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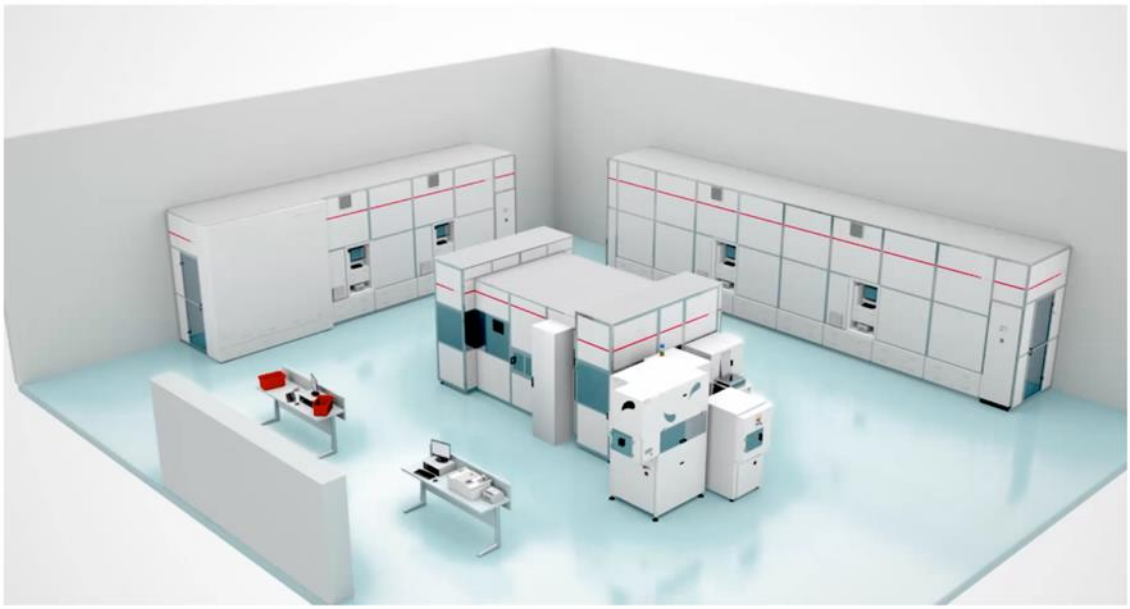
PillPick System Description



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1. GLOSSARY

AUTOBOX	Buffer with 12 positions for processing of PillBox.
AUTOPHIAL	Automatic loading device for the PhialBox.
BLISTER-CUTTER	An AutoPhial module which automatically cuts blister strips into single blisters.
BOXSTATION	PillBox and PhialBox filling station.
CPOE	Computerized Physician Order Entry, part of the HIS (Hospital Information System)
DRUGNEST	Automatic store for the handling and stocking of the unit doses.
DRUGNEST BELT or PIN CONVEYOR	Rotating belt bearing pins, used for handling the unit dose bags in the DrugNest module. The number of belts depends on the DrugNest model.
ID OF BAG	Internal Swisslog identification code for the unit dose bag.
MANUAL INTRODUCTION STATION	Station, from where an operator can manually insert drugs into PillPicker.
PHIALBOX	Canister for blisters, phials, ampoules and syringes.
PICKRING	Dispensing module, binding patients' complete therapy in unit dose into rings.
PICKROBOT	Automatic robot for transferring the bags from PillPicker to the SinglePill Robot.
PILLBOX	Canister of loose oral solid drugs (bulk).
PILLPICK MANAGER	Software for the complete managing of PillPick system (GUI).
PILLPICK SYSTEM	Automated System for management of drugs in unit dose format
PILLPICKER	Automatic machine for the packaging of the unit dose.
PIN	Small rod on which the unit dose packs are hung: this is how the bags are stored inside the DrugNest.
RETURNS BELT or RETURNS PIN CONVEYOR	DrugNest rotating belt where unit dose bags are temporarily stored after being loaded through Window. After they have been scanned and identified, they are transferred into their storage location.
RING	Plastic ring produced by PickRing containing a patient label and all the single dose bags forming the Patient personalized therapy.
RINGROBOT	Robot which transfers the bags from SinglePill to PickRing.
SINGLEPILL	Automatic robot for loading/unloading unit doses in/from DrugNest.
SWISSLOG UNIVERSAL PLATFORM	Swisslog software platform for the integration with CPOE/HIS
TAG	Electronic chip, on which relevant data about canister content are recorded.
UNIT (SINGLE) DOSE BAG	Polypropylene packaging welded at both ends containing a single dose medication, on which drug information and a unique barcode identifying the product and the unit bag are printed
WINDOW	Device that allows bags, returning from wards, to be restored in DrugNest

2. PILLPICK GENERAL SYSTEM DESCRIPTION

The aim of this document is to give a technical and functional description of proposed system for packaging, storing and dispensing of medication in Unit-Dose and the delivery of patient specific therapies.

Figure 1 - PillPick

PillPick packages medications into Unit-Dose bags, univocally identified by a barcode and by customized relevant information printed on each bag.

Unit-Dose bags are automatically stored into DrugNest through SinglePill robot. Each pin of DrugNest contains a given drug with the same lot nr. and exp. Date.

After receiving the prescriptions from wards, PillPick automatically dispense patient-specific therapies. The system collects the Unit-Dose bags to be administered in a ring and bundle them with a plastic ring and a patient label summarizing the ring content and patient data.

Not-administered medications can be easily returned into PillPick system and inventory updated in real time.

PillPick software automatically records all movements information in order to ensure correct accreditation to patient.

PillPick comes in two different configurations:

- PillPick, totally integrated solution for automated packaging, storing, dispensing and returning system for the management of drugs in unit-dose format
- PillPick Light/Flex,
  - solution for central packaging of drugs in Unit-Dose format (PillPick Light)
  - solution for remote, satellite storing, dispensing and returning of medication in UD format and patient specific therapies (PillPick Flex)

Following are reported the devices, managed and driven by the software PillPick Manager, which compose the above mentioned solutions:

	PillPick	PillPick Light	PillPick Flex
BoxStation (Canister filling)	✓	✓	
PillPicker + AutoPhial + AutoBox (Packaging)	✓	✓	
DrugNest (Storing & Returning)	✓		✓
PickRing (Dispensing)	✓		✓

2.1 General Workflow Of PillPick

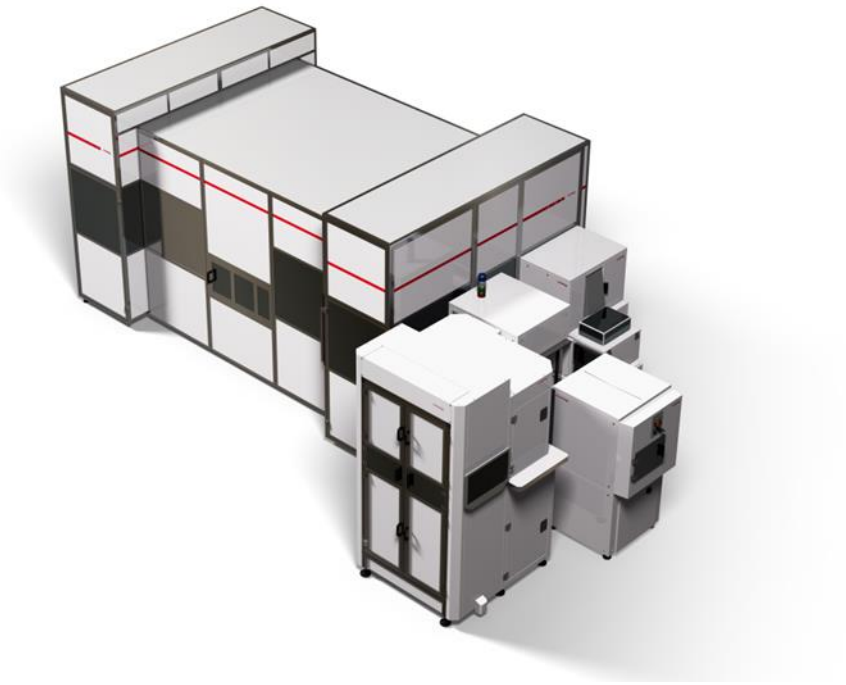


Figure 2 - PillPick system

PillPick is Swisslog's personalized Unit-Dose drug management system for medication management in hospitals.

