

EKN Cloud

OPERATING MANUAL

MANUAL INFORMATION

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Manufacturer:

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1. Introduction

EKN stands for **Eye Knowledge Network** and can be accessed at www.eyeknowledge.net.

EKN Cloud is a web software solution, integrated with the **DRS fundus camera**, used to securely and automatically transfer DRS images and data on a remote server, for backup purposes. It also allows online review of such data by authorized users.

As a backup solution, **EKN Cloud** requires no hardware other than the DRS, the Internet router and a PC to review the data.

For the purposes of this document:

Service	the set of capabilities provided via the EKN
Device	the DRS fundus camera manufactured by CenterVue, identified by a serial number (SN)
Patient	person identified by last name, first name and optionally date of birth and code
Image	image of the retina of a Patient
Exam	set of Images collected for a Patient, on a certain date, by a certain Device
Data	any Exam or Image and any textual information associated to a Patient
User	person that registers on the EKN website and is given access rights to Data
Administrator	User who registers the DRS on EKN

2. Creating an account on EKN

Access to the Services requires one to register as a user on EKN.

To create an account on EKN:

- open the browser and type www.eyeknowledge.net in the address bar to open the EKN home page (see Fig. 1)
- click on **Sign up today!**
- fill-in the registration form (see Fig. 2) with a valid email address, use a strong¹ password
- check and accept the website Terms and Conditions and click on **Sign up**
- check your email: you should have received a message with a confirmation link
- click on the link and you will be ready to login as a new User!

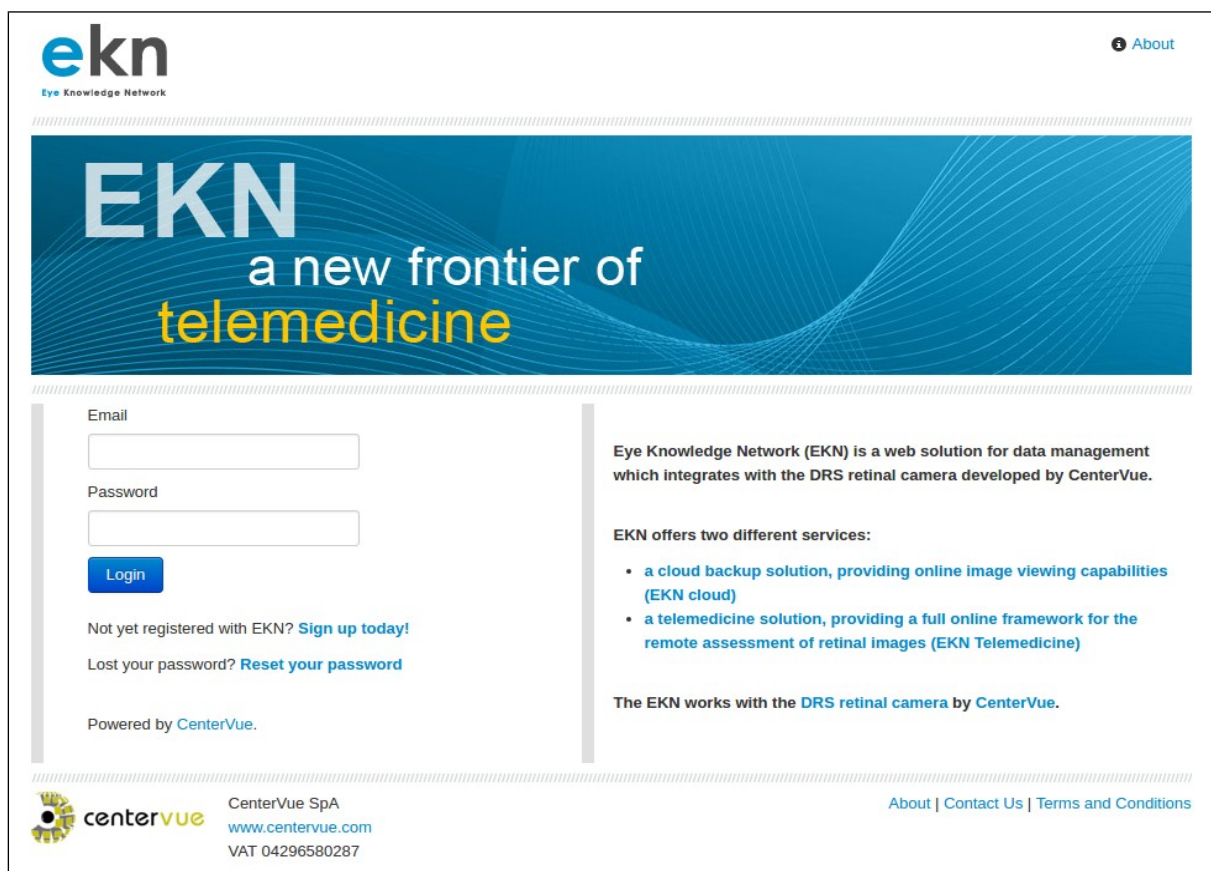


Fig. 1 – Home page for unlogged user



The User's password will be used for Data encryption purposes.

