



Specialist engineering solutions company adopts on-site RFID-enabled YARD TRACKING SYSTEM

Efficient asset tracking at outdoor on-site locations

Seamless integration of RFID asset tracking with GPS
location geo-fencing

Automated on-site inventory management of assets

Remote viewing and mapping of asset status



INSIDE:

Key Requirements
Solution
Implementation
Working
Benefits
Links

TECHNOLOGY

Solution:

EPC Gen2 compliant
asset tracking solution
GPS based location geo-fencing

Tag Type:

Metallica™ UHF Passive

Reader/Antenna:

HandyScanna™

Method:

Single Tracking via hand-held
Reader/Antenna device

Integration Platform:

RFID Middleware:

Xtenna™ WebToolkit
Xtenna™ Studio

Application: Essen RFID's
Asset Tracking System

Database: SQL Server 2005 Exp. ed.

Tag Manufacturer/Supplier:

Essen RFID, with US based chip inlay

Reader/Antenna Manufacturer:

Essen RFID, with US based module

Systems Integrator:

Essen RFID

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CASE STUDY

KEY REQUIREMENTS:

PARASCADD is a specialist engineering services & solutions company offering products and services across a range of Engineering, Procurement and Construction segments. The company manages a large quantity of assets in the form of machinery, equipment and reusable materials at construction sites. Tracking these valuable assets within and across these large site areas is a huge task that is time-consuming, laborious, inefficient and quite unmanageable if done manually, leading to lesser control and co-ordination, missing and misplaced assets, duplication of required deployment and increased operating cost. The company therefore required an automated solution that efficiently tracked and managed all assets at these outdoor and temporary sites, kept accurate asset inventory records and could be accessed in real-time.

Main challenges in implementation:

- Maintaining details of each asset and its location at the site.
- Updating current location of assets and maintaining records of its previous locations.
- Quick search of any asset with its correct location details.
- Checking of asset inventory on a regular basis.
- Reporting of missing assets to the supervisor to enable necessary action.
- Viewing asset locations on the map through a web-based application.

SOLUTION:

Essen RFID offered a solution for on-site tracking assets using RFID and GPS technology in its Yard Tracking System. RFID tags are affixed to each asset and tracked through RFID readers, while GPS is used to locate the current position of each asset at the site. For this purpose, the system utilizes specialized METALLICA™ RFID tags and hand-held HandyScanna™ antenna-readers using a GPRS network. Asset management is automated by the Yard Tracking System.

IMPLEMENTATION:

METALLICA™ RFID tags are affixed to all assets. HandyScanna™ hand-held antenna-reader devices are used for asset registration, inventory and all other processes required within the system. The Yard Tracking System deploys a mobile-based application within each device for this purpose. HandyScanna™ makes use of GPRS connectivity for transferring data from the server to the device and from the device back to the server. Master entries and remote location tracking by the system administrator are done through a web-based application. SQL Server is used as the back-end database.