The Unit-Dose drug management workflow with PillPick consists in the following steps:

1. Patient is admitted and recorded into HIS/EMR
2. Physician prescribes patient therapies
3. Physician's prescription is sent to the pharmacy
4. Therapy is validated by clinical pharmacist
5. PillPick automatically dispenses personalized therapies into individual patient specific PickRings
6. Each ward receives the PickRings for administration to the patient
7. Therapy is integrated with emergencies and therapy changes and complementary drugs not in Unit-Dose package

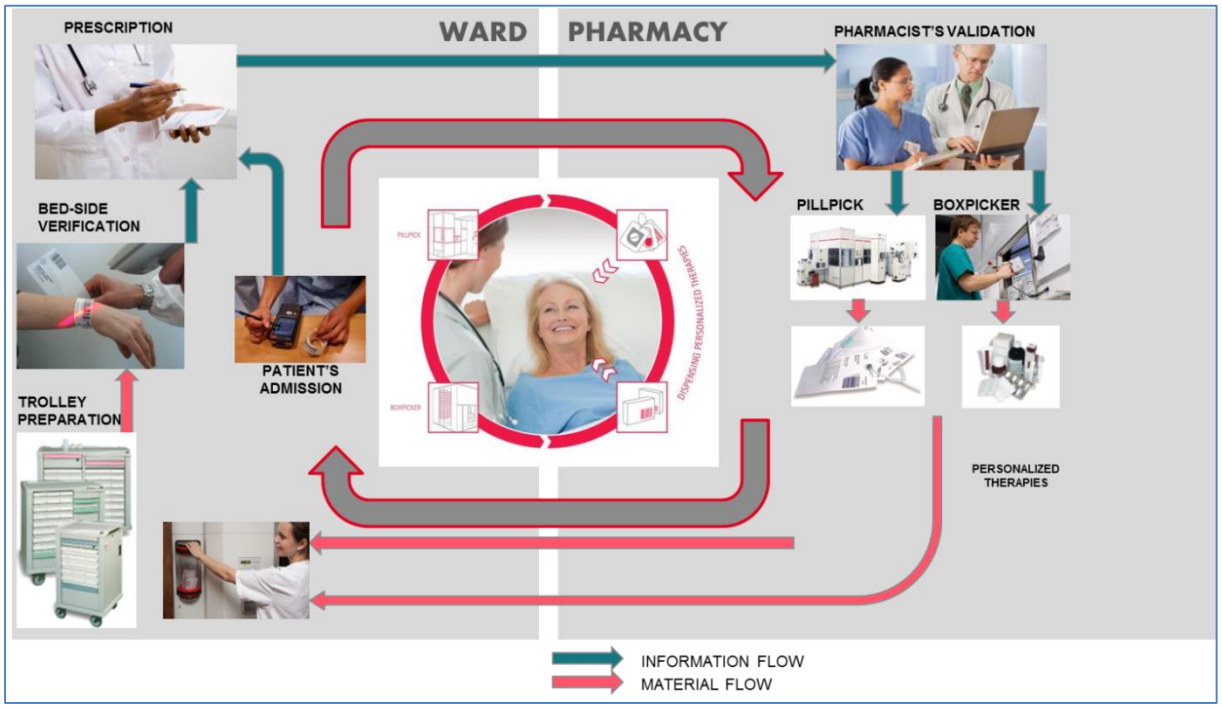


Figure 3 - PillPick system workflow

The system is composed by several modules, each one performing a specific function:

BoxStation: filling and recording station of PillBox and PhialBox canisters

PillPicker: packaging machine of the PillPick System

AutoPhial: multifunction accessory for the automatic cutting of blisters and handling of vials, ampoules, blisters, cups, suppositories, ecc.…

AutoBox: loading buffer for up to 12 PillBox to be loaded into PillPicker

DrugNest: automated storage system for medications in Unit-Dose format

PickRing: automatic module collecting the Unit Dose bags composing the patient's therapy and binding them together with a plastic ring

Return Window: DrugNest device for the introduction of medications returning from wards

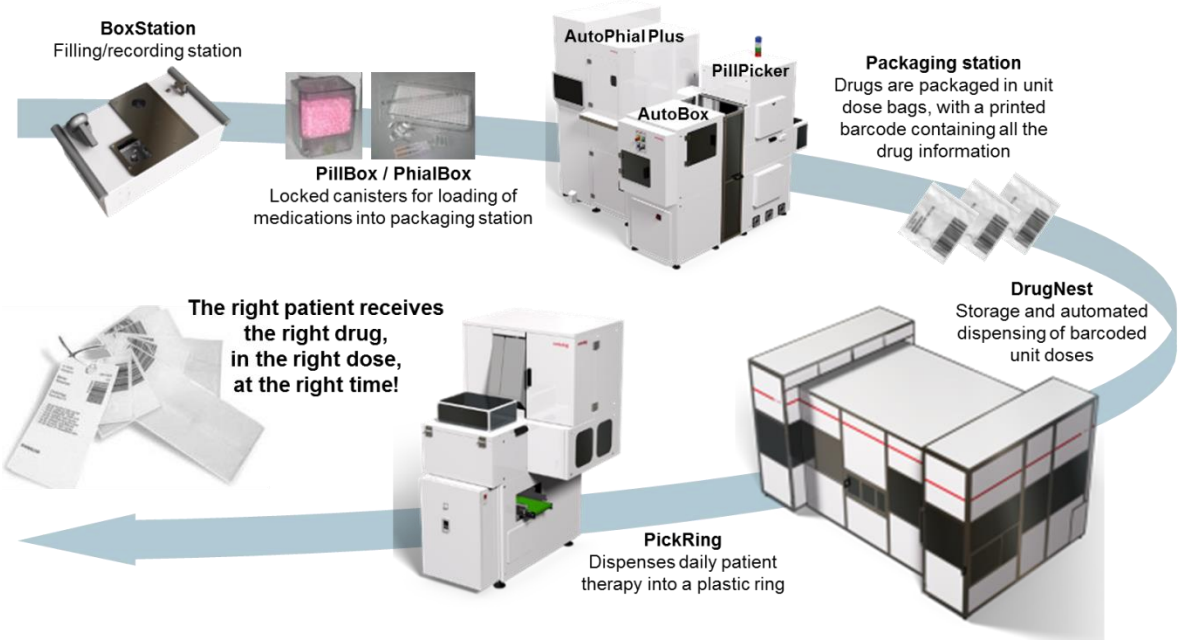


Figure 4 – PillPick modules

2.2 General Workflow Of PillPick Light/Flex Solution

PillPick Light solution is composed by:

- PillPicker
- AutoPhial (optional for blister, phials, ampoules, syringes, etc…)
- AutoBox (optional buffer for oral solids)
- BoxStation
- PillPick Manager

PillPick Flex is the combination of a PillPick Light with the implementation of storage and dispensing units (DrugNest and PickRing) in satellite pharmacies or facilities.

PillPick Light/Flex is the flexible solution for Unit-Dose production and management.

The Unit-Dose drug distribution procedure is as follows:

1. Drugs are singularized automatically in Unit-Dose through the packaging robotic modules (AutoPhial, AutoBox if any and PillPicker);
2. Produced Unit-Dose loose bags are transferred to their storage location (normal shelves or locked cabinets)
3. The operator prepares manually personalized therapies collecting Unit-Dose bags according to the prescription
4. Unit-Dose bags can be transferred to satellite facilities and manually loaded into DrugNest through the Return Window.
5. PickRing automatically dispenses personalized therapies into individual patient specific PickRings
6. Each ward receives the PickRings for administration to the patient
7. Therapy is integrated with emergencies and therapy changes and complementary drugs not in Unit-Dose package

