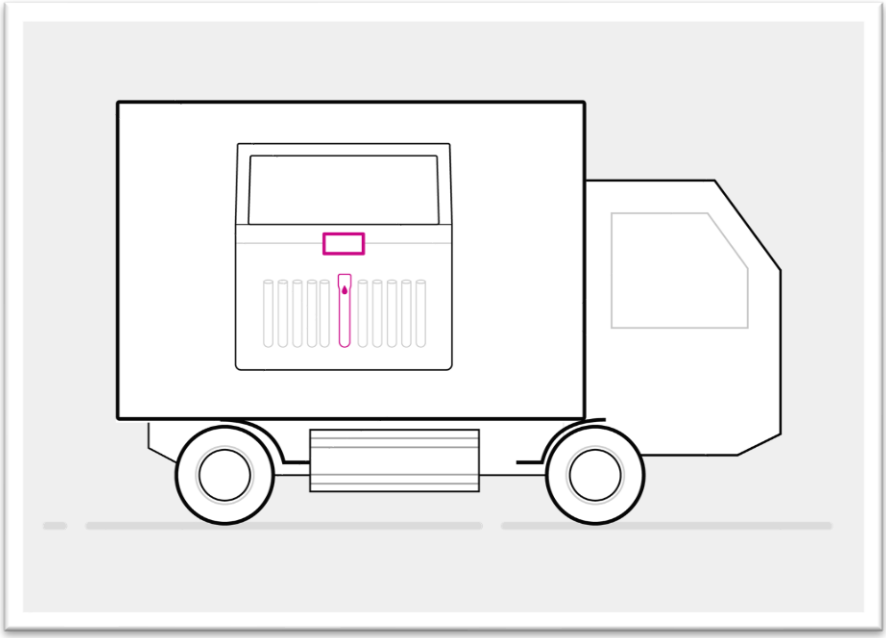
S4DX

Smart.Safe.Samples™

The new quality standard in preanalytics



Operating Manual

Courier App

Version 5.0

Revised on 10.12.2024

1 TABLE OF CONTENTS

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1 PRODUCT DESCRIPTION AND SPECIFICATIONS

2.1 NAME AND ADDRESS OF THE MANUFACTURER

S4DX GmbH

Rupert-Mayer-Str. 44

D-81379 München, Germany

2.2 INTENDED USE

The S4DX Courier App is used in combination with the S4DX SmartTube® Datalogger (hereafter called "SmartTube") to monitor the environmental conditions of biological samples during storage and transport in the preanalytical phase. The Courier App is used by courier drivers to register and route SmartTubes and confirm sample pickups at collection sites, handovers between couriers, and deliveries at lab entrances.

2.3 OVERVIEW OF THE S4DX GMBH PRODUCT FAMILY

This section provides an overview of the product family and its application and classification in the overall system, with a focus on hardware components.

SmartTube® Datalogger

Used to monitor the storage and transport of biological samples and record environmental factors (temperature, vibration).

S4DX Browser Scan

Used for web browser-based registration of biological samples.

Functional with barcode handscanner.

Gateway

Offers automatic and contactless data transmission from the SmartTube© Datalogger in the entrance of the laboratory.

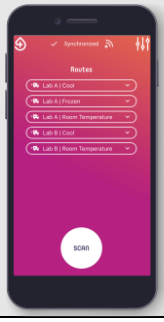
Samples App

Used for the mobile app-based registration of biological samples.

Available for Android and iOS.

S4DX Webservices

The central platform for digital preanalytics, used for data exchange with the LIS and convenient data analytics and visualization.



Courier App

Mobile app for digital transport tracking, compatible with all common transport containers and methods.

Available for Android and iOS.

2.4 WORKFLOW - FROM BLOOD DRAWING TO SAMPLE REGISTRATION

Figure 1. S4DX Workflow

Description of the workflow using the S4DX product family for digital preanalytics. The process starts with patient preparation before sample collection (1), including preanalytical guidance, and post-collection sample processing (2) using the S4DX Samples App or Browser Scan. It could furthermore also cover sample storage at the collection sites and all possible routes of sample transportation in boxes or bags (3) using the SmartTube Datalogger and Lab Gateway (4, 5).

2 APP DOWNLOAD AND USER SIGN IN

Notes:

- Users can lose their data if they work offline or clear the cache of the mobile application.
- The smartphone used for the mobile application should be synced with the current time.

1. Install

Install the S4DX Courier App on your smartphone by scanning one of the following QR codes

GET IT ON Google Play

Download on the App Store

or by searching for "S4DX Courier" in the respective stores.

GET IT ON Google Play

Download on the App Store

Note: For mobile device requirements, refer to Annex I technical specification.

2. Set up the password

You will receive an email with the defined user account to set up the password. Set up the password according to the instructions in the email.

The user account email address is defined by your organisation.

The password set-up email will be

- Sent by no-reply@s4dx.com
- With the subject: Welcome to S4DX Platform.

3. Sign in

Enter the user account in the field "Email" and the password in the field "Password" (see Figure 2) and tap the Log in button to login. Contact your internet provider or institutional help desk if you require additional help connecting to the internet.

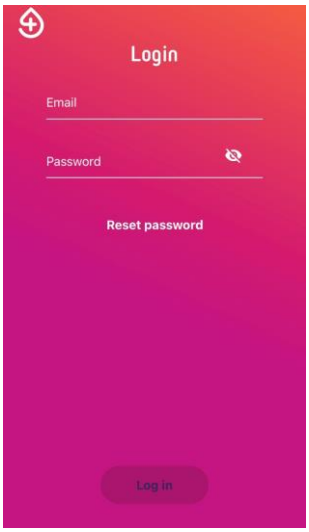


Figure 2. User sign in

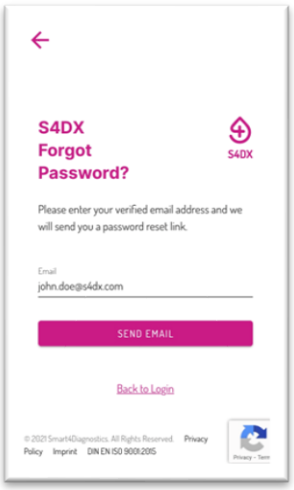
- Use the icon to verify the entered password, when needed.
- Upon successful login, the Courier App home screen will load. (see Figure 3)

Note:

If you enter incorrect log-in credentials (wrong password and/or wrong email address), an error notification will appear at the bottom of the screen. In this case, you can re-enter or reset the password.

To reset the password:

a) Tap on the Reset password button (see Figure 2).
b) Enter the email address and tap "SEND EMAIL" (see the figure below).



c) Follow the instructions received in the email to reset the password. The password reset email will be sent
   - From no-reply@s4dx.com
   - With the subject: Welcome to S4DX Platform.

3 User Interface Overview

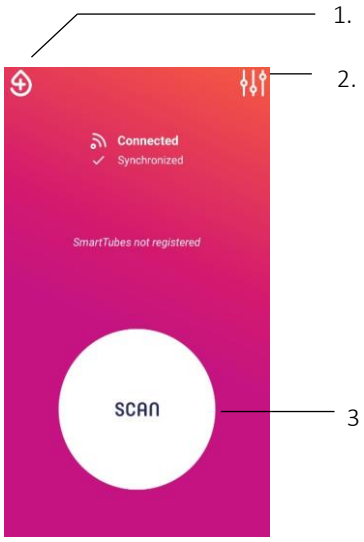


Figure 3. Home screen

Figure 4. Scan Interface

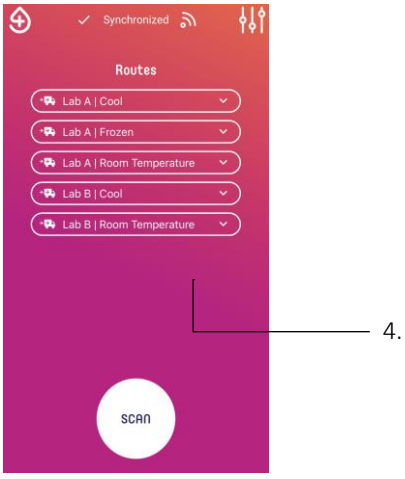


Figure 5. Home screen with "Routes"

Home screen	The main screen of the Courier App allows you to scan SmartTube and QR codes of collection/delivery sites and displays the transport routes (see Figure 3).
1. S4DX website button	Use this button to access the S4DX website with detailed information of S4DX's digital preanalytical solutions, or visit via: https://S4DX.com/
2. Menu button	Navigates to the menu for user profile, contact formular, data privacy policies, log out etc. (see Figure 6).
3. Scan button	Tap this button to start scanning the barcodes on SmartTubes and QR codes provided by S4DX at the collection/delivery sites (see Figure 4).
4. Transport route	Presents the information on the transport routes, usually comprising the transport destinations and conditions. Tap any of the transport routes displayed on the screen to check the SmartTube(s) assigned to that route (see Figure 5).

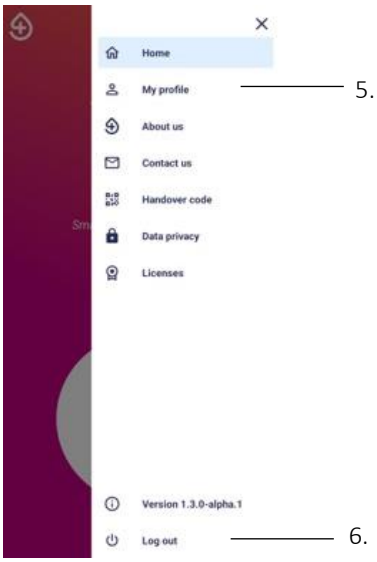


Figure 6. Setting menu

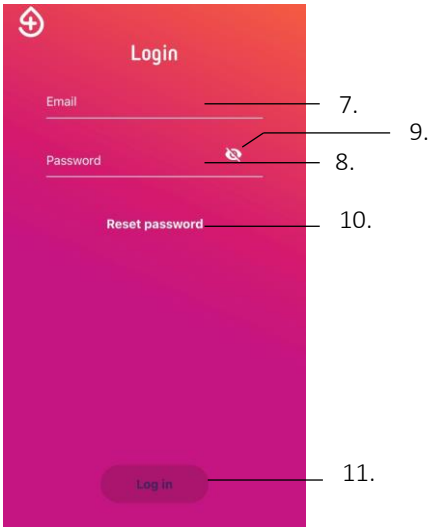


Figure 7. Login interface

Menu	Allows you to change profile settings, contact S4DX, access the S4DX website, view data protection policies and application licenses, and log out (see Figure 6).
5. My profile	Leads to your profile page and allows you to view and change first and last name, and language settings (See Figure 6).
6. Log out	Logs out of your account from the Courier App and leads to the login interface (See Figure 7).
7. Login email field	Type here to enter your account email.
8. Login password field	Type here to enter your account password.
9. Show/hide password	Tap to view or hide the entered password.
10. Reset password	Tap this button to reset your password.
11. Login button	After entering your correct email and password, tap this button to log in.

