

# PT-8100N

User Guide



**LIVEVIEWGPS**



**OVERVIEW** ..... 4

    Lights ..... 4

    On/Off Button ..... 4

    Powering the PT-8100N On ..... 4

    Powering the PT-8100N Off ..... 4

    Checking Signal/Battery ..... 4

    When the PT-8100N Reports ..... 4

**PT-8100N Battery Information** ..... 5

    PT-8100N Battery Reporting ..... 5

    How to Check Battery Status ..... 5

    PT-8100N Battery Life ..... 5

    Safety Circuits ..... 5

    Chargers ..... 6

    Charging Times ..... 6

**Placing the Device in the Slap ‘N’ Track Case** ..... 7

    Connecting the MATE-N-LOK Connections ..... 7

    Set the Reporting Interval ..... 7

**Placing the Slap ‘N’ Track Case on the Load** ..... 7

    GPS Signals..... 7

    Cellular Signals ..... 7

    Considerations ..... 8

**Sensors** ..... 8

    Battery ..... 8

    Inferred Motion ..... 8

    Inferred Motion Example ..... 9

    Panic Button ..... 10

**Reporting Interval** ..... 11

    Special Instructions for Setting the Reporting Interval ..... 11

    Checking the Device Log to See if the Interval was Properly Set ..... 11

**PT-8100N Skip Counter** ..... 12



What is Skip Count? ..... 12

What Does it Do for Me? ..... 12

Example ..... 12

What are the Details of How it Works? ..... 12

How it looks in the Device Log ..... 12

How to request a Skip Count Change ..... 12

**PT-8100N Hibernation** ..... 13

    Waking Interval ..... 13

    Hibernation Skip Count ..... 13

    Setting Hibernation ..... 13

    How to Request a Hibernation ..... 13

**PT-8100N Hardwiring** ..... 14

**Troubleshooting**..... 14

    Local ..... 14

    Hard Reset ..... 14

    Remote ..... 14

    Possible Causes ..... 15

    Possible Solutions ..... 15

**Contacting Support** ..... 15

    Support Request Form ..... 15

    Things to Check & Report to LiveViewGPS Technical Support ..... 15

**Appendix A: PT-8100N – Recommended Standard Operational Procedures** ..... 16

    Charging the Battery ..... 16

    Testing the PT-8100N and Setting the Reporting Interval ..... 16

    Placing the PT-8100N in the Case ..... 16

    Placing the PT-8100N on the Load ..... 16

The PT-8100N is an Assisted -GPS tracking device utilizing CDMA networks for monitoring and reporting. It features a Skip Counter to save on battery and locates when it is not in motion. Its features and functions are explained in this document.

### Lights

There are two lights on the device: link status and the battery. The link status, on the left, identified by a cell tower, shows if there is a cellular tower in range. The battery status light, on the right, identified by a battery, shows battery charge.

### On/Off Button

The On/Off button is used for power-up, power-down and to check cellular signal level and battery.

### Powering the PT-8100N On

To power the device on, press the On/Off button for about 4 seconds. When powering on, the lights should both blink red, then red/green and then green. The unit will not send location or sensor reports on power up.

When you power the device up, the PT-8100N does not report its location until the end of any set intervals or until you request location. It will respond to a Location Request about 60 - 90 seconds after power-up.

### Powering the PT-8100N Off

To power the device off, hold down the On/Off button for about 4 seconds. When powering off, the lights should both blink green, then red/green and then red. The unit will send its location on power down. The location will show in the LiveViewGPS portal about 30 seconds after power down.

**IMPORTANT - Do not disconnect the battery until five seconds after the red lights stop flashing.**

### Checking Signal/Battery

With the PT-8100N device powered on, tap the On/Off button to see the battery/signal status. The signal light will show green, amber or red representing signal strength and then the battery light will show green, amber or red representing battery charge. The green light indicates 90% or better cellular signal strength and battery charge. Amber (green/red) indicates 40% - 90%. Red indicates below 40%.

**NOTE** - The easiest way to check the battery is by checking it in the LiveViewGPS portal. Make certain that the PT-8100N is not attached to the charger that connects to the charging port when you check the battery status because it will report 98% whenever it is on that charger. If you use this method, make certain that the time and date of the battery report in the LiveViewGPS portal is current.



### When the PT-8100N Reports

The PT-8100N does not report its location when it powers up.

On power-up, the PT-8100N continues timing from last Reporting Interval report.

The PT-8100N reports its location at the start of its next reporting interval or approximately 45 - 120 seconds after the Reporting Interval is initially set.

The PT-8100N reports its location at the beginning of the next Reporting Interval unless it is stationary and is on a Skip Count. If it is stationary, on a 1 minute interval, and the Skip Count is 9; it skips 9 minutes (not reports) and reports on the 10th minute. The PT-8100N will report its location when it is pinged (Request Location is clicked).

It will report its location when the panic or assistance button is pressed for 5 seconds.

It will report its location about 30 seconds after the user presses the On/Off button to power it off.

**NOTE - NOTE:** When a device has gone stationary, the PT-8100N will report one more location and then start the Skip Count, if it is enabled.

The PT-8100N with a Skip Count will report Geofence red zone entries sooner than with regular intervals because it will report as soon as it stops.

## PT-8100N Battery Information

How long it takes to charge the battery depends on how low the charge is, what size battery and what charger you have. You can charge the battery using either the PT-8100N charger that connects to the bottom front of the device or with the optional external battery charger that connects directly to the battery.

