

FAQ: T18

Date: 14 October 2019

The Howay T18 is a custom Windows Embedded data collector manufactured by HowayGIS for iGage. Compared to the LT30 and LT30M devices the T18 has:

- Enhanced keyboard that is sufficient for numeric input and robotic total station operation.
- Type B USB connector which is substantially more robust than the USB Mini connector.
- Dedicated DB9-P serial port provides an interface to Total Stations without Bluetooth.
- Dual Bluetooth: standard and long range. The Long Range module can drive robots as far as 950 feet with the internal antenna (external antenna models are available with 3000' range.)
- The dedicated DC in charging port allows the receiver to be charged four times faster than by the USB connector.
- The battery is significantly larger.
- The rubber bumper protects the data collector when dropped and keeps the device from rocking in pole clamps.



1

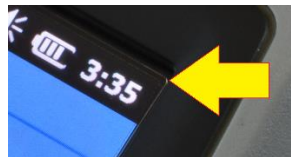
Compared to the LT35, the T18 is 4.7 times faster and has both standard and long-range Bluetooth radios.

The T18 has a one-year iGage warranty. Batteries and accessories are warranted for 90-days.

Commonly Asked Questions

Important: a screen protector is already installed!

The T18 comes from the factory with a screen protector already applied to the screen. If you look in the screen corner you will see the edge of it.



The screen protector provided in the box is an spare screen protector.

Software Applications are Already Installed

If you purchased SurvCE bundled with the T18, the software should already be installed and activated. There is no need to reinstall.

100% Charging

IMPORTANT: If you charge the data collector while it is on, it will never reach 100% charge indication. To reach 100% charge, turn off the data collector and charge while off.

Charging on the T18 can be confusing. Check the section later in this document for additional information.

Opening the Back Cover

Unscrew the lock screw all the way. Then use the bottom of the hand strap clip to pull the lock screw and the cover free.

Power Key

To turn on: Push and HOLD the power key for 5-seconds. This long press is a feature to keep the collector from accidentally turning on during transport.

To turn off: Push and HOLD the power button for 3-seconds, then answer YES.

Clicking ON/OFF key while on is set (by default) to turn the screen OFF and leave the data collector ON. You can modify the default so the power key puts the collector in standby.

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Warnings

DO NOT sit on the data collector while it is plugged into the charger or USB port while on the seat of your vehicle. It will break the internal connectors and is NOT covered by our warranty.

DO NOT leave the data collector inside a vehicle in the summer. Temperatures higher than 160°F will permanently reduce battery capacity and battery life.



Data Collector LCD screens and especially Lithium-Ion batteries are like puppies: in the summer if you leave them in your vehicle with the windows rolled up, you will kill them.

Battery Use, Safety and Disposal



Lithium-Ion Batteries for T18 / LT35 data collectors

The battery is a Lithium-Ion type cell.

WARNING - Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire, and can result in personal injury and property damage.

To prevent injury or damage:

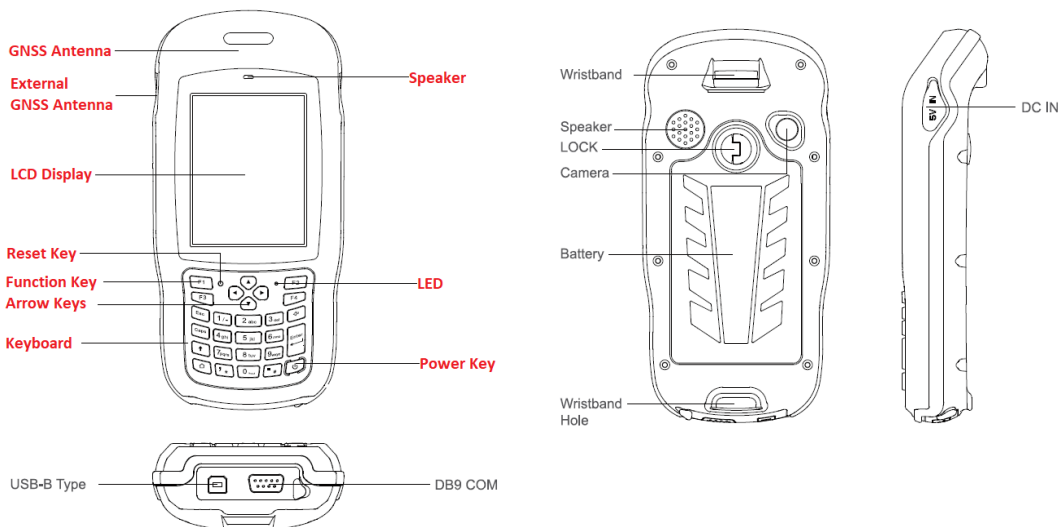
- Do not use or charge the battery if it appears to be discolored, warped, the case is bulging, or leaking battery fluid.
- Do not expose the battery to fire, high temperature, or direct sunlight.
- Do not immerse the battery in water.
- Do not store the battery inside a vehicle during hot weather.
- Do not drop or puncture the battery.
- Do not open the battery or short-circuit its contacts.

