



App Usage Guide

Congratulations on your purchase of the ICT Tracker construction field productivity tracking app for use on your projects. At any time you have questions about our product, please contact support at help@icttracker.com.

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JOBSITE USAGE SAFETY REMINDER!!

We at ICT feel that user safety is always a number one priority when using any type of tool on a construction jobsite. So, for your own personal safety and others onsite, be sure to pay extra attention to your surroundings when walking on a jobsite while using the ICT Tracker in any construction environment.



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Needed to Get Started

To get started you will need a few items before you can begin the process

1. An Apple iPad that support Apple ARKit technology.
 - According to Apple, in order to use ARKit, iOS devices need to have an A9, A10 or A11 chip.
 - The devices that use A9, A10 and A11 chips are:
 - iPad Pro 2016 or newer 9.7" display
 - iPad Pro 2016 or newer 10.5" display
 - iPad Pro 2016 or newer 12.9" display
 - iPad 2017 or newer 9.7" display
 - The ICT Tracker app is not set-up to use on an iPhone.
2. Download the latest version of the ICT App from the Apple Store to the iPad 
3. Autodesk BIM 360 DOCS Account
 - A BIM 360 DOCS Account will be needed to upload the model(s) to.
 - This is the platform that is used to store the NWD files that are imported to the iPad.
4. Your native CAD software used for file generation
5. Autodesk Revit and Navisworks Simulate or Manage (2017 or newer) software.
6. The original project trade model(s) and reference models in its native platform, preferably filtered to just your trade elements by level. These will be needed to place AR reference markers in and generate an NWD file to upload to the BIM 360 account.
7. Login Info for ICT Tracker

We will need a user email address to create an account for each user license.

 - ICT Tracker will use your account email address and a password that we provide for you to login to the app.



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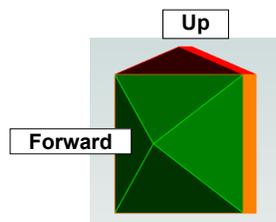
Model Setup

Before a model can be loaded in to the ICT Tracker app, AR Markers must be loaded into the native file as reference points that the field will use to synchronize the model to the field environment.

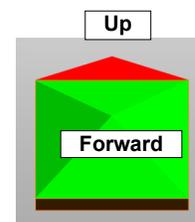
1. Start by selecting the project that the ICT Tracker app will be used and the location of the native format model files. The issue for construction or release for fabrication version of the native model file(s) should be used for tracking.
 - a. If using the augmented reality option, the user needs to identify the layout strategy for locating the markers based on project layout.
 - i. It is recommended that markers are located at each outside column outside of normal core construction traffic or the best available spots on the projects for access
 - ii. Markers should be located 20 to 35 feet apart to re-synch the AR model as you walk the project. Structural columns are usually a good field reference location for the markers.
 - iii. Markers can be located horizontally on the floor or vertically on a wall or column.
 - iv. The more points of reference the better to re-sync the model as needed

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2. Populate model with AR Marker Family
 - a. Insert the ICT provided AR Marker Family in to the models to the designated agreed upon locations.
 - i. Accuracy of layout is important, as each one of these locations correspond with a reference point in the field that a marker will be placed to orientate the model to the jobsite environment
 - ii. Do no modify or scale the Family as the markers provided are vital to the AR to identify the X,Y,Z location in the model in relation to the field as well as set the scale of the AR.
 - b. AR Marker Family Download
 - i. [Revit Families](#)
 - c. The marker naming will be based on a two-character numeric identifier for each AR Marker required.
 - i. Each marker consists of 3 elements.
 - ii. Each marker must be a unique number as two markers with the same number identifier cannot be used by the app.
 - iii. The Family represent as follows:
 1. AR Marker XX: a square element that is used to locate the X,Y center point and set the 1 to 1 scale of AR to the actual printed marker when located in the field
 2. AR Marker XX Up: a triangular element that locates the X,Y,Z point at the:
 - a. Positive Z direction towards the ceiling/sky when mounted in the vertical/wall position.
 - b. X or Y direction facing away from the user when mounted in the horizontal/floor position.
 3. AR Marker XX Forward: a pyramid element that locates the X,Y,Z point at the:
 - a. X or Y direction with point of pyramid facing towards the user when mounted in the vertical/wall position.
 - b. Positive Z direction with point of pyramid towards the ceiling/sky when mounted in the horizontal/floor position.



Vertical/Wall Mount



Horizontal/Floor Mount

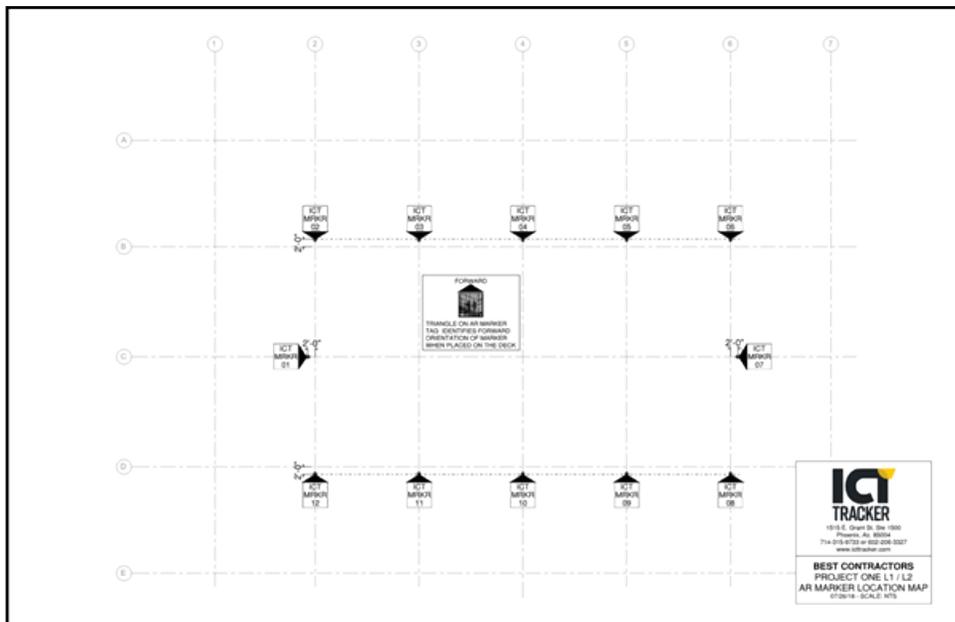


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3. In addition to the layout of the markers, an AR Marker layout sheet with dimensions or elevation reference annotations for each AR Marker location will need to be generated. This will be used for location and orientation of the AR Markers for field placement to be used with the app.
4. Upon completion of locating the markers in the model, an NWC model will need to be generated.
 - a. Autodesk Navisworks Simulate or Manage will be required to generate the NWC model from the native modeling program export.
5. Depending on the model usage by the app some elements should be filtered out to maximize efficiency of the ICT Tracker productivity tracking on the
 - a. Each model needs to be isolated by floor for viewing in the app
 - i. Certain elements on a level might have multiple level attributes based on location between floors, as in risers, or different level annotation based on user error.
 - b. Depending on the tracking strategy, multiple models could be filtered and generated based on usage, phasing or cost code breakouts of an installation. Potential strategies are:
 - i. Rough-in install elements only.
 - ii. Mains vs Branches
 - iii. Finish install elements only.
 - iv. Equipment or fixtures only.
 - v. Insulation or wrap only.
 - vi. Two models representing conduit and cable tray and the same model for pulled wire or cable completion
 - vii. Sleeves or penetrations
 - c. The following elements should be filtered or frozen before exporting to Navisworks
 - i. All insulation or wrap elements
 - ii. Any unnecessary or non-trackable accessories (i.e. gages, thermometers, inserts, etc.)
 - iii. All welds, gaskets, bolts sets, joints elements.
 - iv. All annotation should be filtered from the model
6. Upon completion of installation tracking and model generation strategy, generate NWD Model to use with Augmented Reality App
 - a. Convert all NWC model(s) into NWD format for use with app
 - b. The app only uses NWD files and not NWC or NWF files.

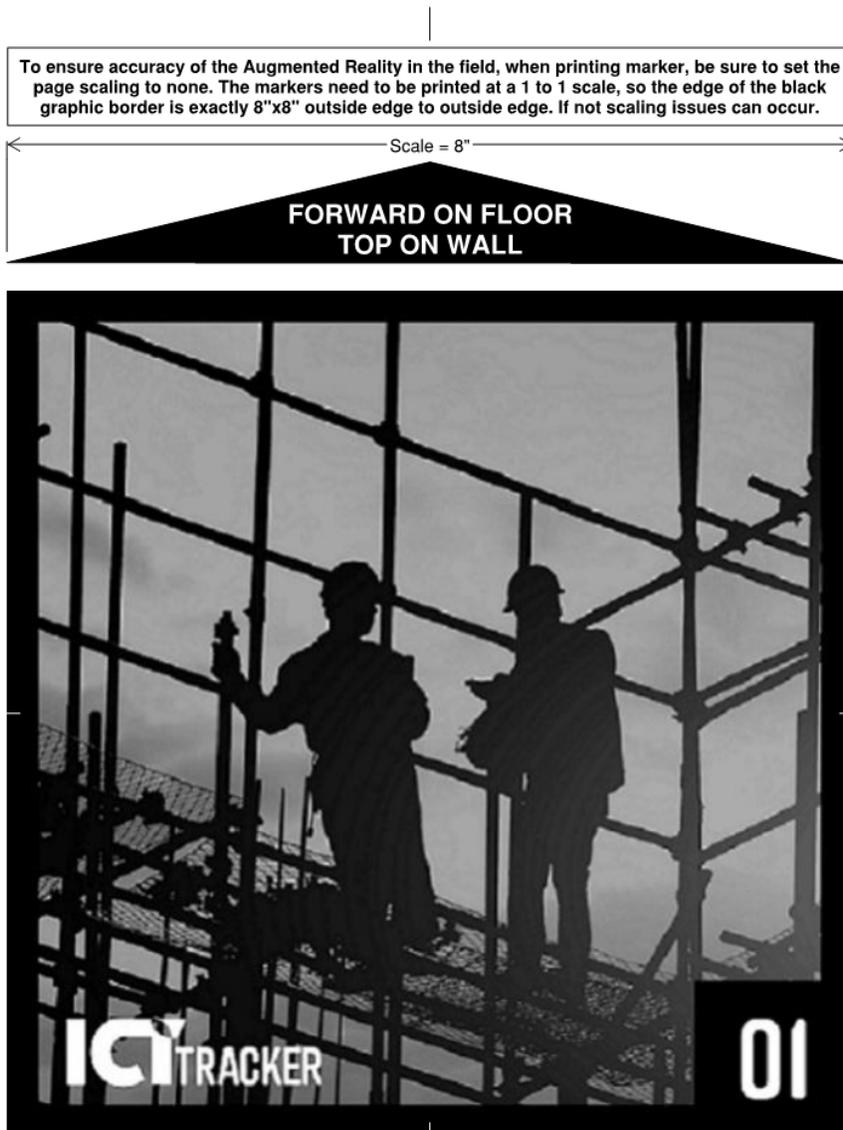
AR Marker Field Layout

1. Before the app can be used in the field, the markers need to be placed at their appropriate locations on the jobsite.
 - a. Reference the AR Marker layout sheet with dimensions or elevation reference annotations for each AR Marker location.
 - b. This needed to be generated by the cad operator who digitally located them in the CAD file.
 - c. Accuracy in the layout of the AR markers is crucial to the accuracy of the augmented reality in relation to the installed items.



