

# Manual PCF EMS

## Equipment Management System

### Physics of Complex Fluids

[pcfems.utwente.nl](http://pcfems.utwente.nl)

#### TL;DR

PCF EMS is the Equipment Management System of the Physics of Complex Fluids group. The web application can be accessed via [pcfems.utwente.nl](http://pcfems.utwente.nl).

**All group members are obligated to use the system when moving equipment.**

Equipment is either **In use** at a experimental setup or **Available** and in storage at a specific storage location. If equipment labeled with **TRACK ITEM** is moved, its location has to be updated in PCFEMS. Equipment labeled with **NO TRACKING** can be moved freely. Items can be found by either searching inside the application, or scanning the unique QR code on the item with any QR code scanner.

With PCFEMS you can also

- keep a logbook of equipment;
- flag equipment when something is wrong;
- view equipment's history.

An EMS only works with full participation of all users. User obligations include

- recording each location change of equipment;
- noticing an ems staff member of new equipment;
- keeping equipment logbooks up-to-date;
- flagging equipment that needs attention.

PCFEMS staff members have extra management functionality including adding new equipment, managing users and entering and labeling new equipment.

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# 1 DEFINITIONS

## EQUIPMENT

Equipment are the necessary items for a particular purpose in and around the labs. A piece of equipment is referred to as an item. Disposable items (inventory) is not considered equipment.

## LABEL

Each item of value at PCF is entered into the EMS and is referred to by a unique ID, starting with PCF (e.g. PCF0103).

Each item in the EMS is physically labeled with a sticker (see Figure 1). On the label you can find the QR-code and some basic item information (brand, model and serial number). The QR-code can be scanned using any QR-code scanner; most phones have a QR scanner built-in to the camera app. If an item has multiple parts, e.g. it comes with a proprietary power supply, the part number and total number of parts is shown next to the ID.

Two types of labels exist, for items that require tracking and items that don't.

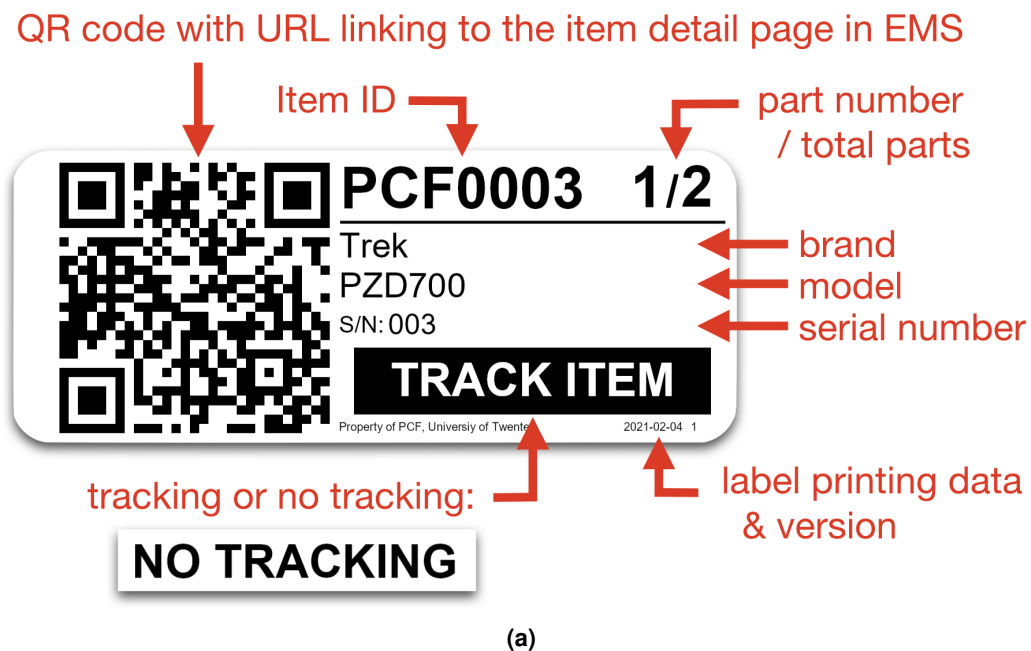


Figure 1

## TRACKING

We distinguish two types of items. Items that:

- **don't require tracking** **NO TRACKING**

This is general equipment that can change user daily, and often have little value. These items can move around freely without recording its location, but are still in EMS for logging/flagging purposes.

