the filled weight is possible.

5.2.4.2 Lance Control

When the Work Mode is set as Manual, this setting item does not show in the Application Settings screen.

- The Work Mode is set as **Top Fill**.

- 1 Select  **Lance Control** in the Application Settings screen.
- 2 Enter a value of 10% Scale Capacity in the field **Misalignment Weight**.
This value is used to determine if the lance hits the container during lowering into the container.

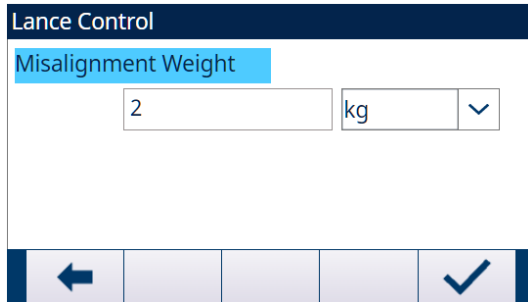


Figure 51: **Lance Control**


- 3 Select the necessary unit in the dropdown list.
Options: g / kg* / lb / t / ton / oz

5.2.4.3 Lance Timing

The Lance Timing is used to configure the timing of Lance Control.

When the Work Mode is set as Manual, this setting item does not show in the Application Settings screen.

- The **Work Mode** is set as **Top Fill**.

- 1 Select  **Lance Timing** in the Application Settings screen.
- 2 Enter the value 1 to 9999 (0.1 to 999.9 seconds) in the field **Max. Lance Time**.
The value 0 [default] means **Max. Lance Time** is disabled.

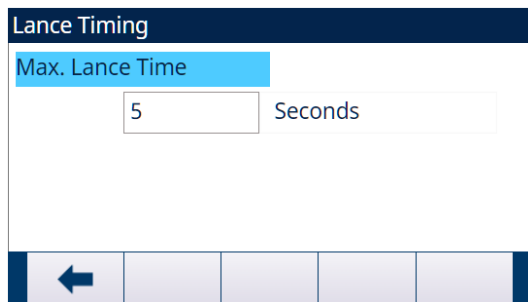


Figure 52: **Lance Timing**


- ➔ This value defines the maximum time to lower the lance from the UP position to the DOWN position or to raise the lance from the DOWN position to the UP position.

5.2.4.4 Drip Pan Control

Some drum filling devices need control of extension and retraction of the Drip Pan to avoid drip pollution.

When the Work Mode is set as Manual, this setting item does not show in the Application Settings screen.

- The **Work Mode** is set as **Top Fill**.

- 1 Select  **Drip Pan Control** in the Application Settings screen.

- When the **Drip Pan** is controlled by Terminal, set **Drip Pan Control** as **Enabled**.

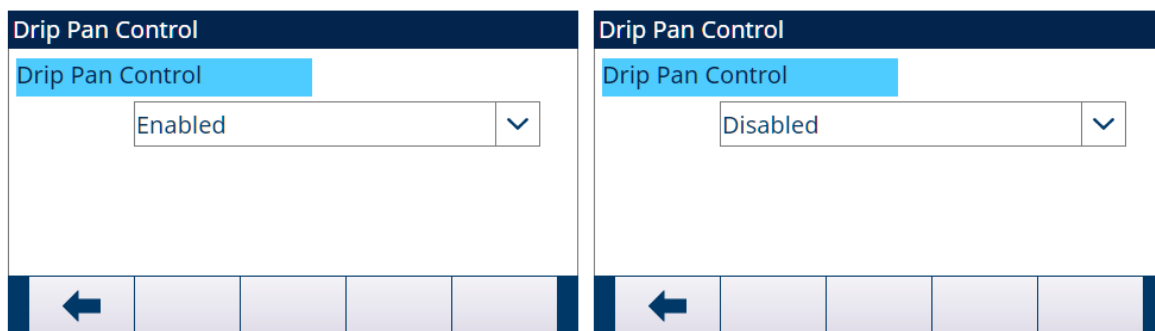



Figure 53: **Drip Pan Control**

- When there is no **Drip Pan** or the **Drip Pan** is mechanically controlled in raising or lowering Lance procedure, set **Drip Pan Control** as **Disabled**.

5.2.4.5 Cycle Transition

The Drum Filling can be programmed to continue between the Fill cycles automatically or semi-automatically.

- Select  **Cycle Transition** in the Application Settings screen.
- To set the parameters, refer to the table that follows.
 - ➔ These parameters affect how the sequence operates.

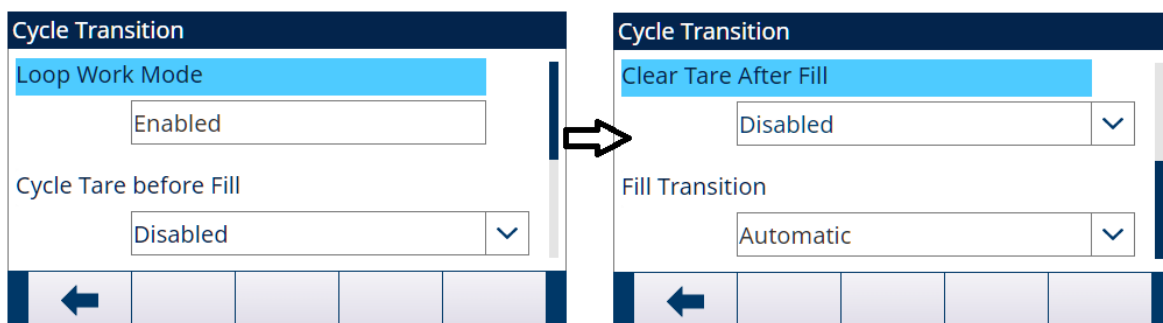



Figure 54: Cycle Transition

Configuration Item	Options	Effect
Loop Work Mode	Enabled	The whole work mode repeats after the work mode cycle is finished.
	Disabled	The work mode does not repeat after the cycles in a Work Mode is finished.
Cycle Tare before Fill	Enabled	<ul style="list-style-type: none"> An automatic tare is performed before starting the Fill. This feature provides a trigger to perform an automatic tare during the sequence such as before a filling cycle. To make the sequence operate automatically without operator intervention, this parameter should be enabled.
	Disabled	An automatic tare is not performed.
Clear Tare After Fill	Enabled	The tare is cleared at the end of the Fill cycle.
	Disabled	The tare is not cleared at the end of the Fill cycle.

Configuration Item	Options	Effect
Fill Transition	Semi-automatic	
	Automatic	

5.2.4.6 Feed Settings

Records in Feed Settings can't be added or deleted.

For the Work Mode of Manual and Top Fill, only one record is available for editing in the Feed Settings screen.

- 1 Select  **Feed Settings** in the Application Settings screen.



Figure 55: **Feed Settings**

- 2 In the **Feed Settings** page, press the EDIT softkey  to edit the existing Feed record.

- ID

Material ID in Material Table

- Name

Material Name

- # of Feeds

1: Only Feed

2: Fast Feed and Feed

- Feed Type

This parameter is only applicable in two-speed system. For one-speed control it is meaningless.

In a two-speed system (for instance, Fast Feed/ Feed), it determines the relationship between outputs (signal-controlled external equipment such as valves and agitators).

Concurrent: During Fast Feed cycle, both Fast Feed and Feed are On.

Independent: During Fast Feed cycle, only Fast Feed is On.

For one-speed system, only use Feed output for filling.



5.2.4.7 Material Table

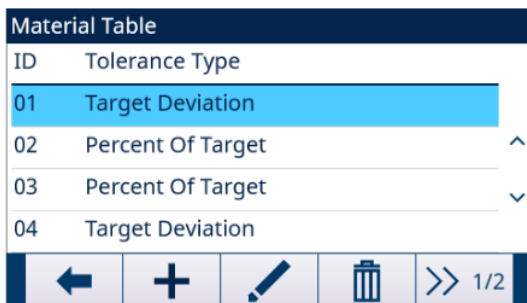
The Material Table is used to quickly select the filling tasks. As a combination of Target Table and Tare Table, user can add, edit, or delete items within the table.

Only the roles of Administrator and Supervisor are authorized to edit the Material Table pages. The role of Operator does not have the access right.

Edit or Add A Material Record

- Access Level: Administrator/Supervisor

1 Press the EDIT softkey  to open the setup screen for editing a record or press the ADD softkey  to open the setup screen to create a new table record.