CASE STUDY

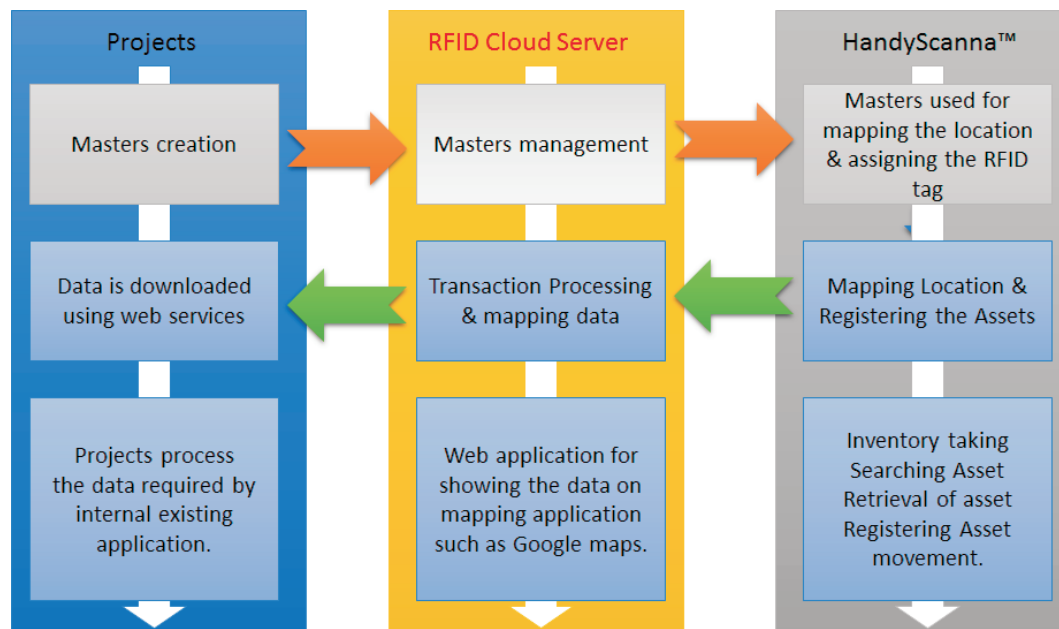


Affixing Tags

WORKING:

The following diagrams illustrate the operation sequence:

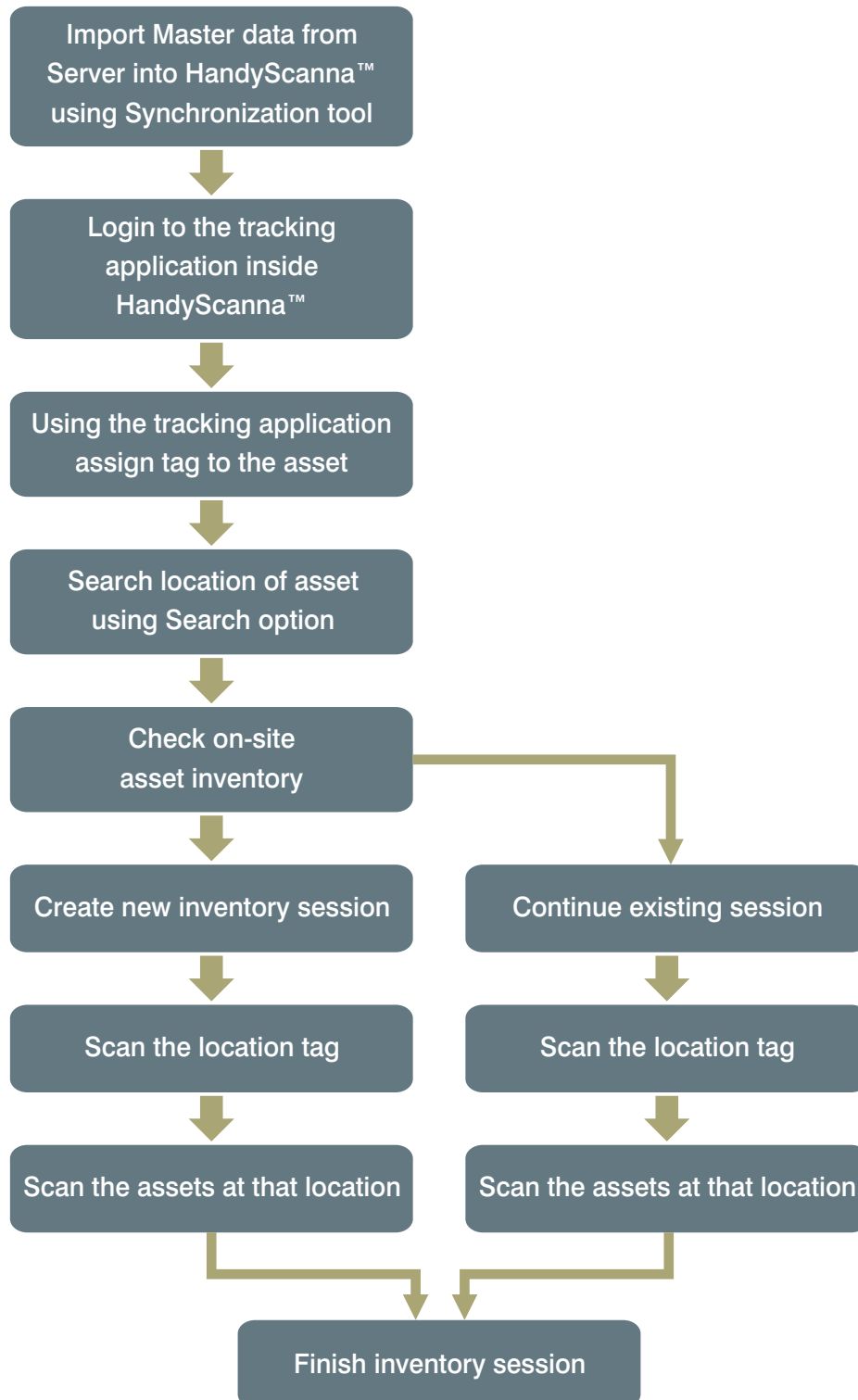
Flow Diagram:





CASE STUDY

Flow Chart - Asset Tracking:





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Web-based Yard Tracking Application:

Essen RFID's web-based Astrax™ application is used by the system administrator for the master entries and also for remote tracking of the asset's current location. Its main modules are:

Registration Modules:

- Site Master
- Zone Master
- Location Master
- Map Zone Location
- Asset Master
- Map Asset Location
- CSV Upload

Search Modules:

- Search Asset
- Asset Management
- Zone-wise Site Search

Site Master:

This module is used to register the various construction sites of the company into the database.

Tracker

Master

Logout

Site Master

Site Name

Goregaon

Discription

Goregaon

IS Active

☒

ID

1

Submit

Reset

	Site_Id	Site_Name	Site_Discription	Site_IsActive	CREATED_BY	CREATED_ON	MODIFIED_BY	MODIFIED_ON
>	1	Goregaon		Y		12/24/2013 6:27:53 PM		12/24/2013 6:27:53 PM
>	2	Borivali		Y		12/24/2013 6:28:06 PM		12/24/2013 6:28:06 PM



CASE STUDY

Zone Master:

In this module, various zones within a particular site can be created and registered into the database.

Zone Master

Refresh

Click To Site Name To Map

MAP Site

Site Name : Goregaon

Zone :Zone 3

Site Name : Borivali

Zone :Zone 1

Zone :Zone 2

	Site_Id	Site_Name	Zone_Id	Zone_Name	Zone_Discription	Zone_IsActive
>	1	Goregaon	3	Zone 3	Goregaon - Zone 3	Y
>	2	Borivali	1	Zone 1	Borivali - Zone 1	Y
>	2	Borivali	2	Zone 2	Borivali - Zone 2	Y

Zone Name

Zone 3

Site ID

Goregaon

Discription

Goregaon - Zone 3

IS Active

☒

ID

3

Submit

Reset

New

Location Master:

The Location Master is used to create exact geo-fencing locations that are registered in the database.

Location Master

Location Code

MUM/GOR/A001

Location Name

Mumbai Goregaon

Geo Fence Radius

5

Discription

ID

1

Submit

Reset

	ID	Location Code	Location Name	Geo Fence Radius
>	1	MUM/GOR/A001	Mumbai Goregaon	5
>	2	MUM/BOR/A001	Mumbai Borivali	5
>	3	MUM/BOR/A002	Mumbai Borivali	5
>	4	MUM/BOR/A003	Mumbai Borivali	5
>	5	MUM/BOR/A004	Mumbai Borivali	5
>	6	MUM/BOR/A005	Mumbai Borivali	5
>	7	MUM/BOR/A006	Mumbai Borivali	5
>	8	MUM/BOR/A007	Mumbai Borivali	5
>	9	MUM/BOR/A008	Mumbai Borivali	5



CASE STUDY

Map Zone Location:

This module is for mapping geo-fenced locations to a particular zone that has already been registered in the Zone Master.

Mapping Location With Zone

Refresh

Click To Zone Name To Edit

MAP Location

Zone Name : Zone 1

Location : MUM/BOR/A001

Location : MUM/BOR/A002

Location : MUM/BOR/A003

Location : MUM/BOR/A004

Location : MUM/BOR/A005

Location : MUM/BOR/A006

Location : MUM/BOR/A007

Location : MUM/BOR/A008

Location : MUM/BOR/A009

Zone Name : Zone 1

Select Locations to Map with Zone

☒ MUM/BOR/A001

☒ MUM/BOR/A002

☒ MUM/BOR/A003

☒ MUM/BOR/A004

☒ MUM/BOR/A005

☒ MUM/BOR/A006

☒ MUM/BOR/A007

☒ MUM/BOR/A008

☒ MUM/BOR/A009

Map Details Location With Zone

Submit

Asset Master:

The Asset Master registers an asset into the database. Details of the particular asset such as ID code, description, etc. are entered during asset registration.