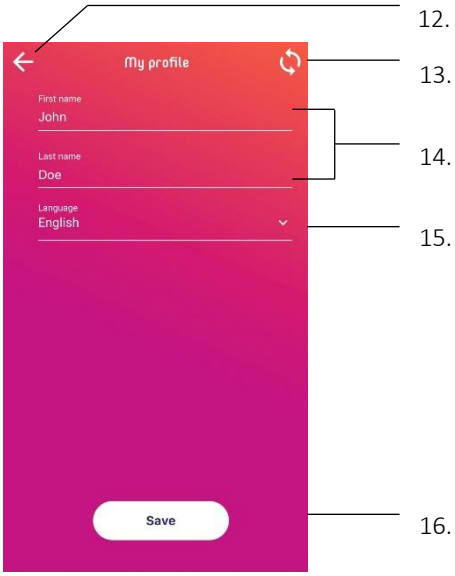


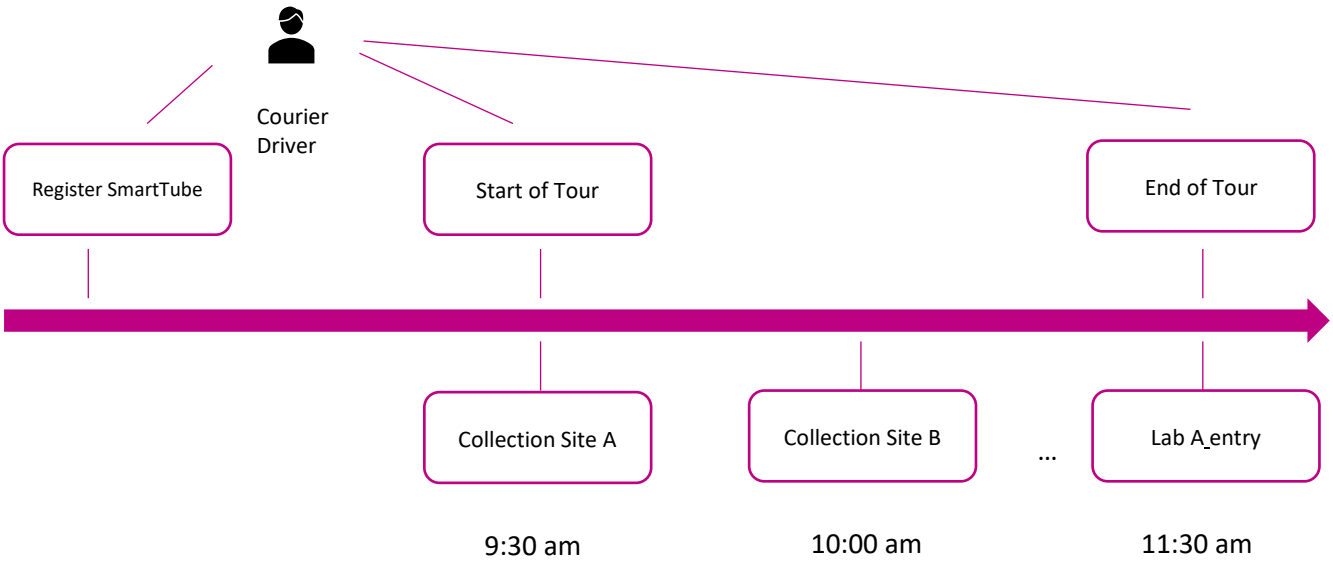
Figure 8. User profile

12. Back to setting menu	Return to menu (see Figure 6) from your profile screen (see Figure 8). - Tapping this button without saving will lead to the loss of changes.
13. Refresh	Tap this to refresh your profile and the laboratory-specific configurations for the Courier App in case the laboratory has updated its configurations.
14. First and last name	Tap to modify the first and last name.
15. Language setting	Tap to change your language settings.
16. Save button	Tap to save the changes in your profile.

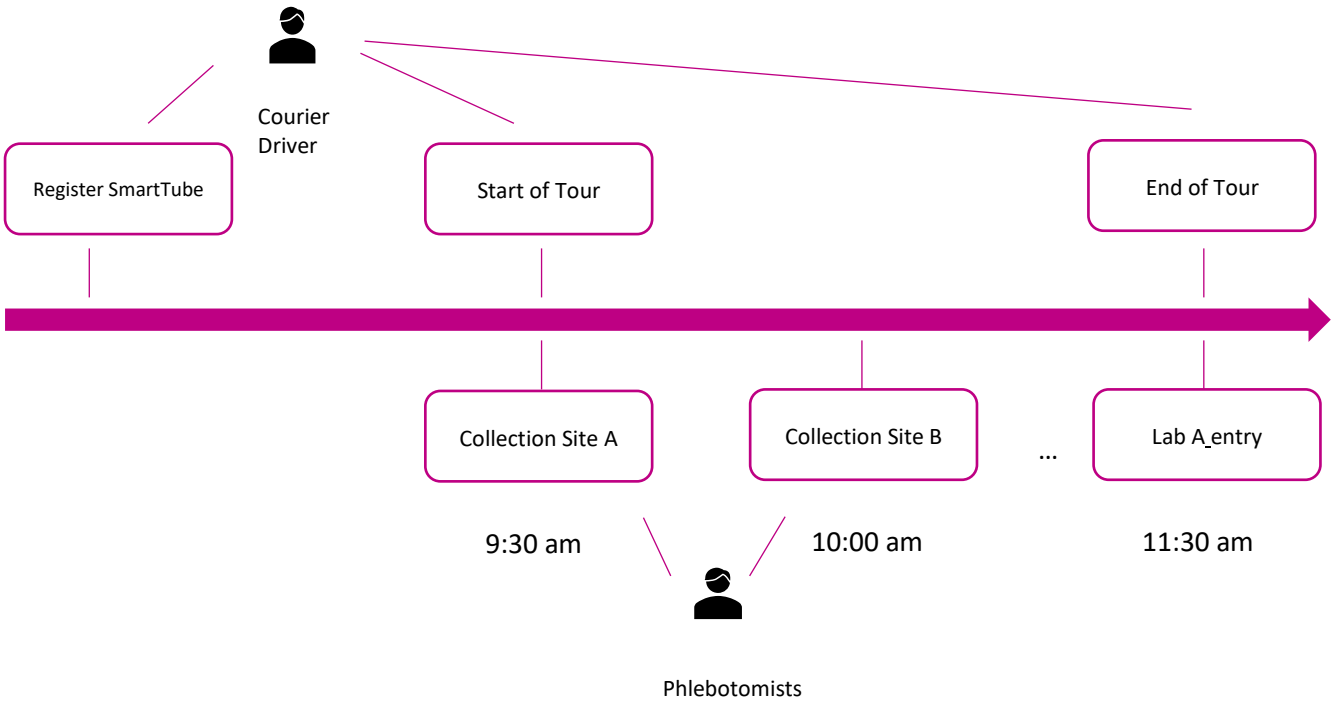
4 OPERATING WORKFLOWS

Summary of the possible workflows:

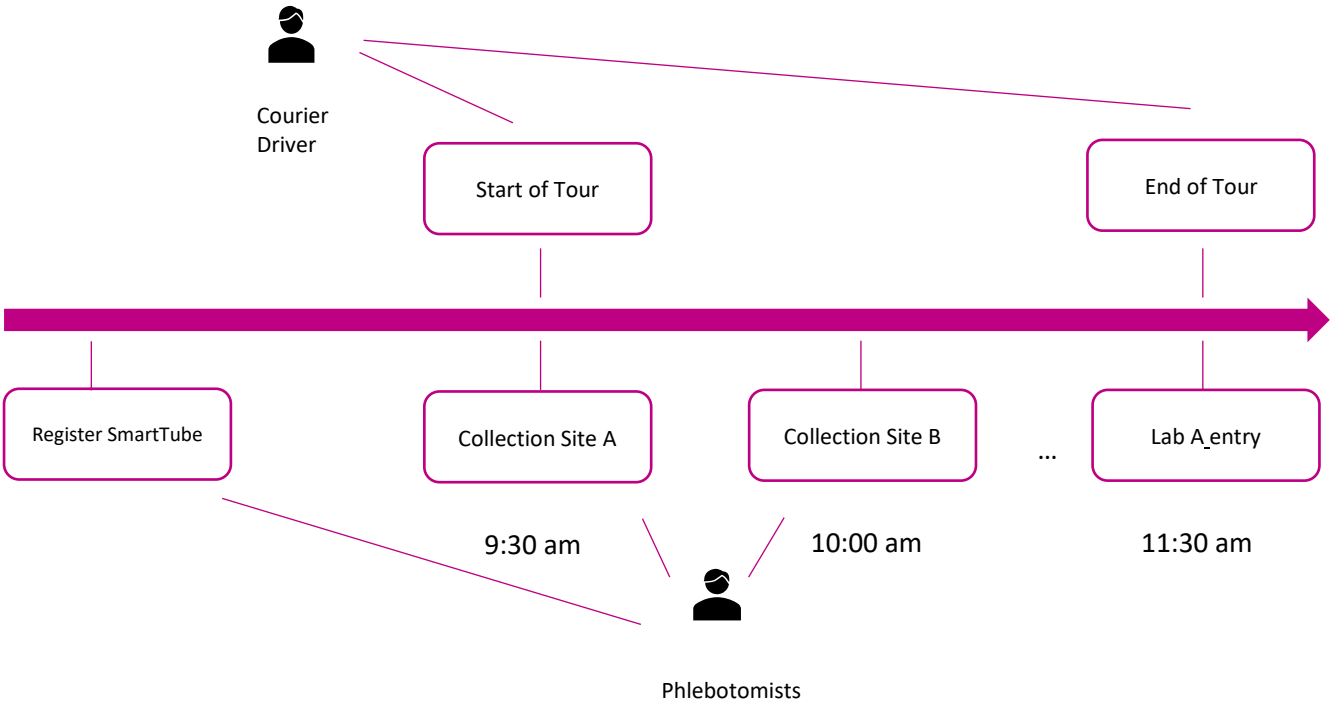
- Basic workflow with only Courier App interaction



