ARDI – Web Interface User Guide

Optrix Pty. Ltd.

ABSTRACT

This documentation covers the basics of what ARDI is, and how to use it to get information about your assets.

Overview

What Does This Document Cover?

This document details the basic user functions of the ARDI web interface.

It is intended for basic users – those who only have *read* access to the software.

Assumed Knowledge

This document assumes you already know the basics of using a website on desktop or mobile.

In Other Media

Much of the content of this document is also available in video form.

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Optrix Pty. Ltd.
10/75 Cygnet Avenue, Shellharbour City Center, NSW, Australia
www.optrix.com.au

Getting Started

What Is ARDI?

ARDI stands for **A**sset **R**elationship and **D**ata **I**ntegrator.

The main job of ARDI is to take all of the information about your assets, consolidate them in a single place, and then provide that information to all levels of an organisation in the easiest and most intuitive way possible.

In many cases, the important information about your assets – information such as current measurements, history, serial numbers, manuals and isolation details etc. – can be found scattered across a number of different systems.

ARDI brings all of this detail together in one place to be easily found, used and managed.

What Can ARDI Tell Me?

ARDI can bring in all kinds of information, including…

Static information, such as name, description, equipment reference number, serial number etc. It can also link directly to maintenance or asset management systems to give you additional details.

Live and historical information, such as measurements and equipment status from the field

Media, such as diagrams, manuals, isolation procedures, work instructions etc.

Location, by highlighting where the asset is located on your floorplans.

Relationships, such as how assets are connected via pipe, cable, wireless or even logically, such as how one asset controls another or operates before another during startup.

The exact details given to you by ARDI are determined by your system administrator, so if you find there's meaningful information missing, please notify them – they may be able to include it.

What is an Asset?

In short, *everything is an asset.*

An asset can represent everything from a single component of a system to an entire facility, and all stages in between. They relate to physical objects, such as buildings, sensors and staff members, and logical things such as production units, areas, subsections and departments.

When your ARDI system is being set up, the administrators choose what items in the real world become assets in ARDI. In a building automation application, assets may represent buildings, floors and rooms. In another, assets may be used to represent specific pieces of field equipment.
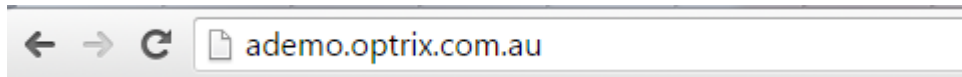
If you can talk about it, it should be an asset in ARDI.

Logging In

Open in a Browser

To login to ARDI, simply open up your web browser on your device of choice. On mobile and desktop, we suggest Google Chrome or Mozilla Firefox, although most browsers are perfectly fine.
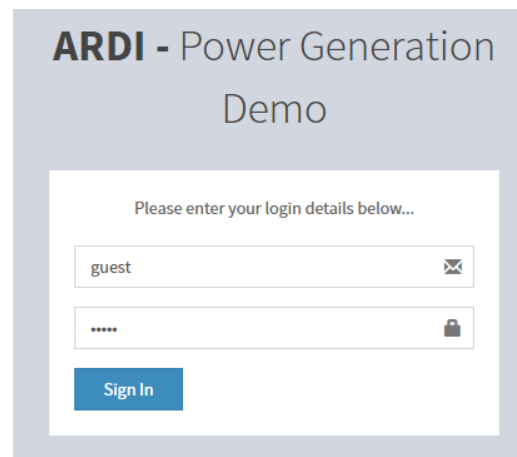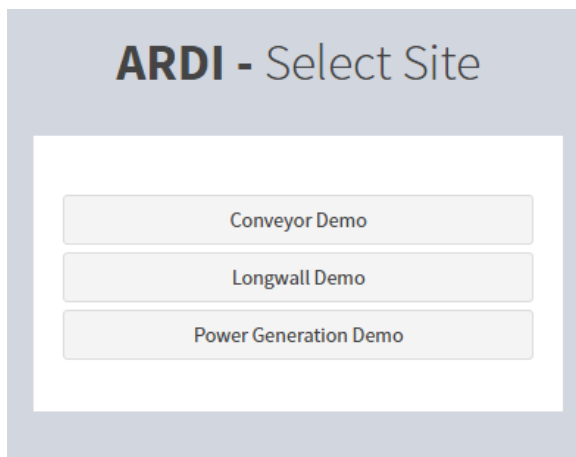
The system administrators will give you the correct address to go to.

Select A Site

*Note that this step is only required if your ARDI server supports **multiple** locations. Most servers only support one site, which means the list below may not appear.*

Select the site you want to access from the *select site* list.

Login

Some ARDI servers require that you verify your identity before you can enter. If requested, please enter your username and password.

Others will give you read-only access to ARDI without needing to validate your username and password.

If prompted, enter your username and password in the fields provided and hit **sign in**.

Welcome to ARDI

Once you've followed step 1 (and optionally 2 and 3, depending on your ARDI configuration), you will be logged into ARDI and ready to explore.