Asset Master

Asset Unique ID: 50697065733135

Asset Name: 50697065733135

Asset Batch No: 10.0

ID: 1

Submit Reset

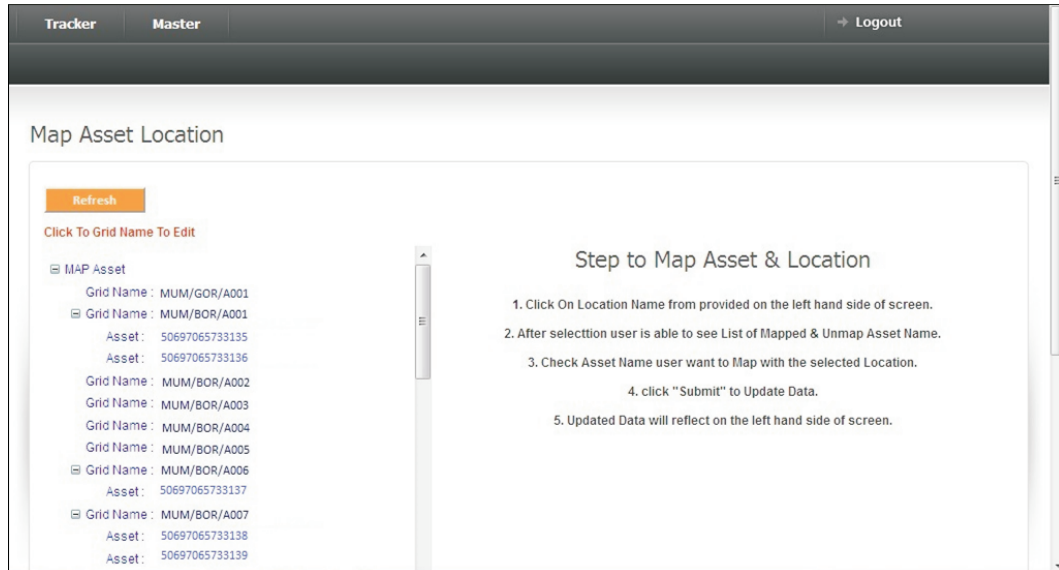
	ASSETID	ASSET UNIQUE ID	ASSET NAME	ASSET BATCH NO
>	1	50697065733135	50697065733135	10.0
>	2	50697065733136	50697065733136	10.0
>	3	50697065733137	50697065733137	10.0
>	4	50697065733138	50697065733138	10.0
>	5	50697065733139	50697065733139	10.0
>	6	50697065733140	50697065733140	10.0
>	7	50697065733141	50697065733141	10.0



CASE STUDY

Map Asset Location:

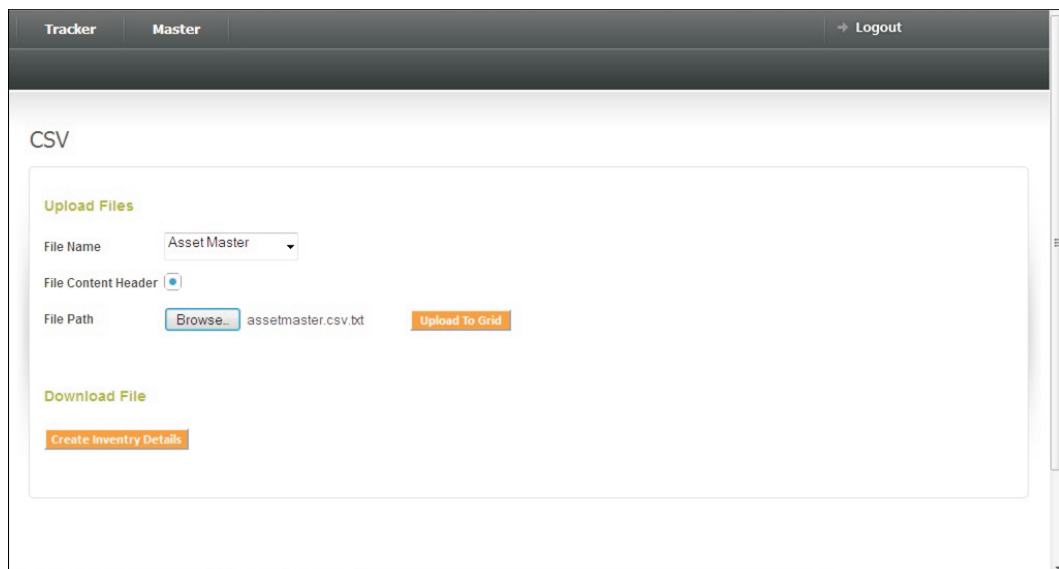
This module maps each asset to a particular geo-fenced location.



