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Advanced Field Services in the Digital Age

User Guide V2.4 for Konect V6.1

December 2021

Konect is an advanced field services mobility solution. It enables anyone (novice or specialist), including those without programming skills, to build field services workflows for the latest generation of smartphones and tablets.

Konect's flexibility allows it to be configured to service almost any field services challenge. Maps, data forms and workflows are easily defined on the desktop and deployed dynamically to mobile devices. Any number of solutions to be delivered through a single mobile app.

The optional integration services bind Konect into the corporate-wide electronic workflow of a modern business.

This guide services project administrators who configure field services workflows and work teams who execute those workflows in the field.

Konect is developed by Global GBM. Visit www.gbmkonect.com and click the resources link on the menu bar to access the Knowledge Base, report and issue or access support resources.

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1 Concepts

Konect is an advanced field services mobility solution. It integrates operators who work in the field on mobile devices into the business-wide workflow.

This is a solution builder framework. It is packaged with a management console for app designers and data administrators, a fully configurable mobile app for fieldworkers and a web-browser interface.

Data integration toolkits and report writer connectors are also available.

Konect is a flexible platform that can be easily configured by in-house personnel to service diverse business outcomes, all of which operate within a single framework. The solution is comprehensive, robust, enterprise quality and fully scalable.

Business units within a large organisation may share data or use their own. They can configure Konect to service common or individual business outcomes. All configured workflows operate within the one cloud-based framework. New configuration can be distributed dynamically without requiring operators to install a new mobile app.

1.1 Software components

Each Konect subscriptions provides:

- a cloud database to securely store data and settings
- the Konect Manager desktop program for setting up the way maps and data present on a mobile device for each group of operators
- advanced security settings to control who can access each dataset and how each group of users can interact with the data
- the Konect Mobile App for operating with the maps and data on mobile devices.

Optional extensions include:

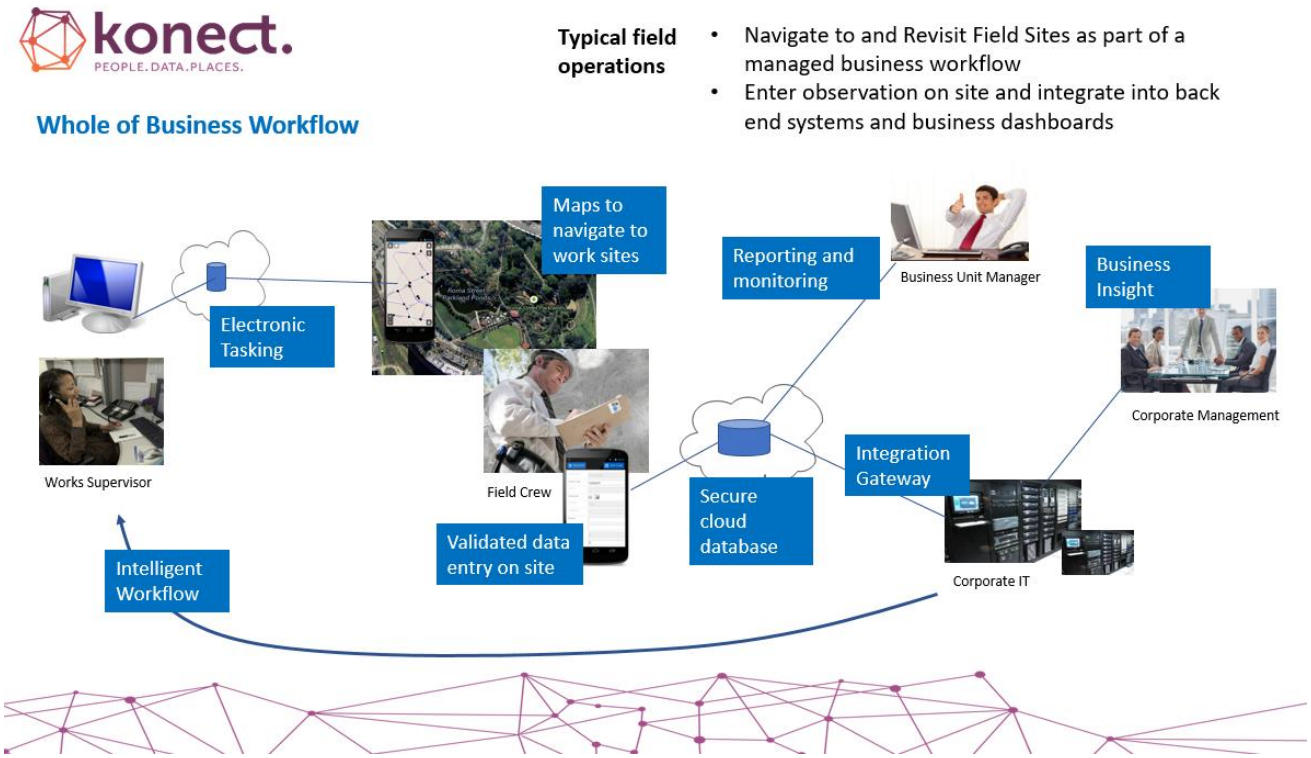
- programming and scripting tools to automate data upload, and to download and manipulate database content under program control
- the Konect App for working with maps and data in a web-browser window.

1.2 Implementation

The Konect Manager software allows administrators to tailor map presentations and data forms for each group of mobile operators and to package those as Konect Projects.

Field personnel log in to the Konect App and choose one of the projects they are authorised to access. Any changes made to the data through mobile devices or the Web App are posted back to the cloud database.

Through the Konect Manager application, office-based personnel can upload new maps and data into the cloud database and dispatch data and custom configurations to work crews. They can also export field observations for use in business workflows or build fully automated business systems by directly integrating the Konect Database with other software products.

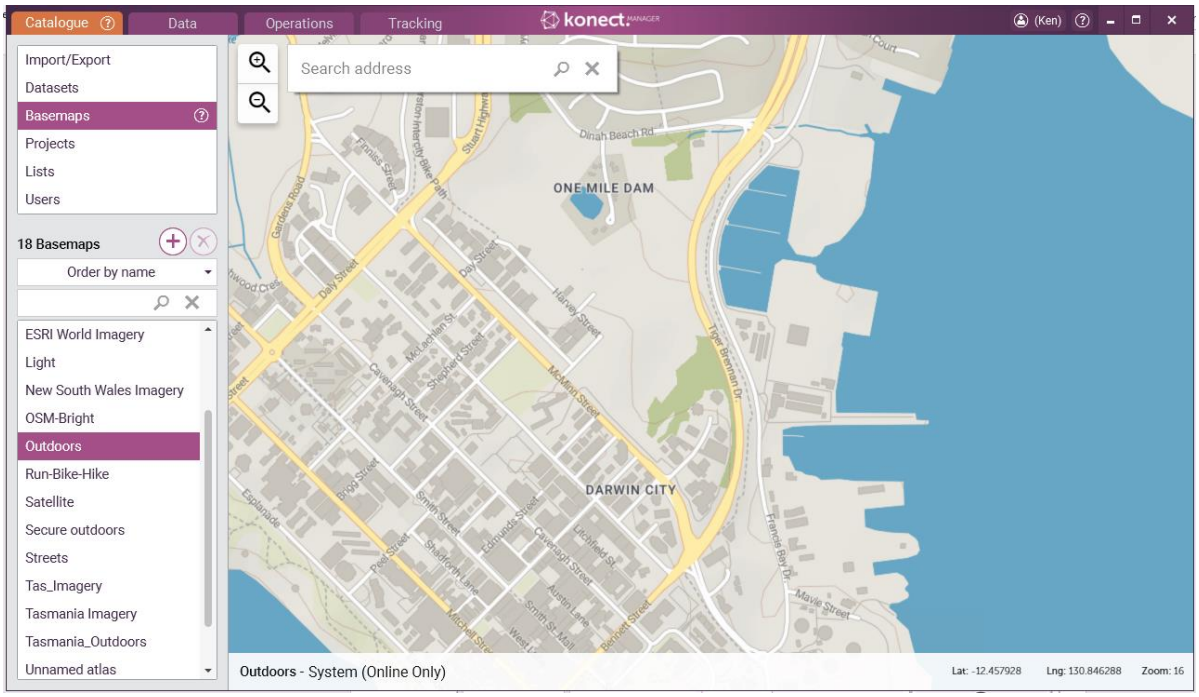


1.3 Definitions

1.3.1 Basemaps

Read-only maps as sets of raster image tiles. Basemaps may be read directly from the web or pre-packaged for download onto mobile devices, so they are available when internet connectivity is lost.

A standard set of basemaps is shipped with Konect. Additonal maps may be sourced from third parties or in-house web servers.



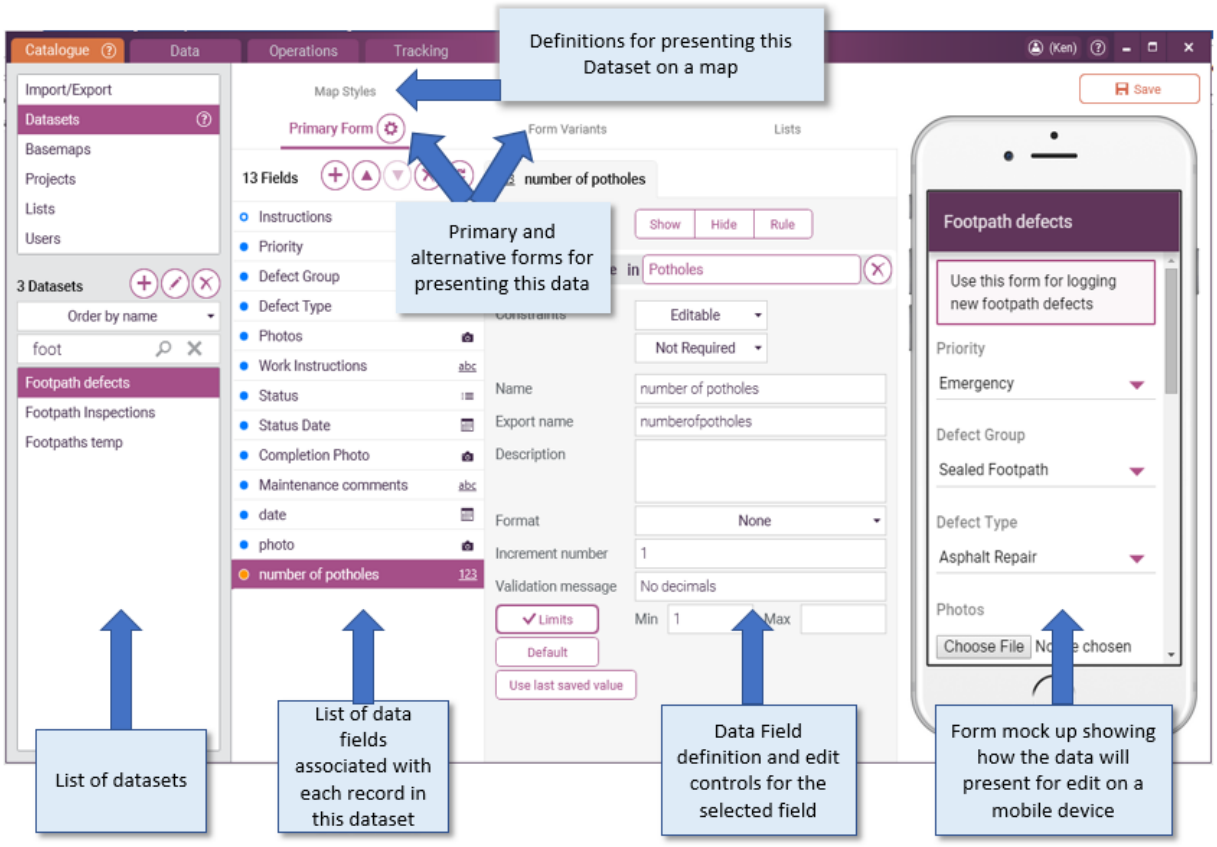
Basemaps are commonly used as the bottom layer in a project map with spatial data layers (datasets) drawn on top of basemaps.

1.3.2 Datasets

Sets of data records with a common schema or dataset definition. Each record in a specific dataset comprises a map feature and values for each data field in the list of data fields defined for that dataset. A database may contain many datasets, each with a different list of linked data fields.

Each dataset definition includes:

- the list of data fields associated with each record in the dataset
- forms that descibe how the data presents on a mobile device and how the data content can be edited. Multiple alternative forms (form variants) are available to tailor data forms to the groups of operators in a business workflow.
- one or more Map Style definitions. These define how each record in the dataset will be drawn on the map.



Each data record in a dataset includes a single map feature (geographical point, line or map region).

Datasets can be linked in one-to-many relationships, for example, to describe the mulitiple components of an asset.

1.3.3 Projects

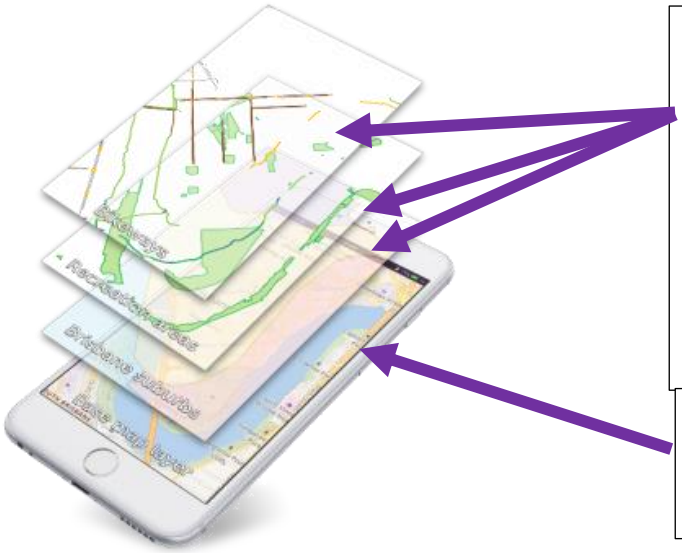
Pre-defined sets of maps, forms and operating settings. Each project is optimised to deliver a productive working environment for a specific group of mobile users.

Maps and data edit forms are optimised for each operator group by building a Konect Project for each user role.

Customers with complex business workflows, especially those with work passing through different groups of field operators, may choose to configure a separate project for each operator role.

For example, there may be a project for operators who record defects, another for contractors who repair those defects, and a third for those who audit the rectification work.

Projects are configured through the Projects tab in Konect Manager. They are presented on mobile devices and also available through the Web Viewer and on the Operations tab on the Konect Manager desktop.



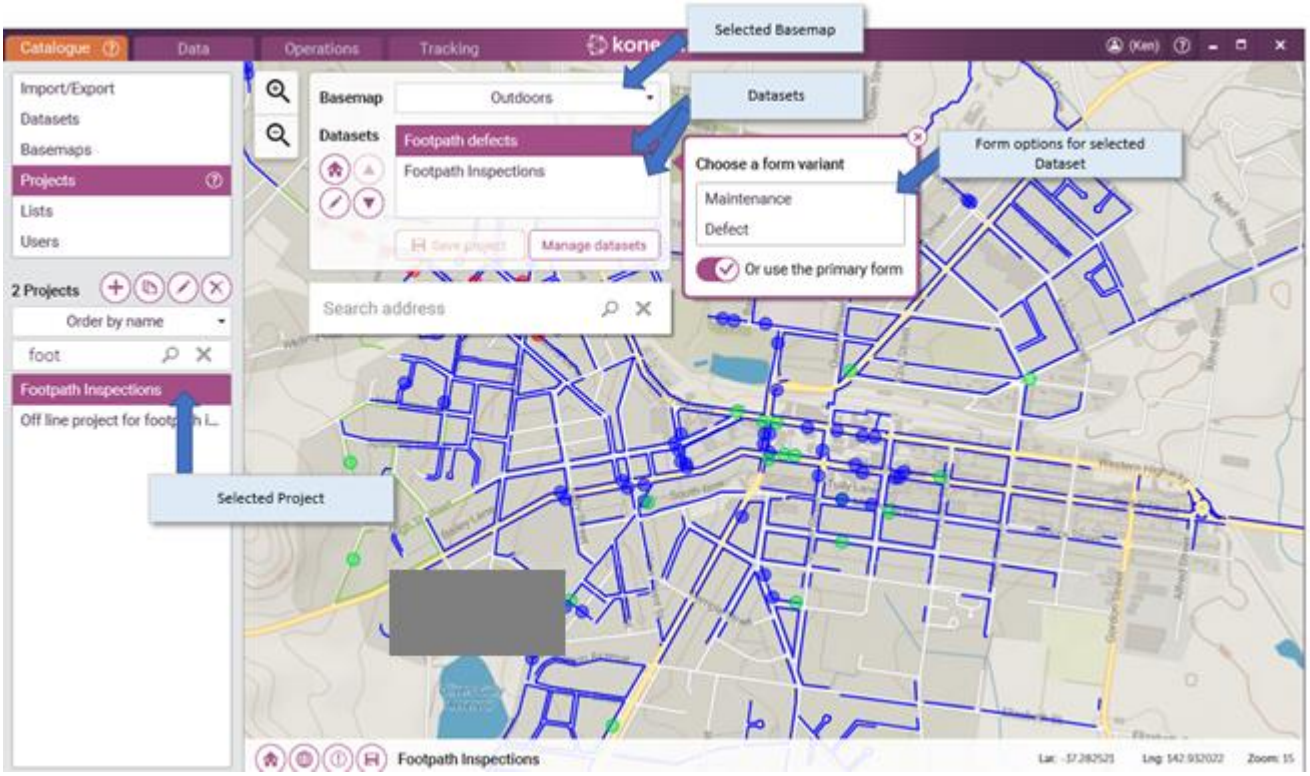
Datasets

Projects are optimised to support the fieldwork to be completed by each group of mobile operators.

They present a map made up of a sequence of ordered layers with each layer presenting a Konect dataset with associated map presentation style and data form.

Basemap

View only map graphic (no interaction)

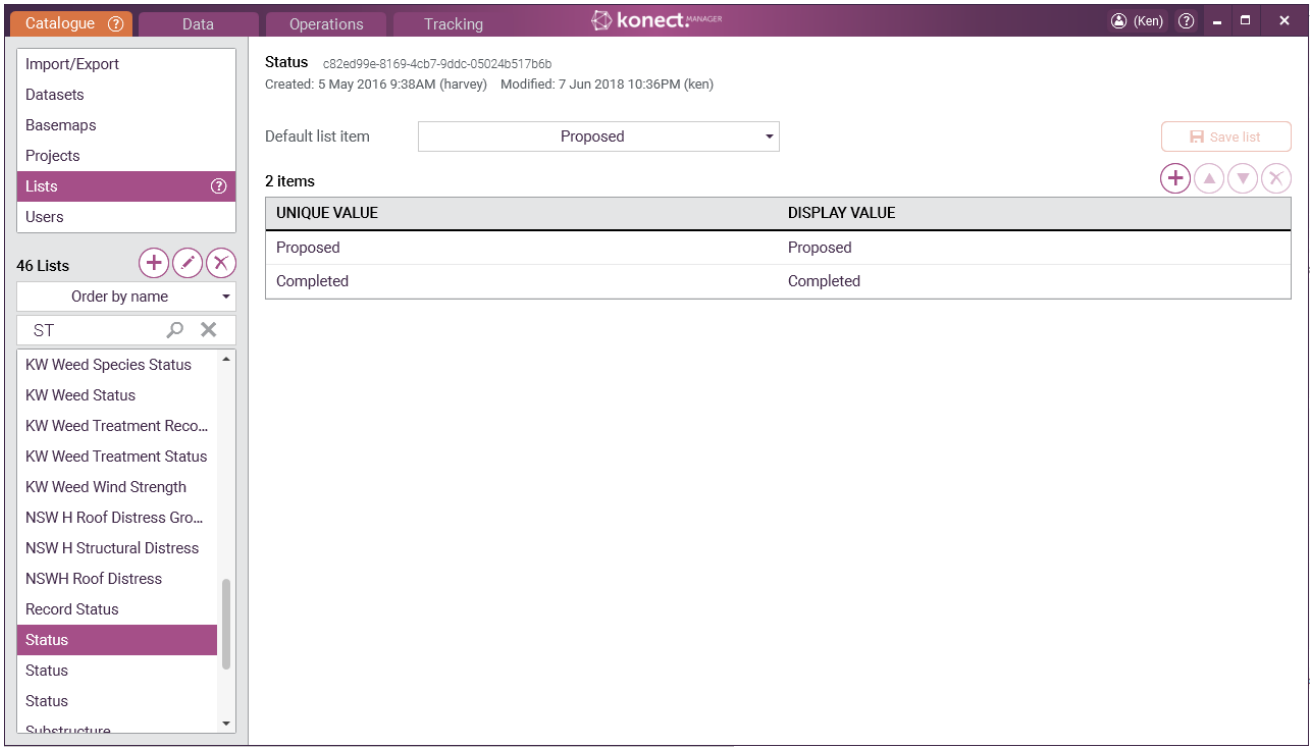


1.3.4 Lists

Lists of options that users may select from pick lists. Data entry can be constrained to ensure users select a value from a list of valid values.

Lists may be nested so that the value selected from one pick list limits the options available for selection from another list.

Lists, queries and form variants combine to deliver workflows where data records are automatically routed to different field crews as the data is updated.



Each entry in a list includes a DISPLAY VALUE that appears in data forms paired with a UNIQUE VALUE that is inserted into the data. The UNIQUE VALUE can control how each data record displays on the map.

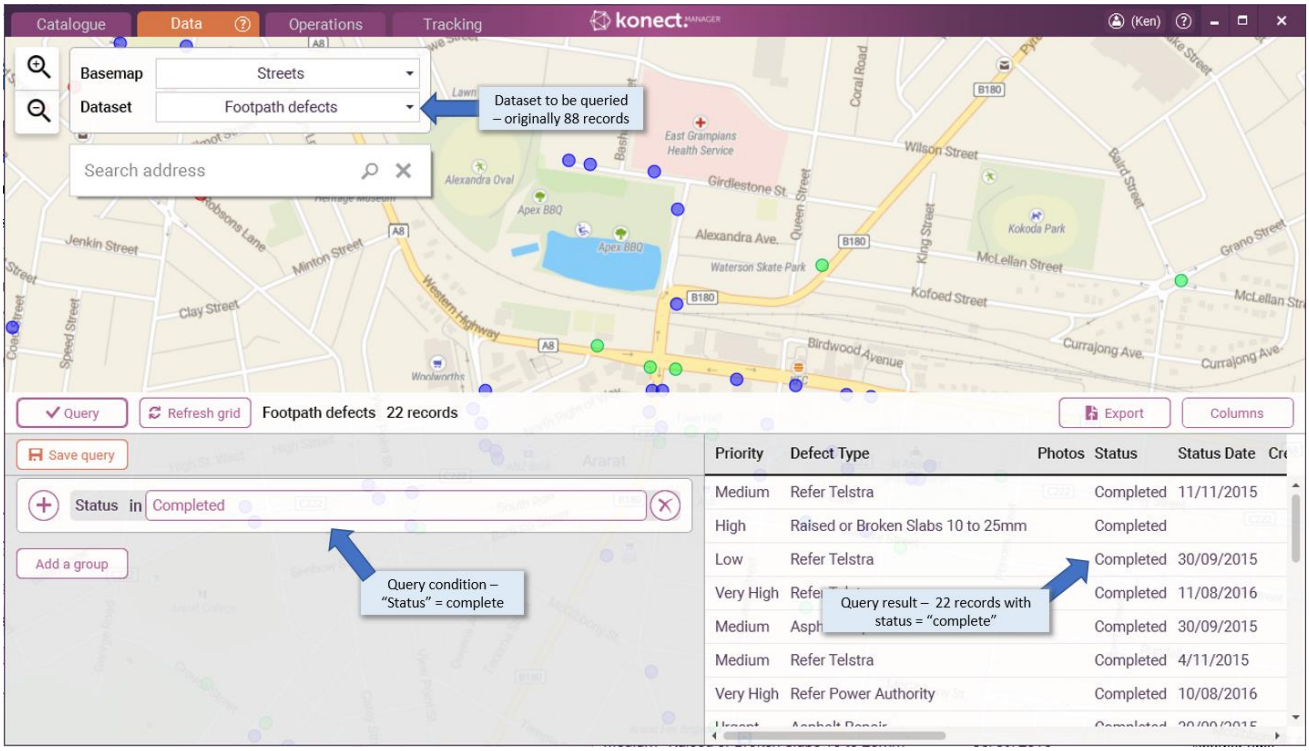
1.3.5 Queries

Dynamic filter used to sub-set a dataset based on the content of the individual data records.

Queries allow an administrator to easily sub-set the records in a dataset based on the data content. Queries can be used to control the data records that appear in a project, a manual data export (through the data tab) or a background business proces (using the API or command line tools).

For example, if a Dataset includes a field called work status, and that field was constrained by a List with values such as “proposed”, “authorised”, “completed” and “audited”, the Dataset could be easily sub-set (using queries) so that each subset included only those records that are at a specific stage in the workflow.

To implement a workflow, different projects are created and assigned to operators responsible for each stage in the business workflow. As each operator completes their assigned work, they update the status value in the data. Konect Projects that include only those data that pass the query conditions can automatially route individual data records to the operator responsible for completing the next process in the workflow.

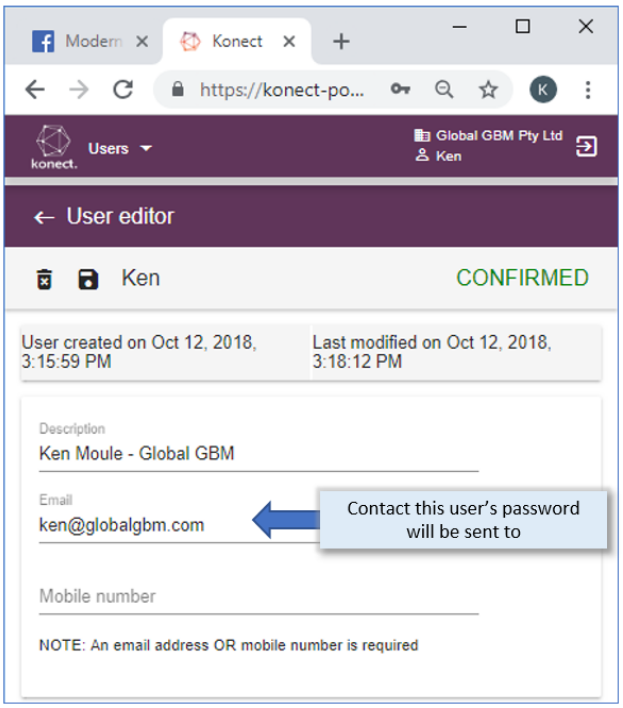


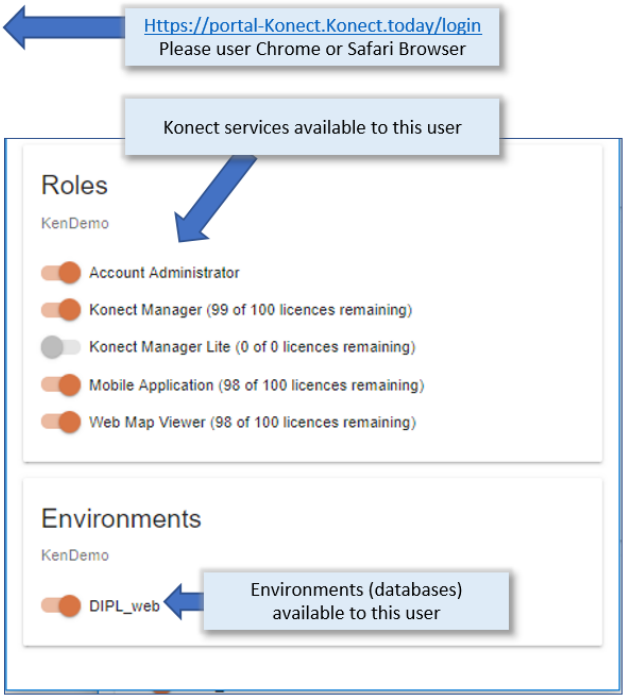
Queries are created and saved with the data tab.