Interface Layout

Here, we will introduce two elements that are on almost every ARDI page.
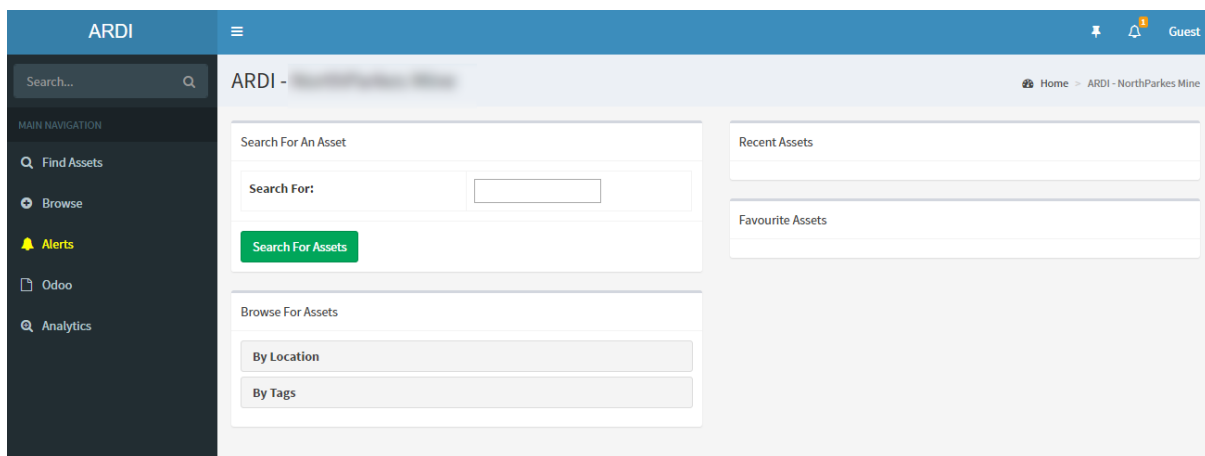
The Sidebar

On the left-hand side of the page is the **sidebar** – shown below in black.

The sidebar is used to navigate around ARDI, allowing you to move between assets and views.

The sidebar is *collapsible*. This means that on small-screen mobile devices such as phones, the sidebar will collapse to the left-hand side and disappear.

To make the sidebar appear on these small devices, click on the symbol with the three horizontal lines in the top-right corner. You can also press the button on large-screen devices if you'd like a little more screen space.

The Topbar

The topbar is the blue bar shown across the top of the screen. It contains the menu button (to collapse the sidebar), as well as buttons for notifications. Lastly, it also contains your user button – to log in, log out or change user settings (such as password) click on your user name.

The Dashboard
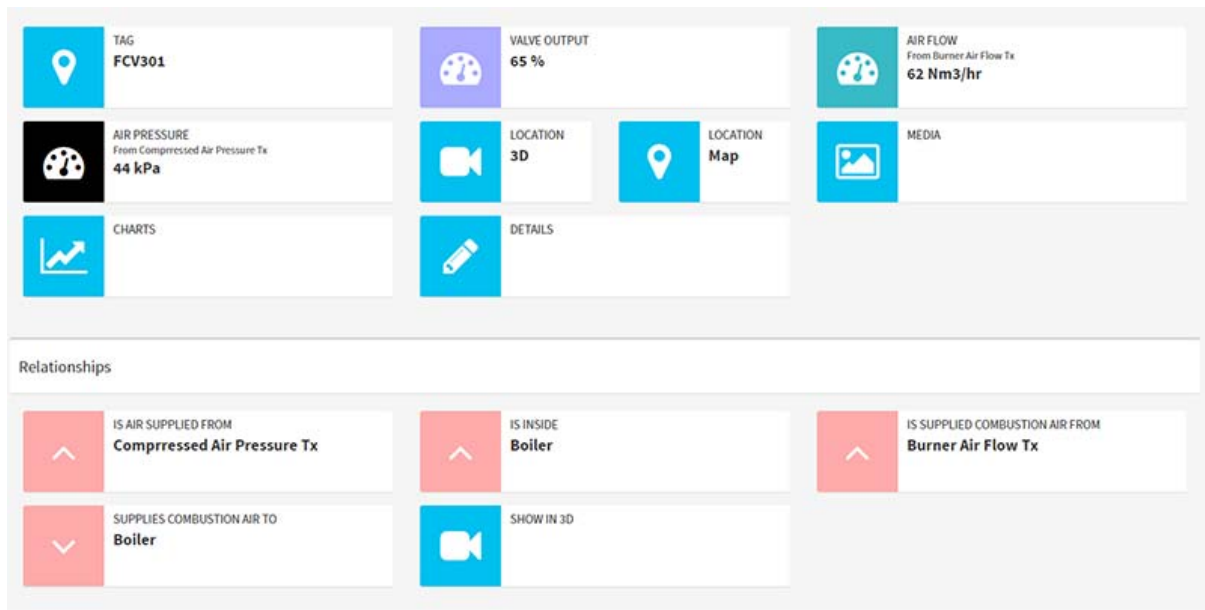
Above is an example of the ARDI dashboard for an asset.

Information

Each box gives you a piece of information, such as serial number, equipment reference number, measurements etc.

If a piece of information is connected to live data, it will update automatically.

Some boxes are interactive – clicking on them will take you to different places. This includes…

- **MEDIA** will take you to a list of documents attached to this asset, allowing giving you access to information such as manuals, calibration sheets, isolation instructions etc.
- **CHARTS** will allow you to create some simple trend charts
- **LOCATION (Map)** will show you the location of the asset on a 2D map.
- **LOCATION (3D)** will take you to the 3D version of your plant and highlight where the asset is (not available on all ARDI installations or devices)
- Some properties will open a live or historical trend of the property.
- Some boxes may take you to further information or even other systems, such as maintenance systems.

Relationships

As well as the measurements, text and media, some of the boxes (below the 'Relationships' header) show you the connections between this asset and its neighbours. In the example above, you can see where air comes from, where the air goes, and what system the machine is part of.