The screenshot shows the 'Map Asset Location' interface. At the top, there's a navigation bar with 'Tracker' and 'Master' tabs, and a 'Logout' button. Below the navigation bar, the title 'Map Asset Location' is displayed. On the left side, there's a 'Refresh' button and a link 'Click To Grid Name To Edit'. Below this, a list of assets is shown, each with a 'Grid Name' and 'Asset' ID. The assets are grouped by 'Grid Name'. On the right side, there's a section titled 'Step to Map Asset & Location' with five numbered steps: 1. Click On Location Name from provided on the left hand side of screen. 2. After selection user is able to see List of Mapped & Unmap Asset Name. 3. Check Asset Name user want to Map with the selected Location. 4. click "Submit" to Update Data. 5. Updated Data will reflect on the left hand side of screen.

CSV Upload:

This module enables bulk insertion of all data (site, zone, asset details) into the database. The user can import existing information into the database instead of individually entering details once again.



The screenshot shows the 'CSV Upload' interface. At the top, there's a navigation bar with 'Tracker' and 'Master' tabs, and a 'Logout' button. Below the navigation bar, the title 'CSV' is displayed. On the left side, there's a section titled 'Upload Files' with a 'File Name' dropdown menu (set to 'Asset Master'), a 'File Content Header' radio button, and a 'File Path' field with a 'Browse...' button and a file name 'assetmaster.csv.txt'. To the right of the 'File Path' field is an 'Upload To Grid' button. Below the 'Upload Files' section, there's a section titled 'Download File' with a 'Create Inventory Details' button.



CASE STUDY

Search Asset:

This module is used to search the location of a particular asset. When the asset code is entered, its geo-fenced location details will be displayed on the screen. This narrows down the asset's current on-site location to within the diameter of the geo-fenced area.

Tracker Master Logout

Search Asset

50697065733135 Search

ASSETID	ASSET UNIQUE ID	ASSET NAME	ASSET BATCH NO
> 1	50697065733135	50697065733135	10.0

Asset Details

Asset Unique ID: 50697065733135 GRID NAME: MUMBAI
Asset Name: 50697065733135 REVISION NO: 0.0
Asset Batch No: 10.0 RADIUS: 5
GIS Location: Mumbai Borivali LATITUDE: 18.92
LONGITUDE: 72.82

Zone-wise Site Search:

This module displays all the assets available within the selected zone for a particular site. This enables the administrator to get an overview of the number of assets available at each zone within each site.

Search Site Zone Wise

Site: Goregaon Site: Goregaon
Zone: Zone 1 Zone: Zone 1 Search

ID	Location Code	Location Name	Zone
> 1	MUM/GOR/A001	Mumbai Goregaon	Zone 1
> 2	MUM/BOR/A001	Mumbai Borivali	Zone 1
> 3	MUM/BOR/A002	Mumbai Borivali	Zone 1
> 4	MUM/BOR/A003	Mumbai Borivali	Zone 1
> 5	MUM/BOR/A004	Mumbai Borivali	Zone 1
> 6	MUM/BOR/A005	Mumbai Borivali	Zone 1
> 7	MUM/BOR/A006	Mumbai Borivali	Zone 1



CASE STUDY

HandyScanna™ Application:

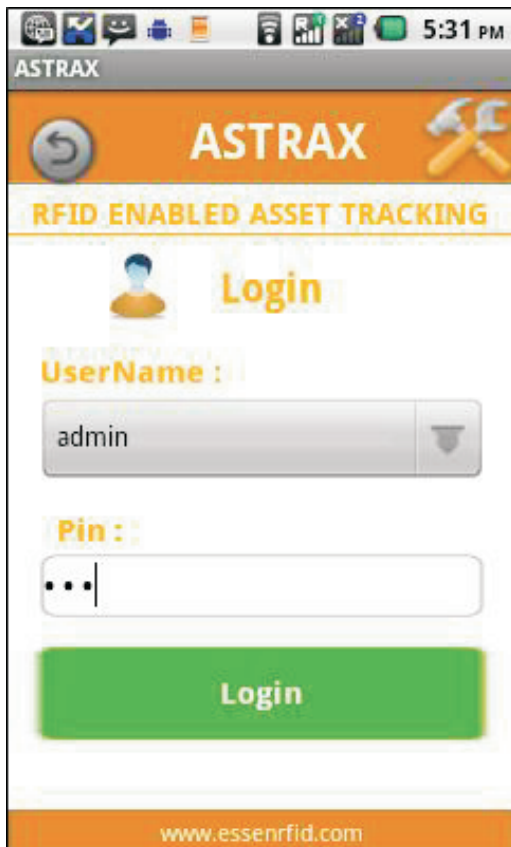
The Yard Tracking System deploys hand-held HandyScanna™ devices for on-site tracking of assets. The device performs the following tasks:

- Importing Data (from the server into HandyScanna™)
- Asset Registration (assigning of tags to assets)
- Finding Assets
- Asset Inventory (asset stock checking)
- Synchronization with Server (data updated back to server)

Importing Data (from Server to HandyScanna™):

To import data from the server into the HandyScanna™ device, the following steps have to be done:

1. Login to the application with a valid user name and password.



2. Once logged into the application, the user can download the server data by using the Database Synch option from the home screen and the tools for device synchronization provided in the Astrax™ desktop application.



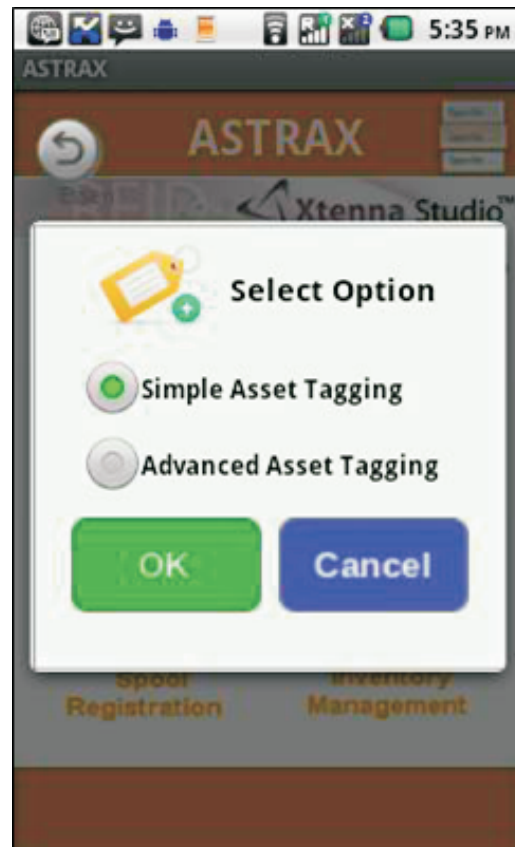
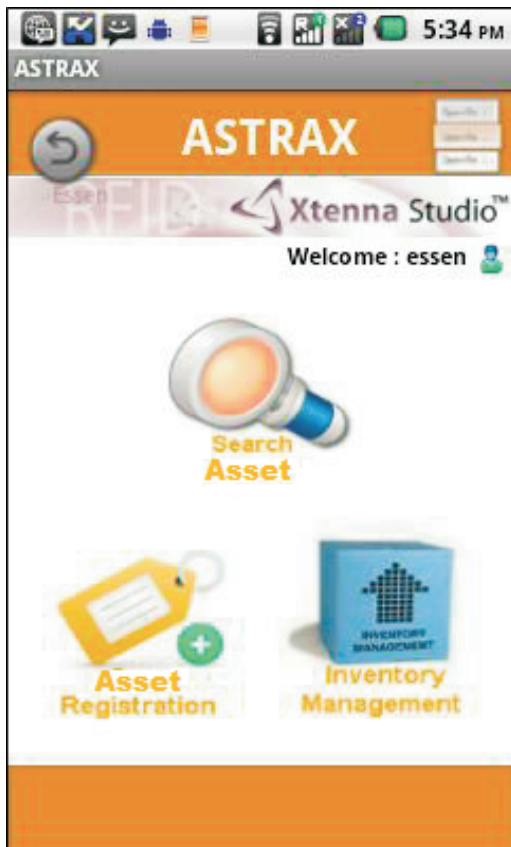
CASE STUDY

Synchronization Handy-Scanna	
Handy Scanna IP Address :	10.242.48.101
Handy Scanna Port :	9191
File Path This System :	E:/QIPL_HYD.DB

[Download file from Handy-Scanna](#) [Synchronize data on server](#) [Upload file in Handy-Scanna](#)

Asset Registration (assigning of tags to assets):

After data has been downloaded from the server, the HandyScanna™ device application is used to assign a tag to each asset. This is done through the Asset Registration option on the device screen.