In this example 22 of the data records have "completed" in the status column.

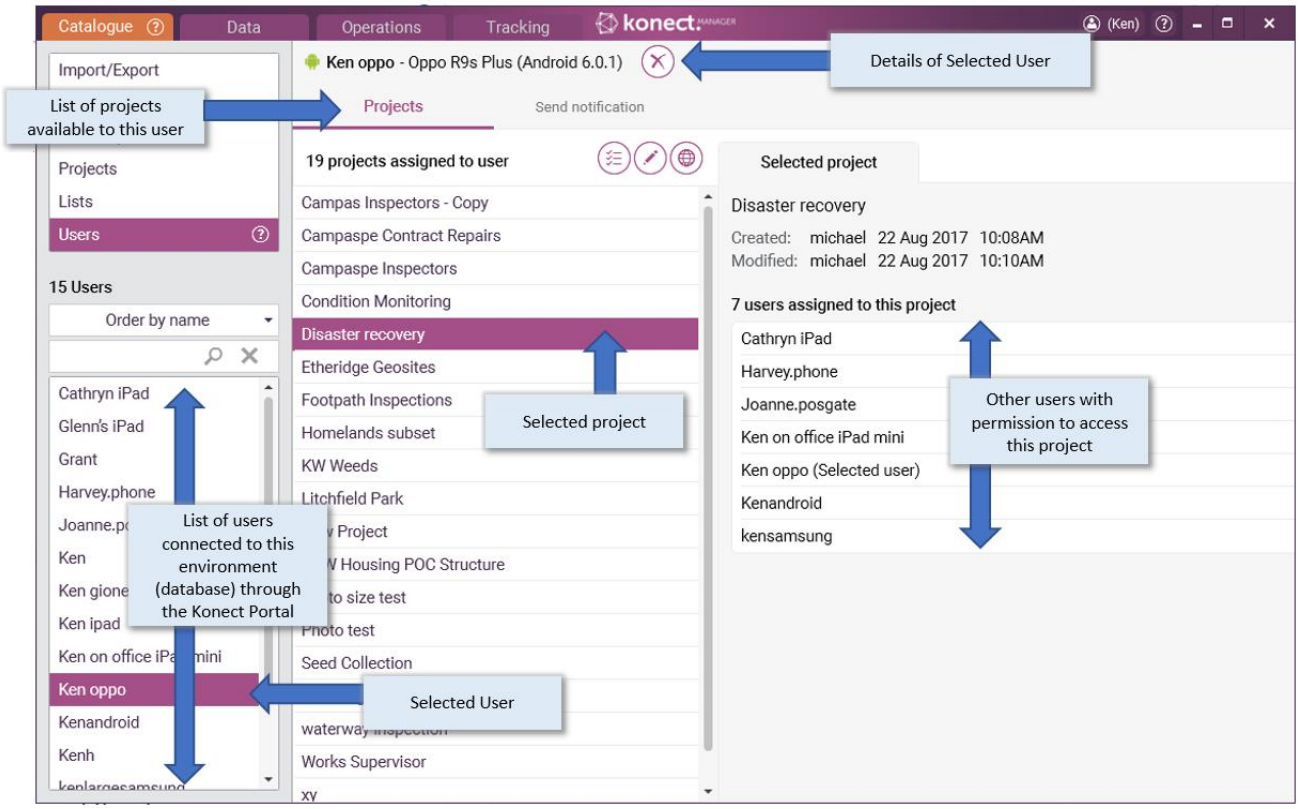
1.3.6 Users

Individuals, designated by their personal username and login combination. The administrator for each organisation authorises users through the Konect Web Portal (konect-portal.konect.today). The administrator controls which Konect environments (databases) the user may interact with and the Konect programs they may use with that data.





Konect Mobile App and Web Viewer users are restricted to working with pre-defined Konect Projects. Konect Manager is used to set up projects and assign rights to individual users to access those projects.



2 Getting started in 10 steps

This chapter is a very brief guide to help new users get started with Konect. Refer to Chapter 3 (Manual – Konect Portal) and Chapter 4 (Implementation Guide – Konect Portal) for further detail.

2.1 Install Konect Manager

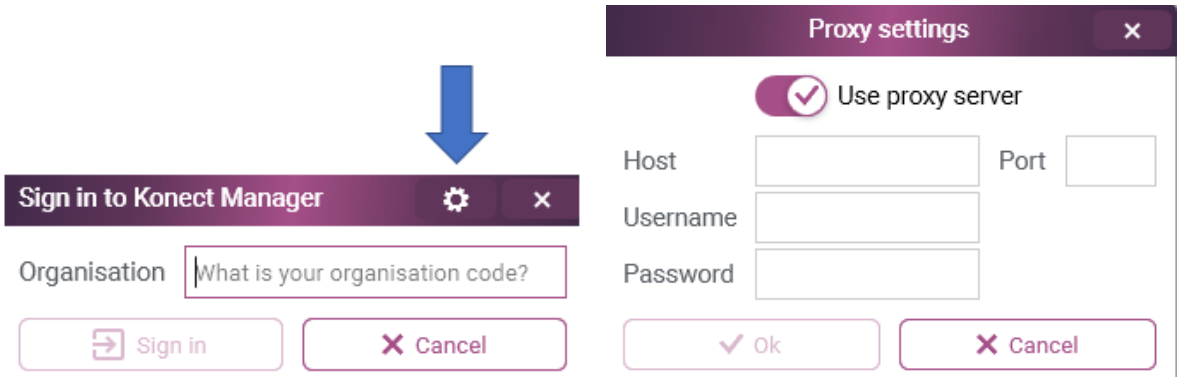
Download and install Konect Manager onto a Windows PC. The installer is available on the4 resources link at www.globalgbm.com There are two releases with identical functionality. The "per machine" installer will make the software available to any user logged into the windows desktop and needs administration privileges for installation. The "per user" install will only make Konect Manager available to the user who installed the software and does not require administration privileges.

Konect Manager is a web-based system and needs constant connectivity to the external services through standard https calls. If the local network administrator has denied access to all external services, the following URLs will need to be whitelisted:

- api.konectech.com
- api-uk.konectech.com
- maps.tilehosting.com
- cognito-idp.ap-southeast-2.amazonaws.com
- cognito-idp.eu-west-2.amazonaws.com.

Cognito is the identity management system at Amazon web services. Maps.tilehost.com is a service we use to display maps. The other two relate to the core Konect service.

Connection details may be set through the configuration button on the login window for those networks that require them. Contact your network administrator for details.



For Mac computers, run Konect Manager through your PC emulator but preferably by installing a Windows Virtual PC onto your Apple Macintosh. Two very good utilities are Parallels Desktop (www.parallels.com) or Oracle Virtual Box (www.virtualbox.org). Both of these utilities build a Windows 10 virtual computer for Konect Manager while simultaneously running your regular Apple apps.

2.2 Log in to Konect Manager

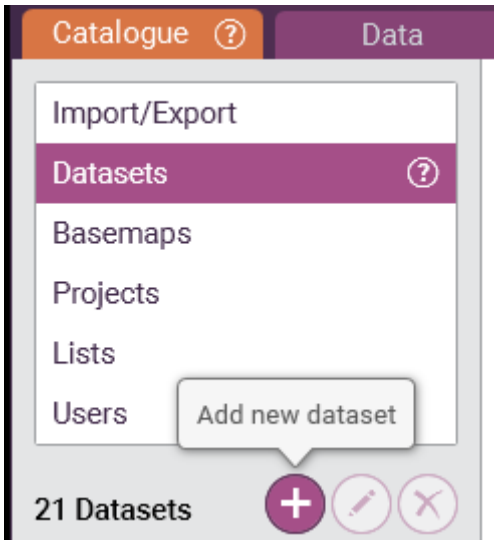
Start Konect Manager on your Windows PC and log in using your Organisation code, username and password. Organisation name and username should have been provided by your account administrator or in an on-boarding email.

An interim password will be sent to you directly from our identity management software whenever a new user is added through the administration portal. The password may come as an SMS message or email. It is not unusual for emailed passwords to go to junk mail.

On the first login you will be prompted to reset your password.

Your account administrator will be able to reset your username and trigger password reset if you have not yet logged in successfully. A lost password link is available on the login screen.

2.3 Create data

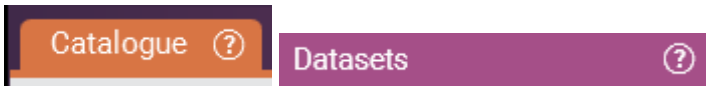


Load files into the Konect Database through the Import/Export item on the Catalogue tab. You may also create new datasets through the Dataset item on the Catalogue tab.

See 4.3 Catalogue – Import/Export

2.4 Build Data Forms and define Map Styles

The form builder can be found in the database section of the Catalogue tab.

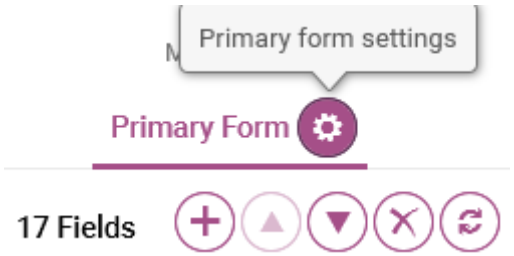


Each dataset has a Primary Form. Adding and removing items from the Primary Form automatically updates the database structure.

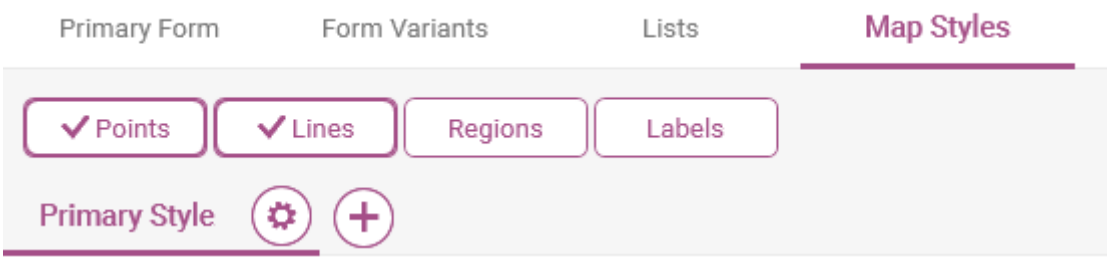
Forms control which data elements are visible in the Konect Mobile App and how each item can be edited.

Form variants are optional and are used to create sets of forms that work on the same dataset. Form variants are used to optimise form behaviour for different operator groups. For example, to assign different view or edit privileges depending on an operator's role in your organisation.

The "Settings" button controls whether a feature can be drawn, edited or deleted in the Konect App.



The Map Styles control on the Dataset tab is used to set the type of map feature that can be drawn (points, lines or regions) and its graphical style. Map Styles can be controlled by the content of any data field that is constrained by a list of values (see 1.3.4 Lists).



See 4.3 Catalogue – Import/Export

2.5 Define a project

Projects describe a working environment for a group of field services personnel. They combine a map (comprising a basemap and one or more datasets) with a form and graphical styles definition for each dataset.

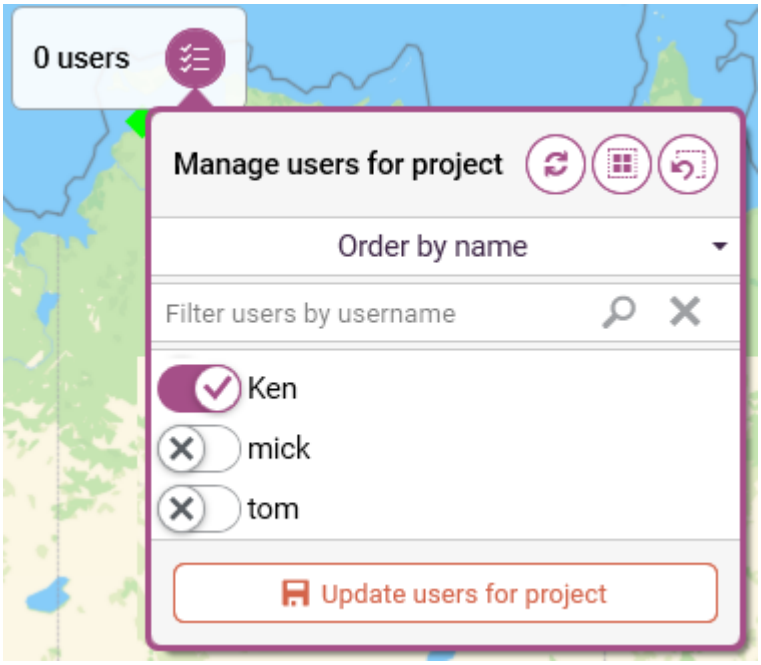
Choose a basemap and then add one or more datasets. If a dataset has form variants, choose either the Primary Form or one of the variants. Similarly, if a dataset has multiple map presentation options, choose one of the Map Styles that were set up through the Dataset tab.

See 4.4 Catalogue – Datasets

2.6 Authorise a device to access a project

Open the Operations tab in Konect Manager and choose an active project from the pick list.

Choose the “Users” dropdown, tag the target device (User) and click “Update”.



See 4.6 Catalogue – Projects

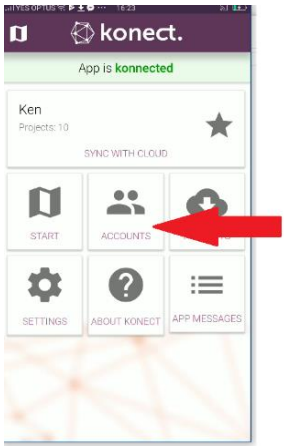
2.7 Install the Konect App on a mobile device

Download the Konect App from the relevant app store and install.

See 5.1 Installing the app

2.8 Link the device to the current Konect Account

Start Konect on a mobile device and select the “Accounts” button on the Konect App dashboard.

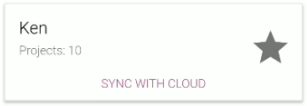


An app user may be endorsed to access projects from one or more Konect Organisations. To connect a device to an organisation, log in to the device with username, password and Organisation code.

Customers using older versions of the software may need to log in with their Account PIN rather than the Organisation code.

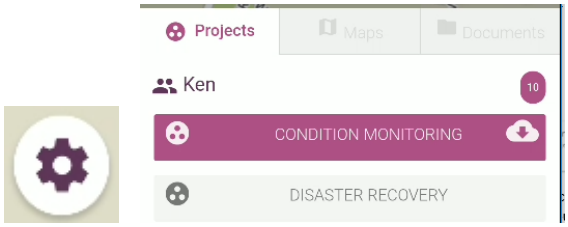
See 5.2 App dashboard

2.9 Open the project on the authorised device



Click “Sync with cloud” button on the Konect App dashboard to retrieve available projects from the Cloud database.

Click the “Start” button at top of the Dashboard screen to open a project map.



If your device is authorised to access multiple projects for this organisation, you may need to click the “Map selection” button at the bottom right of the map screen to swap between available projects.

See 4.3 Catalogue – Import/Export

2.10 Enter and edit data on the mobile device

Create new features or edit existing features as permitted by the form settings. If you are operating in the normal online mode, all changes will be directly reflected in the cloud database.

See 4.3 Catalogue – Import/Export

2.11 View data edits in the office

Go to the Operations tab in Konect Manager and choose the project that was used on the mobile device. Maps and data forms in Konect Manager operate in a very similar manner to those on the mobile device.

See 4.4 Catalogue – Datasets

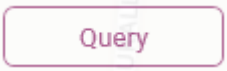
Alternatively open the optional Web Viewer in a Google Chrome or Apple Safari browser.

See 3.3 Web Viewer

2.12 Export data

Select the Data tab in Konect Manager and choose one of the Datasets that were edited on the mobile device.

The data will appear in both list form and on the map. Click a map feature or double click a row in the data grid to open the data form.



Optionally sub-set the content through a data query.

Click the “Export” button to create a file containing the data that passed the query conditions.

3 Manual – Konect Portal

The Konect Portal works in a web browser (Google Chrome or Apple Safari). The current edition of the Konect Portal does not operate reliably with Internet Explorer. The portal provides:

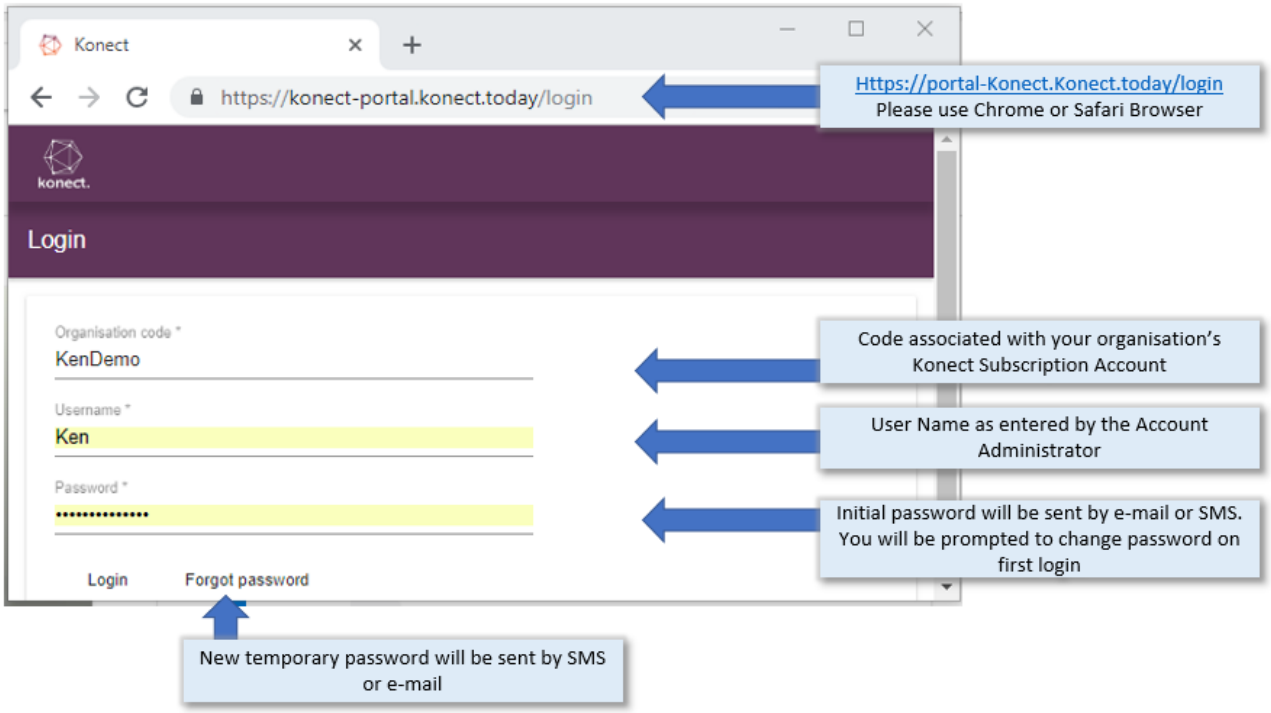
- **User Management**

  Authorised administrators may add and remove users, grant individual users premission to operate specific parts of the Konect solution and decide which environments (customer databases) those users are permitted to access.

- **Web Viewer**

  Users who have been granted rights to access specific Konect Projects, and have subscriptions for the Konect Web Viewer, can carry out similar functions to those available through the Konect App.

3.1 Portal login



Log in with your Organisation code, username and password. Refer to 3.2.2 User administration for information on user on-boarding.

Options available to logged-in users depend on which roles have been granted by the account administrator.

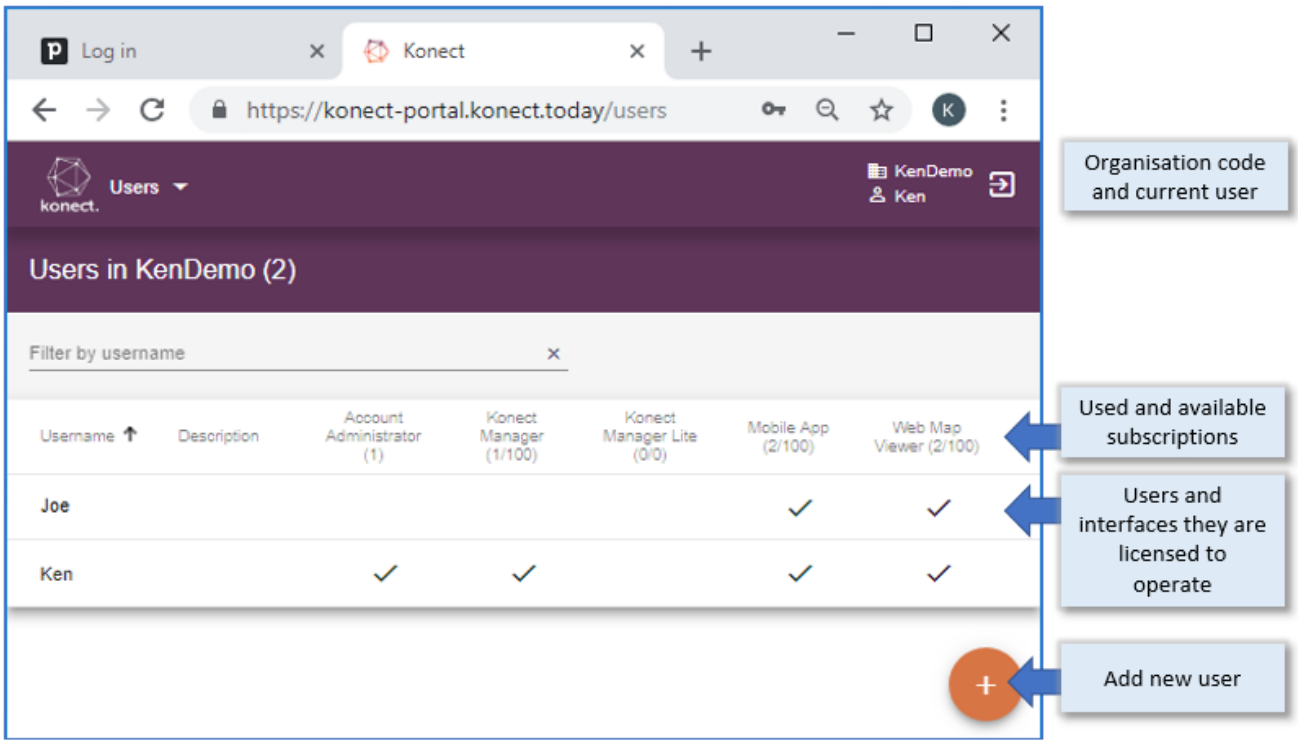
3.2 User management

3.2.1 Concepts

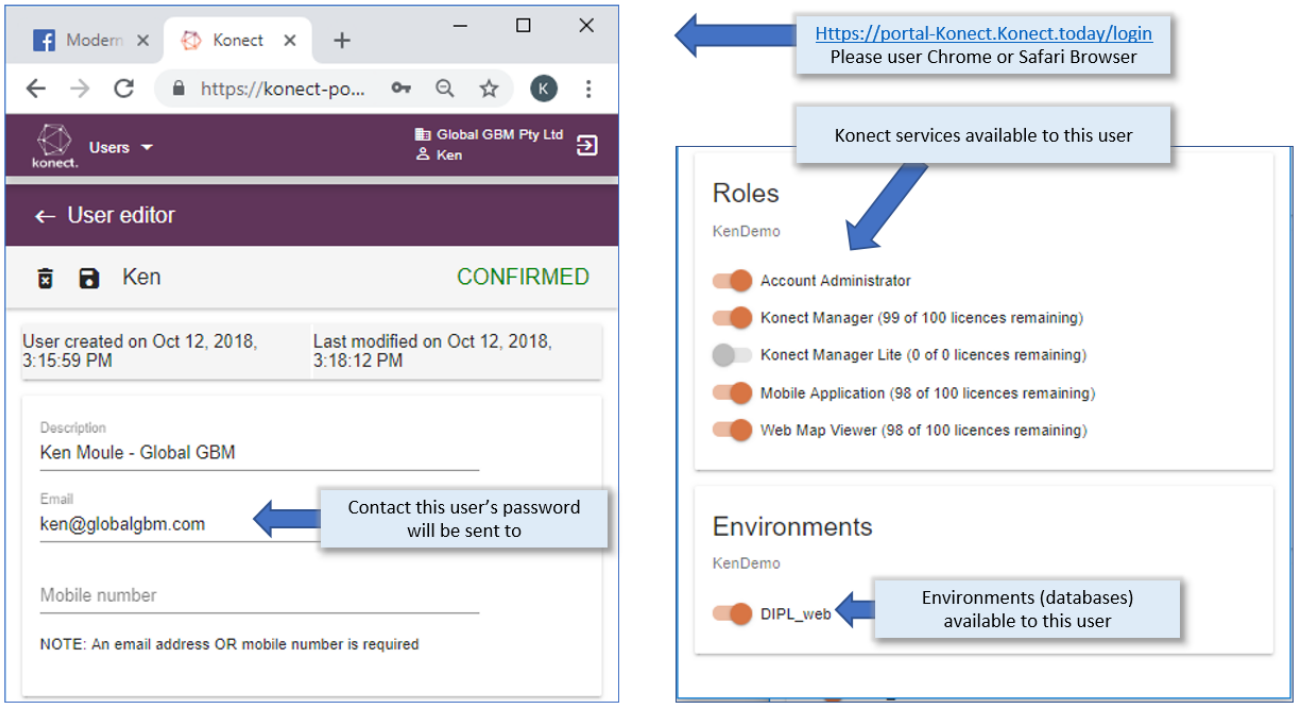
Customer accounts are called "organisations" in Konect. An organisation is initially granted a single operating environment, but customers may request any number of additional environments (costs may apply). No data or settings are shared between organisations or between the multiple operating environments within a single organisation.

3.2.2 User administration

Selected users may be granted administrator privileges for an organisation. When an administrator logs in they will have access to the Users tab which allows them to add and remove users and assign user rights to operate specific parts of the Konect software suite.



Double-click an existing user to set the Konect services they are permitted to access.