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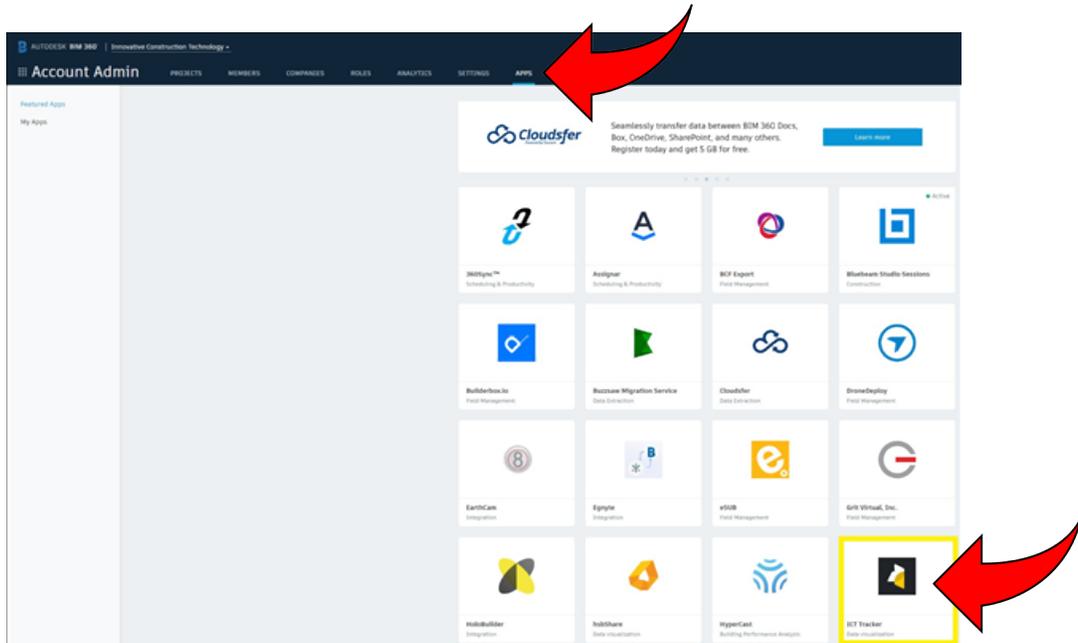
2. Print new markers or use the ones provided by ICT.
 - a. If you are printing new ones, the scale of the marker is critical to the scale of the augmented reality.
 - b. When printing new AR Markers, be sure the page scaling is turned off or set to none.
 - c. Page size needs to be a minimum 8-1/2"x11" to get the 8"x8" markers.
 - d. To download more AR Markers, follow the link below:
 - i. [AR Mark Download](#)



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BIM 360 set-up

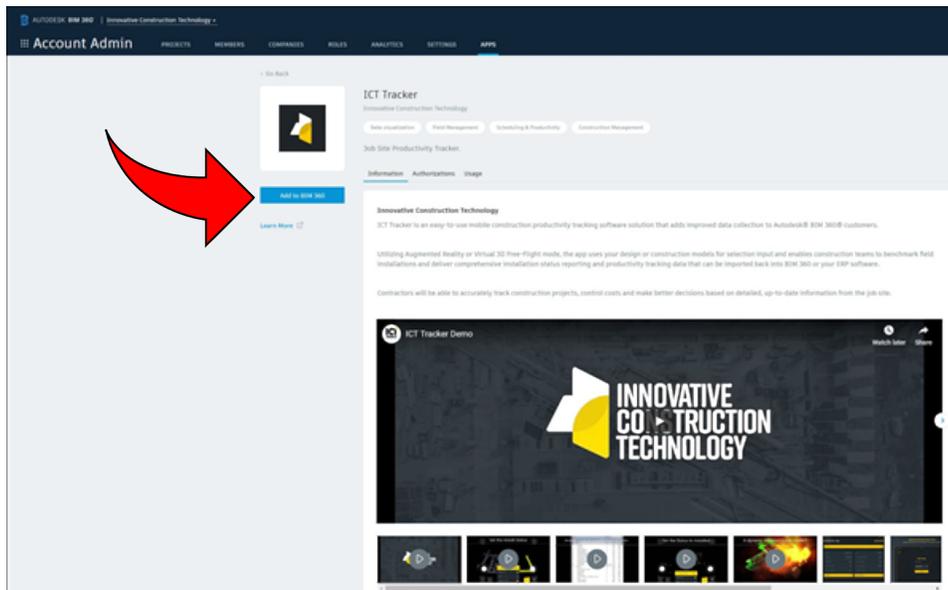
1. The first item that needs to be done before using ICT Tracker with BIM 360, is that the BIM 360 DOCs ICT Tracker app needs to be loaded for the iPad app to have access to the NWD files within BIM 360 DOCs.
2. We need a company BIM 360 account admin to log in as an admin user on BIM 360.
 - a. Access this interface at this URL: <https://admin.b360.autodesk.com/> or within BIM 360 “Account Admin” option
3. Navigate to the “APPS” tab on the ribbon see the “Featured Apps” section.
4. Look for ICT Tracker in the app selection list and click on the ICT Tracker App icon.



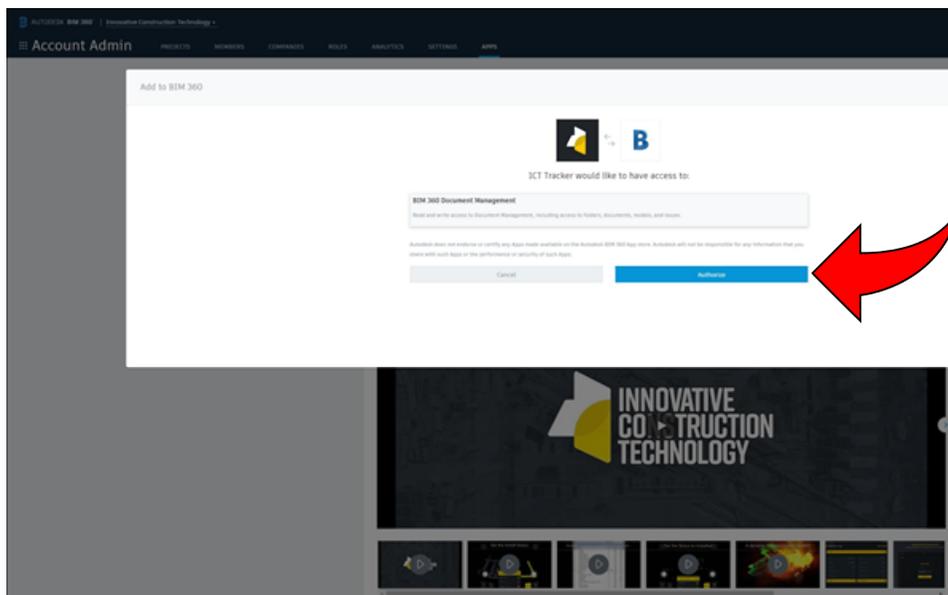


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5. Select the blue “Add to BIM 360” button under the ICT Tracker logo to start the install.

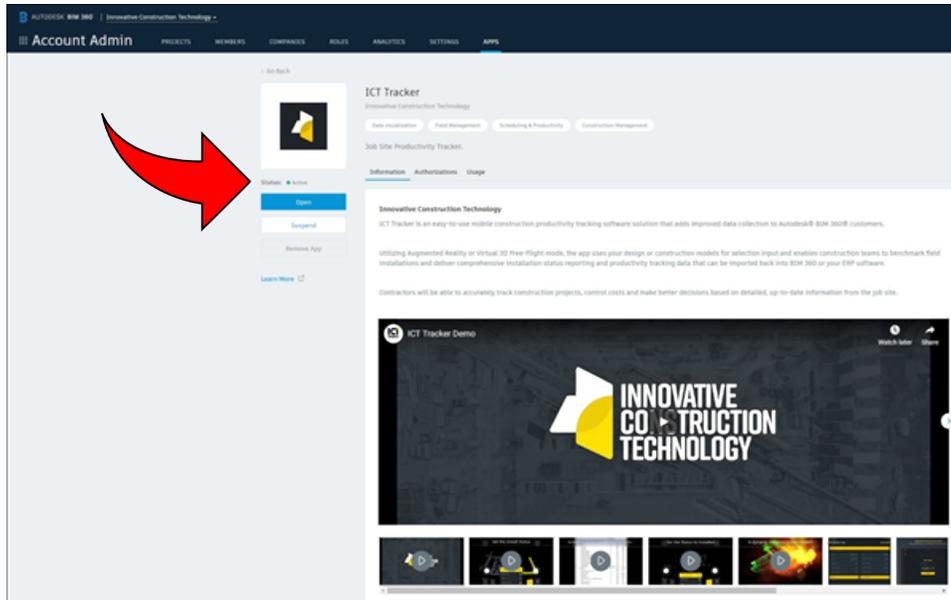


6. On the Add to BIM 360 dialogue box, select the blue “authorize” button to continue load

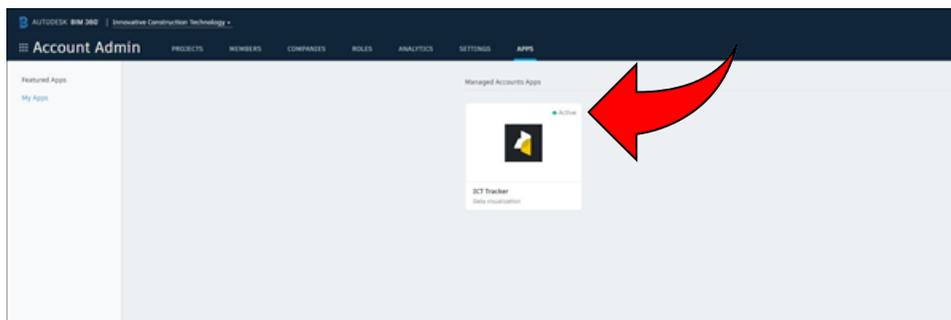


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7. This will bring you back the ICT Tracker app screen and if the install went correctly, you will see the status under the ICT Tracker logo now shows “Active”.



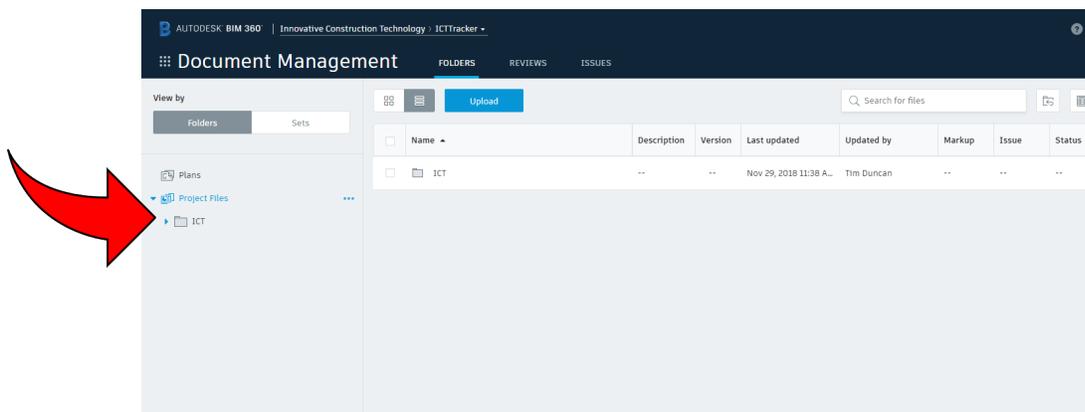
8. If you select the “Apps” from the ribbon, you will go back to the “Featured Apps” screen. You can now select the “My Apps” option on the left to see the apps installed and you will see the ICT Tracker app in the list and the radio button on the top right will be green and the status will be “Active”