CASE STUDY

ASTRAX

Asset Tagging

Asset Type: Pipes

Asset code
50697065733135

TagId
0B0400024E43425300000000

Save

Clear

ASTRAX

Asset Tagging

New TagID Information

Asset Code
50697065733135

New Tag ID
0B0400024E43425300000000

Confirm save

Cancel

Find Asset:

This is used to find the current location of a particular asset. When an asset's location is required to be searched, its asset code is entered in the search box and the location details will be displayed on the screen.

ASTRAX

Single search

50697065733135

Search

Search result

Last location: EL00101
Asset type: Pipes
Asset code: 50697065733135

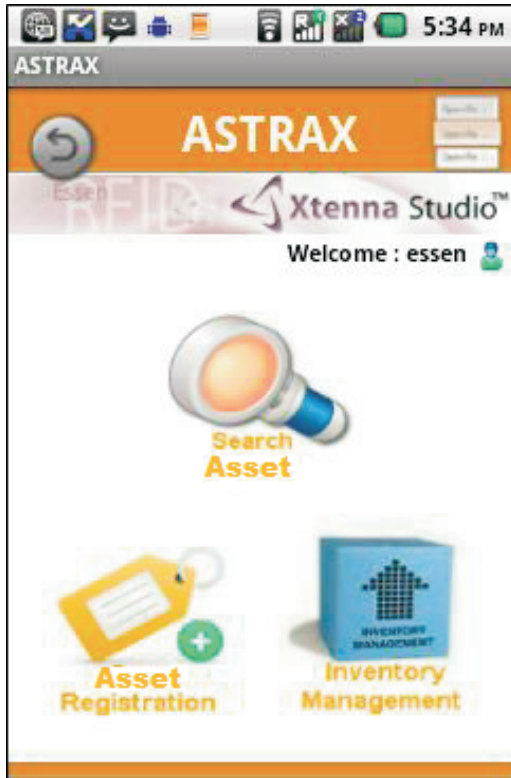
Scan location EL00101



CASE STUDY

Asset Inventory (asset stock checking):

This is done through the Inventory Management option on the device screen.



If a new inventory session is being started, select the Start New option.





CASE STUDY

Select a location from the dropdown provided and start scanning the asset tag. When scanning at the current location is completed, stop and move to the next location. In a similar manner, select the location and scan the asset tags. When scanning at all location is finished, the inventory session is completed.

ASTRAX

Inventory

EL00101

Location name: EL00101

Found Un-Scanned

Stored: 1, Scan: 1 21

AssetId	AssetType
50697065733135	Pipes

ASTRAX

Inventory

EL00101

Location name: EL00101

Found Un-Scanned

Stored: 16, Scan: 16 4

AssetId	AssetType
50697065733135	Pipes
526F6465733033	Rods
50697065733036	Pipes
50697065733130	Pipes
50697065733035	Pipes
526F6465733035	Rods

If an incomplete inventory session is needed to be completed, select the Continue option on the earlier Inventory Actions screen.

ASTRAX

Incomplete Inventory

- 1) SessionID :20131224174413essen
Created By :essen
Create Date :24-12-2013 05:47:04 PM
- 2) SessionID :20131220115918essen
Created By :essen
Create Date :20-12-2013 11:59:22 AM
- 3) SessionID :20131220113313essen
Created By :essen
Create Date :20-12-2013 11:33:20 AM
- 4) SessionID :20131218093605essen
Created By :essen
Create Date :18-12-2013 09:36:08 AM
- 5) SessionID :20131218091947essen

ASTRAX

Incomplete Inventory

1) SessionID :20131224174413essen

Created By :essen

Create Date :24-12-2013 05:47:04 PM

2) SessionID :20131220115918essen

Created By :essen

Create Date :20-12-2013 11:59:22 AM

3) SessionID :20131220113313essen

Created By :essen

Create Date :20-12-2013 11:33:20 AM

4) SessionID :20131218093605essen

Created By :essen

Create Date :18-12-2013 09:36:08 AM

5) SessionID :20131218091947essen

Session ID

20131224174413essen

Do you want to continue ?