Grey or Unknown Values

In some cases, values in your dashboard may appear as **unknown** or grey.

This is caused by something upstream causing uncertainty about the measurement.

Grey values represent indicate that the value is approximate. These usually occur if you upstream components such as non-return valves. As these *might* trap energy in your system, the displayed upstream value may be incorrect.

Unknown values occur when there is an isolation somewhere between this asset and the measurement point. Because there is no sensor available, ARDI can't guarantee that the value is zero.

Finding Assets

Because ARDI has access to so much information about your assets, there are several different ways of finding assets.

The method you use depends on what you know about the asset you're interested in, the most common being 'Search'.

For example, do you know the name or *equipment reference number* (sometimes known as a 'Tag Number') for your asset? In that case, you should **search**.

What about if you don't know the name or reference number, but you know what machine its part of? Then you should **browse by location**.

Not sure of what it's part of, but you know what it's connected to? Start at the point you know, and work your way forwards or backwards by **browsing by connection**.

Not sure exactly where it fits on your plant, but you know what *type* of asset it is? Perhaps **browsing by tag** will help.

And finally, if you don't know anything more than *where* it is, you can **use the 2D map** and click on it there.

Searching

Searching is the most common way to track down an asset you're interested in.

If you happen to know the name, description, equipment reference number – or indeed the value of *any* property of the asset – you can use search to track it down.

For example, if you have an asset with the Equipment Reference Number **TRN192**, you can simply….

- Type the number (or a partial number) into the *search control* – located at the top of the sidebar.

- If there is only one match to your search, you'll be taken there immediately. Otherwise, you'll be given a list of options.
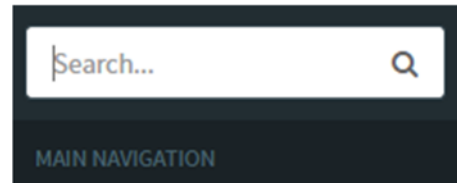
The following icons appear in your search results…

	Dashboard
	Diagram
	Edit/Update
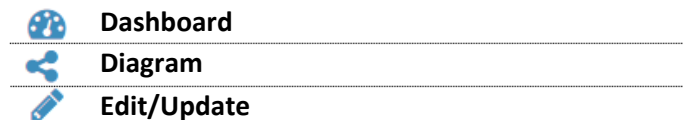
Click on any of these icons to be taken directly to the dashboard, diagram or details page for that asset.
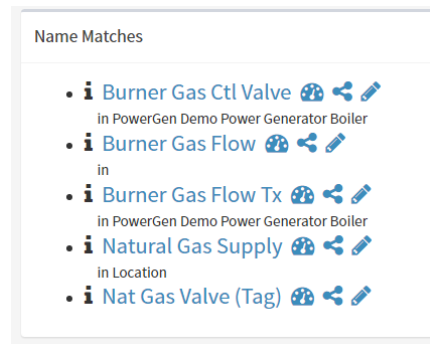
Example Usage

John knows that the Equipment Reference Number of the asset is **PT-29**. He types that into search, hits 'Enter' and is immediately taken to the asset.

Browsing By Location

One of the most common relationships in ARDI is **Location**.

The location relationship forms a *hierarchy* – a tree that begins at the most general point (usually your entire site), and more and more specific as you descend into the items within it.

By following a hierarchy, you can drill down through sites, areas, buildings, systems and machines to find individual component parts. For the industrial market, the ISA-95 standard covers this style of hierarchy.
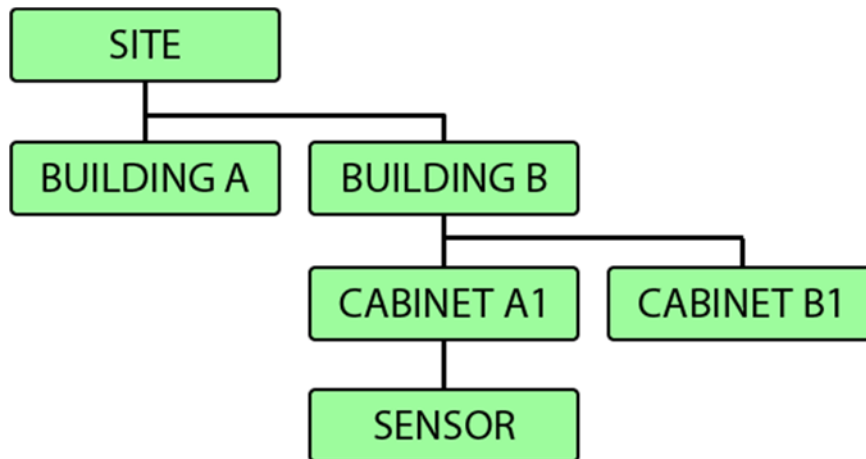
Above, you can see that **Sensor** is located inside **Cabinet A1**, which is inside **Building B**, which is part of your **Site**.