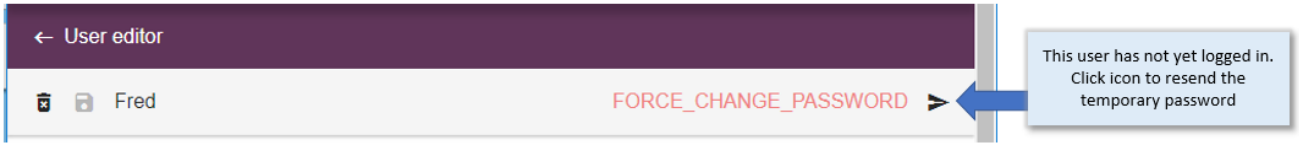


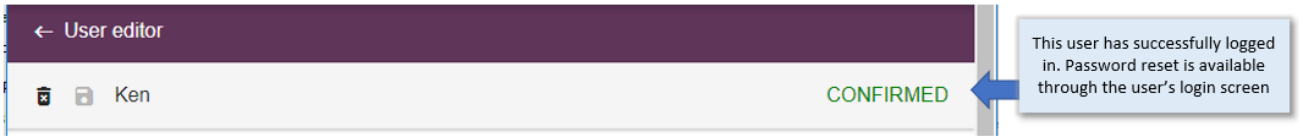
Each user requires either a unique email address or Australian mobile phone number. Username and temporary password are sent directly to the registered email or phone number.

Your Konect username is Ken and your temporary password is fPARyu16. Contact your administrator for your Organisation code.

For safe delivery of passwords, contact details must be unique across an organisation. No two users can be registered with the same email or phone number.

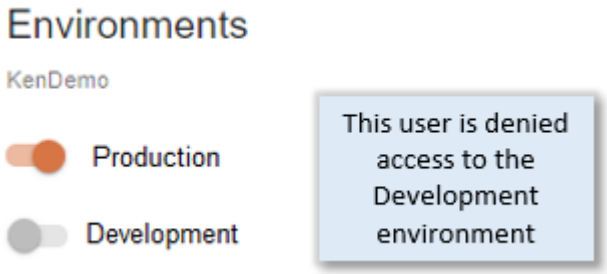
On successful login the user will be prompted to change their password. Login status is presented on the user editor screen in the portal.





Organisations are normally issued with a single operating environment (database). Additional environments can be created on request (e.g. a separate environment for production and test) (costs may apply).

The administrator may prohibit a user from accessing specific environments.

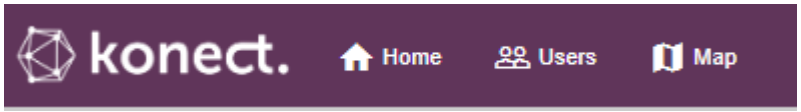


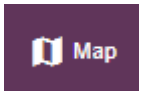
To grant the same individual a different set of Roles in two environments, that individual will need to log into each environment with a different username. The individual will need a unique email addresses for each username or use an email and mobile phone number. With services such as Gmail it is possible to create multiple email addresses and consolidate them into a single mailbox.

3.3 Web Viewer

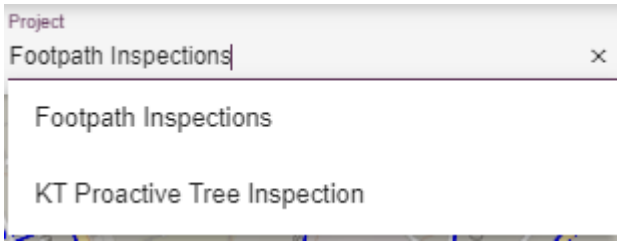
The Web Viewer operates in a browser window using either Google Chrome or Apple Safari. Windows Internet Explorer and Edge are not supported. The Web Viewer provides similar map display and data edit capability as the Konect Mobile App.

Users who have been granted access rights to the Web Viewer (see 3.2.2 User administration) will see a Map tab at the top of the home screen.





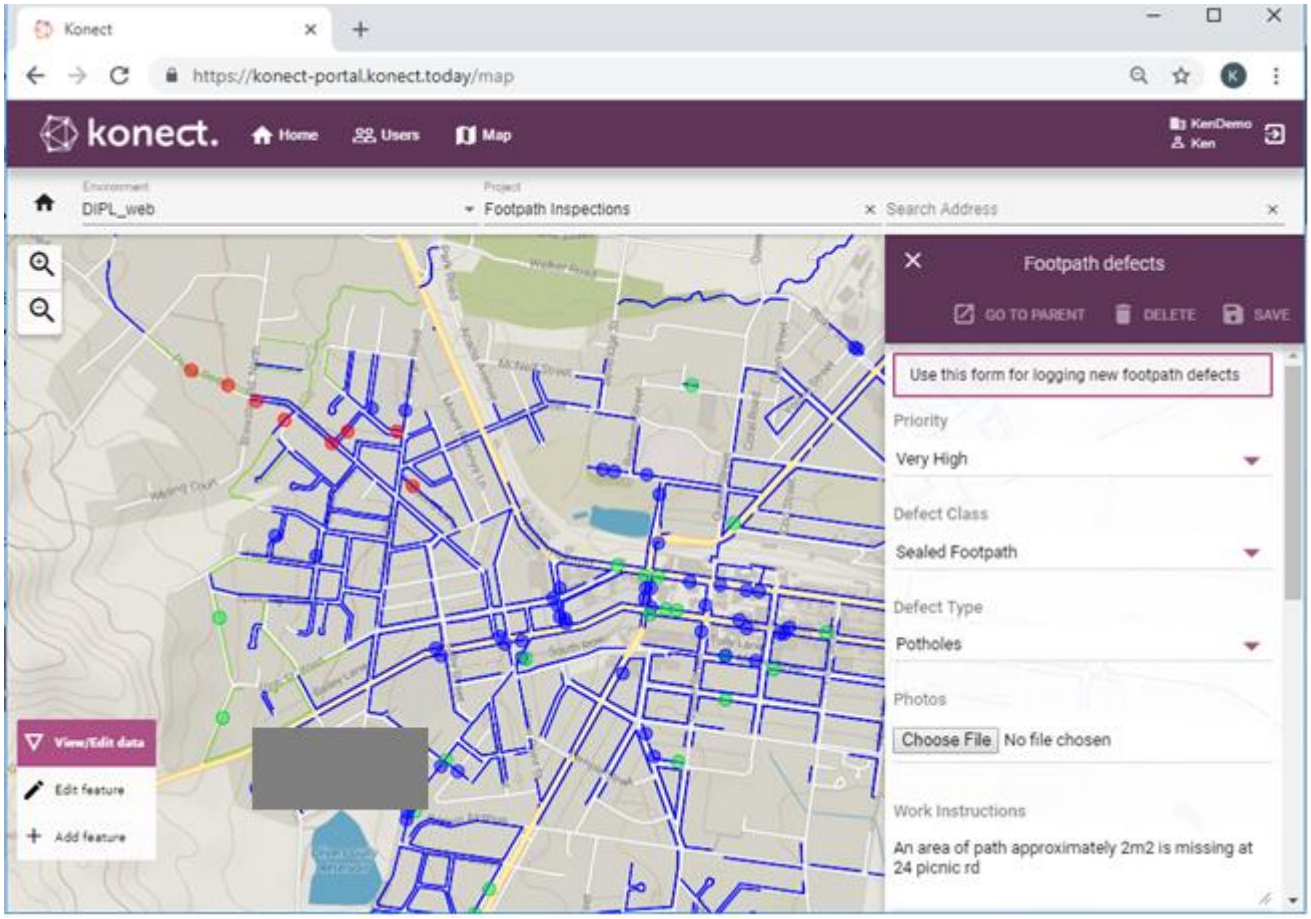
Choose the map tab and select a Konect Project from the dropdown.

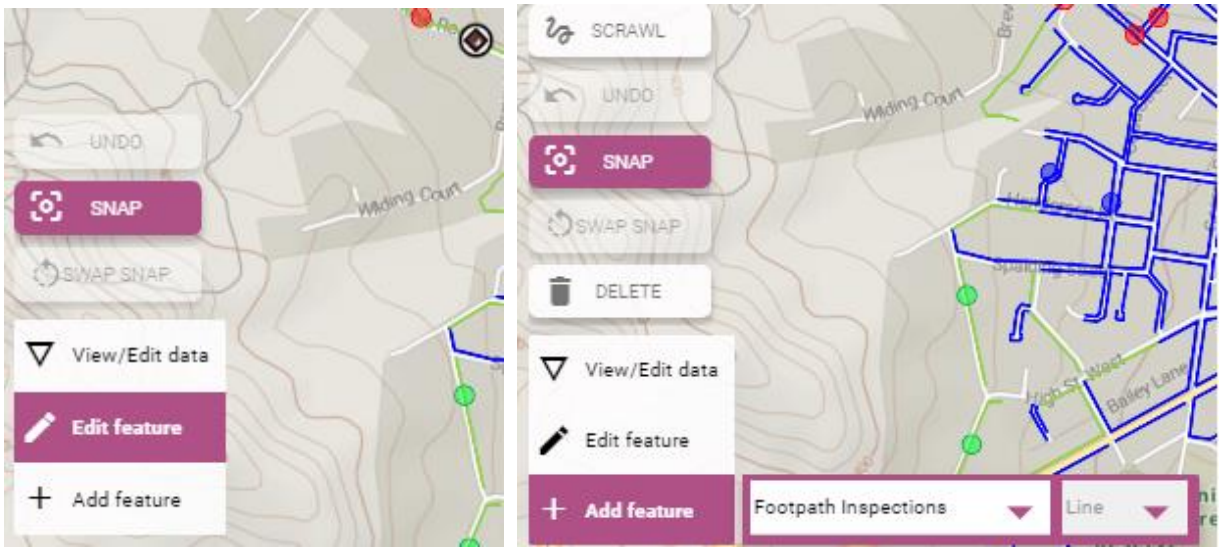


The projects list will only show those projects that the user has rights to access (see 1.3.3 Projects).

The Web Viewer behaves very much like the Mobile App but does not connect to a GPS.

Select the “View/Edit data” tool and click on the map to open a data form with the behaviours defined in the dataset and project definitions.





Choose “Edit feature” to unlock map editing capability.

Choose “Add feature” to access the drawing tools.

3.3.1 To use the Konect Web Viewer

- Set up a project through Konect Manager (Konect Manager – Projects)
- Grant the target user rights to access that project (Konect Manager – Operations tab)
- Grant the target use user rights to use the Web Viewer (Konect Portal – Users)
- Open a supported Web Browser (Google Chrome or Apple Safari)
- Log in to the Konect Portal at https://konect-portal.konect.today
- Choose the Map tab
- Select a project map from the drop-down list at the top of the screen.

4 Implementation Guide – Konect Manager

Konect Manager operates on a Windows PC or Windows emulator. It is used by data administrators to manage data, build forms, build maps and set up field workflows.

This chapter explains Konect Manager operation. The following chapter describes the Konect Mobile App.

Customers who are unable to run Konect Manager directly on their Windows PC may arrange to operate it in a browser via Google Workspaces. Contact your account representative for details.

4.1 Operating controls

The main controls are on the tab strip at the top of the main Konect Manager screen.

The active tab is highlighted in orange. Click the "?" control on the active tab for online help.

Use the Catalogue tab to import data, define intelligent data forms, and set up new operational projects with the maps and datasets that will be dispatched to the mobile devices.

Depending on the role assigned to the user (see 3.2.2 User administration), Konect Manager may open in Normal or "Lite" mode.

- Normal mode is intended for trusted data administrators.
- Lite mode is intended for operations personnel who are not permitted to import data or edit configuration settings.

Lite mode does not provide access to any of the functions that are normally accessed through the Catalogue tab.

Use the Data tab to review and export data and to define dynamic data subsets (queries). Saved queries sub-set the records in a dataset based on the content of the data records.

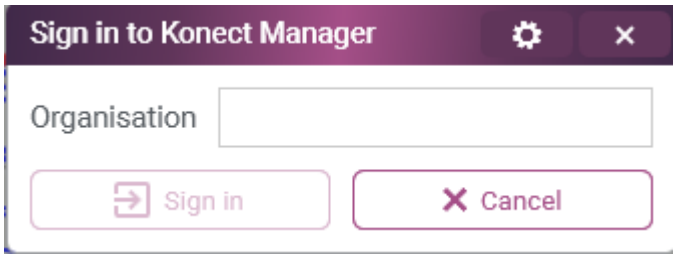
Use the Operations tab to preview project maps and to authorise mobile users to access projects on their mobile devices or through a web browser.

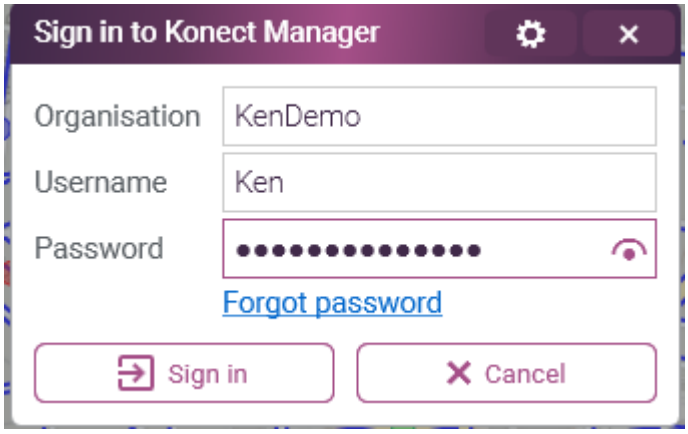
Projects are pre-defined through Catalogue>Projects.

Use the Tracking tab to see the map location of work crew. Enable GPS tracking on the device (see 5.3 Working with Konect App) to activate tracking.

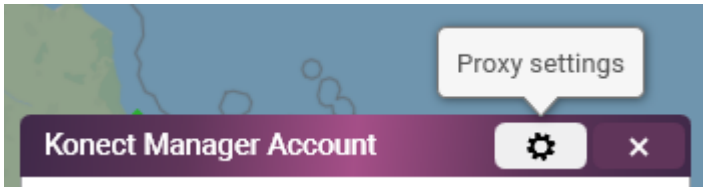
4.2 Log in to Konect Manager

Start Konect Manager on your PC and log in by entering your Organisation code and then your username and password.



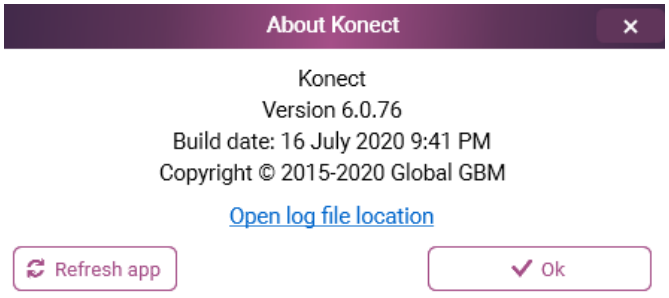


The Forgot password link will send a new temporary password to the email address or mobile phone number associated with your account.



If your local network administrator has locked internet access through a proxy server and local firewall, click the “Settings” button to set access credentials for your internet service. Contact your local network administrator for details. You may also need your network administrator to whitelist the Konect URL.

Use the “?” button to access version information and to manage the installation.



Konect Manager will normally prompt operators to install updates as they are released. Before reporting any operational issue use the “Refresh app” button to check you are working with the latest software version. In some installations you may require administrator rights to your local PC to install updates.

Konect writes a log files that stores operational details. Click “Open log file location” to access the folder where the log files are stored. The Konect support team may require these files to investigate operational issues.

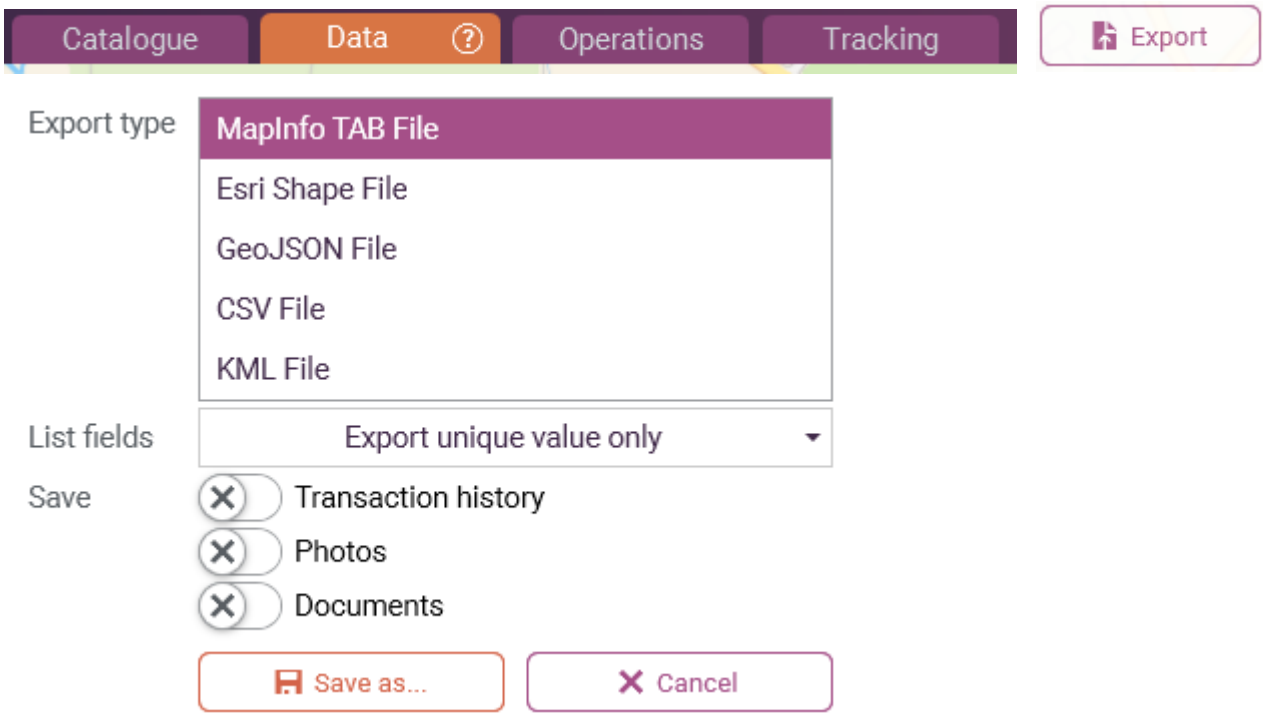
4.3 Catalogue – Import/Export

Konect is an open system. All Konect Database content can be exported into files in a variety of formats. Data can also be imported in a full range of formats.

Data can be manually imported through the Import/Export menu on the catalogue tab. Automated and scripted uploads are available through the optional command line tool KB Import and through the Konect API.

4.3.1 Export Data

Click the Export button on the Data tab to extract content from the Konect database.



Tag “transaction history” to export all historical transactions as well as the current content of each data record. Data exports can be automated through the KB Export and Konect API tools.

4.3.2 Import – Example solutions

Example solutions can be selected from the graphics on the right-hand screen. You are free to import and adapt these.

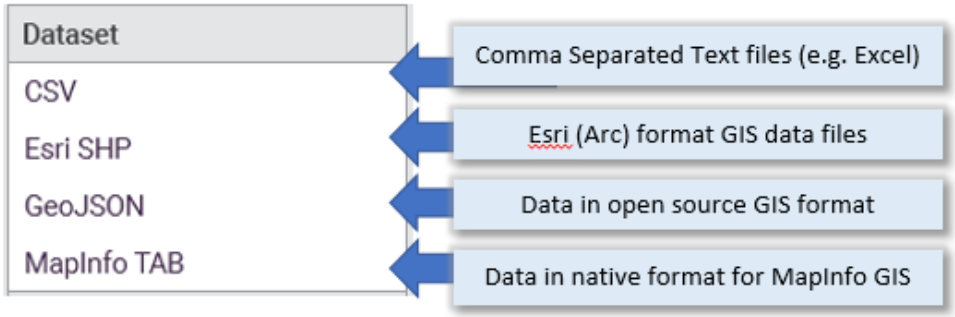
4.3.3 Import/Export – Konect Package KPK

Konect KPK files may contain dataset definitions, project definitions, data or attachments (photos or PDF files). This is a convenient way to package implementation templates for transfer between environments (databases).

Refer to the KPK export section below to understand KPK files.

4.3.4 Import/Dataset

Datasets are introduced in 1.3.2 Datasets and more fully described in section 4.4 below. Konect accepts data files in the following file formats:

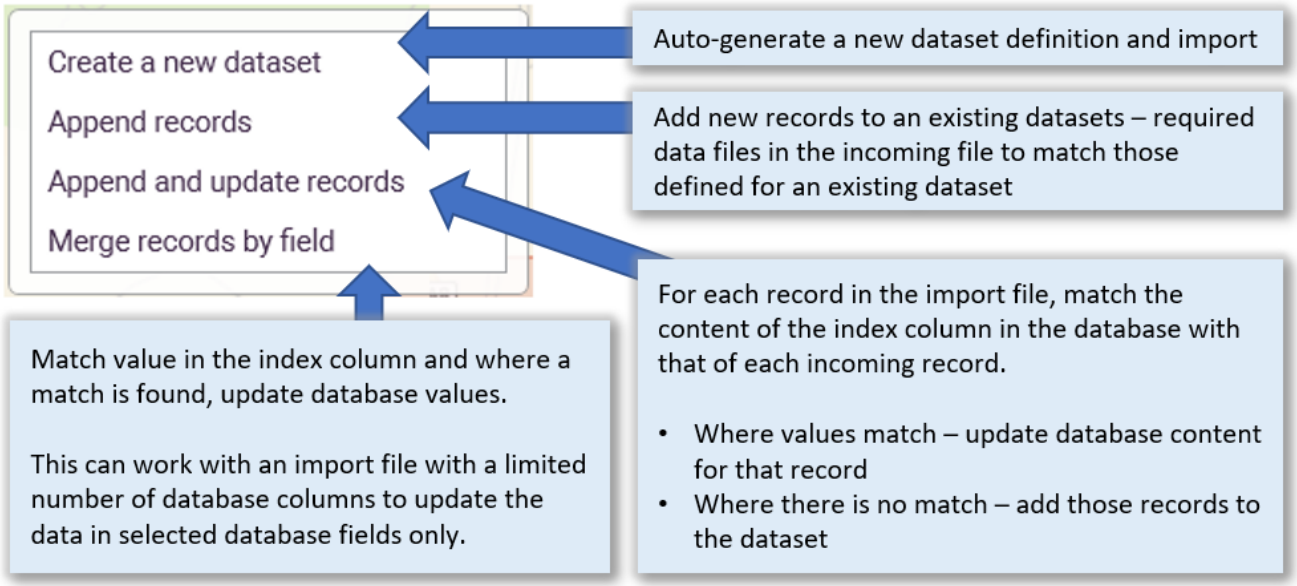


Each data record in Konect is linked to a map feature. This may be a point location, linear feature or a region (polygon). Internally Konect holds all data as latitude and longitude values and displays them in popular projection. The import program will automatically convert GIS data on import.

For GIS formats (Esri, GeoJSON and MapInfo), the map feature will be extracted directly from the spatial data file. Konect will interpret map datum definitions in the incoming GIS file and automatically convert and store in WGS84 and display them in popular projection.

Comma delimited text (CSV) files require Latitude (Y coordinate) and Longitude (X coordinate) values as columns in the data. These point locations are assumed to be in degree and decimal degrees in WGS84 (the native projection of Global Navigation System constellations).

Options for inserting data into the Konect Database are:



- **<u>Create a new dataset</u>**

  Konect will create a new dataset with a set of data columns and data types to match those in the incoming data file. Following data import, go to the Dataset tab to define how those data fields should appear in a data form, how they should be displayed on a map and how the data can be edited.

- **<u>Append records</u>**

  Konect will add new data into an existing dataset. Where column headings in the data file match those in the existing dataset (export name), the records will be added to the dataset, with default values inserted for any missing data fields.

  Each row of data in the import file will be inserted as a new record in the dataset. Any _id colums in the import file will be ignored and new Konect ID created for each record imported.

- **Append and update records**

  Konect will attempt to match the content of a specified data field in the incoming record with the content of a corresponding data field in the target dataset.

  Users may request that incoming records are matched by Konect id (_id) or any other data column (index column) that contains values that are unique across all records in the Konect Dataset.

  To match by Konect ID (_id):

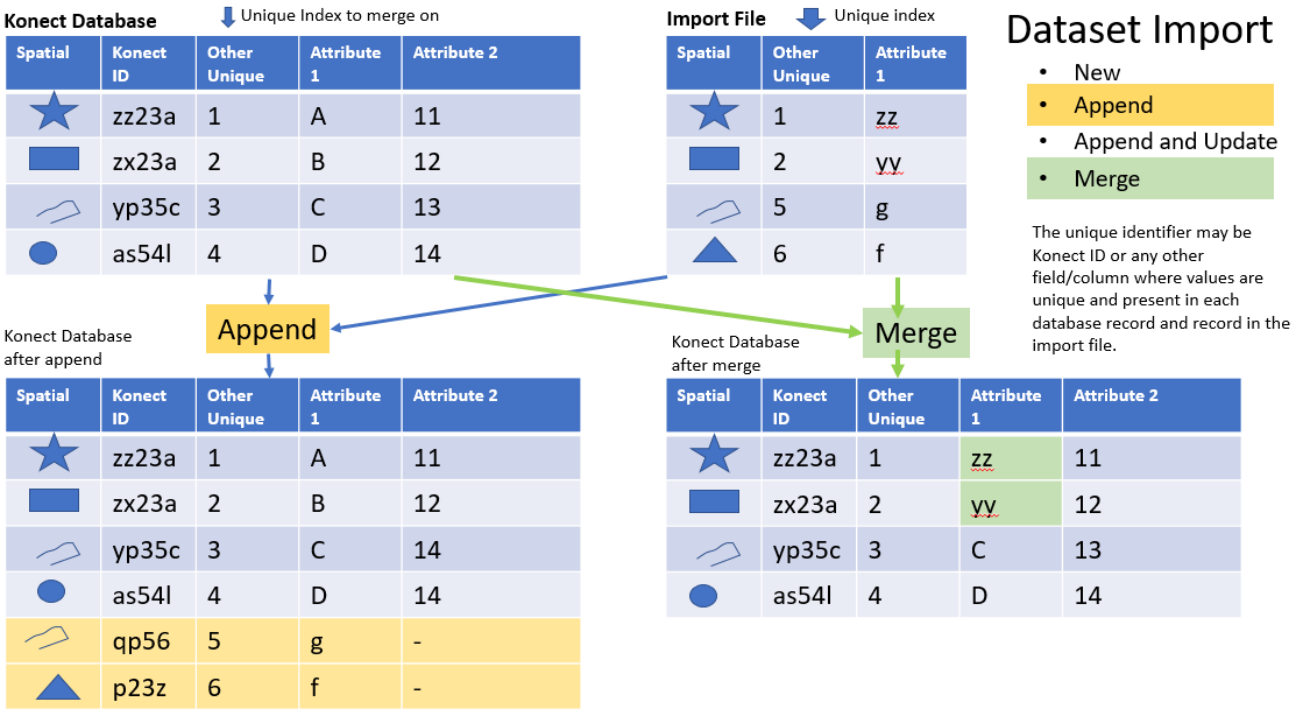
  - If the _id column in the incoming data file matches that of an existing dataset record, the record in Konect will be updated.
  - For incoming records that do not have a value set for _id, the incoming records will be inserted into the dataset and given a new value for _id.
  - If an incoming record has a value set for _id, and that value does not match any existing record in the dataset, the new record will be rejected.