- Do not charge the batteries in chargers other than the supplied charger or a direct replacement.
- Do not charge similar batteries in the supplied charger, even if they fit well.
- **WARNING** - Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. The battery fluid is extremely corrosive, and contact with it will result in personal injury and/or property damage.
- If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
- If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.

Factory User Manuals


You can find electronic copies of the factory user manuals on the iG8g.com website. Click on 'Tools', then the T18 or LT35 folder, then UserManual.

General Information



Keyboard Notes

Default Assignments	F1	Start Menu
	F2	(unassigned)
	F3	Camera
	F4	Main OS Screen

To use the letter keys 'a..z' and special keys, click the shift key: , to return to the number keys click the shift key again.

LED Notes

The LED will be green when the data collector is ON.

The LED will be red when the data collector is OFF, but charging.

Charging

The dedicated power adapter charges the battery four times faster than the USB connector:

- USB Connector Charge Rate: 0.5 A
- Dedicated DC Power Adapter: 2.0 A

IMPORTANT: if you charge the data collector while it is on, it will never reach 100% charge indication. To reach 100% charge, turn off the data collector and charge while off.

IMPORTANT: if you completely discharge the battery, the T18 will not begin charging it unless you remove it from the device and reinsert it.

You can use the external charging tray, or when charging a completely dead battery inside the collector:

1. Open the back cover and remove the battery.
2. Plug in the T18 into the external power supply. The LED will blink once.
3. Put the battery back in the T18. The battery will begin to charge and the LED will be continuously lit.
4. Wait an hour for the battery to charge 'most' of the way before turning the collector on.

The battery is not charging unless the red LED is turned on. You may need to turn on the data collector, then plug in external power to begin charging.

Dedicated Charge Port

The supplied barrel connector is 4.0 mm x 1.7 mm center positive 5.0 V at 2 amps. The data collector is not water proof when the rubber cover is not seated over this connector.

Opening the Back Cover

Unscrew the lock all the way, then use the bottom hand strap clip to pull the lock screw and the cover free.

Really Turning the Data Collector ON and OFF

To turn on, push and hold the power button for 4-seconds.

If you click power button again, it will TURN OFF THE SCREEN, but the DC will continue to run. Push power button again to turn screen off.

To turn off, push and hold power button for 4-seconds:



Click on Yes to turn off the data collector.

Standby or Just Turn Off the Backlight

If you tap the ON/OFF key on the T18, one of two things will happen:

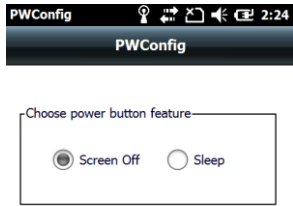
- Standby
- Backlight Toggled ON or OFF

Typically when used as a survey controller you will want to toggle the backlight because standby will break Bluetooth, Wi-Fi and Cellular data connections.

You can program the function of a short press on the ON/OFF key using the 'PWConfig' setting. You can find this setting in 'Start: Settings: System: PWConfig':



Which displays the 'power button feature':



'Screen Off' is a good selection for most applications.

