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**DV9253 Connectivity Project**

**Mono Cloud Platform: Overview Specification**

Version: 1

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To follow

**Data Exchange – Controllers to MCP**

Overview

The controllers used in the assets are going to be storing data and sending this in small batches when each controller is in an idle status (when the user is opening a door on an oven for example). This process will minimise the potential data loss should any network issues cause a dropout in connectivity.

More to follow….

**Design Updates**

Overview

Below are generic updates to the V1 design:

* To follow

**Access Control**

Overview

User access levels will be setup to ensure only the relevant groups only have access to the correct areas of the Mono Cloud Platform (MCP).

Access Levels

1. **Administrator** 
   1. Able to access all parts of the system
2. **Editor**
   1. Add/edit/delete details of customers
   2. Add/edit/delete details of Dealers done
   3. Add/edit/delete Assets
   4. Add/edit/delete Controllers done
   5. Add/edit/delete address details of customers
   6. Add/edit/delete Engineer users
   7. Add/edit/delete Client Administrators
   8. View Reports
3. **Dealer** 
   1. Add/edit/delete Client Administrators
   2. Move Controller address
   3. View Reports
4. **Engineer** 
   1. Move Controller address
   2. Log any information on the Controller, change log report.
   3. View Reports
5. **Client Administrator**
   1. Add/edit/delete sub users (Clients)
      1. Specify which groups of sub users can access reports
      2. Specify which groups of sub users can push updates (Wallpaper, 7 Day timer etc)
   2. View Reports
6. **Clients**
   1. View Reports

**Setup Process: Create Asset**

Overview

Each asset type has to be created and saved to the Mono Cloud Platform (MCP) once so that it can be then added as a unique asset with an associated serial number to each client. Every variation of the asset has to be added individually.

Create Asset Process

1. Editor level user creates a new asset, the fields are:
   1. Asset Category (Oven, Water Meter etc)
   2. Asset Type (Convection, Deck etc)
   3. Controller Type (Eco-Touch, Eco 2 etc)
   4. Number of Controllers (this equals the number of individual controllers on the asset, allows for additional auth codes)
   5. Number of Trays (4, 10 etc)
   6. Tray Size (40cm x 60cm, 30” x 18”)
   7. Handed (Right-handed, or Left-handed)
   8. Format (Portrait or Landscape)
   9. Power (Single-phase or 3-phase)
   10. Power Consumption variables
       1. Light power consumption
       2. Heating element consumption
2. Entered data is validated and then saved in the MCP database.
3. It would be possible to edit any assets which have already been added

The above process is a one-time setup procedure for each variation of asset.

It is anticipated that the asset type for Phase I will be only ovens, however future asset types could include other Mono or 3rd party company products. It is expected that other asset types such as fridges will have their own set of fields which will differ from the above.

**Setup Process: Client Module**

Overview

The Client Module holds all the information on the client and location details for where each controller is physically installed, below are the fields which are stored within this module:

Setup Fields - Manual Entry

* Client Name
* Client Head Office
  + Address Line 1
  + Address Line 2
  + Address Line 3
  + Town/City
  + Postcode
  + Primary Contact Name
  + Primary Contact Number
  + Primary Contact Email
* Zone
  + Zone South
  + Supermarket Central
  + Supermarket North
  + Supermarket South
* Region
  + 71
  + C01
  + C02
  + C03
  + C04
* Cluster/Area
* Store Code (unique number entered manually)
* Type
  + Convenience
  + Supermarket
  + OFC
* Store Name
* Address Line 1
* Address Line 2
* Post Town
* Postcode

**Setup Process: Client Asset Assignment**

Overview

The Controller Module holds all the information on the controller, below are the fields which are stored within this module:

Setup Fields - Manual Entry

* Serial Number (Unique Field)
* Authentication code (Generated by MCP)

Auto Populated Fields - On first connection with Controller, power cycle and reported directly if any of the fields below are changed via USB on the machine manually.

* Firmware Version
* Software Version
* Recipe Version
* Skins
* Wallpaper
* 7 Day Timer
* Sleep Delay
* Controller date and time
* Status
  + Online
  + Offline

Remotely updatable features on each controller:

* Firmware
* Software
* Recipe
* Skins
* Wallpaper
* 7 Day Timer
* Sleep Delay
* Controller date and time
* Remote Kill
  + Enabled
  + Disabled

**Setup Process: Dealer Module**

Overview

The Dealer Module holds all the information on the dealer, and location details for where each controller is physically installed for each of their clients, below are the fields which are stored within this module:

Dealer Setup Fields - Manual Entry

* Dealer Name
* Dealer Region
* Dealer Contact

Dealers also have to manage where each asset is physically located and which client, they have placed this with. Below is the fields the dealer will need to complete for each of their clients before any assets can be assigned and activated.

