Mintaka STARXG+ Guide for VOS PMOs & Vessels

Introduction

This document describes how the Mintaka STAR**XG+** ("**Plus**") differs from the Mintaka STAR**X** & STAR**XG**. Most features and functionality is the same; it has two pressure sensors, a temperature sensor, a relative humidity sensor, is in Weather Service Mode by default, and uses MintakaCommander to export data, issue commands and install updates.

The main differences is the **Plus** has the same more accurate pressure sensors as the STAR-**Touch ("Touch")**, new temperature & humidity sensors are NIST traceable, uses LoRa to communicate with the **Touch**, and it is powered by 2 alkaline C-cell batteries.

Use MintakaCommander to adjust the temperature offset and relative humidity offset in addition to the Pressure Offset.

Important: Update MintakaCommander before connecting the **Touch** and **Plus** so that Commander can recognize the instrument. Also update the instrument to the latest build.

LoRa - Low Power, Low Bandwidth, Long Range Wireless Communication

LoRa communication technology uses a modulation technique that allows very weak signals to be detected. The result is that LoRa communications can be transmitted over longer distances using much less power, especially as compared with WiFi. For the **Plus** this means that standard alkaline batteries can be used instead of expensive Lithium batteries.

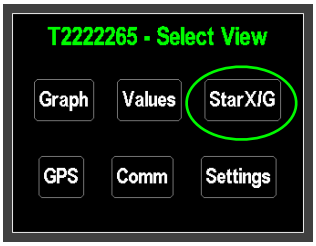
LoRa is a low bandwidth technology as compared to WiFi, but the **Touch** and **Plus** transfer a very small amount of data, so high bandwidth is not necessary.

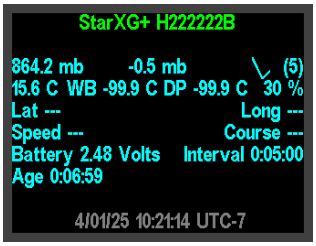
In the **Touch** and **Plus,** the LoRa signals uses the same unlicensed radio spectrum as 2.4 gHz WiFi, so available worldwide.

In the LoRa communication model, there is no concept of "connection" as there is in a WiFi / Internet model. The **Plus** transmits a weather report and listens for an acknowledgment from the **Touch**. If it doesn't receive an acknowledgment it tries two more times before going to sleep. The format of this weather data report is proprietary, so even if a third party could intercept the report, it is extremely unlikely they will be able to decipher it. Likewise, a third party could attempt to transmit a message to the **Touch** but the only message the **Touch** understands is a weather report in its proprietary format. As a broadcast technology, a receiving device recognizes and accepts data only in the format expected, otherwise a message is ignored.

Mintaka STAR-Touch XG/XG+ Screen

Data from the STAR**X / XG / XG+** is displayed on the STARX/G screen.





Mintaka STARXG+ ("Plus") Operation

The **Plus** is very similar in operation to the STAR**X/XG**. The desired reporting interval can be set in MintakaCommander; the default is 5 minutes. The **Plus** sends its weather reports to "WxReport". The **Touch** listens on "WxReport" and will acknowledge when it receives a report.

When the **Plus** is first powered up, or when it wakes up from sleep (either normally or by pushing the Select button), the LED with flash purple like the STAR**X/XG**. However, if the Select button is pushed again, the behavior is different. When Select is pushed, the **Plus** will attempt to send a report to the **Touch** and two flashes will occur.

The first flash will be either blue, indicating a report was sent with a valid GPS fix, or yellow, indicating that no GPS was available to include in the report.

The second flash will either be green, indicating that the report was acknowledged by a **Touch** or red indicating that no **Touch** acknowledged the report. Because of the retry attempts, the red flash will be several seconds after the first flash (green or yellow).

Thus, during installation, the Select button can be used to determine if the installation location is within range of the **Touch**.

To reboot the **Plus**, push and hold the Select button for about 5 seconds. This is the same behavior as the STAR**X/XG**.

Important operating notes:

- When installing the batteries, their orientation may seem backwards. The plus end of the batteries should point toward the battery compartment cap (it has a + on it). When the **Plus** is installed sensors end up, the plus end of the batteries point down.

- Be careful when screwing on the battery compartment cap so as not to damage the threads.

- In contrast to the STRA**X/XG,** attaching a USB cable will not cause the **Plus** to wake up. Push the Select button to wake it up.