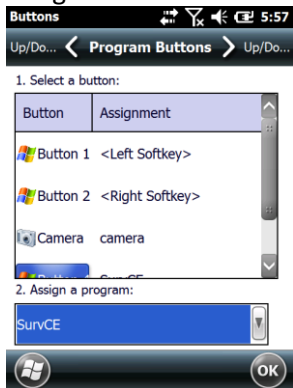
Internal Clock / Date Time Retention

The internal clock has a 'Super-Cap' which provides standby power when the battery is removed. About 3-hours of standby time is available if the Super-Cap has been recently charged. Charging occurs when the device is plugged into external power through the top-left power connector or the USB connector on the bottom.

If you remove the main battery for charging in the external tray, the real time clock will not recharge.

Customize F1, F2, F3, F4 Buttons

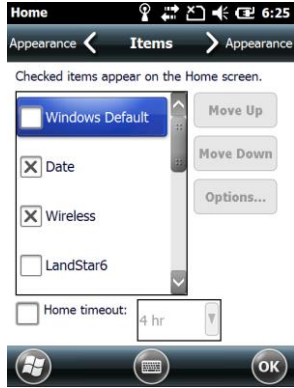
Start: Settings: Personal: Buttons



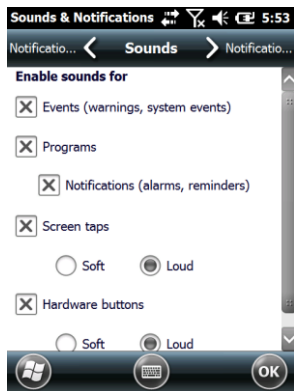
iGage Standard Settings

These are the setting adjustments that we make to all LT35/T18 Data Collectors.

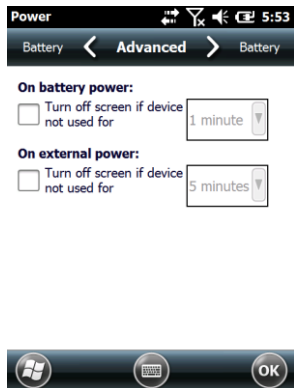
Today (the Home) Screen: Start: Settings: Home: Items (tab), check 'Date, Wireless, SurvCE':



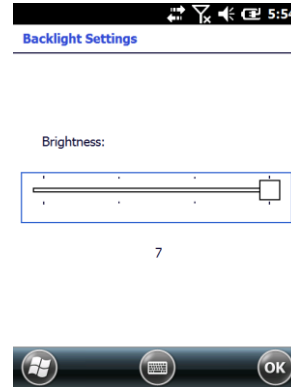
Start: Settings: Sounds & Notifications: Set all to LOUD!



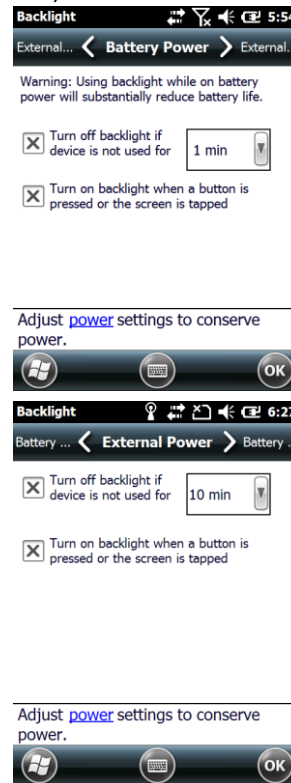
Then Power: Advanced (top tab): Uncheck both boxes, OK



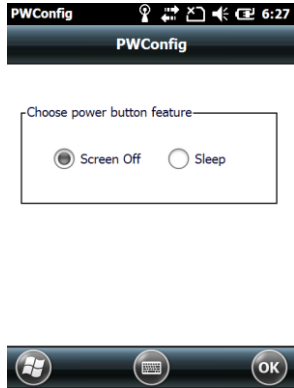
Then System: (Big Red) BL: set brightness all the way up, OK



Then Backlight (with the bulb): set Battery Power to turn off after 1-minute (check both boxes), set the External Power to turn off after 10-minutes, then OK



Then PWConfig:



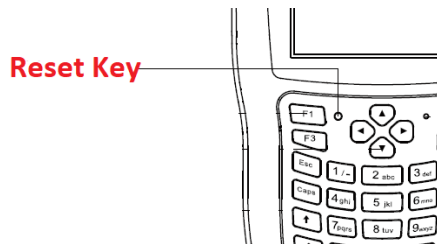
Turn off the internal phone, turn on Wi-Fi and Bluetooth (unless you will be using the phone).