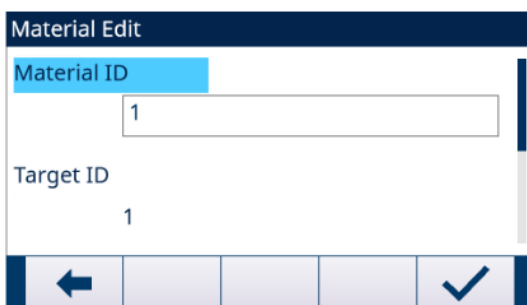


ID	Tolerance Type
01	Target Deviation
02	Percent Of Target
03	Percent Of Target
04	Target Deviation

Toolbar: Back, Add (+), Edit (pencil), Delete (trash), Next (1/2)

Figure 56: Material Table

2 Enter a Material ID.




Material Edit

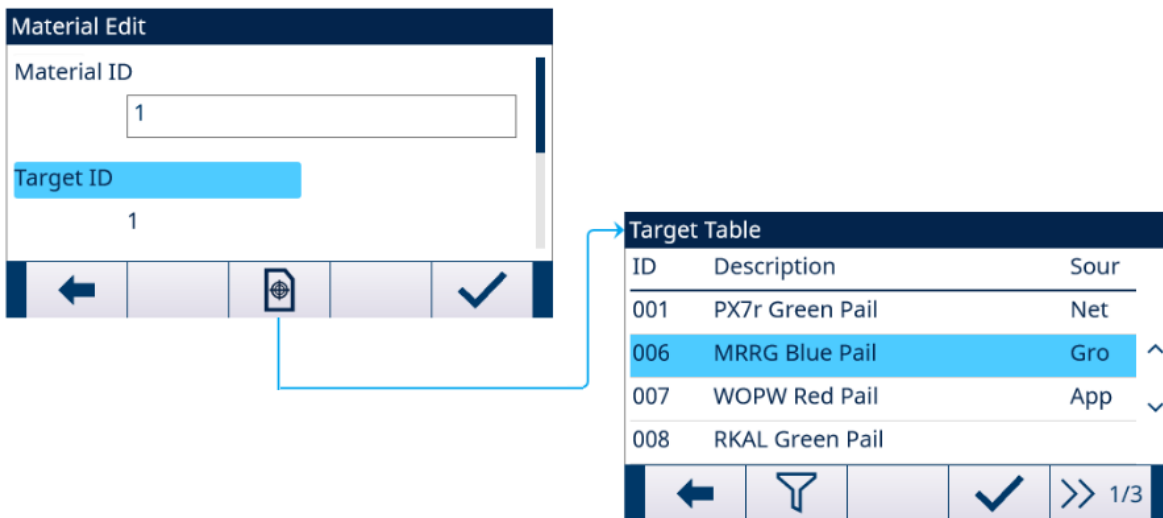
Material ID:

Target ID:

Toolbar: Back, Add (+), Edit (pencil), Delete (trash), Confirm (checkmark)

Figure 57: Material ID

3 In the **Material Edit** page, when Target ID is highlighted, press the TARGET TABLE softkey  to open the **Target Table** page and select a Target record or add a Target record. See [Configure the Target Table ▶ Page 17]



Material Edit

Material ID:

Target ID:


Toolbar: Back, Add (+), Target Table (target icon), Confirm (checkmark)

Target Table

ID	Description	Sour
001	PX7r Green Pail	Net
006	MRRG Blue Pail	Gro
007	WOPW Red Pail	App
008	RKAL Green Pail	

Toolbar: Back, Filter (funnel), Confirm (checkmark), Next (1/3)

Figure 58: Material Edit - Target Table

- In the **Material Edit** page, when **Tare ID** is highlighted, press the TARE TABLE softkey  to open **Tare Table** page and select a Tare record or add a Tare record. The **Tare Table** is used to store all the Tare information. The **Tare Table** here is a shared table, which is concurrently used in different applications. Tare configuration only shows when **Cycle Tare** [see [Cycle Transition ▶ Page 12]] and **Container Tare** [see [Container Tare ▶ Page 24]] are **Enabled** at the same time. See [Configure the Tare Table ▶ Page 20]

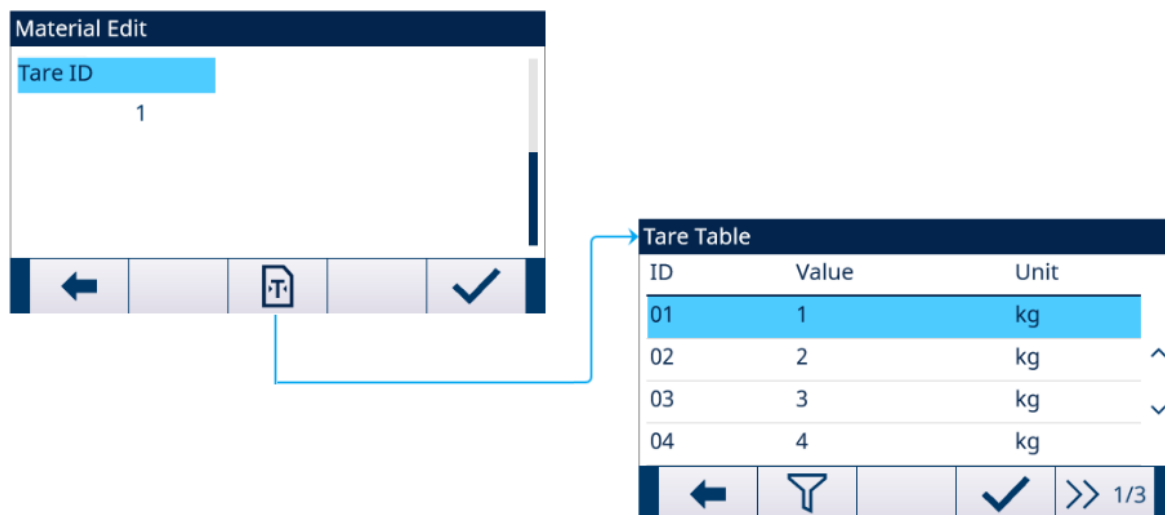







Figure 59: **Material Edit - Tare Table**

➔ The **Material Table** parameters are set.

ID	Tolerance Type	Target	Unit	+Tolerance	-Tolerance	Spill	Fine	Totalization Type	Target Description	Tare Value	Unit	Low Limit	High Limit	Tare Description
01	Target Deviation	10	kg	0.5	0.5	1	2	Net Weight	PX7r Green Pail	1	kg	0	0	Desc1
02	Percent Of Target	11	kg	0.5	0.5	1	2	Gross Weight	MRRG Blue Pail	2	kg	0	0	Desc2
03	Percent Of Target	10	kg	0.5	0.5	1	2	Gross Weight	WOPW Red Pail	0	kg	2	5	Desc3
04	Target Deviation	10	kg	0.5	0.5	1	2	Net Weight	PX7r Green Pail	3	kg	0	0	Desc3

Figure 60: **Material Table** Parameters

- Press the OK softkey  to accept the modifications or additions to the **Material Table**.
 - Press the EXIT softkey  to return to the previous page without saving modifications or additions.
 - Press the DELETE softkey  to delete a material record in the list.
 - Press the TRANSFER softkey  to generate **Material Table** reports to any connection with a Reports assignment.
 - Press the RESET softkey  to clear all configuration change records.
- ➔ The **Material Table** is configured.

5.2.4.8 Cycles

The Cycles setup page provides a selection to enable or disable tracking based on the number of cycles run. At this point, additional Filling cycles are prohibited until the number of cycles is reset.

- Select  **Cycles** in the Application Settings screen.