Using *relationship diagrams* (usually just called 'diagrams'), ARDI can help you find equipment by exploring these hierarchies.
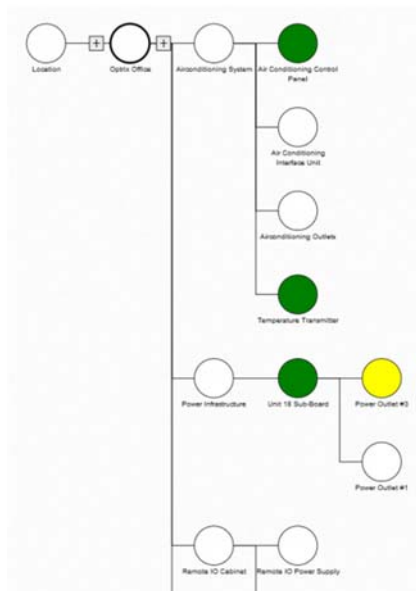
To the left is an example diagram from ARDI. It begins at the office, then splits into various sub-systems, such as air-conditioning, power etc.

You can click on any of the symbols to update your drawing or access the dashboard for the asset.

When your asset has a *lot* of children – which is common when dealing with the location hierarchy – you will only be shown the level immediately below the currently-selected asset.

You can browse the Location hierarchy from the 'Find Assets' page – the first page you see when you log into ARDI, or go to the diagram of any asset from the sidebar on the Dashboard.

Example Usage

Emily is looking for the vibration transmitter for a machine. She simply searches for the machine, opens the Location diagram, and tracks down the sensor that is part of the machine.

Browsing By Tag

Assets in ARDI are often 'tagged' based on common attributes. For example, all water pressure sensors will usually be tagged 'Water Pressure Sensor'.

This can make finding a particular *type* of asset quite easy when you use the tags to find them.

To begin browsing your tags, click on 'Browse' in the Sidebar and choose **By Tags**.
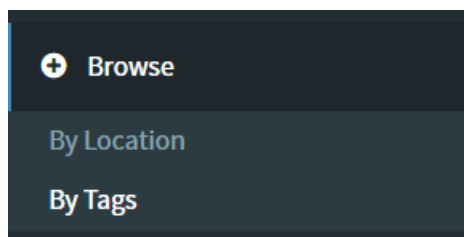
This will bring up a diagram very similar to the Location diagram.

Tags form a hierarchy just like Location – for example, **Water Pressure Sensor** can be part of the **Pressure Sensor** collection, which is itself part of **Sensors** and **Equipment**.

In the example below, 'Spray' is under 'Equipment > Mechanical'.
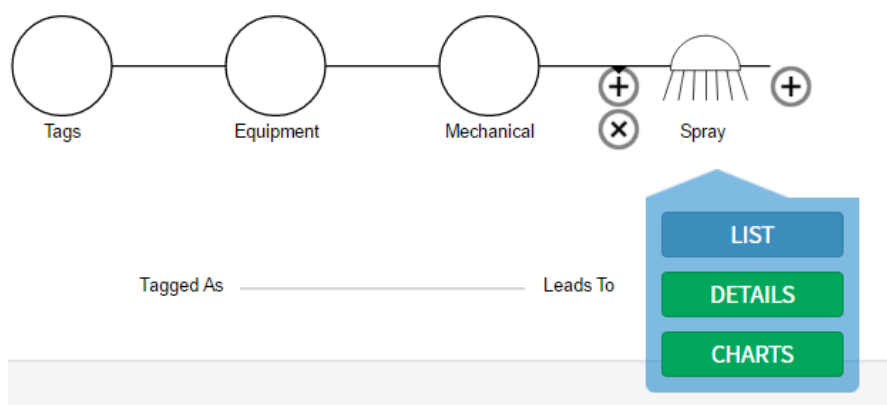
Clicking on the "List" button allows you to see a list of all of the sprays.

Note that if you're not entirely sure of how your asset is classified, you can ask for a list of one of the *earlier* tags. In the example above, if you asked for a list of Mechanical items, the list would include those assets marked as sprays.

Example Usage

Geoff is trying to ensure there are enough spares for the magnetic flow transmitters on site, but is unsure of how many are in the field. By going to the list of tags, choosing 'Equipment', 'Flow Transmitter', 'Magnetic Flow Transmitter' and hitting 'List', he has access to a list of every meter on site.

Browsing By Connection

As well as knowing how your assets are connected in terms of hierarchy – for example, via Location and Tag – ARDI knows how your assets are connected *physically* too.

The diagram page has a set of buttons at the top that are used to change which relationship you are looking at.
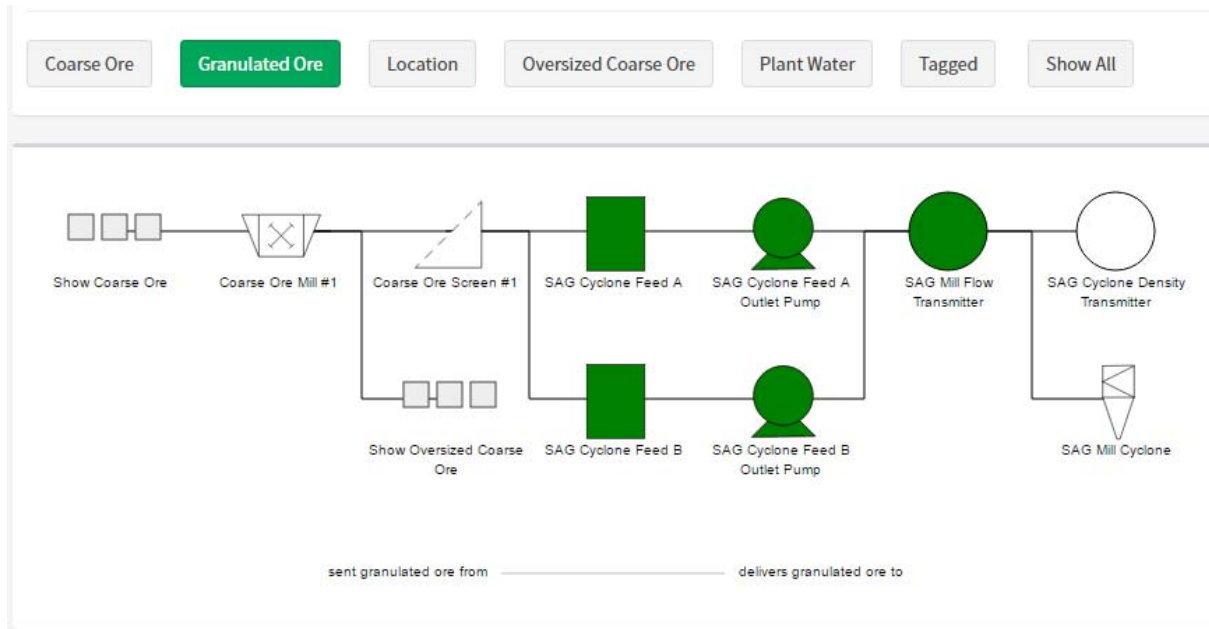
In the diagram above, we are looking at the path that granulated ore takes from our ore mill, through the processing system.