### PT-8100N Battery Reporting

The PT-8100N only reports its battery level on request. To make sure the system gets periodic battery updates, the LiveViewGPS portal automatically requests battery level from PT-8100N devices on every fourth successful interval report or anytime a user clicks the Request Location button.

It's possible that your PT-8100N will occasionally miss a battery report (just as it can occasionally have an unsuccessful location attempt). The most common reasons for missed battery reports are similar to the reasons for missed location reports (loss of cellular signal due to device placement, device environment or locations with poor cellular coverage). The effect of occasional missed battery reports can be more pronounced at longer reporting intervals, since significantly more time can pass between battery updates.

The PT-8100N calculates remaining battery by taking a voltage sample. If conditions on the device have changed drastically since the last voltage sample, it's possible to see spikes or sags in the battery percentage. This effect is often more pronounced with high reporting frequency. For example, a PT-8100N on a 5 minute reporting interval could report 50% battery at 13:00 and 60% battery at 13:20. However, the battery reading at 13:00 was made when both the GPS and cellular radios were at max power (causing the voltage to sag), but the reading at 13:20 was made when both radios were off. For this reason, we encourage users to look at several battery reports to get a sense of remaining battery, and not to make conclusions based on a single battery report.



### How to Check Battery Status

You can check battery status three ways:

- The most accurate reading is from a voltmeter. A full charge is read at 4.1 – 4.2.
- Disconnect the charger and perform a location request on the LiveViewGPS portal. **NOTE:** Make certain the reading is taken after the tracker was removed from the charger and that the date on the battery reading is today's date and the current time.
- If it is not connected to the PT-8100N charger that plugs into the bottom of the device, you can look at the PT-8100N battery LED. It should be solid green.

**NOTE:** If the reading is 98% it may mean the device was just placed on the charger.

**To check device status:** Tap the On/Off/Status Button.

Battery Status LED	Link Status LED
Red - Below 40% or Low battery	Red - No signal
Orange - 40%-90% (Medium) battery	Blinking Red - Searching
Green - 90% - Full battery	Green - Good Signal

**NOTE:** The PT-8100N is programmed to shut off if the battery is below a certain level to prevent loss of data. Do not leave an uncharged battery on the shelf for a long period of time.

### PT-8100N Battery Life

Battery / Interval	1 day	4 hour	1 hour	30 minutes	5 minutes	1 minute
Internal Li-Ion .72 Ahr	10 - 12 days	9 - 9.5 days 56 - 58 locates	6 - 6.5 days 131 - 143 locates	4.5 - 4.8 days 211 - 221 locates	1 - 1.5 days 330 - 371 locates	8 - 12 hrs 333 - 447 locates
4.0 Ahr (3.7V) Li-Polymer	55 - 60 days	50 - 52 days 300 - 325 locates	36 - 41 days 727 - 973 locates	25 - 30 days 1100 - 1427 locates	6.5 - 9 days 2000 - 2220 locates	2.5 - 3.5 days 1800 - 2483 locates
10.0 Ahr (3.7V) Li-Polymer	135 - 150 days	125 - 130 days	90 - 100 days	62 - 75 days	16 - 22 days	6 - 9 days

- For testing purposes the Skip Count was set to 0.
- Tests performed in a lab environment. Actual results may vary.
- Batteries were also tested in a freezer and were not affected.
- Li-polymer batteries do not have a memory and do not require periodic draining.

### Safety Circuits

There is a safety circuit built into the external polymer battery and also into the PT-8100N. It will kick in if the following occurs:

- Battery goes to 0 and device shuts down
- Device is left for a period of time so internal current draw depletes the battery to the point the safety circuit kicks in

When the PT-8100N is connected to the barrel charger that plugs into the charging port at the bottom of the PT-8100N, it senses this and reports the battery at 98%. If using an external battery, it is better to charge with the external battery charger because it reports the actual charge, versus the 98% that it reports when it is on the charger.

## Chargers

The time required to charge the battery is dependent on both the battery and the charger. There are three chargers that can be used. One connects to the charging port at the bottom of the PT-8100N. The other two connect directly to the battery. The charger that connects directly to the battery is faster than the charger that connects to the battery through the PT-8100N charging port.

If the external battery is drained to 0% the charger that connects to the bottom of the PT-8100N may not be able to unlock the safety circuit. In this case, you must use the charger that connects directly to the battery.



Figure 1 - PT-8100N Power Supply



Figure 2 - Standard Battery Charger (1.0 A) for LVGPS Batteries



Figure 3 - Rapid Charger (3.0 A)

### Charging Times

Battery	PT-8100N Charger 1.0 Amp	External USB Charger 1.0 Amp	Rapid Charger 3.0 Amp
Internal .72 Ah Lion	1.5 hour	Can't use	Can't use
4.0 Ah Li-Polymer	8 hours	5-8 hours	Don't use
10.0 Ah Li-Polymer	Don't use	14 hours	3.3 – 5 hours
20.0 Ah Li-Polymer	Don't use	28 hours	7.6 – 10 hours