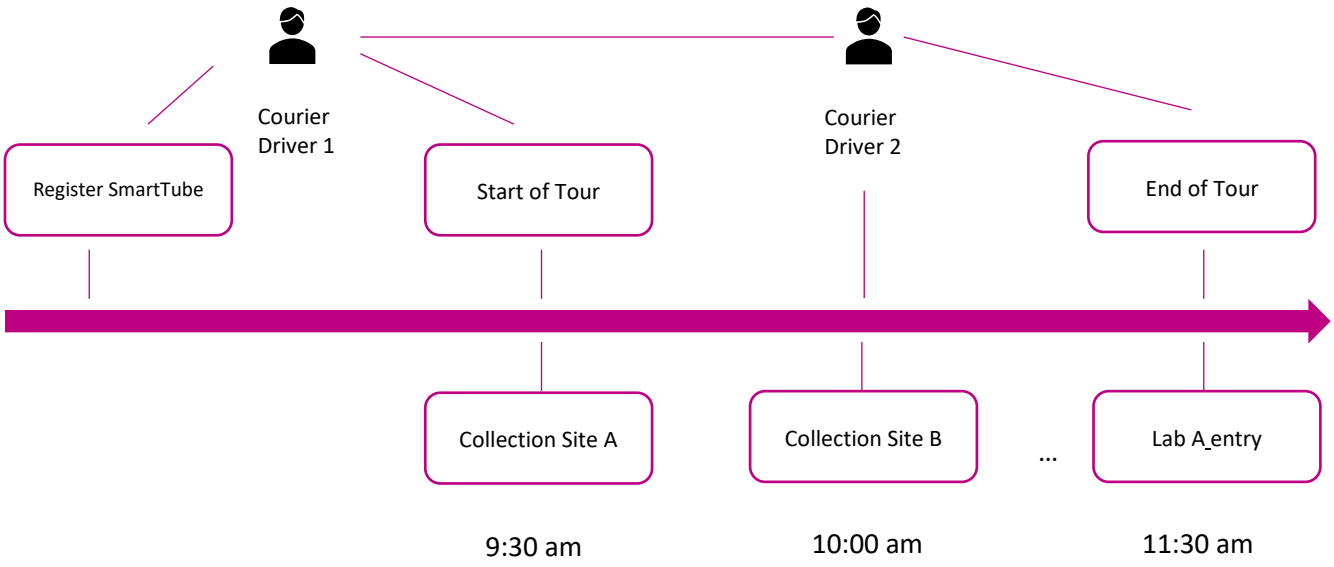
- Registration of samples in the collection site and SmartTube registration made by courier. Samples/Browser scan and Courier App interaction



- Registration of samples in the collection site and SmartTube registration made by personnel from the collection site (usually phlebotomists). Samples/Browser scan and Courier App interaction



- Courier handover. This workflow could be combined with any of the previous workflows. Here is the example for the basic workflow



5 OPERATING PROCESS: BASIC WORKFLOW - COURIER APP ONLY

This section explains the operation of the Courier App for sample transport management when the laboratory is adopting only the Courier App for pre-analytical monitoring. The target users of this application are courier drivers who transport biological samples.

6.1 SMARTTUBE REGISTRATION

Before collecting biological samples at the collection sites, the couriers must **register the SmartTubes**. By assigning a SmartTube to a particular route, the SmartTube will be virtually linked to that route and will collect and store its transport parameters such as temperature and shock events.

1. Start scan

Tap the "SCAN" button to start scanning (see Figure 9).

Note: The first time a courier uses the Courier App, the mobile device will ask for an approval to access the camera. Tap "OK" to enable the Courier App to access the camera to continue scanning (see Figure 10)

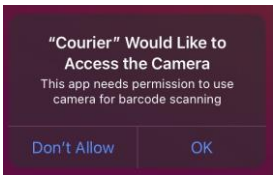


Figure 10. Camera access

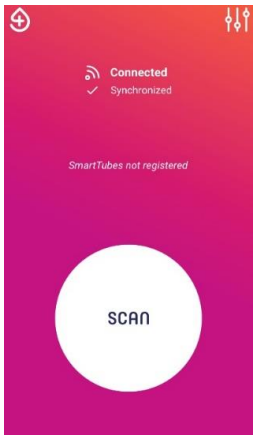


Figure 9. Home screen

2. Scan SmartTube

Place the SmartTube in front of the smartphone such that its camera faces the barcode attached to the SmartTube, and hold still for 1-2 seconds (see Figure 11).

Note: Tap the barcode in the camera view to focus on the barcode, if needed.

Figure 11. Scan SmartTube

3. Assign SmartTubes to routes

a) Tap the ○ button next to the desired route to select it. Only one route may be selected. After a route has been selected, the button will appear solid and the "Register" button below will be enabled (see Figure 12i and 12ii).

In this step, a SmartTube is linked to one transport route to facilitate the monitoring of samples with that destination and/or transport condition.

b) Tap "Register".

c) Place the registered SmartTube in the transport container (bag, box) corresponding to the transport route chosen in step **a)** (see below).

For example, if SmartTube "st101" is registered for the route "Lab A l Cool", then the SmartTube "st101" should be placed in the transport container for Lab A in cooled condition.

- Route information will be displayed on the screen after successful assignment of a SmartTube to a route (see Figure 13).

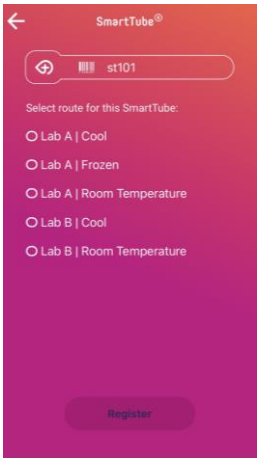


Figure 12i. Assign SmartTubes to routes

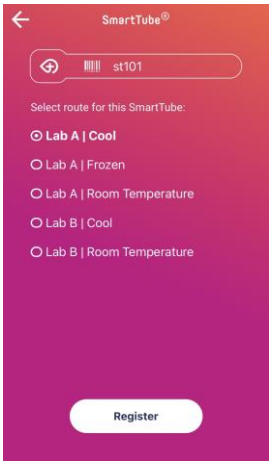


Figure 12ii. Assign SmartTubes to routes

Figure 13. Registered transport routes

4. Repeat SmartTube registration for additional SmartTubes (if necessary)

a) Tap the button "SCAN" to start scanning and registering a second SmartTube to a second transport route (if any).

b) Repeat steps 2 and 3 to assign remaining SmartTubes to their corresponding routes, until all transport routes in which a courier driver is working on that day are covered by SmartTubes.

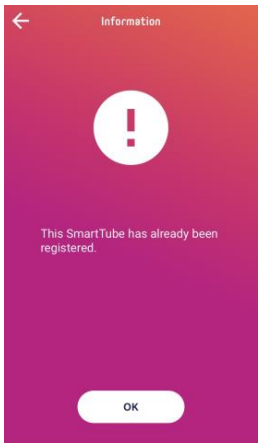
Each time the user registers a SmartTube to a transport route, the "Routes" list will be updated, and that transport route will appear on the screen (see Figure 14).

Figure 14. Transport Routes

Note:

- Usually, users register one SmartTube to one transport route. However, two or more SmartTubes can be assigned to the same transport route, such as if the courier driver has several boxes with the same condition and destination.

- Each SmartTube can only be assigned to one transport route. By trying to register an already registered SmartTube again, an error information will appear (see below). Tap "OK" to continue the SmartTube registration with an unregistered SmartTube.



6.2 SAMPLE PICK UP

–Location: Collection sites (doctors' clinics, hospitals).

This step allows the courier drivers to record that they have picked up the biological samples from a specific collection site.

1. Scan QR code of the collection site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the collection site.

The QR codes are usually attached at the entrance or reception of the collection site (see Figure 15).

Figure 15. QR code at the collection site

2. Record pick up

a) Tap the radio button ○ next to the relevant route to select it (see Figure 16).

The circle will turn solid after selecting it and the "Pick up" button below will be enabled (see Figure 16).

The chosen transport route in this screen should correspond to the destination and/or transport condition of the samples that the courier driver has picked up. For example, if the courier driver is at "Collection Site A" picking up the samples that should be transported to Lab A under cooled conditions, then the courier driver should select "Lab A | Cool".

> **Note**: The following steps need a special configuration for the lab. It is not available for all users

Figure 16. Sample pick up at the collection site

b) Tap on the increase or decrease buttons to enter the number of bags for pickup.

When there is no sample to pick up, tap on the "No samples to pick-up". Doing so sets the number of bags for pickup to 0 and is not editable.

c) Tap the "Pick up" button to record that the samples have been collected for that particular transport route.

By tapping on "Pick up", courier drivers confirm that samples that have been physically picked up will be transported under the given transport conditions and delivered to the given destination (if applicable).

3. Repeat sample "Pick up" if necessary

Repeat steps 1 and 2 if it is necessary to pick up samples from several transport routes at the same collection site.

Do not place samples in transport containers for transport routes other than the one for which the "Pick up" was recorded.

Do not click "Pick up" if a sample does not exist or has not been picked up.

6.3 SAMPLE DROP OFF

Location: Delivery sites (laboratory entrance).

This step allows the courier drivers to confirm that the samples have been delivered to the relevant laboratories.

1. Scan QR code of the delivery site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the delivery site.

The QR codes are usually attached at the entrance or reception of the delivery sites (see Figure 17).

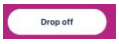
Figure 17. QR code at the delivery site

2. Sample drop off

a) Tap the  button next to the relevant SmartTube(s) to drop off.

SmartTubes are identified by the transport route name.

After tapping the  button, it will slide right.

The 

button will only be enabled when at least one sample route is selected.

Tap the button "All transports" (see below), to select all transport routes to a particular delivery site.

b) Tap the "Drop off" button to confirm that the SmartTubes and the samples have been delivered.

By tapping "Drop off", courier drivers confirm that the chosen SmartTubes and samples have been physically dropped off at the delivery site.