- **require tracking** **TRACK ITEM**

The location of the item has to be kept track of. These items have to be scanned before they can be moved and used for an experiment or by a user.

## STATUS

An item can have one of the following status:

- **in use** In use  
Item is in use, meaning it is assigned to an experimental setup and possibly to a user. This item can not be moved to a different location without changing the assignment. See Figure 2a.
- **in storage** Available  
Item is not in use, thus available for use by anyone and can be found in a specific storage cabinet. See Figure 2b.
- **no tracking** No tracking  
Item is not tracked, location and user unknown. See Figure 2c.

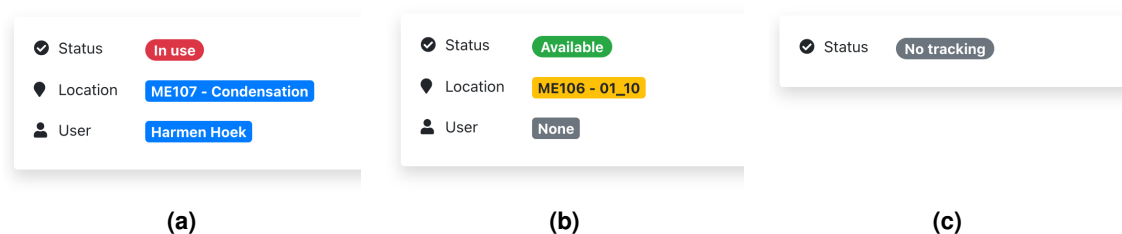


Figure 2

## ASSIGNING

Assigning is designating an item to a specific location, and optionally a user. When an item is assigned to a location, it is used at this location. If an item is not assigned, it is at a specific storage location. Only items that are tracked can be assigned.

## FLAGGING

Flagging is marking an item for attention or treatment in a specified way. An item can for example be flagged as missing, broken or due for inspection. Flagging is meant to bring the item to the attention of a staff member and is only meant to be done when you cannot resolve the problem yourself.

## LOCATION

The location of an item consists of two parts, which depend on the item status:

- in use: lab + experimental setup (e.g. ME107 - Condensation)
- in storage: lab + cabinet (e.g. ME106 - 01\_10)

All the locations are pre-configured inside the EMS, and don't require further attention.

## STAFF

A staff member is an EMS user with extra functionality inside EMS and does not correspond to the group staff members outside EMS. Any user can be appointed as a staff member. Extra functionalities of staff members include adding new items and users, updating all item details, removing items and adding new categories, locations and flags.

## 2 RESPONSIBILITIES

Proper equipment management only lasts if everyone cooperates. To ensure everyone knows when to use the system, we define several responsibilities for EMS users and staff.

**It is the responsibility of EVERY GROUP MEMBER to:**

- assign equipment before moving equipment for use at an experimental setup;
- unassign an item when no longer using the item and returning it to the correct storage location;
- keep used equipment logbooks up-to-date;
- flag items if problems arise the user cannot resolve alone;
- notify a staff member of the arrival of new equipment;

**In addition, it is the responsibility of EMS STAFF MEMBERS to:**

- oversee the correct usage of the EMS by all group members;
- add new equipment to the EMS, and remove equipment that is no longer around;
- label new equipment, and update labels if label is not up-to-date;
- ensure item details are correct at all times;
- resolve flags;
- add new group members and deactivate group members who no longer work at the group;
- assign new staff members if necessary;
- add new categories, locations and flags if necessary;
- verify the location of items that are in use for more than 6 months.