#### Battery Charger Lights

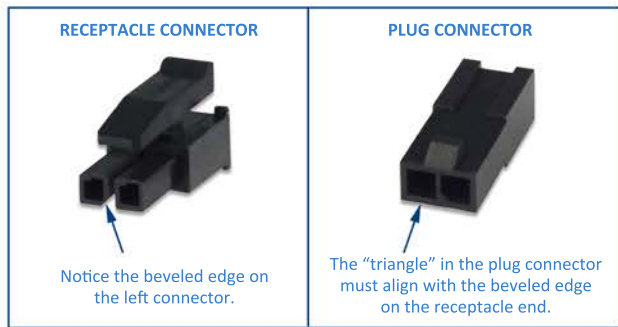
Orange (red/green) – Charging  
Green – Charging complete

**NOTE:** The PT8100N Power Supply does not have a light.

## Placing the Device in the Slap 'N' Track Case

### Connecting the MATE-N-LOK Connections

LiveViewGPS external batteries use MATE-N-LOK connectors. LiveViewGPS Lithium batteries have a MATE-N-LOK receptacle which inserts into a corresponding MATE-N-LOK plug. The connectors are keyed as pictured below. **CAUTION:** Do not force the connector on incorrectly which can cause the power supply to overheat and damage the device.



The clip must also be positioned where it locks onto the latch.



When the PT-8100N is placed in the case, check the following:

1. The battery is connected.
2. The status lights blink when you tap the On/Off button.
3. The wires are not pinched.

Close the case and latch. You should not have to press hard to close the lid.



### Set the Reporting Interval

After closing the case, you should check the device on the LiveViewGPS portal to make certain it locates. You should also set the interval before placing the device. Refer to page 11 for special instructions on setting the Reporting Interval.

It is strongly recommended you set up procedures to perform this operation before embedding the device because it may be difficult to do afterwards.

## Placing the Slap 'N' Track Case on the Load

Whether you place the device inside a trailer, on a vehicle or in a baiting operation, the principles are the same. In an ideal world you'd take the case and slap it on top of the vehicle's cab or roof. This will provide results 99% of the time (no device is guaranteed to work 100%). In reality, you have to settle for a compromise between best accuracy and covert practicality. GPS units work well in typical single or multi-story houses, but they will not track as well inside glass or metal buildings. When the tracker cannot get a GPS signal the device will report location by cell phone tower location triangulation. GPS units track most accurately when they are outside with a clear line of sight to the sky and moving, therefore it is recommended that initial testing be performed in a moving vehicle.

### GPS Signals

When the GPS satellites transmit signals back to Earth, the public signal (known as L1) is broadcast at 1575.42 MHz, a power level which is far too weak to be received through walls, roofs and even dense foliage. It's important to understand the relationship between the road and GPS signals. Visualize GPS signals as straight lines that hit the road and are reflected upwards in a multitude of angles, some bounce up relatively straight, others come in at angles. Those signals that hit metal obstructions are reflected away; those that hit the case are received. We want as many of those signals to hit the case so they can be processed as successful reports.

### Cellular Signals

The average cell sector has a transmission range of about 7 miles. The signal strength is attenuated the further it is from the cell tower. Cell signals transmit through materials. However, the signal is attenuated, depending on the thickness and the materials absorption spectra. Generally speaking, signals pass through wood, plastic and fiberglass, but not so well through lead, steel or thick glass. Any building that has a significant thickness of concrete or amount of metal used in its production will attenuate the signal. Concrete floors are often poured onto a metal pan which completely blocks most radio signals. Some solid foam insulation and some fiberglass insulation used in roofs or exterior walls have foil backing, which can reduce transmittance. Energy efficient windows and metal window screens are also very effective at blocking radio signals.

## Considerations

For placement in a trailer there are a few considerations:

- Is the roof made of non-metallic material?
- Does the trailer have wooden floors?
- Where can you place the device where it is not visible?
- If the trailer is all metal, can the device be placed underneath a vehicle (using a magnetic “Slap ‘N’ Track” case) with an unobstructed view of the road?
- If placement is under the trailer, can you find a flat area facing the road, away from metal and magnets up, and away from any protruding metal (frame, driveshaft, exhaust, etc)?
- Can you avoid placement in wheel wells and bumpers as these are not suitable positions?
- Is the trailer roof translucent? If so, it is recommended that the device be placed near the roof.

**NOTE:** Directly after a placing a device, the device should again be checked in the LiveViewGPS portal.

Device: 11EC04D2 sensors have indicated that it has entered a low battery state.

Last known location (as of 2011 February 7, Monday 7:26:42am CST): 7329 Vista Mountain Dr, Austin, TX 78759, USA

The system has made this determination based on the most recent data available as of 2010 November 29, Monday 11:27:09 CST

When you re-charge the battery and it detects passing the 25% threshold, and you have set it to notify you, you will get an email similar to the following:

Device: 11EC04D2 sensors have indicated that it has exited a low battery state.

Last known location (as of 2011 February 7, Monday 7:26:42am CST): 7329 Vista Mountain Dr, Austin, TX 78759, USA

The system has made this determination based on the most recent data available as of 2010 November 29, Monday 11:27:09 CST

When the PT-8100N is connected to the PT charger that plugs into the PT, it will always read 98%.

It is normal to see some fluctuations in the +/- 5% range.

## Inferred Motion

“**Inferred motion**” is calculated by the LiveViewGPS portal comparing the current locate to the previous locates and then determining the probability of a device actually moving. A **yes** response indicates that the current locate is different from the last locate and that the LiveViewGPS portal has calculated that the difference is sufficient to determine that the device is moving. This allows you to set up a notification. The user should either check the motion indicator to make certain the device is in motion or look at the Map View to see if a trail of dots is leaving the site. Notifications are only sent if the status changes.