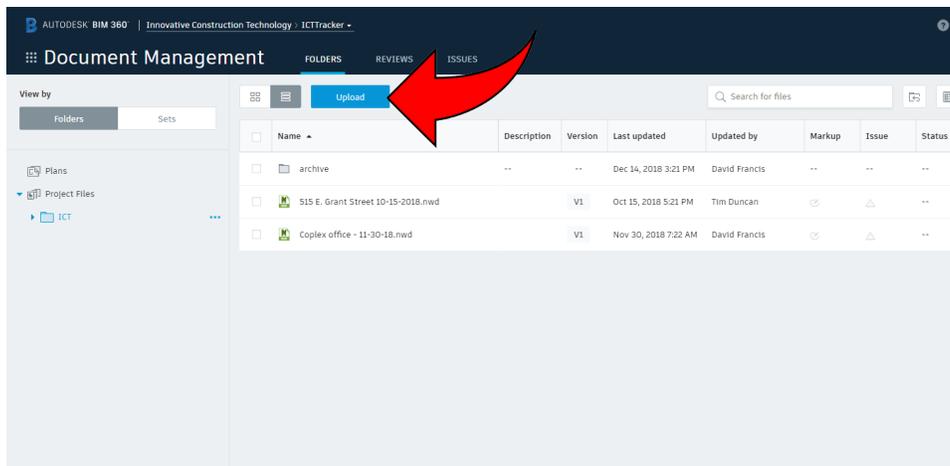
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Uploading models to BIM 360 DOCs

1. Upon completion of the NWD file generation, all NWD models must be uploaded to BIM 360 DOCs
 - a. To upload model(s) to BIM 360 DOCs you will need access to a new or existing project within your BIM 360 Docs Account from your Account of Project Admin.
 - b. The ICT Tracker NWD files must be located under the Project Files section within BIM 360 DOCs, under a folder named “ICT”.
 - i. If this folder does not exist, the Account or Project Admin needs to create the “ICT” folder for the users.



- c. Use the “Upload” feature to load your prepared NWD models in the ICT folder.
 - i. Remember that files without the AR markers cannot be used with the app.



- d. Once the project NWD files are loaded in BIM 360 DOCs, you are ready to use the app.

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App tools and Download

1. As with most iPad apps, finger gestures produce different results.
 - a. Single point selection.
 - i. Tap the screen with your finger to select an object or a screen dialogue button.
 - b. Multiple item selection.
 - i. Drag finger across screen to do a continuous selection of objects or option to create a selection lasso box.
 - c. To take a screen snapshot to share.
 - i. Press and hold the Sleep/Wake (on/off) button on the top of your iPad.
 - ii. Quickly click the Home button at the bottom of the screen.



2. User interface screen icon buttons

- a.  Opens the “Add Project” screen: used to add project files to app.
- b.  Opens the “Logout” screen: logout app button and help email address.
- c.  Opens the “Project Selection” screen: list of downloaded projects on iPad.
- d.  Return to previous screen: for view only screens.
- e.  Exit screen: for screens that require input.

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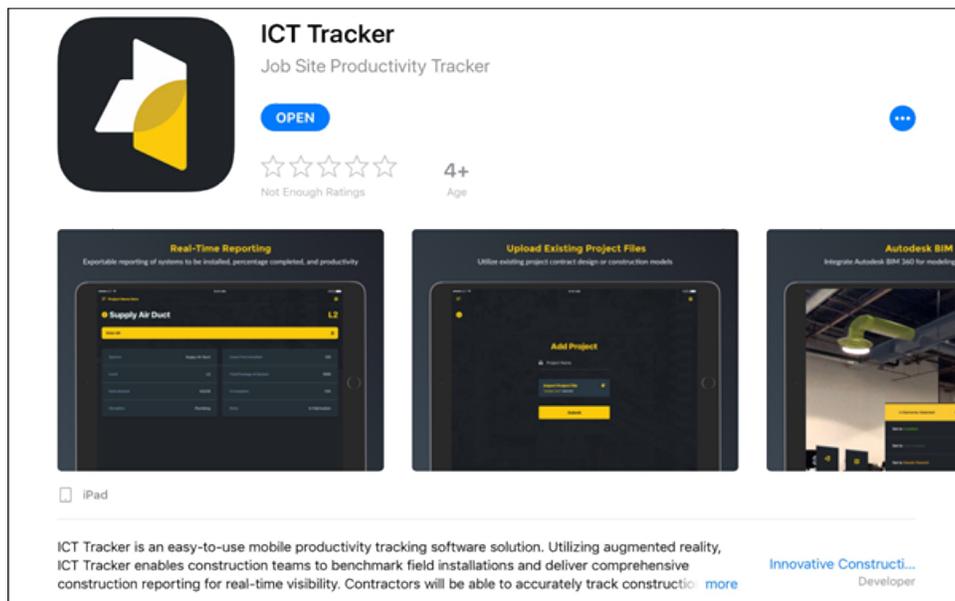
3. AR mode screen icon buttons

- a.  Exit AR mode.
- b.  Finger drag selection option.
- c.  Manual positioning tools: Move/Rotate/Scale.
- d.  Free Flight Mode.
- e.  Object Properties.

4. To obtain an ICT Tracker Subscription License, please contact ICT.

- a. Each subscription is specific to each iPad ID number, so be sure load on to the iPad to be used on site for tracking.

5. Use the Download ICT Tracker app from Apple App Store.



ICT TRACKER

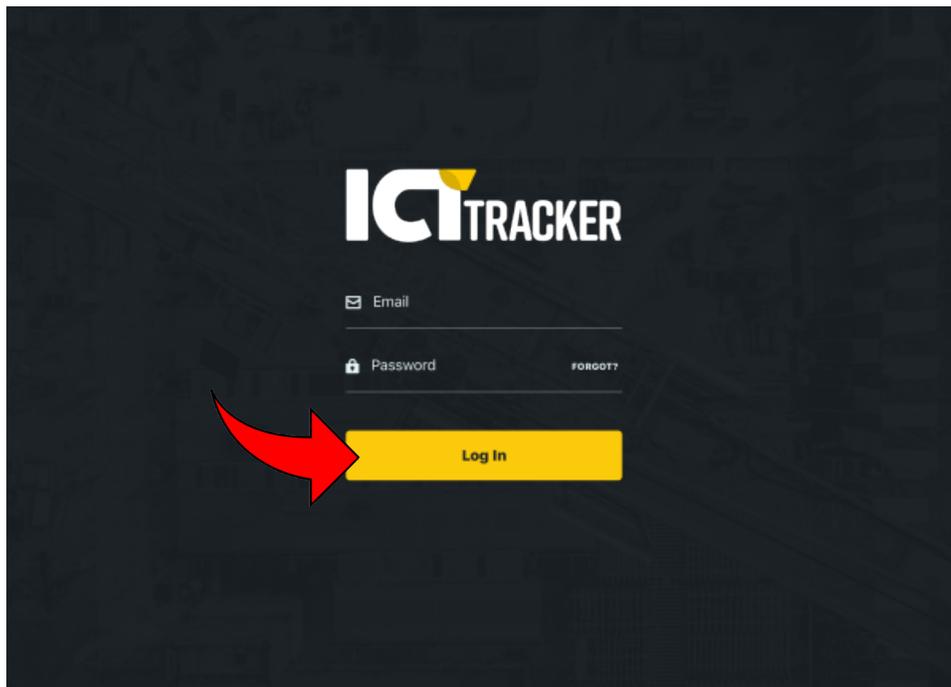
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Starting App and Uploading Models

1. Once the app is downloaded on to the iPad, tap on the ICT Tracker Icon to open the app.



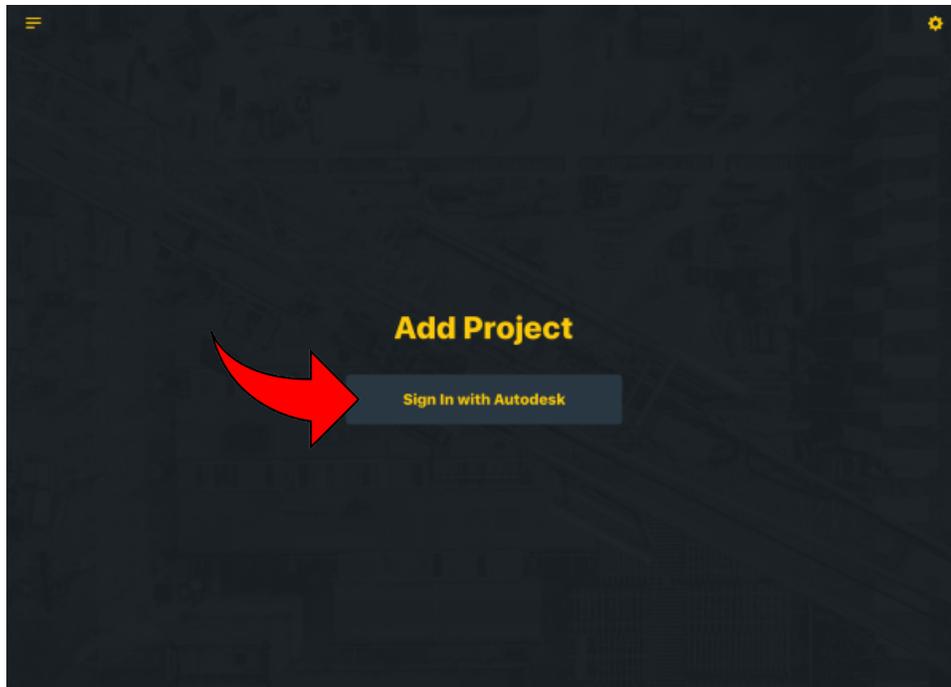
2. When the app opens, it will take you to the login screen.
 - a. Enter the user ICT Tracker subscription email address and ICT issued password.
 - b. Tap on the “Log In” button to enter the app.



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3. Opening Screen

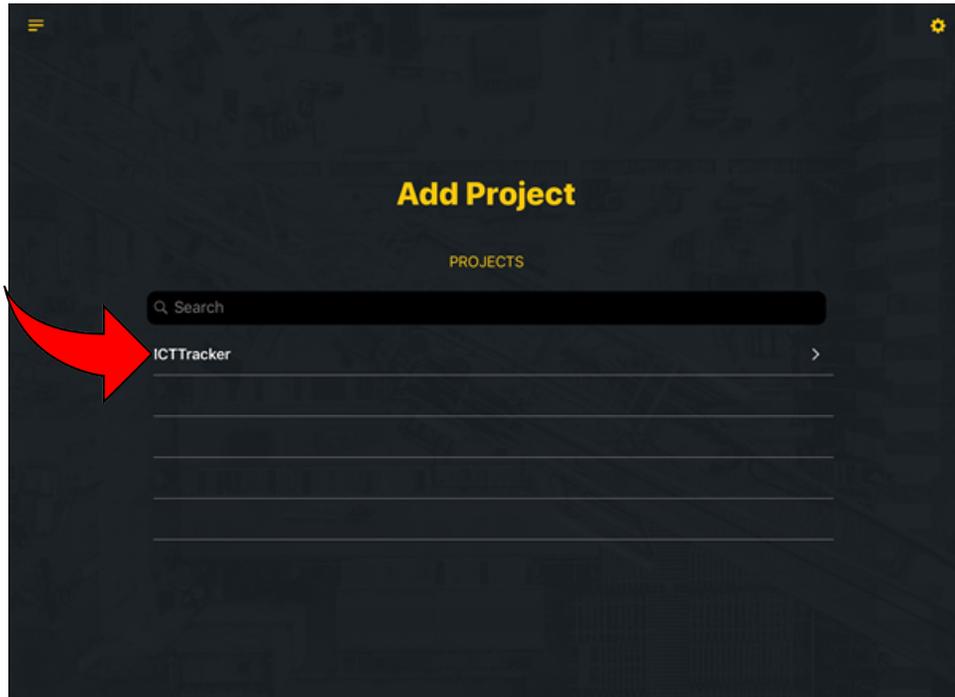
- a. The first time the app is used, the opening screen will go direct to the “Add Project” Screen.
 - i. To add a project, tap the “Sign in with Autodesk” button to open the BIM 360 account and add a new Project to the app.
 - ii. You will need your Autodesk BIM 360 DOCs credentials to login.