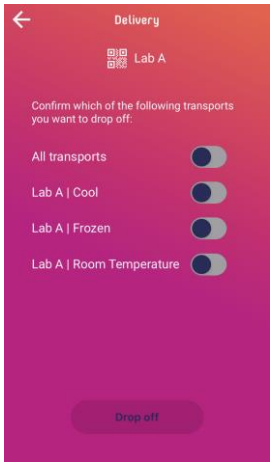


Figure 18. Sample drop off at delivery site.

c) Leave samples and SmartTube(s) at the laboratory sample arrival site within a radius of 1.50 m from the Gateway for 2 minutes. (see Figure 19)

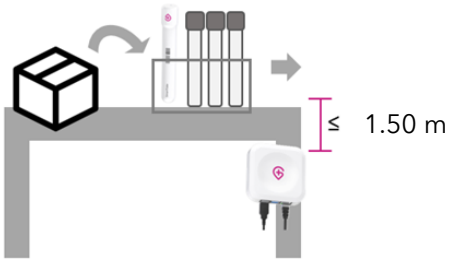


Figure 19. Sample positioning for data read-out

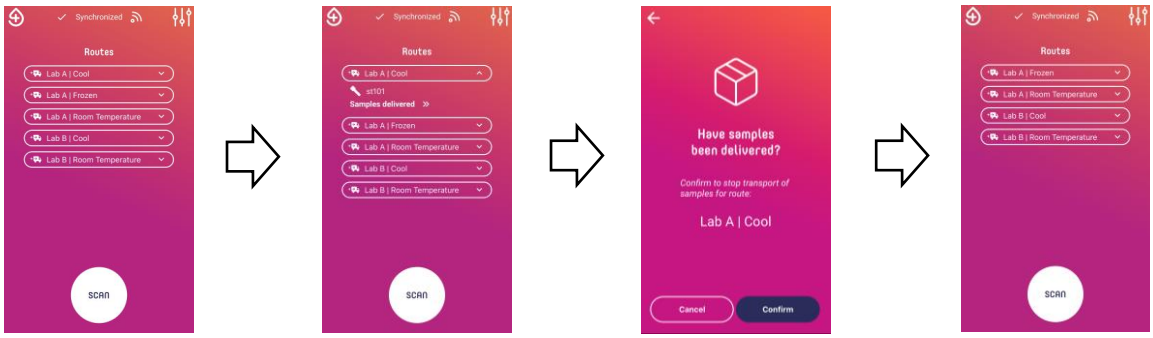
Note: A manual sample drop-off is possible without scanning the QR codes at the delivery sites.

a) Tap the transport route on the "Routes" page.

b) Tap the Samples delivered » button.

c) Tap "Confirm".

The SmartTubes (and samples) corresponding to the transport routes (such as "Lab A I Cool") have then been successfully dropped off and will no longer be shown on the home screen.



The records of transport routes and registered SmartTubes are only kept in the Courier App for the day of the transport. Unfinished transports are automatically cleared at the end of the day. Users will receive the following reminder on the second day.

Remember to finish all transports at the end of the day either by scanning the QR codes at the delivery sites or by manual drop-off.

6 OPERATING PROCESS – INTEGRATING BROWSER SCAN/SAMPLES APP AND COURIER APP. SMARTTUBE REGISTERED BY COURIER

This section explains the operation of the Courier App for sample transport management when the laboratory has adopted sample registration application – Browser Scanner/Samples App – at the collection sites. The target users of this application are courier drivers who transport biological samples.

The Courier App can be integrated with the Browser scan/Samples App without registration of SmartTubes at collection sites. If collection sites do not register the SmartTube, it is inevitable that the courier drivers register the SmartTubes.

7.1 SMARTTUBE REGISTRATION

Before collecting biological samples at the collection sites, the couriers must **register the SmartTubes**. By assigning a SmartTube to a particular route, the SmartTube will be virtually linked to that route and will collect and store its transport parameters such as temperature and shock events.

1. Start scan

Tap the "SCAN" button to start scanning (see Figure 20).

Note: The first time a courier uses the Courier App, the mobile device will ask for an approval to access the camera. Tap "OK" to enable the Courier App to access the camera to continue scanning (See Figure 21)

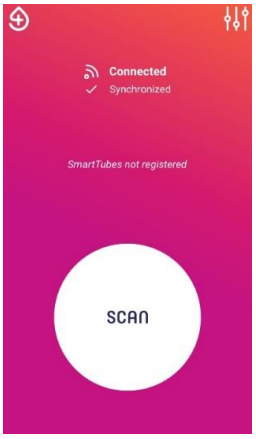


Figure 20. Home screen

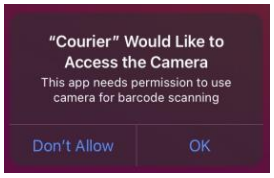


Figure 21. Camera access

2. Scan SmartTube

Place the SmartTube in front of the smartphone such that its camera faces the barcode attached to the SmartTube, and hold still for 1-2 seconds (see Figure 22)

Note: Tap the barcode in the camera view to focus on the barcode, if needed.

Figure 22. Scan SmartTube

3. Assign SmartTubes to routes

a) Tap the radio button to the desired route to select it. Only one route may be selected. After a route has been selected, the button will appear solid, and the "Register" button below will be enabled. (See Figure 23i and 23ii)

In this step, a SmartTube is linked to one transport route to facilitate the monitoring of samples with that destination and/or transport condition.

b) Tap "Register".

c) Place the registered SmartTube in the transport container (bag, box) corresponding to the transport route chosen in step **a)** (See below).

For example, if SmartTube "st101" is registered for the route "Lab A l Cool", then the SmartTube "st101" should be placed in the transport container for Lab A in cooled condition.

- Route information will be displayed on the screen after successful assignment of a SmartTube to a route (See Figure 24).

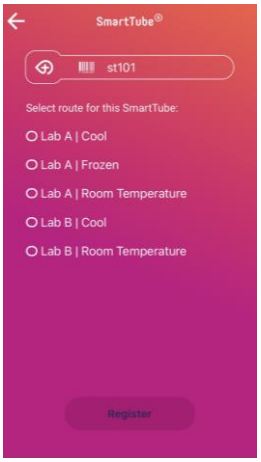


Figure 23i. Assign SmartTubes to routes.

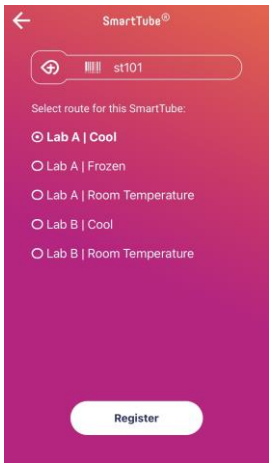


Figure 23ii. Assign SmartTubes to routes.

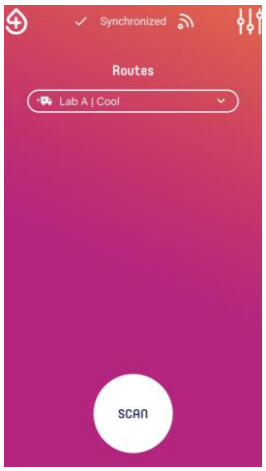


Figure 24. Registered transport routes.

4. Repeat SmartTube registration for additional SmartTubes (if necessary)

a) Tap the button "SCAN" to start scanning and registering a second SmartTube to a second transport route (if any).

b) Repeat steps 2 to 3 to assign remaining SmartTubes to their corresponding routes, until all transport routes in which a courier driver is working on that day are covered by SmartTubes.

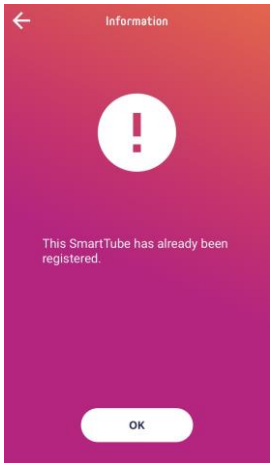
Each time the user registers a SmartTube to a transport route, the "Routes" list will be updated, and that transport route will appear on the screen (see Figure 25)

Figure 25. Transport routes

Note:

- Usually, users register one SmartTube to one transport route. However, two or more SmartTubes can be assigned to the same transport route, such as if the courier driver has several boxes with the same condition and destination.

- Each SmartTube can only be assigned to one transport route. By trying to register an already registered SmartTube again, an error information will appear (see below). Tap "OK" to continue the SmartTube registration with an unregistered SmartTube.



7.2 SAMPLE PICK UP

Location: collection sites (doctors' clinics, hospitals).

This step allows the courier drivers to record that they have picked up biological samples from a collection site.

1. Scan QR code of the collection site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the collection site.

The QR codes are usually attached at the entrance or reception of each collection site (see Figure 26).

A list of available transports routes will be displayed (see Figure 27).

Figure 26. QR code at the collection site

2. Record a pick up

a) Tap the toggle button on the right of the relevant route(s) (see Figure 27).

The transport routes will only appear as available if the phlebotomist who is operating the Browser scan/Samples App has marked and confirmed the samples as "ready for pickup".

The button will turn selected after tapping and the "Pick up" button below will then be enabled.

The chosen transport route in this screen should correspond to the destination and/or transport condition of the samples that the courier driver has picked up. For example, if the courier driver is at "Doktor Demo" picking up the samples that should be transported to Labor Müller under cooling conditions, then the courier driver should select "Labor Müller cooled".

b) Tap the "Pick up" button to record that the samples have been collected for that transport route.

By tapping on "Pick up", courier drivers confirm that samples that have been physically picked up will be transported under the given transport conditions and delivered to the given destination (if applicable).

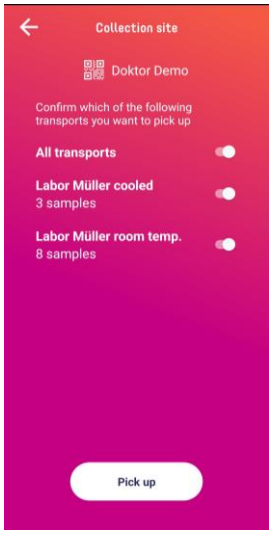
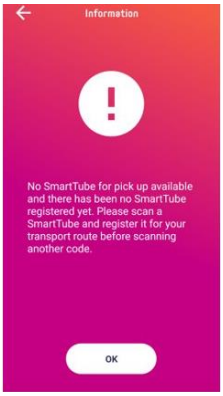


Figure 27. Sample pickup at collection sites

Note: When no SmartTube is registered to the samples to be picked up, neither by the users at the Collection Site nor by the Courier drivers, an error notification will pop up after choosing the corresponding transport route.

In this case, please click on the OK button and register a SmartTube to this transport route. Refer to Section 6.1.



7.3 SAMPLE DROP OFF

Location: Delivery sites (laboratory entrance).

This step allows the courier drivers to confirm that the samples have been delivered to the relevant laboratories.

1. Scan QR code of the delivery site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the delivery site.

The QR codes are usually attached at the entrance or reception of the delivery sites (see Figure28).

Figure 28. QR code at the delivery site

2. Sample drop off

a) Tap the button next to the relevant SmartTubes to drop off.

SmartTubes are identified by the transport route name.

After tapping the button, it will slide right.

The Drop off button will only be enabled when at least one sample route is selected.

Tap the button of "All transports" (see below), to select all transport routes to a particular delivery.

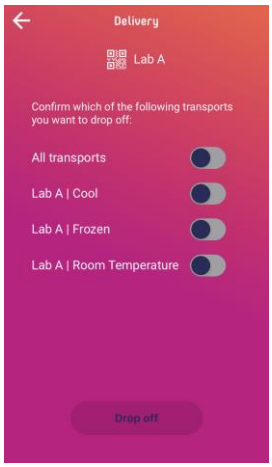


Figure 19. Sample drop off at delivery site.

b) Tap the "Drop off" button to confirm that the SmartTubes and the samples have been delivered.