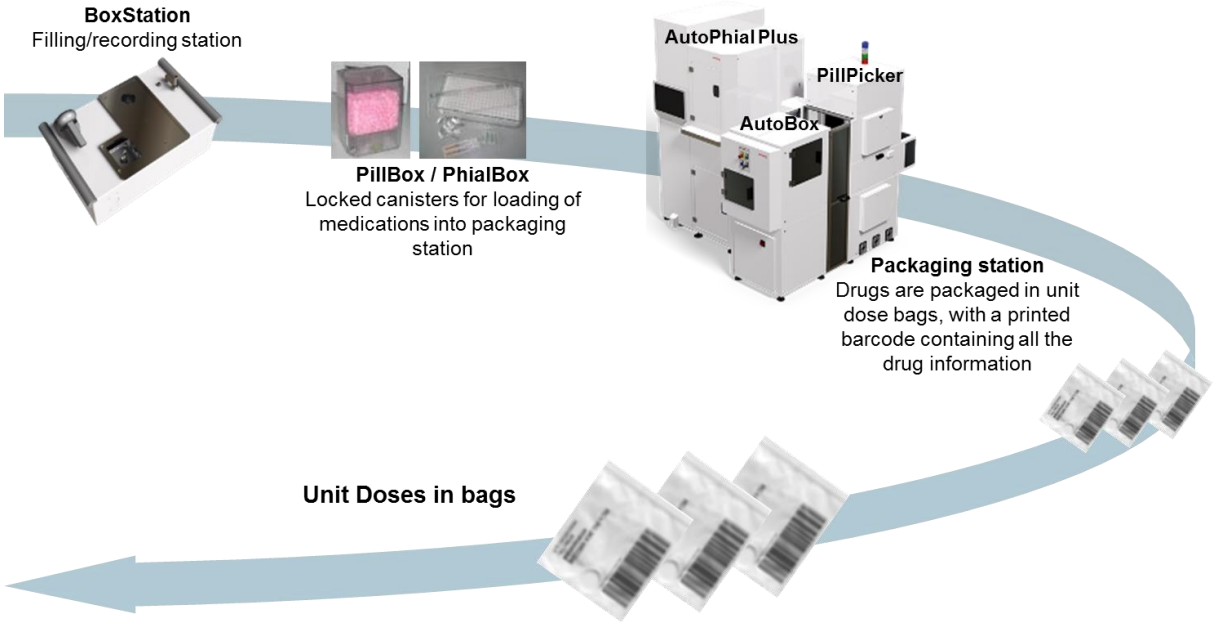


Figure 5 - PillPick Light

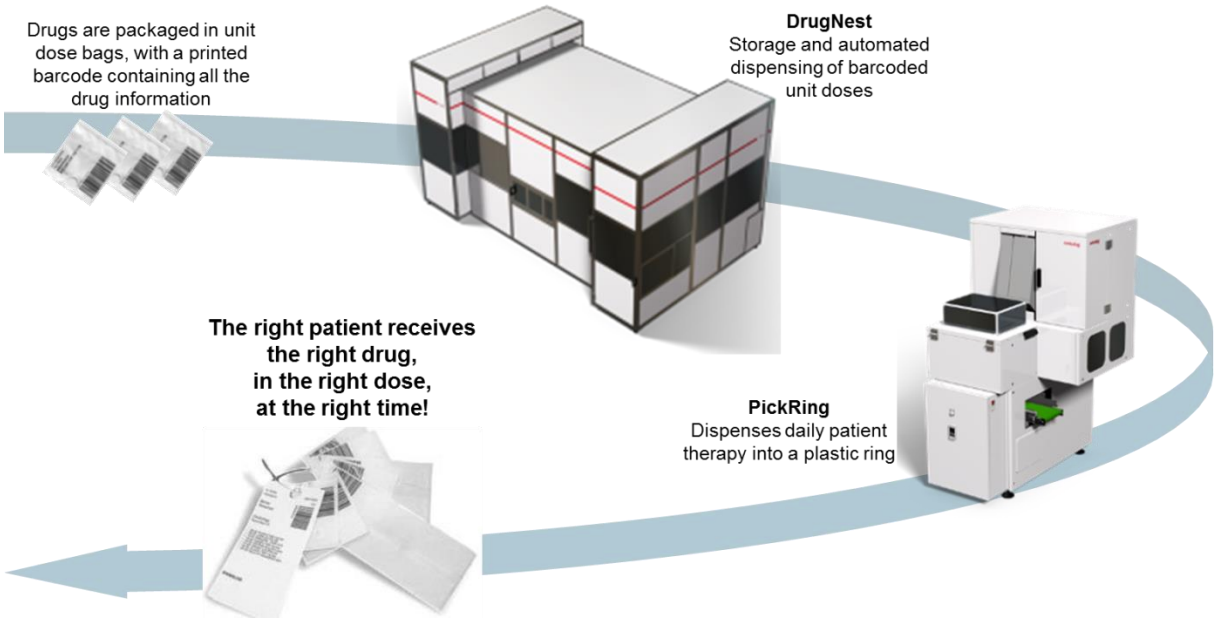


Figure 6 - PillPick Flex

3. PILLPICK MODULES DESCRIPTION

3.1 BoxStation

Figure 7 - BoxStation

BoxStation is the filling and recording station for PillBox and PhialBox canisters: it allows a secure transfer of drugs from their original packages to canisters.

BoxStation allows to:

- open the canisters
- fill them with drugs
- register the drug information in the canister chip (TAG)
- print sticker labels for visual identification of canisters content
- double check canister's content

Two different types of canister are available, according to the drug typology to be handled:

- PillBox: for loose oral solids (tablets, capsules, coming directly from bulk or from deblistering unit)
- PhialBox: for vials, ampoules, blisters, suppositories, syringes and other forms

PillBox and PhialBox ensure safety because they can be opened only by the packaging unit or by an authorized operator who is qualified to work with BoxStation.

Each PillBox and PhialBox is equipped with an RFID-TAG chip that allows to register the information relating to the drug inserted in the canister.

Furthermore the operator can print a sticker label containing the main medication information, in order to allow a visual check of canister's content:

1. Drug code;
2. Commercial name;
3. Form;

4. Dose;
5. Strength;
6. Expiration time;
7. Lot number;
8. Barcode of the product.

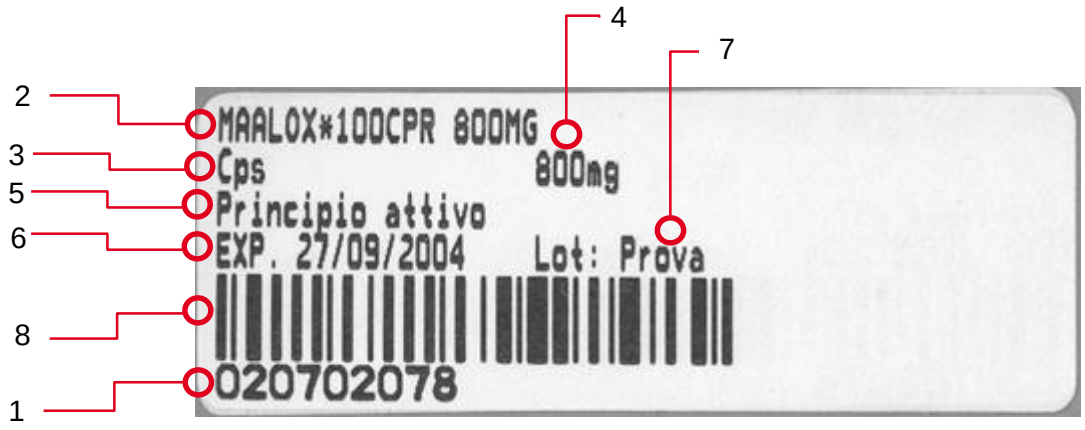


Figure 8 - BoxStation Label

Each canister is equipped with a second label identifying the canister with an unique code (number and barcode).

The code begins with a letter that identifies the canister type:

- Letter A followed by 4 numeric digits = ***PillBox***
- Letter B followed by 4 numeric digits = ***PhialBox***

Figure 9 - Sample of canister's label

3.1.1 PillBox

PillBox is the patented canister by Swisslog, for managing and loading automatically loose oral solids in the PillPicker packaging unit of PillPick System.

Figure 10 - PillBox

PillBox is box with a removable lid and a removable crossframe. While PillBox itself is not drug specific, the removable crossframe, with different holes (per drug size), guarantees that only one tablet/capsule is picked up from the suction device.

PillBox is composed as following:

- CrossFrame;
- Cover;
- Chip;
- Safety Closure.

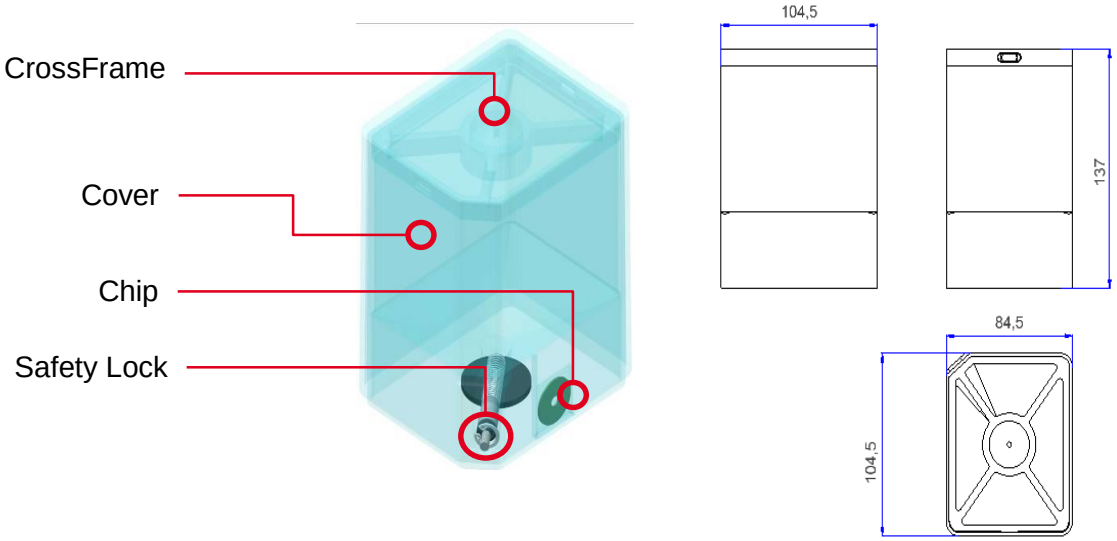


Figure 11 – PillBox parts

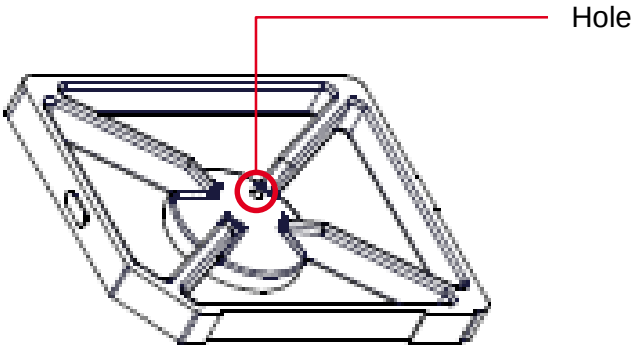


Figure 12 - PillBox Crossframe

The CrossFrame is equipped with a barcode. The code begins with the letter ‘A’ that identifies the type of canister (PillBox) and 3 numeric digits that identifies the diameter of the hole.

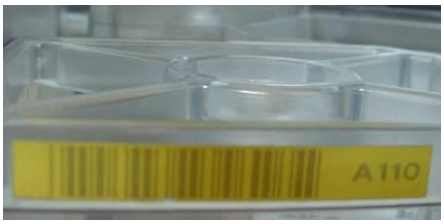


Figure 13 - CrossFrame Label

3.1.2 PhialBox

PhialBox is a Swisslog's patented canister for medication in vial, ampoule, blister and suppository.