¹ Combine letters and number, use at least 8 characters

Fig. 2 - Registration form

3. Login

To login the EKN, type the e-mail that you specified at registration in the Email box, type the Password, then click on **Login**.



After 10 minutes of inactivity a session expires and you may need to login again.

4. Registering a DRS on EKN

The DRS fundus camera is the source of medical data for your EKN account and needs to be “registered” (i.e. configured) for data transmission to EKN.



Activation of EKN services requires purchase of a dedicated license. Please contact us at info@centervue.com or infous@centervue.com for information about the available licenses and for purchasing licenses.

To register your DRS on EKN, proceed as follows:

- Login with your credentials;
- Click on **Admin** and then on **Register new DRS on EKN**: the DRS registration form will open (see Fig. 3);
- Follow the instructions and type the DRS Serial Number (a 4-digits number found on the device itself), the One Time Secrete Key (which can be read on the DRS screen by accessing the settings), optionally the DRS Location (which may be useful for example in case of multiple DRS devices located in different offices) and a Group Name (which is useful if you intend to connect more than one device).
- Click on **Register DRS**
- Information about existing licenses is provided upon successful registration (see Fig. 4).



Registering the DRS on EKN will elect you as the **Administrator** of your DRS device

New DRS Registration

*DRS Serial Number

drs-1234

This must be the DRS serial number, like 1234

*One Time Secret Key

074ab6d4eqd8966

This key is obtained from your DRS. Instructions here:
<https://www.eyeknowledge.net/connect>

DRS Location

Santa Clara, CA

This is a free-form string containing the location of your DRS. Not required.

Group Name

1234-group

For example: "General Hospital Ophthalmology Department"

Description

Fig. 3 – DRS Registration form

Device Group: drs-3503 group

Connected Devices

These devices are all connected and visible to all users of the device group; all patients and exams are visible in the same inbox.

Device name	Registered at	Location	Last seen	License status
drs-3503	2015-08-13	Plymouth <input type="button" value="⌵"/>	2015-09-28 13:02:15 UTC	VALID LICENSE

Fig. 4 – Admin page

5. Online data review

Once a DRS is connected to EKN and is configured for data upload and a valid license is available, it will automatically transfer images and patient related information to EKN as soon as new data is available.

- check the DRS Operating Manual for information on how to configure a DRS for data upload;
- If a DRS is connected to EKN and patient data already exists on the Device, it will start uploading on EKN and will continue until all Data is transferred;
- duration of the transfer depends on the number of Patients / Images stored on the DRS and on the actual speed of the Internet connection;
- Data is encrypted at origin, transmitted in encrypted form via https channel and stored on the server in encrypted form to guarantee protection on personally identifiable health information;
- only the DRS Administrator can access the data in the decrypted (i.e. visible) form

Log-in with your credentials at any time to access the Inbox page and see the patients stored on EKN (see Fig. 5).

The screenshot shows the EKN (Eye Knowledge Network) interface. At the top left is the EKN logo. The top navigation bar includes 'Inbox', 'Admin', 'Profile', 'Log out', and 'About'. A search bar is located below the navigation bar with a 'Search' button and an 'Advanced Search' button. On the left side, there is a sidebar with 'Licenses Remaining' (showing 'drs-3503') and 'EKN Cloud Storage' (showing 'Expires: 2016-08-13'). The main content area is a table of patients. The table has columns for 'Patient code/id', 'Patient name', 'Exams', 'Last exam upload', and 'Last exam recorded'. Three rows of patient data are visible. Numbered callouts (1-5) point to: 1. Licenses Remaining sidebar; 2. Patient table; 3. Search bar; 4. Location filter dropdown; 5. Top navigation bar.

