**RIEDL definition of an international interface between pharmacy IT systems and order picking systems based on the standardized interface description in Germany Ver. 1.12**

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# 1 Basic questions

## 1.1 Stock maintenance only in the pharmacy IT system / System boundary

The system boundary for stock movements is the pharmacy. Within the pharmacy the order picking system (OPS) represents the only storage location. All stock movements within the pharmacy do not touch the system boundary and thus do not result in a change in stock. The pharmacy IT system is responsible for the stock maintenance relevant for the pharmacy.
Thus, inputting and outputting of stock on the robot always happen without change in the stock level of the pharmacy IT system. Only when a product is handed over at the point of sale or newly delivered, it is entered into the pharmacy IT system.
The K-dialog can be used to reconcile the stock of the pharmacy IT system and the OPS. This process has to be started by the pharmacy IT system.

## 1.2 Stock input (new delivery) Where? How?

Stock can be input into the OPS using the I-dialog. This dialog will send all important data to the pharmacy IT system.

## 1.3 Storage location management

The storage location in the OPS (bay, shelf, start position) is managed and assigned by the OPS.
The storage area (self-service, behind-the-counter, OPS, basement, reserve stocks) is managed and assigned by the pharmacy IT system.

## 1.4 Input screen form on the electronic cash register

It is recommended, to display only the OPS articles on the pharmacy IT systems using the alpha input on first access. The articles in the storage area OPS should be marked. It should be easy to toggle. Scanning has to, of course, remain possible.

## 1.5 Placing of orders

An order number for stock outputs has to be assigned by the pharmacy IT system and for stock inputs by the OPS. The combination order number/number of point of sale allows for a clear identification. Identical order numbers always belong to the same order. In case of output orders consisting of more than 10 articles (batch processing) the order has to be divided into several orders.
Grouping several articles into one order should be done depending on the conveyor system. In case of a continuous conveyor system each selected article should be immediately ordered from the OPS. Order picking only makes sense in connection with a conveyor system which is able to transport several packs at the same time.

## 1.6 Order buffering

Buffering is always carried out by the OPS until the message «no further order possible» is sent to the pharmacy IT system. The number of orders buffered in the OPS is configured variably by the OPS. A maximum number of 20 orders seems to make sense.

## 1.7 Stock reconciliation pharmacy IT system/OPS when putting the OPS into operation

When putting the OPS into operation the synchronization of data between OPS and pharmacy IT system can be carried out using either an installation disk or the K-dialog.

## 1.8 Handling of follow-on articles

The handling of follow-on articles is the responsibility of the pharmacy IT system. That means the article code of the old packs has to be sent to the OPS until the old packs are sold out.

## 1.9 List of returned sales

Solved by the A-dialog as batch process.

# 2 Communication between OPS and pharmacy IT system

## 2.1 Dialogs

### 2.1.1 Basic dialogs

There are some dialogs agreed upon which are sufficient for the operation of OPSs. With these dialogs a multitude of cases of use can be handled. Thus, there is an output dialog for the movement of stock to the point of sale, for expiry lists, for removal or returns. The pharmacy IT system is responsible for the realization of these tasks.

### 2.1.2 Message types

As part of the dialog two types of messages have to be distinguished:

- asynchronous messages (can be sent by OPS or pharmacy IT system any time)
  or
- messages based on request as response to an asynchronous message.

Each side can send a request to the other side at any time (asynchronous). All responses that refer to this request are messages “based on request”. In addition to this, the possibility to communicate various information about the state at any time is provided for – quasi without being asked and unrelated to a current request.

A message itself cannot be divided and cannot be interrupted by any other message (no matter whether asynchronous or based on request). A dialog, on the other hand, can be interrupted, that means a request does not necessarily have to be followed by a related response.

### 2.1.3 Configuration of dialogs

It has to be configurable on the pharmacy IT system and on the OPS which dialogs will be understood resp. which dialogs will be used for the single tasks. At the beginning of the projects, the pharmacy IT systems or the OPSs will probably not yet have realized all the dialogs. At the start of the machines, the possible dialogs and the protocol version are transmitted.

## 2.2 Description of the individual dialogs

### 2.2.1 A-dialog: Stock output, Change in quantity

Request by pharmacy IT system to output packs from the OPS. This one at once responds with the quantity delivered. OPS is also able to send an asynchronous response message to point out an unexpected change in the quantity delivered, e.g. after determining that a shelf is empty. When the order picking process is finished, a confirmation for each order has to be sent from the OPS to the pharmacy IT system.