2 Select to Enable or Disable the **Track Cycles** function.

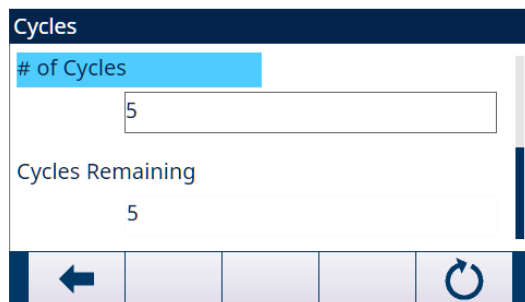
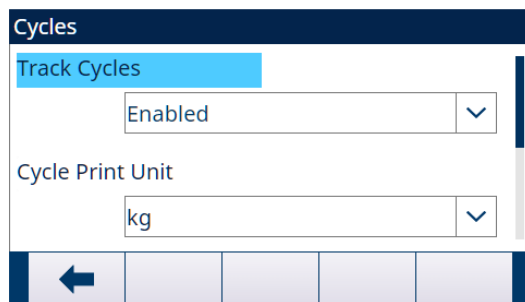
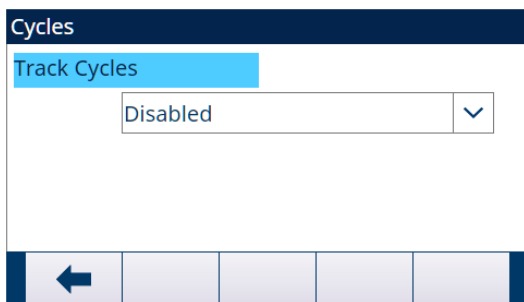




Figure 61: **Cycles**

3 If the **Track Cycles** function is **Enabled** , set the **Unit** used in Cycle-triggered Demand Print and the **# of Cycles**.

- ➔ The **# of Cycles** set in this page is the same as the one set through the **Number of Cycles** softkey  in the Application start-up screen.
- ➔ The RESET softkey  in this page is used to clear the **# of Cycles** value set.

When the number of cycles is completed, a message pops up. One complete "cycle" is determined based on the Work Mode selected.

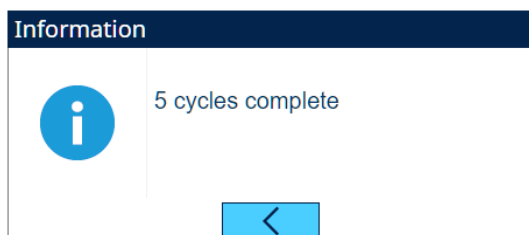


Figure 62: Cycles Completed

5.2.4.9 Timing

Timing parameters are related to the sequence steps in Work Mode. Application display shows Timing is counting down when Timing works (e.g., Start Delay).

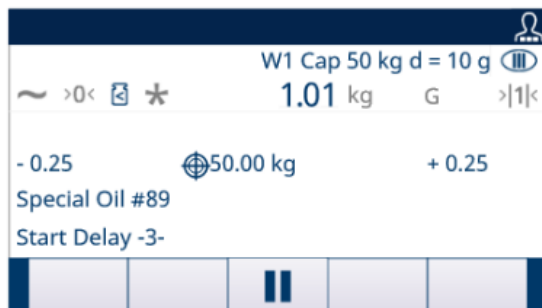



Figure 63: Timing

- 1 Select  **Timing** in the Application Settings screen.
- 2 To set the **Timing** parameters, refer to the table **Timing Configuration**.

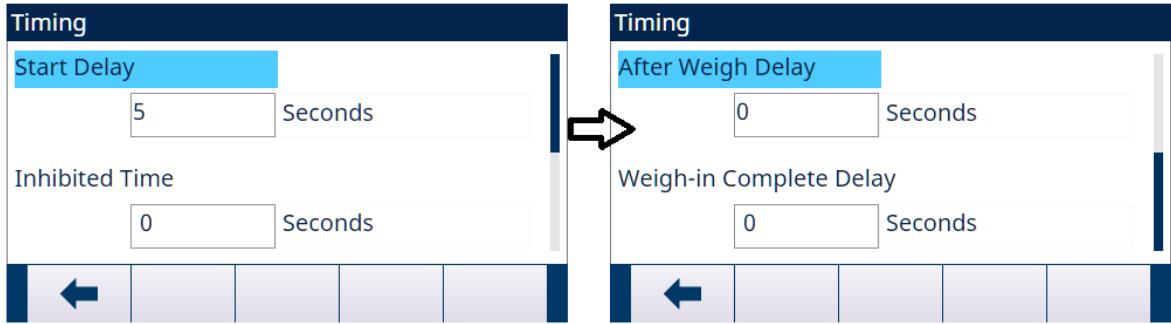



Figure 64: Timing

Timing Configuration	
Parameter	Description
Start Delay	<ul style="list-style-type: none"> Delay the start of the cycle after the Start softkey  is pressed. Values from 0 to 999 seconds can be entered. Enter 0 to start immediately If a Start Delay is programmed, the Start Delay Output (if programmed) turns "On" during the Start Delay time.
Inhibited Time	<ul style="list-style-type: none"> When Filling switches from Fast Feed cycle to Feed cycle, a mechanical impact or falling material impact works on Scale, and the weight during this interval is unbelievable. Delay Inhibited Time defines time before target comparison. Values from 0 to 999 seconds can be entered.
After Weigh Delay	<ul style="list-style-type: none"> Used for Tolerance Check. Delay the tolerance test at the end of a weigh cycle. This could be used to allow pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels. During the delay, terminal counts down the remaining delay time. Values from 0 to 999 seconds can be entered. If an After Weigh Delay is enabled, the After Weigh Delay Output (if programmed) turns "On" during the delay time.
Weigh-in Complete Delay	<ul style="list-style-type: none"> Used only to designate an amount of time that the Complete: Fill is turned On after the completion of the Weighing (Fill). When the weigh-in transition is set to Semi-automatic, the Complete: Fill remains On while the sequence is holding, until the operator acknowledges by pressing the OK softkey. Values from 0 to 99 seconds can be entered.

5.2.4.10 Container Tare

When the programmed Fill cycle involves placing an empty container onto the scale before it is filled, the weight of the empty container can be evaluated to confirm that the correct container is placed on the scale. This is done by enabling Container Tare and Tare ID in a Material Table record.

- 1 Select  **Container Tare** in the Application Settings screen.
- 2 Select to Enable or Disable **Container Tare** function.



Figure 65: Container Tare

If a non-zero tare value is entered into the record, this weight is used as the tare weight for the container.

If the tare value field is "0" and values are entered into the fields Low Limit and High Limit, then Container Tare Checking is enabled. The gross weight of the container on the scale must satisfy Container Tare Checking OK Condition, otherwise the message "Paused - Invalid Tare" shows in status Line.

If any other error, e.g. Tare Failed-Motion, Tare Failed-Over Capacity, etc., happens when Tare is triggered, the information, e.g. Tare Failed-Motion, Tare Failed-Over Capacity, etc., shows in System Line, and the message "Paused - Invalid Tare" shows in the Status Line.

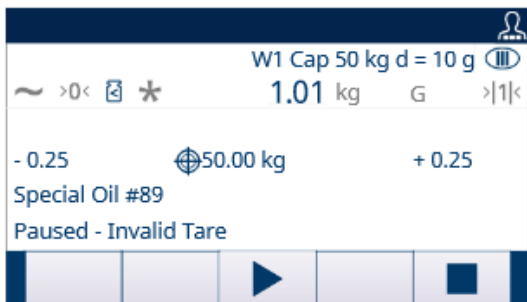


Figure 66: Paused - Invalid Tare

5.2.4.11 Interlocks

This signal can be used to prevent the start of a Fill cycle if required containers or control measures are not in place.

- Select **Interlocks** in the Application Settings screen.

In the Interlocks page, select to Enable (by One-Time Detection or Continuous Monitoring) or Disable the OK to Weigh-in function.

One-Time Detection: Filling starts upon one-time signal input.

Continuous Monitoring: Filling operates upon continuous signal input. When the signal stops, the filling task is paused.

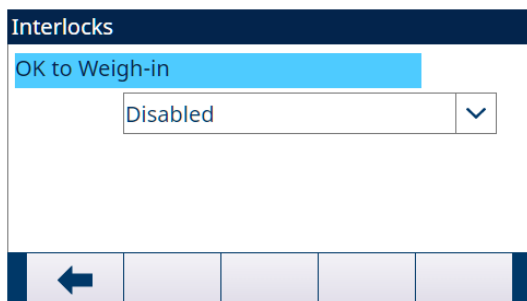


Figure 67: Interlocks - OK to Weigh-in

- If **OK to Weigh-in** is Enabled, make sure that the related Weigh-in discrete input is "On".
 - ➔ If the **OK to Weigh-in** signal is not present, an error display is shown and the sequence is paused.