The PhialBox is composed as following:

- Cover;
- Insert;
- Safety closure;
- RFID Tag

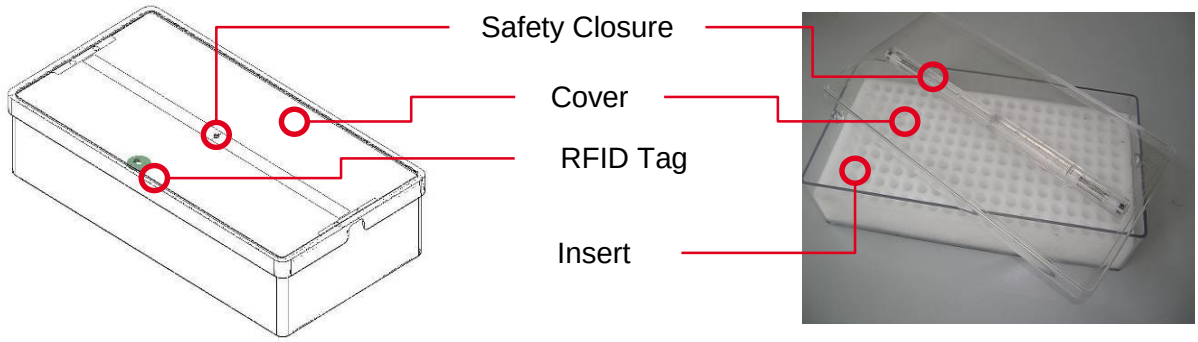


Figure 14 - PhialBox parts

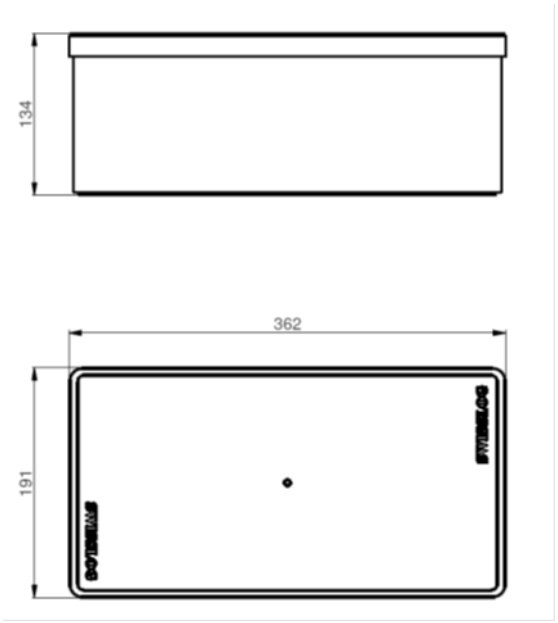


Figure 15 – PhialBox

3.1.2.1 PhialBox Inserts

In order to accommodate all different drug forms, a pre-cut insert is placed into PhialBox.

Each insert type is identified by a barcode, which is associated to a certain drug in order to verify correctness during the BoxStation filling and recording procedure.

Figure 16 - PhialBox insert's label

Different types of inserts are available in order to optimize the handling of as much different kind of medication as .

Following Figure represents some example of inserts:

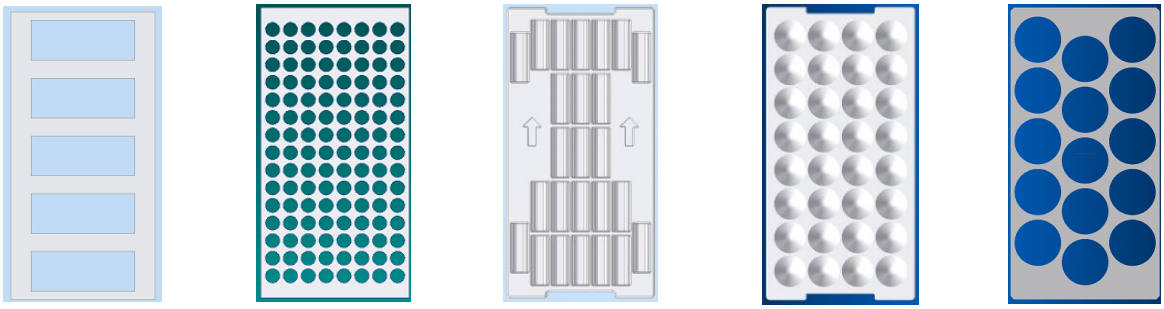


Figure 17 - Insert typologies

3.2 PillPicker

PillPicker is the packaging machine of PillPick System, able to produce Unit Dose bags starting from drugs contained in PillBox canisters.

When connected to AutoPhial, PillPicker also packages all drugs form such: vials, ampoules, blisters, suppositories.

Figure 18 - PillPicker

PillPicker is able to package drugs with different dimensions, by modifying automatically the length of the bags according to the drugs dimensions.

Figure 19 – Unit-Dose Bags produced by PillPicker

The Unit Dose bags are produced through several steps performed by 6 different stations of PillPicker:

1. The bag of the appropriate size is produced, printed with relevant information and sealed in its bottom part (Station 1)
2. The barcode is checked (Station 2)
3. The bag is filled with the drug coming from the PillBox or from AutoPhial (Station 3)
4. The bag is sealed in its upper part (Station 4)

5. The bag is punched in order to obtain the hole (Station 5)
6. The bag is ready to be ejected through lateral chute or to be transferred to DrugNest. In case one of the previous step (i.e. barcode check) did not succeed, the bag is discarded into a discard bin. (Station 6)

The Unit-Dose bag's dimensions produced by PillPicker is automatically to the drug to be packaged:

	Dimensions of the bags
Width	75 mm
Min. Length	55mm (optional) – 85mm (standard)
Max. Length	195mm

On each bag the System prints all the necessary information for the visual and data processing identification of the product, and in particular:

1. Unit-Dose unique code and barcode;
2. Commercial name of drug;
3. Generic name (active principle)
4. Drug Form;
5. Dose;
6. Lot number and Expiry date.

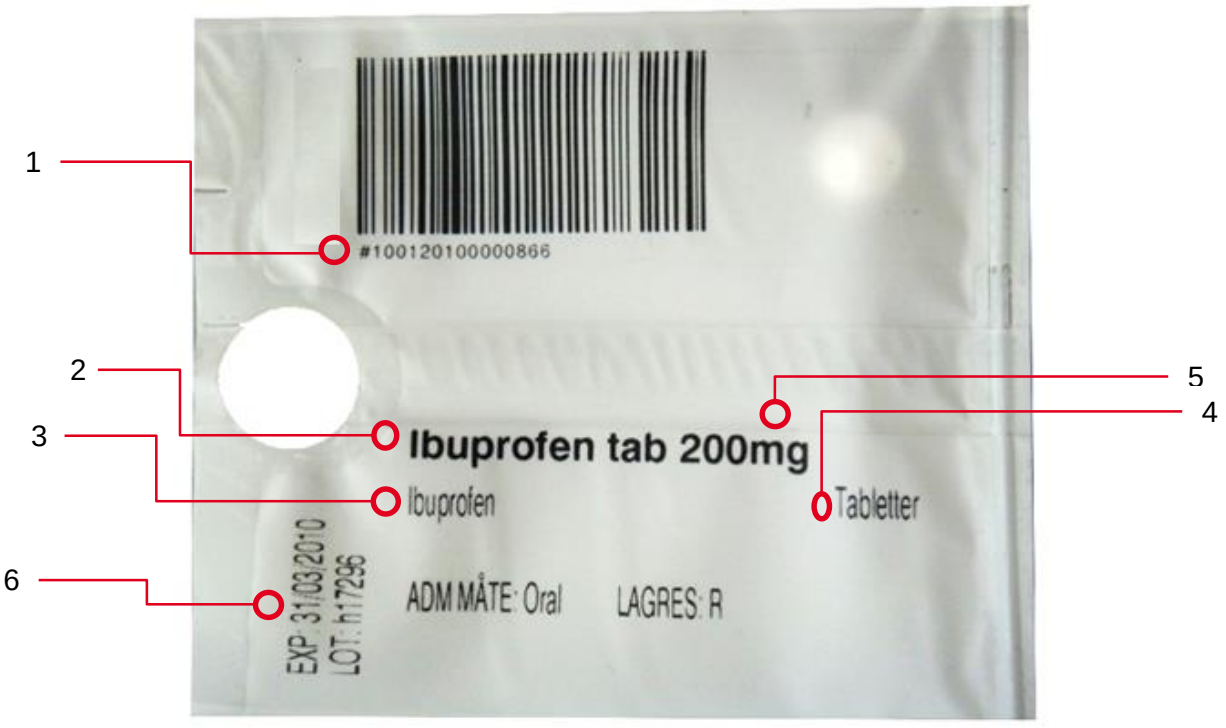


Figure 20 – Unit-Dose bag details

Each Unit-Dose bag is assigned with a unique code in order to have a complete traceability of the single unit through the whole flow, from the pharmacy to the ward and back.

The code is generated as follows:

- Automation code of the product: is the code assigned by the system to each medication (# + 7 digits)

- Progressive unique code of the bag: this number allows to have complete track of each bag produced by PillPicker (8 digits)

The bag univocal code is a complex code, resulting from the combination of two separate information that united allow the unicity of the code. The code is 15 characters long plus the starting character "#".

#0021610 50053432

Figure 21 - Unit-Dose bag code example

PillPicker uses a polypropylene film with an internal pleat. The film stays folded and flat if small items are packaged, while it widens up if bigger items are packaged.