## 3 MANUAL

This manual is written for PCF EMS version 1.0(.2). The manual can be used for both desktop and mobile, however on mobile some elements may be hidden.

### 3.1 Login

PCFEMS can only be accessed when logged in. All group members have an account linked to their UTwente email address (*example@utwente.nl*).

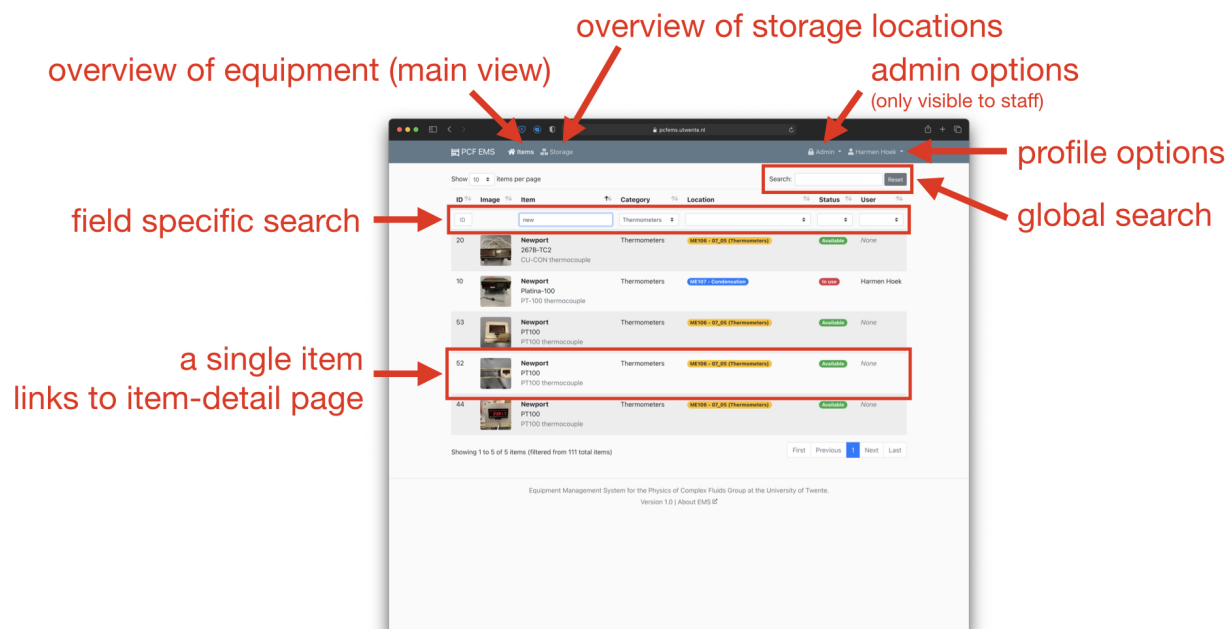
- Go to [pcfems.utwente.nl](http://pcfems.utwente.nl).
- If you have never logged in before, or forgot your password, press `Forgot Password?` to request a new password.
- Login with your username (first name + last name, all lowercase, e.g. *Eliud Kipchoge* = *eliudkipchoge*, *Rembrandt van Rijn* = *rembrandtvanrijn*) and password.

After logging in you will be automatically redirected to the home of the app with the item list.

### 3.2 Equipment overview & Item search

The main view of the app gives an overview of all the items, see Figure 3. The table can be searched real-time with the global search bar in the top-right, or using the field specific search options in the table. Clicking an item will redirect to the item-detail page.

In the top menu bar you can find links to the overview of storage locations, admin options (only visible to staff) and profile options.



**Figure 3.** Item list. The home view of the EMS.

### 3.3 QR code scanning

Alternatively to searching for an item, an item label QR code can be scanned to directly be forwarded to the item detail page. Scanning can be done with any QR code scanner. Most phones have a QR scanner built-in to the camera app (see Figure 4).