If you are looking for asset **A**, and you know it must be connected to asset **B**, you can do the following….

- Search for Asset B.
- Press the 'Diagram' button in the Sidebar
- Change the diagram to the connection you want to follow (ie. power)
- Work backwards or forwards through the diagram to find the asset you're looking for.

Example Usage

Sandra is diagnosing a problem with a machine and suspects that it might be a faulty power supply. Unfortunately, she doesn't know which supply feeds this particular unit.

Searching for the machine in ARDI, she switches to the 'Power' diagram. There she can follow the path the power takes – through isolators and breakers - allowing her to very quickly spot which supply she needs to find. She can then open the Dashboard and confirm its location on the map.

Using The 2D Map
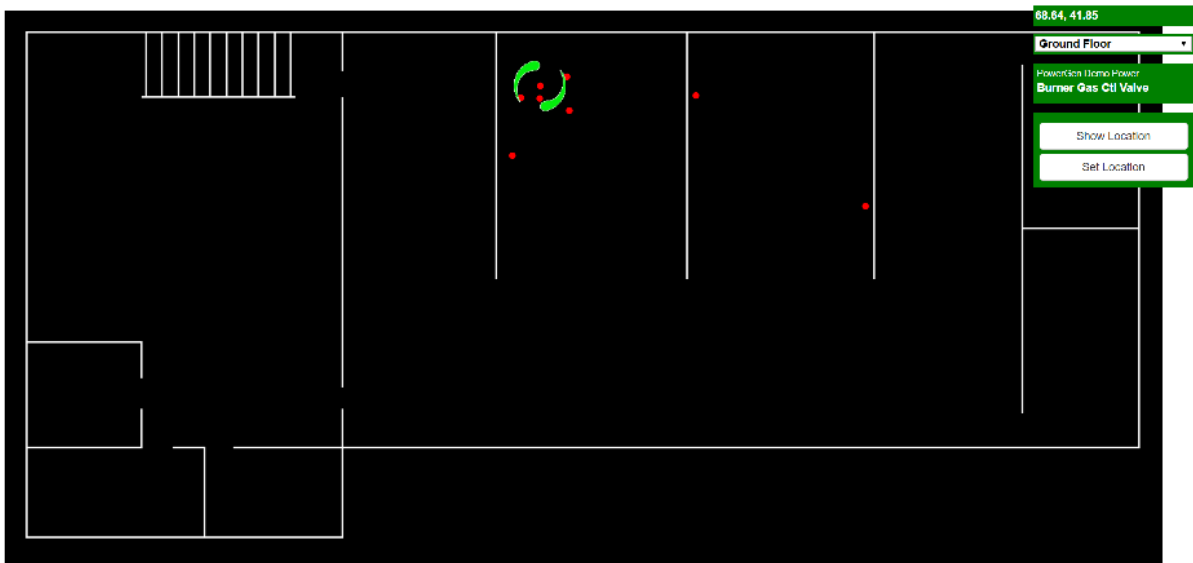
You can open ARDIs floorplan maps from the **Find Assets** button on the Sidebar, or by pressing the **Location (2D)** button from an asset Dashboard.

Simply click on any of the red dots to see which asset you've selected.

You can change which floor you are looking at with the drop-box in the top-right hand corner.

The map can *pan* (ie. move up, down, left and right) by clicking and dragging on any part of the map.

You can *zoom in and out* of the map by using your scrollwheel.

Charts and Time Travel

This section covers how you create charts in ARDI, and how you use our **TimeTravel** control.

Note that this is an advanced topic – if you've read the previous sections of this document, you should now be capable of using ARDI.

The following sections explain more about how you can use charts in ARDI – in particular, the ability to view historical information and compare.

Basic Trendlines

The easiest chart to create is a trend line – a chart showing the changes to a single asset property over time.

All you need to do to create a trendline is open the asset dashboard and click/touch the property. You'll be shown a live trend.
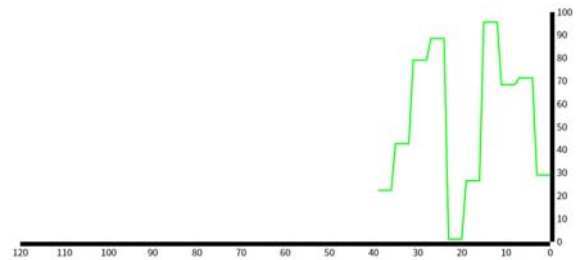
The Time Travel Control

The time-travel control appears in several different ARDI products and is the way you control *when* you are looking at. It appears in the top-left corner of the screen.