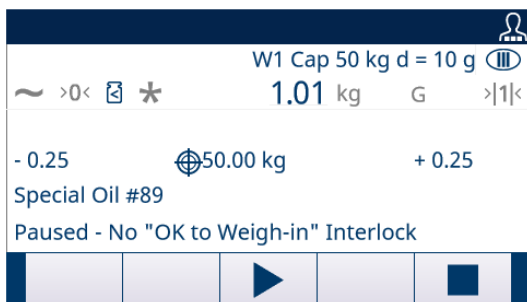


Figure 68: No Interlocks Discrete Input

- ➔ Operator must press the Start / Resume softkey to retest the Interlocks again, or press the Stop softkey to stop the Work Mode.
- ➔ The sequence will not continue until the problem is fixed and the interlock input is received by the terminal.

5.2.4.12 Jog

If the programmed spill value is too large and the Feed output turns off too soon, the final weight will not be within tolerance. In this case, the Jog function can be used to manage under-fill and slowly feed additional material to reach the tolerance value.

1 Select **Jog** in the Application Settings screen.

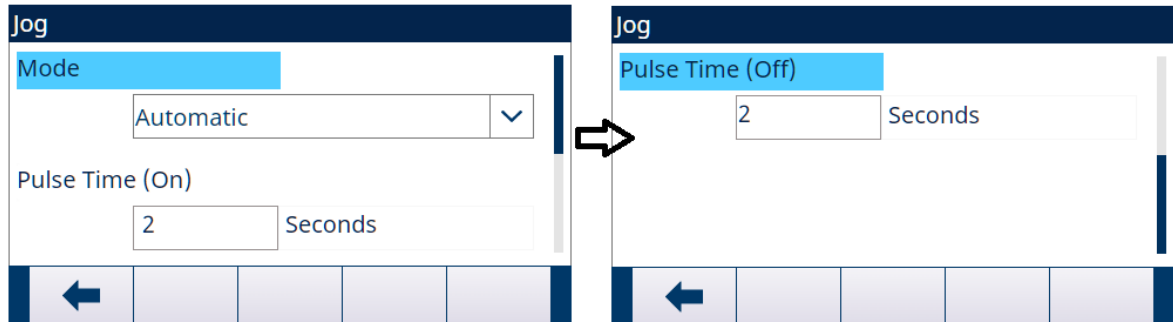


Figure 69: Jog

2 To set the **Jog** parameters, refer to the below table.

Parameter	Options	Effect
Mode	Disabled	The Jog function does not work.
	Automatic	When a weight is below the low tolerance range, the Jog function is initiated automatically and repeats until the weight is within tolerance.
	Manual	<ul style="list-style-type: none"> This procedure is performed manually by pressing the Jog softkey J or by programming a discrete input as a jog function. Each time the manual Jog function is initiated, it runs one pulse on/off cycle. The Jog softkey J is to be pressed multiple times to reach the lower tolerance level.
Pulse Time (On)	-	This parameter controls how long the jog pulse stays "On" in seconds.
Pulse Time (Off)	-	<ul style="list-style-type: none"> This parameter controls how long of a pause is between jog pulses in seconds. In manual Jog mode, the Jog softkey J will not work again until this time expires.

5.2.4.13 Feed Alarm

Feed Alarm function is used to ensure that a change in weight occurs over a period of time. Feed Alarm could indicate process issues such as a hole in the receiving vessel, clogged delivery valve, etc.

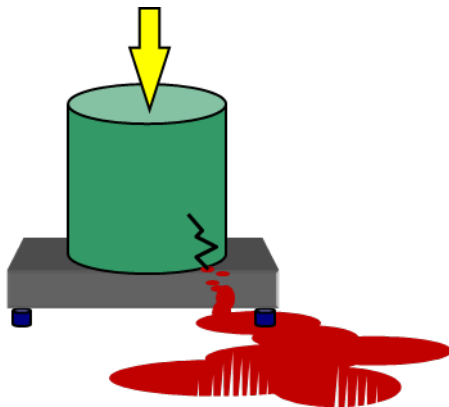



Figure 70: Feed Alarm

- 1 Select  **Feed Alarm** in the Application Settings screen.
- 2 To set the **Feed Alarm** parameters, refer to the below table.

Parameter	Description
Initial Feed Timeout	If Fast Feed and Feed are both involved in the filling, terminal checks weight change during both Fast Feed and Feed.
Initial Feed Weight Changed	<ul style="list-style-type: none"> • The minimum Initial Feed Weight Changed • For Fill cycle, if weight < Round (initial weight + Initial Feed Weight Changed), then Alarm.
Unit	g/kg/lb/t/ton/oz
Process Timeout	Top Fill Work Mode: <ul style="list-style-type: none"> • Monitor the time for fill. • Test the time from the raising edge of start Delay to falling edge of Complete. When terminal is in state of Holding, this time interval is not accumulated into process Timeout.

If Feed Alarm occurs during sequence, the screen displays as below.



5.2.4.14 Tolerance Acceptance

The IND500x provides various controls based on Tolerance Acceptance.

Setup

The parameters to be set for Tolerance Acceptance are defined as below:

Parameter	Options	Effect
Manual Accept	Disabled	<ul style="list-style-type: none"> • The cycle automatically aborts when an Out of Tolerance condition is determined. • The number of cycles is not consumed.
	Enabled	An Out of Tolerance message shows and the operator must either accept the Out of Tolerance weight or reject it. If accepted, the cycle continues. If rejected, the cycle aborts.
	Auto Continue	Even if Out of Tolerance condition is determined, the next cycle continues directly.
Zero Tolerance Value	-	<ul style="list-style-type: none"> • This sets the weight value that the weight must be within (from gross zero) to start a Fill cycle. • Zero Tolerance Value should be smaller than the value of (Target - Spill). • This field only shows when Cycle Tare Before Weigh-In is Disabled, and Work Mode includes Fill.

Other Features Related to Tolerance Acceptance

- Jog
- Overfill Adjustment
- Tolerance Check

The table that follows explains how these features work.

Manual Accept	Out of Tolerance	Operation
Enabled	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press the Tolerance Acceptance softkey $\pm\checkmark$. Press \checkmark to continue next cycle or press \times to abort the cycle. Tolerance OK after Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark (added into Cycle Count In Tolerance) to continue next cycle or press \times (added into Cycle Count Out of tolerance - rejected) to abort the cycle.
	Under Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Tolerance Acceptance message shows directly. Press \checkmark to continue next cycle or press \times to abort the cycle. Manual Jog <ul style="list-style-type: none"> Press the Tolerance Acceptance softkey $\pm\checkmark$. Press \checkmark to continue next cycle or press \times to abort the cycle. Tolerance OK after Manual Jog <ul style="list-style-type: none"> Press \checkmark (added into Cycle Count In Tolerance) to continue next cycle or press \times (added into Cycle Count Out of tolerance - rejected) to abort the cycle. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Press \checkmark to continue next cycle or press \times to abort the cycle.
Disabled	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark to confirm the adjustment. Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Tolerance Acceptance message shows directly. Press \checkmark to confirm that cycle will be aborted.
	Under Tolerance	<ul style="list-style-type: none"> Manual Jog <ul style="list-style-type: none"> Press \checkmark to confirm the Manual Jog. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Press \checkmark to confirm that cycle will be aborted.
Auto Continue	Over Tolerance	<ul style="list-style-type: none"> Manual Overfill Adjustment <ul style="list-style-type: none"> Press \checkmark to confirm the adjustment. Manual Overfill Adjustment Disabled <ul style="list-style-type: none"> Next cycle starts directly.
	Under Tolerance	<ul style="list-style-type: none"> Manual Jog <ul style="list-style-type: none"> Press \checkmark to confirm the Manual Jog. Automatic Jog <ul style="list-style-type: none"> No operation necessary. Jog Mode Disabled <ul style="list-style-type: none"> Next cycle starts directly.

5.2.4.15 Action Log

When the Work Mode is set as None, this setting is not configurable and the message "Function Disabled" shows.

When Fill Pac is installed, the IND500x provides the ability to log certain actions that occur during the weigh-in and weigh-out cycles into an Action Log.