(a)



QR code detected  
click to go to item in app

(b)

**Figure 4.** QR code scanning using the camera app of a smartphone.

### 3.4 Item detail-page & Assign an item

The item-detail page (see Figure 5) shows all the details of the item, the item-specific logbook and history and shows the item actions.

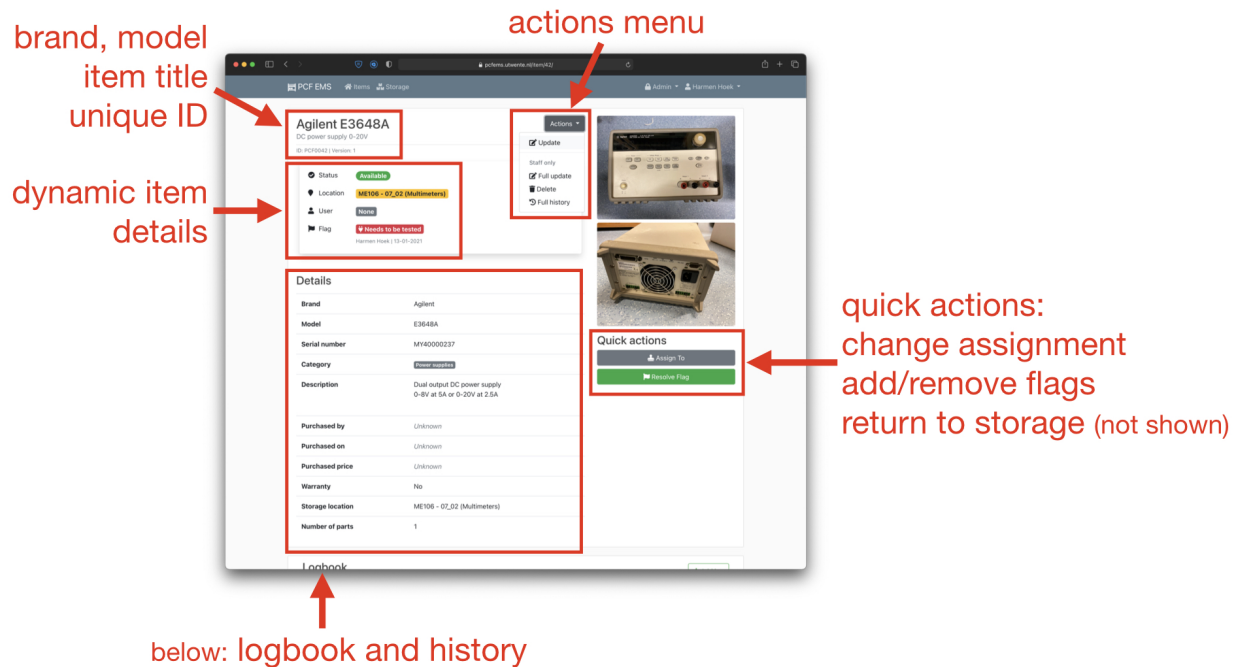
The main purpose of the EMS is keeping track of the whereabouts of equipment. Tracking a piece of equipment is done by assigning an item to a specific location and optionally a user when in use.

To assign an item:

- press Assign To in the Quick Actions menu;
- enter the location (experimental setup) where you plan on using the item and optionally add a user and return date.

Once assigned, the item will appear as in use and the location and user will change to the selected values.

If an item is already assigned, the item can be reassigned by pressing `Change Assign To`, or returned to storage by pressing `Return to Storage` from the `Quick Actions` menu. Each item has a specific storage location (that can be changed by updating the item), make sure to return the item to the correct location.



**Figure 5.** Item-detail page.

### 3.5 Logbook

Each item has a built-in logbook that can be found on the item detail page (see Figure 5). To add a log, select `Add log`. To each log 2 attachments (e.g. specific settings, manuals or pictures) can be added. You can only edit or delete your own logs.