Start: Settings: Connections: Wireless Manager:



Hard Reset

The small black hole on the keyboard is NOT an LED, it is a 'Hard Reset' button. You can use the stylus to press it which is the equivalent of removing the battery, reinserting the battery and restarting the data collector.



Any work in progress which has not been committed to flash memory will be lost.

Plug in to External Power when Connecting USB

The T18 will charge from both the USB and the external power connector. Some computers may not have enough power available on the USB port to sustain the T18 charging.

If you hear repeated happy and sad connection sounds, try plugging in both the external power supply AND then the USB connector.

Wi-Fi: Important Note when connected with WMDC

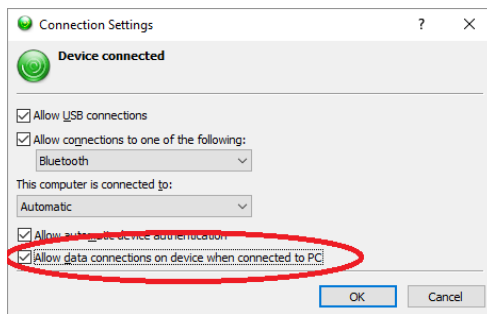
If you are connected to the Data Collector with the USB connector (using Windows Mobile Device Center or shudder...ActiveSync) using the default settings, then the Wi-Fi modem is disabled and Wi-Fi will not work while connected.

If you would like Wi-Fi to work on the data collector while you are connected to a PC, you need to enable the feature.

From the 'Windows Mobile Device Center' application window:

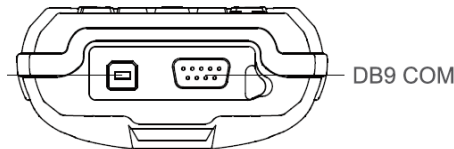


click on 'Mobile Device Settings' then click on 'Connection Settings'.



Check the box 'Allow data connections on device when connected to PC.'

The DB9-P COM Port on the bottom of T18



T18: The DB9 port is COM 2

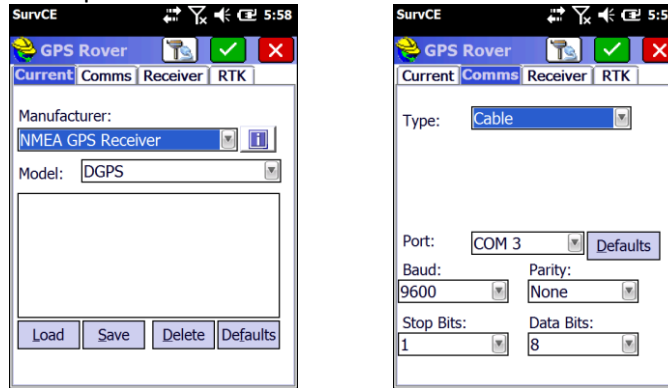
COM Port Summary

COM PORT	T18
1	(not available)
2	Bottom DB9-P or Long Range Bluetooth
3	Internal GPS: 9600 baud
4	
5	Virtual GPS
6	
7	Standard Bluetooth
8	
9	Standard Bluetooth

Internal GPS Receiver

COM3 9600 BAUD HARDWARE PORT

In SurvCE setup like this:



9

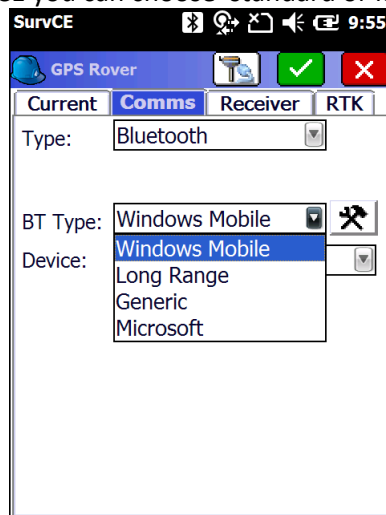
A separate FAQ “T18_UsingInternalGPS_SurvCE” describes how to best configure SurvCE for use with both the internal and an external survey grade receiver.

