Stars LTE-CTrack

Rechargeable-battery version

Technical specifications for cellular environmental monitoring and GPS positioning.



Environmental sensing | **LTE-M / NB-IoT + GPS** | **USB-C rechargeable**

Measurement specifications

PARAMETER	SPECIFICATION / CONDITIONS
Ambient temperature	−40 to +85 °C (−40 to +185 °F). Typical accuracy: ±0.3 °C (±0.54 °F) at 25 °C. Device-use limits below also apply. [1]
Relative humidity	0–100 %RH extended range; 0–80 %RH normal range. Typical accuracy: ±2 %RH at 25 °C, excluding hysteresis and non-linearity. Non-condensing. [1]
Atmospheric pressure	300–1100 hPa (8.86–32.48 inHg). Typical absolute accuracy: ±1 hPa at 950–1050 hPa and 0 to +40 °C (32 to 104 °F). [1]
Internal temperature	−55 to +125 °C (−67 to +257 °F). Device interior reading. The operating limits below still apply. [1]
Illuminance	0–200,000 lux. Approximate light-level indication, dependent on exposure and mounting.
Battery status	Automatic detection of battery operation, external power, charging and full-charge status. Remaining charge and runtime are estimates, dependent on reporting, GPS, signal, temperature and battery age.

Enclosure & operating envelope

PARAMETER	SPECIFICATION / CONDITIONS
Dimensions	Nominal 65 × 100 × 40 mm (2.56 × 3.94 × 1.57 in), plus installation clearance for cables, connectors and mounting.
Protection	IP65 with seals, covers and connector protection correctly fitted. Charge only with a dry port. An open/unprotected USB connection does not retain IP65.
Operating temperature	Rechargeable configuration: −20 to +60 °C (−4 to +140 °F) during discharge, limited by the cell. Charging has a narrower permitted range; see page 3. [2]

[1] Sensor/conversion ranges and typical sensor accuracy do not establish calibrated product accuracy. Observe the battery/charging limits. Exposure, airflow and internal heating affect readings.

[2] The battery limits narrow the sensor's −40 to +85 °C reference range. Avoid condensation and corrosive atmospheres.

Cellular, GPS & reporting

PARAMETER	SPECIFICATION / CONDITIONS
Cellular technologies	LTE-M / Cat-M and NB-IoT, using compatible LTE-FDD cellular service.
Radio band references	LTE-M: B1/2/3/4/5/8/12/13/14/18/19/20/25/26/27/28/66/85. NB-IoT: B1/2/3/4/5/8/12/13/18/19/20/25/26/28/66/71/85. [3]
Radio data-rate limits	Radio reference maxima: LTE-M 589 kb/s downlink and 1,119 kb/s uplink; NB-IoT 127 kb/s downlink and 158.5 kb/s uplink. Effective telemetry throughput is lower and depends on radio revision, firmware and network. [3]
Radio transmit power	Radio reference power class 5, typically 21 dBm. [3]
FCC identification	Contains FCC ID: 2AJYU-8VC0002.

Positioning & measurement acquisition

PARAMETER	SPECIFICATION / CONDITIONS
GPS position	Latitude −90 to +90°; longitude −180 to +180°; position time and available movement data.
GPS acquisition	Configurable acquisition window: 30–120 s. Positioning can be enabled or disabled and scheduled by transmission cycles.
Reporting intervals	Independent external-power and battery schedules: 1 minute to 18 hours. Very short intervals increase consumption and network use.
Readings per message	1–37 readings per transmission, subject to the configured interval and valid sensor data. Remote configuration is applied when the device next communicates.
Threshold monitoring	Configurable high/low environmental limits and supported positioning alerts. Notifications use received device data and the selected service features; delivery depends on network and platform availability.

[3] Use only the supported, provisioned and authorized radio-band subset. Reference maxima are not guaranteed throughput. Metal/insulated enclosures may impair cellular and GPS reception.

Power, charging & battery care

PARAMETER	SPECIFICATION / CONDITIONS
USB power input	USB-C; regulated 5 V DC nominal. Source capacity: at least 1 A. The source rating is not the device's constant current draw. Use a suitable cable; do not apply a forced higher voltage. No USB-PD/fast-charge capability is specified. [4]
Installed battery	One rechargeable lithium-ion cell: 3.7 V nominal; 3,350 mAh nominal / 3,250 mAh minimum (supplier test: 0.2C discharge at 25 °C). Nominal energy: approximately 12.4 Wh.
Charging temperatures	Cell reference: 0 to +45 °C (32 to 113 °F), subject to its temperature-dependent charge-current limits. With the fitted nominal 0.545 A charger: only above +10 °C and up to +45 °C (above 50 °F to 113 °F). [5]

[4] 5 V / ≥1 A is the specified external supply requirement. Input tolerance and absolute maximum input current are not specified; do not substitute component maximum ratings.

[5] Observe both temperature and current limits. The internal-temperature charge interlock does not implement the 0–10 °C current reduction and is not a direct calibrated cell-temperature measurement.

Storage & end-of-life handling

Storage longer than 3 months: 0–25 °C (32–77 °F), ≤65 %RH and below 50% charge, away from corrosive gas. Follow the supplier's 6-month controlled charge/discharge maintenance recommendation. Recharge time and runtime depend on operating conditions.

Do not charge or use a swollen, leaking, overheated or damaged battery. Do not puncture, crush, short-circuit, incinerate or immerse it. Battery removal/replacement must follow Stars service instructions.