The Alibi memory and Action Log can exist simultaneously. In certain applications where the Alibi memory is required, the Action log file cannot be used. It is also possible to program an Action Log Output connection that sends each record out a programmed port as the action is logged. Action Log Output connection can be assigned in a Connection in Setup>Communication>Connection.

Action Log is Enabled in the  Action Log screen in Application Settings.

File Structure

The file is an encoded binary file and each record in the Action Log file is 9 bytes long. Approximately 150,000 records can be stored in the log file.

Each record includes:

- Date and time stamp fields
- An action code.
- Check digit



This log file can then be viewed at the terminal, and this log file as well as its .csv format file **act_log1.csv** can be exported via FTP or shared data server using the 1K Xmodem protocol.

Logged Actions

Each action is recorded by its action code. If enabled, the following actions are logged when they occur.

Action Code	Logged Action	Action Code	Logged Action
1	Start Fill Cycle	11	Accept Out of Tolerance
6	Cycle Paused	12	Reject Out of Tolerance
7	Cycle Resumed	13	Auto Continue Out of Tolerance
8	Cycle Aborted	14	Start Manual Jog
9	Tolerance OK	15	Overfill Adjustment
10	Out of Tolerance	-	-

Search Action Log

- 1 In the Action Log page, press the View Table softkey  .
 - ➔ The Action Log Search page shows.
- 2 Use the Search Field 1 selection box and associated data fields to enter specific search information to limit the search.
- 3 Press the Search softkey  .
 - ➔ Action Log Search View page shows.

Print Action Log

It is not possible to print the whole Action log file at once, but each record can be printed as it occurs if a connection is configured (in setup at Communication > Connections) with an assignment of Print Proxy Output. Each record provides the date, the time and the Action log text, and is 40 characters long.

A sample of this print is shown below:

- 04-Aug-2020 11:06:25 Start Fill Cycle
- 04-Aug-2020 11:07:25 Cycle Paused
- 04-Aug-2020 11:08:25 Cycle Aborted

5.2.4.16 Pac Statistics

Pac Statistics determines whether the Drum Filling will track statistics during the Work Mode cycle.

- Pac Statistics can be viewed, printed, exported by FTP or by serial port or Ethernet using the 1K Xmodem protocol and the Parameter server.

- The Pac Statistics data exist in a file and is updated each time a new cycle is completed or aborted and new information is available. The file is named "**Pacstat1.txt**" and is located in the RAM:/ folder of the IND500x.
- Pac Statistics is Enabled in [View/Transfer/Reset Pac Statistics](#) screen in Application Settings.

The statistical information available includes:

Statistic	Description
Total weight	Total Weight of latest 50 Records.
Maximum weight	The largest weight of all weighments
Minimum weight	The smallest weight of all weighments
Medium weight	The final weight most often reached
Average weight	The mathematical average of all weighments
Standard deviation	The standard deviation of all weighment values
Minimum cycle time	The shortest weigh cycle time
Maximum cycle time	The longest weigh cycle time
Average cycle time	The mathematical average of all cycle times
Total cycle time	Statistical total cycle time
Cycle Count-in tolerance	The total number of weighments that were in tolerance
Cycle Count Out of Tolerance - accepted	The number of out of tolerance weighments that were accepted
Cycle Count Out of Tolerance - rejected	The number of out of tolerance weighments that were rejected
Cycle Count aborted	The number of cycles that were aborted
Out of Tolerance – Auto Continued	The total number of weighments that were automatically continued This occurs when <ul style="list-style-type: none"> • Manual Accept is Auto Continue • Weighment Out of Tolerance • Jog Mode Disabled or Manual Overfill Adjustment Disabled

View/Transfer/Reset Pac Statistics

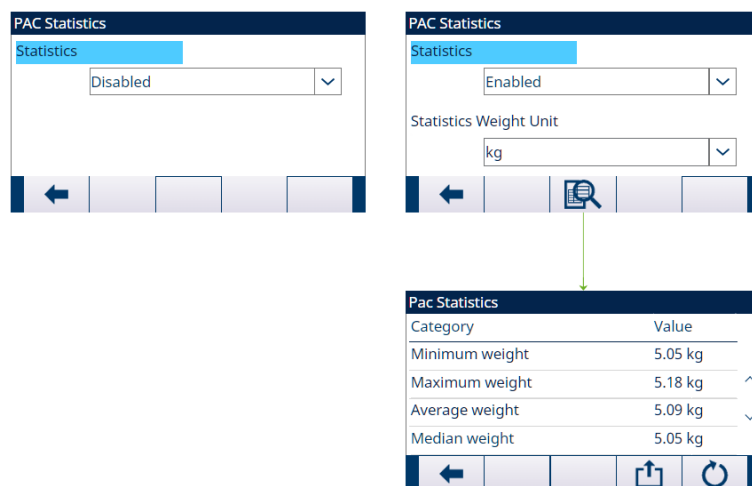


Figure 71 : Pac Statistics

- 1 Press the VIEW TABLE softkey . The **Pac Statistics** list is shown.
- 2 Press the TRANSFER softkey to transfer the **Pac Statistics** to any connection with a Reports assignment.
- 3 Press the RESET softkey to clear the **Pac Statistics**.

5.2.4.17 Overfill Adjustment

In certain applications, a Manual adjustment of an overfill condition is desirable while the final filled container (final weight) is still on the scale.

Overfill Adjustment is Disabled or set as Manual in the  Overfill Adjustment screen in Application Settings.

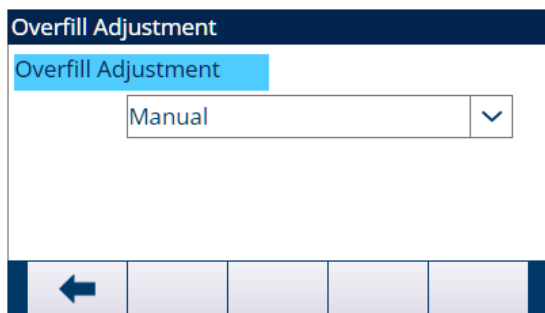


Figure 72: Overfill Adjustment

- If Overfill Adjustment is set as Manual and the final weight is over the upper tolerance limit, the operator is prompted to make a manual adjustment to the material and an OK softkey shows. After the manual adjustment, the operator must acknowledge the completion of the adjustment by pressing the OK softkey, the tolerance is then tested again.
- If Overfill Adjustment is Disabled, an **Out of Tolerance** condition occurs when the final weight is beyond the upper tolerance limit.

5.2.4.18 Autospill Adjustment

If the final weight of a weigh-in cycle or weigh-out cycle repeatedly fails to reach the exact target value, the Autospill Adjustment feature can be used to calculate a new spill value continuously to improve the accuracy of the process.

The number of cycles to average and a percentage of error to apply are programmable in the setup mode. After re-calculation, the new spill value can be kept in the active target record. Alternatively, a programmable option permits the value to be stored in the permanent Target Table record.

Averaging the error over several cycles and taking a smaller percentage of adjustment will provide a more accurate result over a period of time. For quicker results, fewer cycles can be averaged and a higher percentage of the error can be applied.

Setup

Autospill Adjustment is Enabled in the Autospill Adjustment screen in Application Settings.

The table that follows explains the items to be defined for Autospill Adjustment feature.

Configuration Item	Options	Description
Autospill Adjustment	Enabled	Selects to enable or disable the Autospill Adjustment.
	Disabled	
Cycles Averaged	-	<ul style="list-style-type: none"> • A value between "1" and "9" can be entered as the number of successful cycles to be averaged for a spill adjustment. • This parameter determines how many cycles should be averaged to determine the adjustment to the spill value. After an adjustment, this number of cycles must be run again before another adjustment is made.
Adjustment Factor	-	<ul style="list-style-type: none"> • A value between "1" and "99" percent can be entered as the adjustment factor for the spill adjustment. • This parameter determines what percentage of the calculated error will be applied to the spill value. For example, if the error is determined to be 0.1 kg after averaging 3 cycles, and the adjustment factor was programmed as 50%, then the spill value would be adjusted by 50% of the error or 0.05 kg.
Update Table	Enabled	Save adjusted spill values into the Target Table.
	Disabled	The adjusted spill values are only saved in the active target record.