By tapping "Drop off", courier drivers confirm that the chosen SmartTubes and samples have been physically dropped off at the delivery site.

c) Leave samples and SmartTube(s) at the laboratory sample arrival site within a radius of 1.50 m from the Gateway for 2 minutes (see Figure 30).

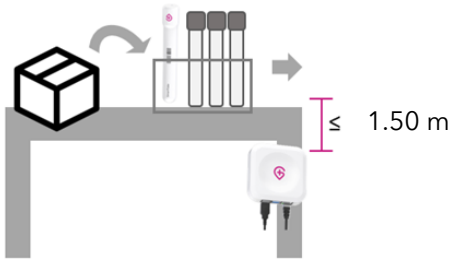


Figure 20. Sample positioning for data read-out

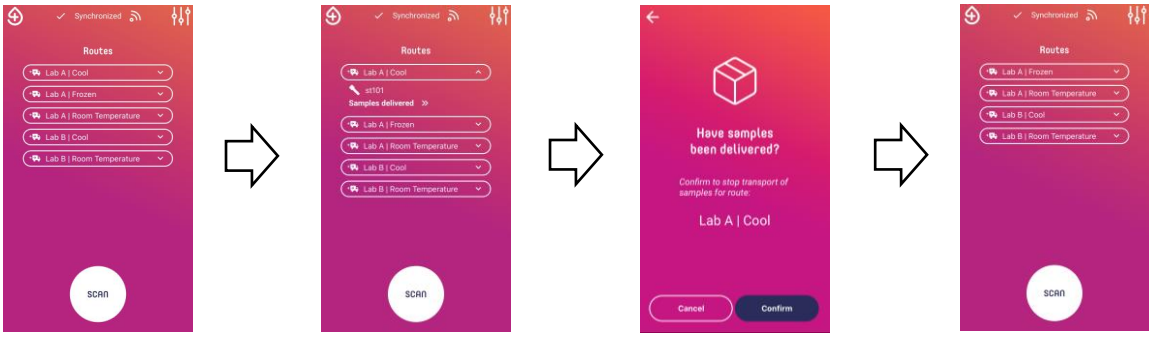
Note: A manual sample drop-off is possible without scanning the QR codes at the delivery sites.

a) Click on the transport route on the "Routes" page.

b) Tap the Samples delivered » button.

c) Tap "Confirm".

The SmartTubes (and samples) corresponding to the transport routes (such as "Lab A I Cool") have then been successfully dropped off and will no longer be shown on the "Routes" page.



The record of transport routes and registered SmartTubes are only kept in the Courier App for the day of the transport. Unfinished transports are automatically cleared at the end of the day. Users will receive the following reminder on the second day.

Remember to finish all transports at the end of the day either by scanning the QR codes at the delivery site or by manual drop-off.

7 OPERATING PROCESS – INTEGRATING BROWSER SCAN/SAMPLES APP AND COURIER APP. SMARTTUBE REGISTERED BY COLLECTION SITE PERSONNEL

This section explains the operation of the Courier App for sample transport management when the laboratory has adopted sample registration application – Browser Scanner/Samples App – at the collection sites. The target users of this application are courier drivers for biological samples.

The Courier App can be integrated with the Browser scan/Samples App with registration of SmartTubes at collection sites.

8.1 SMARTTUBE REGISTRATION

Before collecting biological samples at the collection sites, the users at the collection site must **register the SmartTubes** using Browser scan or/Samples App. By assigning a SmartTube to a particular route, the SmartTube will be virtually linked to that route and will collect and store its transport parameters such as temperature and shock events.

8.2 SAMPLE PICK UP

Location: collection sites (doctors' clinics, hospitals).

This step allows the courier drivers to record that they have picked up biological samples from a collection site.

1. Scan QR code of the collection site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the collection site.

The QR codes are usually attached at the entrance or reception of each collection site (see Figure 31).

A list of available transports routes will be displayed (see Figure 32).

Figure 31. QR code at the collection site

2. Record a pick up

a) Tap the toggle button on the right of the relevant route(s) (see Figure 32).

The transport routes will only appear as available if the phlebotomist who is operating the Browser scan/Samples App has marked and confirmed the samples as "ready for pickup".

The button will turn selected after tapping and the “Pick up” button below will then be enabled.

The chosen transport route in this screen should correspond to the destination and/or transport condition of the samples that the courier driver has picked up. For example, if the courier driver is at “Doktor Demo” picking up the samples that should be transported to Labor Müller under cooling conditions, then the user should tap “Labor Müller cooled”.

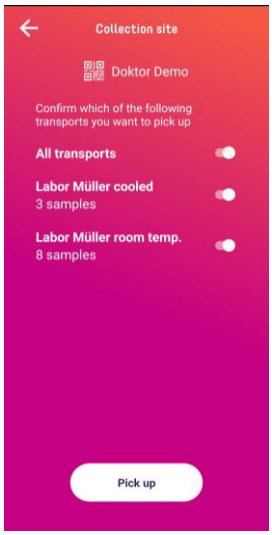


Figure 32. Sample pickup at collection sites

b) Tap the “Pick up” button to record that the samples have been picked up for that transport route.

If a SmartTube has been registered by the Browser Scan/Samples App to a transport route, then it will be picked up and stored locally by the Courier App when the user has selected this transport route in the collection site screen.

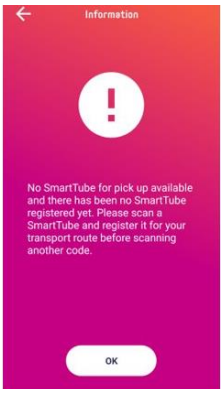
If there has been no SmartTube registered by the Browser Scan/Samples App, then the Courier App will follow the basic workflow (refer to Section 5.1) and the courier will need to register the SmartTube.

By tapping on the “Pick up”, courier drivers confirm that samples that have been physically picked up will be transported under given transport conditions and delivered to the given destination (if applicable).

Note:

When no SmartTube is registered to the samples to be picked up, neither by the users at Collection Site nor by the Courier Drivers, an error notification will pop up after choosing the corresponding transport route.

In this case, please click on the OK button and register a SmartTube to this transport route. Refer to Section 6.1.



8.3 SAMPLE DROP OFF

Location: Delivery sites (laboratory entrance).

This step allows the courier drivers to confirm that the samples have been delivered to the relevant laboratories.

1. Scan QR code of the delivery site

Tap the "SCAN" button on the Courier App and place the smartphone such that its camera faces the QR code at the delivery site.

The QR codes are usually attached at the entrance or reception of the delivery sites (see Figure 33).

Figure 33. QR code at delivery site

2. Sample drop off

a) Tap the button next to the relevant SmartTubes to drop off.

SmartTubes are displayed by the transport route name.

After tapping the button, it will slide right.

The Drop off button will only be enabled when at least one sample route is selected.

Tap the button of "All transports" (see below), to select all transport routes to a particular delivery.

Figure 34. Sample drop off at delivery site.

b) Tap the "Drop off" button to confirm that the SmartTubes and the samples have been delivered.

By tapping "Drop off", courier drivers confirm that the chosen SmartTubes and samples have been physically dropped off at the delivery site.

c) Leave samples and SmartTube at the laboratory sample arrival within a radius of 1.50 m from the Gateway for 2 minutes. (See Figure 35)

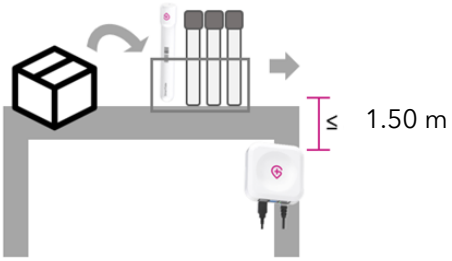


Figure 35. Sample positioning for data read-out

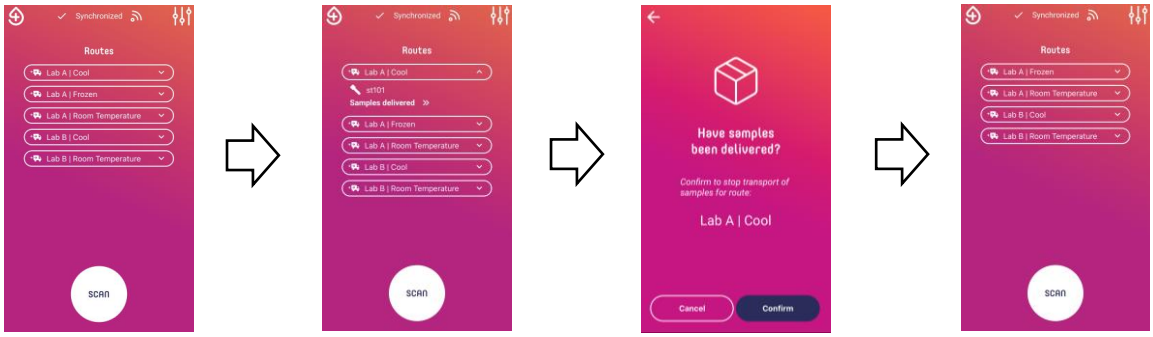
Note: A manual sample drop-off is possible without scanning the QR codes at the delivery sites.

a) Click on the transport route on the "Routes" page.

b) Tap the Samples delivered » button.

c) Tap "Confirm".

The SmartTubes (and samples) corresponding to the transport routes (such as "Lab A I Cool") have then been successfully dropped off and will no more show on the "Routes" page.



The record of transport routes and registered SmartTubes are only kept in the Courier app for the day of the transport. Unfinished transports are automatically cleared at the end of the day. Users will receive the following reminder on the second day.

Remember to finish all transports at the end of the day either by scanning the QR codes at the delivery site or by manual drop-off.

8 OPERATING PROCESS – SAMPLE HANDOVER

In some transport plans, courier drivers may hand over the collected samples to other courier drivers to avoid making detours, ensuring the most efficient routing plan.

This step happens after courier drivers have collected samples from collection sites and before they deliver the samples to delivery sites.

To reduce complexity, the workflow will be described based on the role of the courier drivers, which are as follows:

- Courier Driver 1: to hand over the samples.
- Courier Driver 2: to receive the samples.

The instructions are in chronological order. Each courier driver need only perform the steps described for their role.