GPS Multiplexer

There is a ‘GPS Multiplexer shim’ that mirrors the hardware connection on COM 3 to virtual connections on COM 5 and COM 8. We recommend that you connect to COM 3 directly. In our testing COM 5 works, but SurvCE is forced to search for an attached receiver on every connection.

Long Range Bluetooth

In SurvCE you can choose ‘standard or long range’ Bluetooth:



‘Windows Mobile’ is the standard Bluetooth. If you ‘Find Device’ with ‘Long Range’, then you must connect with ‘Long Range’. If you ‘Find Device’ with ‘Windows Mobile’, then you must connect with ‘Windows Mobile’. To change the radio in use it is best to Delete Device every known device and then refind.

Installing Long Range Bluetooth Drivers on T18

Background

T18's have two Bluetooth modems. One is standard, the other is Long Range. A dedicated driver takes care of switching between the two.

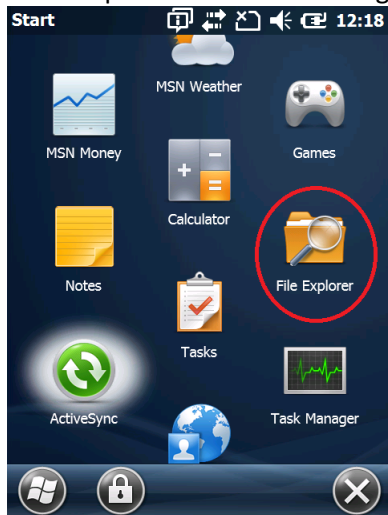
If you update the OS you will need to install the LongRange drivers to use the Long Range Bluetooth modem in SurvCE.

Update Procedure

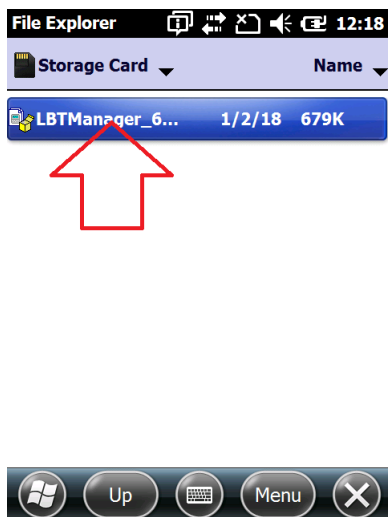
Get the latest .CAB file from: <https://iggps.com/out/T18/LongRangeBluetooth/index.htm> NOTE: We include the driver on OS update cards that we supply.

Move the .CAB file to the device. You can use WMDC, or just put it on the microSD card under the battery. In the example below it has been placed on the root of the SD Card.

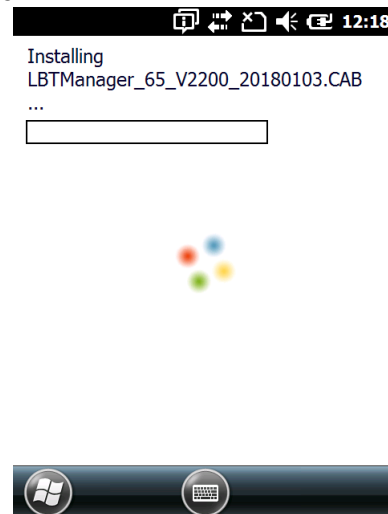
Start the 'File Explorer' from 'Start: Programs':



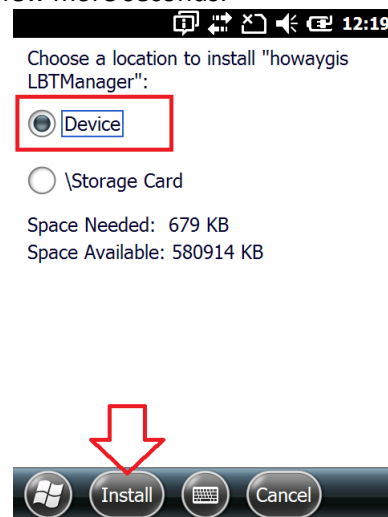
Browse to the file location where the .CAB file is placed:



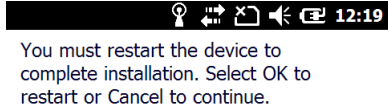
Click on the LBTManager .CAB file. After a few seconds:



Wait a few more seconds:



Select 'Device' then click on Install. After a few more seconds:



Click on Ok. The T18 will reboot.