  To match by any other data column:

  - The content of all _id fields in the incoming data file are ignored.
  - If the content of the specified index field in the data file matches that of an existing record in the dataset, then contents of the old Konect record will be updataed.
  - If the content of the index column of an incoming record does not match the content of any record in the Konect dataset, the new record is inserted and given a new value for the Konect ID (_id).
  - Incoming records that do not have a value set for the index data field will be rejected.

- **Merge records by field**

  Use this option to update values in an existing dataset. Where the index value in the incoming data records match the specified colum in the Konect Database, database values will be be updated. Where there is no match, the incoming records will be rejected.



2 records added – no records changed

2 records partially changed – no records added

Merge is very useful for bulk edits for specific data fields. For example, it is possible to export data into a file (see Data tab/Export), edit that data in an external application (e.g. Excel) and then use the edited file to do a selective update of the Konect Database.

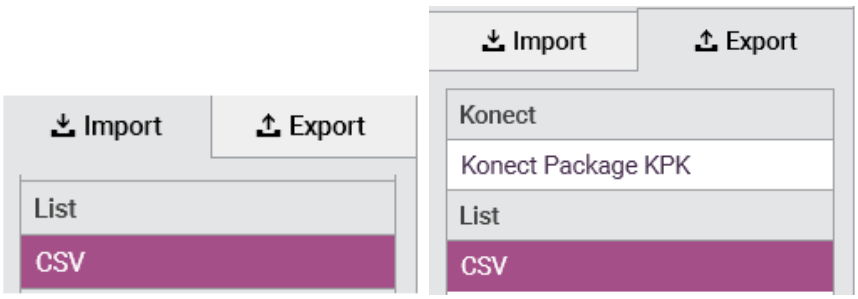
The incoming merge file must contain the index field used to make a unique match with existing records in the database. It does not need to include all data columns. If a data column is missing from the incoming merge file, its value will be unaltered.

For more information on importing data go to the Konect Knowledge Base at accessible from the resourcs page at www.gbmkonect.com.

4.3.5 Import/Export Lists – CSV

Lists are pairings of UNIQUE VALUES (that will be inserted into the data) and DISPLAY VALUES (that are presented for user selection on data forms). Refer to 1.3.4 Lists for information on how lists are used in Konect.

Lists may be exported to and imported from comma delimited text (CSV) files. These files are compatible with data editing environments such as Microsoft Excel.

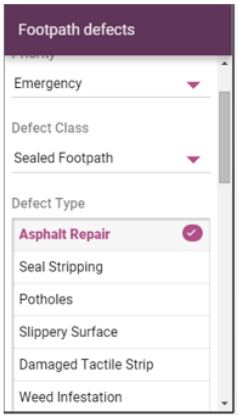


	A	B
1	UniqueValue	DisplayValue
2	Sealed Footpath	Sealed Footpath
3	Gravel Footpath	Gravel Footpath
4	Concrete Footpath	Concrete Footpath
5	Footpath Referal	Footpath Referal
6	Kerb Ramp	Kerb Ramp
7	Nature Strip Defect	Nature Strip Defect
8	Vegetation	Vegetation

Parent List – Footpath

	A	B	C	D
1	**ParentUniqueValue**	**UniqueValue**	**DisplayValue**	
2	Sealed Footpath	Asphalt Repair	Asphalt Repair	
3	Sealed Footpath	Seal Stripping	Seal Stripping	
4	Sealed Footpath	Potholes	Potholes	
5	Sealed Footpath	Slippery Surface	Slippery Surface	
6	Sealed Footpath	Damaged Tactile Strip	Damaged Tactile Strip	
7	Sealed Footpath	Weed Infestation	Weed Infestation	
8	Sealed Footpath	Pit lids	Pit lids	
9	Gravel Footpath	Rutting/Scours	Rutting/Scours	
10	Gravel Footpath	Pit lids	Pit lids	

Child List – Footpath Defect Type – options restricted by parent list



Simple lists are expressed in two columns in a comma separated text file – UniqueValue and DisplayValue. These simple lists may be entered directly into Konect through the dataset editor or created in a tool such as Microsoft Excel, exported to a CSV file and imported using this utility.

Setting up cascading pick lists (where valid values in a pick list are constrained by values selected in an earlier list) requires a parent list (for initial selection) paired with a child list. Create and edit child lists in a spreadsheet program and upload them into Konect with this utility. Child lists are represented in a CSV file with three columns of data:

ParentUniqueValue – the unique value corresponding to a selection in the parent list that must exist in the data for this item to be offered for selection in a child list

UniqueValue – the unique value in the child list

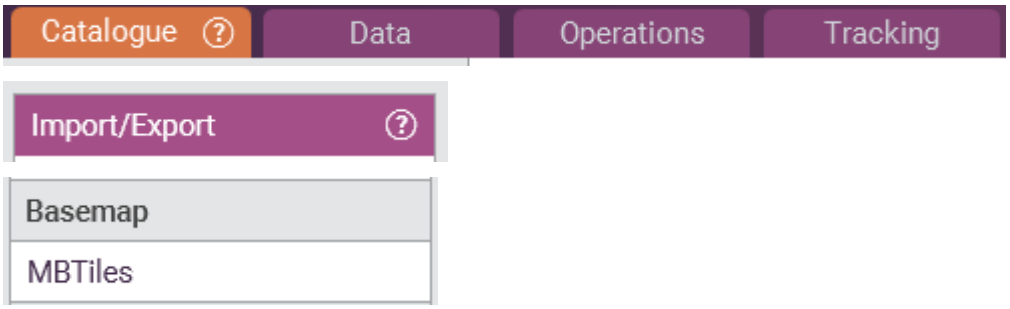
DisplayValue – the corresponding value in child list that will be displayed in the pick list in the data form

Child lists may cascade through multiple levels.

4.3.6 Import/Basemap – MBTiles

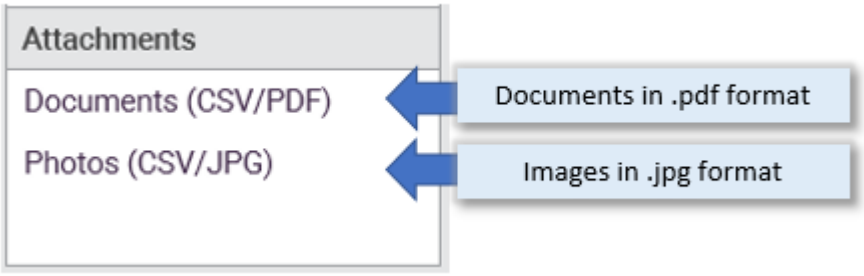
Basemaps are sets of raster image tiles that are used as the base layer that underlies spatial features that are rendered from vector datasets. Refer to section 1.3 for further information. Basemaps may be read dynamically from the web or pre-positioned on a mobile device so they are available off-line.

A set of on-line basemaps are distributed with the Konect software and customers can register any other map services they have rights to access. For off-line access, web tiles can be cached in MapBox tile format (MBTile files) using QGIS or other utilities. These MapBox file files and be imported into Konect through the import/export function of the Catalogue tab.

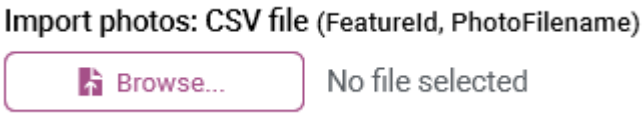


For more information on registering your own web maps and preparing tile sets for operation offline, refer to the Konect Knowledge Base available on the resources link at www.gbmkonect.com.

4.3.7 Import/Attachments



Konect allows multiple PDF documents or multiple images (photographs) to be attached to each data record. Refer to the section 4.4 for information on preparing the datasets to store photos and attachments.

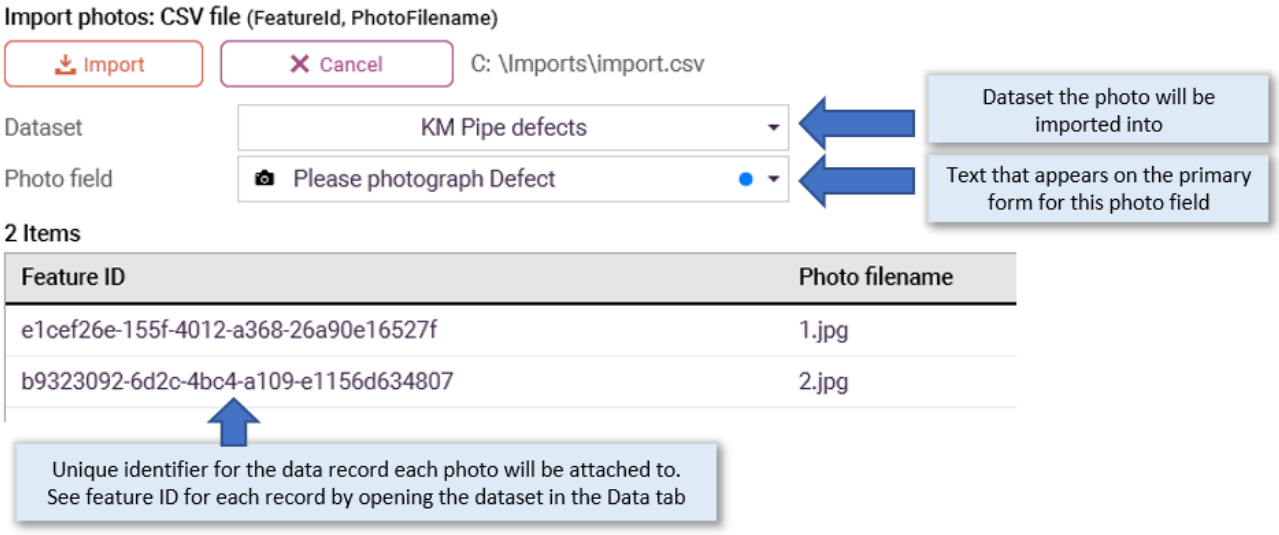


Importing documents or photos into the database requires a comma delimited text file that has, for each document or image, the pairing of the unique Id of the dataset record and the associated file name.

	A	B
1	e1cef26e-155f-4012-a368-26a90e16527f	1.jpg
2	b9323092-6d2c-4bc4-a109-e1156d634807	2.jpg

This file needs to be a simple .csv file (no header record) in the same folder as the files to be imported (e.g. .jpeg – photos, or PDF files – documents).

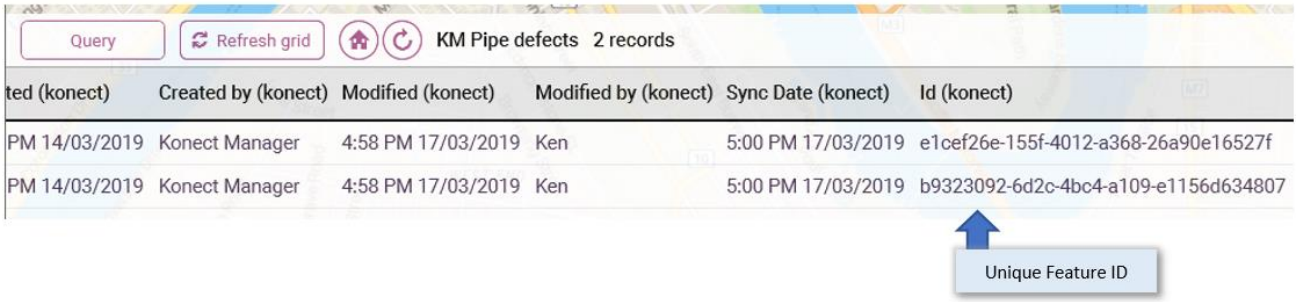
The data will be presented on screen for validation and you will be asked to specify the dataset that the photos/documents need to be attached to and the field in that dataset the photos will be attached to.



To find the unique identifier for a database record, open the dataset in the Data tab and see the value in column ID (Konect). The value is also shown as a _id in exported data files.

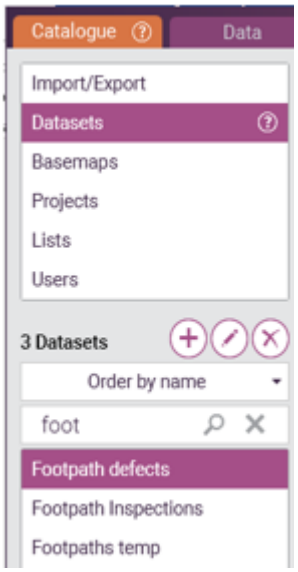
If only a few images need to be imported, it can be easier to simply open the data form in the Operations or Data tab and browse for the images/documents individually for each record.

See



For more information refer to the Konect Knowledge Base that is available on the resources link at www.gbmkonect.com.

4.4 Catalogue – Datasets



Konect is typically used to collect or edit information that relates to an object in the real world. Each real-world item is represented by a map feature and each type of feature can have a different set of data items (data fields) associated with it.

The database stores information in logical groups called “Datasets”. The list of data fields associated with the map features is the same for all records in a dataset but varies between datasets. For example, a dataset representing assets will store different data to one representing asset inspections.

Records in different datasets can be linked. For example, if the dataset of assets is linked to the inspections dataset, it is possible to chain from an asset to the multiple inspections carried out on that asset over time.

Datasets are built into project maps, with each dataset represented as a map layer.

Dataset definitions describe:

- **Primary Form**

  The list of data fields associated with each record in a dataset and the default form for editing the data

- **form variants**

  Alternative data forms optimised for operators in specific user roles

- **Lists**

  Lists of valid values – used to constrain the content of specific data fields

- **Map Styles**

  Definition of how features are drawn on a map

- **Queries**

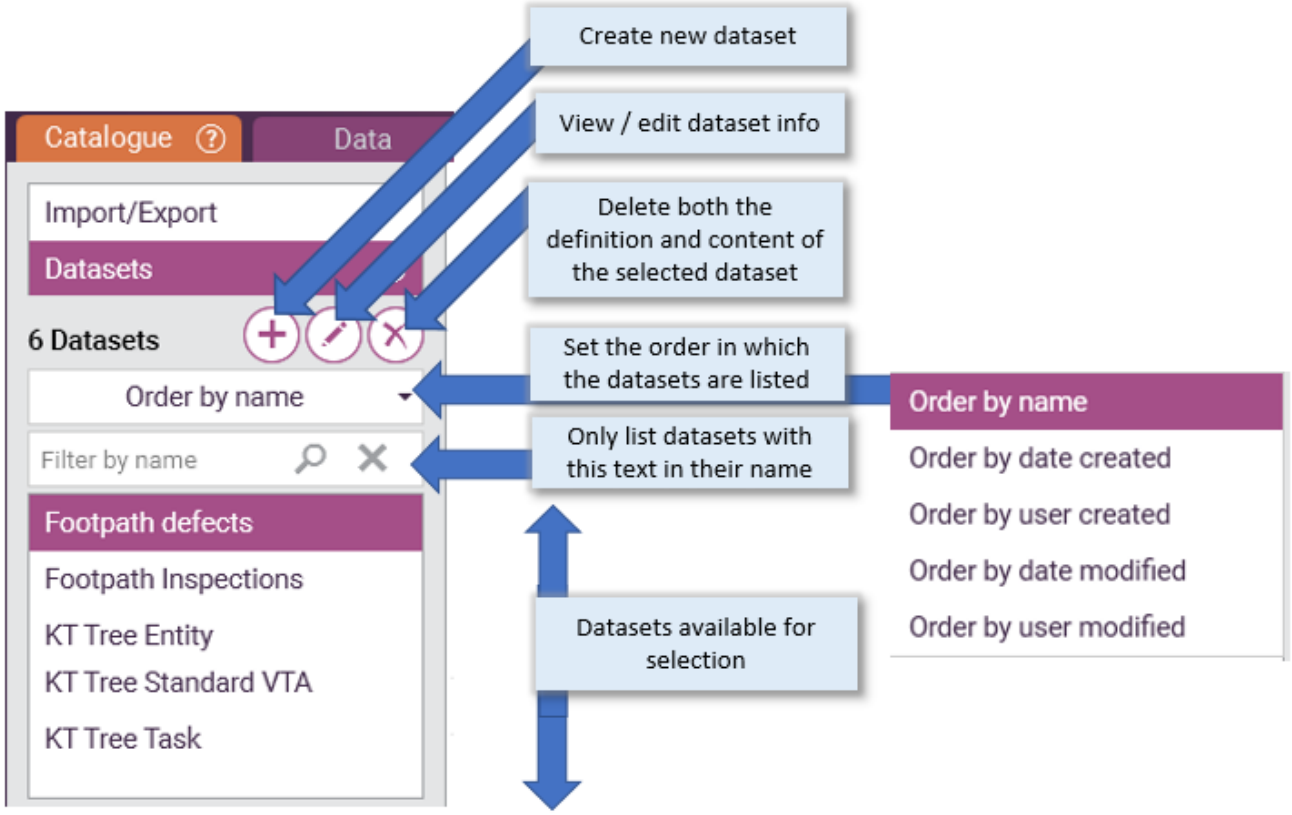
  Re-usable filter definitions for sub-setting the records in a dataset

- **Topology**

  Rules that ensure spatial relationships are maintained between features in different datasets (layers) when maps are edited

4.4.1 Dataset chooser

Click on a dataset in the list to select.



4.4.2 Creating a new dataset

Use the "+" button to create a new dataset.

4.4.3 Editing dataset name and description

Click the "Pencil" button to view dataset name and description.

4.4.4 Deleting a dataset

Click the “X” button to permanently delete the selected dataset definition and all its content.

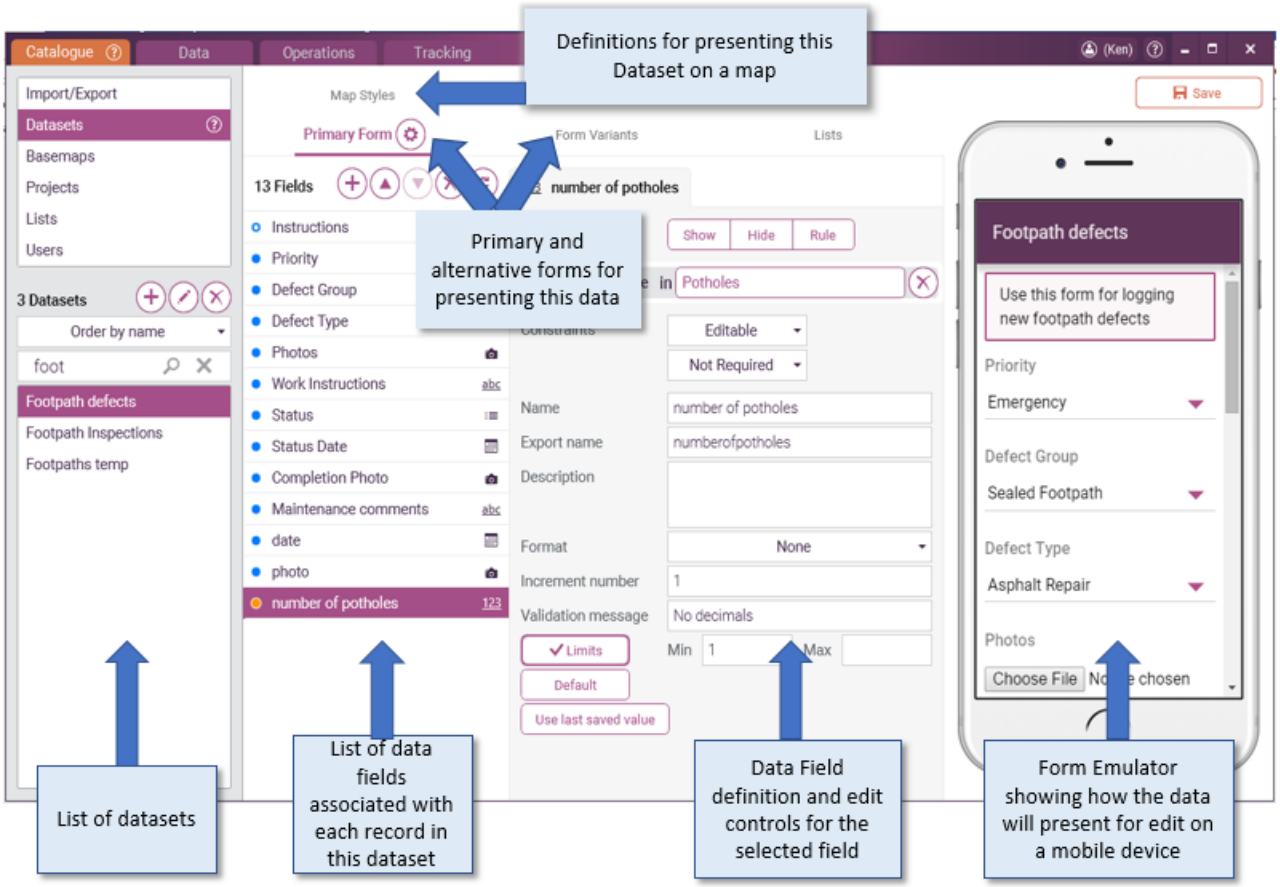
4.4.5 Building Data Forms

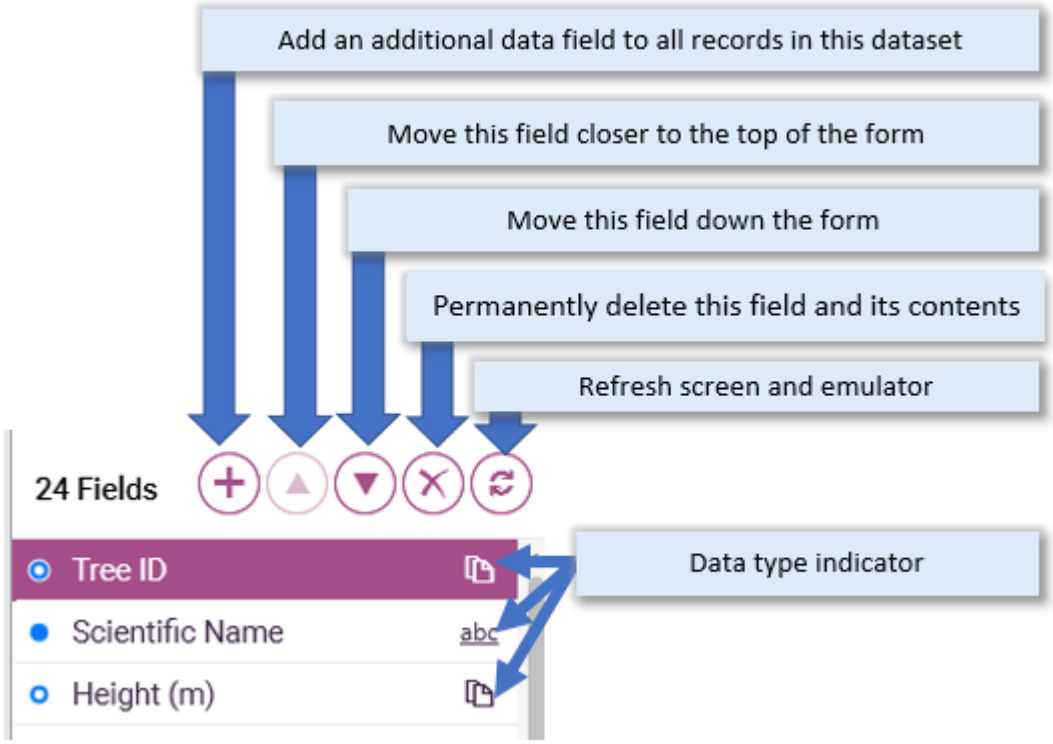
Catalogue > Datasets > Primary Form

Konect forms control the way end-users see and edit data and map features. Each dataset has a Primary Form and may also have alternative forms (form variants) that present different views of the same data.

The Primary Form is built automatically whenever a new dataset is imported or created through Konect Manager. Choose the primary form to add or remove data fields.

Form variants present an alternative view of the data fields defined through the primary form. Multiple form variants can be defined to optimise edit rights, prompts and default values for different user groups or operations.





Primary Form Select the Primary Form and use the "+" button to add additional data fields to a dataset. Each data field has:

- **Name:** This is the text that presents on data forms.
- **Export name:** This is the external name used when the data is shared through external systems such as through spreadsheets, GIS files or integration tools.
- **Description**: Free text that describes this element of data. The description field can be used to give end-users instructions on how to work with the data.
- **Visibility and edit controls:** These settings control which data fields are displayed to end-users and how those data can be edited.
- **Data type:** The type of data that is stored, such as text, date, time and numbers.

Konect supports the following data types:

abc Text abc Multi-line text	Simple text – any numbers of lines Can be tagged to read from a barcode scanner Can be tagged to be searchable through the search bar at the bottom of the Konect App If a text file contains a string starting with http:// or https:// and is read only, clicking the field will open the external URL.
Text (Calculated)	Text string auto-calculated from values in other data fields
1.23 Number	Numbers with decimals
Number (Calculated)	Numeric value auto-calculated from numbers in other data fields
123 Whole number	Numbers without decimals

Date and time Date Time	Date and time fields – calendar and time pickers available
Date & time (Calculated)	Date or time value auto-calculated from values in other data fields
y/n Yes/No	Logical – true or false
Yes/No (Calculated)	Logical (yes/no) value auto-calculated from values in other data fields
List	Select value from pick list – can be converted to a text field
Photo	Any number of images can be stored – with camera activation and select from the gallery on mobile device
Document	An individual PDF File may be specified through a form in Konect Manager and viewed on the device
Label	Text to be presented on the form – normally used to open headings or instructional text in a Konect smart form. If the label's "Description" starts with //http: or //https: it will be treated as a web link. Clicking the link in a Konect form will open it in a web browser. Any text enclosed in curly brackets will be replaced by the value in the form for the dataset field of that name. {cy} will be replaced by the Y coordinate (latitude) of the current map object and {cx} will be replaced with the X coordinate(latitude). Examples: • If the dataset contains a data field with export name "genus" and that field contains the text "Eucalyptus" then the string "https://en.wikipedia.org/wiki/{genus} will be interpreted as: https://en.wikipedia.org/wiki/Eucalyptus. Clicking it will open information about Eucalyptus in Wikipedia. • https://www.google.com/maps/dir/?api=1&destination={cy},{cx} will link out to google maps to navigate to the active map feature.
Generate a unique id	Auto filled with a globally unique text string
User friendly tag	Auto filled with a unique text string that is easier to read than that produced by the more rigorous unique ID generator used above
Geographical attribute	Geographic location or dimensions calculated from the associated map feature
Copy value from dataset	Duplicate a value associated with another spatial feature at the same location as this feature (e.g. autofill with road name when a pothole is drawn on a road).

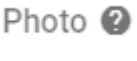
The data type cannot be changed once a data field has been created. If necessary, delete the data field and create a new field with the same name but a different data type. The data content of a deleted data field will be lost. If necessary, export the data (Data tab/export) and reimport once the structure has been corrected (Catalogue/Import/Dataset).

As well as the Primary Form, alternative forms (form variants) can be created over the same data. Form variants allow the user experience to be optimised for each operator group.

For example, inspectors who log defects may be provided with one data form and maintenance crews who repair the defects provided with a different form variant. The two forms may hide and show different parts of the data record with edit rights that respect the different business needs of the two groups of users.