In most cases when you open a web page, you will be looking at **live** data - the latest information available.

Change Context

Change Range

Change Date/Time

Toggle Comparison
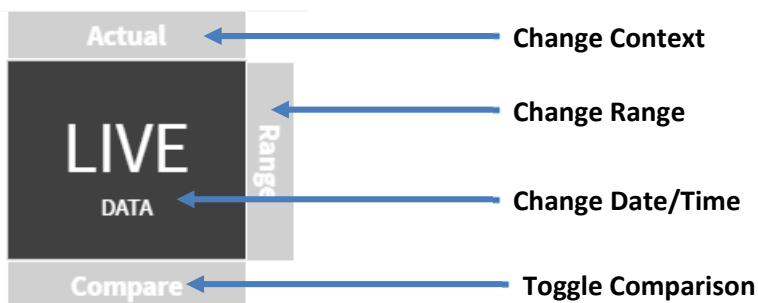
Events

Some of the following documentation will discuss *events*. Events are time-frames – the start and end of a shift, the start and end of a batch or production run etc. **Many ARDI servers don't use events**. If your site doesn't, you can simply ignore these points.

Changing Date and Time

When you click on the black square, a new menu appears.

Live returns the chart to showing the latest data.

Event allows you to pick an event (ie. batch number #2295, afternoon shift on 20/2/2015 etc.) to view. In many cases, this will result in you looking at a *range* of time rather than a single moment.

Calendar opens up a calendar so you can pick a specific date and time to view.
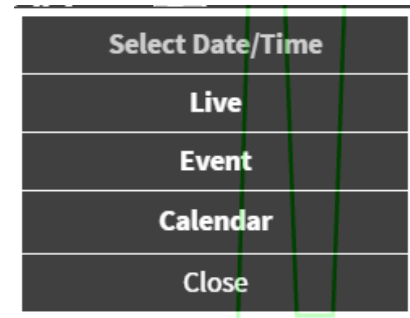
Viewing a Range of Time

If you'd like to look at more than one instant in time, you'll need to choose a *range*. By clicking the range button, both a second date box and a menu will appear.

As above, **Calendar** lets you pick a date and time to act as the *end* of your range.

Event allows you to choose from your list of events

Recent allows you to pick from some common date ranges, such as 'Today', 'Yesterday' etc.

Once you've selected the time, your charts will update.

Please be aware that…

- If you choose a time that occurs before your current start time, then the time you've selected will become the new start, and the existing start time will become the end.
- If you're running "Live" and choose an end date, it will become the new start date and the *current time* will become the end date.
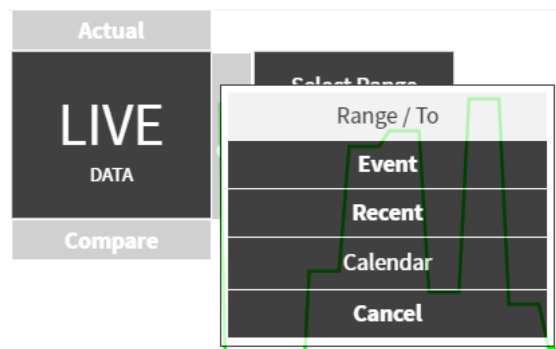
Comparing to Another Time

You can compare one instant or one range of time to another, using the *compare* button.

When you click the compare button, you'll be given the same options as when clicking the range button. The only difference is that your reports will now show extra, dotted lines to show the measurements made at the chosen time.
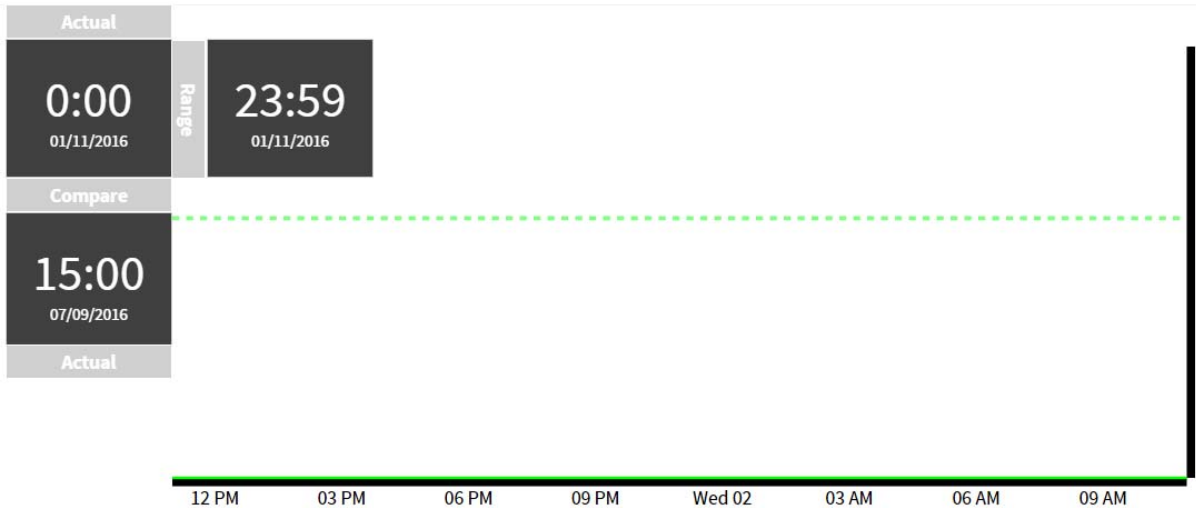
Above you can see a chart of two very stable values – the solid line represents the **top** range (0:00-23:59 on 1/11/2016) while the dotted line represents the **bottom** range (15:00-14:59 on 7/9/2016).