End Client Setup Fields - Manual Entry

* Client Name
* Zone
  + Zone South
  + Supermarket Central
  + Supermarket North
  + Supermarket South
* Region
  + 71
  + C01
  + C02
  + C03
  + C04
* Cluster/Area
* Store Code (unique number entered manually)
* Type
  + Convenience
  + Supermarket
  + OFC
* Store Name
* Address Line 1
* Address Line 2
* Post Town

**Setup Process: Asset Connectivity**

Overview

Once the asset has been manufactured, it will need to be added to the Mono Cloud Platform (MCP) so it can be enabled for data connectivity and checked it is responding on the MCP before it is assigned to a client. Unless the asset is added to the MCP, it will not be able to communicate and transmit data.

Setup Process – pre dispatch

1. Editor level user adds hardware from a preset list of assets which have already been entered into the MCP, Controller details including model name and serial number
2. One off authentication code generated by MCP
3. Editor adds authentication code to controller via the Controller touch screen
4. Controller is plugged into network and connected to internet
5. Editor looks for hardware to become active in MCP, once active Editor disconnects controller.

The Controller is now ready for installation, at this stage it can be shipped to any customer but is ready to be connected to the MCP.

**Asset Assignment Process: Direct Sale**

Overview

Once the Asset has been setup in the MCP, it needs to be assigned to a client. Once assigned to a client it will start recording and storing data.

Setup Process – pre dispatch

1. Editor level user selects asset type, then is displayed a list of unassigned serial numbers of assets.
2. They then select the serial number and then select a client to assign this to.
3. The client options drills down into regions and areas, until they reach store level and assign the Asset to this location.

The Asset is now ready to transmit data, the MCP is ready to receive and process the data from the asset.

Setup Process – Controller on site

1. Controller is installed on site and Ethernet connection is active
2. If customer uses a proxy server, then the proxy server details need to be provided to the Engineer by the client so they can be added to the to the controller via the Controller touch screen to establish an internet connection. Default connection type is DHCP.
3. Engineer logs in to the MCP looks for the Controller.

The Controller is now fully active, registered to the client and actively recording data.

**Asset Assignment Process: Dealer Sale**

Overview

Once the Asset has been setup in the MCP, it needs to be assigned to a dealer. Once assigned to a dealer, it can then be assigned by the dealer to a client of theirs. Once assigned to the end client, it will start recording and storing data.

This overview overs the Controller being sold via an authorised Mono Equipment Dealer.

Setup Process – pre dispatch

1. Editor level user selects asset type, then is displayed a list of unassigned serial numbers of assets.
2. They then select the serial number and then select a dealer to assign this to.

The Controller is now ready for installation, at this stage it can be shipped to the Dealer and is ready to be connected to the MCP.

Setup Process – Dealer

1. Dealer logs into MCP
2. New Controllers are displayed in hardware list
3. If client is not added, Dealer must create account on MCP and add location details.
4. The Dealer drills down into regions and areas, until they reach store level for their client and assign the Asset to this location.

Setup Process – Controller on site

1. Controller is installed on site and Ethernet connection is active
2. If customer uses a proxy server, then the proxy server details need to be provided to the installing engineer by the dealer/end client so they can be added to the to the controller via the Controller touch screen to establish an internet connection. Default connection type is DHCP.
3. Engineer logs in to the MCP looks for the Controller.
4. If Asset is connected, the dealer should see the Asset status as active (if the asset is turned on and connected to the internet).

The Controller is now fully active, registered to the end client via the dealer and actively recording data.

**Report Module**

Overview

Below is a list of reports authorised users will be able to view on the MCP, all reports can be downloaded in a CSV format which would contain the raw data of the report and the date range:

Utilisation

Peak time usage   
Start End time

Calculate the utilisation of the controller over a given date

Energy Usage

Need to know heater rating (wattage) from setup process  
Accumulated Heater on time   
Accumulated lights (wattage)   
Accumulated damper  
Accumulated Canopy   
Accumulated Steam  
Accumulated fans  
Sleep mode power usage to be provided by Mono as a fixed variable

Programme Usage

Display a list of all programmes used in a table format by selected date range.