Initial state of the app for both couriers:

Courier Driver 1

Figure 36. Courier driver 1 initial screen

Courier Driver 2

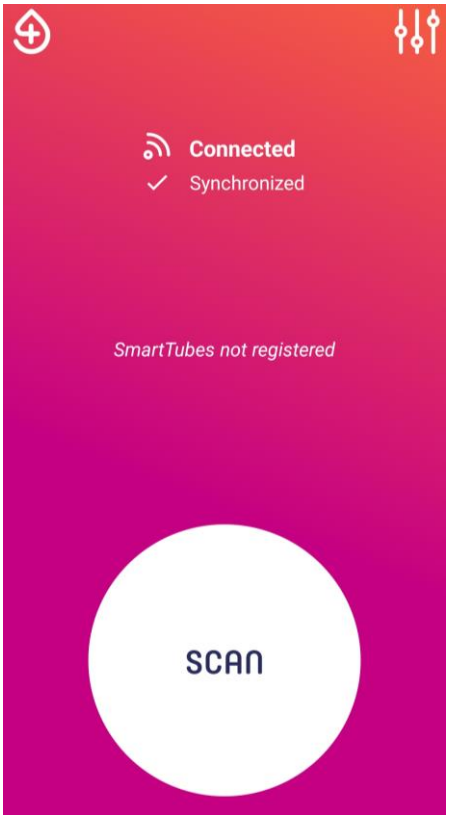


Figure 37. Courier driver 2 initial screen

1. Courier Driver 2: Open QR code

a) Tap the button on the home screen.
b) Tap on "Handover code" (see Figure 38).

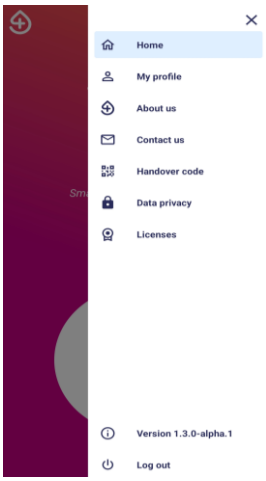


Figure 38. Courier driver 2 Handover QR code

2. Courier Driver 1: Scan the QR code of Courier Driver 2

a) Tap the "SCAN" button on the home screen, place the smartphone such that the camera faces the QR code on the smartphone of the other courier driver (see Figure 39).

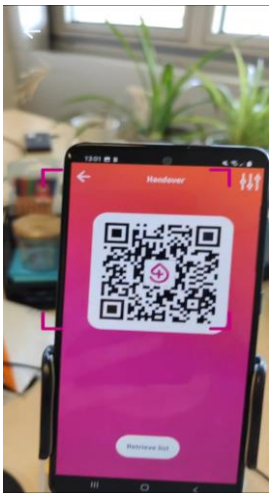


Figure 39. Courier driver 1 QR code scanning

3. Courier Driver 1: Select the samples to hand over

a) Tap to choose the samples to drop off (see Figure 40).

Samples are identified by the transport route name.

After tapping the button, it will slide right.

The "Handover" button is only enabled when at least one sample route is chosen.

Tap the "All transports" button (see below) to select all transport routes to hand over.

b) Tap "Hand over" to confirm that the SmartTubes and the samples have been handed over (see Figure 40).

Figure 40. Select samples to handover.

4. Courier Driver 2: Retrieve list of handed over samples

After Courier Driver 1 has confirmed the sample hand-over, Courier Driver 2 retrieves the list of samples automatically or by tapping on the "Retrieve list" button (see Figure 41).

Figure 41. Retrieve list of handed over samples.

5. Courier Driver 2: Confirm or reject sample reception

a) Tap "Reject all" before selecting any transport route, if Courier Driver 1 does not receive any samples.

b) Select  to choose the samples to drop off.

After selecting the  button, it will slide right.

The "Reject all" button will turn into "Confirm" only when at least one sample route has been chosen (see Figure 42).

Select the "All transports" button to select all transport routes to receive.

c) Tap the "Confirm" button to confirm that the SmartTubes and the samples have been received.

After confirming sample reception, the selected transport routes will appear on the main screen of Courier Driver 2.

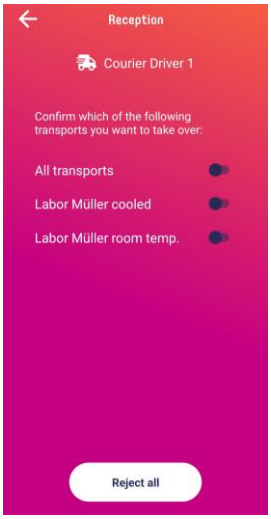


Figure 42. Sample reception.

By confirming sample reception, Courier Driver 2 also confirms that the selected samples have been physically received.

Final state of the app for the two courier drivers:

Courier Driver 1

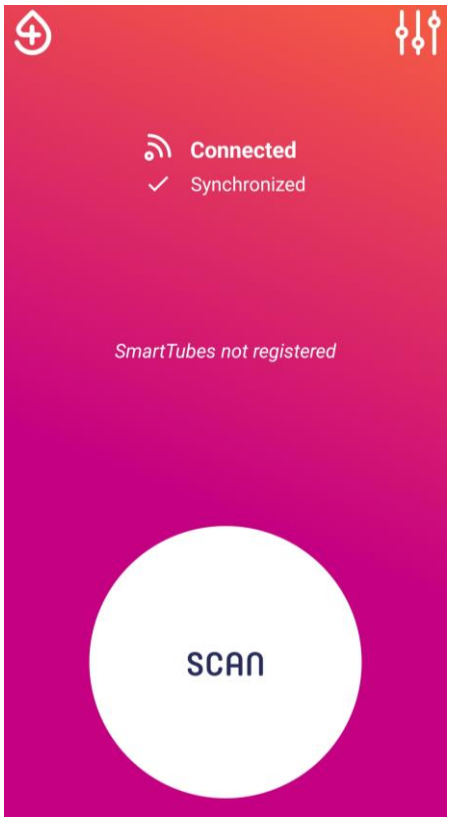


Figure 43. Courier driver 1 final screen

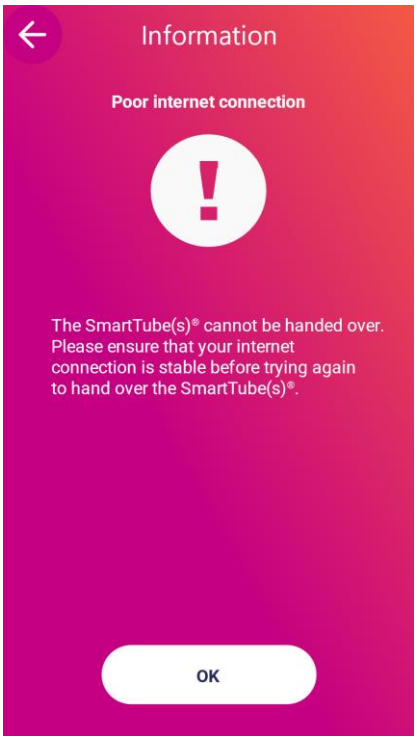
Courier Driver 2

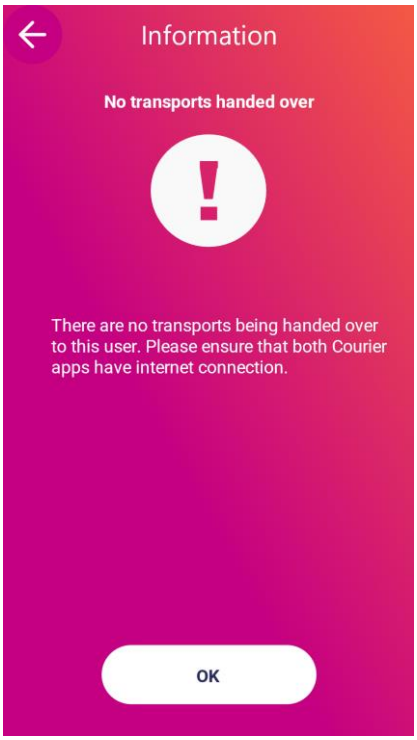
Figure 44. Courier driver 2 final screen

Note:

If no transports were handed over, or there is an internet connectivity issue the following screens will appear for courier 2.

Follow the instructions, tap OK, and try again to retrieve the information.





9 USER INFORMATION SYSTEM

To improve communication with the user, S4DX will send notifications, for example, to inform users about software updates.

Notifications will not be shown to the user if the app is open in the background. The message will be displayed in a simple dialog pop up (See figures below).

Tap on "OK" and follow the instructions shown in the notification.

a. b.

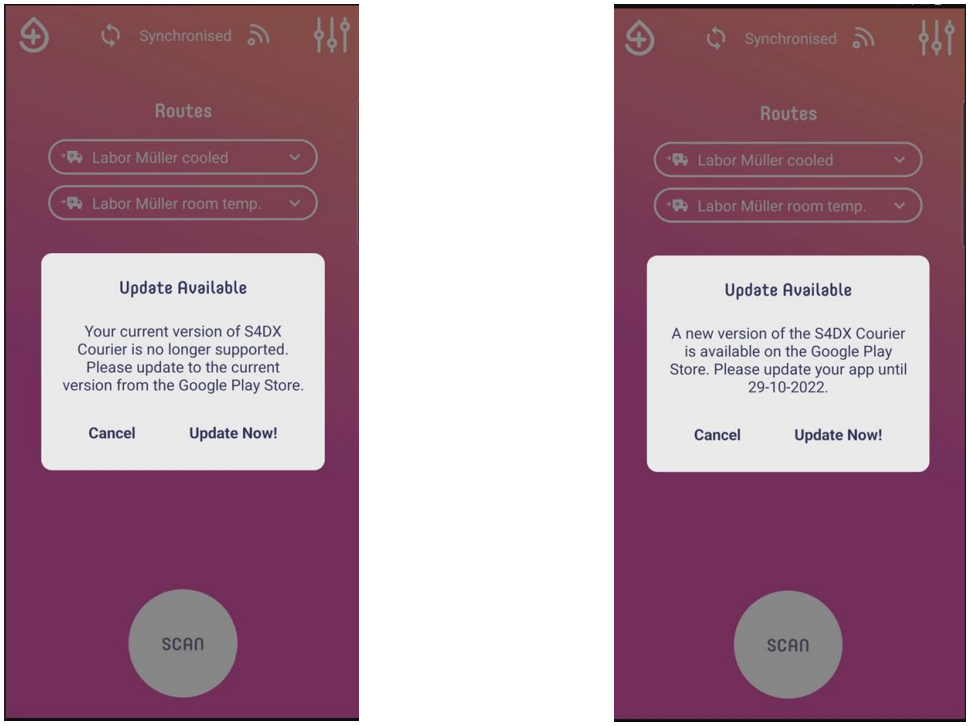


Figure 45.a. User information system for version no longer supported.
b. User information system for deprecated version

10 GPS TRACKING

In order to organize the logistics of the routes more efficiently for lab managers or logistic coordinators, S4DX offers GPS tracking for the couriers. The position of the courier is obtained through the S4DX Courier app within an interval of one min and it is visualized on the admin dashboard.