### 3.6 Flagging

The goal of flagging is show users something is wrong with the item and to notify a staff member. Examples of flags are 'Needs repair', 'Needs to be tested', 'Missing' or 'Incorrect information'. Flagging is done by selecting `Flag` on the item detail page (see Figure 5). To give more details of the problem a comment can be added to the flag. Once flagged, a specific flag icon will show up with the item on the list view and the flag will appear on the item detail page. Only flag an item if you are unable to solve the problem yourself!

### 3.7 Update an item

All users can update the description, storage location and images by pressing `Update item` in the `Actions` menu on the item detail page. Staff members can update all details of an item.

### 3.8 Q&A

**Q: Can a staff member see my password?**

**A:** No, your password is encrypted and cannot be viewed by anyone.

**Q: I am trying to reset my password, but I am not receiving an email.**

A: Either your account is set to *inactive* by a staff member, or your no account is registered to your email address. You don't receive an error message when requesting a new password, to prevent hackers from obtain email addresses using this functionality. Contact a staff member for further help.

**Q: I want to Assign an item to a location or user that is not in the list.**

A: Only staff members can add locations or users, please contact a staff member.

**Q: I want to Assign an item to an external user or group.**

A: A staff member can add a user (or group) and set this user to inactive. Now this user or group can be assigned items to. In the future a separate 'Add to external' feature might be added.

**Q: Something is not working**

A: PCFEMS is build from the ground up. Even though thoroughly tested, it is possible bugs are still around. Please report these bugs immediately to [Harmen Hoek](#). Report the error message and way to recreate this error.

**Q: Is it safe?**

A: Short answer: yes.

Long answer: PCF EMS is written in Python-based web framework Django. Django is one of the most secure web frameworks, and basically as safe as a web framework can be. Django provides ways to protect against some common web application vulnerabilities, including SQL Injection, CRLF Injection, Timing Attack, Clickjacking Attack, Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF), Encrypted connection.

More about Django security: [docs.djangoproject.com/en/3.1/topics/security/](https://docs.djangoproject.com/en/3.1/topics/security/).

The connection is encrypted (https) and the server is hosted locally the UT.

The application complies with the General Data Protection Regulation (AVG) by only storing the uttermost personal information (first name, last name and email address). As of writing this manual, it does not yet automatically delete old (inactive) user data.

**Q: I want to see the source code**

A: That's in unusual question, but you can find it all here: [github.com/harmenhoek/pcfems](https://github.com/harmenhoek/pcfems). And I'll am more than excited to share with you the details.



## 4 MANUAL FOR STAFF

For staff members extra functionality is available to manage the system.

### 4.1 Add a new item

To add a new item, select **New Item** from the **Admin** menu in the main menu bar.

When adding an item, add as many details as possible, to improve the findability of the item in the system. All starred items are mandatory.

There are the available fields:

- **Title** - A short 25-character title describing what the item is. Be as general as possible, but add specific details if space allows to differentiate it from other items. Good titles are: *15 MHz function generator*, *DC power supply 0-20V*, *40MHz analog oscilloscope* and *4K USB camera*.
- **Category** - A category bins items that are similar and makes searching for similar items easier. For example when searching for a power supply selecting the *Power supplies* category shows all power supplies (AC, DC, HV). Find a category that is most specific. For example a multimeter might fit in the *General electronics* category, but is better binned in the *Multimeters* category. If you are sure an item might form a new category with other items, this category can be added in the manage environment (section 4.4).
- **Brand** - The brand of the item. If the item is homemade, use *Homemade*. If unknown, use *Unknown*.
- **Model** - The model of the item. If unknown or homemade, use *Unknown*. Does the item consist of multiple parts (e.g. a proprietary power supply), comma separate the models in this field.
- **Serial** - The serial number of the item. Does the item consist of multiple parts (e.g. a proprietary power supply), comma separate the serial numbers in this field.
- **Parts** - The number of separate parts of the item. For example, a laser might consist of the laser itself, a power supply and a remote control. All these 3 parts can be disconnected and all mandatory for the laser to work. This item will thus have 3 parts.
- **Description** - Add as many details about the item as possible: text written on the item, specs or even descriptions and spec sheets copied elsewhere online.
- **Storage Location** - Find a storage location with similar items and verify space is available here to storage it. Each shelf in a cabinet is a separate storage location. New locations can be added in the manage environment (section 4.4).
- **Image** and **Image2** - Add images of the front and back (connections) of the item. Take photos with a neutral background if possible. More images can be added to logbook if needed.
- **Purchased by**, **Purchased on** and **Purchased price** - Optional fields to specify who bought the item, when and at what price.
- **Warranty**, **Warranty expiration** and **Next service date** - Optional fields for newly purchased items to specify any warranty information. Warranty items will show up in the manage environment separately sorted by the next service date.