PillPicker itself is able to package all different typologies of oral solids:

- Loose tablets
- Loose capsules

Used in combination with AutoPhial:

- Blisters
- Vials
- Ampoules
- Syringes
- Cups
- Suppositories

provided that they do not exceed the following dimensions:

Max. Weight 65g

1. Max. Diameter 50 mm - Max. Length 65 mm
2. Max. Diameter 25 mm - Max. Length 110 mm
3. Max. Diameter 20 mm - Max. Length 120 mm
4. Max. Diameter 15 mm - Max. Length 135 mm
5. Max. Diameter 10 mm - Max. Length 145 mm

Figure 22 - Some samples of drugs that can be packaged by PillPicker

3.3 AutoPhial

AutoPhial is the multifunction accessory, designed and patented by Swisslog, for the automatic loading of:

- vials
- ampoules
- blisters already in Unit-Dose format
- cups
- suppositories

and, when equipped with Blister Cutter, for the automatic cutting of blisters strips.

Figure 23 – AutoPhial

AutoPhial provides two loading bays in which the PhialBox that contains the drugs to be packaged is placed.

According to the loading job list (see PillPick Manager section), the correct PhialBox is opened and transported in the working area.

At this stage a mechanical arm provided with a suction device picks up the drugs one by one and places them in a transport system, which carries the drugs to the bag filling station of PillPicker.

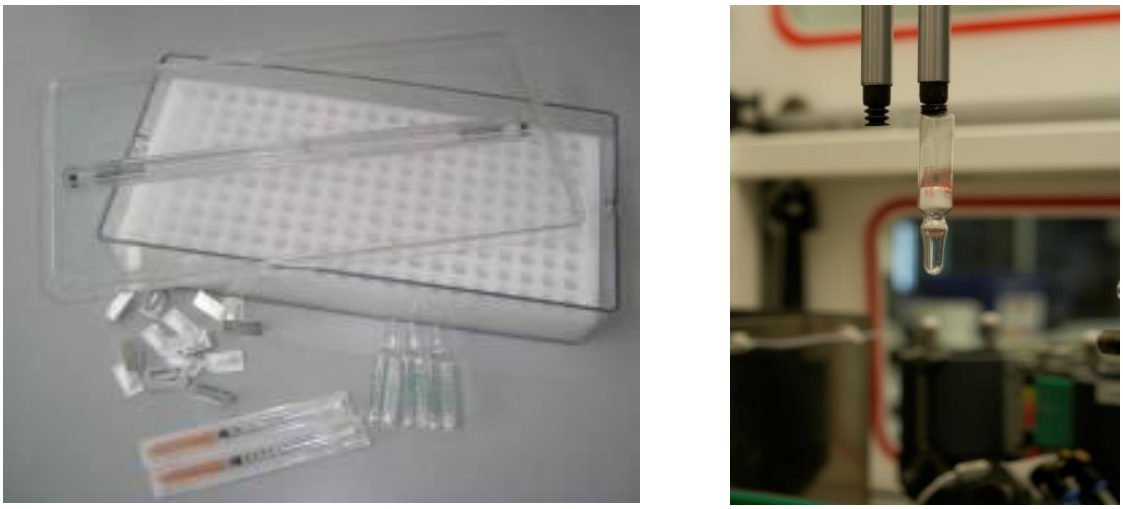


Figure 24 – PhialBox and working area of AutoPhial

3.3.1 Blister Cutter

AutoPhial can be equipped with a special device, Blister Cutter, that picks up a strip of blister and automatically cuts it in Unit-Doses.

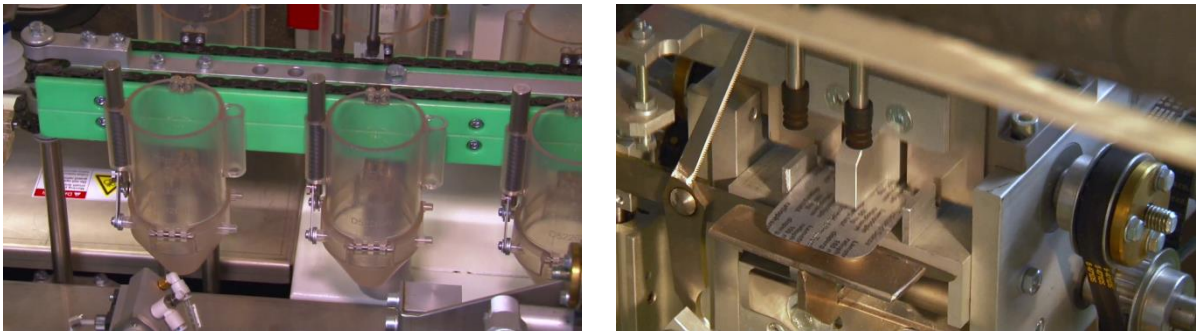
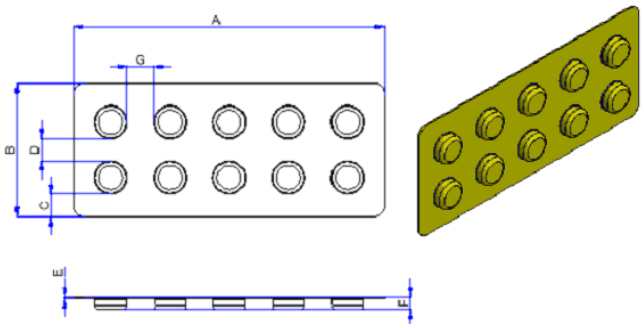


Figure 25 - BlisterCutter

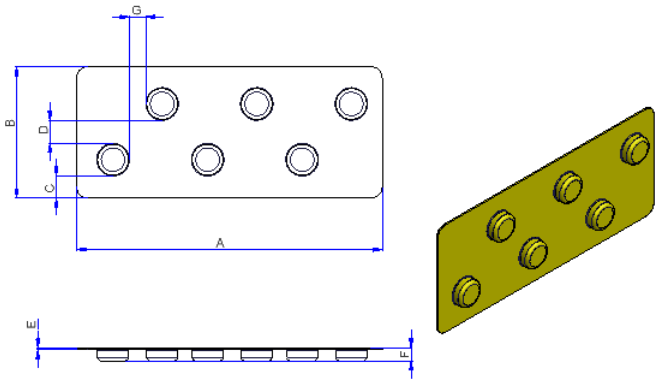
AutoPhial BC is able to cut the blister with the following shape and dimensions:

- Typology 1



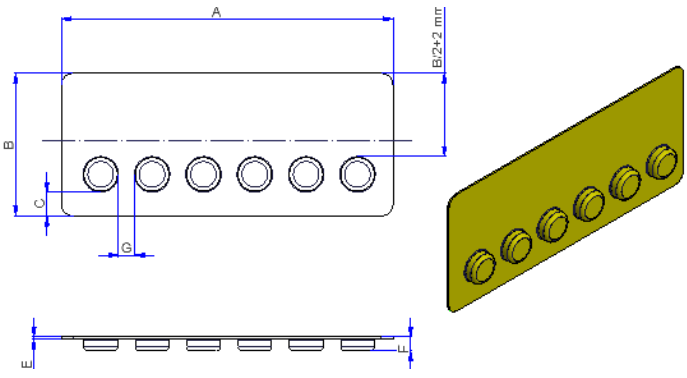
	MIN (mm)	MAX (mm)
A	20	140
B	36	70
C	0.7	---
D	3	---
E	0.4	2
F	3	12
G	3	---

- Typology 2



	MIN (mm)	MAX (mm)
A	20	140
B	36	55
C	0.7	---
D	3	---
E	0.4	2
F	3	12
G	3	---

- Typology 3



	MIN (mm)	MAX (mm)
A	20	140
B	36	55
C	0.7	---
E	0.4	2
F	3	12
G	3	----
A	20	140

3.3.2 Manual feeding

For all drugs of large dimensions or for the ones with a particular shape (bags of drinkable powders, syringes suppositories, tubes,…) it is possible to carry out the PillPicker feeding in manual way.

The products, which respect the following dimensions, could be packaged through a manual insertion in the machine:

Max. Weight 65 g (common)

1. Max. Diameter 50 mm - Max. Length 65 mm
2. Max. Diameter 25 mm - Max. Length 110 mm
3. Max. Diameter 20 mm - Max. Length 120 mm
4. Max. Diameter 15 mm - Max. Length 135 mm
5. Max. Diameter 10 mm - Max. Length 145 mm

The drugs are manually loaded into the system through AutoPhial's door. If the Bar Code confirms the drug is in the packaging list then the door opens to manual loading.

3.4 AutoBox

AutoBox is the automatic feeder used to load PillBox inside the packaging machine. It is composed by a rotating table containing 12 PillBox which are automatically inserted into the PillPicker.

Figure 26 - AutoBox

It allows making faster the change of the drugs to be packaged with PillPicker and makes easier the operator's work during the phase of drug's preparation for restoring the stock in the warehouse.