If the device is in your notification list for **inferred motion** and the location changes from the previous address, an email similar to the following:

Device: 11EC04D2 sensors have indicated that it has entered an inferred motion state.

Last known location (as of 2011 February 7, Monday 7:26:42am CST): 7329 Vista Mountain Dr, Austin, TX 78759, USA

The system has made this determination based on the most recent data available as of 2010 December 14, Tuesday 3:15:23pm CST.

After the device has reported its location at the same address twice, you will get another email similar to the following:

Device: 11EC0CED sensors have indicated that it has exited an inferred motion state.

Last known location (as of 2011 February 7, Monday 7:26:42am CST): 7329 Vista Mountain Dr, Austin, TX 78759, USA

The system has made this determination based on the most recent data available as of 2010 December 14, Tuesday 3:15:23pm CST.

## Sensors

The PT-8100N has three Sensors: battery, inferred motion and panic.

Example of PT-8100N Sensor Information:

Sensor	Value	Date	
battery	60%	2011 February 3, Thursday 8:40:48am CST	
inferred motion	no	2011 February 2, Wednesday 8:39:45am CST	
panic	1	20101 December 13, Monday 2:250:17pm CST	

The battery for the PT-8100N updates every fourth successful reporting interval and every manual location request.

**Panic** shows the last time that someone pressed the assistance button at the bottom of the PT-8100N.

The updates highlight in blue for 10 seconds after they occur to alert you.

### Battery

This sensor tells you the current status of the battery. If you click on the envelope next to this sensor it will notify you if the battery goes lower than 25%. If the device is in your notification list for low battery and it goes lower than 25%, you will get an email similar to the following:



## Inferred Motion Example

The device is on a 30-minute reporting interval at 8 a.m. The inferred motion sensor says “no”. The device reports seven times. If you had the Inferred Motion alerts “on”, you would see the following:

Time	Address	Notes	IM Sensor	IM Alert Triggered	Explanation
8:00	1234 Main Street	GPS locate at start	N	N	
8:30	1440 Main Street	Cellular locate ~2 blocks East of start	N	N	Not enough distance; No alert sent because last inferred motion status is the same as this one.
9:00	1100 Main Street	Cellular locate ~1 block West of start	N	N	Not enough distance; No alert sent because last inferred motion status is the same as this one.
9:30	Heading North on Interstate 35W	Cellular locate 5 miles Northeast of start	Y	Y	IM “auditor” determines the device moved sometime between 9 and 9:30 (by comparing the 2 positions); Device switches from inferred motion = “no” to “yes”; Alert will be sent at 9:30 saying that inferred motion was detected based on the position at 9:00 (since it moved sometime between 9 and 9:30).
10:00	Heading North on Interstate 35 W	Cellular locate 20 miles North of previous	Y	N	Truck continuing down highway; No alert sent because last inferred motion status is the same as this one.
10:30	7000 Interstate 35W	Cellular locate 7 miles North of previous location	Y	N	Truck stops, but we won’t “officially” know that until the next locate; No alert is sent; this position is still far enough away from the last one to indicate significant movement between the two.
11:00	7200 Interstate 35W	Cellular locate ~2 blocks North of previous location	N	N	IM “auditor” determines the device stopped sometime between 10 and 10:30 (by comparing the 2 positions); Device switches from inferred motion = “no” to “yes”; Alert will be sent at 11:00 saying that inferred motion was detected based on the position at 10:30 (since it stopped sometime between 10:30 and 11); Technically, it would have stopped sometime between 10 and 10:30, but we can’t detect that until we see 2 locations near the same spot.

## Panic Button

The Panic or Assistance button is at the bottom of the PT-8100N. If the button is pressed for 5 seconds it will send locations and sensor information to the LiveViewGPS portal. It could be used for child tracking, executive protection or to locate a lost hiker.

When the panic button is pressed the lights will flash back and forth from the battery light to the GPS light, first red, then amber, then green, then eventually off. The LiveViewGPS portal generates two battery readings, two locations and highlights panic for 30 seconds. The first locate sent is the last known location. The second is generated when the Panic button is pressed.



It will put two messages: "Sensor: panic reading of 1.0" in the Event Log:

<b>Sensor:</b> 2011 April 25, Monday 1:45:03pm CDT	<b>Sensor:</b> panic reading of 1.0
<b>Event:</b> 2011 April 25, Monday 1:45:03pm CDT	<b>Device:</b> 11EC1A0E(11EC1A0E) sensors have indicated that it has a panic state.
<b>Sensor:</b> 2011 April 25, Monday 1:45:03pm CDT	<b>Sensor:</b> inferred motion reading of 0
<b>Sensor:</b> 2011 April 25, Monday 1:44:36pm CDT	<b>Sensor:</b> battery reading of 0.8
<b>Sensor:</b> 2011 April 25, Monday 1:44:36pm CDT	<b>Sensor:</b> panic reading of 1.0
<b>Event:</b> 2011 April 25, Monday 1:44:36pm CDT	<b>Device:</b> 11EC1A0E(11EC1A0E) sensors have indicated that it has a panic state.