- b. The other option to load a project file is to tap the “Create New Project” button text on the top right of the “Project Files” screen to open the “Add Project” screen.

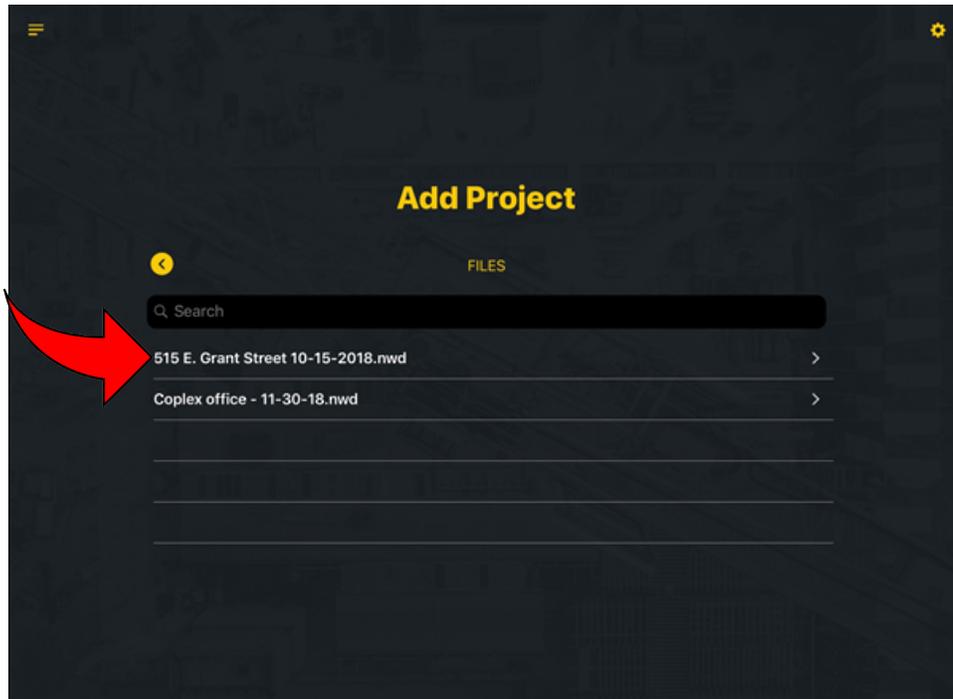
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4. The “Add Project: Projects” screen will open and list all the projects that the user has access to on the BIM 360 DOCs site and have a folder named “ICT” under the Project Files section.
 - a. Tap the project you want to select files from.



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5. The “Add Project: Files” screen will open and list all the NWD files that are on the BIM 360 DOCs project folder.
 - a. Tap the file you want to upload to the ICT Tracker app.



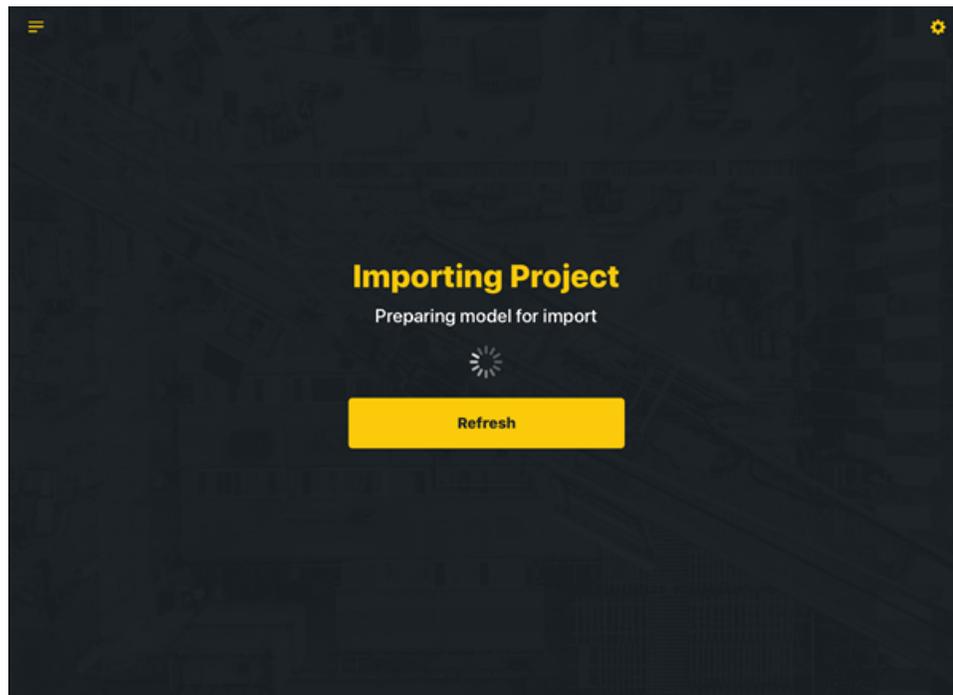
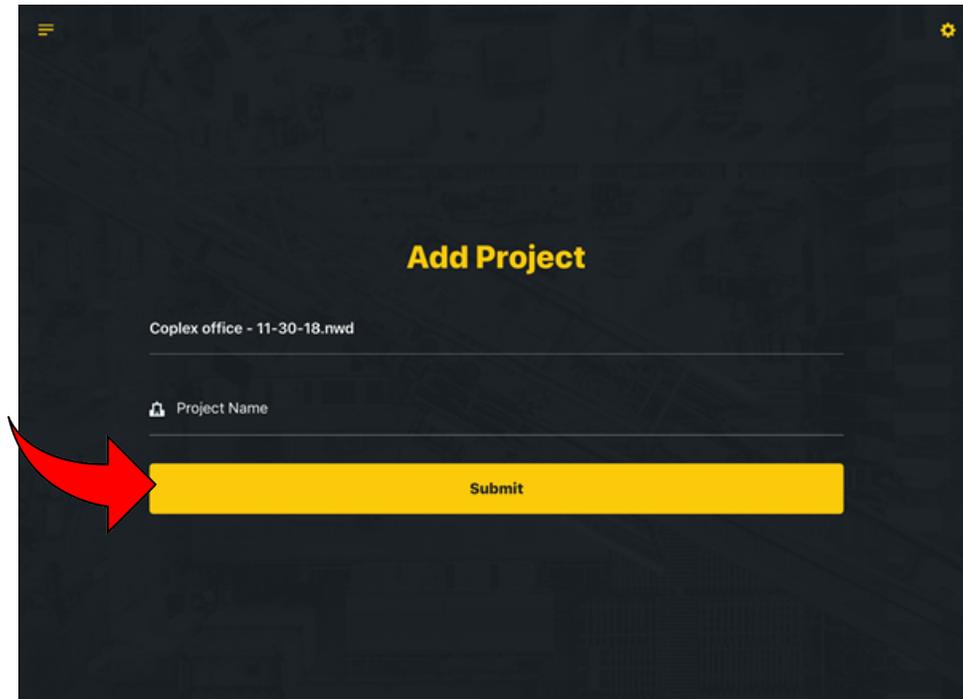


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6. The “Add Project: Submit” screen will open and show the file that has been selected to be uploaded to the iPad. The user needs to give the file a project name that will display on the “Project Files” screen.
 - a. Typical naming criteria you might want to consider:
 - i. <PROJ NAME>-LL-TT-MRKR 00-00-ZZ.
 1. <PROJ NAME>: Project name or abbreviation or project number.
 2. LL: Two-character level name: L1, L2, L3, UG, RF.
 3. TT: Two-character trade or element type identification.
 - a. If you deal with multiple trades you might consider this option, or characters for different model elements based on your breakout tracking strategy. Some examples:
 - i. MH: Mechanical Duct
 - i. MP: Mechanical Pipe
 - ii. EL: Electrical
 - iii. PL: Plumbing
 - iv. FP: Fire Protection
 4. MRKR-00-00: AR Markers associated with the model.
 - a. MRKR 01-08
 5. ZZ: File type or status.
 - a. FIN: Finish
 - b. RI: Rough-in
 - c. PT: Press Testing
 - d. SUPP: Hangers/Supports
 - e. GRD: Grilles/Registers/Diffusers
 - f. INS: Insulation
 - g. EQ: Equipment
 - h. SLV: Sleeves
 - i. EC: Conduit
 - j. CT: Cable Tray
 - k. LGHT: Lighting
 - l. FIXT: Fixtures
 - m. OP: Openings
7. Note that the same model can be uploaded multiple times to the app for different stages of use with alternate naming.
 - a. Example: Installation version model and pressure testing model.

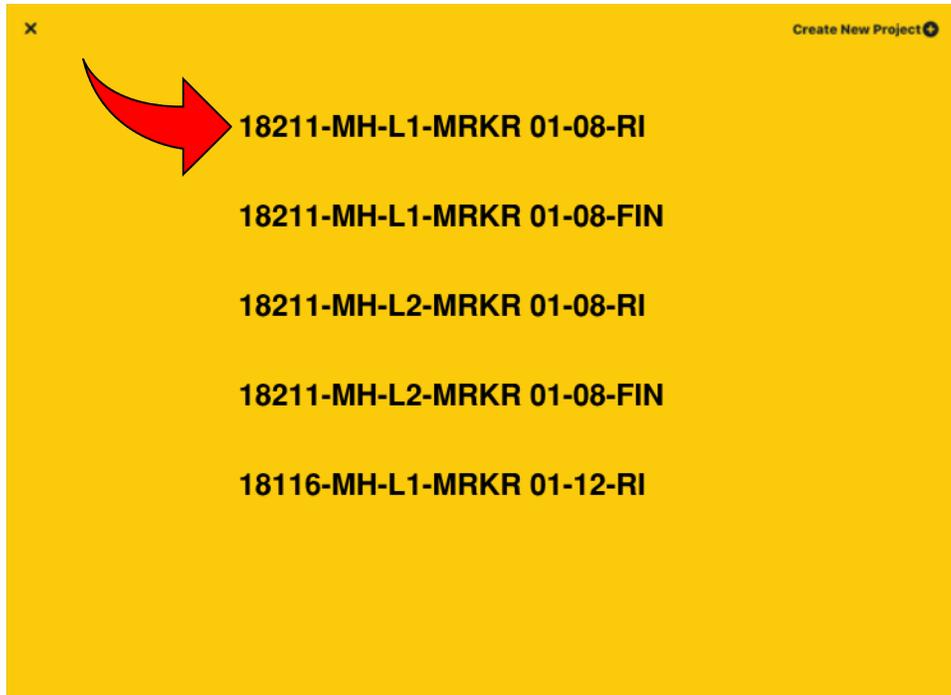
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8. Tap the “Submit” button to start the file conversion and upload to the iPad.
 - a. The importing project screen will be displayed as this process can take 15 seconds to 5 minutes depending on file size/complexity and WIFI speed.