When the reboot is complete, move the slide to the right or left to unlock. (This lock will be removed the next time the device boots.)

The drivers are installed and SurvCE will now be able to access the Long Range Bluetooth.

External GPS Antenna Connector


The correct antenna mating connector is:

LEMO Circular Push-Pull Connector FFA.00.250.CTAC29

They are available from Mouser Electronics.

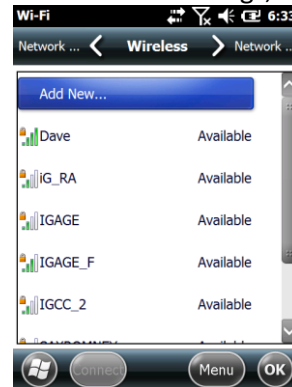
We have a variety of suitable antenna connectors available.

Connecting to Wi-Fi

From the main menu, click on the wireless manager icon:  (or Start: Settings: Connections: Wireless Manager. Make sure that Wi-Fi is enabled:



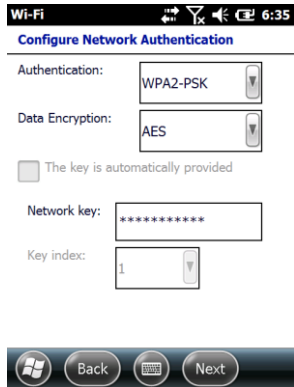
Click on Menu: Wi-Fi Settings,



Then click on the access point you want to connect to (IGAGE_F in this example):



Click on Next:

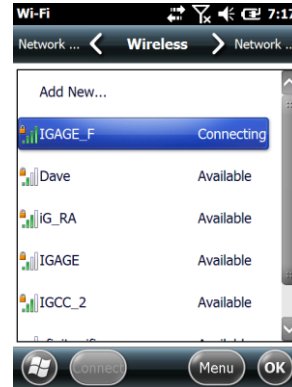


Enter the network key (this is the secret passcode for your access point) The passcode is case-sensitive and must be exactly correct.

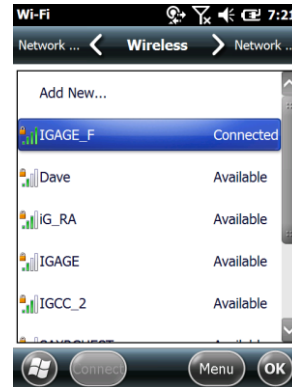
Click on Next:



Finally click on Finish:



The data collector will show 'Connecting' for a while and then switch to 'Connected':

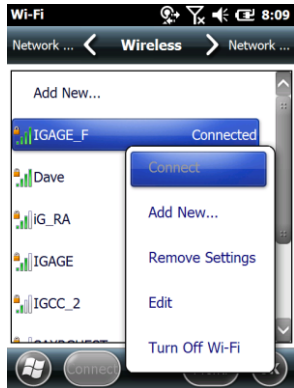


You should be able to browse to any non-secure (HTTPS) site using the 'Internet Explorer':



Wrong Wi-Fi Passcode?

If you type in the passcode incorrectly, the fastest way to correct it is to return to the Wi-Fi menu, then click and hold on the 'bad' access point:



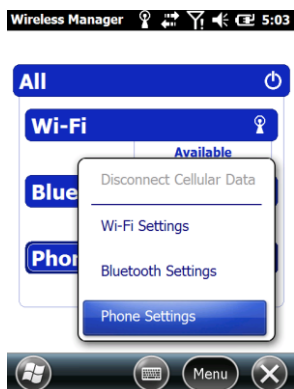
Then click on 'Remove Settings'. Finally start the connection process again.

Wireless Manager: Phone Settings Note

From the Wireless Manager dialog:



If you click on 'Menu':



Then Phone Settings:



A message says 'phone is not ready, wait 15-seconds and try again.'