3.5 DrugNest

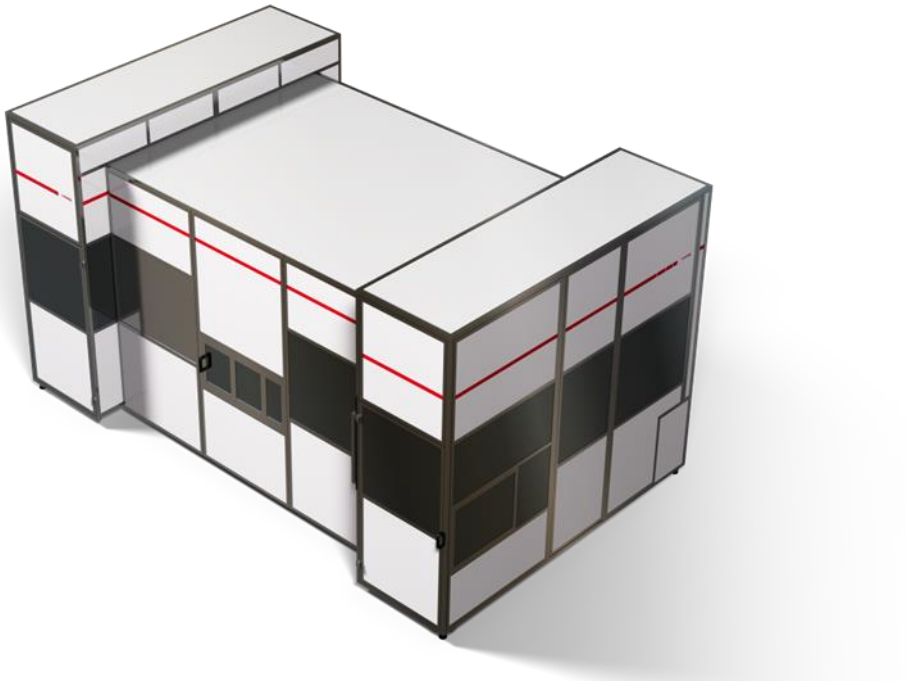


Figure 27 - DrugNest

DrugNest is an automated warehouse composed by a rectangular frame with several rings containing rods on which are loaded the bags. It is available in different models:

Model	Rods number (drug types number)	Rated storage capacity (number of doses)
19L20	2640	26.400
19L24	3168	31.680
33L20	4440	44.400
33L24	5328	53.280

The bags produced by PillPicker are automatically loaded on DrugNest store through SinglePill robot, a mechanical arm with a suction device and a rod that collects bags from PillPicker and place them into the available positions in DrugNest.

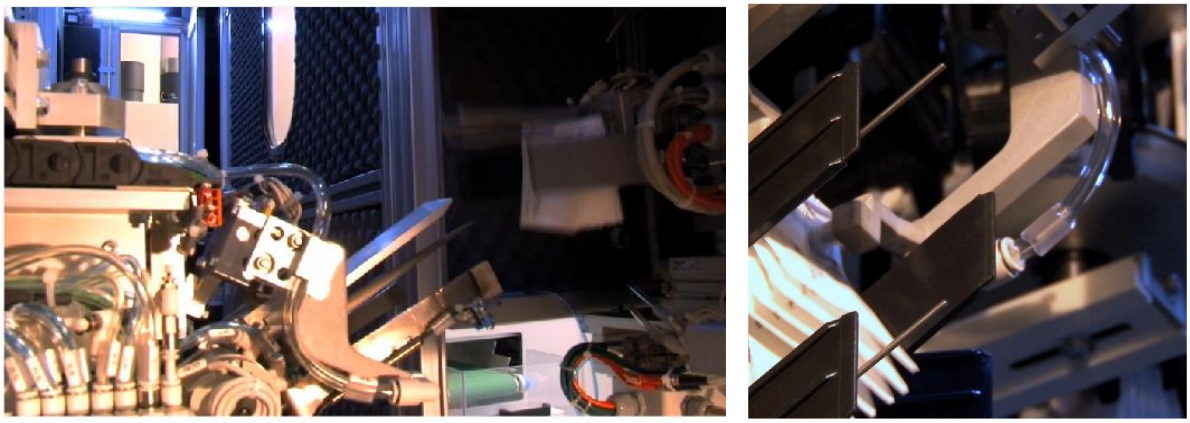


Figure 28 - SinglePill

DrugNest utilizes the same device, SinglePill robot, in order to collect the single dose bags and transfer them to PickRing where they are grouped together with a plastic ring.

3.5.1 Storage logic

Stock handling in DrugNest follows three principles:

1. Random logic
2. First expired first out
3. Traceability

1. The random logic implies that Unit-Dose bags do not have a pre-set storage location but they are arranged in the most convenient available storage location inside DrugNest.

   This logic optimizes drug dispensing by reducing to the minimum level the movements needed to collect Unit-Dose bags.
2. First Expired - first out means that drugs with the closest expiry date are dispensed first, reducing the risk of having expired drugs in stock close to zero.

3. Traceability means that each single dose inside DrugNest is perfectly identified and tracked. This brings to an efficient handling of lot and expiry date per each Unit-Dose bag, which can be easily tracked in all its movements.

PillPick Manager manages DrugNest stock by automatically creating loading jobs for PillPicker for each medication that is running below a certain quantity (so-called “par-level”).

The calculation of the par-level and reorder quantity for each medication can be made through 2 different methods:

- The Classic method
- The Statistic method

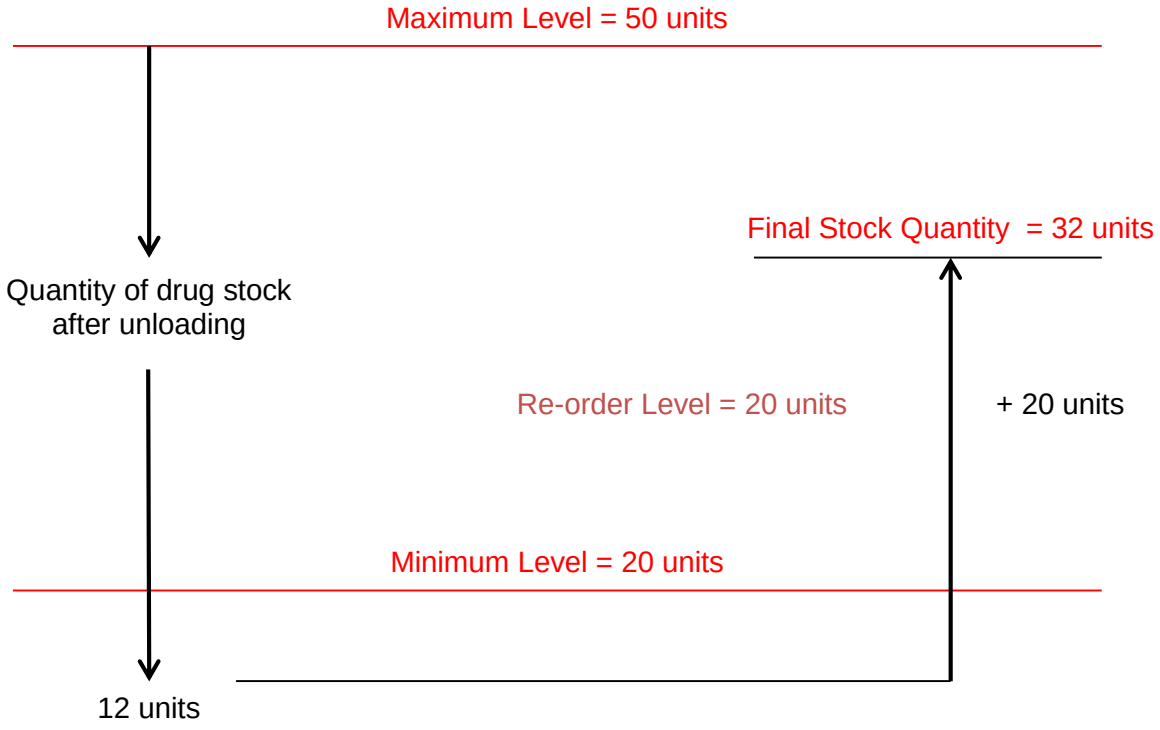
3.5.1.1 Classic Method

The Classic Method simply uses 3 parameters to generate reorder jobs:

- Minimum (Par) Level
- Re-order Quantity
- Maximum Level

Set up par-level, maximum level and re-order quantity. When the DrugNest stock runs below the par-level, the system creates a loading job for PillPicker equal to the re-order quantity.

If the re-order quantity field is left empty, the system automatically requires the quantity needed to reach the maximum level.



3.5.1.2 Statistic Method

The Statistic Method generates loading jobs for PillPicker starting from the consumption data of a given period (i.e.: the last 3 weeks).

This method guarantees a higher accuracy, since the user only has to set the number of days he/she wants to have on stock, and the system would automatically set par-level and reorder quantity according to the consumption of the set time-period.

Statistic method also takes into consideration seasonal fluctuation in the consumption of specific medications.

3.5.2 Output

PillPick Manager receives electronically-prescribed therapies from the CPOE and checks automatically the availability of the required amount of doses inside the DrugNest in order to dispense patient-specific therapies into PickRings.

In case of missing drugs in DrugNest, a warning is generated on PillPick Manager and the user has the possibility to

- Start the therapy production anyway and integrate the missing unit manually
- Generate a loading job on PillPicker and package the necessary amount of UD bags before dispensing

When the user confirms, the system starts picking up each single dose composing the therapy of patients and delivers them to PickRing (as described in chapter 3.7).

3.6 Return Window

This function allows to load back into DrugNest not administered medications returned from wards.

The returned bags are loaded through DrugNest window onto a dedicated pin carousel, called “Transfer” or “Return conveyor” and then scanned to be identified by the system. After their identification, they will be automatically arranged onto their storage location: not recognized or expired bags will be discarded.