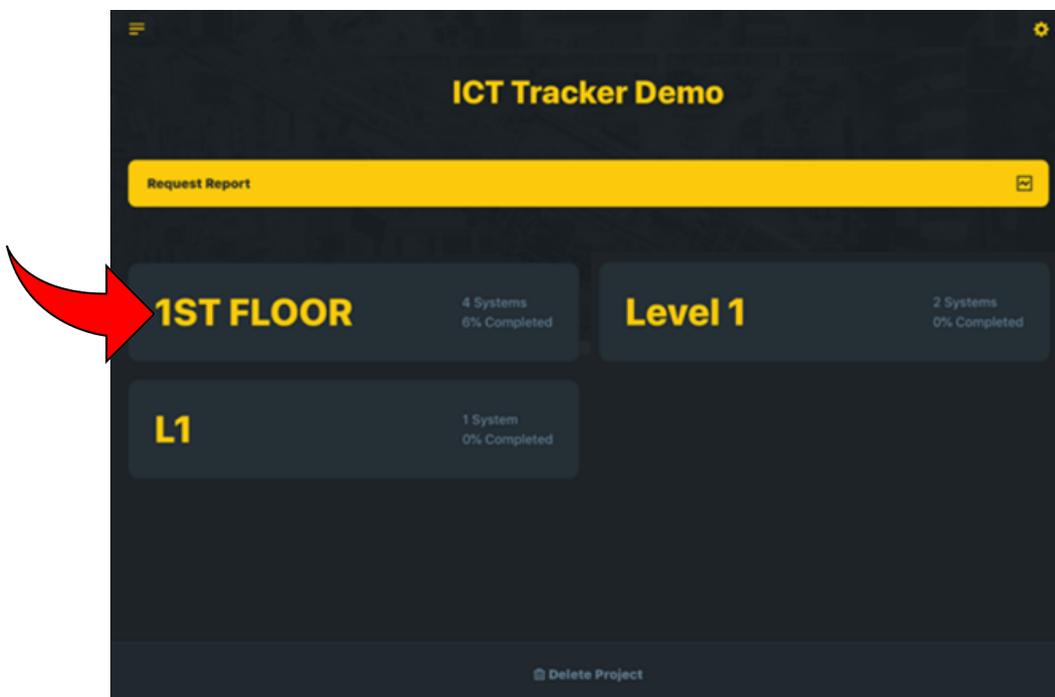
Entering Project Model

1. Once project file(s) are loaded in the app, each one will show up on the “Projects Screen”.
 - a. The next time the app is started, the file listed on top will be the default opening screen the user sees each time the app opened.
 - b. To load a project, tap on the name of the project to open.



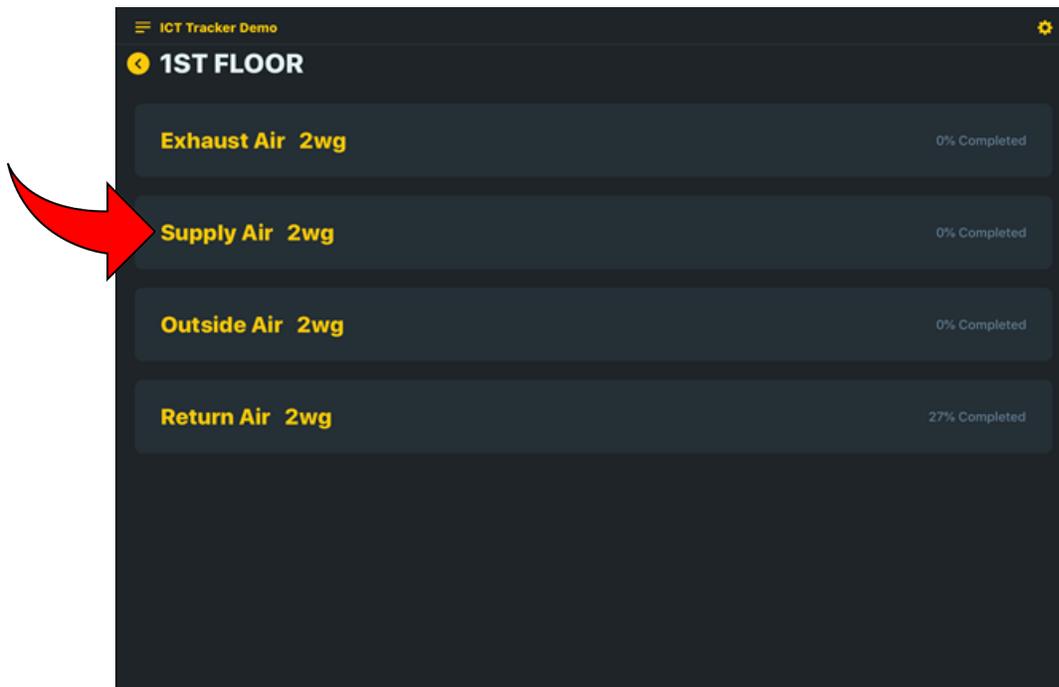
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2. When a project is loaded, it opens the “Level Selection” Screen.
 - a. This identifies the levels available from the model upload.
 - i. Typically, we recommend loading per floor.
 - It is the user’s option on the model setup.
 - If the file size is not too large, then multiple floors can be loaded, but the file upload and conversion time will be longer.
 - ii. Note the level naming is controlled by user model and not the app.
 - b. This screen also identifies the number of systems on each level and total percent completed for all the systems on that level.
 - c. Tap on the level button text you want to open.



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3. Once a level is selected, it opens the “System Selection” Screen.
 - a. Identifies the systems available from the model upload.
 - b. This screen also identifies the selected level and percent completed for each system.
 - c. Tap on a system button text you want to open.



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4. Once a system is selected, it opens the “System Status” Screen.
 - a. The “System Status” screen Identifies the following items from the model upload and entered by the user.
 - i. System: Comes from the model.
 - ii. Level: Comes from the model.
 - iii. Cost Code: Entered by the user.
 - iv. Budget Hours: Entered by the user.
 - v. Total Hours Logged: Entered by the user.
 - vi. Budget % Complete: Calculated by the app.
 - vii. Total Footage of the System: Calculated by the app from the model.
 - viii. Linear Feet of Rework: Calculated by the app from the user selection.
 - ix. Linear Feet Installed: Calculated by the app from the user selection.
 - x. Installed % Complete: Calculated by the app.

The screenshot displays the 'System Status' screen in the ICTRACKER app. At the top, it shows 'ICT Demo MD' and a settings icon. Below that, the system name 'Supply Air 2wg' and the level '1ST FLOOR' are displayed. A yellow bar at the top contains the text 'Enter AR' and a download icon. The main content is a table with two columns of data. At the bottom, there are two yellow buttons: 'Log Hours' and 'View Hours Report', each with a refresh icon.

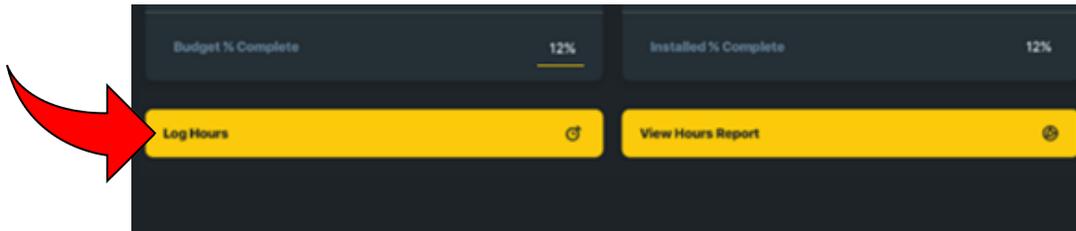
System	Supply Air 2wg	Level	1ST FLOOR
Cost Code	MD-01-HVAC	Total Footage of System	3227.06
Budget Hours	800	Linear Feet Rework	92.32
Total Hours Logged	320	Linear Feet Installed	1866.97
Budget % Complete	40%	Installed % Complete	57%

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Hours and Budgets

1. Cost Code and Budget Hours.
 - a. These are optional to be entered by the user by tapping on the “Cost Code” or “Budget Hours” and entering the data.
 - b. If entered, the “Budget Hours” are used to calculate the “Budget % Complete”.
 - c. This data is also exported as part of the CSV report and is associated with all elements in the model for use in project management software and estimating productivity.

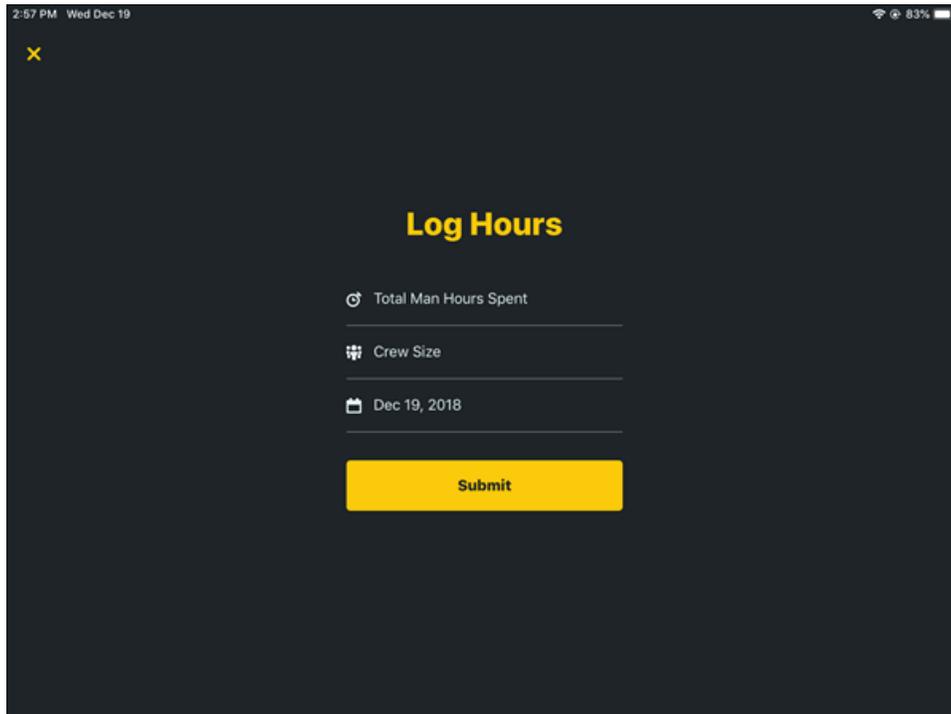
2. Log Hours
 - a. An additional option when you the ICT Tracker app is to enter the manhours per day. These show up as a calculation under “Total Hours Logged” and are associated with the selected elements to identify labor spent on a day along with linear feet, piece or poundage of the installed elements.
 - b. To enter hours, tap on the “Log Hours” button text at the lower left of the “System Status” screen.



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3. The Log Hours Screen

- a. The “Log Hours” screen will appear.
 - i. Tap on the “Total Man Hours Spent” text and the keyboard will appear
 - ii. Enter the Total Manhours for the day for the men that worked on that system.
 1. This is not per man, but total of the number of men times hours worked.
 2. For example, 3 men at 8 hours equals 24 Total Man Hours.
 - iii. Tap on the “Crew Size” text and a roller option wheel will appear allowing the user to select how many workers where in the crew that worked on that system that day.
 - iv. The default date is the current date as shown.
 1. Tap on the date shown to change, if the date is correct for the current day then no change is needed.
- b. Once all the fields are set, tap on the “Submit” button.
- c. Additional Dates with Man hours and crew size can be entered from this screen and will record each time the “Submit” button is tapped.

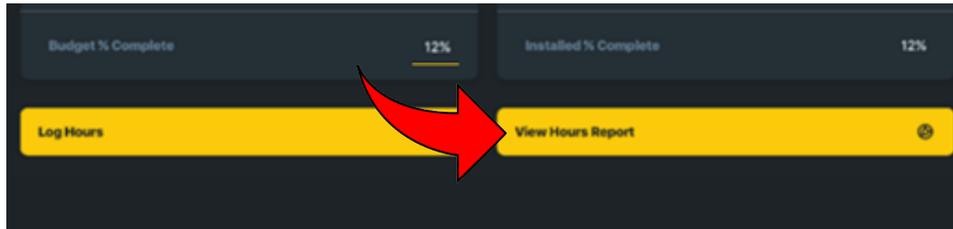


- d. Tap the exit screen  button on the top left to exit back to the “System Status” screen.