### 2.2.2 I-dialog: Stock input information

The I-dialog controls the stock input on the OPS. For this, the delivery note number as well as possibly the expiry date have to be transmitted from the OPS to the pharmacy IT system additionally to the article code. On the basis of the status, the pharmacy IT system can distinguish whether new delivery or a stock return is supposed to be input. The pharmacy IT system decides on the basis of the transmitted data whether the article may be input resp. whether the expiry date is needed or the order identifier is supposed to be set.
The texts sent by the pharmacy IT system will have to be displayed on the OPS in any case.

Each pack will be at first scanned on the OPS which will then send an i-msg to the pharmacy IT system. Status 0 = request for pack as new delivery, Status 1 = request for pack as stock return
If the input request is responded to with Status 00, then the article will be input. In case of Status 01, the article will not be input, the reason for the non-acceptance should be specified in plain text. (Please, not more than 2 x 40 characters.)
If the Status 02 is sent, the user will be asked by the machine to enter an expiry date and a new i-msg with expiry date and new order number will be sent. After the article was input successfully, an i-msg with

Status 06 will be sent. A response with Status 07 means that the pack was not input. The reason for the non-acceptance of the pack will be displayed on the OPS (e.g. pack was not positioned correctly against the gantry). The complete process will be started over (new i-msg with new order number...).

If an input request is not accepted because there is no order identifier set in the pharmacy IT system for this article, the pharmacy IT system will sent an I-cmd with Status 4, the user will be now asked on the OPS whether he wants to set an order identifier for this article. If he wants to set an identifier for this article, he has to send a new input request with Status 4 or 5 (set order identifier for pack as new delivery resp. as stock return) and wait for the response from the pharmacy IT system.
When an article will be input for the first time, a first message mode can be selected on the OPS. When this mode is selected, every pack will be input with Status 4 or 5 and the order identifiers will be sent to the pharmacy IT system for all packs.

Inputting a new delivery will be started with PZN 0 and Status 02. If the pharmacy IT system responds with Status 00, the delivery note number is correct, if it responds with Status 01, an error occurred in the delivery note number.
In this case, the process will be started over, as described above, only when the pharmacy IT system responds with Status 00, is the delivery note number valid and the stock input can be started.
The stock input will be completed with an i-msg with Status 03.
In case of tandem machines, each machines functions independently. That means that the first machine can input packs as stock returns while the other machine processes a new delivery. It also happens that both machines process the same stock input, in this case the messages for start and end of stock input have to be sent by each machine separately (physically via one and the same interface, the same delivery note number with different order numbers and order location numbers).

### 2.2.3 P-dialog: Article name

Request from OPS to pharmacy IT system concerning the article information of a pack (name, item form (abbreviation), unit, expiry date). Response to OPS with corresponding message. Used to automatically maintain the article names in the OPS.

### 2.2.4 O-dialog: Order status

Request from pharmacy IT system to OPS concerning the progress or status of an order. Response with plain text. The message can also be asynchronously sent from OPS to pharmacy IT system, to point out an error in the order.

### 2.2.5 S-dialog: Machine status

Request from pharmacy IT system to OPS concerning the status of the OPS. Response with plain text. The message has to be sent asynchronously from OPS to pharmacy IT system to point out an error in the OPS.

### 2.2.6 R-dialog: Start/recovery procedure

To synchronize the starting and restarting of the systems, the systems exchange start messages. The start messages include the version of the used protocol software.

### 2.2.7 B-dialog: Stock level/Storage locations

Request for information from the pharmacy IT system to OPS, reply for an article number with all storage locations, with their input data etc. For a continuous stock reconciliation from OPS --> pharmacy IT system a batch request can be started on the pharmacy IT system. (K-dialog)
In most cases, data concerning storage location, capacity, quantity at storage location and expiry date is irrelevant for the pharmacy IT system. In our case, a software switch can be used to shorten the B-dialog. When this flag is set, „00“ is sent for number of lines and the rest of the data is omitted. This shortens the B-dialog by up to 260 characters.
In connection with the B-Dialog, it is possible to signal each change in stock level with an asynchronous b-msg. In this case, the message will also report the packs that are ordered by the Riedl system.

### 2.2.8 K-dialog: Stock control / Stock reconciliation

This dialog is used to retrieve the stock data of the OPS as quickly as possible and to transmit it.