5.2.4.19 Auxiliary Output

A separate Auxiliary Output signal can be triggered by weight threshold (gross weight) in either the weigh-in cycle or the weigh-out cycle (but not both) and terminated on weight or time duration. This signal can be used as a control for external devices such as a mixer or heater or other device adding additional control to the process.

The Auxiliary Output signal is configured in the Auxiliary Output screen in Application Settings to activate within a programmed weight range or for a certain amount of time after passing a programmed weight threshold.

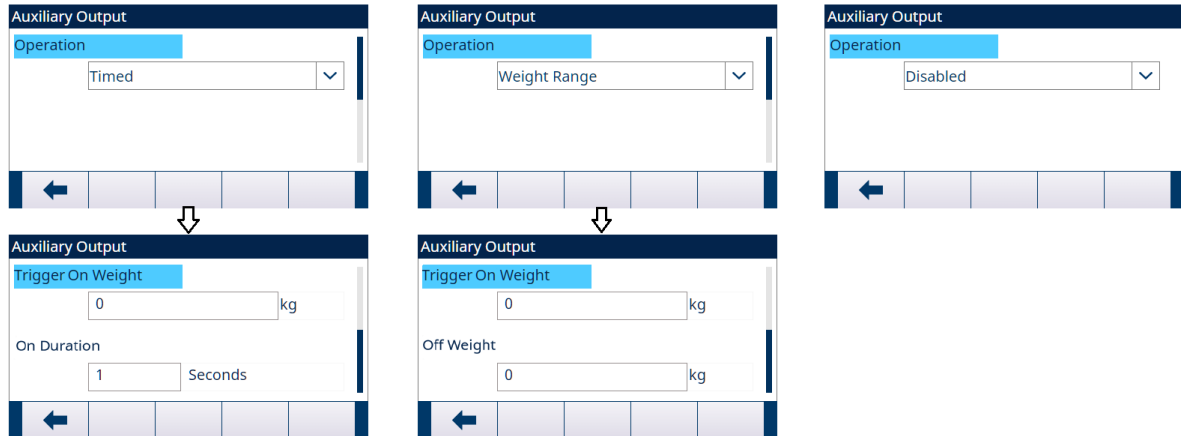


Figure 73: Auxiliary Output

The configuration items for Auxiliary Output are defined in the table that follows:

Configuration Item	Options	Description
Operation	Disabled	Auxiliary Output is Disabled.
	Timed	Auxiliary Output operates based on time.
	Weight Range	Auxiliary Output operates based on the weight within a certain weight range.
Trigger On Weight	-	<ul style="list-style-type: none"> This is the weight value that will trigger the start of the Auxiliary Output. A value between "0" and scale capacity can be entered as the trigger point to turn on the Auxiliary Output.
On Duration	-	<ul style="list-style-type: none"> This value determines how long the Auxiliary Output remains on. A value between "0" and "999.9" seconds can be entered.
Off Weight	-	When is Operation selected as Weight Range, this value determines the weight that turns the Auxiliary Output off.

Operation

Auxiliary Output starts working after the Active Cycle is really working.








If a new cycle is started before the Auxiliary Output completes its cycle, the Auxiliary Output will be turned off.


5.2.4.20 Configure Discrete I/O

5.2.4.20.1 Input

In some circumstances, it is necessary to perform filling tasks without pressing buttons on the terminal's front panel. This is achieved by configuring discrete inputs which correspond to the SmartTrac soffkey, Target Start/Resume and Target Pause/Abort soffkeys, so that filling can be controlled by remote devices.

Input Assignment Selections			
Input	Effect	Input	Effect

Input Assignment Selections			
Start/Resume	<ul style="list-style-type: none"> The Start Input for a Work Mode is equivalent to Start/Resume softkey  This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Start/Resume softkey in Filling softkey directly. 	OK Key	Duplicates the function of the console OK key  .
Pause/Abort	Equivalent to Pause softkey  or Abort softkey  .	No Key	Duplicates the function of the console No key  .
Silence Alarm	Turns the alarm output off.	Lance up	For Top Fill Work Mode: This input is used to indicate the lance is fully up and out of the container. This input must be ON to start a cycle and will activate the cycle complete signal at the end of the filling cycle.
OK to Weigh-in (Fill)	<ul style="list-style-type: none"> An input signal used to Indicate it is OK to begin and continue the weigh-in cycle Used as a "Container in Place" sensor. If assigned, input must be ON to begin the filling sequence. If signal is lost after initial use, cycle is paused and the [No OK to Weigh-in Signal] error is shown. 	Lance down	<ul style="list-style-type: none"> For Manual Work Mode: This input is set so the lance is positioned just inside the container for filling. The terminal monitors this input throughout the fill and pauses the fill if the input turns OFF. For Top Fill Work Mode: This position is set so the lance is into the container to reduce spillage but the lance is near the top of the container.
Jog	If manual jog is selected, this procedure is performed manually by pressing the weigh-in MANUAL JOG softkey  provided or by programming a discrete input as a jog function.	Drip Pan Retracted	For Top Fill Work Mode: Indicates the drip pan (if enabled) has been retracted and the lance can be lowered.
Manual Accept	<ul style="list-style-type: none"> Manual Accept Input determines to reject or accept the out of tolerance. Equivalent to Tolerance Acceptance softkey . This parameter can be triggered by 3 ways: <ul style="list-style-type: none"> Set parameter directly. PLC Command Press Tolerance Acceptance softkey directly. 	Drip Pan Extended	For Top Fill Work Mode: Indicates the drip pan (if enabled) has been extended and the lance can't be lowered.

1 Press the SETUP softkey  in the start-up screen of Drum Filling.

- In the Application Settings screen, select **Discrete Inputs**.
- In the **Discrete Inputs**, press the EDIT softkey to open the setup page for editing an existing input assignment or press the ADD softkey to add a new discrete input assignment.

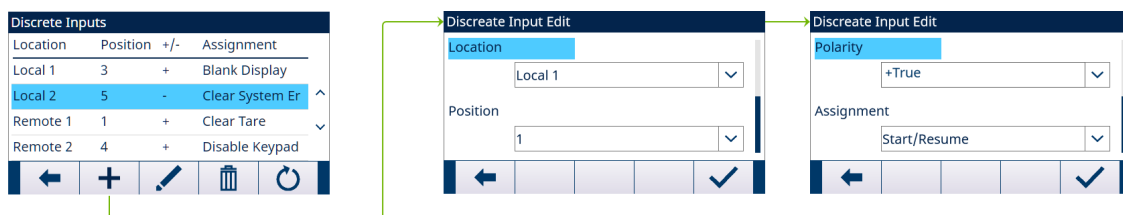






Figure 74: Discrete Inputs

- Enter the input assignment address.
Location: This field defines the Input is local or remote.
Position: This field defines position of the discrete input option assigned to a function.
- Select the **Polarity** as **+True** or **-True**.
- To select an input assignment, refer to the table **Input Assignment Selections**.
- Press the OK softkey to confirm the entry.

5.2.4.20.2 Output

Output Assignment Selections			
Output	Effect	Output	Effect
Under Zone	Indicates the final fill weight is under tolerance.	Over Zone	Indicates the final fill weight is over tolerance.
Tolerance OK	<ul style="list-style-type: none"> Indicates the final fill weight is within tolerance. Reset by end of Fill cycle. 	Extend Drip Pan	(Optional) Output to move the drip pan into the extended position when the lance is in the "Lance Up" position.
Alarm	Alarm can be trigger by: <ul style="list-style-type: none"> Starting weight invalid Autotare Fault Process Timeout Initial Feed Timeout Refill Timeout Dump Timeout Parameter Invalid Parameter Logic Error Material not enough 	Holding	<ul style="list-style-type: none"> When Weigh-in transition or Weigh-out transition is Semi-automatic, terminal holds at the end of Weigh-in cycle or Weigh-out cycle or each material feed and must be acknowledged before continuing When this status output is "On". it indicates the sequence is in a holding state or a paused state. Only one of the three status outputs (Ready, Running, Holding) will be on at one time.
Auxiliary Output	Used as a separate output control signal based on weight or time.	Fast Feed(For 2-speed only)	This output is not used in a one-speed fill weigh-in cycle. It turns "on" during the faster speed of a two-speed fill weigh-in cycle.
After Weigh Delay	When "On", indicates the After weigh delay timer is counting down.	Feed	This output turns "on" during a one-speed fill weigh-in cycle or during the slower speed of a two-speed fill weigh-in cycle.