Users will be able to compare data for a secondary date range.

When a bake program is selected to run, a generic event is triggered. This is titled "Selected to run" with a description of "Product Ref". This data is captured and stored with the date, the total accumulation of this will provide the value for the Programme Usage field.

The product reference number (in the range 0 - 239) indicates which program has been selected.

Inactive Report (Power on)

Display a pie chart show the total time the controller has been on (Accumulated time field?) and take this away from the XXX field to calculate the used time. This should then provide the inactive time.

Users will be able to compare data for a secondary date range and show the actual difference and percentage value.

The controller will issue a generic event titled "Power on" when power is applied.

Currently the controller posts regular cavity temperature values as "Temps", "Thermocouple 1", "Measured temp." every 30s unconditionally. This could be taken as a 'heartbeat' to determine that the system is powered but if this stops it could be as a result of a network failure. If the network functionality is recovered during the power on time, normal telemetry will continue.

A generic event "Broker reconnects" is tallied and reported upon reconnection of the MQTT broker service.

Inactive Report (Utilisation)

Display a pie chart show the total time the controller has been on (Oven status and take this away from the XXX field to calculate the used time. This should then provide the inactive time.

Users will be able to compare data for a secondary date range and show the actual difference and percentage value.

The current oven operating condition is reported by mode and state. These are reported immediately when a value changes.

USB Updates

Any updates performed manually via USB on the controller are reported and stored.

MODES:

Event title: "Oven mode"

Values:

 "STANDBY"    - Oven is off

 "IDLE"       - Maintaining the set temperature and fan operation

 "PROGRAMME"  - Programme mode is selected

 "MANUAL"     - Manual bake mode is selected

 "MULTIBAKE"  - Multi-bake mode is selected

 "DIAGNOSTIC" - Diagnostic mode selected via high-level menu option

STATES:

Event title: "Oven state"

Values:

 "IDLE"      - Maintaining the set temperature and fan operation

 "PRECYCLE” - The oven is preparing for the bake (heating/cooling etc).

 "CYCLE"     - Bake cycle is started and timers are running

 "SLEEP"     - Oven has entered sleep state

Additionally, an event titled "Ready status" will report whether the oven is currently ready to bake a selected product.

So, for a typical bake operation, programme mode is selected, the state will change to "PRECYCLE" whilst the oven gets to temperature and once ready the operator will press a start button and the bake time will commence. The state changes to "CYCLE".

At the end of the bake, the operator presses a stop button and the state will change to either pre-cycle again or back to idle.

This way we can determine the total time that the oven was actually running a bake.

We can determine other factors too e.g. the oven has been at ready temperature for a long period of time before a bake is actually run.

A long time spent in pre-cycle when the oven should be heating might indicate that the heaters are becoming less efficient etc. (The latest temperature set-point is reported immediately when it is changed).

Uptime Report  
Display a pie chart showing the up time (which data fields?) with a percentage value.

Users will be able to compare data for a secondary date range and show the actual difference and percentage value.

Oven Status   
Display a list of all Controllers which have an error status (Oven Fault Status field). This is a real-time report showing the live values (as close as possible to live). This table of data will also list the store name and region.   
  
This report is designed for the user to see if all the Controllers which are reporting an error are in the same store.   
  
   
An alarm event is triggered immediately when there is a fault condition which contains a fault code.

Event type "Alarm", title "Fault Ref".

**Mono Cloud Platform**

Login  
Overview

This section takes user to a screen which allows users to login. Users can not use the site without logging in. Google Captcha will be used to help prevent automated systems getting into the site. Login fields:

* Email Address
* Password
* Google Captcha
* Password reminder link

If the password reminder link is clicked, the user must enter their email and then wait for a link which is sent to them. This link is time sensitive and only valid for a limited for 60 minutes.