The pharmacy IT system sends an article number (start number) to the OPS. The OPS then has to deliver the stock data for the next largest article numbers. To improve the performance, up to 10 article numbers can be retrieved at the same time. No stock data will be delivered for the start number. If there are no larger article numbers, the number of transmitted levels is zero. If less than the ordered article numbers are larger than the start number, the number of transmitted stock levels has to be adjusted accordingly.

The first request has to be started with country 0 code selection 0 and empty pack code (20 empty spaces).
For all further requests the country, code selection and pack code in the last line of the stock data of the last reply have to be entered accordingly.

## 3 Code table

| Country | Country code | Pack code | Code name | Code length |
|---|---|---|---|---|
| Italy | 039 | 01 | PZN | 7 |
| | | 02 | EAN 13 | 13 |
| | | 03 | EAN 8 | 8 |
| | | 04 | MINSAN | 9 |
| | | | | |
| Switzerland | 041 | 01 | PZN | 7 |
| | | 02 | EAN 13 | 13 |
| | | 03 | EAN 8 | 8 |
| | | 04 | Pharmacode | 12 |
| | | 05 | Code8 (all 8-digit codes which are not EAN 8, without any check) | 8 |
| | | | | |
| England | 044 | 01 | PZN | 7 |
| | | 02 | EAN 13 | 13 |
| | | 03 | EAN 8 | 8 |
| | | | | |
| South Aftrica | 027 | 01 | PZN | 7 |
| | | 02 | EAN 13 | 13 |
| | | 03 | EAN 8 | 8 |
| | | | | |

Code is left justified. All digits have to be filled, if necessary, they have to be filled with leading zeros. The rest of the field will be filled with blanks.

Ex. PZN 12345 Code: 0012345_____

# 4 Overview of individual dialogs

## 4.1 A-Dialog – Stock output

| **Dialog form** | **´A´** | 1 character |
|---|---|---|
| Order number | | 8 characters (number) > 00000000 |
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Delivery point number | | 3 characters (number) > 000 |
| Priority | max = 1 default = 3 min = 5 | 1 character (number) |
| Number of lines (Number of different types of packs) | 10 is maximum | 2 characters (number) |
| • Country | | 3 characters (International Phone Code – e.g. 044 for UK) |
| • Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| • Pack code | | 20 characters (number) |
| • Quantity | | 5 characters (number) |
| • Flag: Stock location to be cancelled **(Not used in RIEDL)** | 1 Stock location to be cancelled<br>0<br>(**SET to 0** for the Riedl Speedcase– not used) | 1 character (number) |

### 4.1.1 A-Dialog – Response (from OPS to pharmacy IT system)

| **Dialog form** | **´a´** | 1 character |
|---|---|---|
| Order number | > 00000000 | 8 characters (number) |
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Delivery point number | | 3 characters (number) > 000 |
| Order status | 0 in progress<br>1 in queue<br>2 queue full<br>3 aborted<br>4 order completed (end message)<br>5 change of ordered quantity from order picking system to pharmacy IT system | 2 characters (number) |
| Number of lines (Number of different types of packs) | 10 is maximum | 2 characters (number) |
| • Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| • Type of Code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| • Pack code | | 20 characters (number) |
| • Delivered quantity | | 5 characters (number) |

## 4.2 I-Dialog – Stock input request, response

| **Dialog form** | ´**I**´ | 1 character |
|---|---|---|
| Order number | > 00000000 | 8 characters (number) > 00000000 |
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of Code (PZN, EAN, Pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |
| Quantity | | 5 characters (number) |
| Expiry date | ddmmyy or 000000 if unknown or unwanted | 6 characters (number) |
| Order status | 0 article allowed to be input / delivery number valid<br>1 article not allowed to be input / delivery number not valid<br>2 article must be input with its expiry date<br>4 no stock location associated with this article ***<br>5 article must be input in refrigerated unit | 2 characters (number) |
| Text message | 3 characters (data length)+Data+\0<br>Width < 70 characters<br>Height < 18 characters | In plain text, the reason for a rejection can be given or it can be referred to particularities. |

*** Each article has to be associated with a stock location (whether it may be input into the order picking machine or not) in the pharmacy IT system.