Sensors		
Sensor	Value	Date
<b>battery</b>	98%	2011 April 26, Tuesday 8:40:48am CST
<b>inferred motion</b>	no	2011 April 26, Tuesday 8:39:45am CST
<b>panic</b>	yes	2011 April 25, Monday 2:250:17pm CST

You can e-mail a notification for a panic reading of yes.

For PT-8100N devices, setting the reporting interval or selecting **Burst** mode will almost always result in a "Success" message from the server, because the request is successfully received by the service providers' server. However, the server is not able to deliver the interval change to the device. This can be quite confusing for users, as the interval appears to have been successfully set but the device will just report "unknown location" once and then never report again.

To make certain that an interval set or burst selection is valid, when you set the **Reporting Interval**, you must make certain that the location automatically reported directly after that one is a good locate, in other words, not UNKNOWN location.

This is what happens when you set the interval:

- 1) You select it and it sends it.
- 2) Qualcomm replies "Successful" to the LiveViewGPS portal that it got the request to change the interval.
- 3) Qualcomm sends a "Stop Reporting" command to the device.
- 4) The device receives it or not. If it doesn't receive the command, this is as far as it goes. Nothing changes.
- 5) If the PT-8100N receives the message, it will send an acknowledgement to Qualcomm.
- 6) Qualcomm sends the new interval. (If Qualcomm does not get the acknowledgement from the device, the device is stuck at "Not Reporting").
- 7) If the PT-8100N receives the new interval, it will set it and then let you know that it got the new Reporting Interval by sending its address. This takes about 45 to 120 seconds. If the device were pinged during this time, you would not be able to tell if the interval change got through. If it didn't get the new interval, it is stuck at "Not Reporting".

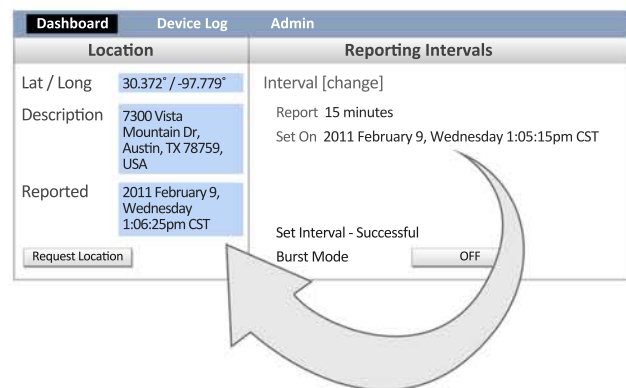
In some cases the Qualcomm knows that a device is not available, such as when a device is powered down or the battery runs down. In those cases, a message is sent to Qualcomm; however no message is sent to Qualcomm if a device is disconnected from power or moved where it cannot get a cellular signal. A "Successful" message means that the Interval Change message was received at Qualcomm and the device is not known to be unavailable.

When the LiveViewGPS portal reports "Device Unavailable" it means that the network knows that it cannot communicate with this device. It could indicate that the device was not configured properly, there is a break in the system, that there is a coverage problem or the device sent a disconnect message before powering off due to a low battery. It could be caused by changing the interval twice in a row without letting the response occur. Another cause would be disconnecting power without turning the device off first. Turning the device off using the power button does a graceful shutdown, informing the wireless service provider that it is powering down. If powering the device down for a few minutes does not resolve this problem, report it to Technical Support.

### Special Instructions for Setting the Reporting Interval

Before attempting an interval change, make certain that the device is reporting location by clicking on the request location button. If you do not get a location report, it will not properly change the location and you risk setting it to "Stop Reporting".

- 1) Select a new Reporting Interval. Note the time. Do not: a) press any buttons; b) connect or disconnect power to the PT-8100N or c) request location from the LiveViewGPS portal.
- 2) Watch the Dashboard - Location panel for the latest reported time. It should update after about 45 - 120 seconds. If the **Successful** message goes away and the date under **Location** has not changed, your interval change did not take place. Change the Interval selector to Select an Interval **and** then re-select the interval that you desire and start over.



### Checking the Device Log to See if the Interval was Properly Set

If you want to check whether or not the interval was properly set:

- 1) Go to the Device Log from the Dashboard for that device.
- 2) Unselect everything except Reporting Intervals.
- 3) Highlight the date of the last interval set and copy it to the paste buffer.
- 4) Select Locations. This will usually cause the last interval to become lost in the location reports.
- 5) Use Ctrl / F to bring up the browser Find window, use Ctrl / V to paste the date of the last interval set into it, and press the Enter key.
- 6) It should highlight the last interval set and then you can look at the locations that occurred directly after to see if they were good or unknown.



## What is Skip Count?

The PT-8100N has a vibration sensor. If the device is not moving, it can be configured to skip reporting intervals and save the battery using a Skip Count setting. The Skip Count setting tells the device to not report for a number of pre-defined skips, thus conserving the battery. If the Reporting Interval is set to 5 minutes, and it has Skip Count of 12, it will report once every hour while not moving. Note that the Skip is actually time dependent, not count dependent. In other words if the hour is up, but only 8 skips have occurred, it will still report at the next interval.

## What Does it Do for Me?

Location reports use more energy than sitting idle to call out to GPS and cell towers. They also use more energy if they are in a poor coverage area and therefore need to increase the signal strength. If a device has a Skip Count, it uses less battery when it is not in motion, as detected by the vibration sensor, by skipping location requests.