Changing Contexts

At the top of the Time Travel control, you may see a **context** button. This button is only available if your ARDI site is making use of the context feature.

Before we cover its use, we will discuss what a context is.

In some cases, there may be different places for ARDI to find values for your properties. For example, a plant might have a *model* or a *simulator* that predicts how your system should operate, and you'd like to see those values instead of your live ones.

You could also have taken a 'snapshot' of your plant when it was in ideal working condition, and you'd like to look at those values – and more importantly, compare them against the current state of the system.

By changing your context, you can choose between these sources of information. This means you can easily create a chart that details the state of your system against an 'ideal' state, or a 'dangerous' state that you've recorded earlier, or find out close your model was to the real-world.

You can change the context separately for both the upper and lower parts of your comparison.
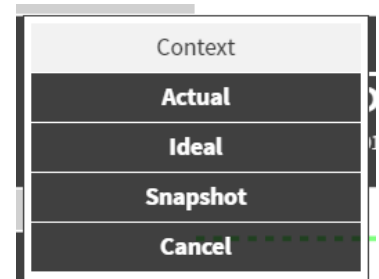
Other Charts

As well as a single trendline, there are many other charts available.

These are accessed by clicking on the **Charts** button either in the Dashboard or the Diagram for your asset.

ARDI uses your *relationships* to help create charts that might be meaningful for you. It guides you through the process by asking three questions…

- The *type* of chart you'd like to make
- The *property* you want to report on
- The *assets* you'd like to show.
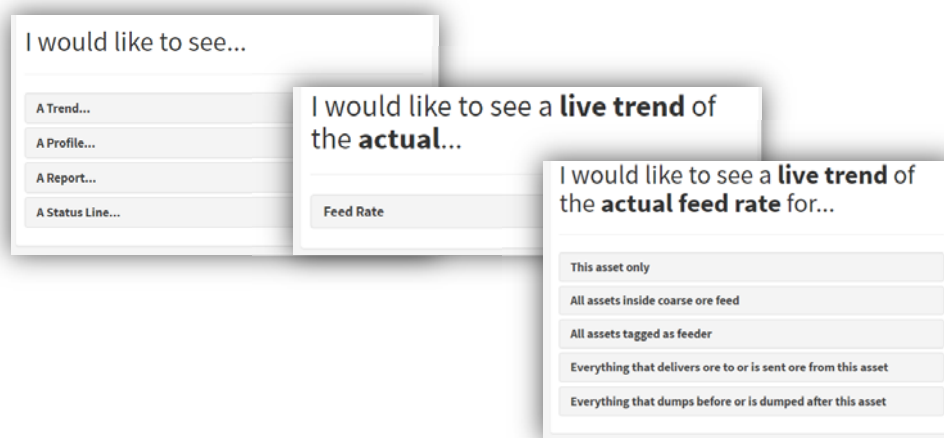
Single-Line Charts

For example, the standard single trendline chart can be made by choosing that you would like to see a **trend** of the **property** for **this asset only**.

This is identical to the chart you get by clicking on a property in the Dashboard.

Multi-Line Charts

You can make a multi-line trend chart by using the relationships to select which assets you'd like to include.

In the example above, the asset has three relationships (Location, Granulated Ore and Conveyor Sequence) and is tagged as a 'Feeder'.

This means that you can quickly produce a chart that compares your asset to…

- All other feeders on the plant.
- All other assets in the same section/machine
- All of the items that are part of the granulated ore transfer line
- All of the feeders that dump onto the same conveyor belt
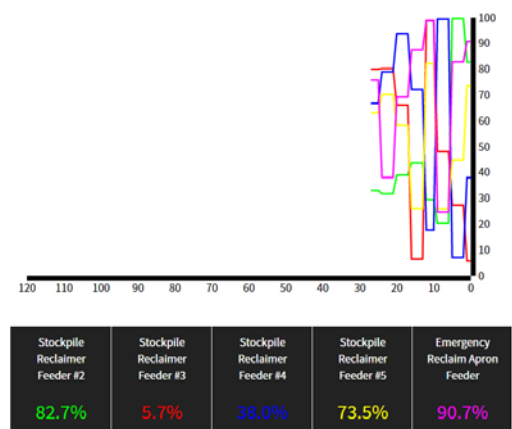
Profiles

A profile is a chart which uses your *relationship* as an *axis*.

In the above example, there's a chart that shows five feeders. In this case, they all dump their contents onto the same conveyor belt.