### 4.2.1 I-Dialogue – Stock input request – *Request for the OPS*

| **Dialog form** | ´**i**´ | 1 character |
|---|---|---|
| Order number | > 00000000 | 8 characters (number) > 00000000 |
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Delivery note number | any character | 12 characters |
| Country | | 3 Numbers (International Phone Code – e.g. 044 for UK) |
| Type of Code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |
| Quantity | | 5 characters (number) |
| Expiry date | ddmmyy or 000000 | 6 characters (number) |
| Order status | 0 Stock input request / New delivery<br>1 Stock input request / Stock return<br>2 Start new delivery | 2 characters (number) |

| | | |
|---|---|---|
| | (country, type of code, pack code = 0)<br>3 End new delivery (country, type of code, pack code = 0)<br>4 Set order identifier for stock return<br>5 Set order identifier for new delivery<br>6 Article stored in Speedcase<br>7 Article not stored - aborted | |

## 4.3 P-Dialog – Item name request

| **Dialog form** | **´p´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of Code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |

### 4.3.1 P-Dialog – Response to item name request

| **Dialog form** | **´P´** | 1 characters |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of Code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |
| Item name | | 40 characters |
| Item form (abbreviation) | | 3 characters |
| Item unit (20 mg, 500 mg...) | | 10 characters |
| Expiry date | ddmmyy | 6 characters |

## 4.4 O-Dialog – Order status

| **Dialog form** | **´O´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Order number | > 00000000 | 8 characters (number) > 00000000 |

### 4.4.1 O-Dialog – Response to Order status

| **Dialog form** | **´o´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Order number | > 00000000 | 8 characters (number) > 00000000 |
| Order status | 0 in progress<br>1 in queue<br>3 aborted<br>4 finished<br>8 not found | 2 characters |
| Plain text | 3 characters length + Data+\0<br>Width < 70 characters<br>Height < 18 characters | variable, as short as possible |

## 4.5 S-Dialog – Status of the OPS

| **Dialog form** | **´S´** | 1 character |
|---|---|---|
| Order location number<br>(999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |

### 4.5.1 S-Dialog – Response to Status of OPS

| **Dialog form** | **´s´** | 1 character |
|---|---|---|
| Order location number<br>(999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Status of the Order picking system | 0 ready<br>1 rot ready<br>2 partial breakdown<br>6 queue full | 2 characters |
| Text message | 3 characters length + Data+\0<br>Width < 70 characters<br>Height < 18 characters | variable, as short as possible |

## 4.6 R-Dialog – Start/Recovery request (from OPS to pharmacy IT system or from pharmacy IT system to OPS)

| **Dialog form** | **´R´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Protocol version | VVVV | 4 characters , e.g. 0200 for version 2.0 |
| Supported dialogs | 3 characters length + Data+\0 | variable, e.g. 003AOR\0 |

### 4.6.1 R-Dialog – Response to Start/Recovery (from pharmacy IT system or from OPS)

| **Dialog form** | **´r´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Protocol version | VVVV | 4 characters , e.g. 0200 for version 2.0 |
| Supported dialogs | 3 characters length + Data+\0 | variable, e.g. 003AOR\0 |

## 4.7 B-Dialog – Stock level request

| **Dialog form** | **´B´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |

Concerning the shortened B-dialog, see chapter 2.2.7.

### 4.7.1 B-Dialog – Response to stock level request

| **Dialog form** | **´b´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |
| Total quantity | | 5 characters |
| Number of lines (Number of different types of packs) | 10 is maximum | 2 characters (number) |
| • Stock location | ASCII :<br>2 Shelf<br>2 Drawer<br>3 Position in mm | 10 characters |
| • Capacity | | 5 characters |
| • Partial quantity for this location | | 5 characters |
| • Stock input date | Ddmmyy | 6 characters |

## 4.8 K-Dialog – Stock level control

| **Dialog form** | **´K´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Pack code | | 20 characters (number) |
| Stock level | | 2 characters **> 00**, <= 10 |

### 4.8.1 K-Dialog – Response to stock level control

| **Dialog form** | **´k´** | 1 character |
|---|---|---|
| Order location number (999 or 998 is reserved for Speedcase) | | 3 characters (number) > 000 |
| Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| Start Pack code | | 20 characters (number) |
| Number of lines | | 2 characters (number) |
| • Country | | 3 numbers (International Phone Code – e.g. 044 for UK) |
| • Type of code (PZN, EAN, pack code – To be defined) | | 2 characters (number) |
| • Pack code | | 20 characters (number) |
| • Quantity | | 5 characters (number) |