While it is not moving, it will report "Location reported at Unknown Address (lat/Ing NaN/NaN)" at each Interval setting until it has reached the Skip Count, at which time it will attempt to locate. This is the same message that it reports when it cannot determine its location.

It is important to point out that the PT-8100N is not asleep during the Skip Count. As long as it has power the PT-8100N is always listening for a signal in case a Location Request, Burst, or Interval Change Request comes in. It sends out its location on the Interval setting when it is in motion.

## Example

Reporting Intervals	
Motion [change]	
Report	1 minute
Set On	2011 June 29, Wednesday 4:24:59pm CDT
Stationary	
Report	1 hour , 40 minutes
Set On	2011 June 29, Wednesday 4:26:58pm CDT
Burst Mode	<input type="button" value="OFF"/>

In this example, the Skip Count is set to 99. If the Motion Reporting Interval is 1 minute, it will report every 100 minutes. If a user changes the Motion Reporting Interval to 10 minutes, it will automatically change the Stationary report to every 16 hours, 40 minutes or every 1,000 minutes.

## What are the Details of How it Works?

When a device has gone stationary, the PT-8100N will report one more location and then start the Skip Count. The PT-8100N with a Skip Count will report Geofence red zone entries sooner than with regular intervals because it will report as soon as it stops.

If a manual **Request Location** is sent, it always responds to it, reporting location and battery and it does not affect the **Skip Count**.

Whenever there is a stop and start it will reset the **Skip Count**.

If the **Motion - Reporting Interval** is changed, it will reset the **Skip Count** and report at least one location before starting skip.

When skipping, it does not report the battery or the location. Every 4th Reporting Interval location report, the battery is reported.

When connected to a charger, the device will still skip.

## How it Looks in the Device Log

With an Interval of 30 minutes and skip of 4, the **Device Log** looks like this:

```

5 Location 2010 August 23, Monday 7:15:38pm CDT Location reported at : Unknown Address (lat/Ing NaN/NaN)
4 Location 2010 August 23, Monday 6:43:42pm CDT Location reported at : Unknown Address (lat/Ing NaN/NaN)
3 Location 2010 August 23, Monday 6:11:46pm CDT Location reported at : Unknown Address (lat/Ing NaN/NaN)
2 Location 2010 August 23, Monday 5:39:50pm CDT Location reported at : Unknown Address (lat/Ing NaN/NaN)
1 Location 2010 August 23, Monday 5:07:54pm CDT Location reported at : Unknown Address (lat/Ing NaN/NaN)

Location 2010 August 23, Monday 4:35:47pm CDT Location reported at : 7501 N Capital of Texas Hwy, Austin, TX 78731,

```

**NOTE:** 30 minutes with a skip of 4 should produce a report about every 2 1/2 hours. The actual number of skips is based on when the expected Reporting Interval is due, not necessarily the actual setting.

## How to Request a Skip Count Change

The device must be powered on and in a good coverage area in order to change the Skip Count.

You can click the envelope in the lower right to contact LiveViewGPS Technical Support to request a Skip Count Change. Please provide the following:

- Company
- Folder that the device is in.
- Device name or ESN.
- Skip Count.** The **Skip Count** settings that can be sent over the air are 0, 1, 4, 9, 19, 39, 59, or 99.

Click Submit. The report will go to several people for a fast response. LiveViewGPS is available between 7 AM and 5 PM PST.

Alternatively, send an email to [info@LiveViewGPS.com](mailto:info@LiveViewGPS.com) or call the number below.

The LiveViewGPS PT-8100N has a Hibernation option that can be enabled by technical support. Hibernation is a mechanism to save battery for extended periods of time by shutting the device down between location reports.

- Power being applied through the hardwire connector will interrupt hibernation on the PT-8100N.
- Power being applied through the charging jack will not interrupt hibernation on the PT-8100N.
- Charging the battery through one of our external battery chargers will not interrupt hibernation on the PT-8100N.

When a device is in Hibernation, you cannot send real time commands to request location or change intervals. If you send commands when it is hibernating, the commands will be stored. When the device wakes up, it will check for commands and check its Hibernation Skip Count. When the PT-8100N is hibernating, it does not wake up on motion.

Location	
Lat / Long	30.377° / -97.779°
Description	7846-7663 N Capital of Texas Hwy, Austin, TX 78759, USA
Reported	2011 January 20, Thursday 8:12:37am CST
<input type="button" value="Request Location"/>	Request sent. Device hibernating, expect report in 1 hour...

When hibernation is enabled it does not listen for requests to change the interval or pings. If you sent a Location Request it will put give you a message: "Request sent. Device hibernating, expect report in 1 hour..." , and then put the request in a queue to send it when the device wakes on the Wake Interval.

The **Dashboard – Reporting Interval** panel is disabled with a "Hibernation ON" message. It will tell you what the hibernation reporting interval is.

### Waking Interval

This defines how long before the device wakes up to check for messages. It can be set to Hibernation OFF, or an interval of 5, 10, 15, 30, 60, 90, 120, 150, or 180 minutes.

When the device wakes on the Waking Interval, it will check for a ping request or interval change request from the LiveViewGPS portal and honor it. After it has honored manual requests from the LiveViewGPS portal, it will additionally determine if it should send its location or skip it.

### Hibernation Skip Count

The Skip Count defines how long many wake-ups it will skip in between sending a location report. The Skip Count can be from 0 to 10. If the Waking Interval is 180 minutes (3 hours) and the skip is 10, then it will send a locate every 30 hours (1800 minutes).