Output Assignment Selections			
Start Delay	When "on", indicates the Start Delay timer is counting down.	Running	<ul style="list-style-type: none"> When this status output is "on", it indicates a Work Mode is running. Only one of the three status outputs (Ready, Running, Holding) will be on at one time.
Complete: Cycles	<ul style="list-style-type: none"> When this output is "On", indicates Track Cycles is Enabled and the number of programmed cycles has been completed (Cycles Remaining <1). If Weigh-in/out transition is Semi-automatic, output is "on" when the cycle is Holding until operator presses OK. If Weigh-in/out transition is Automatic, output is "on" for the amount of time programmed in the Weigh-in Complete in Timing Setting. 	Lower Lance	<ul style="list-style-type: none"> Signal to the lance control to lower the lance. Turns ON until the Input "Lance Down" signal is ON. This signal is not pulsed like the Raise Lance signal.
Complete: Fill	<ul style="list-style-type: none"> If Weigh-in transition is Semi-automatic, output is "On" when the cycle is Holding until operator presses OK. If Weigh-in transition is Automatic, output is "On" for the amount of time programmed in the Weigh-in Complete in Timing Setting. 	Raise Lance	<ul style="list-style-type: none"> Signal to the lance control to raise the lance at the end of the filling sequence or after a "Hit" detection. The output is turned on steady (not pulsed) until the "Lance Up" input turns ON.
Ready	<ul style="list-style-type: none"> When this status output is "On", it indicates the system is ready and a new cycle can begin. Only one of the three status outputs (Ready, Running, Holding) will be on at one time. 	-	-

- 1 Press the SETUP softkey  in the start-up screen of Drum Filling.
- 2 In the Application Settings screen, select  **Discrete Outputs**.
- 3 In the **Discrete Outputs**, press the EDIT softkey  to open the setup page for editing an existing output assignment or press the ADD softkey  to add a new discrete output assignment.

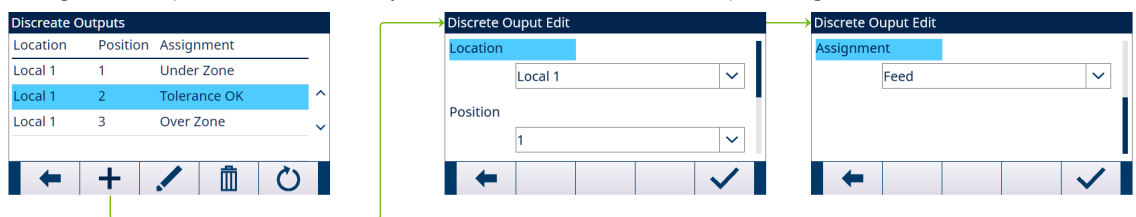



Figure 75: Discrete Outputs

- 4 Enter the output assignment address.
Location: This field defines the Output is local or remote.
Position: This field defines position of the discrete output option assigned to a function.
- 5 To select an output assignment, refer to the table **Output Assignment Selections**.
- 6 Press the OK softkey  to confirm the entry.

5.2.5 Advanced Settings

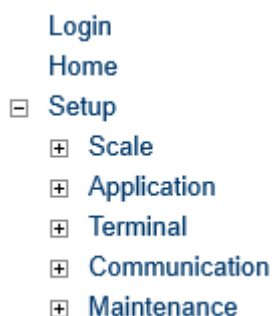





Figure 76: Advanced Settings Menu

5.2.5.1 Configure Communication

When Fill or Number of cycles operation is completed, a Demand Print is triggered.

- 1 Select  Advanced Settings in the Application Settings screen.
- 2 To find the Connections branch, follow the path: Setup>Communication>Connections.
- 3 In the **CONNECTIONS VIEW** page, press the ADD softkey  to create a new connection assignment.
- 4 Press the UP and DOWN navigation keys to select or highlight a connection assignment in the list to be edited and press the EDIT softkey  to open the setup page for editing.
- 5 Select the **Port**, and the option **Demand Output** in the field **Assignment**.
- 6 To select the Demand Print Trigger and the Template, refer to the table that follows.

Demand Print Trigger	Trigger Event of Printout	Template
Trigger 4	Fill finished.	Template 6 <pre> Fill Cycle 37 of 500 Material XP-50 Start: 16:37:13 14/Mar/2015 Finish: 16:37:35 14/Mar/2015 Target: 5.000 lb Net Delivered: 4.998 lb ***** </pre>
Trigger 7	Number of Cycles finished.	Template 10 <pre> Total of 55 cycles complete Finish: 16:38:52 14/Mar/2015 Total material: 26.540 lb ***** </pre>

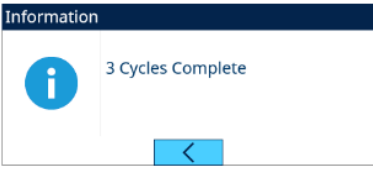

5.3 Operation

This chapter states the specific operation sequence in two different Work Modes by giving examples.

5.3.1 Run Drum Filling

The Drum Filling is run according to the absolute value of the weight.

When the following scenarios happen, a message pops up, and operator can't enter into the dedicated Filling display.

Scenario	Error Display	Action
When Track Cycles is enabled, but Cycles Remaining is 0		Reset Cycles.
When Active Target is not valid		Set a valid Active Target.

5.3.1.1 Lance Positions

Two lance positions are supported in the manual lance mode –Lance Up and Lance Down. Sensors are required for both positions.

5.3.1.1.1 Work Mode - Manual

Lance Up

The Lance Up position is with the lance completely out of the container to allow enough space to remove or add a container.

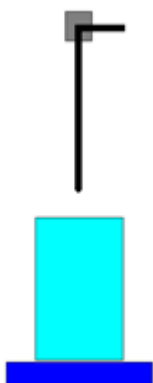


Figure 77: Manual - Lance Up

Lance Down

The Lance Down position is the lance position where the filling will take place. This position can be with the lance completely to the bottom of the container or with the lance just inside the container – it is application dependent. The tolerance check will also be done with the lance in this position.

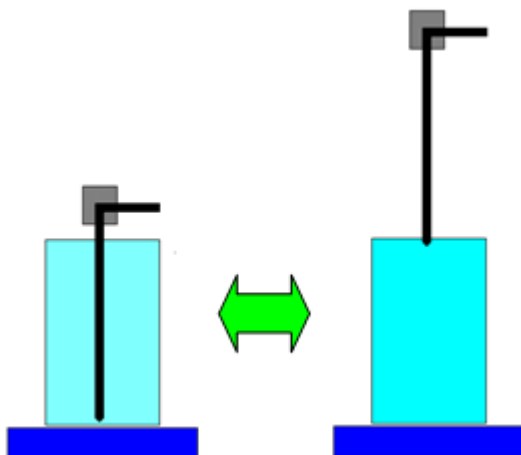


Figure 78: Manual - Lance Down

5.3.1.1.2 Work Mode - Top Fill

Two lance positions are supported in the Top Fill mode—Lance Up and Lance Down. Sensors are required for both positions.

Lance Up

The Lance Up position is with the lance completely out of the container to allow enough space to remove or add a container.

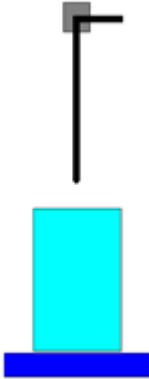


Figure 79: Top Fill -Lance Up

Lance Down

The Lance Down position is the lance position where the filling will take place. This position is normally with the lance just inside the container. The tolerance check will also be done with the lance in this position.

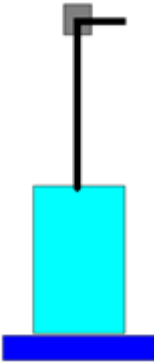


Figure 80: Top Fill - Lance Down

5.3.1.2 Work Mode – Manual

Overview

If the Lance control mode is selected as “Manual”, the terminal will prompt the operator for lowering and raising the lance and then start the filling sequence. This means that lowering and raising the lance are not controlled by the terminal but by an external device.




Configuration

This section lists a specific setup for the Fill cycle. For a complete list and explanation of all setup parameters for IND500x Drum Filling, see the Chapter [Configuration ▶ Page 58].