Home page  
Overview – All Users

The home page of the MCP will display features which are only visible depending on the logged in users’ profile. All users will see the following elements:

* Mono Brand
* Icon strip on left with mobile menu
* Alert bell
  + If urgent message has been sent to the user profile logged in, then a red dot will display showing that unread alerts on waiting. When clicked, this will drop down and display the last 5 alert headlines. Clicking any alert will take the user to the alert module.
* Refresh “circle”. This will reload the data on the page without reloading the entire page (like a browser reload) which causes more data to be requested, this function only refreshes the main data pane.
* Users name with link to account profile section
* Welcome message
  + “Morning *Firstname*” displayed between hours of 00:00 and 11.59
  + “Afternoon *Firstname*” displayed between hours of 12:00 and 17:59
  + “Evening *Firstname*” displayed between hours of 18:00 and 23:59
* Client Brand and calendar
  + Date range on calendar will allow the report information to be filtered by date
  + Account history shows major events such as the controller being off line

Home page  
Overview – User type X

The home page of the MCP will display features which are only visible depending on the logged in users’ profile. All users will see the following elements:

* Mono Brand
* Icon strip on left with mobile menu
* Alert bell
  + If urgent message has been sent to the user profile logged in, then a red dot will display showing that unread alerts on waiting. When clicked, this will drop down and display the last 5 alert headlines. Clicking any alert will take the user to the alert module.

**Alert Module**

Overview

The Alert Module allows users to be notified of system (MCP) and Controller alerts. All alerts will appear on the home page under the “bell” icon also.   
  
**MCP Alerts**

MCP alerts are not expected to be that frequent and are to notify users of any planned downtime, or emergency issues relating to the operation of the MCP. These messages will also be sent via email to all users of the MCP.

**Controller Alerts**

Controller alerts are critical notifications which the user needs to be aware of. Critical Controller notifications are:

* Oven fault status
* Oven status
* Downtime
* Door left open
* Oven disabled
* Power status

These messages will also be sent via email to all users of the MCP.

**User Profile**

Overview

MCP user accessible fields.

**About Us**

Overview

General information on the MCP and Mono.

**VISUAL TO GO HERE**

**Contact**

**Overview**

The template provides, company address details, contact telephone numbers and a form.

**Site wide features and functionality**

The following widgets are required to deliver the functionality recommended for the MCP.

Cookie warning widget (W-COK)

Overview

The cookie warning is provided in response to current EU privacy legislation. From a design and usability perspective it is considered better to display at the foot of the page.

Functional description

The warning is shown once only. The user doesn’t need to interact with the warning. The cookie is set immediately to record that the warning has been displayed. Therefore, the logic is as follows: -

1. - User arrives on any page
2. - Cookie checked to see if warning message shown before
3. - If cookie not set
   1. - Set cookie
   2. - Show warning message
   3. - If user clicks “Close” warning panel is closed
   4. - If user clicks “Learn more” user is taken to Cookies page and panel is closed

The mobile variant is simply scaled and centralised on the user’s device.

Technical recommendations

Ideally if the cookie has already been shown then the front-end code delivered to the browser should no longer include the cookie code to reduce page weight.

Cookie expiry can be 5 years.

Analytics

Overview

Google Analytics is to be used.

Functional description

Any view of a page using the supplied templates will cause the Analytics code to be triggered.

Build fundamentals

There are a number of fundamentals that should be followed to ensure that the site is best presented for search engines. These include: -

* Lightweight pages
* Caching
* Minimising calls to the server by combining JS files and considering CSS sprites
* Optimising images
* Minimising calls to the server to render a page

Device compatibility

The site will be designed to be responsive with some adapted functionality for the mobile variant. The site will be tested to operate uniformly and to the specification in the following device, operating system and browser combinations: -

|  |  |  |  |
| --- | --- | --- | --- |
| **Desktop** | **OS** | **Browsers** | **Browser versions** |
| 1. Windows | 1. Edge | Latest version |
| 2. Chrome | latest version |
| 3. Firefox | latest version |
| 4. Opera | latest version |
| 2. Macintosh | 1. Safari | latest version |
| 2. Chrome | latest version |
| 3. Firefox | latest version |
| **Mobile** | 1. iOS | 1. Safari | latest version |
| 2. Chrome | latest version |
| 2. Android | 1. Android Browser | latest version |
| 2. Chrome | latest version |
| 3. Opera Mini | latest version |
| 3. BlackBerry | 1. BlackBerry | latest version |
| 2. Opera Mini | latest version |
| **Tablet** | 1. iOS | 1. Safari | latest version |
| 2. Chrome | latest version |
| 2. Android | 1. Android Browser | latest version |
| 2. Chrome | latest version |

W3C/ AAA compliance

The web pages will comply with the World Wide Web Consortium (W3C) XHTML 1.0 standard for HTML web pages.

The web pages will comply with minimum W3C WCAG Level 1/A standard for accessibility.

Domains

The site will reside on TBC