Figure 29 – DrugNest Return Window

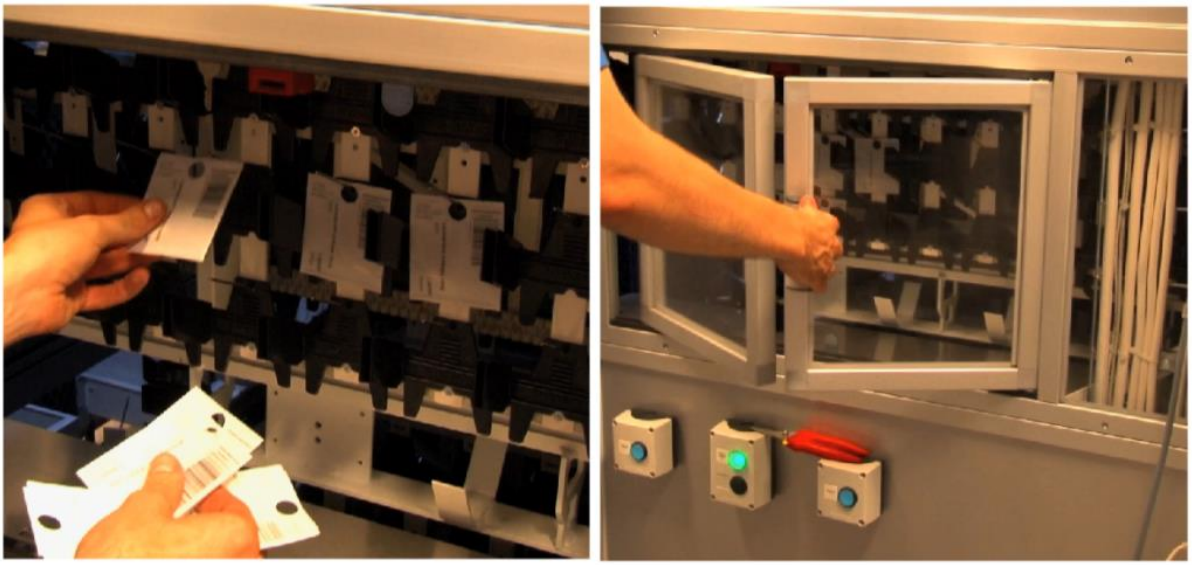


Figure 30 – Returns loading

3.7 PickRing

The system is equipped with a special device named PickRing that allows to collect all the single dose bags included in the patient therapy and to bound them together with a plastic ring.

Figure 31 - PickRing

A pre-perforated label, containing the patient data, is bound together with the bags into the plastic ring.

This label (mm 150x75) typically contains the patient data and the list of drugs included in the patient therapy.

The layout and information in the label can be configured and customized according to user's need.

Following an example of standard label layout.

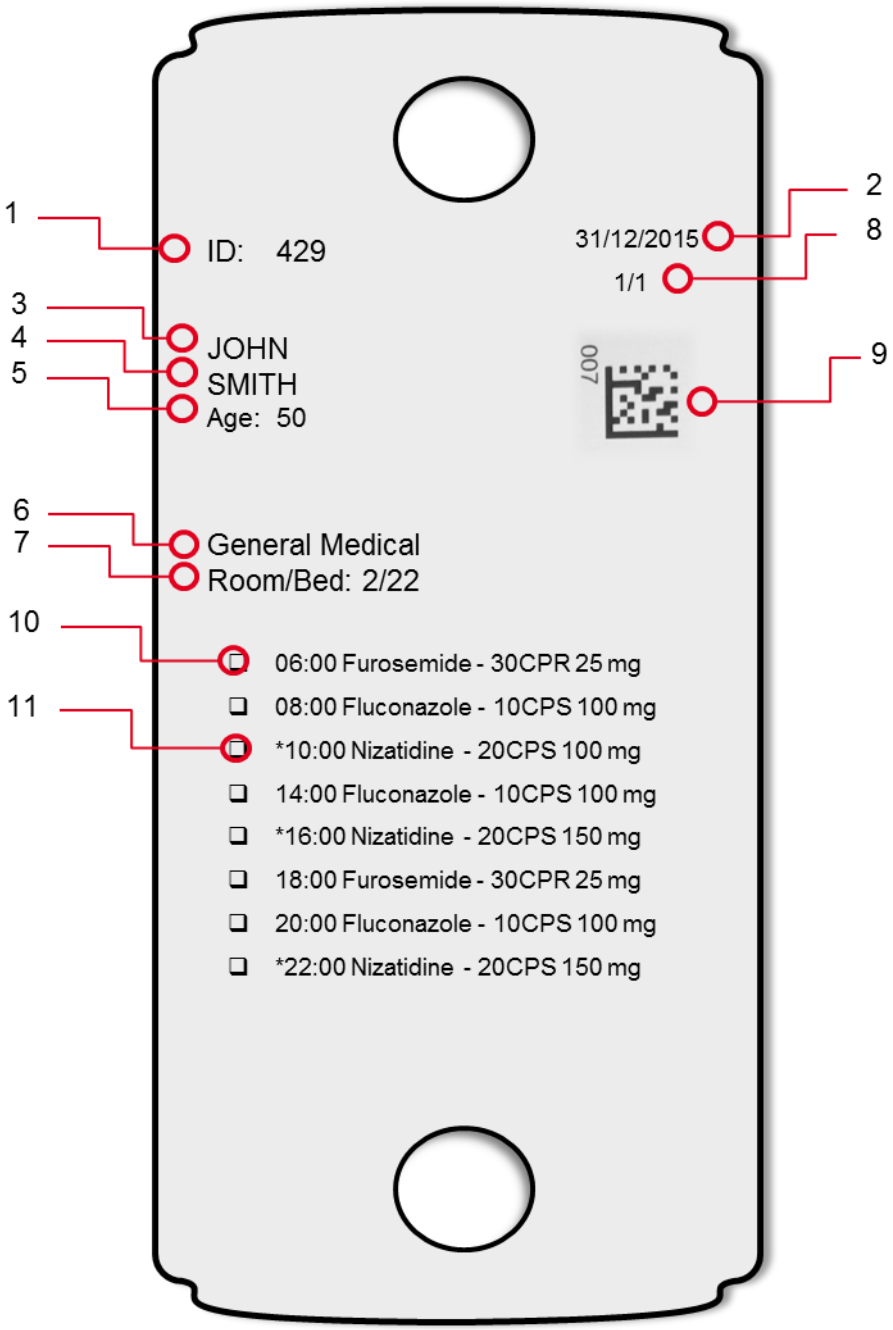


Figure 32 - Sample of Label

1. Ring ID (only for traceability use)
2. Date
3. First name of the patient
4. Last name of the patient
5. Age of the patient or birth date
6. Name of ward
7. Number of room/bed
8. Quantity of rings per patient
9. Barcode of the Patient
10. Administration unit (in the ring)
11. Administration unit (not in the ring)

The patient label displays the list of drugs included in patient therapy sorted by administration time in chronological order. It contains till 22 lines, each line represents a drug prescription of the therapy and contains the following information:

1. Empty square, the nurse can mark it after the administration of the corresponding drug
2. Administration time
3. Brand name
4. Form
5. Strength
6. Star indicating that the corresponding drug is included in the patient therapy but it's not present in the ring (no unit dose format, refrigerated drug, oversize, slow mover) and should be integrated from a different location (BoxPicker, fridge, manual shelves)

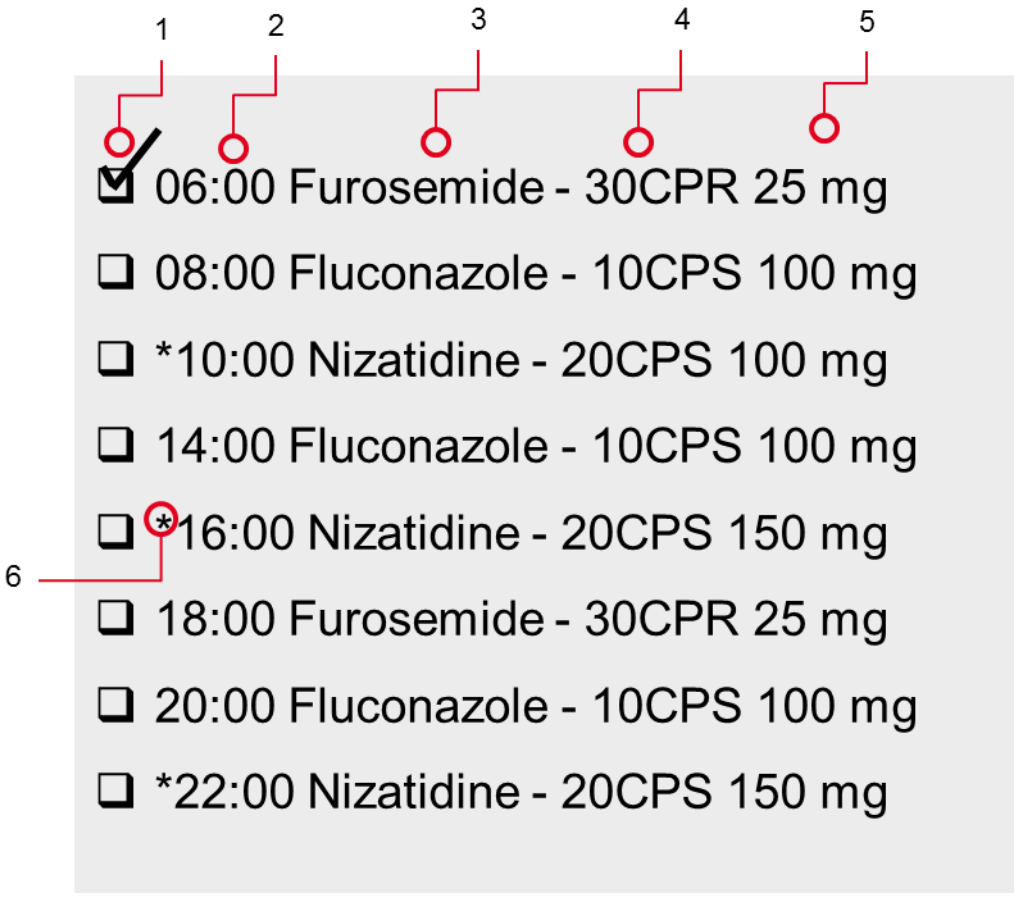


Figure 33 - Sample list of label's drug

4. PILLPICK MANAGER

PillPick Manager is the software for the management and control of PillPick System.