Patient code/id	Patient name	Exams	Last exam upload	Last exam recorded
60038	B G drs-1440 Padova	5 / 5	almost 3 years ago (2013-07-02 10:29:20 UTC)	almost 3 years ago (2013-07-02 10:26:19 UTC)
60039	, anonymous drs-1440 Padova	1 / 1	almost 3 years ago (2013-07-02 10:17:34 UTC)	almost 3 years ago (2013-07-02 09:59:11 UTC)
24533	Z , G drs-1385 Selvazzano	5 / 5	over 3 years ago (2012-10-01 07:46:43 UTC)	over 3 years ago (2012-09-30 13:56:06 UTC)

Fig. 5 – Inbox page

The Home page provides the following information:

1. available licenses
2. Patient list (table) showing Patient code, Patient name, serial number of the originating DRS Device and its location, Number of uploaded Exams / total number of Exams stored on DRS, Date the last Exam was uploaded, Date the last Exam was captured
3. Patient search function
4. Location filter (if more than one location is defined)
5. Access to the **Admin page**, **Profile page**, **About page** and Log out command

Click on the desired Patient's code or Patient name to access the corresponding **Patient Page** (see Fig. 6).

6. Patient Page

The Patient page provides access to all information available for the Patient, including:

1. Display of a selected retinal Image, with zoom capabilities;
2. Thumbnail view of all Images stored for the Patient;
3. Patient- and Image-related information;
4. Command to go back to the Inbox (or home) page
5. Command to display the red-free version of the selected Image
6. Command to create mosaic images (see par.)
7. Command to download image as a jpg file
8. Tab to choose between single-field Images (Exams) and multi-field mosaics

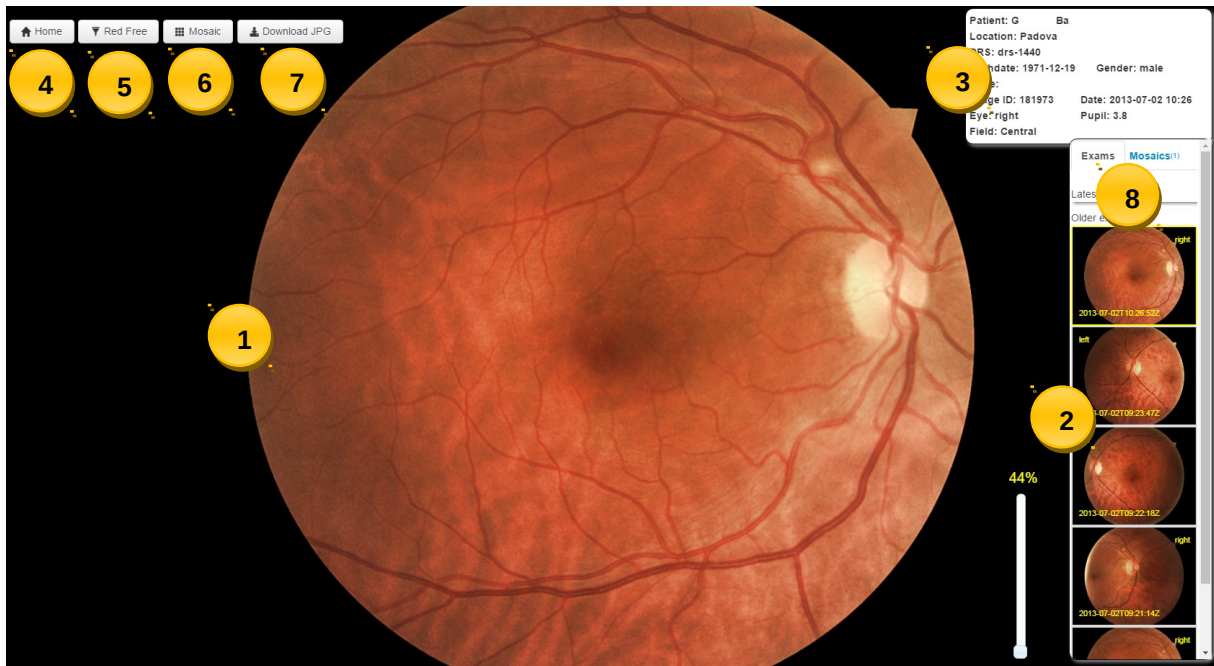


Fig. 6 – Patient page

Automated Mosaic function

A **mosaic** is the composition of multiple, partially overlapping, fields of the same retina and it is used to obtain a wider view.

In the Patient page, EKN provides a function to automatically generate compositions of DRS Images. The resulting mosaic images are permanently stored on the local memory and can be reviewed at any time as individual fields.



2 to 7 fields can be used to generate a mosaic.

A central field is always required.

The typical time required for generation of a 3-fields mosaic is approximately 1 min.



Fig. 7 – Example of 2-fields mosaic

To generate a mosaic, proceed as follows:

- in the Patient page click on **Mosaic**;
- select the group of Images to be composed by identifying the eye and date of acquisition, then press **Select** (see Fig. 8);
- select / deselect the actual Images to be composed within the selected group, then press **Create Mosaic** (see Fig. 9).

The resulting mosaic image will eventually be available by clicking on the **Mosaics** tab.