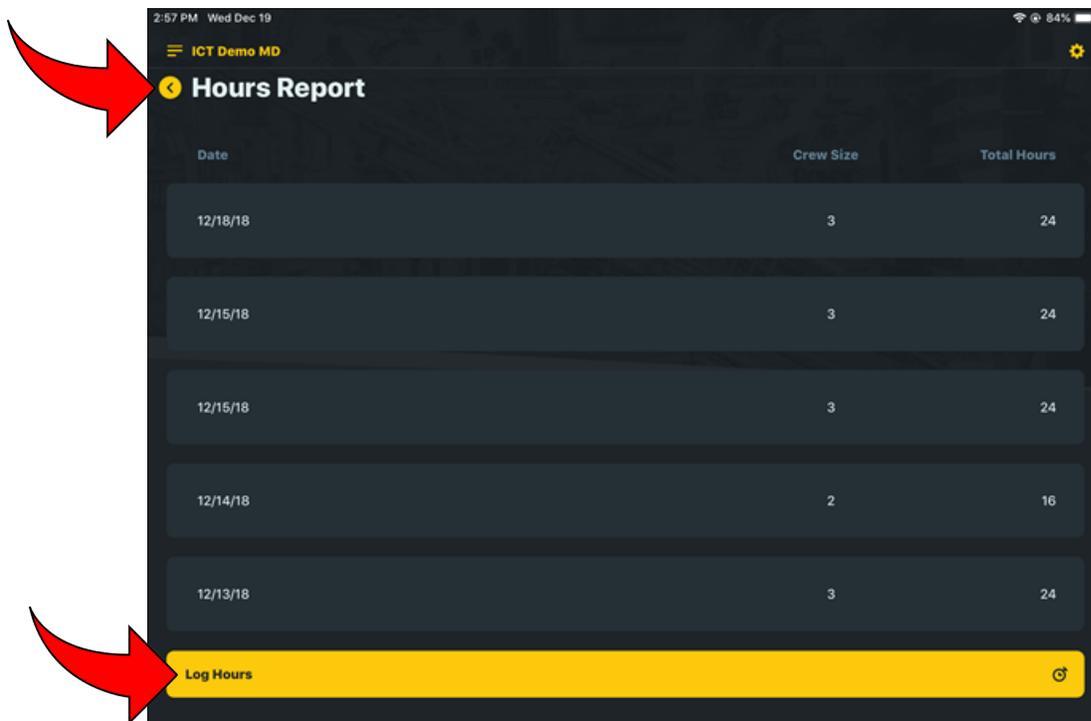
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4. The Hours Report Screen

- a. To see a daily input of hours, from the “System Status” screen, tap the “View Hours Report” button text on the bottom right of the screen to open the “Hours Report” screen.



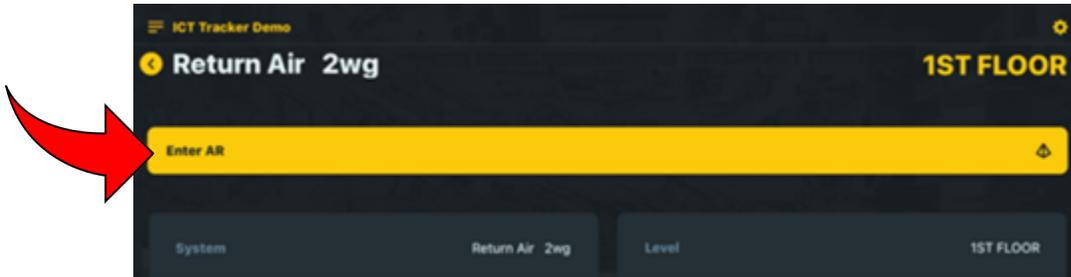
- b. The “Hours Report” screen shows a scrollable list of the Date, Crew Size and Total Hours entered into the system record.



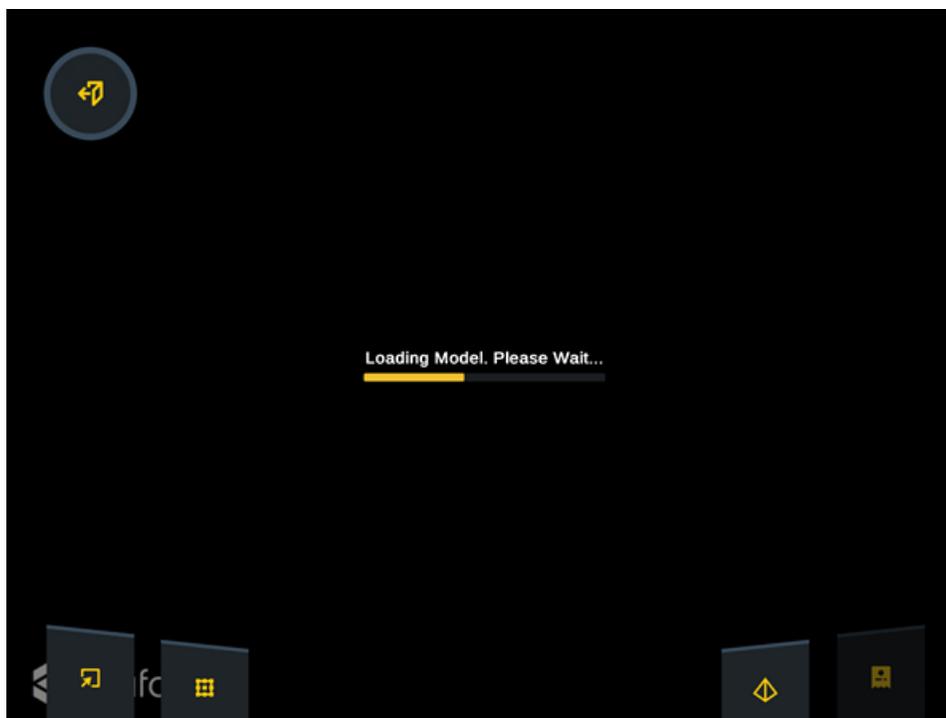
- c. From the “Hours Report” screen the user can also enter the “Log Hours” screen by tapping on the “Log hours” button text on the bottom of the screen.
- d. To exit the “Hours Report” screen, tap on the yellow arrow on the top left to return back to the “Systems Status” screen.

Entering AR Mode

1. Tap on a “Enter AR” button text to enter the AR environment.



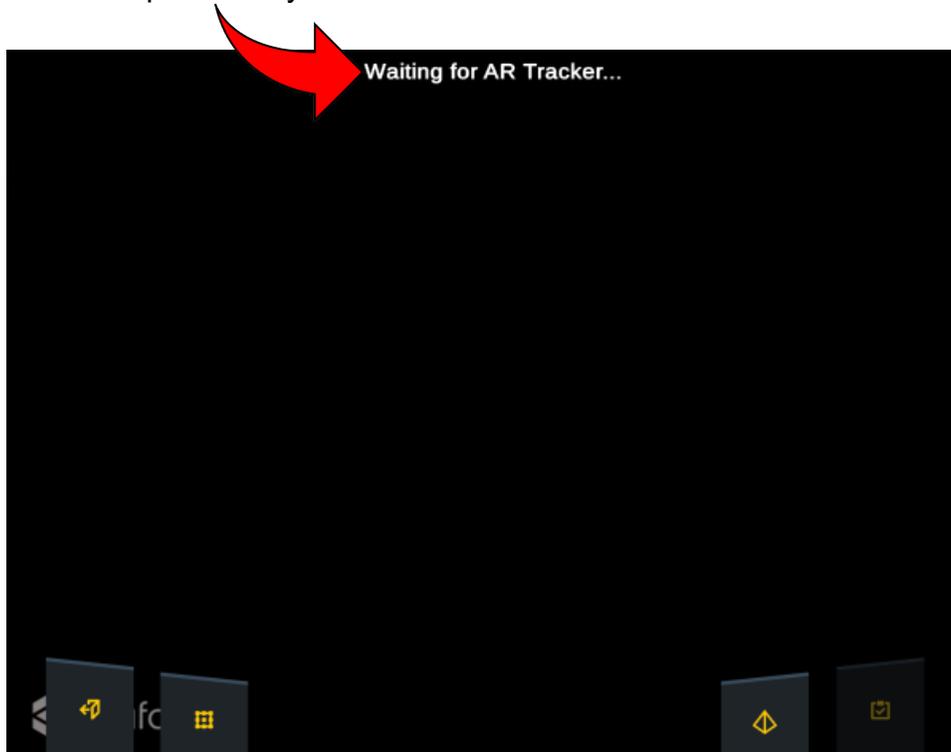
- a. A slider bar will show the status of the model load.
- b. Initial model load in the AR environment can take 5 seconds to 5 minutes, depending on model size.
- c. At the end of the load, the screen will freeze for a few seconds as the model is loaded into iPad's memory.
 - i. Once the file is loaded into the iPad memory, it will load instantaneously one each usage from this point on.





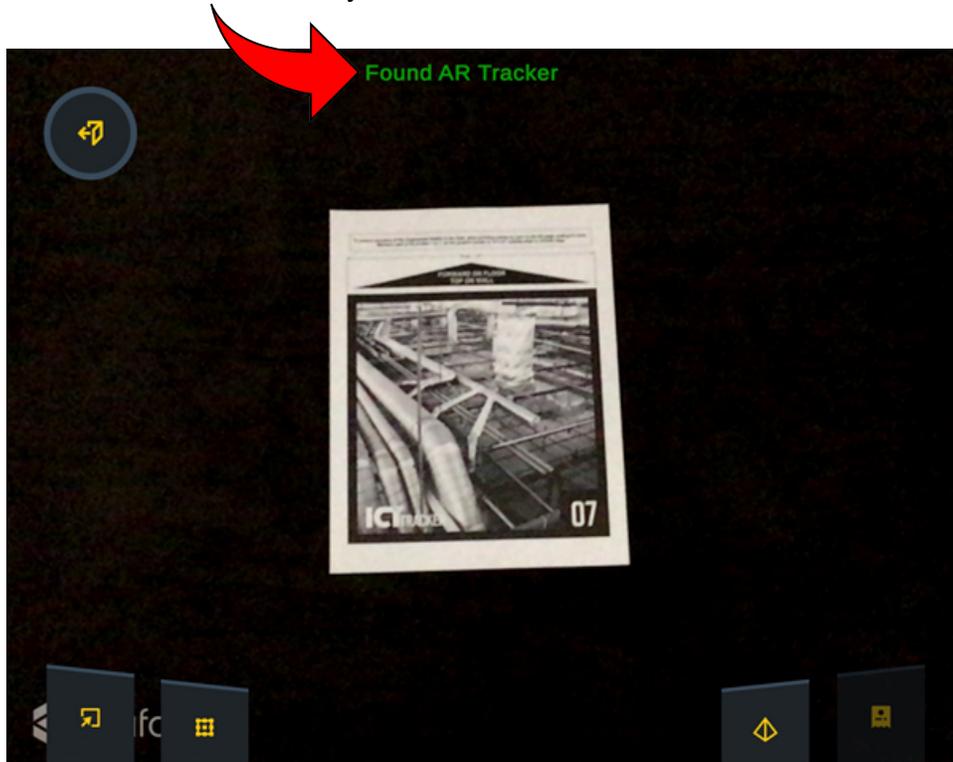
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2. Upon completion of the model loading, the white “Waiting for AR Tracker...” text will display at the top of the screen.
 - a. At this point the app is looking for the AR Marker in the field to synchronize the model to the field environment.
3. When prompted “Waiting for AR Tracker...” use the viewing screen to hover over the appropriate AR Marker in the field.
 - a. This will open and sync the model to the field.