While the operator groups may see and edit data differently, both work with a common set of data records.

Each data field has a name that will appear on the form, an Export name that will appear as the column heading for any data exports such as spreadsheet files and a field description.

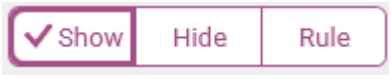
The Description will present when a user taps the "?" hotspot on the form. 

Name (the text displayed in the form) and the order the data fields present in the form can all be set independently for each form variant. Data field addition/removal, list selection and Export name can only be set on the primary form but are inherited into each of the variants.

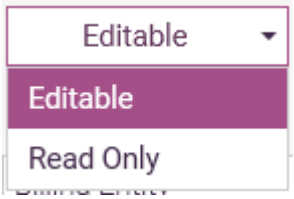
Choose an existing dataset to display the Primary Form.

- The form emulator updates the form layout dynamically as details are added.
    -

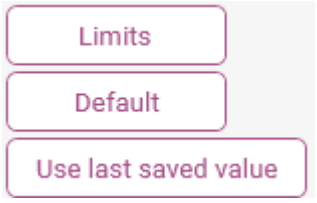
Click the "Save" button to retain changes.
    - If necessary, click the "Refresh" button to update the emulator display.
- Click the "+" button at the top of the form to add a new data field and select the type of data to be held in this field. Adding a new item into the form automatically adjusts the database structure to accommodate the new item.
    - "Geographical attributes" are calculated dynamically and are normally attributes of the map feature associated with each database record, for example, the feature length area or map coordinates.
    - "Copy values from dataset" will auto-populate a data field by reading data from features on another map layer at the same location as the data record being created.
- Select a data field and click the up and down buttons to change the presentation order of data fields in the form.
- Click the "X" button to remove/delete a data field. Existing content in this data field will be permantly lost.
-

In the data field section, the Name is the text that will appear on the form. The Export name is the name of the data field for data export, import and merge from external data operations (Catalogue>import and Data>export).
- 

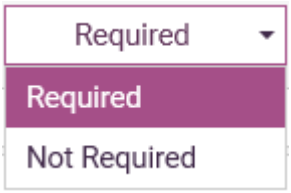
Individual data fields may be presented on the form or hidden. Forms can be dynamic with data fields presenting on the form or hidden depending on the data content of any data field (visibility rules).

- 

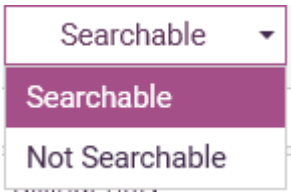
A form may control whether an individual data field is editable or read only. The setting may be different on the primary form and each form vaiant.



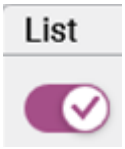
Validation rules for editable data fields are defined at the bottom of the panel and vary depending on the data type. It is also possible to set specific default values or automatically copy in the last value entered for a record in this dataset.

- 

For editable fields, select Required to prevent operators from saving a data record until a value has been entered for this data field.

- 

Choose “Searchable” to instruct the Konect App to scan values in this data field when using the search control on the Mobile App (see 4.3 Catalogue – Import/Export).

- 

Data entry can be constrained to the selection of a value from a list of valid entries. Lists can be arranged in hierarchical relationships whereby the choice of options presented for selection depends on the data content in another field that is controlled by a related list.

  List values can be edited directly in the form for simple lists. Hierarchical relationships (dependent list relationships) are defined externally and loaded through Catalogue>Import>Export>Lists.

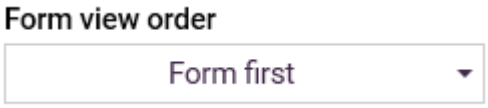
4.4.6 Form settings

There are several important controls under the “Settings” button.

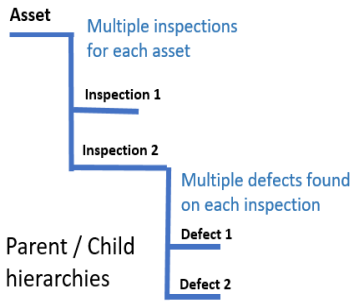
-

Choose this button to create a new dataset with an identical list of data fields and form layout – Primary Form only.

-

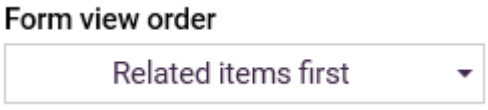
The setting controls whether operators are permitted to create new map features or delete features – Primary Form and form variants.
- 

Forms can be linked together in parent/child relationships, for example with multiple inspections linked to an asset. This setting controls whether the user interface first opens displaying values for the parent (in this case the asset) or the linked child records (in this case a list of inspections).
-

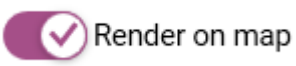


This setting is used to create hierarchical data relationships where multiple records of this dataset can be linked to a single record in a parent dataset. Normally mobile operators will create the parent feature and have the option of adding multiple data records to this dataset that share the same map outline as the parent feature.

The alternative setting allows the daughter records to have a map representation different from the parent record but with an implicit relationship in the data that allows daughter records to be linked to their parent for reporting. For example, the Draw geometry option can be used to mark point defects on a road (linear feature) and subsequently relate the child records (defects) to the parent records (road)

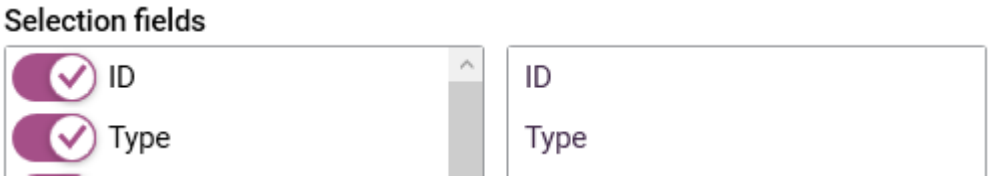


Data Forms open when a user clicks on a feature on the map. Where there is a linked parent dataset, use this setting to control whether the form opens with the focus on the parent or child dataset. In either case the user will be able to navigate between the parent and records in the child datasets.

- 

Use this setting to control whether the feature is drawn or hidden on the map.

The setting is especially useful for simplifying the map display where multiple child records are linked to a parent record with the “copy geometry” setting. In that case, the map outline of the child records is exactly the same as the outline of the parent record so there is little value in drawing the each of the child records. Unnecessary drawing of child records can slow map operations.

- 

Selection fields are those that present in list view, either when an operator clicks a location on the map or when a set of records are returned from a data search on the mobile device.

4.4.7 Dataset – Map styles

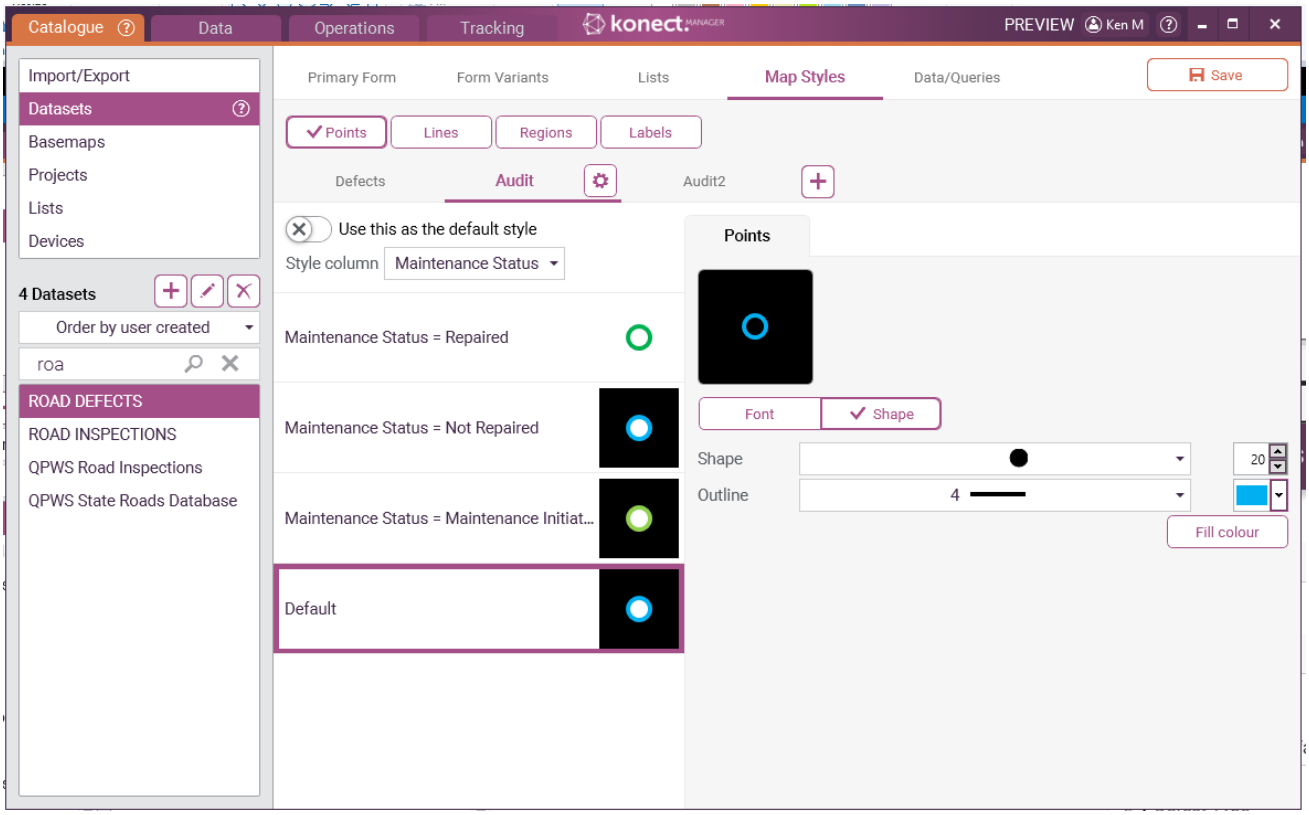
Catalogue > Datasets > Map styles

Style sheets manage how features present on the map. Multiple style sheets can be created for each dataset and one of them chosen when the layer is added in a project map.

Tick the tags at the top of the style sheet definition form to allow drawing of points, lines or regions.

To set map labelling style, check the “Labels” button and then choose a field and a style for writing the content of that field on the map.

This setting controls the labelling style only. Labels also need to be chosen/turned on in the project map (see 4.6 Catalogue – Projects).

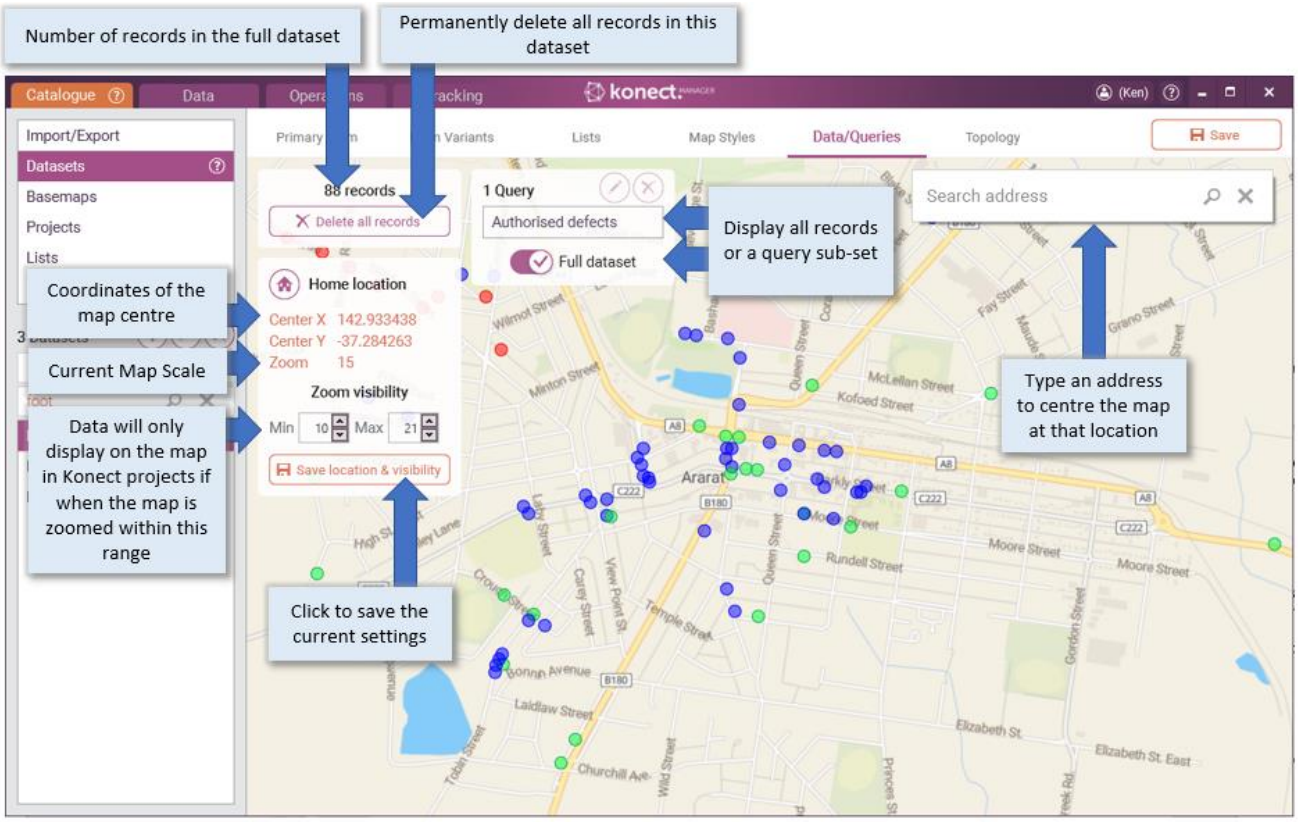


4.4.8 Queries/Data subsets and map display

Catalogue > Datasets > Data/Queries

This sub-tab set is used for:

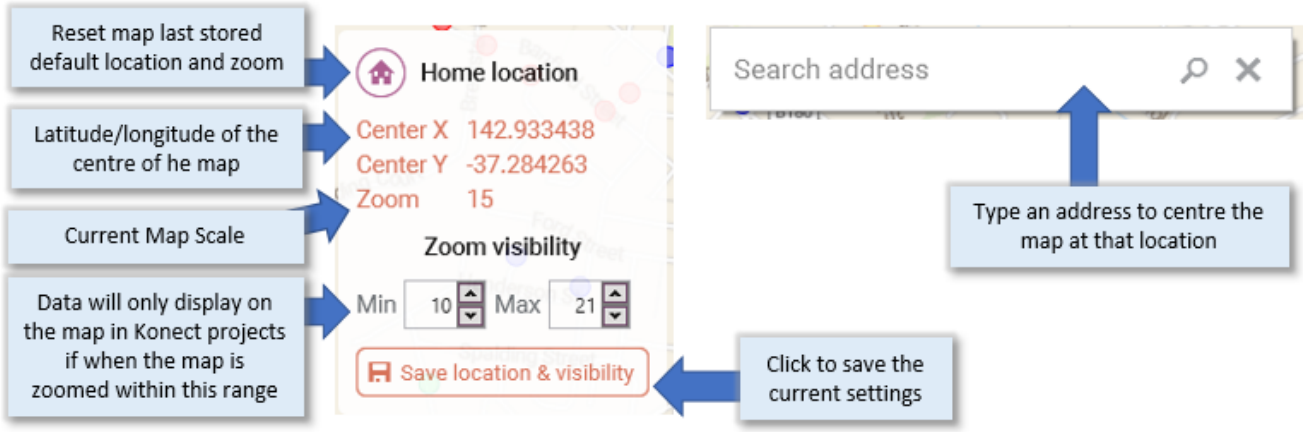
- setting the default scale and geographical location for presenting this dataset on a map
- setting the map scales at which each dataset is visible on a project map
- permanently deleting all data in the selected dataset.



4.4.8.1 Home location and zoom

The home location defines the latitude and longitude of the centre of the map and map scale. This controls the part of the world that will be visible when a new map is opened through the Data tab.

The coordinates of the centre of the map are the current zoom are displayed on Home location dialogue. They are updated as the map is zoomed and panned.



Click on the map and use the mouse wheel to zoom in and out. Click on the map and drag the mouse to display a different geographical area. Alternatively type a location in the search box to centre the map at that location.

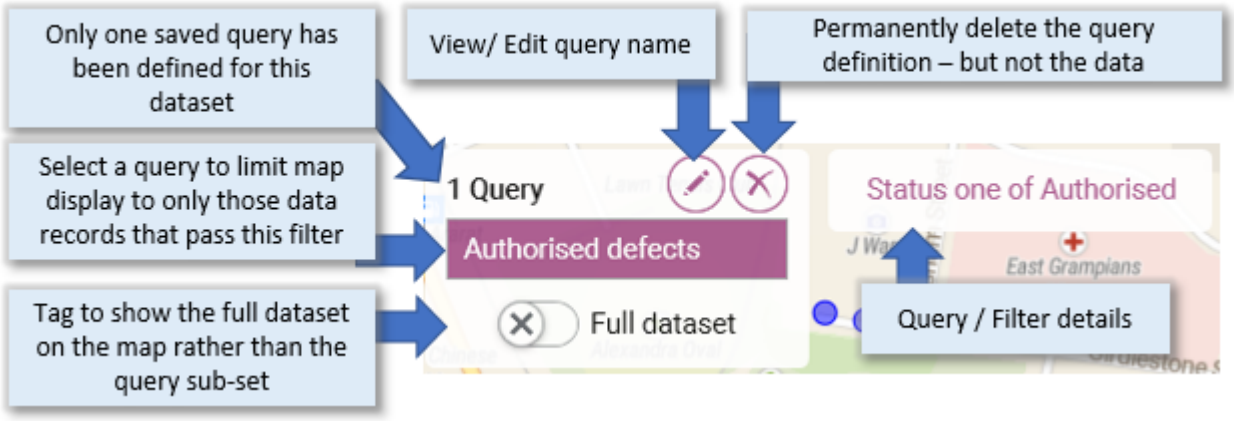
Zoom visibility is useful for hiding a dataset when the operator has it zoomed out or zoomed in too far. For example, the administrator may choose to declutter a map by hiding minor roads when the map is zoomed out to the national scale.

Zoom settings are levels that have a maximum (zoomed in) of 21. The area displayed in a map is larger at smaller numbers.

Watch the current zoom setting as the map is zoomed in and out. If the map looks cluttered, set a minimum zoom setting as the number where the data should disappear. Similarly set the maximum number at the point where the map is zoomed in so far that the data for this dataset has no value.

Click “Save location and visibility” to save the settings.

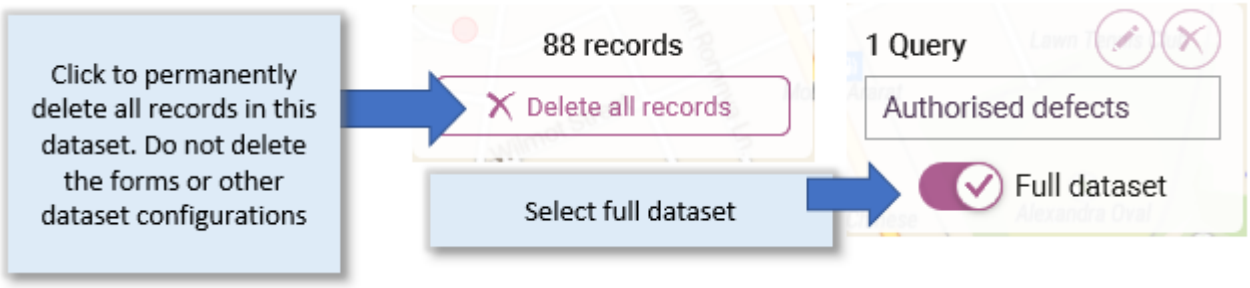
4.4.8.2 Data queries



A query tab will be presented for each query that has been saved to the database. Choose one of the existing saved queries to change the map to hide any data records for which data content fails to pass the query filter.

Queries are created and saved through the Data tab.

4.4.8.3 Data delete



Click the “Delete all records” button to permanently delete all data content for this dataset. Deleted content cannot be retrieved. Only the data records will be deleted. Dataset configurations such as form definitions and queries are not affected.

4.4.9 Topology and graphical editing

4.4.9.1 Snap rules

Snapping will auto-move the vertex of a feature being drawn or edited to the exact location of a node in another dataset. Snapping works when:

- a new vertex is drawn, or an existing vertex is moved

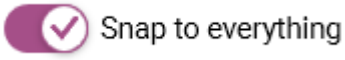
AND

- the vertex is placed graphically very close to (within 4 pixels on the map) of a vertex in an existing map feature in a dataset that is listed in the snapping rules

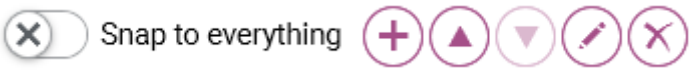
AND

- snapping is active in the mobile device, web or Konect manager interface being used.

Use dataset/topology to set the snapping rules for a dataset.



Choose “Snap to everything” to make all nodes in all datasets in the current map potential snapping targets. Where there are multiple snapping targets in range, the closest node wins.



Alternatively, specify target datasets in priority order.

In the example below, when drawing or editing a map feature in this dataset, the location will be snapped to vertices in only the two datasets listed. If potential snap locations are found in both datasets, then the location of the first item in the list will be selected.

Type	Summary	Layer	Point	Line	Region
Point	When drawing a 'Footpath defects' point, snap to nearby '00 Footpath Scheduler' lines.	00 Footpath Scheduler		✓	
Point	When drawing a 'Footpath defects' point, snap to nearby '00 Footpath Segments' lines.	00 Footpath Segments		✓	

4.4.9.2 Move rules

The move rules for a dataset specify how map features in other map layers (datasets) are moved in response to relocating a feature in the current dataset. These rules describe the topological relationship between real world features and ensure the relationships are maintained through editing.

For example, a rule can be set that connects a tap to a pipe, such that if the tap is moved, the end of the pipe the tap is connected to is also moved (i.e. the tap remains connected to the end of the pipe). Topological relationships are commonly used to ensure ongoing integrity of linear networks such a power distribution system, drainage networks and telecommunications networks.

Move rules only operate when snapping is turned on.

4.5 Catalogue – Basemap

Maps are fundamental to Konect.

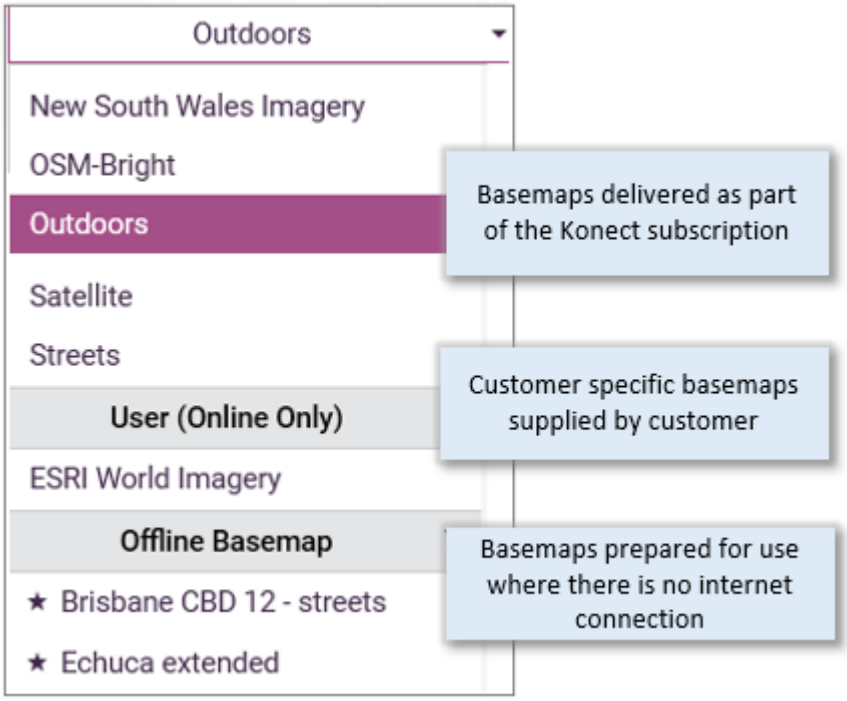
Maps are made up of a basemap overlaid by one or more layers of map features, with data associated with each of those features.

A basemap is a mosaic of images (map tiles) that provide a graphical representation of the world. They may be simple street maps, aerial imagery or satellite views.

Most customers simply choose one of the basemaps from the options packaged from their Konect subscription.

Organisations with access to web map servers may load those image tiles directly into Konect.

Basemaps are commonly downloaded on demand as web tiles but may be cached onto the device for offline operation. Refer to the Konect Knowledge Base available on the resources page at www.gbmkonect.com for information on building offline caches of image tiles in MBTile format.

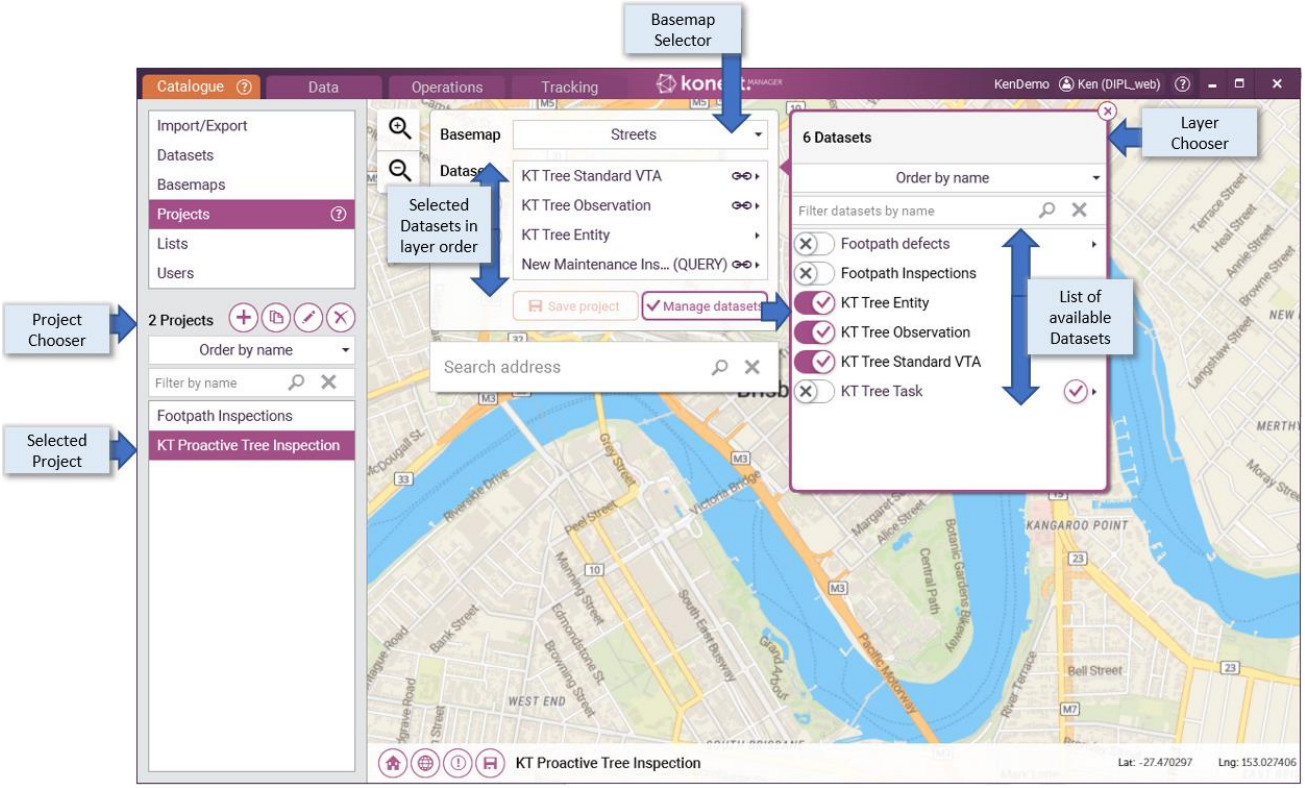


For information on registering your own web maps and preparing tile sets for operation offline, go to the Konect Knowledge Base that is available on the resources page at www.gbmkonect.com.