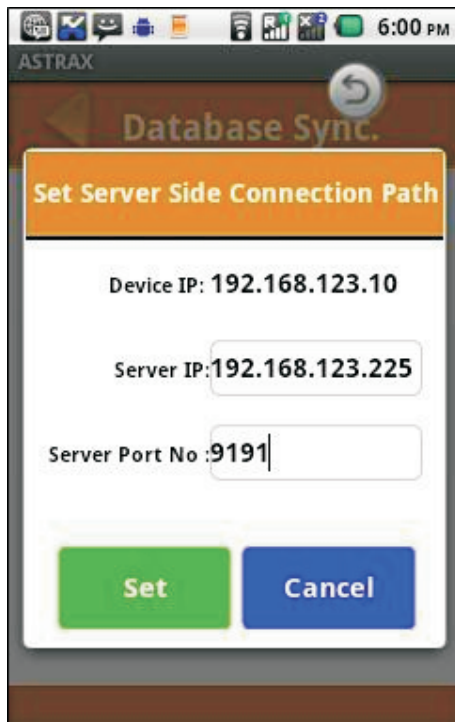
Continue Cancel



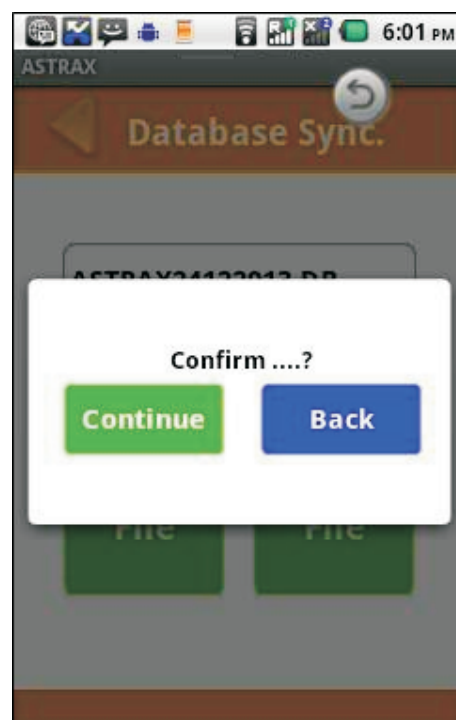
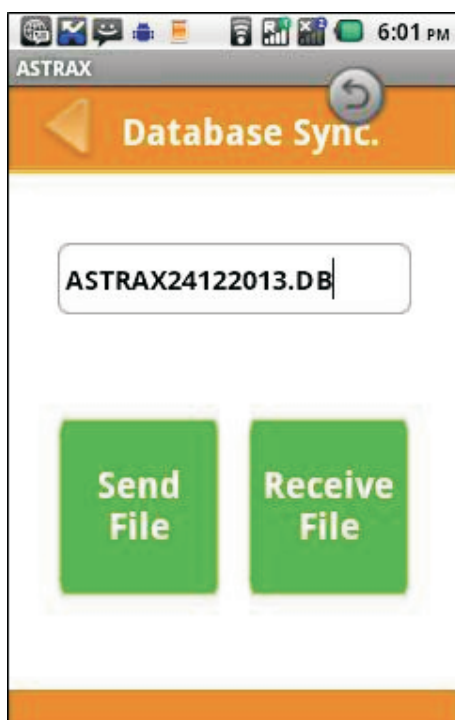
CASE STUDY

Synchronization with Server:

When location scanning is completed, the transaction data is synchronized back into the cloud server. This function is performed through the Database Sync option.



Once the HandyScanna™ is connected to the server, the file is uploaded into the database.





CASE STUDY

BENEFITS:

- Efficient management of on-site assets.
- Easy location of assets within geo-fenced area.
- Efficient management of inventory sessions.
- Instant report generation including for missing assets.
- Asset status can be viewed from a remote location by management.
- Asset location can be viewed on map using the web-based application.
- Contactless tracking that does not rely on line-of-sight operations.
- Reduction in manual search and resultant time savings.
- Prevents asset misplacement.
- Optimum asset utilization and timely maintenance.
- Prevents duplication in deployment of assets at the site.

LINKS:

Hardware:



Tags:



Software:



Reference Example:

<http://www.essenrfid.com/Mailer/asset-inventory-flash-demo.pdf>