SQUID-4G

User manual version 1.3
Unpacking - Upon opening the box that Squid-PRO comes shipped in, you will see the Pelican case and below that a documentation box containing an SD card, calibration certificate and AC auto adapter. Inside the Pelican carrying case you will find the Squid-PRO unit, AC charger and antennas.

Starting Up - Power up Squid-PRO by pressing the rollerbutton on the front of the unit. You should notice a horizontal startup bar for approximately 20 seconds. After startup, Squid-PRO scans all nearby cellular networks followed by the acquisition of base station names and finally GPS satellite lock. Time scan usually takes between 1 to 2 minutes total for all networks.

Before You Start - Completely charge up your Squid-PRO using the supplied AC/DC transformer. Note the mini-USB port for later use with a PC. Be sure to also securely connect all antennas to the Squid-PRO for maximum sensitivity. Note: GPS connection on the side of unit is ONLY for ACTIVE GPS antenna.

Trackball - In addition to providing navigation to all menus and features, the Trackball also indicates scanning status by blinking and changing color. BLUE and GREEN=Finding Networks. BLUE and RED=Acquiring Names. Solid BLUE=All names acquired. NOTE: Once Squid-PRO has acquired networks, it continues to search in the background without showing text or trackball blinking unless the unit is powered off.

Connecting Antenna - Be sure to connect all antennas before making any measurements. Screw antenna into SMA connector securely by holding the end and turning clockwise.

Magnetic Hook - Squid-PRO contains a fold-out hook that easily slips onto a utility belt or low hanging wire. The embedded magnet also allows Squid-PRO to be mounted temporarily to metal surfaces.

Main Screen - Once the Squid-PRO powers up and scans all nearby base stations, you will notice the main screen complete with Network Carrier, Type of wireless standard, RSRP measurements in dBm and Squid-PRO menu icons below. Use the rollerbutton on the Squid to navigate up, down, left or right at anytime.

4G LTE base stations are listed according to their wireless carriers. Not all carriers are supported. Some carriers sharing bandwidth with other carriers will not be displayed. Consult the FCC’s commercial 4G allocation for your area for details.

FRQ MHz lists the nearest wireless carrier frequencies detected. Not all bands are supported so ask your BVS sales agent.

RSRP values are listed as they are scanned. Use the RE-LIST SORT BY RSRP function to place the strongest base stations at the top.
ICONS and their FUNCTIONS

DOWN ARROW - Use this arrow to scroll down when the list is greater than 4.

UP ARROW - Use this arrow to scroll up when the list is greater than 4.

REFRESH DISPLAY - Use this to update info on the screen and remove or add items that are not current.

SORT BY RSRP - This icon lists RRP so that the strongest RSRP values appear at the top (for instance, -55 dBm is stronger than -93 dBm)

INFORMATION - This screen displays which antenna (left and right) is receiving which wireless carrier standard.

GPS - Displays navigation information including latitude, longitude, UTC and fix. The GPS antenna must be connected to the GPS connector on the top of the unit in order to achieve GPS lock. If your unit does not contain a Sprint module, you must use an active antenna to achieve GPS lock.

BATTERY - This screen displays battery power left (percentage) of the Squid’s internal batteries. Typical runtime is approximately 8 hours.

POWER OFF - Select this icon to turn off the Squid.

BACK ARROW - Select this icon anytime to go back to the previous screen.
**USER SCREENS and their FUNCTIONS**

**STARTUP SCREEN** - Upon power up, Squid-PRO will display the firmware version and progress bar. It typically takes about 30 seconds for Squid-PRO to power up and begin locating nearby base stations.

**FINDING NETWORKS** - After the startup screen, Squid-PRO takes a moment to find and list nearby networks by brand name, band and RSRP value. Even if this list has filled the screen, Squid-PRO may continue to add base stations and acquire more names. CDMA networks are typically found almost instantly. GSM/UMTS networks generally take longer to acquire and are scanned while “Finding Networks...” is shown. The Trackball will blink **GREEN** and **BLUE** until it has found all networks listed.

**ANTENNA INFORMATION** - This screen displays which antenna (left, center & right) is receiving which wireless standard. These connections are hard-wired to the receiver modules so the user knows that when facing the screen, left antenna connection is always for GSM while the connection on the right is always CDMA. The function of the center antenna depends on the Squid-PRO configuration. If equipped with a Sprint CDMA module, the center antenna is a shared CDMA/GPS (passive) antenna. If not equipped with a Sprint module, the center antenna is an active GPS antenna and marked appropriately.

**GPS** - Displays navigation information including latitude, longitude, UTC and fix. The GPS antenna must be connected to the GPS connector on the top of the unit in order to achieve GPS lock. If your unit does not contain a Sprint module, you must use an active antenna to achieve GPS lock.

**BATTERY STATUS** - This screen displays battery power left (percentage) of the Squid’s internal batteries. Typical runtime is approximately 8 hours.
RSRP DIRECTION FINDING - This screen is most useful for antenna alignment when the operator may be out of arm’s reach to the unit while holding or repositioning an antenna. Notice the PEAK HOLD at the end of the horizontal dBm. That will remain until a higher dBm is detected.

POWER OFF - Select this power icon to turn off the Squid.

EMERGENCY SHUTOFF SWITCH - Since Squid-PRO powers off normally through software, there is a small possibility that the software can become unresponsive. In this case, Squid-PRO would not be able to be shut down until the battery fully dies. For this reason, an emergency shut off switch is located on the right side of the unit on it’s side. Use a paper clip or any wire small enough to fit into the hole. Hold the switch until the screen goes dark. You may now power your Squid-PRO back up again normally.