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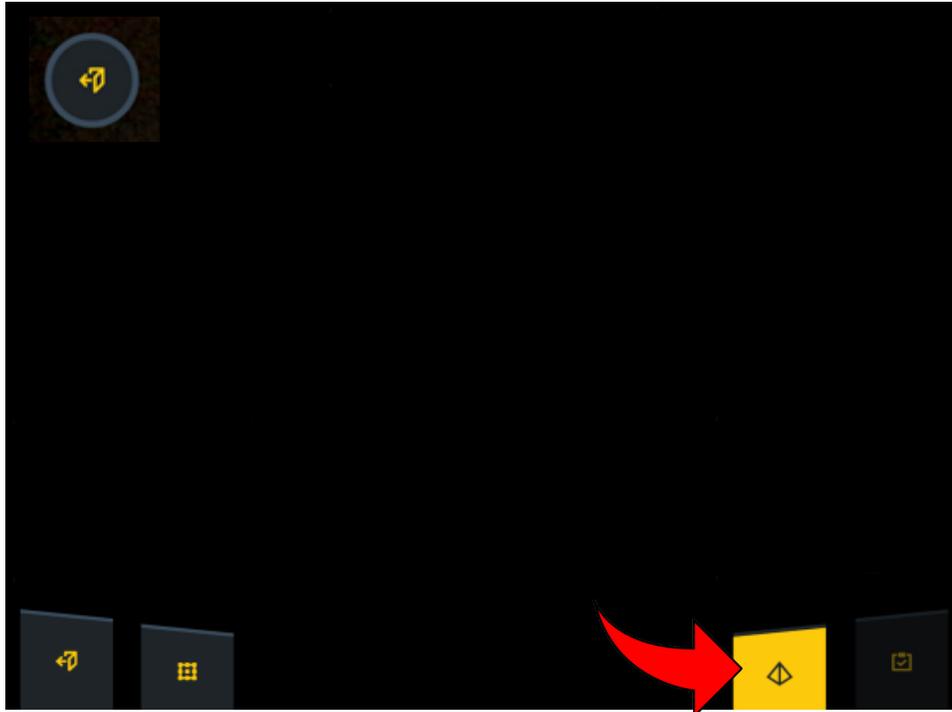
4. When the marker is found, the green “Found AR Tracker” text will display at the top of the screen.
 - a. The AR Marker is now synchronized with the model.



- b. The calibrated model is now ready to start tracking.

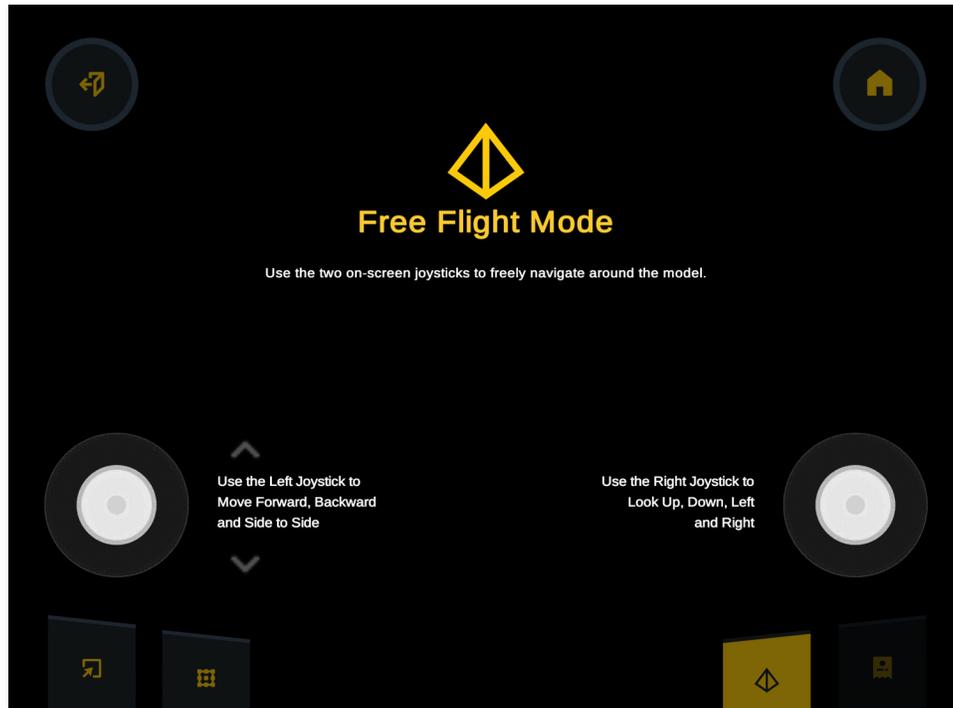
App Usage Guide

5. Environment options for selection.
 - a. Utilize synchronized model in AR environment or select “Free-Flight”  Mode button on the lower right for to enter free flight for tracking.



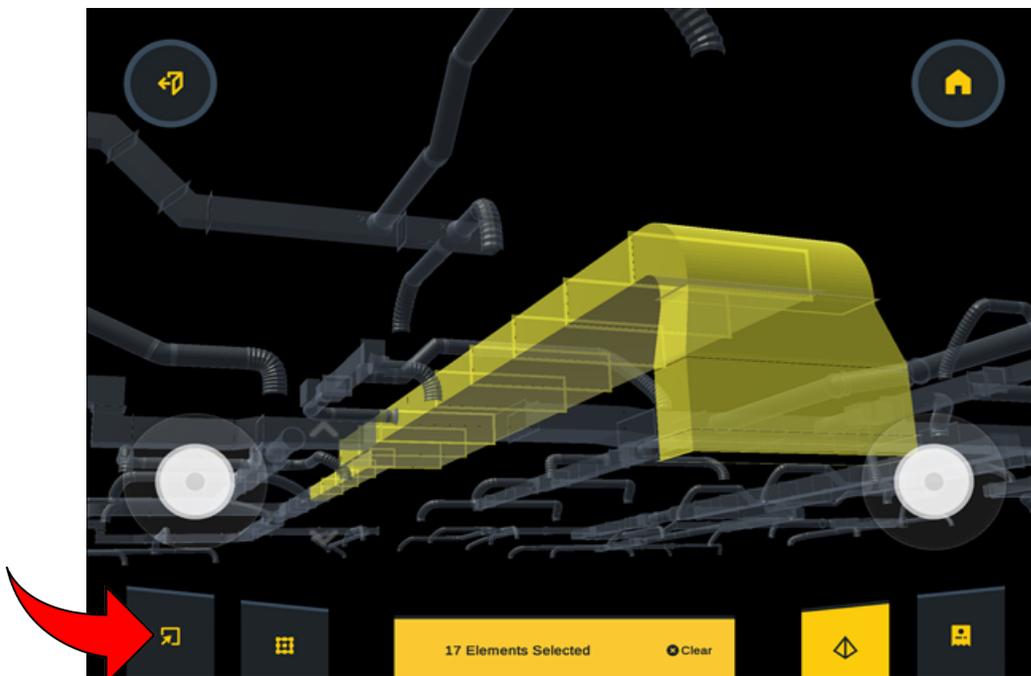
App Usage Guide

6. Either environment starts in “Selection” mode and the view is based on the AR marker reference point on the project or in Free-Flight mode it is based on the last AR view orientation before entering Free-Flight.



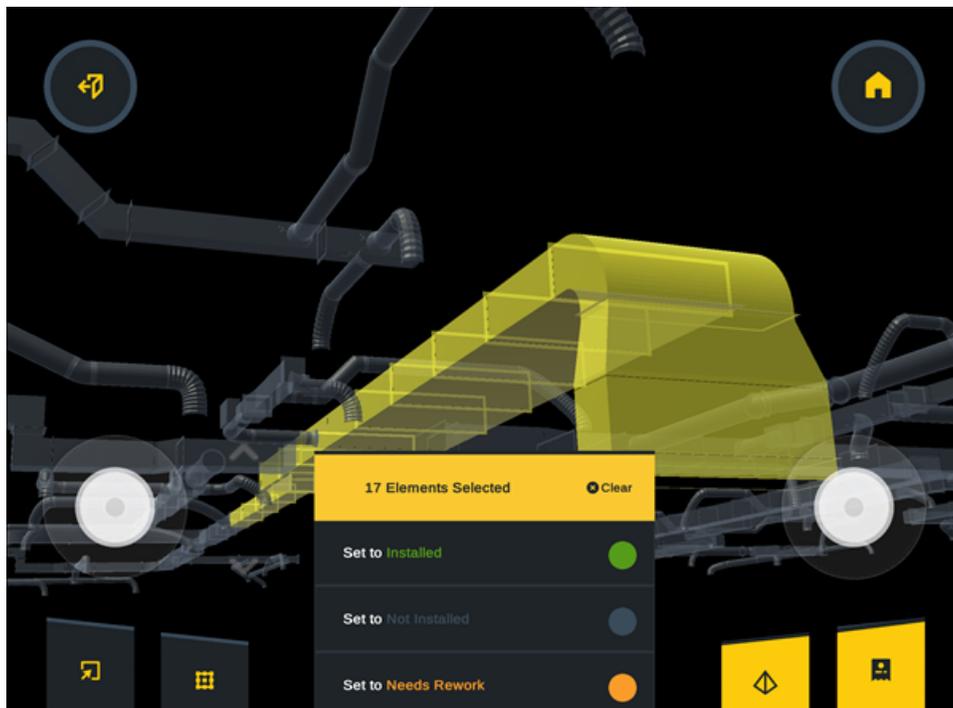
Selecting Elements to Change Status

1. Once you have entered AR Mode and synced to the marker, look up with the iPad using the viewing window to see the overlay of cad elements vs the installed field elements.
2. Start selecting elements that are overlaid with the installed items in the field.
 - a. Select the model elements from the screen with your finger to select/deselect elements in AR model.
 - b. Elements will change color when selected and show up on the “Elements Selected” count on the bottom of the screen.
 - c. Selection options:
 - i. Option 1: Single Pick: Select each model element individually by picking them with your finger.
 - ii. Option 2: Linear Selection: Select multiple elements at a time by dragging your finger along the model elements to do a continuous selection.
 - iii. Option 3: Lasso Box: Select the “Selection & Zoom Tools”  button on the lower left of the screen to change the “Linear Selection” option to “Lasso Box”.
 - Allows user to select multiple elements with a selection window.
 - All items will be selected in window box if more than 50% of the element is within the window outline.
 - To get back to “Linear Selection”, use the “Selection & Zoom Tools” button to change the selection setting.