### Setting Hibernation


Setting Hibernation requires the following information:

- ✓ Company
- ✓ Folder that the device is in.
- ✓ Device name or ESN.
- ✓ Motion Interval required.
- ✓ How often the device should wake up to check for messages ( 5, 10, 15, 30, 60, 90, 120, 150, or 180 minutes).
- ✓ How many wake-ups it should skip before sending a location report. The Skip Count can be from 0 to 10.

Hibernation can only be set by LiveViewGPS personnel. You must make certain that the device is on in an area of known good coverage before setting hibernation because the process requires sending commands that retry until received and if the device is not available it will rack up charges.

### How to Request a Hibernation

The device must be powered on and in a good coverage area in order to change the Skip Count.

You can click the  envelope in the lower right to contact LiveViewGPS Technical Support to request a Skip Count Change. Please provide the following:

- ✓ Company
- ✓ Folder that the device is in.
- ✓ Device name or ESN.
- ✓ Motion Interval required.
- ✓ How often the device should wake up to check for messages ( 5, 10, 15, 30, 60, 90, 120, 150, or 180 minutes).
- ✓ How many wake-ups it should skip before sending a location report. The Skip Count can be from 0 to 10.

Click Submit. The report will go to several people for a fast response. LiveViewGPS is available between 7 AM and 5 PM PST.

Alternatively, send an email to [info@LiveViewGPS.com](mailto:info@LiveViewGPS.com) or call the number below.

## PT-8100N Hardwiring

The PT-8100N 'Hardwire' Cable converts 10-30V DC vehicle power to 5V DC. If the battery on a hardwired PT-8100N discharges and stops reporting, tethering the tracker to a power source will recharge the battery and also resume operation without having to press the on/off button.



- The converter has an 18-Pin PT-8100N connector that plugs into the PT-8100N. A cover must be removed first.
- If the PT-8100N is off or discharged, and power is connected through the hardwire connector, it will power itself on.
- If the PT-8100N is hibernating, it will wake up and will never hibernate while on power.
- If reporting intervals are set, the device will continue to report on those intervals.
- If the truck shuts down and the battery on the PT-8100N drains, the tracker will send a final report when it detects that it has 0% battery, and before it powers itself down to protect reserve battery.

## Troubleshooting

The PT-8100N only tries to determine its location for 30 seconds. It uses gpsOne™ CDMA Assisted-GPS location technologies, so it is capable of position fixes in several different modes. It falls back through these modes to obtain the best available position fix meaning that accuracy will improve from the time it initially powers up and reaches one cell tower, and then improves as it reaches more cell towers. It may be in range of only one cell tower, but this is not always enough to pinpoint the device location. Below is a description (in descending order) of how the generalized accuracy of those modes works.

- Satellite GPS/AGPS/AAGPS (accuracy measured in 10s of meters)
- Forward Link Triangulation (accuracy measured in 100s of meters)
- Cell Sector Direction and Distance (accuracy measured in 1000s of meters)
- Cell Sector Lookup (accuracy measured in miles)

Two things that will impair the accuracy of the device are: 1) being inside a building and 2) not moving. Inside a building, the PT-8100N is usually not able to obtain a Satellite signal, so it has to report what it can determine from the cell tower location and triangulation methods. Inside a building it is typically not able to

reach many cell towers; sometimes only one or two and those signals are not direct. Once the device is outside and moving, accuracy improves. Using logic and the map, users can obtain a close estimate of the address of the device location. When it is outside on the move, you can follow it easily.

### Local

If you have trouble with the device and the device is accessible, follow these procedures:

- 1) Check the lights for link status and battery. If you tap the On/Off button and both lights do not light, it means the device is off. It could have a drained battery or it could have been disconnected momentarily from the battery or powered off. If the lights come on and they are amber (red/green) or red, then the signal or battery is weak.
- 2) Make certain that the device is not placed where there are too many metal or non-porous materials surrounding it.

### Hard Reset

- 1) Plug into the PT-8100N charger that connects to the bottom of the device.
- 2) The battery LED comes on. If the battery was severely drained it may take 10-15 minutes for it to come on.
- 3) Press the On/Off button for 10 seconds to perform the hard reset. The lights will blink off momentarily. If that occurs, the PT-8100N has reset.
- 4) Connect the battery to a charger that connects to it directly. Charge the battery fully.

### Remote

If you have trouble with the device and the device is in the field then follow these procedures:

- 1) Make certain that the location has Sprint coverage.  
<http://www.showmycoverage.com/mycoverage.jsp?id=Q39370M>  
Remove the checks from the roaming coverage.  
Put in the street address, city, state and zip code.  
Click the Map It button.
- 2) Look at the LiveViewGPS portal to make certain that an interval was set.
- 3) Click the Request Location button.
- 4) Select the Hybrid Map View to see what the area looks like.
- 5) Select the Terrain Map to see if there are canyons or areas where cellular signals have difficulty.
- 6) Click on Traffic view to see if the device could be stopped in traffic.
- 7) Check the size of the error circles.

## Possible Causes

### Battery

- Make certain that the battery was fully charged.
- Old or cold batteries can lose power rapidly once they get to a certain level.
- Poor battery or power connections, can contribute to weak signals.