They drop their contents in a specific order – feeder #2, #3, #4, #5 and the Emergency Reclaimer Apron Feeder.
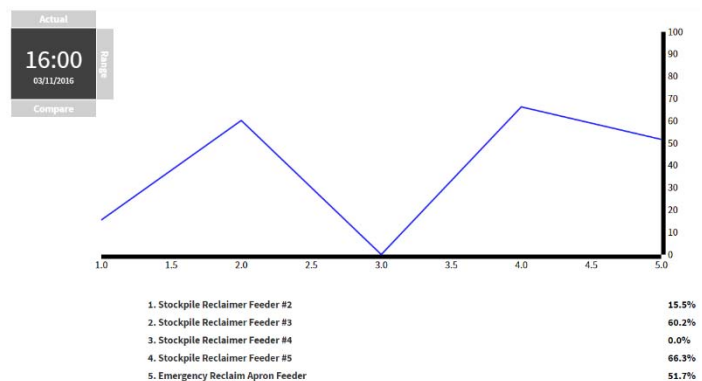
It just so happens that we have a relationship named **sequence** which follows this pattern, starting at Feeder #2 and working its way through to the reclaimer feeder. The ARDI diagram is shown below…
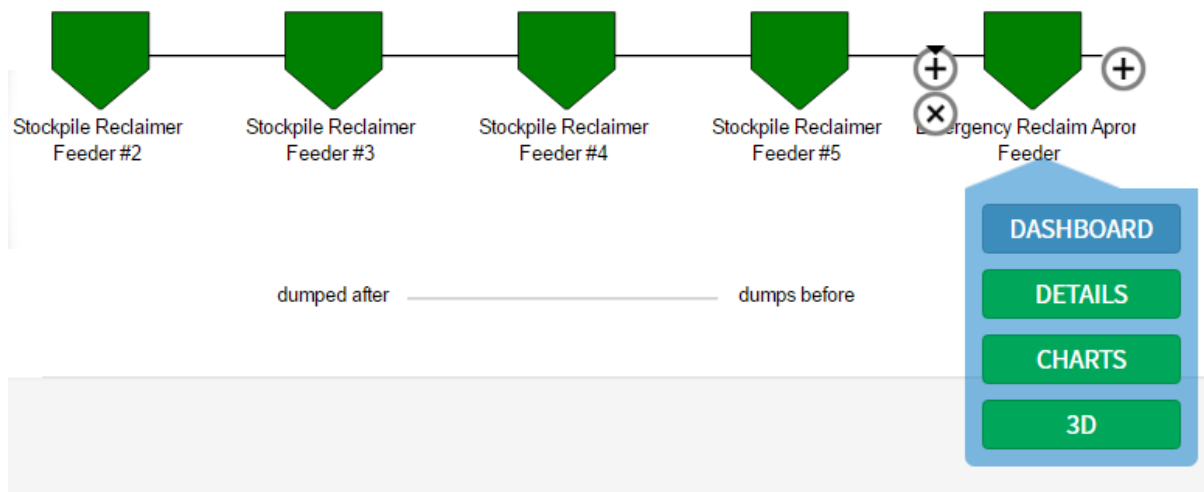
If we were to make a profile chart of this, we will end up with a chart where the Y-axis is the property we are interested in, while the X-axis is the order of the asset in the relationship.

On the chart page, we choose to show a **profile** of the **property** for **Everything that dumps before or after this asset**.

This style of chart is great for discovering problems with load balancing and locating potential leaks or blockages in process lines.

1. Stockpile Reclaimer Feeder #2	15.5%
2. Stockpile Reclaimer Feeder #3	60.2%
3. Stockpile Reclaimer Feeder #4	0.0%
4. Stockpile Reclaimer Feeder #5	66.3%
5. Emergency Reclaim Apron Feeder	51.7%

Status Lines

Trends and profiles work for **analogue** measurements – meaning that they won't allow you to choose properties that are **digitals** or **enumerations**.

If you'd like a chart to show how these discrete properties have changed, the Status Line chart will allow you to choose between your non-analogue properties to build a chart around them.

Advanced Usage Examples

Finding a Leak

If you believe that there is a leak in a system that has multiple sensors, you can make finding it simple by creating a *profile chart*.

For example, if you believe you have a water leak in a line that has several pressure sensors, open any one pressure sensor on the line, click **Charts**, **Profile**, **Pressure** and **Everything that supplies water to or is supplied water by this asset**.

You'll get a single straight line – if you see a dip, you've either got something consuming water, or a leak.

Plan Comparison

You can show how the load-balance of your system varied between your plan and your execution.

By comparing two instants in time across two different contexts, your dotted line gives the *planned* distribution, while your solid line gives your *actual* distribution.
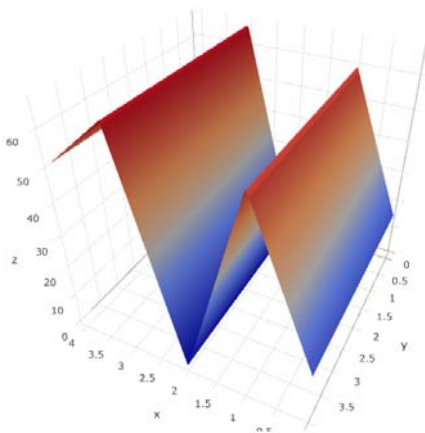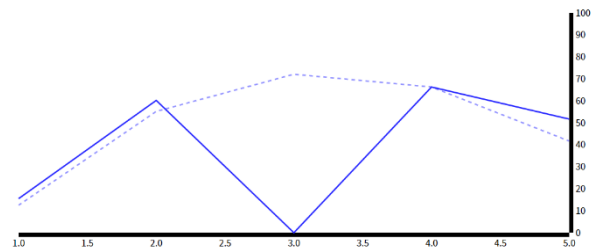
Profiles Over Time

One of the most powerful profile-based reports appears when you have a profile report across a range of time.

Because you have *three* axes (Sequence, Value and Time), a 3D surface plot is generated to show how the value has changed across the relationship, over time.