Nevertheless, this section is focused on the S4DX Courier app. When the application is freshly installed and the user logs in, the user can register the SmartTube as explained in sections. In addition to the dialog to access the camera with the application, the following dialog will show up to ask the user for permission to track their position:

If the user selects any of the first two options from the dialog, the GPS information will be tracked from that moment onwards and sent to S4DX web services every minute until the last SmartTube registered in the application is dropped off by the user.

***Note**: the dialog will be shown to the user for the very first time of usage of the application but not every time that the user scans a SmartTube.*

If the user selects the option "*Don't allow*" from the dialog, the application won't record any position from the user although the GPS is turned on in the phone.

The GPS tracking functionality could be enabled or disabled at any time by the user directly in the settings from the mobile phone or through the application's settings on the drawer.

a. b.

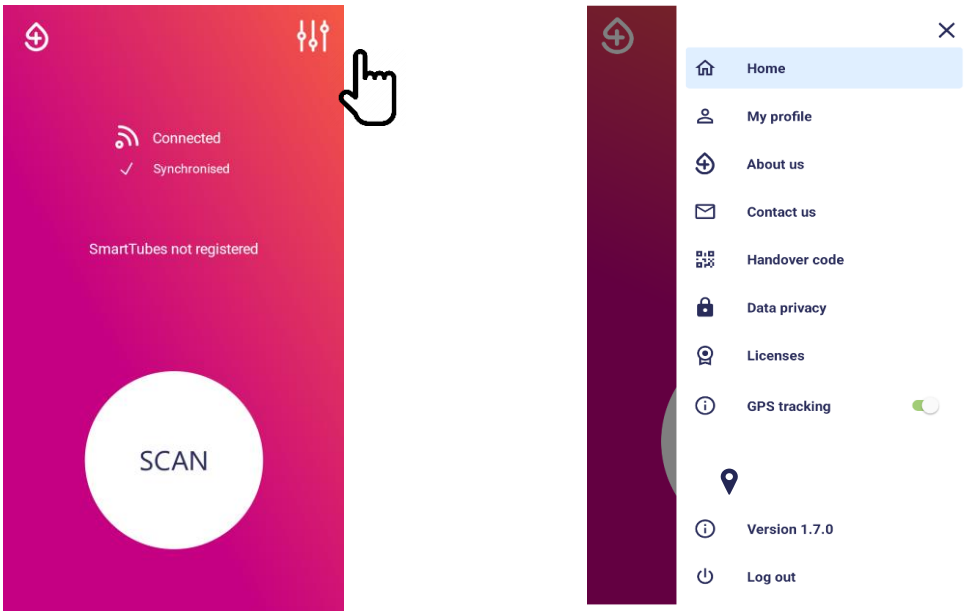


Figure 46.a. Home screen, cursor pointing to the drawer for the application settings.
b. Toggle to enable/disable the GPS functionality.

If the user does not have the GPS tracking functionality enabled before using the application, the user is asked to go to the phone's settings to enable the GPS again as it is not possible to access the GPS directly; the following actions are required:

Case Android

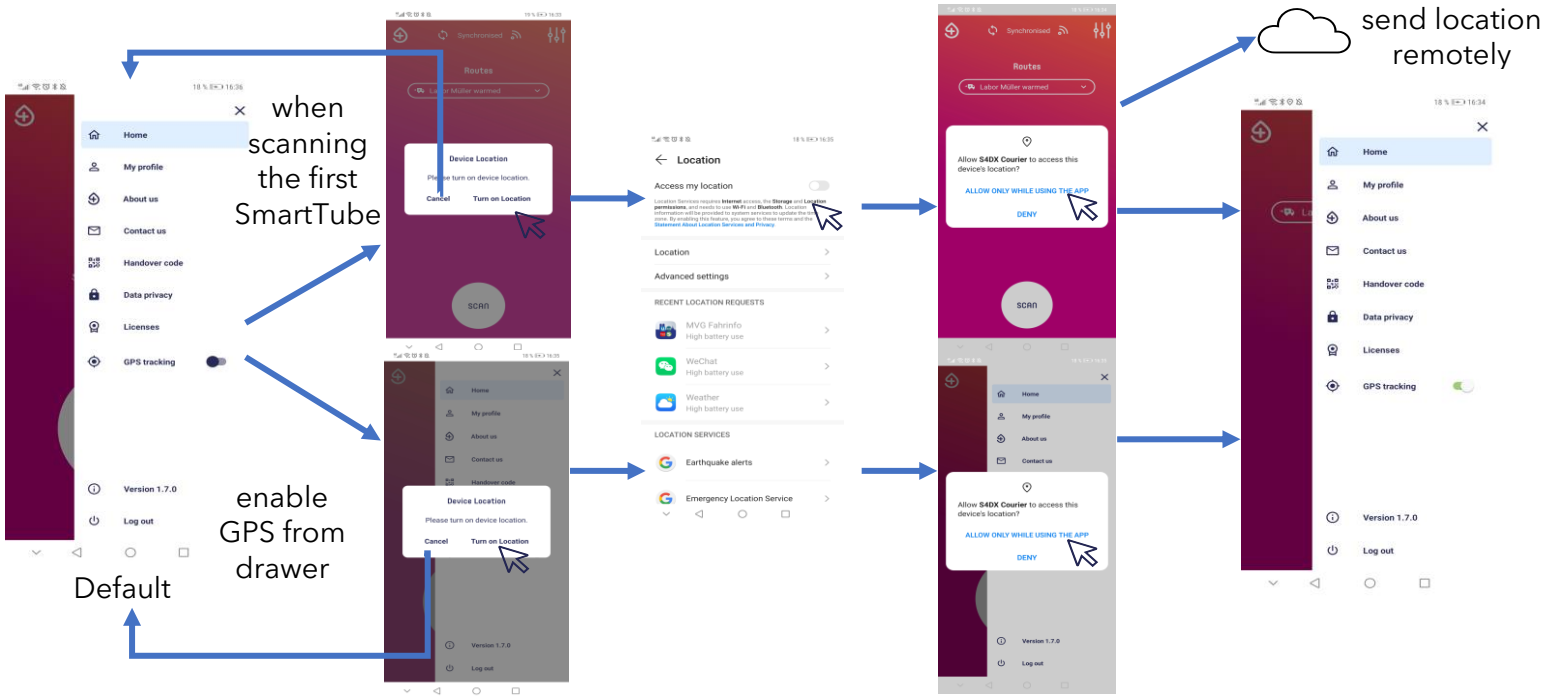


Figure 47. Dialog to enable the GPS functionality through the application settings for Android.

Case iOS

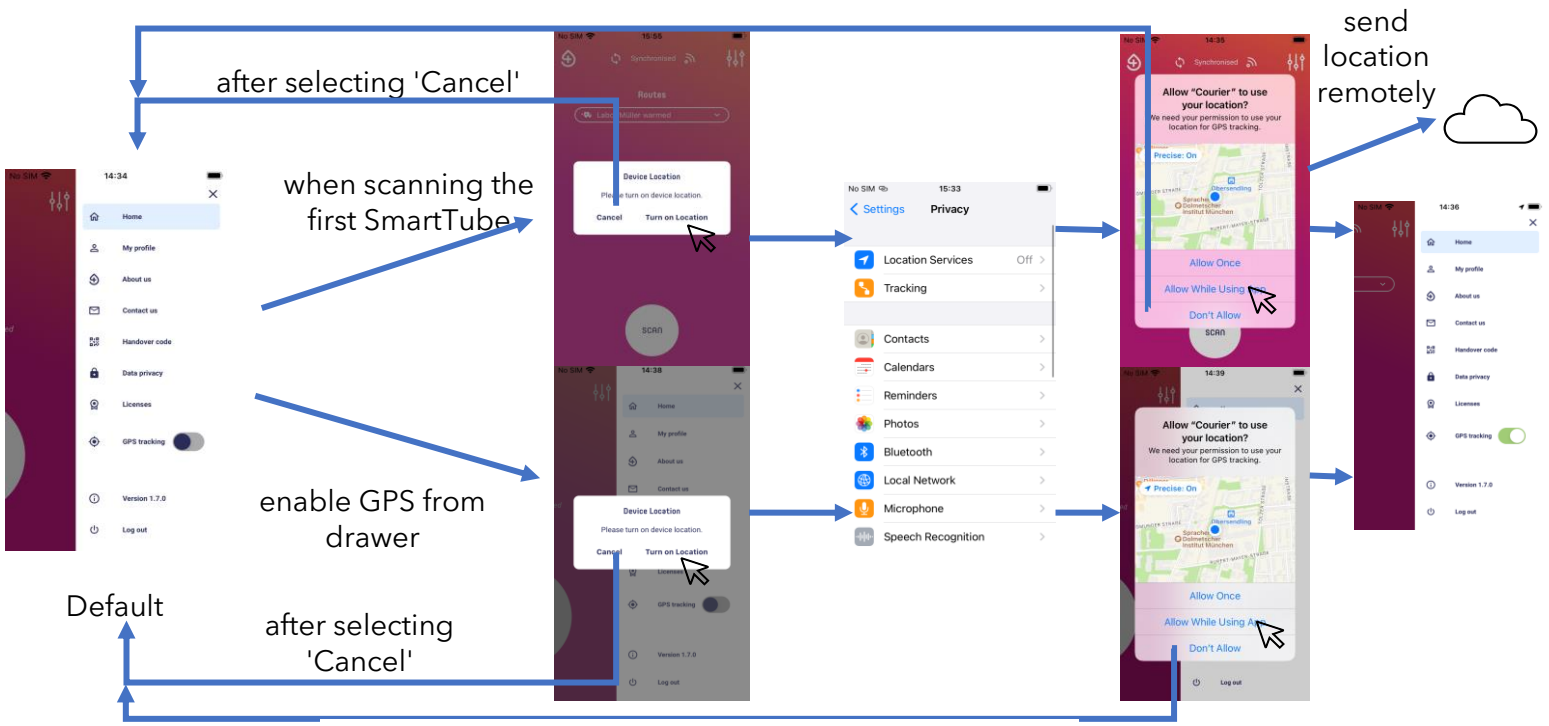


Figure 48. Dialog to enable the GPS functionality through the application settings for iOS.

11 BAG TRACKING FEATURE

To keep track of the bags used by couriers to transport samples, S4DX offers bag tracking to keep continuous track on where sample transport bags are. The S4DX Courier app can now register bag barcodes and associate them to SmartTubes.