### 4.2 Update an item fully or delete item

To update all item details, go to the item-detail page, and select **Full Update** from the **Actions** menu. To delete an item, select **Delete** from the **Actions** menu. Note that there is no undo functionality when an item has been deleted.

### 4.3 Print QR codes

Printing QR codes is a 2-step process: exporting the data from EMS followed by importing the data and printing the labels with the Dymo software.

1. Exporting the data can be done in the manage-environment of EMS. Go to Admin → Manage → Export. Select the ID range of items you wish to export (e.g. 10-50, for labels PCF0010-PCF0050), and press Export. 2 csv-files will be exported named `export_tracking.csv` and `export_nottracking.csv`.

2. Open the Dymo software DYMO Connect for Desktop (tested on Windows 10 with DYMO Connect for Desktop 1.3.2). Open the template `pcfems_labels_version20210204_tracking.dymo` and select Import data in the top of the screen. Select the csv file `export_tracking.csv` that was just exported, verify you selected the tracking file. Once imported make sure the label size shown in the bottom of the screen matches the labels currently in the printer, and press Print to print the labels.

3. Repeat step 2 for the no-tracking items. Use `export_nottracking.csv` in combination with `pcfems_labels_version20210204_no_tracking.dymo`.

The Dymo LabelWriter 450 Turbo was used when writing this manual. Standard label size: Medium Multipurpose Labels 30335 | LW 32x57mm SKU: S0722540.

## 4.4 Manage environment

The manage environment of EMS allows staff members to see extra statistics and manage the system. The manage environment can be found under Admin → Manage.

### 4.4.1 Overview

In the overview tab you can find the items that are currently flagged, the currently assigned items and items under warranty. Items that are flagged need attention and flags can be resolved immediately from this view.

### 4.4.2 Users

Adding users to EMS can be done from this view. There are 3 types of users: general users (don't have access to any of the staff functionalities), staff (can add, remove and fully edit item plus have access the the manage environment) and admins (have access to the back-end, cannot be added through the EMS front-end).

Users cannot be deleted from the system, as their name can still be used throughout the system. Instead a user can be set to Inactive. Inactive users can no longer login or reset their password.

Passwords cannot be reset through this interface. A user reset their password with their known email address using the Forget Password? functionality on the login page.

### 4.4.3 Activity

Under development. Currently shows all the raw page request.

### 4.4.4 Flags

Flags can be edited and added here. A flag has a name, description and icon. Icons can be found in the [Font Awesome library](#).

### 4.4.5 Categories

Categories can be edited and added here. Make sure a category is unique and does not overlap with other categories.

### 4.4.6 Locations

Each item in EMS is linked to a location. Each location is build up out of 2 parts:

1. Lab
2. Setup or Cabinet

When an item is in use (assigned to a user) the location is Lab + Setup, when the item is in storage the location is Lab + Cabinet.

On this page you can add Labs, Setups and Cabinets. EMS takes care of combining these into locations.

### 4.4.7 Export

Here you can export items to csv-files. See section [4.3](#).