It does not matter how long you wait, there will never be any phone settings.

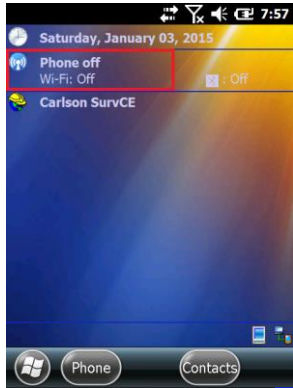
Provisioning an 'iGage DAC' SIM card in a T18 Data Collector

iGage provided cards need to be activated prior to provisioning!

1. Put the full sized SIM card in the data collector under the battery. Use the closure

for the hand strap to pull up on the battery door screw after unscrewing the latch.

2. Turn on the T18.
3. If the Phone is off:



Click on the blue antenna:

4. From the 'Wireless Manager' click on:

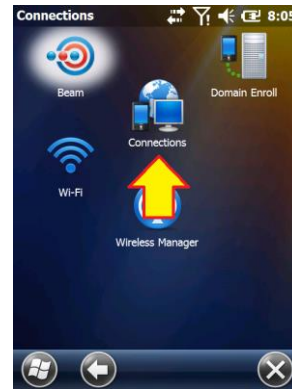


the phone bar. After a while the bar will be dark blue:

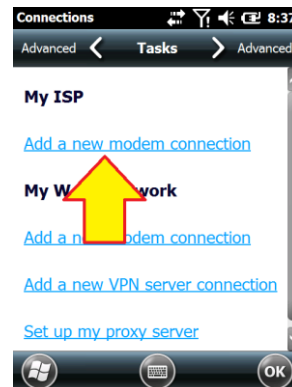


Note: The phone in the LT35 is fully Band-Automatic, Menu-Phone Settings has no function. Click the X button to return to the main menu. Then click 'Start: Settings':

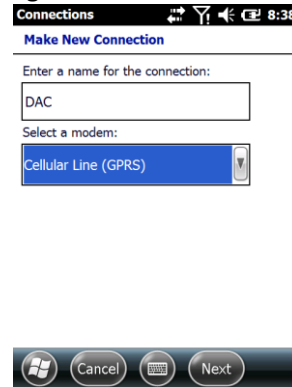
Connections':



5. Click on 'Add a new modem connection':



6. Change the connection name and type:

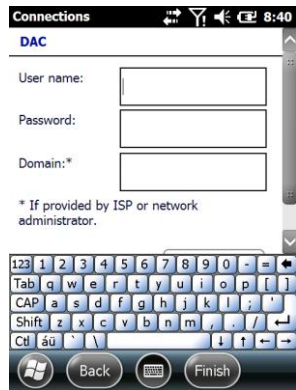


7. Click Next:



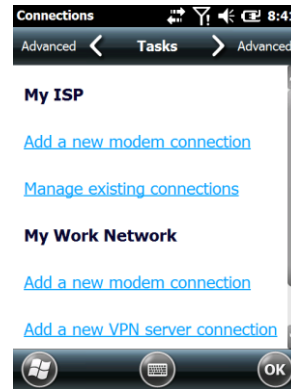
Set the APN (Access point name) to dac.com.attz

8. Click Next:



Leave the User Name, Password and Domain blank.

9. Click Finish:



Click OK to return to the main menu.

Return to the 'Wireless Manager' and turn off the cell phone. Wait 10-seconds and turn it back on again.

After a few minutes it should register on the network.

If the card has been used in another device, it might take 30 minutes for the network to fully register the device. You can verify that internet is available by using the Internet Explorer and browsing to www.igage.com.