The images resulting from the mosaic process may contain artifacts (such as duplicated or disconnected vessels) that are generated at the transition between two adjacent fields and that are not present in the original images. Such artifacts can be easily ruled out by comparing the mosaic image with the original single-field images.



Fig. 8 – Step 1 for mosaic generation

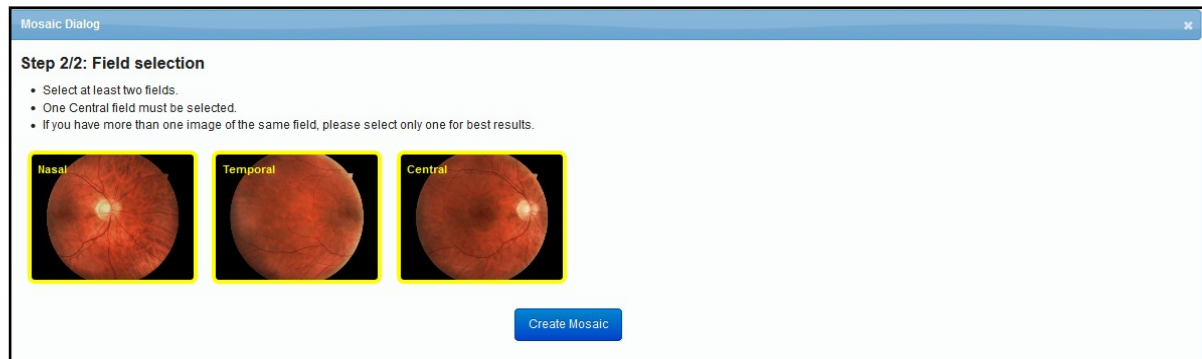


Fig. 9 – Step 2 for mosaic generation

9. Admin Page

The **Admin page** provides the Administrator with an overview of all connected Devices, for each existing device group.

The overview provides information in terms of Device identification (serial number), date the Device was registered on EKN, location of the Device (if specified at registration), date the Device was last online, available licenses (see Fig. 4).

The page also allows to register a new DRS within an existing Device Group or register a new DRS within a new Device Group.

10. Profile Page

The Profile page allows to modify the access credentials (password and/or e-mail).

11. About Page

The About page provides various information, including the website terms and conditions and the manufacturer's contact information.

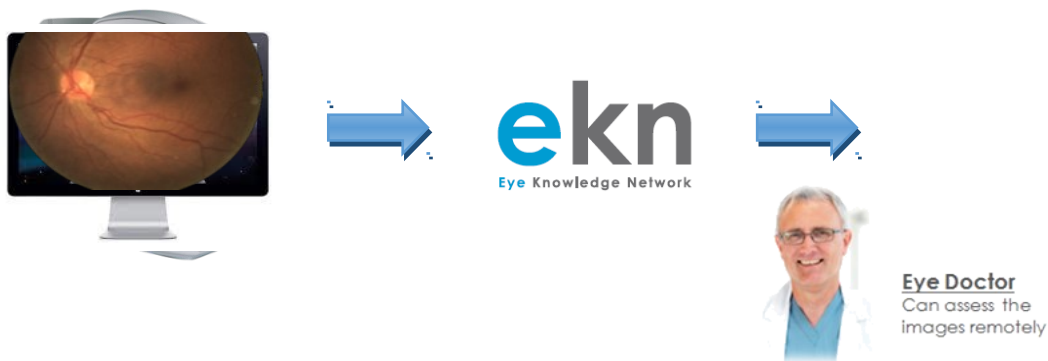
12. Technical Specifications²

EKN Cloud:

- Integrates natively with the DRS
- Data is encrypted prior to transmission and resides on the server in encrypted form
- Supports access to multiple DRS devices (device group)
- OS independent (Windows, Mac OS, Linux)
- Requires no software installation
- Browser based (Internet Explorer v8 and v9, Safari, Mozilla Firefox, Google Chrome)
- Multi-OS support (Windows, Mac, Linux)
- Supports the following types of users:
 - Administrator (single user): enables the EKN functionality on DRS unit(s); has access to stored images

Minimum requirements & limitations

- DRS unit(s) must be registered on www.eyeknowledge.net
- Users need to register on www.eyeknowledge.net
- Internet connection must be available on the DRS unit (LAN/ADSL)
- Recommended minimum bandwidth: 2 Mbit / sec symmetric
- Supported browsers include: Firefox 9+ / Safari 5+ / Chrome 11+ / Internet Explorer 8+
- Network infrastructures and any necessary hardware are not included in the solution
- Internet connectivity is not included in the solution
- PCs used for reviewing images and grading are not included in the solution



² Specifications are subject to change without notice for improvement – rev02 of 2016-05-02