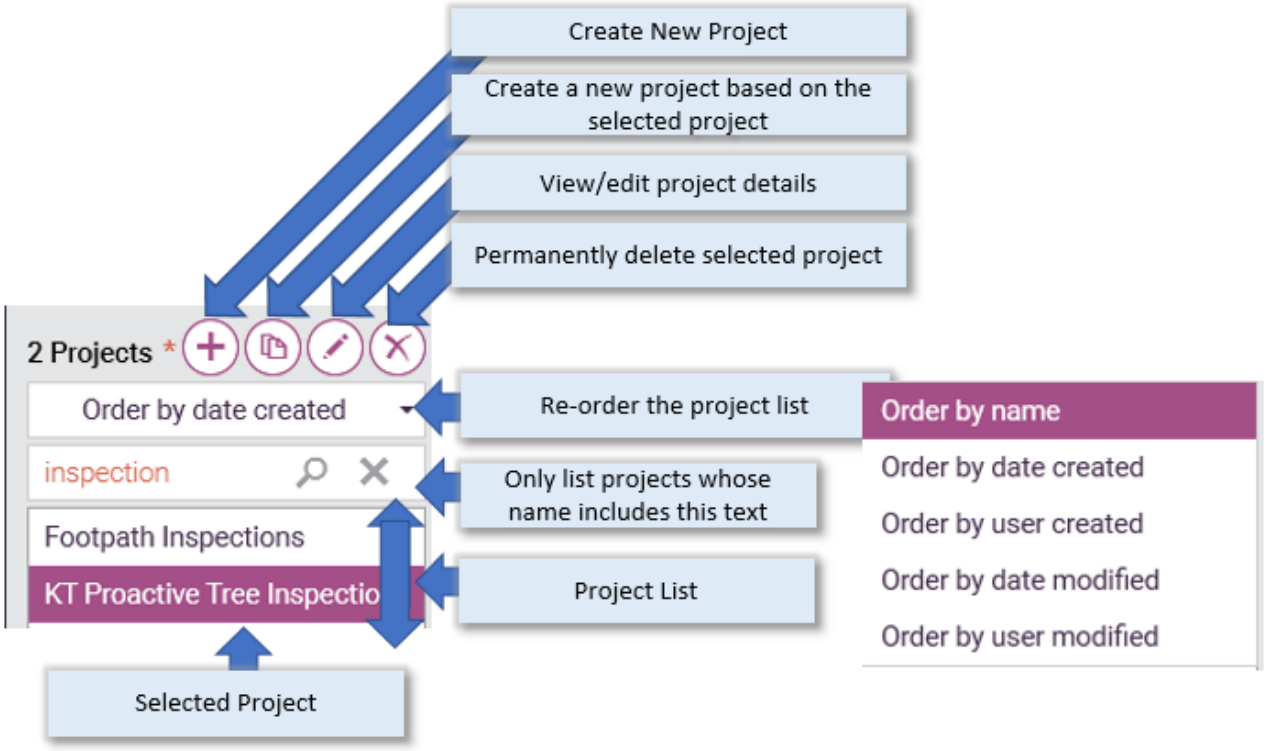
4.6 Catalogue – Projects

Catalogue > Projects

Projects define the working environment for groups of mobile app operators or web users. This section explains how to build a project from a basemap and an ordered list of datasets.

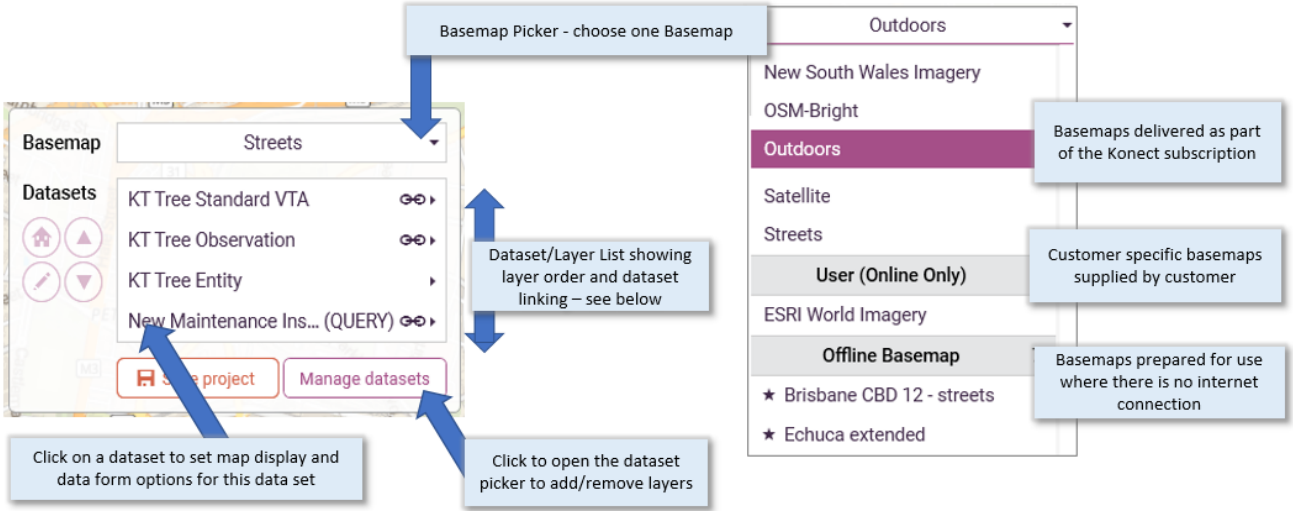


4.6.1 Project chooser



Select a project by clicking on its name in the project chooser or create a new project by clicking the icon on the project chooser.

4.6.2 Map layer manager

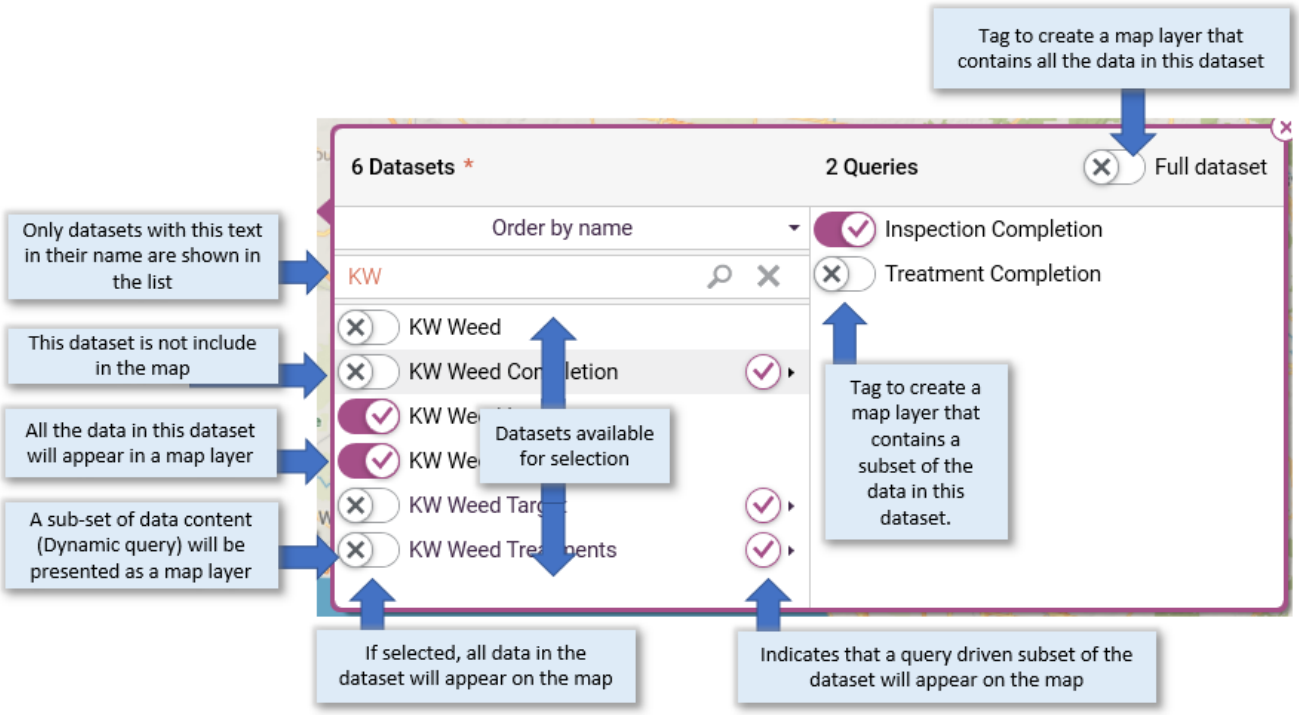


The layer manager presents the list of datasets that will be combined to build the project map. Each layer is a Konect dataset. Each dataset is drawn on top of those lower down the list. All datasets (vector layers) sit above the basemap (raster layer).

See 4.5 Catalogue – Basemap for a list of basemaps that are registered with the current database. Choose an offline basemap for operators who work in areas without internet access. See 4.5 Catalogue – Basemap for more information on basemaps.

Click the “Manage datasets” button to add and remove datasets/map layers.

4.6.3 Dataset selection



Queries are a named filters that subset the data within a dataset. They are dynamic so that the data records that pass the query conditions will change as data content changes. Queries are created through the Data tab and are listed at Catalogue/dataset – Data/Queries tab for each dataset.

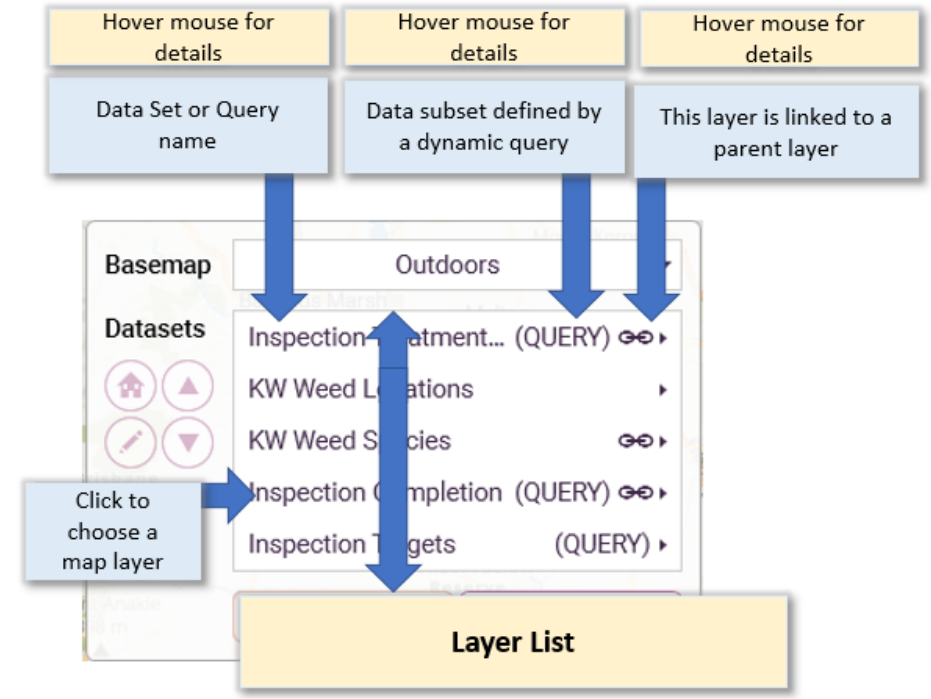
Select “full dataset” to have all data records for this dataset included in the map layer. Select one or more queries to create layers that include only those data that pass the filter conditions in the selected query. It is possible to include the full dataset and the data from one or more queries as separate layers on the same project map, possibly paired with different data forms and Map Styles.

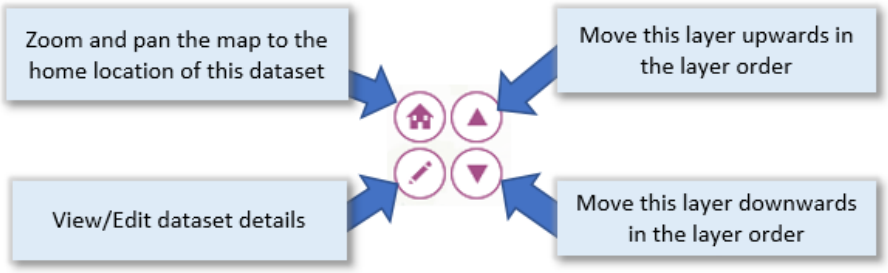
4.6.4 Map layers details

Each item chosen through the dataset selection screen (above) will be drawn as layer in the final map.

Layers may contain all the data in a chosen dataset or may include only the portion of the data records that pass the data-filtering conditions defined in a saved query. See 1.3.5 Queries for more information on queries.

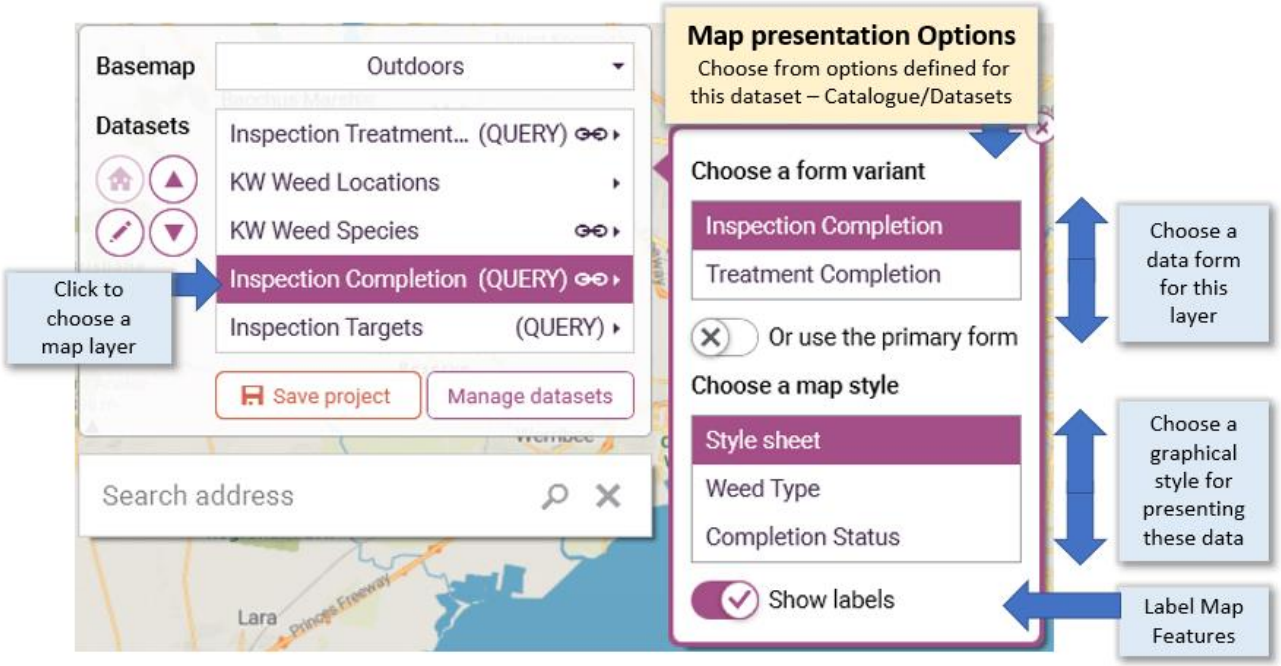
The data items in some layers may contain child records that are linked to a parent record in another layer. These are highlighted in the layers list with the link icon. Linking requires that both the parent and child datasets are included in the project as map layers.





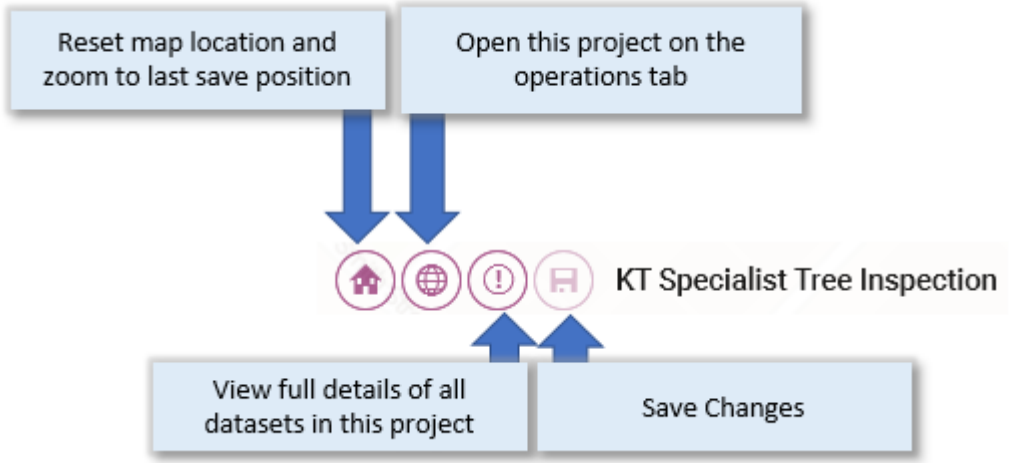
Click on a layer to select it and use the up and down buttons to set the layer order. Upper layers may obscure layers lower in the list.

Choose each layer in turn and select the map presentation options for that dataset. The map presentation options screen will only present if there are multiple options to choose from. Choices are limited to those that have been defined through Catalogue/Datasets/Forms and Catalogue/Datasets/Map Styles.



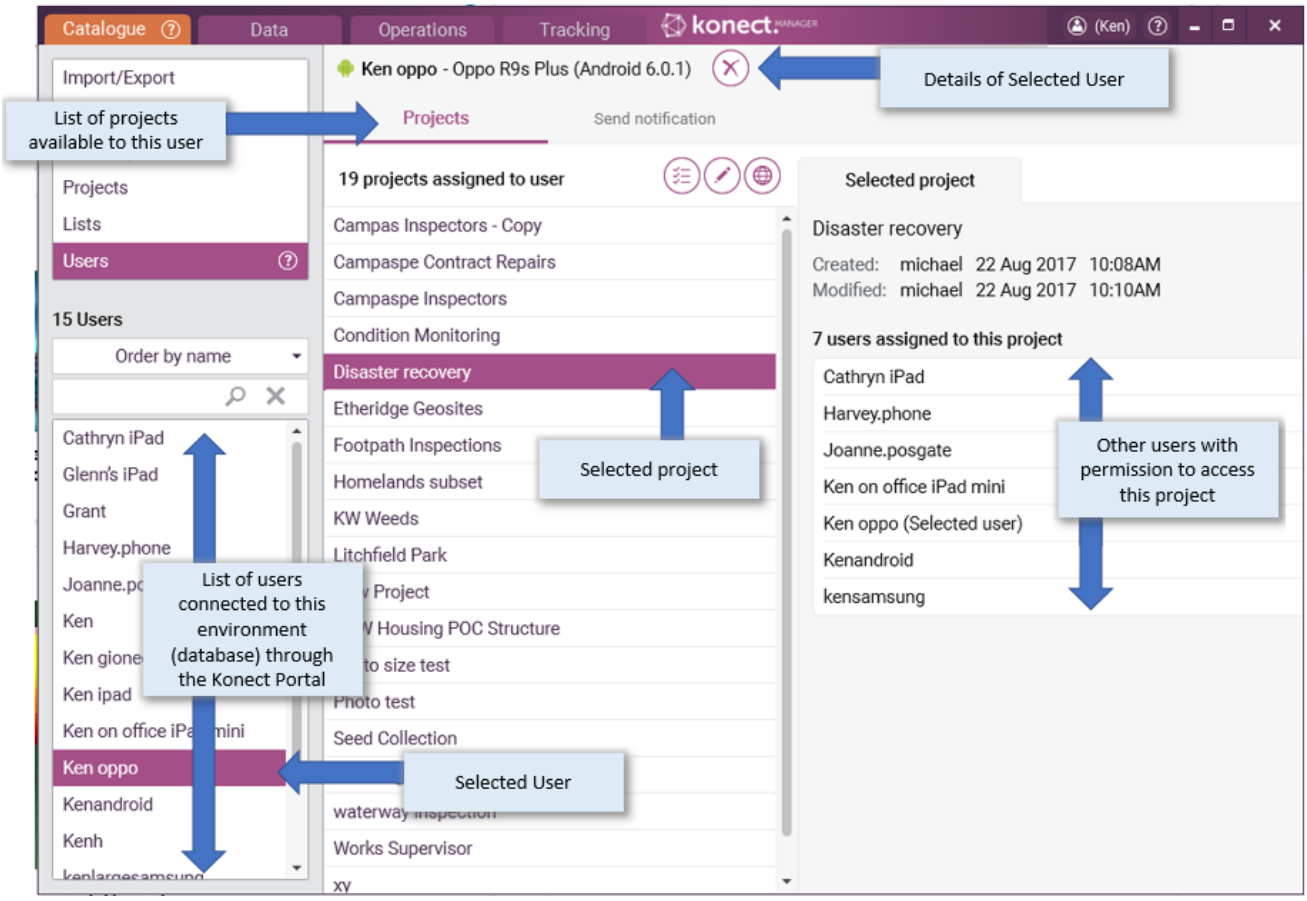
Save project Click to save the project definition. Saving a project will also reset the home location for the map.

The map may reposition to the home position of the new dataset. If necessary, click the "Home" button at the bottom of the map screen to reset zoom and centroid of the map before saving the project.



4.7 Catalogue – Users

This tab lists all users that have been authorised to access the current environment (by an administrator using the Konect Portal).



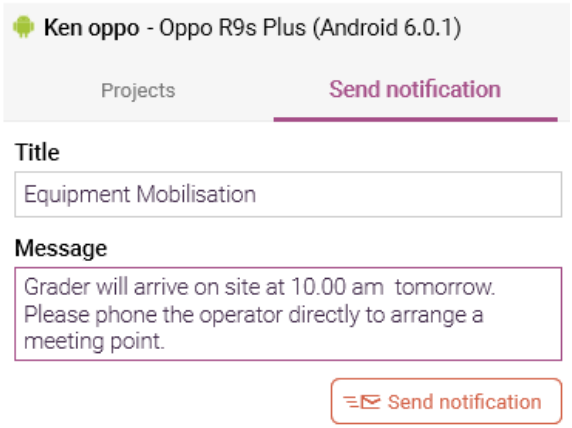
Use this screen to monitor the assignment of projects to users. Projects can be assigned to users through this screen or through the Operations tab.

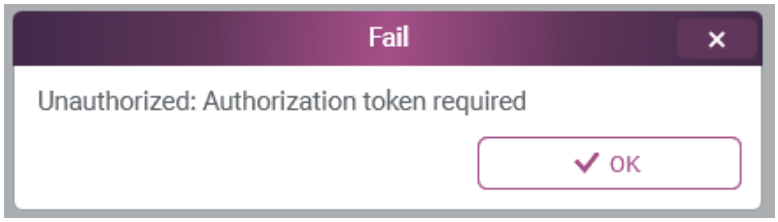
Mobile app and web users will appear in the list if they have been registered to this organisation by an administrator using the portal. Users will not be able to view any data until they have been granted access to a project. Data interactions are always limited by the datasets, forms and maps defined in the project.

4.7.1 Push messaging

Catalogue/Users/Send notifications

This screen allows messages to be pushed directly to individual mobile operators. Messages will be queued on the server when mobile devices are offline.





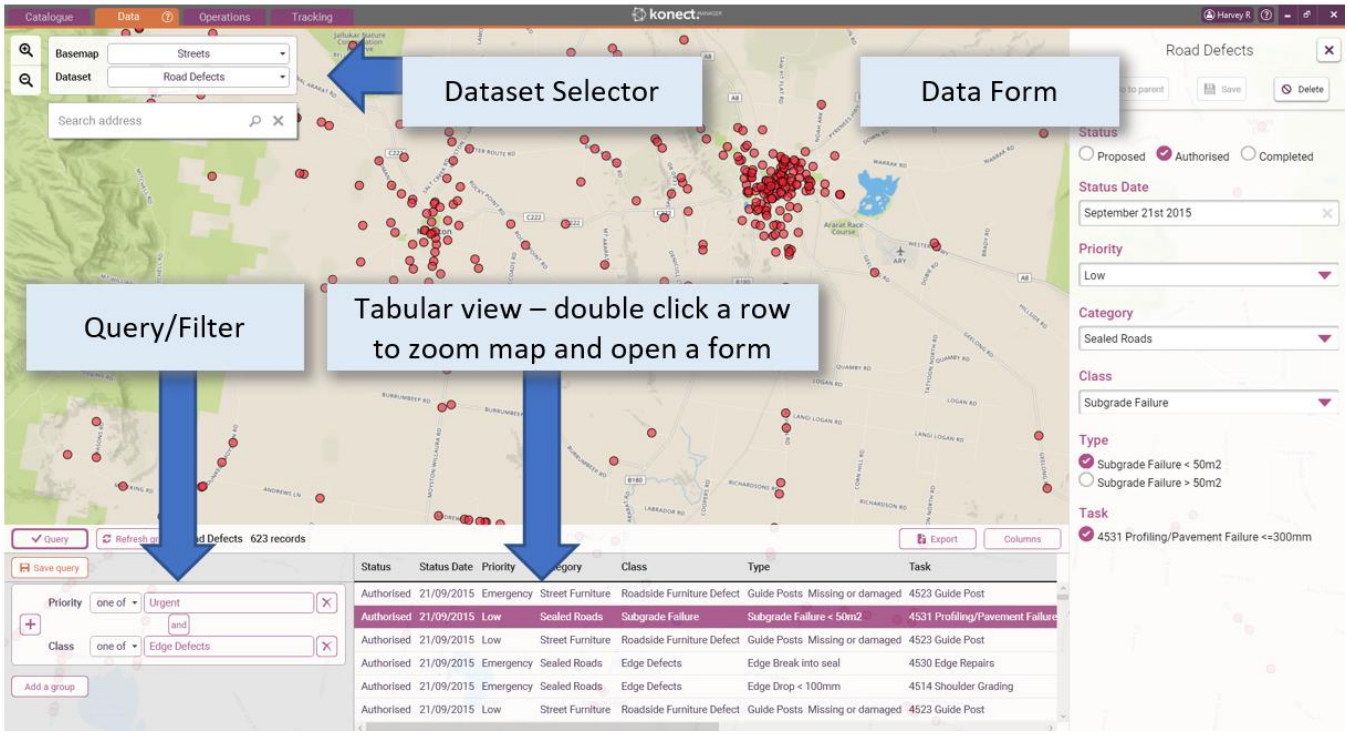
Push messaging is not supported for customers who have not upgraded to the security model that requires mobile device login by username and password.