App Usage Guide

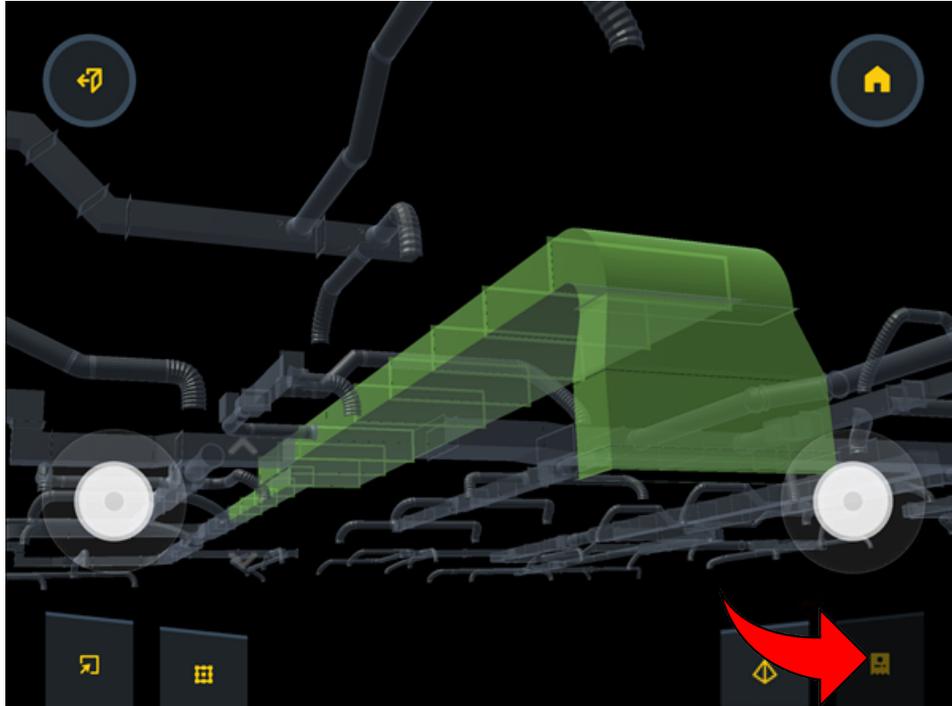
3. Once all the elements are selected as a group to change their status, tap on the “xx Elements Selected” button on the bottom to open the “Selection Setting Options” dialogue box.
 - a. To change elements status, tap on “Set to ...” text option in the dialogue box.
 - b. By default, when the model is first opened, all elements are shown as “Not Installed” and are colored grey.
 - c. Elements options:
 - i. “Set to Installed”: Elements turn Green.
 - All elements in this setting will be identified as installed on the model and calculated into the installed “Linear Feet Installed” on the system status interface screens.
 - ii. “Set to Not Installed”: Elements turn Grey.
 - All elements in this setting will be identified as not installed on the model and will not be calculated on the installed status on the system status interface screens.
 - iii. “Set to Needs Rework”: Elements turn Yellow.
 - All elements in this setting will be identified installed items that need rework due to a design change and calculated into the “Linear Feet Rework” on the system status interface screen.



- d. To exit “Selection Setting Options” dialogue box, tap on the “Clear” button. 

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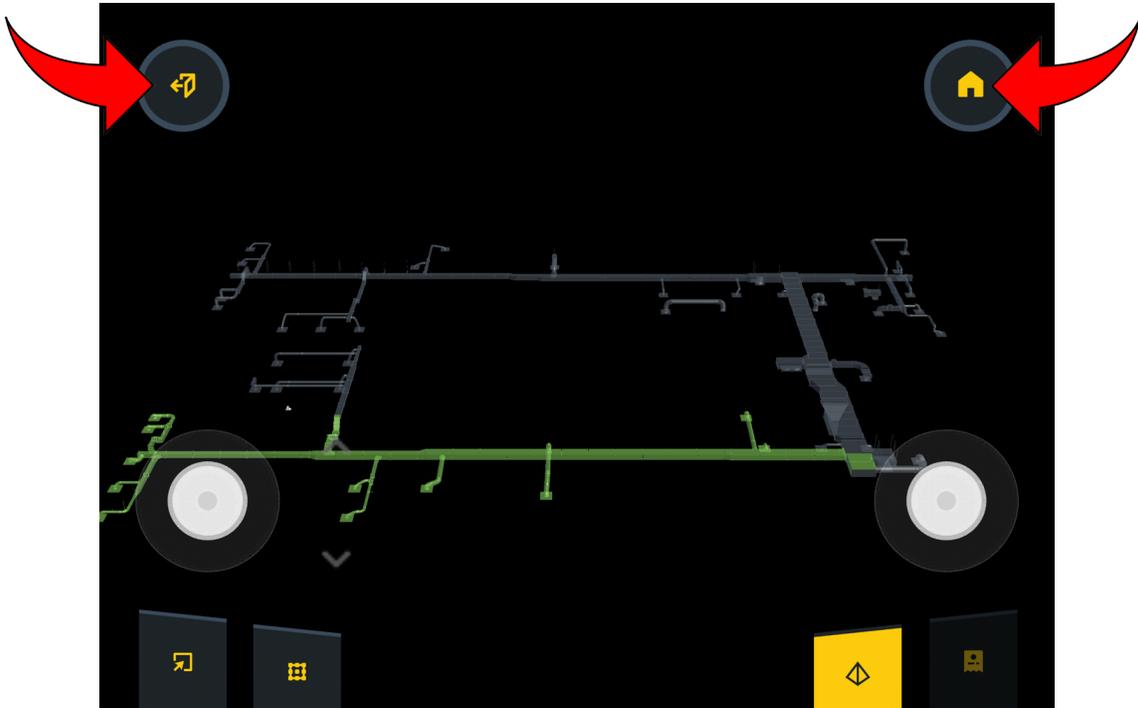
4. Once the status is applied the model elements will change color to signify the status of the element



5. Properties button
 - a. On the lower right of the screen there is the “Properties” button. 🏠
 - b. When an element is selected, and the properties button is selected, certain quick reference data will pop up in the lower middle of the screen.
 - i. The typical properties are Size, Name, System, Length, Weight.

App Usage Guide

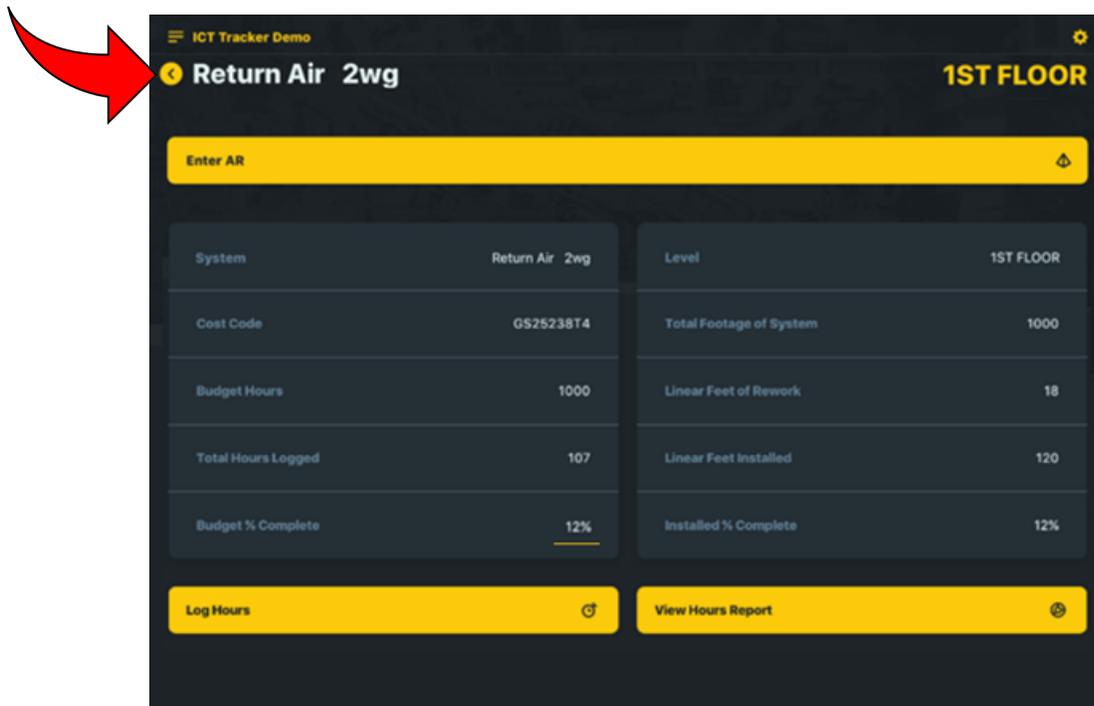
6. Another option only available in “Free Flight” mode is the “Home” 🏠 button at the top right to get a perspective plan view to see status of model or make more selections



7. From this view, the user can also make selections and change status of the model as well as selecting an element and checking the properties.
8. When finished the user can exit the AR Screen by selecting the “Exit AR” 🏠 button on the top left of the screen.

Changing System Selections

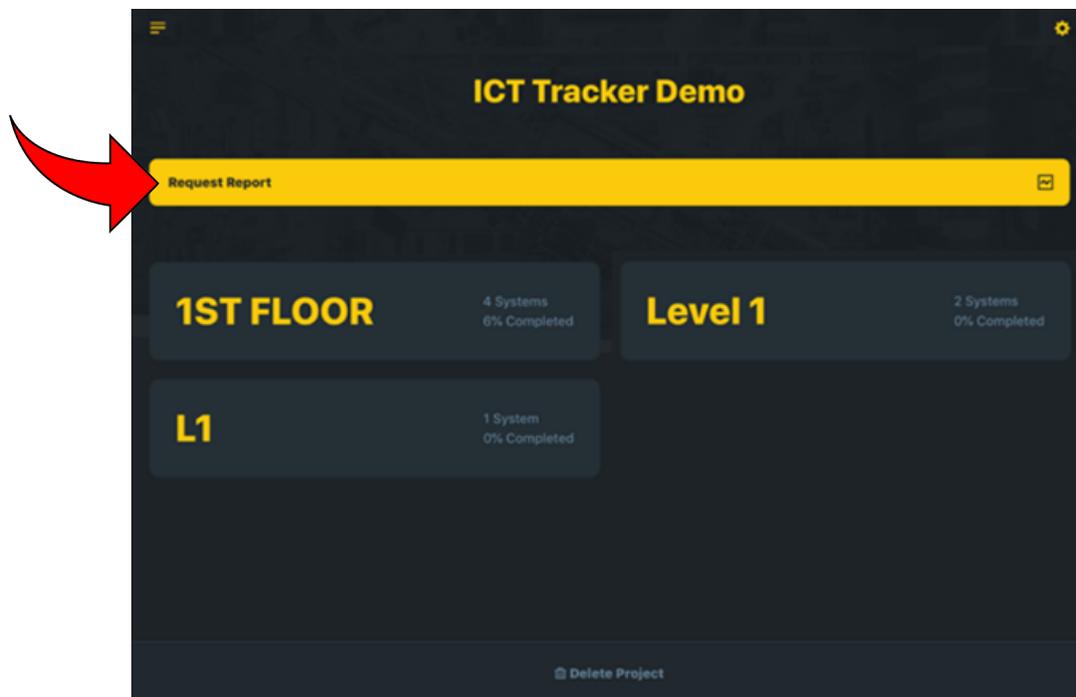
1. When the user exits the AR mode, the status screen appears to check “System Status” screen updated totals



2. To exit the “System Status” screen, tap on the yellow arrow on the top left to return back to the “Systems Selection” screen
 - a. Once the user exits, they can select another system to track from the list of systems available
 - b. If the user chooses this option, the selection process starts again.

Report Options

1. System Report
 - a. On the “System”, the user can view system Percent complete totals
 - b. To send a snapshot of the screen, press and hold the Sleep/Wake (on/off) button on the top of your iPad and quickly click the Home button at the bottom of the screen. The snapshot can be messaged or emailed to another user use the
2. Detailed Report
 - a. Go back to the “Floor Level” screen.
 - b. Tap the “Request Report”.
 - c. A report will be generated by ICT and sent to the user email.



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Exiting the App and Support

1. To logout of the app, tap on the use the “Exit System”  button, located at the top right of any one of the “Add Project”, “Level Selection”, “System Selection” or System Status” screens.
2. The “Logout” screen will appear and tap the logout button text to exit the app.
 - a. The user can close the app on the iPad or logout completely out of the app.
 - b. For any other assistance use, the help@icttracker.com email for support questions