PillPick Manager functionalities included in the basic license are:

4.1 Orders

4.1.1 Orders to load

PillPick System activity is based on the inventory levels of each stores controlled by PillPick Manager software: DrugNest, Boxes, Manual stores (when present). These stores are required to be filled with the assigned medications. When PillPick Manager receives an order for a specific drug, this can be either automatically dispensed from DrugNest or manually picked from manual stores, if present. When the quantity of a drug runs below the minimum level set for that drug in the assigned store, PillPick Manager automatically generates a request to refill that store with the needed amount of drug to reach the maximum level set. These requests appear as "packaging jobs" in this dedicated “Orders to load” list: operator checks the list and collects the needed boxes to run packaging operation accordingly. Operator can package a drug even it is not part of the packaging list.

4.1.2 Orders to dispense

This function allows to manage dispensing orders to be sent to PillPick System. From here it is possible to start and check the progress of the dispensing orders; moreover, it is possible to select multiple wards and days of therapy to be dispensed, in order to optimize the production of therapies when more than one PickRing are available to produce patient rings.

4.2 Operations

4.2.1 Specific unloading

This function allows to unload drugs from DrugNest independently from prescription orders. It is possible to choose the type of drug, a specific exp. date and/or batch number and the quantity of units to be dispensed. dispensing destination can be chosen between PickRing and a specific drawer (for loose bags). The default destination for the unloaded bags is the Pharmacy, but it is possible to select a different destination (ward).

Operator can create a list with the drugs to be dispensed, and run the unloading operation when needed.

4.2.2 Drug returns loading

This function allows to load back into DrugNest all unit dose bags with drugs not administered to patients and returned from wards. PillPick DrugNest is equipped with a specific window where the returned bags can be loaded onto a dedicated pin carousel, called “Transfer” or “Returns” belt, with no pre-sorting needed. Each bag will be automatically scanned through barcode readers: after their identification, they will be automatically arranged onto pins into the warehouse: bags not recognized or expired will be rejected.

4.2.2.1 Multi load

An additional configuration of the return loading function allows to speed up the return operation by having the Pharmacy staff to load multiple units of the same drug (assuming same lot and exp. date) by sorting the bags manually before loading into the Return belt. Then, the system scans and reads only the first bag on each pin: the other below are supposed to be the same and are loaded immediately without scanning. With this function the operator must be careful in loading the same product and same lot /expiration date onto a pin.

4.2.3 Inventory

The DrugNest inventory function is an automated operation that needs to be activated each time it is necessary to re-align the logic quantity with the real quantity of products in stock.

Every time a discrepancy of stock is found, the system records this and automatically puts that drug in the inventory list. Operator may check the list once a day and run inventory operation just by pushing the “Start” button: the inventory operation is automatically done by the system that counts all unit dose bags of the products in the list and aligns the inventory with the right quantity.

Thanks to this operation, PillPick Manager keeps the stock always updated with the real quantity.

4.3 Store

4.3.1 Stock

This function gives a real time picture of the stock of product inside PillPick System. Operator may choose research filters such as: type of product, lot N°, exp. date, storage, etc.

The list can always be printed/extracted into excel version.

4.3.2 Drugs

This function allows to analyze and define all technical and operating parameters for the whole drug database managed by PillPick System. The drug database section contains two main categories of data:

- General data: they are provided by the hospital, through software interface or by importing needed information from an Excel file. Once they are transferred into PillPick Manager, operator can assign all technical data to the products.
- Technical data: Pharmacy staff (opportunely trained by Swisslog) can fill in all fields with data needed for PillPick functioning.

4.3.3 Expired drugs

PillPick Manager automatically checks expiry date of products inside the DrugNest (and, as an optional feature, also for products on manual stores).

Expiry window is customizable according to Hospital needs. PillPick Manager displays all expiring drugs in a specific window from where operator may decide to run a dispensing operation.

4.3.4 List of Boxes

This function is the list of all filled and recorded boxes (PillBox and PhialBox).

It shows all box information as box number, quantity of units contained, date of filling, operator access.

4.3.5 Recalled lots

This function allows to map products on the basis of a recalled lot N° and to remove them from the corresponding warehouse (DrugNest, Manual Stores, Boxes).

4.4 History

4.4.1 History movements

This function allows to map all operations carried out through PillPick system. Operator may refine the research by means of specific filters in order to display/print/extract the needed report.

4.4.2 Produced lots

This function displays all information related to production batches of the packaging module (PillPicker), such as: packaging date, units required VS produced and eventually rejected for each job done.

The report can be printed and/or saved as an excel file.

4.4.3 Bag check

Each unit dose bag has a unique progressive number (see “bag ID” in the picture) that is contained in its barcode and allows its complete traceability.

Through the scanning of the bag barcode it is possible to know its story, from the packaging to the dispensing for a specific patient and eventually to its return into Pharmacy stock.

4.4.4 View rings

This tool display all rings that have been dispensed by the system and it is useful to check if every ring was done successfully. In case of any fault/error, the "wrong" ring ID is displayed in red in the list, allowing the operator to unload that ring again.

By default, the function displays the rings produced the current day: through a calendar window it is possible to extend the research to past dispensing operations.

4.4.5 Alarms history

This function allows to display a complete history of the alarms occurred.

Different filters are available to easy detect the alarms, the period of time and the corresponding machines.

4.4.6 Access history

This function allows displaying, in the selected period, the complete list of users who acceded to the system, describing time, machine, operation.

4.4.7 History Account

This function allows to keep track of changes on the user and group accounts.

4.4.8 Statistics

This function enables to evaluate performance and reliability of PillPick System through production statistics and gives the user the possibility to extract all data in excel file.

4.5 Config

4.5.1 View store

This function allows to have a complete overview on the store status:

- Drugs on the all positions
- Enabled pins
- Disabled pins
- Occupied pins
- Still available pins

4.5.2 Users

This function allows to manage user’s accounts and rights of access to the different functionalities of PillPick Manager software and machines software.

All the rights, for all the Swisslog systems are assigned through this configuration function.

Only the Administrator can configure user/groups and rights.

4.5.3 Priority Management

This function is exclusively reserved to authorized Administrators.

This function allows to set the priority of the therapy to be displayed on the label of the rings and/or on level of the Orders to Dispense (PillPick Manager). For urgent orders, priorities may be set major or equal to 90 in order to be sorted as destination in the PickRing.

4.5.4 Diagnostic of jobs

This section allows the view on the different operations currently ongoing:

- Packaging folder: all information on drug in packaging phase are displayed (drug data, type of production, number of produced units).
- Load folder: loading operations are displayed.
- Unload folder: dispensing operations are displayed.
- Manual Pick List folder: operator can print a list of the missing drugs after the unloading of the therapies.
- Returns folder: diagnostic of PickCase with all positions done.
- Transfer belt folder: here bags on transfer (return) belt are displayed. Transfer belt is the one used to read and identify the bags loaded manually through window, in order to arrange them into DrugNest, in the right position.
- Emergency procedure folder: in case of problems/failure in therapy dispensing/drug unloading from DrugNest, it is possible to stop the job in progress through a dedicated emergency procedure. In order to interrupt the dispensing of therapies (or of drugs to supply ward stock) there is a new specific folder displaying the procedure must be executed. For this procedure it is preferable to use the main console-PC instead of laptops. If the DrugNest is not in alarm status, put DrugNest on "hold" mode and let PickRing complete ring production in progress (unless PickRing it is already blocked). Turn in "manual" mode the PickRing.
- System Configuration folder: the information about DrugNest and SinglePill are showed with other information about configurations.

4.5.5 Tables

"Tables" is a list of databases including:

- Units table: list of the wards and related dispensing time frames. Time frame is the time window for therapy dispensing (i.e. 24h dispensing from 6:00 pm D - 6:00 pm D+1). Pharmacy staff can also define multiple timeframes for one ward (i.e. 8 a.m.- 12 a.m.; 2 p.m.-8 p.m.) and the therapy preparation will be split accordingly (DrugNest software has to be configured accordingly).
- Manufacturer table: List of the manufacturers.
- Patients table: list of the patients.
- Reports table: list of the reports. Only reports market at their side will be displayed in the program.
- Wards schedule table (Optional): In order to define the automatic start of therapy dispensing, operator must configure time schedule for the different wards.