Error messages may be presented if the user has not yet logged in their device with username and Organisation code.

4.8 Data tab

The Data tab is where you will review your data. You may:

- present data on the map and watch it change dynamically as it is edited in the field
- display the data in tabular form
- edit data through data forms
- build and save queries that define dynamic subsets of the data
- export data to use in other systems.



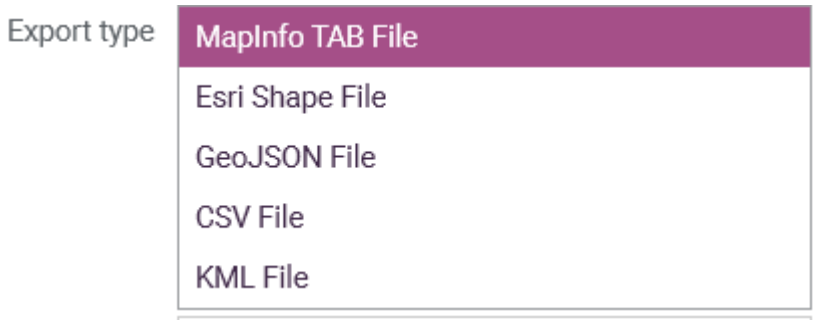
Click a feature on the map to open the data form.

Double click a row in the data grid to zoom the map on that location and present a data form.

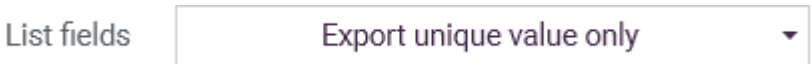
Click the “Query” button to create a dynamic data query. Click the “Save query” button to save the query definition for subsequent re-use, either in the Data tab or to define a data subset for inclusion in a project. Saved queries can subsequently be selected in the dataset dropdown list.

Click the “Columns” button to choose which data fields in a dataset are to be displayed in the tabular view or included in export files.

Choose the “Export” button to extract database content into external files as regular text (CSV) or one of the available GIS formats. The export file will include only those data columns set through the “Columns” control and the rows of data for which content passes the current query settings.

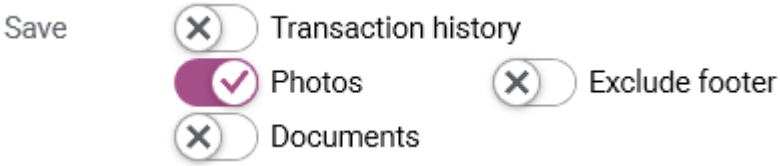


Choose a format for the exported data file. Additional formats are supported by the optional command line utility KD Export that incorporates the GDAL ETL toolset.



Where data forms constrain data entry to values from look-up lists, choose whether to show the codes (UNIQUE VALUES) or the extended descriptions (DISPLAY VALUES) in the exported data file. Refer to Catalogue/Datasets/Lists to view the unique value and display values defined for each data list.

Konect maintains a full transaction history of all edits to every record in each dataset. Choose transaction history to export both the current content of each data record and historical content as values changed over time.



Use these settings to export photos or documents if those exist in the dataset. Photos and Documents will be placed in sub-folders below the exported data file, with a naming convention that links each exported item to Konect’s unique record ID.

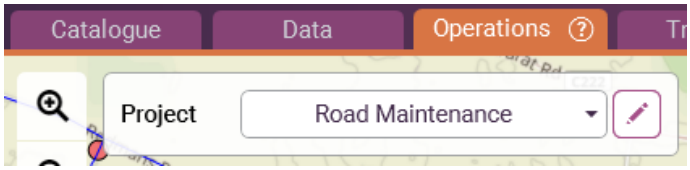
Choose “exclude footers” to exclude the image metadata (location, photo date etc) that is normally rendered at the bottom of images and image annotations.

4.9 Operations tab

The Operations tab is used to:

- dispatch a project to selected field devices
- see data on the map and watch it change dynamically as it is edited in the field
- view and edit spatial and attribute data for an object or create new objects.

4.9.1 Open a project



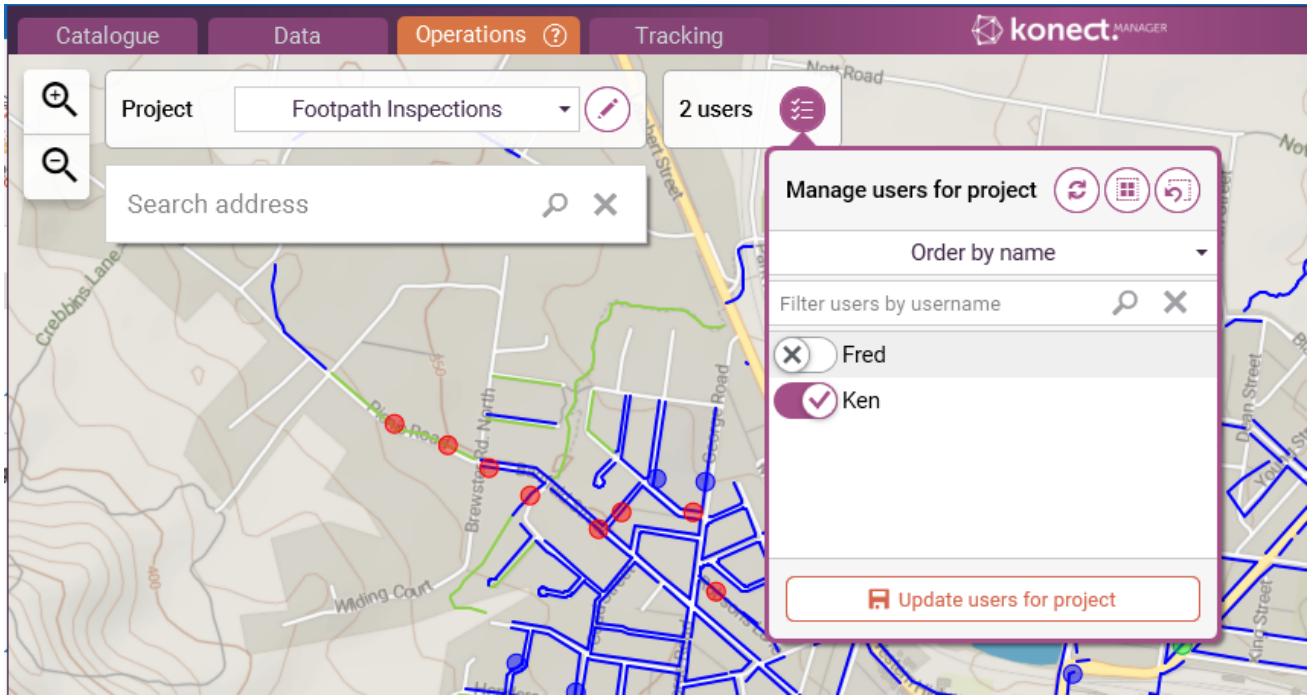
Choose a Project from the pull-down list of projects that have been created through the projects section on the Catalogue tab. The project map will present, centred in its default location that was defined when the map definition was last saved.

Click the “Edit” button to view or change project details.

4.9.2 Dispatch a project

Open a project in the Operations tab and select the users that are to receive this project. Those users will have this project available on the mobile app or Web Viewer.

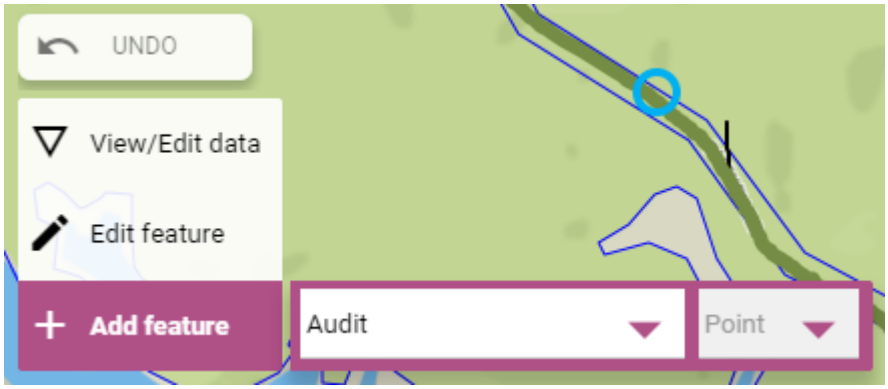
Users will not be available for selection unless they have been granted access to this environment by an administrator using the Konect Portal.



See also catalogue/users to manage the assignment of projects to users.

4.9.3 View, edit and create spatial objects

Choose the appropriate tool to:



- "View/Edit data" will open the form for editing the data associated with a map feature.
    - Select this tool and click on the map to choose a feature to edit.
- "Edit feature" allows the individual vertices that define a spatial outline to be moved.
    - Select this tool and click on a map feature to show the individual vertices (nodes) that define the map outline.
    - Select a node and drag to a new position or use the tool buttons to delete a note.
    - Use the "Delete" button on the form to remove a feature from the dataset.
    - Click the "Save" button on the form to save the new outline.
- "Add feature" allows new items to be drawn directly on the map.
    - Select the feature type to draw from the pick list. This list is controlled through options set in the definition of the form that were selected when this datset was added to the project.
    - Click "Save" on the data form to add the new feature to the dataset or click "Delete" to remove the new feature.

4.10 Tracking tab

The Tracking tab shows the most recent location update received from each device.

Tracking is activated through "Settings/Report location and status" in the Konect Mobile App.

5 Manual – The Konect App

The Konect App operates identically on Apple iOS, Android or Windows 10 tablets and smart phones.

5.1 Installing the Konect App

Install the Konect App from the Google Play Store (Android), Apple App Store iOS or the Windows 10 App store. Download is free. See the Konect Mobile App heading at www.gbmkonect.com/downloads.

Following installation, you will find the Konect icon in your app list.

Tap the icon on your mobile device to start Konect.

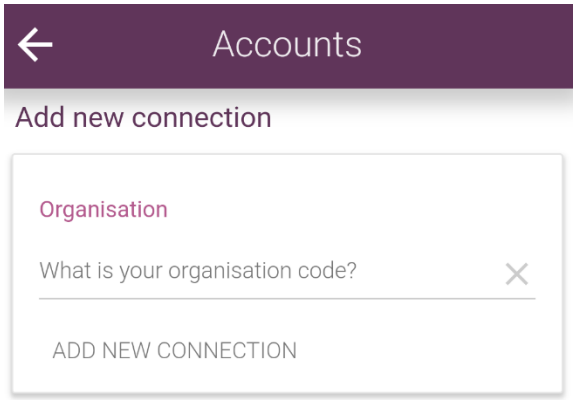
5.2 App dashboard

Konect will open at the dashboard. You will not be able to leave the dashboard until your device has been registered with an account and you have synched your device with the cloud to receive at least one project that the account administrator has authorised you to access.

5.2.1 Accounts

Mobile devices need to be granted permission by the account administrator to access the database associated with an account. To register with an account:

-

Tap the “Accounts” button on the dashboard
- 

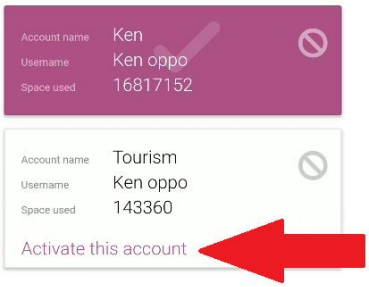
  Enter your organisation code and click “ADD NEW CONNECTION”. You will be prompted for the usename that was issued to you by your account administrator and your individual password.

  New user are issued with a temporary password and asked to change the password at login. User names and passwords are automatically forwarded by either e-mail or mobile phone SMS when an account administrator first registeres a new use through the account portal (see section 3.2.1).

  You administrator can send a new temporary password if you have not logged in. After you have successfully logged in once, you can use the ‘Forgot password” link to have a new temporary password

sent to your registered e-mail or mobile phone. It is not unusual for e-mail systems to classify Konect's pasword messages as junk mail.

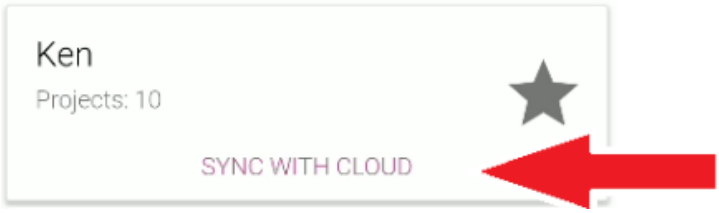
- Those users who have been granted access to work across multiple environments (databases) will be prompted to choose an active environment when they activate an account.



- If you have connected to multiple accounts/organisations, choose one of these to be your active account.

- Use the back arrow at the top of the accounts screen to return to the dashboard.

5.2.2 Sync with Cloud



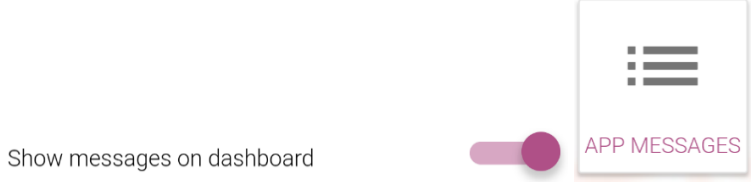
Click "SYNC WITH CLOUD" on the dashboard to update form and map configurations for your active account.

5.2.3 Settings

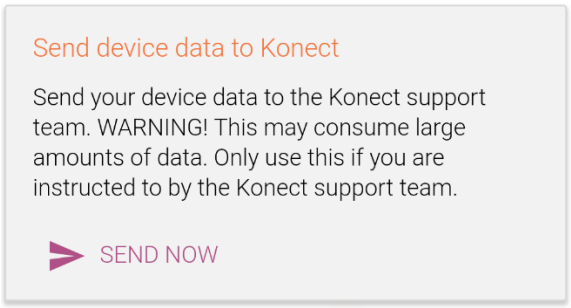
Click the "Settings" button on the dashboard to customise operation.

This is where you control whether the GPS location will be shown on the map, activate GPS tracking and control which buttons appear on the map. See the section below on using GPS in Konect.

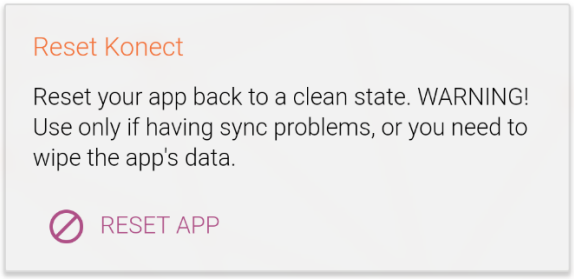
Camera image quality settings allow images to be downsized to speed up synchronisation and reduce data costs.



This setting adds the "App messages" button to the dashboard. App messages log the internal processes and may assist technical staff to debug operational problems.



This option uploads the internal data cached to the development centre to assist the debug of operational problems.



This control resets Konect to factory settings and is normally only used to reset the application after a program malfunction. You will lose all local data and offline data and will need to reload all projects. We recommend that you sync projects with the cloud before selecting this option.

Konect can exchange content with the cloud database dynamically or cache data on the local device for offline operation. See 4.4 Catalogue – Datasets for information on using Konect in offline mode.

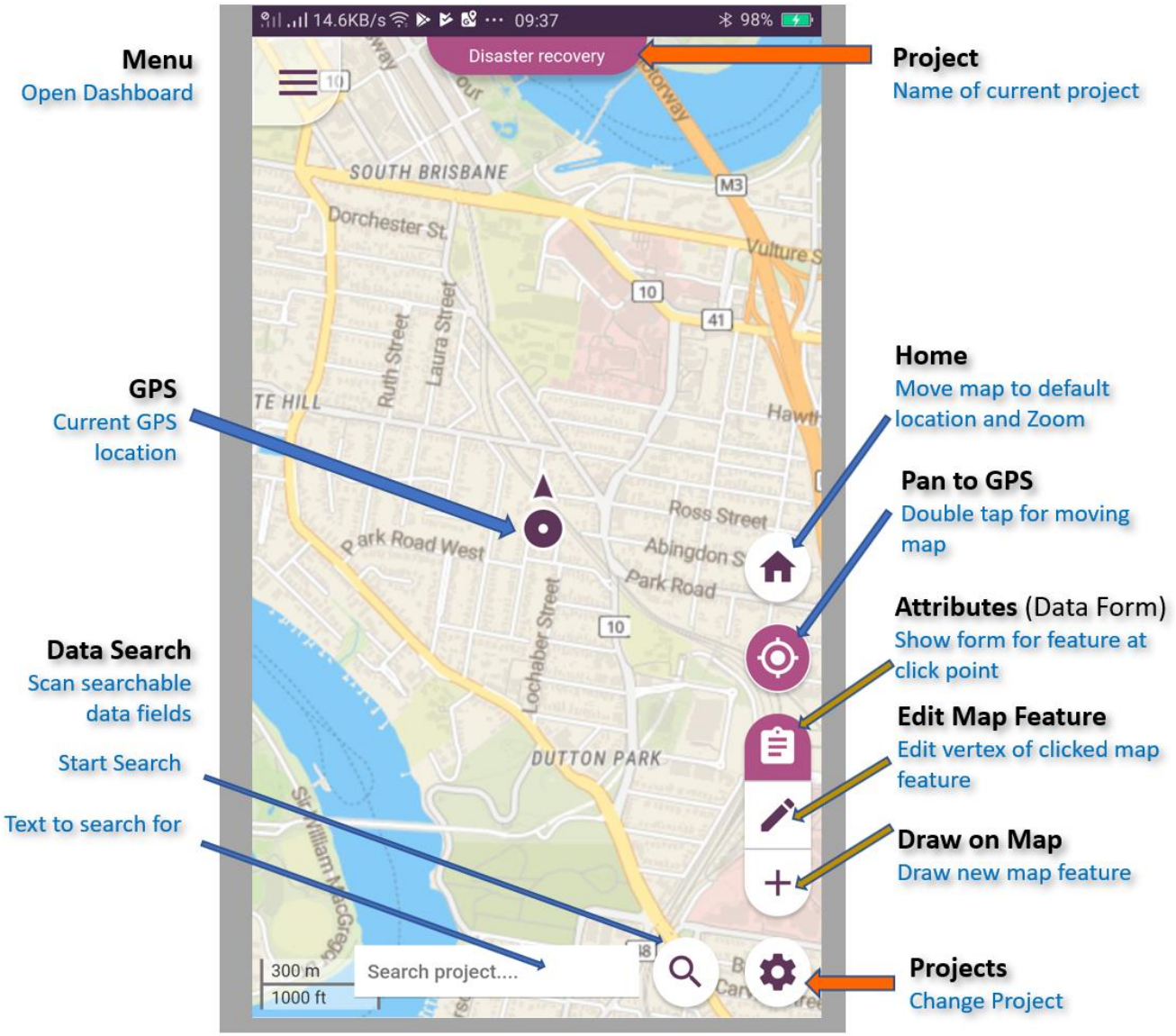
Click the “Start” button to open a project map. You will not be able to exit the dashboard unless you have rights to access at least one project. The button will not be available unless you have been granted rights to at least one project and have synched to download that project.

Projects are configured through the Konect Manager software by a project administrator. Each project includes the maps, datasets, forms and business rules that have been set for a specific type of field assignment.

5.3 Working with Konect App

5.3.1 Map screen

Click the menu bar in the top left of the dashboard to open a project map. This menu button is not active until the account administrator has given your device authority to access a project.



Konect presents the map that the project administrator has defined for the current project. Tap the "Project" button to choose an alternative project from the list of projects in the current account that your device may have been authorised to access.

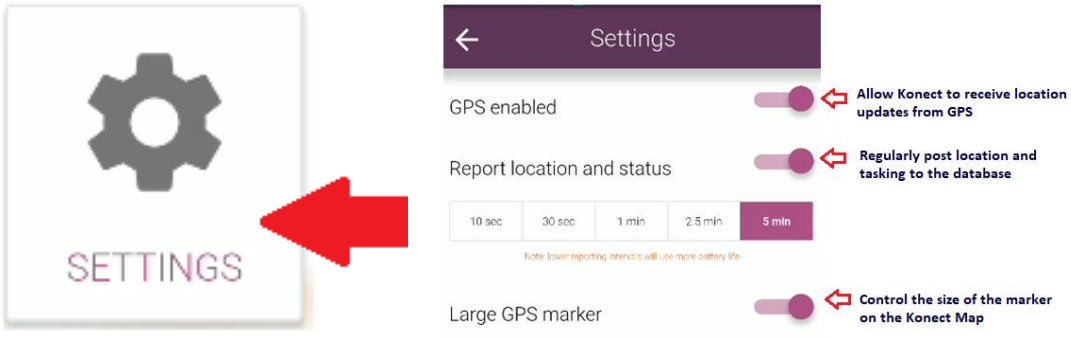
A device may be permitted to access projects in multiple accounts. If necessary, tap the "Menu" button to return to the dashboard to make a different account active.

5.3.2 GPS location

Konect links into the location services sub-system of your device operating system that may use GPS or other mechanisms to estimate your current location. Accuracy will depend on conditions and your device hardware.

Location services or GPS must be turned on through the settings controls in your mobile device operating system.

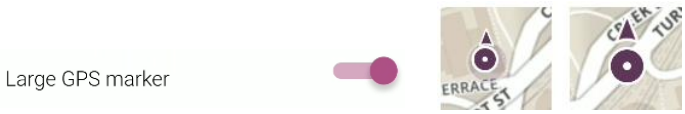
Dashboard settings in Konect control the presentation of location information.



GPS Map Marker

Enable GPS through the “Settings” button. Once enabled, the current GPS location will be presented on the map.

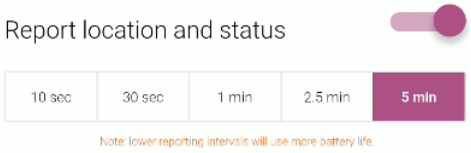
The size of the GPS marker can be changed through the settings screen.



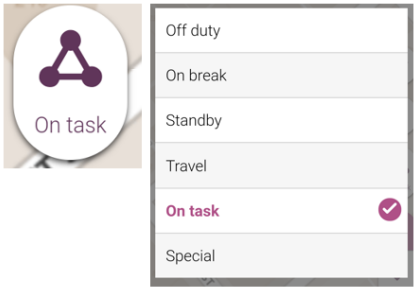
Pan map to GPS

The “Pan map to GPS Location” button will appear on the map once GPS is enabled. Single tap the button to centre the map on the current GPS position. Double tap to enter moving map mode in which case the map will pan automatically so the current GPS position is always displayed on the screen.

Status updates



When status update reporting is enabled, an additional button will appear on the right edge of the map.

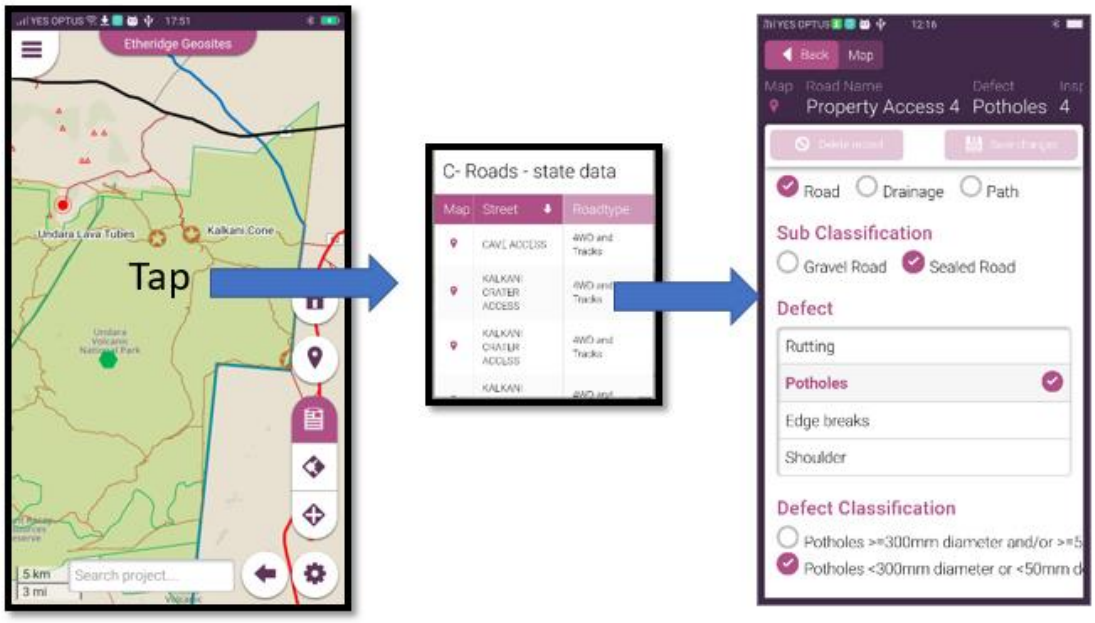


Tap to choose an operational status. Operational status will be posted to the database with each GPS location update at the time interval chosen on the Konect settings screen.

When enabled, device location and operating status will be updated regularly on the Tracking tab in Konect Manager.

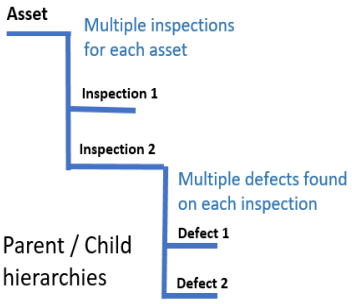
5.3.3 Attributes tool – Open Konect Data Form

Choose the data form (attributes) tool and tap on the map. If a map feature under the tap point has an associated Data Form, the form will open. Data Forms and their behaviours are defined in Konect Manager by the administrator who set up your active project.



If there are many features under the tap point, a list will be presented. Tap on an item to open the relevant form.

Tap the map icon in the list to highlight the location of the selected feature.



Forms may link together in a hierarchy with multiple child records linked to the parent record and map feature.

Click the “Related items” tab to switch between parent and child data records in a hierarchy.

Where a data form is configured to include photos, buttons will be presented for taking a new photo with the inbuilt camera or importing an existing image from the photo gallery on the device.

Image time stamping

With location services enabled on your device, the device camera will normally write a location into the image metadata. If that information is available, Konect will write it onto white space at the bottom of the image whenever photos are taken from within Konect or imported from the photo gallery on the device.

Three dates will be written on the bottom left of the image if the information is available:

- Imported date is the date the image was added to the Konect form
- Photo date is the date the image was taken
- Annotated date is the date annotations were last added or modified through the Konect image annotation tool.

Dates are recorded in the time zone of the device and an offset between that time zone and UTM time.

Image preview

Tap a thumbprint to open the image in fast preview mode or use a long tap to open directly in image annotation mode. In preview mode you map pinch and stretch to zoom the image.

- Swipe left or right to see the previous or next image in a group
- Swipe down to close the image
- Swipe up to enter image annotation mode.