### Cell Coverage

- Poor cell coverage in a given area.
- Location services do not roam.
- Terrain, such as tall buildings, mountains, rock bluffs and heavy forestry can aggravate a problem.
- Bad weather can cause bad cell coverage, for example thunderstorms or very heavy clouds.

### Placement

- If a device is placed where it cannot get continuous good cell coverage all of the time, it will not ping all of the time.
- If a device is either in extreme heat or cold, it may not function correctly.

## Possible Solutions

It is normal for any cellular device to lose coverage as it moves. Directly after a placing a device, the device should be checked in the LiveViewGPS portal.

If it report "Timed Out", but updates the sensors, the device is functional and should report a good location once it is in an area of good coverage.

Make certain that the battery is over 20%. Depending on how old the battery is, it may drop off rapidly once the battery level gets to a certain level.

Verify that the device is in a good Sprint coverage area:

<http://www.showmycoverage.com/mycoverage.jsp?id=Q3937OM>



## Contacting Support

### Support Request Form

If you need to report a problem, click the Support tab in the Dashboard.

Click Send Email. The report will go to several people for a fast response. LiveViewGPS is available on weekdays during normal business hours from 7:00AM – 5:00PM PST.

Alternatively, send an email to [info@LiveViewGPS.com](mailto:info@LiveViewGPS.com) or call the number below.

## Things to Check & Report to LVGPS Technical Support

This list of questions will help to narrow down the cause.

- 1) What do the lights do when you tap the On/Off button?
- 2) Is the message: "Timed Out" or "Device Unavailable"?
- 3) Is it updating sensors?
- 4) Is the unit fully charged?
- 5) What was the last known battery level?
- 6) Was the battery reading taken after a power cycle and not connected to the charger?
- 7) Is the device last indicating motion?
- 8) Is the device last indicating inferred motion?
- 9) What type of terrain is it in?
- 10) How much traffic is there?
- 11) What does the coverage map show for that area?
- 12) Are there other trackers on this shipment that are working okay?
- 13) Is the unit in an area where there may be obstructions? GPS will pass through fiber-glass or wood, but not heavy metal or thick glass.
- 14) What interval is it set to?
- 15) What is the AHr rating of the battery?

## Appendix A: PT-8100N – Recommended Standard Operational Procedures

This appendix lists the Best Practices for an efficient operation. That being said, every site and application is somewhat different, so it is recommended that the customer use this appendix, the PT-8100N User Guide and common sense to generate their own S.O.P. LiveViewGPS can review it and suggest changes or point out potential issues.

Most of the problems are caused by:

- 1) Not setting the Reporting Interval correctly.
- 2) Sending a device out unpowered. This problem happens when the battery is temporarily disconnected and then the device not powered back up.
- 3) Sending a unit out with a battery that is not charged. This usually happens when the battery is checked while still connected to the charger and when the device is not powered down after charging.

### Charging the Battery

- 1) Do not leave uncharged devices on the shelf for long periods of time.
- 2) Charging of the battery should be performed with the power to the device turned off. This can only be done with the chargers that connect directly to the battery.
- 3) The charger that connects directly to the battery charges the fastest.
- 4) Consult the battery charts in the PT-8100N User Guide to determine how long it takes to fully recharge a drained battery.
- 5) Do not leave drained battery on the shelf, recharge as soon as possible.
- 6) It is helpful to check the voltage with a voltmeter. 4.1-4.2 volts is a full charge. The device must be disconnected from the charger when doing this test.
- 7) The battery light on the PT-8100N shows green at 90%, so it should only be used as a rough indicator. The device must be disconnected from the charger when doing this test.
- 8) The most accurate method of checking the battery strength is in the LiveViewGPS portal. The device must be disconnected from the charger or it will read 98%.
- 9) Watch for the light on the charger to change. Usually it will go to green. Some go to red. Check for 100% charge in the LiveViewGPS portal. Always check the date and time of the reading on the Dashboard – Sensor panel.

### Testing the PT-8100N and Setting the Reporting Interval

- 1) The PT-8100N should always be sent with 100% charge. A lesser charge may track the normal trip, but you must be prepared for the event that tracking is required for days.
- 2) It is recommended that you request a Skip Count of 99 instead of setting the Reporting Interval to Not Reporting. Skip Count only affects the device when it is not moving and you can always ping the device.
- 3) If you change the Reporting Interval, make certain to ping the device first to make certain it is available and in good coverage.
- 4) The Successful message only indicates that the command to change the interval was sent. You must receive a new locate in the Location panel before the Successful message goes away to be certain that the Reporting Interval was set at the device.
- 5) Device should not be stored with a drained battery.
- 6) Check the battery level in the LiveViewGPS portal with the device not on the charger. Always check the date and time of the reading on the Dashboard – Sensor panel.

### Placing the PT-8100N in the Case

- 1) Press the On/Off button on the PT-8100N right before placing the device to make certain the power is on.
- 2) Ping the device in the LiveViewGPS portal to make certain the device locates.

### Placing the PT-8100N on the Load

- 1) If there is a wooden floor or a fiberglass roof, signals can pass through these porous materials.
- 2) If the trailer construction is not porous, then look for places where there are cracks or seams.
- 3) Placement location should be noted and changed. Placement in the rear of the trailer is not recommended because it may be discovered by thieves earlier.
- 4) Once placed, ping the device again in the LiveViewGPS portal to make certain the device locates before the trailer leaves the facility. It is best to do this with the trailer door closed.