Attachment A9
VIPER for Field Users

Revised: 3/31/2015

VIPER is a wireless network based communications system designed to enable real time transmission of data from field sensors to a local computer, remote computer, or enterprise server and provide data management, analysis, and visualization. The VIPER system allows users to collect data with multiple instruments utilizing fixed or mobile monitoring strategies. An example of a fixed monitoring strategy is an Ebam setup in a residential removal scenario, while a mobile strategy example is a MultiRAE utilized for personal monitoring during drum staging.

The VIPER Survey Controller software manages the LifeLine hardware and the software for each LifeLine component. This allows the user to view a screen that displays real time readings for each monitoring instrument.

LifeLine Components
- LINC: Small, light, AA Lion battery powered, weatherproof module designed to attach to the output port of a specific field sensor. Contains firmware to communicate with the sensor to acquire and process data (including A/D conversion if required), and 802.11b radio to join the wireless network established by the LifeLine Gateway. Single toggle switch actuation, two LED status lights. Field service life is approximately 16 hours. The LINC connects to a single instrument's communications port and then connects via Wi-Fi to a Gateway. Includes an embedded GPS and appends latitude and longitude coordinates to sensor readings.
- Gateway: connects one or more LINCs via Wi-fi. Access the LINCs on a laptop through the Gateway via either a local Wi-Fi connection or through the internet. The Gateway can be accessible via the internet by using one of the two USB cellular air card slots or by connecting it to a LAN via its Ethernet port. The Gateways are also capable of forming a mesh network.
- Meter Application: instrument specific software that connects to the LINC through the Gateway; receives the native sensor data and converts it into a CAP message. This application is managed through the VIPER Survey Controller. The window will display all of an instrument's sensors, which will be green if they are communicating correctly and grey if they are not. A separate meter app window will open for each device on a run (as opposed to survey controller, which will only have one window which shows the status of multiple devices).
- Survey Controller: PC software application designed to communicate with a specific Gateway via the network. Data can be made available to local applications and remote enterprise resources. The meter app connection can be local (directly to the Gateway wifi network), or it can connect to the Gateway from anywhere on the internet.

VIPER Configuration

A pre-configured laptop is included in the Gateway kit. This allows users to secure hardware connections and begin transmitting data, rather than requiring the configuration of communication specifications to enable data transmittal.
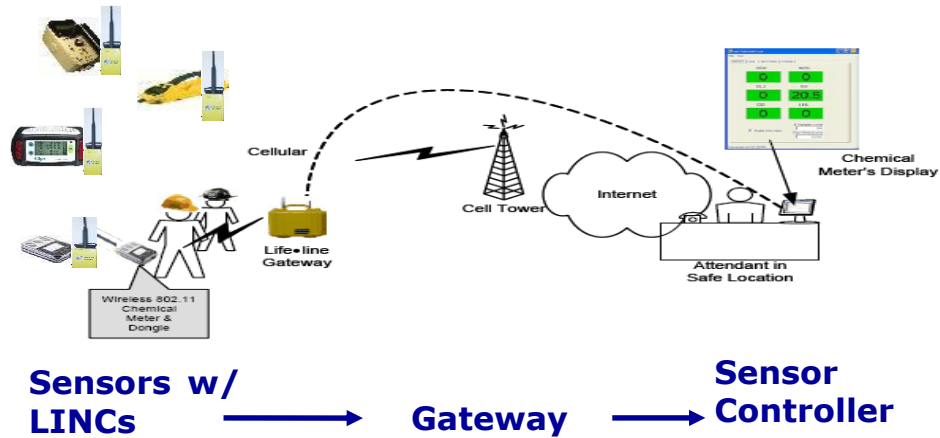
Deployment Manager

Deployment Manager provides a live web view of the data, the locations of the instruments, and trend graphs for each instrument. Data is also displayed via a Google Earth KML field with automatically updates with new readings showing the real time movements of mobile survey teams.

General Operations

When setting up a VIPER run this should be your general process:
1. Start up the instrument, preform any calibration checks, zeroing, or fresh air calibrations
2. Turn on the Gateway (via the power switch on the top of the pelican case by the handle)
3. Make sure the "cell" light is illuminated and the "mesh" light is illuminated and occasionally blinking
4. Boot up the Viper computer and connect the computer to the WiFi network EPAERT1
5. With the LINC powered off plug it into the instrument
6. Turn the LINC on by pressing the white power button
7. Watch for the lights on the LINC to illuminate. Ideally the WiFi, Data, and GPS lights will turn on
8. If all these buttons illuminate, a meter app should pop up on the computer
9. Then open the survey controller, set up a run, and start logging

General Troubleshooting

If the Instrument is not available in your list to create a run:
** Insert instructions for adding a LINC to the list

How to access LINC Configuration/ Set Baud rate (troubleshoot the LINC showing power and WiFi but no data or GPS).
10. Ensure your computer wifi is connected to EPAERT1
11. In your browser enter the address http://192.168.3.### (where ### is the LINC ID)
12. Enter the username and password; both are dpac
13. The resulting screen should say B&B Electronics
14. Select Configuration from the menu at the top of the page
15. In the menu on the left side of the page select "Serial Port 2 Settings"
16. Find the category "Serial Port Bit Rate"
17. Set the baud rate appropriate for your instrumentation
18. Then click commit
19. You should get a message saying "configuration changes committed successfully"
20. Power cycle the LINC and try to connect again

How to access Gateway Firewall settings (troubleshoot your data not getting to deployment manager)
21. Ensure your computer wifi is connected to EPAERT1
22. In your browser navigate to http://192.196.4.1
23. Enter the password: admin
24. In the menu at the top of the page select network --> Firewall
25. This will bring you to a screen titled "Port Forwarding Rules"
26. Scroll through the list and see if you can find your LINC ID. For each LINC there should be three entries in the following format, ###d, ###t, and ###g (where ### is the LINC ID)

Instrument Specific Troubleshooting

DataRAM
- The instrument baud rate is determined by the firmware version. The version is displayed on the startup screen. Version 106 - Baud rate = 38,400. Version 104 - Baud rate = 9,600
- Make sure the LINC is properly configured for the same baud rate as the DataRAM.
- The Device number must be set to "1" in order to communicate with the LINC. To access the device number navigate to "Setup Parameters", press next 2 times to access the third screen, use the arrows to highlight the device number (highlight the digit), and use the +/- keys to change the number to 1.

ER Truck Specific
- The LINCs are stored without batteries. You must insert a battery before turning LINC on.

Viper Deployment Manager
- Viper.ert.org
- For each new response/ action you should re-register the survey controller application
- This allows each event to have a unique ID in the subscription Weston data managers pull from the server
- To do this in survey controller click "Viper Server" --> Re-register
- You will get a message asking you if you would like to re-register. If this is a new project and you are collecting a new data set not connected to previously viperized data say "Yes"
- In the resulting form you should give the Instance a name that reflects the project and fill in the contact information with someone who will be the point of contact for the project's Viper. This is who ERT will contact if they need any information
- There is a lag in pushing data from the local machine to the server. A typical lag is 15 minutes, but it can stretch up to 45 minutes.

Viper Survey Controller Data
- Locally stored data will be in the following location on the viper laptops
- C/ Program Files(x86)/ Viper.....
- You can clear junk data (i.e. data from tests) in survey controller
- Go to Data --> Compiled Data and clear the folder