Tapping the “Edit” button in preview mode also activates the image annotation tools.

Image annotation

In image annotation mode, the top row of buttons activate map zoom and pan along with addition and editing of annotations.

Tap this button to drag the image. Pinch and stretch to zoom in our out. Be sure both fingers are on the image area for zoom operations.

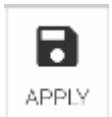
Use these tool buttons to add arrows, circles rectangles, shapes, polylines, squiggles, text or symbol annotations.

Tap the “Annotation editing tool” and click on an annotation drawn in this session to move, resize or rotate the annotations. It may be possible to double tab the image to move individual nodes in a drawing object. Tap a colour on the pallet on the right of the screen to change the colour of the active annotation.

To add text, tap the text tool and type. Click the “Go” button on the keyboard to finish. Text may be moved, rotated and resized. To change the content, delete and retype.

All live annotations can be edited. It will not be possible to edit annotations created in some earlier editions of the software as those annotations will have been fused into the image and are therefore no longer available as separate annotation objects.

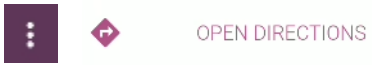
Additional action buttons are available at the bottom of the screen.



Tap the “Apply” button to fuse annotations to the image and close the annotation session. The annotation time will be automatically stamped onto the white space at the bottom of the image, replacing any earlier annotation date reference.

Tap “Cancel” to exit annotation mode without applying the latest edits.

Navigate to location



Tap the three stacked ellipses at the top right of the form and then select “Open directions”. The location of the current map feature will be passed directly to the navigation software registered on your device. This will commonly be Google Maps and will give the operator direct access to turn-by-turn navigation assistance to drive to that location.

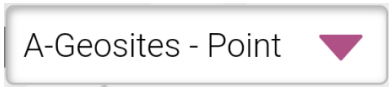
Save Data Edits

Tap the “Save” button at the top of the screen to keep you changes. You will not be permitted to save until all content passes validation and any mandatory data fields (marked with orange stars) have been completed.

Tap the back arrow to exit without saving.

5.3.4 Draw on map

Tap the “Draw” button and select an available drawing style from the list. The list of features that can be drawn and their graphical style will have been set by the project administrator.



Point objects are defined as a single vertex. Line and area objects will have multiple vertices. There are four ways to add the vertices that make up a new map feature.

Simple tap

Simply tap on the screen to add a new vertex at the tap point. Click “Save” to complete drawing the object.

Precision drawing

Tap a second time when drawing a feature to drag the vertex to a new location. The vertex location will be offset from the tap point so it can be dragged to an accurate location that is not under the operator’s finger on a touch screen. Drag to the required location and let go to lock that location.

Scrawl

Choose the “Scrawl” button and trace you finger across the screen. Vertices will be added automatically along the scrawl path.

Draw with GPS

Tap the “GPS” button to add a vertex at the current GPS location.

Snap

Tap the “Snap” button to enter or exit snap mode. In snap mode, vertices or nodes in features being edited are moved to exactly the same location as the nearest node on an existing map feature.

Snapping behaviour is modified by the topology settings for the dataset being edited. See Catalogue/Datasets/Topology.

Edit tools

The undo, vertex delete and feature delete tools described in the feature edit section below are also active in feature drawing model.

Save map feature

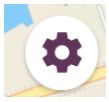
Tap the “Save” button once drawing has been completed. If the administrator has associated a data form with this feature type, the data form will open automatically.

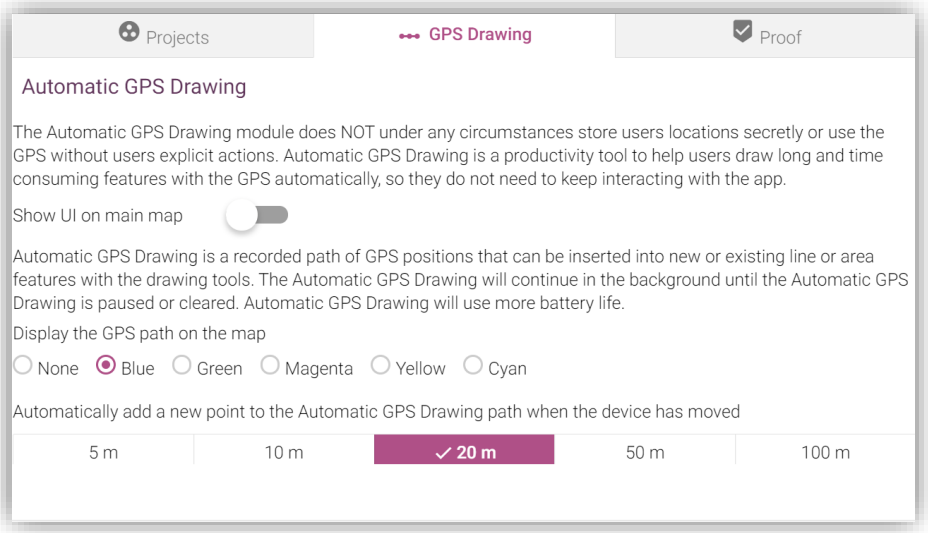
5.3.5 GPS track recording

Konect Automatic GPS Drawing allows users to create or update line or area features with a recorded GPS path. The path is a recording of GPS positions. New positions are automatically included in the GPS track when the GPS has moved a configured distance from the previously recorded position. GPS positions can also be included manually into the GPS track.

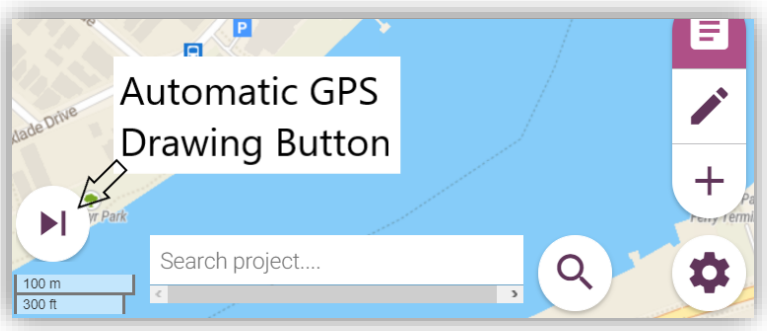
The Automatic GPS Drawing path is used with the drawing tools in either the ‘add new feature’ or ‘update existing feature’ drawing modes. Users can save the GPS path to a new feature or use the drawing tools to add additional points anywhere within the GPS track to new or existing feature.

5.3.5.1 Automatic GPS drawing settings


The Automatic GPS Drawing settings can be found alongside the project picker that is accessed through the settings button at the bottom right hand corner of the map. .



Click “Show UI on Map” to present the Automatic GPS Drawing Button.



Users can change:

- the colour that the GPS track is displayed on the map (no display, blue, green, magenta, yellow, or cyan). The default is blue.
- the distance filter which configures the distance the GPS position must be from the previous position to automatically be included in the GPS track. The default is 20 metres.
    - Please note initially the second position in the GPS track will be updated closer than the configured distance filter until the second position is further away.
- whether to automatically clear the GPS track from the map after the GPS drawing path has been saved.

5.3.5.2 Location tolerance and battery concerns

While the GPS tracking is actively recording positions, the Konect App and the GPS will continue to run even when the App is in the background. This will consume additional battery. The lower the location tolerance settings, the higher the battery consumption will be.

Some devices may flag the Konect App as a high battery-consuming app when using the GPS and may kill the app in the background under some circumstances. More information can be found here: https://dontkillmyapp.com/

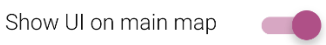
5.3.5.3 Feature quality and performance concerns

Having a low value for the distance filter can make the GPS track untidy and cause it to jump around (particularly while stationary) depending on the quality of the GPS fix.

Having a low value for the distance filter can also make any created features very large and complex. The GPS tracking feature has a cap of 10,000 positions. If this cap is reached, create a feature with the GPS track and start another. Large features can slow down Konect and other GIS applications that may use them. For Konect to work optimally, a post-processing procedure to thin nodes may be required for features with more than a few thousand vertices.

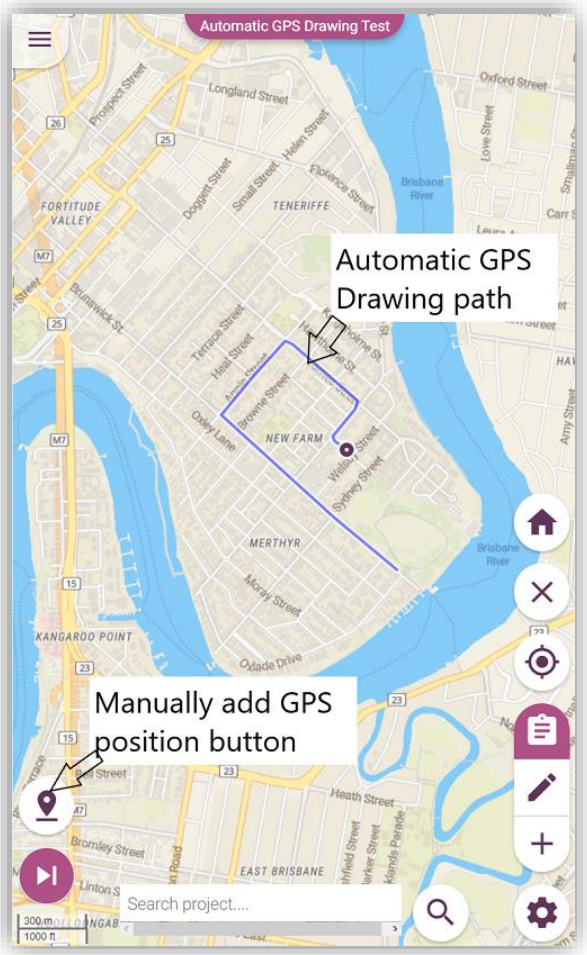
5.3.5.4 How to use GPS Drawing

1. Ensure the GPS is enabled through the main settings menu.
2. Ensure the “Show UI on Map” option is checked in Automatic GPS Settings.



3. Open a Konect Project in map view and press the “GPS tracking menu” button from the bottom of the left-hand toolbar. This button will always be available regardless of main mode setting and when it is highlighted there is an active track.
4. Press the “Start” button from the GPS tracking pop-up menu. This will start the GPS track.

- Pressing the “Pause” button will keep the GPS track, but prevent new positions from automatically being included. Press the “Start” button again to resume automatically recording new positions
- Pressing the “Clear” button will clear the GPS track from the device

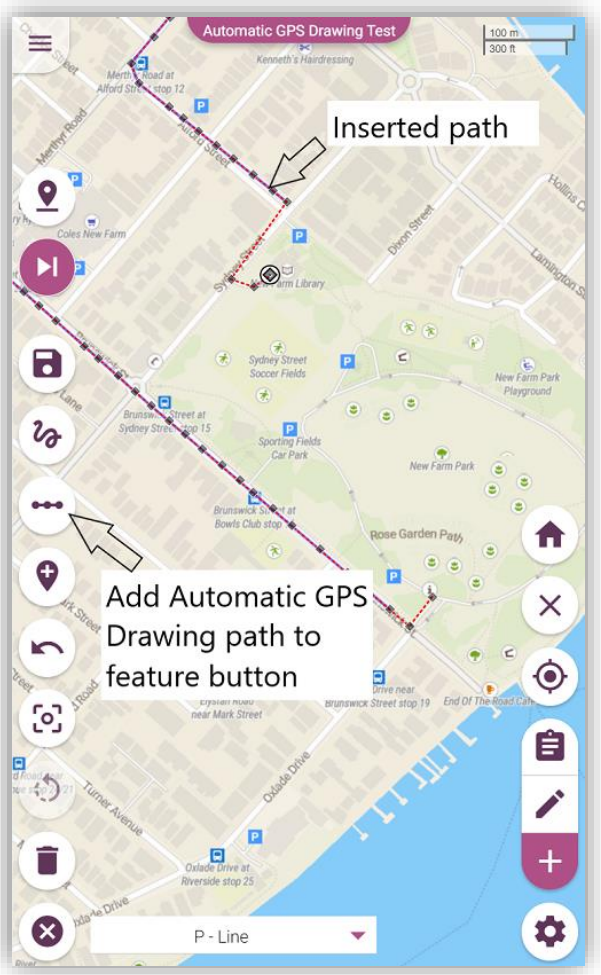


5. The GPS Drawing path will be displayed on the map in the colour specified in the Automatic GPS Drawing settings.
6. Walk/ride/drive the track you wish to record; new positions will automatically be included in the GPS track when the GPS is further away from the previously recorded position than the configured distance filter.
7. Additional GPS positions can be included by pressing the “Manually add GPS position” button. This will add the current GPS position to the GPS track. This feature is useful for adding finer detail to the GPS track than can be captured by the automatic recording. This button becomes active when a GPS track is started, can be used when the GPS track is paused and is available in all modes.

5.3.5.5 How to create a new feature with Automatic GPS Drawing

1. Open a Konect Project and enter the ‘add new feature’ mode.
2. Choose to draw a line or region feature from the drop down at the bottom of the map. This drop down will offer the same target data sets and drawing options offered for normal on-screen drawing.

3. Use an existing Automatic GPS Drawing path or create a new Automatic GPS drawing path.
    - Pausing the GPS track while drawing will ensure no additional GPS positions are included (this can occur when there is poor GPS quality).
4. If you wish to include vertices from an existing Automatic GPS Drawing path, press the Add Automatic GPS drawing path to feature button. This will append all the positions from the path into the new feature. This button is only available when a track is active, and a line or area is being drawn to a dataset.



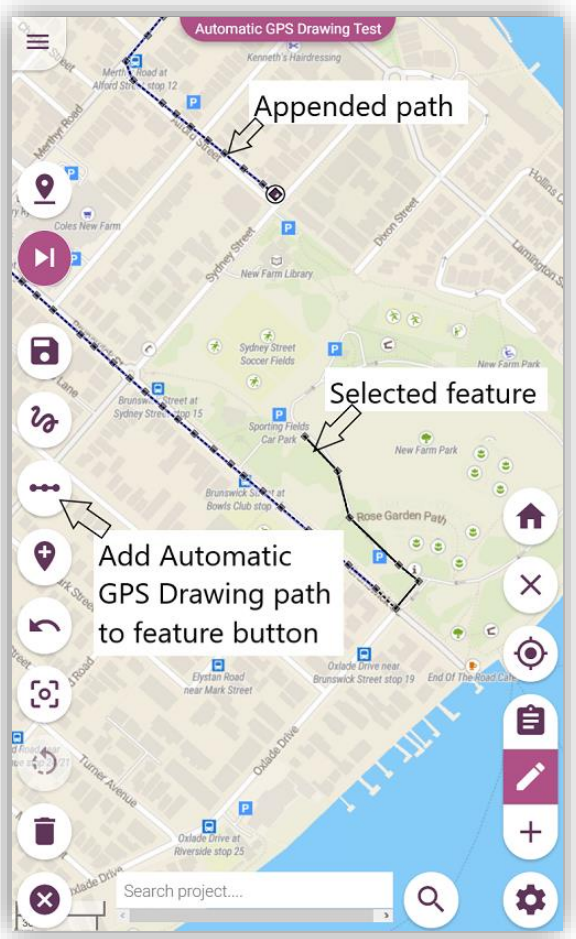
    - If any points were already drawn, the copied GPS track will be appended to these points.
    - The drawing tools will continue to work as normal and allow you to append points to the end of the feature or to edit any points within the feature, including the appended GPS track.
    - The undo button will roll back the add GPS track to feature action and remove the entire GPS track.
5. Press the “Save” button on the map and fill in the data form.
6. If the ‘automatically clear GPS track setting’ is enabled, and the GPS track was used in the feature, the GPS track will be cleared.

5.3.5.6 How to update an existing feature with the GPS track

1. Open a Konect Project and enter the ‘update existing feature’ mode.
2. Click on the map to select a line or area feature to update.
3. Use an existing GPS track or create a new GPS track to use for the feature.

- Pausing the GPS track while drawing will ensure no additional GPS positions are included (this can occur when there is poor GPS quality).

4. Press the “Add GPS track to feature” button. This will append all the positions from the GPS track to the end of the feature. This button is only available when a track is active, and a line or area feature has been selected.



5. The drawing tools will continue to work as normal and allow you to append points to the end of the feature or to edit any points within the feature, including the appended GPS track.
6. The undo button will roll back the add GPS track to feature action and remove the entire GPS track.
7. Press the “Save” button on the map.
8. If the ‘automatically clear GPS track setting’ is enabled, and the GPS track was used in the feature, the GPS track will be cleared.

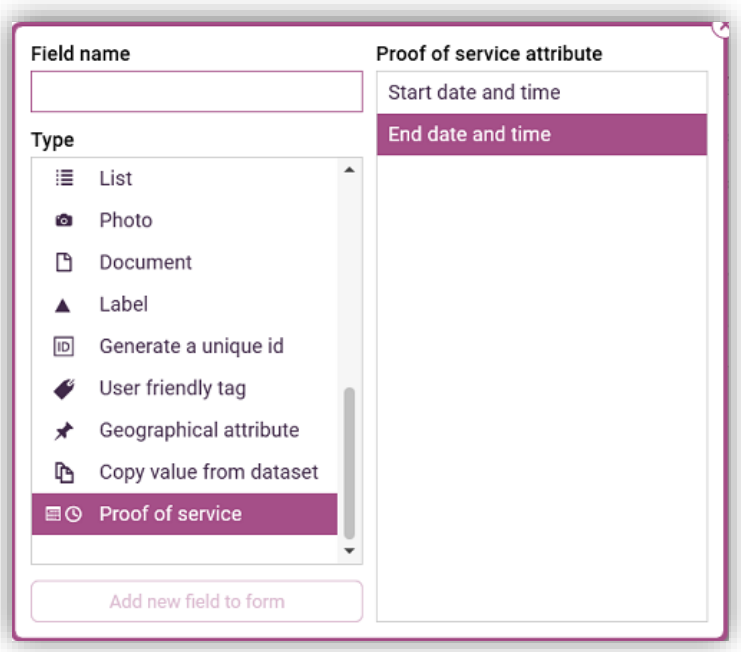
5.3.6 Proof of service

Konect proof of service is a second Automated GPS Drawing path used for proof-of-service work. It runs in background with minimal user interaction, so as not to interfere with the primary GPS drawing. If this cut-down version of GPS drawing is not suited to your proof-of-service use cases, use the primary GPS drawing function instead.

The proof-of-service GPS track:

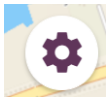
- can be recorded at the same time as the primary GPS tracking function
- will use the distance filter defined in GPS tracking
- suffers from the same battery and quality issues as the primary GPS tracking
    - is limited to a maximum of 10,000 positions

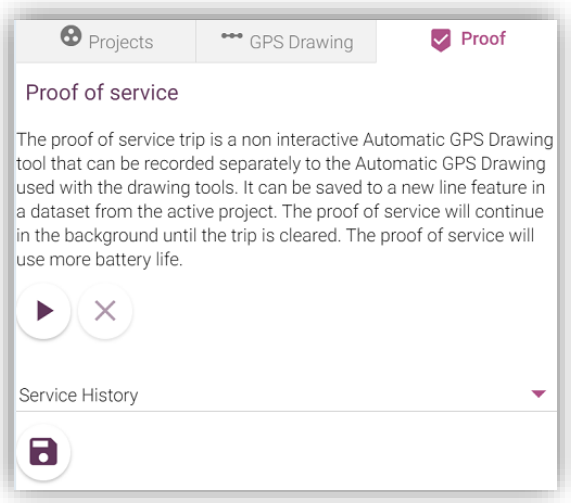
- will not be displayed on the map
- cannot be paused
- can only be used to create new line features
- can record two additional auto-value fields configured through Konect Manager
    - start date and time of the first recorded GPS position
    - end date and time of the final recorded GPS position.



5.3.6.1 *How to create a proof-of-service feature*

1. Ensure the GPS is enabled in the main app settings.
2. Open a Konect Project on the Konect App and show a map.
3. Open the proof-of-service screens through the button in the bottom right of the map and choose the “proof” tab.

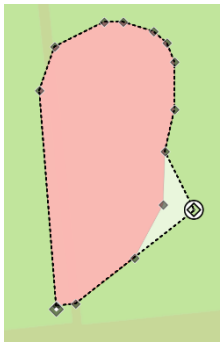




4. Press the “Start proof of service” button.
5. Pressing the “Clear proof of service” button will clear the proof-of-service GPS track from the device.
6. Continue to perform your regular shift work.

7. At the end of the shift open the proof-of-service UI again.
8. Select the dataset to save the proof-of-service GPS track to
9. The dataset list will only contain datasets that can create new lines.
10. Press the “Save” button, the dataset form will immediately open and store the proof-of-service GPS track as the feature’s geometry.
11. Fill in the data form and press the “Save” button.
12. The proof-of-service track will be cleared on closing the form.

5.3.7 Edit map feature



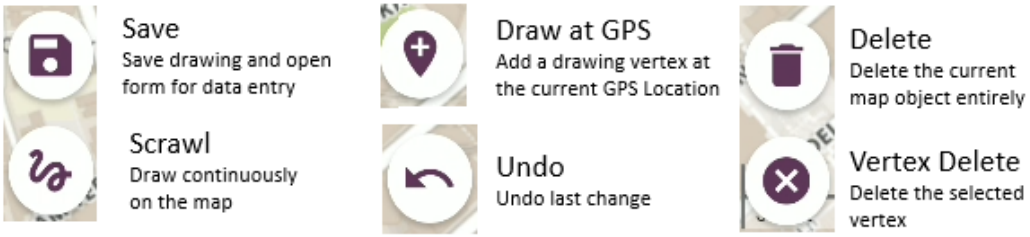
Choose the “Edit map feature” tool and tap on the map.

If the project administrator allows the geometry of the feature at the tapped location to be edited, the individual vertices that make up the spatial feature will be highlighted.

Drag the marker representing the vertex to its new location. The marker representing that vertex will be displaced so it is not directly under your finger if you are working on a touch screen.

Use the six tool buttons on the left of the screen to complete your map editing.

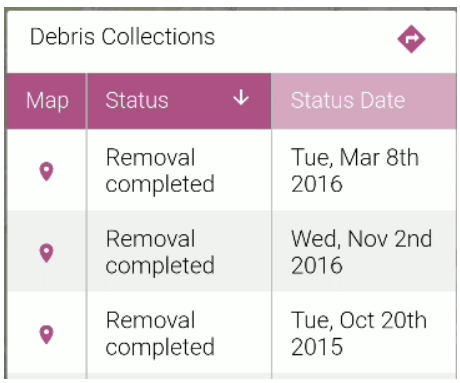
The feature will be redrawn in its final location once the “Save” button is clicked.



5.3.8 Data search

Type text into the search box and click the magnifying glass.

Data administrators can set individual data fields as being searchable as part of a dataset definition. Konect will match the search sting with text in all searchable data fields.



Tap an item in the list to open the form. Tap the “Map icon” to highlight the map location of that feature.

Searching works on text fields and only on those data fields that have been tagged as being searchable in the dataset definition. Search is not case sensitive.

5.4 Working offline

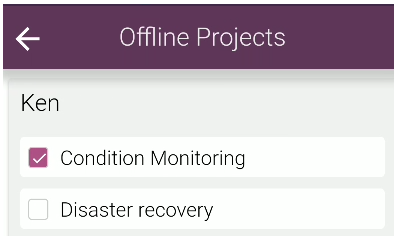
Konect normally reads data from the cloud database as it is needed. Additional data increments are retrieved as the map pans to each new area. Edits are shared with the cloud database instantly.

When a project is tagged for offline operation, the entire dataset is downloaded immediately and cached on the device. With an offline project, field crews can keep working even when outside the area of telecommunications coverage.

Most projects employ raster image tiles as the base layer of any map and draw datasets, or vector data, on top of the map tiles. As map tiles cannot be read dynamically from a map server when a device is offline, tiles in the operating area need to be downloaded into a local database and stored on the device.

A number of software products including MOVAC, ESRI and Tile Mill cache raster maps in a MBTile file. MBTile files can be uploaded through the Import/Export tab of Konect Manager and chosen as the background map when a project is defined in the Catalogue/Data sets tab of Konect Manager.

If you tag a project with a map that is built on an MBTiles file background, the whole of the MB tiles file will be automatically downloaded and stored on the device when you tag the project for offline operation.



In this example, the Condition Monitoring project is tagged for offline operation while the Disaster recovery project will transact directly with the cloud database and will only work when connectivity is available.

With an offline project, you will need to click “Sync with cloud” to upload your local edits into the cloud database and retrieve data updates from the cloud. The cache of map tiles will remain on the device until you choose to remove them by un-tagging the project on the offline projects screen.

There is no need to remove an offline project to update content. Simply click “Sync with cloud” when communications are available.

For more information go to the resources page at www.gbmkonect.com and navigate to the knowledge base.

6 Konect extensions

Customers may subscribe for optional components that include:

6.1.1 Extensions and integration tools

A number of separately priced extensions are available to fully integrate Konect into corporate workflows.

Web Viewer

The Konect Web Viewer works in Google and Safari web browsers. It delivers a very similar user experience to the mobile app with linked maps and data forms. The Web Viewer is described in section 3 (Konect Portal) of this documentation.

Report Writer Gateway

Implementation templates are available to directly integrate the Konect cloud database with common reporting and business analytics engines such as Microsoft Power BI, Tableau, Google Data Studio and Spotfire.

Customers may create their own reports and dashboards with their preferred business intelligence tools or engage Konect resellers who have numerous report templates on offer. Contract the Konect Team for details.

Automated data import and data export toolkit

These utilities run on the customer's computer network and either regularly poll Konect to update a local copy of Konect data or directly update the Konect Database from local files. Customers often build scripts that integrate the Konect upload and download tools with the open source GDAL data translation engine (https://www.gdal.org).

Documentation is available at:

https://api.konectech.com/manager-update/tools/KonectDatasetExportTool.pdf
https://api.konectech.com/manager-update/tools/KonectDatasetImportTool.pdf

Contact your Global GBM reseller for licensing.

Integration toolkits

An Application Programmes Interface is available for two-way data exchange between Konect and external applications. This is a standard REST API.

Access the online documentation is available at www.gbmkonect.com/developer-api/. Contact your reseller for an API key to activate your account.

Asset system integrations

Asset system integrations are normally completed in partnership with domain specialists familiar with the target asset system. Interfaces are typically provided to exchange Work Orders, Work Requests and Asset information.

These automated interfaces allow the Asset system to become the primary point of truth for assets and works and financial information and Konect extends the reach of those systems into the field.

Custom integrations

Our consultants can directly integrate the Konect Database with external business systems to implement corporate-wide electronic workflows that span multiple business applications.

Additional extensions are constantly under development. Refer to the Konect Roadmap and contact your Konect Reseller for more information.

Support services

Assistance in configuring Konect to service the special needs of your projects is available from Konect consultants or any of our authorised resellers. Either contact your Konect reseller directly or log a contact request through www.gbmkonect.com/contact.

Issues with software operation can be logged directly into our service centre software through the support centre link at on the resources section of www.gbmkonect.com. Yor will need to create a new account to register your first issue. Log into an existing account to track issue resolution.

www.gbmkonect.com

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