Configuration	Value	Configuration	Value
Work Mode	Manual	Active Target Material	Active Target Value, Tare Value, etc.
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-in : Enabled



Configuration	Value	Configuration	Value
Input	OK to Weigh-in Start/Resume Pause/Abort Lance Down	Jog	Mode: Automatic Pulse Time (On): 2.0s Pulse Time (Off): 2.0
Cycle Transition	Cycle Tare before Fill = Enabled Clear Tare After Fill = Enabled Weigh-in Transition = Automatic Loop Work Mode = Disabled	Feed Alarm	Disabled by setting Timeout = 0
Material Table	Material record is added.	Tolerance Acceptance	Manual Accept: Enabled Zero Tolerance Check: Disabled
Cycles	Track Cycles = Enabled # of Cycles: 3	Pac Statistics	Disabled
Timing	Start Delay: 3 Inhibited Time: 3 After Weigh Delay: 3 Weigh-in Complete: 4	Overfill Adjustment	Manual
Container Tare	Disabled	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-

Operation

- 1 Enter the start-up screen of Drum Filling.
- 2 Put a container on the scale. Press the OK softkey .
 - ➔ After the container is on the scale, the terminal prompts for manual lowering of the lance.
- 3 Lower the lance.
 - ➔ Terminal detects the input "Lance Down" is ON.
- 4 Press the Start/Resume softkey  by a discrete input (input assigned with **Start/Resume**) to start filling.
 - ➔ During the filling process, the terminal continuously monitors the "Lance Down" input. Weigh-in interlock is not detected.
- 5 Terminal checks **Start Delay**. **Start Delay** is counting down per second until **Start Delay** = 0.
 - ➔ **Start Delay** Output becomes "On" when **Start Delay** counts down until 0.
- 6 Terminal detects Input OK to Weigh-in Interlock signal.
- 7 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.
- 8 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
 - *If Source Weight < (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
 - *If (Target - Feed - Spill) ≤ Source Weight < (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
 - *If Source Weight ≥ (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
 - *When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 9 Terminal does Tolerance Check.
 - ➔ If (Target - (-Tolerance)) ≤ Source Weight ≤ (Target + (+Tolerance)), message Tolerance OK shows.
- 10 Terminal clears tare. the display prompts for manual raising of the lance.
- 11 Raise the Lance and confirm the action by pressing the OK softkey .
- 12 Container can be removed by others.

Exception in Step 9:

- 1 If Source Weight < Target - (-Tolerance), terminal starts Auto Jog automatically.
 - ➔ Feed Output is pulsed on and off continuously according to Jog setting, while Fast Feed Output is "Off".
- 2 If Source Weight > Target + (+Tolerance), terminal shows status Manual Adjust.

- 3 Do Overfill Adjustment manually and press OK softkey  to confirm the result. Or directly press Tolerance Acceptance softkey \pm  to accept or reject the result.

5.3.1.3 Work Mode – Top Fill

Overview


In this mode, the Lance is lowered into the container until the “Lance Down” sensor is triggered. The lance does not move during the fill. During the fill process, the Lance position is checked, while if the “Lance Down” input is OFF, the filling is paused and an error message is displayed. When the Fill is complete, the Lance is raised to the “Lance Up” position.

Configuration

This section lists a specific setup for the Fill cycle. For a complete list and explanation of all setup parameters for IND500x Drum Filling, see the Chapter [Configuration ▶ Page 58].



Configuration	Value	Configuration	Value
Work Mode	Top Fill	Active Target Material	Active Target Value, Tare Value, etc.
Output	Fast Feed, Feed Start Delay After Weigh Delay Tolerance OK Out of Tolerance	Interlocks	OK to Weigh-in : Enabled
Input	Start/Resume Pause/Abort	Jog	Mode: Automatic Pulse Time (On): 2.0s Pulse Time (Off): 2.0
Cycle Transition	Cycle Tare before Fill = Enabled Clear Tare After Fill = Enabled Weigh-in Transition = Automatic Loop Work Mode = Disabled	Feed Alarm	Disabled by setting Timeout = 0
Material Table	Material record is added.	Tolerance Acceptance	Manual Accept: Enabled Zero Tolerance Check: Disabled
Cycles	Track Cycles = Enabled # of Cycles: 3	Pac Statistics	Disabled
Timing	Start Delay: 3 Inhibited Time: 3 After Weigh Delay: 3 Weigh-in Complete: 4	Overfill Adjustment	Manual
Container Tare	Disabled	Autospill Adjustment	Disabled
Auxiliary Output	Disabled	-	-

Operation

- 1 Enter the start-up screen of Drum Filling.
 - ➔ Terminal starts a self-checking procedure.
 - Terminal raises Lance until “Lance Up” = ON.
 - Terminal is cleared to the **gross mode** and shows a dedicated display ready for Filling
- 2 Put a container on the scale. Press the Start softkey  to run filling.
 - ➔ Terminal detects that input “**Weigh-in Interlock**” = ON.
 - Terminal retracts drip pan.
 - Terminal lowers the Lance.
- 3 Terminal automatically starts filling when the input “**Lance Down**” is ON.
- 4 Terminal checks **Start Delay**. **Start Delay** is counting down per second until **Start Delay** = 0.
 - ➔ **Start Delay** Output becomes “On” when **Start Delay** counts down until 0.
- 5 Terminal detects Input OK to Weigh-in Interlock signal.
- 6 Terminal takes Tare, and will use absolute value of the Net weight as Source Weight for target comparison.

- 7 Terminal continuously monitors the weight and controls the Feed Outputs, Tolerance Check Outputs and Status Display.
 - *If Source Weight < (Target - Feed - Spill), then Fast Feed Output = On, Feed Output = Off, Status = Fast Feed
 - *If (Target - Feed - Spill) ≤ Source Weight < (Target - Spill), then Fast Feed Output = Off, Feed Output = On, Status = Feed
 - *If Source Weight ≥ (Target - Spill), then Fast Feed Output = Off, Feed Output = Off. After Weigh Delay (Output = On) starts to count down, which allows pressure to equalize in a sealed vessel or to allow some extra settling time for unstable weigh vessels.
 - *When After Weigh Delay counts down to 0, After Weigh Delay Output becomes "Off".
- 8 Terminal does Tolerance Check.
 - ➔ If (Target - (-Tolerance)) ≤ Source Weight ≤ (Target + (+Tolerance)), message Tolerance OK shows.
- 9 Terminal clears tare and raises the Lance.
- 10 Extend the Drip Pan.
- 11 Container can be removed by others.

Exception in Step 8:

- 1 If Source Weight < Target - (-Tolerance), terminal starts Auto Jog automatically.
 - ➔ Feed Output is pulsed on and off continuously according to Jog setting, while Fast Feed Output is "Off".
- 2 If Source Weight > Target + (+Tolerance), terminal shows status Manual Adjust.
- 3 Do Overfill Adjustment manually and press OK softkey  to confirm the result. Or directly press Tolerance Acceptance softkey  to accept or reject the result.

6 Error Message

No.	Message (TFT Display)	Alarm Code	Namur Level	Error Log	I/O	Description	Action
1	Auto tare failed	6200	3	Y	N	Container Tare check failed.	Check container or remove source of instability.
2	Filling process timeout.	6203	3	Y	N	The filling or dosing cycle time is more than max. cycle time.	Inspect material quantity and feeding system.
3	You have entered an invalid parameter	6204	3	Y	N	Invalid parameter	Check application parameter settings and enter a valid parameter.
4	You have entered an invalid parameter combination	6205	3	Y	N	Parameter logic error	Enter a consistent application parameter combination.
5	Refill Timeout	6206	3	Y	N	After the Refill / Dump / Filling / Dosing feeder turns on, time is expired, but the weight does not increase.	Inspect material quantity and feeding system.
6	Initial feed timeout, no weight change detected	6209	3	Y	N	After the Initial feeder turns on, time is expired, but the weight does not increase.	Inspect material quantity and feeding system.
7	Dump Timeout	6210	3	Y	N	After the Dump output signal turns on, time is expired, but the weight does not increase.	Ensure material path not blocked.
8	Material not enough	6212	3	Y	N	The current material is not enough for dosing at cycle starting (for Dose mode): Gross Weight < (Low Threshold + Heel Weight).	Refill enough material.

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