Recycle the device/battery through an authorized electronics/battery collection point or household hazardous-waste program. Never place it in household trash or curbside recycling. If removed safely by authorized personnel, insulate the terminals with nonconductive tape and package the cell separately. Contact Stars or the recycler before handling a damaged cell.

support@starstelemetry.com | Battery recycling guidance (US EPA)

How the device operates

CTrack balances regular data reporting with low battery consumption. Sleep reduces power use; it does not mean that enabled environmental monitoring stops. Local checks, recorded readings and cellular transmissions serve different purposes.

STAGE	WHAT THE DEVICE DOES
1 Sleep	On battery, the device spends most of its time in a low-power sleep state. It is not continuously connected to the web platform.
2 Check & measure	Short local wake-ups check enabled environmental alarms. Scheduled intermediate readings are collected for the next routine report. A local check does not normally require a cellular connection.
3 Transmit	When a routine report, a new locally detected alarm or a manual touch request is due, the device starts a communication cycle. It sends measurements and status, and exchanges available configuration updates.
4 Return to sleep	The device remains awake only as needed for sensing, any scheduled GPS acquisition and communication attempts, then returns to low-power operation. Connection time varies with reception and network conditions.

Alarm response between routine reports

With environmental alarms enabled, normal-operation checks run approximately once per minute between routine reports. They compare valid readings with the enabled limits already applied to the device: ambient temperature, humidity, internal temperature, pressure and illuminance, as configured.

When a new alarm condition is detected, CTrack starts an unscheduled transmission instead of waiting for the normal reporting interval.

A condition that remains active does not mean a new email is sent at every local check. Return to normal is reflected after updated data reaches the platform.

Example — a 2-hour reporting interval with 6 readings per transmission gives approximately one stored reading every 20 minutes. The local environmental checks still run approximately once per minute. A new high-temperature alarm detected at a check starts an unscheduled transmission without waiting for the 2-hour report.

Platform-derived conditions, such as estimated battery charge, calculated environmental indicators and an offline timeout, are evaluated using received data or communication history. They do not all trigger independent checks inside the sleeping device. Email/SMS delivery requires the applicable service features and correctly configured recipients.

Verify the alarm path

Enable the intended limits and recipients, confirm settings have reached the device, and perform a controlled test within the permitted operating conditions. Compare the event time, reading and configured limit in the platform/email. Reviewing or acknowledging an event does not correct its physical cause; investigate the monitored condition.

Operation & user controls

Send a reading now — five taps



Figure 1 — Circular touch mark on the enclosure (enlarged schematic).

To request a transmission manually, make five quick taps on the marked circular touch area within 3 seconds, lifting your finger between taps. Stop tapping as soon as the transmission indicator LED starts flashing. Then wait for the communication cycle to finish and check the Stars platform to confirm that a new reading was received. Do not open the enclosure to perform this action.

The recognized sequence requests a transmission without waiting for the scheduled interval. Use it to check installation, obtain an updated reading after moving the device or bring forward a connection for pending settings. If GPS is enabled, the device also attempts a fresh position within its configured acquisition window.

Allow the communication cycle to finish, then refresh the platform and check Last transmission and the reading time. Touch may be unavailable while a communication or maintenance cycle is already running; wait before trying again. The gesture does not reset the device or change its configured reporting intervals. Frequent manual transmissions consume additional battery energy and network allowance.

Initial setup & placement

Sign in with the purchase account, scan the device QR code and assign its Location, Area and Measurement point. Install where the sensors can represent the monitored space and cellular/GPS reception is adequate. Allow readings to stabilize after moving between temperatures.

Schedules & configuration

Set separate reporting intervals and readings-per-transmission for battery and external power. The device automatically selects the schedule for the detected power source. Saving a web form does not by itself confirm application: check the device's pending/confirmed configuration status after it communicates. Longer reporting intervals reduce routine radio activity; alarms and manual requests can still cause earlier transmissions.

GPS & history

GPS is enabled separately and runs according to the configured transmission-cycle schedule. It is not continuous tracking. Shorter GPS intervals and longer acquisition attempts increase energy use. An environmental report without a new position is not proof of a GPS hardware fault. Distinguish measurement time, last received transmission and the last valid position time.

Power, charging & interruptions

Use the specified 5 V USB supply rated at least 1 A and observe the temperature/charging limits on page 3. Battery percentage and runtime refer to available readings and are estimates. Poor cellular coverage, frequent alarms and GPS use reduce runtime. A failed connection causes limited retry attempts.

Data security & access control

Encrypted transmission. Individual device identity. Managed access.

SECURITY FEATURE	TECHNICAL DESCRIPTION
Data in transit	Device communication supports MQTT over TLS 1.2 with AES-128-GCM or AES-256-GCM encryption. The cipher suite is negotiated when the connection is established. GCM provides authenticated encryption to protect transmitted data confidentiality and integrity.
Device authentication	Mutual certificate authentication (mTLS). Each device is provisioned with an individual digital certificate and associated credentials for its connection to the Stars communication service.
Credential maintenance	Certificate-based credentials support controlled renewal and revocation. Contact Stars if equipment is lost or unauthorized use is suspected.
Web access & permissions	Access to the Stars Telemetry web platform uses HTTPS and authenticated user accounts. Location and Area permissions control which monitoring points a user can access and manage.
Remote configuration	Configuration changes require appropriate user authorization and are exchanged when the device communicates with the platform. Check pending/confirmed settings to verify application.

Protection scope

The encryption specified above protects the communication link between the device and the Stars communication service. It does not describe encryption of stored records, downloaded files or the delivery of email/SMS notifications.

Account and data care

Use a strong, unique password. Keep device setup codes private and grant access only to the people who need it. Review permissions when users change roles or leave your organization. Alarm emails, SMS messages and exported files may contain monitoring or location information; protect their recipients and storage accordingly.

Data handling and privacy: Stars Telemetry Privacy Policy

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