12.1 SMARTTUBE REGISTRATION WITH BAG

1. Scan a SmartTube. In the SmartTube registration screen, assign a route to the SmartTube

   Tap the radio button to the desired route to select it. Only one route may be selected. After a route has been selected, the button will appear solid, and the "Register bag" and "Without bag" button will be enabled. (See Figure 49)

   In this step, a SmartTube is linked to one transport route to facilitate the monitoring of samples with that destination and/or transport condition.

Figure 49. SmartTube registration screen with bag configuration enabled.

   To continue with assigning this SmartTube to a bag, click on "Register bag".

2. Scan the barcode of a bag

   Place bag in front of the smartphone such that its camera faces the barcode attached to the bag and hold still for 1-2 seconds (see Figure 50)

Note: The barcode on the bag can be any type of barcode with any type of letters, numbers or characters

Figure 50. Camera screen while scanning the barcode of a bag

3. Assign SmartTube to bag

In this step, a SmartTube is linked to one bag to facilitate the monitoring of samples with that destination and/or transport condition. The bag is linked to the transport route of the SmartTube.
To continue with assigning the SmartTube to this bag, click on "Register" (see Figure 51). Place the registered SmartTube in the bag corresponding to the transport route chosen in step 1.

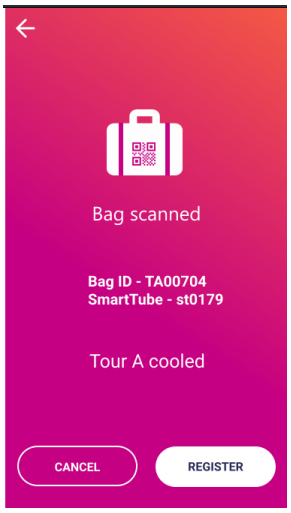


Figure 50. Camera screen while scanning the barcode of a bag

4. Transport Route in Home Screen

In Home Screen, click on the route (see Figure 51) to see the assigned SmartTube together with its linked bag (see Figure 52).

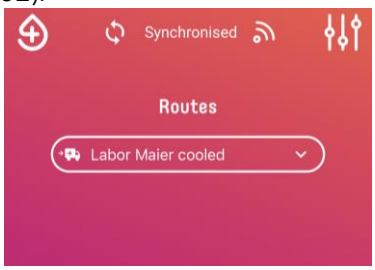


Figure 51. Transport Route in Home Screen.

Figure 51. Transport Route with the linked SmartTube and Bag.

12.2 SAMPLE PICK UP WITH BAGS

1. Scan the QR Code of a collection site

Scan the QR code of a collection site. In the collection site screen (see Figure 52), the user needs to choose the correct bag in which the picked-up samples will be placed. Afterwards, the user needs to click on “Pick up”.

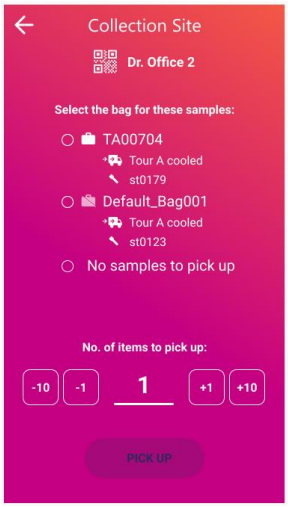


Figure 52. Collection site screen showing bags and their corresponding SmartTubes and routes.

12.3 SAMPLE DROP OFF

1. Scan the QR Code of a delivery site

Scan the QR code of the delivery site. In the delivery site screen (see Figure 53), the user needs to choose the correct bags to drop off. Afterwards, the user needs to click on “Drop off”.

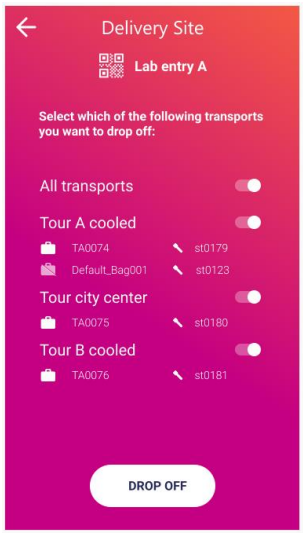


Figure 53. Delivery site screen showing bags and their corresponding SmartTubes and routes.

12 COUNTER FOR PICKED UP ITEMS

To keep track of the number of items picked up by the couriers, S4DX offers a counter to keep continuous track on how many samples are transported and from which collection site. The S4DX Courier app can now add the number of picked up samples from each collection site.

After scanning and registering SmartTubes for the required routes, when the user scans the QR code of the collection site, on the bottom of the screen a counter will allow the user to enter the number of items picked up (see Figure 54). The name for the "items" can be configured, together with how many buttons are showed next to the counter (either 2 or 4). The user needs to either type the number of items in the counter field or use the buttons to reach the correct number. The user needs to click on "Pick up" afterwards.

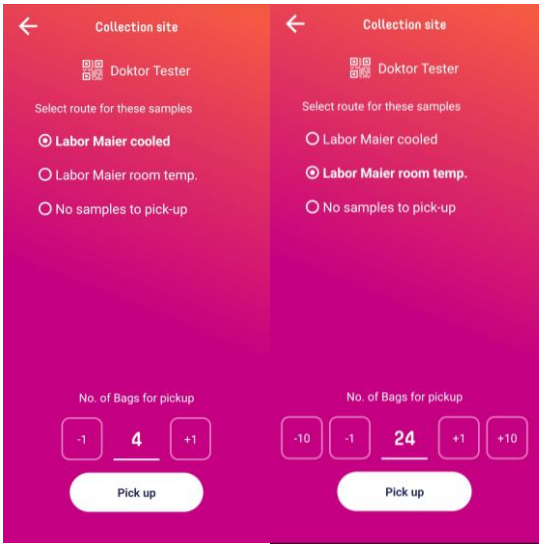


Figure 54. a. Counter for number of items picked up from collection site with 2 buttons for adding or subtracting the number. b. Counter for number of items picked up from collection site with 4 buttons for adding or subtracting the number.

In Home Screen, when clicking on each route, the user can see all the pick-ups together with the number of items picked up from each collection site (see Figure 55).

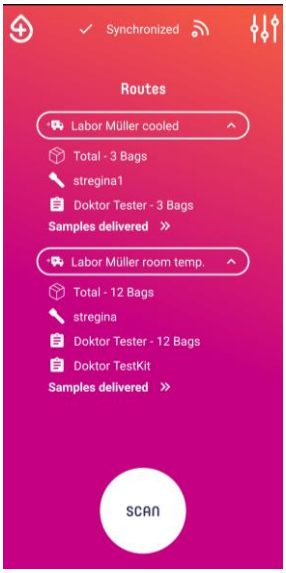


Figure 55. Home Screen with all the routes and number of items picked up from all the collection sites.

13 TROUBLESHOOTING

Problem Description	How to solve it	Next step
Mobile device does not start.	Did you charge your mobile device?	S4DX is not responsible for personal hardware used by the courier drivers.
App does not open.	- Close the app according to the device manufacturer's instructions and then restart the app. - If problem continues, restart your mobile device. - If problem continues, uninstall the app, go to your "App/Play-Store" (iOS/Android), and re-install the S4DX app.	If App does not open even after restarting the App and/or mobile device and no update is pending, contact S4DX.
Log in: The user cannot log in.	- Are you connected to the internet, and do you have a stable internet connection? - Are you using the correct password? - Have you tried to reset your password? - Have you contacted your admin?	If password is correct and resetting your password does not work, please contact S4DX.
Internet: User cannot connect to the internet.	- Did you switch off mobile data and/or WiFI on your phone? - Are you in a location with no internet access at all?	Internet connectivity might depend on your hardware or institutional settings. Please contact your internet provider or institutional help desk if you

		require additional help connecting to the internet.
App does not scan QR-Codes.	- Hold your phone steady over the QR code to allow the camera to focus on it. - Tap on the screen on the QR code to focus the camera on this point. - Did you allow the S4DX app to use the camera of your device? - Is the printed QR-code damaged? - Have the QR-codes been produced according to the S4DX guidelines (downloaded and printed from S4DX-Webservices)?	If camera access is not blocked and QR codes have been produced according to guidelines, contact S4DX.
App does not scan/recognize Datalogger.	- Is the barcode clearly legible? - Is there enough light and are you in generally acceptable conditions for scanning the barcode?	If barcode quality and barcode scanning settings are acceptable and the scan is still not working, contact S4DX.
Incorrect options displayed for: - Transport routes - Transport conditions - Collection sites and/or lab destinations	- Contact your internal project responsible for setting up the missing transport routes, transport conditions, or collection sites on the S4DX WebService.	
Other	Contact S4DX	

VERSION OVERVIEW

Version	Change	Author
1	Create Review	Yun Lin Regina Wehler, Yannick Boege
2	Update about new features, workflows added Review	Yun Lin Monica Tuta, Yannick Boege
3	New logo for the app. Adjustments to the user notification system, handover process, and offline app usage. More detailed user instructions on various screens of the app.	Monica Tuta
4	Additional features	

5	Add notes in 2. for cache removal and sync of time. Change Smart4Diagnostics for S4DX Change Satellite app for Samples app Update technical specification	Mónica Tuta Fajardo

ANNEX I TECHNICAL SPECIFICATION

Technical Requirements Samples App	
Supported operating systems and devices	Android: Smartphones, tablets, third party devices that are operated with Android 9 (API level 28) or later
	iOS: Smartphones with iOS 13.4 or later and hardware architecture of arm64 or above.
Supported barcode formats	Aztec, codabar (Android and iOS above 15.4), code128, code39, code39, ean13, ean8, pdf417, qr, upce, itf
Supported sample tube types	All tube types and tube dimensions according to customer specifications
Internet connection	WIFI or wireless (3G or 4G/LTE)
Supported screen size	No size restriction, only portrait format for smartphones and portrait/landscape format for Android tablets
Required permissions	Camera usage to read barcodes
	Use cookies in the in-app-browser
	Location usage in foreground and background (Courier only)
	Send notifications (Courier only)
	Find and connect to devices in the local network
Supported operating systems and devices	Android: Smartphones, tablets, third party devices that are operated with Android 9 (API level 28) or later
	iOS: Smartphones with iOS 13.4 or later and hardware architecture of arm64 or above.
Supported barcode formats	Aztec, codabar (Android and iOS above 15.4), code128, code39, code39, ean13, ean8, pdf417, qr, upce, itf

We are glad to be there for you!

We look forward to working with you and appreciate your opinion!

We can only achieve a high-quality and efficient development of our product together with your help. Please let us know your experience, difficulties, or suggestions for improvement regarding the Samples App through:

- E-Mail: contact@s4dx.com
- Telephone: +49 (0) 89 724 018 40
- Webpage: Contact-S4DX
- Samples-App: “Contact us” – Write us a message

Thank you!

Together for the precision of clinical decisions!

Your S4DX team