BASE STATION INFORMATION - This screen allows the user to see many details about the currently selected base station.

OPTIONAL DIRECTION FINDING ANTENNA - This option includes a DF antenna, bracket and antenna cable. Note the assembly in the photo. Attach antenna before powering up the Squid-PRO. Recommended procedure for DF antenna use is to begin by first attaching omni-directional antenna(s) to acquire local base stations. After all local carriers have been detected, swap out omni for direction finding antenna. Be sure to choose the appropriate antenna connection (left connector for AT&T or T-Mobile or right connector for Verizon).
TYPICAL SQUID-PRO APPLICATIONS - Since Squid-PRO provides dBm accurate measurements, it allows installers to verify and optimize M2M sites for the following applications and more.

Remote Meter Reading

Power Station Monitoring & Control

Variable Message Signs

Gas, Water & Oil Flow Monitoring

Fire, Law & Rescue Operations

Cellular ATM Transactions

Cellular Lottery Terminal Transactions

Fleet Management Solutions
GLOSSARY OF M2M TERMS

AVL (automatic vehicle location)
A system that determines the geographic location of a vehicle and transmits this information to a tracking center.

CDMA (code division multiple access)
A form of multiplexing that allows numerous signals to occupy a single transmission channel, optimizing the use of available bandwidth. The technology is used in UHF (ultra high frequency) cellular systems in the 800 MHz and 1.9 GHz bands. CDMA offers several data bearer options including IS-95, 1xRTT, and SMS (short-message service).

Condition Monitoring
The process of monitoring a parameter of condition in equipment, such that a significant change is indicative of a developing failure. It is a major component of predictive maintenance. The use of conditional monitoring allows maintenance to be scheduled, or other actions to be taken to avoid the consequences of failure, before the failure occurs. Nevertheless, a deviation from a reference value (e.g. temperature or vibration behavior) must occur to identify impeding damages.

EDGE (enhanced data rates for GSM environment)
A digital mobile phone technology that allows increased data transmission rates and improved data transmission reliability.

Edge Device
These wireless device networking solutions connect virtually any intelligent device to the Internet or IP network for remote monitoring, control and configuration.

GPRS (general packet radio service)
A packet-based wireless communication service that delivers data at rates up to 114 Kbps and continuous connection to the Internet for mobile phones, devices, and computers on GSM networks.

GSM (global system for mobile communication)
A digital wireless system that uses a variation of TDMA (time division multiple access) to digitize and compress data. It then sends this data down a channel with two other streams of user data, each in its own time slot. GSM operates at either the 900 MHz or 1800 MHz frequency band and offers several data bearer options including GPRS (general packet radio service), HSCSD (high-speed circuit switched data), and SMS (short-message service).

LBS (location based services)
A location-based service (LBS) is an information service, accessible with mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device. LBS services can be used in a variety of contexts, such as health, work, personal life, etc. LBS services include services to identify a location of a person or object, such as discovering the nearest banking cash machine or the whereabouts of a friend or employee. LBS services include parcel tracking and vehicle tracking services. LBS can include mobile commerce when taking the form of coupons or advertising directed at customers based on their current location. They include personalized weather services and even location-based games.
MNO
A mobile network operator (MNO), also known as mobile phone operator, carrier service provider (CSP), wireless service provider, wireless carrier, or cellular company, is a telephone company that provides services for mobile phone subscribers.

MVNO
A mobile virtual network operator (MVNO) is a company that provides mobile phone service but does not have its own licensed frequency allocation of radio spectrum, nor does it necessarily have all of the infrastructure required to provide mobile telephone service. A company that does have frequency allocation(s) and all the required infrastructure to run an independent mobile network is known simply as a Mobile Network Operator (MNO). MVNOs are roughly equivalent to the “switchless resellers” of the traditional landline telephone market. Switchless resellers buy minutes wholesale from the large long distance companies and retail them to their customers.

Smart Grid
A smart grid includes an intelligent monitoring system that keeps track of all electricity flowing in the system. It also incorporates the use of superconductive transmission lines for less power loss, as well as the capability of integrating alternative sources of electricity such as solar and wind. When power is least expensive a smart grid could turn on selected home appliances such as washing machines or factory processes that can run at arbitrary hours. At peak times it could turn off selected appliances to reduce demand.

Smart Services
The use of advanced sensing, communication, and control technologies to deliver services more effectively, economically, and securely.

SMS (short-message service)
The process of sending short data messages to and from mobile phones and devices.

Telematics
The integration of wireless communication devices (and often location tracking devices) into automobiles for remote engine diagnostics, stolen vehicle surveillance, roadside assistance, etc.

Telemedicine
Telemedicine is a rapidly developing application of clinical medicine where medical information is transferred through interactive media for the purpose of consulting, and sometimes remote medical procedures or examinations. Telemedicine may be as simple as two health professionals discussing a case over the telephone, or as complex as using satellite technology and videoconferencing equipment to conduct a real-time consultation between medical specialists in two different countries. Telemedicine generally refers to the use of communications and information technologies for the delivery of clinical care.

Telemetry
A highly automated communications process by which measurements are made and data collected at remote or inaccessible points and transmitted to receiving equipment for monitoring, display, and recording. Telemetry may also include two-way communication for the purpose of remote machine management and control.