Setting up Email

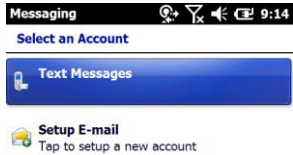
Your network/email administrator will provide you with information similar to this:

Your Name:	Tee Eighteen
Email Address:	t18@igage.com
Password:	secretpassword
Account Type:	POP
Incoming Mail Server:	pop.igage.com
Outgoing Mail Server:	smtp.igage.com
Incoming POP3 Port:	110
Outgoing SMTP Port:	587
Outgoing Authentication:	yes, same as username/password

From the main screen on your device, click on Start, then E-mail:



Select an Account will be shown:



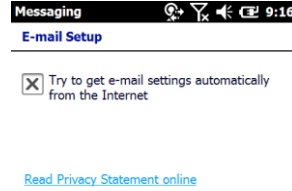
Click on 'Setup E-mail'

Enter your email address and password, leave 'Save Password' checked:



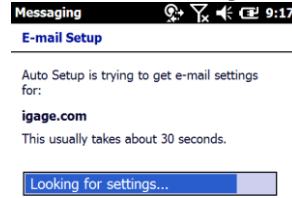
Click Next

It won't hurt to try to automatically provision:

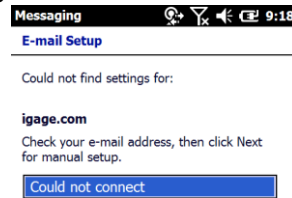


With 'Try to get...' checked, click on Next

Wait for the failure message:

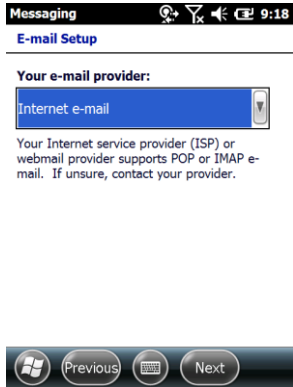


After 30-seconds you will typically get this error message:



Click Next

Select 'Internet e-mail':



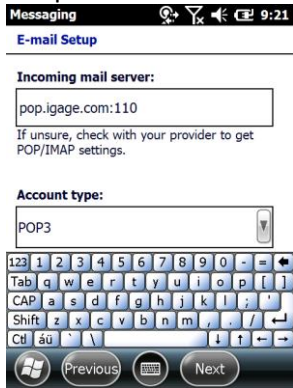
Click Next

Enter your name:



Click Next

Enter your incoming mail server, don't forget to append the port number as shown below:



Click Next

Enter your user name (usually the email address, but not necessarily):



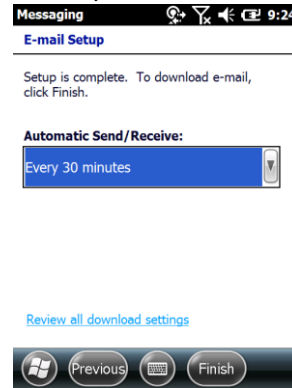
Click Next

Enter the outgoing SMTP server, don't forget to include the port number. Typically your outgoing server will require authentication:



Click Next

Make the send/receive time reasonable:



Click Finish

You should be able to send and receive email with attachments now.



Speed, Power Use and Battery Expectations

100% Charging

IMPORTANT: If you charge the data collector while it is on, it will never reach 100% charge indication. To reach 100% charge, turn off the data collector and charge while off.

Speed Comparisons

Time from clicking on SurvCE on desktop until Load file is displayed:

Device	Time to Load SurvCE	Relative Speed
LT35	19.13	100%
LT30	13.11	146%
Carlson Surveyor 2	12.11	158%
LT30TN	11.17	171%
Ranger 3	7.12	269%
Nautix X8	4.22	453%
T18	4.11	465%

These speed differences appear to be consistent across all tested operations (time to bond to Bluetooth, time to connect to Wi-Fi, time to load state plane grids, time to reprocess .RW5 files.)

Power Notes

Apparent 10 hour+ operation with all radios and backlight turned off.

Battery size: 3.7 V 6500mAh 24.05Wh

Base power usage: 2.4 W/hr 10.0 hr
backlight off, Wi-Fi off, Bluetooth off

Standby Power usage: 1.4 W/hr 17.2 hr

Backlight usage:

Level Max: 0.45 W/hr 8.4 hr display full ON

Level 3: 0.25 W/hr 9.1 hr

Level 1: 0.05 W/hr 9.8 hr

Wi-Fi usage:

ON, not connected 0.21 W/hr 9.21 hr

ON, connected active 0.51 W/hr 8.26 hr

Bluetooth usage: (Std or LR) 0.28 W/hr 9.00 hr

The data collector should provide 8 hours of operation with Wi-Fi active and connected and reasonable backlight use.