NEXA SYSTEMS

Technical Publications Division

Atlas-7

Field Telemetry Unit

TECHNICAL MANUAL & FIELD GUIDE

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Revision History

Rev.	Date	Author	Summary of Changes
1.0	02 Jun 2025	J. Okafor	Initial release for Atlas-7 Rev. A hardware.
2.0	19 Nov 2025	J. Okafor	Added LoRaWAN provisioning chapter; revised specifications.
3.0	08 Feb 2026	E. Vasquez	New troubleshooting matrix; updated safety notices.
3.2	14 Mar 2026	E. Vasquez	Corrected mounting torque values; added quick reference card.

Contents

Chapter 1.

About This Guide

This manual documents the installation, operation, and maintenance of the **Nexa Atlas-7 Field Telemetry Unit**, a ruggedized environmental and asset-monitoring device intended for unattended outdoor deployment. It is written for field technicians, systems integrators, and site operators who install or service Atlas-7 units in the course of their work.

1.1. Who Should Use This Manual

- **Field technicians** performing initial installation, commissioning, or scheduled maintenance.
- **Systems integrators** incorporating the Atlas-7 into a larger sensor network or SCADA environment.
- **Site operators** responsible for day-to-day monitoring and first-line troubleshooting.

No specialized electronics training is required to complete standard installation procedures; however, Chapter 5 assumes familiarity with basic hand tools and low-voltage DC wiring practice.

1.2. How This Manual Is Organized

Chapter	Contents
2	System overview, key features, and hardware architecture
3	Pre-installation planning, mounting, and network setup
4	Day-to-day operation, control indicators, and operating modes
5	Maintenance schedule and troubleshooting reference
App. A	Full technical specifications
App. B	Quick reference card (tear-out summary)

1.3. Notice Conventions

Throughout this guide, callouts flag information that affects safety, data integrity, or successful commissioning. Each type is used consistently:

DANGER

Indicates a hazard that **will** result in serious injury or permanent equipment damage if ignored. Danger notices always precede the step they apply to, never follow it.

WARNING

Indicates a hazard or action that **may** result in injury, data loss, or equipment damage if precautions are not observed.

NOTE

Supplementary information that clarifies a procedure but carries no safety implication.

FIELD TIP

Practical, field-tested advice that speeds up a task or avoids a common mistake.

Chapter 2.

System Overview

2.1. Product Description

The Atlas-7 is a self-contained, solar-assisted telemetry node designed for multi-year unattended operation in remote or harsh environments. It combines a modular sensor bay, an industrial communications stack, and a weatherproof enclosure rated to IP66. A single Atlas-7 unit can host up to six interchangeable sensor modules and report readings over cellular LTE-M, LoRaWAN, or a wired RS-485 backhaul, depending on the communications card fitted.

Key Features

- Modular sensor bay accepting up to six field-swappable probes (temperature, humidity, soil moisture, vibration, water level, or custom analog input).
- Dual-radio communications card: LTE-M/NB-IoT primary link with LoRaWAN failover.
- Solar trickle-charge system rated for 90 days of full function with zero sunlight.
- Tamper-evident enclosure latch with optional tilt and open-door alarms.
- Over-the-air firmware updates via the Nexa Cloud fleet console.

2.2. Hardware Architecture

Figure 2.1 shows the functional blocks of a fully provisioned Atlas-7 unit and how it exchanges data with Nexa Cloud.

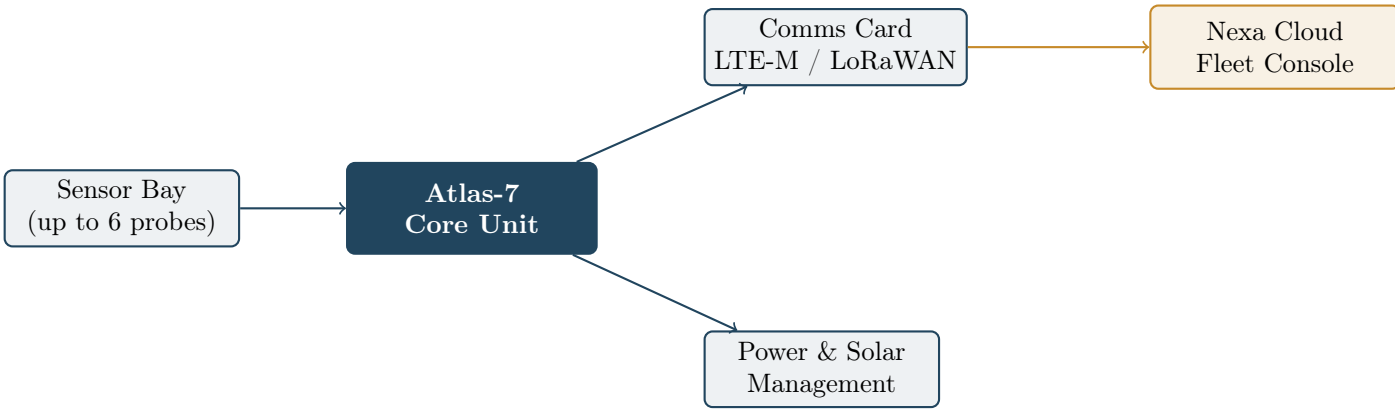

Figure 2.1.: Atlas-7 functional block diagram.

2.3. Specifications Summary

Parameter	Value
Enclosure rating	IP66, UV-stabilized polycarbonate
Operating temperature	−30 °C to +60 °C
Power input	12 V DC nominal, integrated 8 W solar panel
Battery	18 Ah LiFePO4, field-replaceable
Sensor bay	6 ports, screw-terminal, hot-swappable
Primary radio	LTE-M / NB-IoT, 3GPP Release 13
Failover radio	LoRaWAN 1.0.3, EU868 / US915 selectable
Dimensions	340 mm × 220 mm × 118 mm
Weight (unpopulated)	2.4 kg

A complete specification listing, including tolerances and certification marks, appears in Appendix A.

Chapter 3.

Installation and Setup

3.1. Pre-Installation Checklist

Before travelling to a deployment site, confirm the following:

- Mounting location provides a clear southern sky view for the solar panel (northern sky view in the southern hemisphere).
- Cellular coverage or a LoRaWAN gateway is confirmed within range using the Nexa Cloud coverage map.
- The unit has been pre-registered in Nexa Cloud with its unique device ID (printed on the enclosure label).
- A torque driver (2–6 N·m) and M8 stainless mounting hardware are on hand.

WARNING

Do not power on the Atlas-7 indoors under fluorescent lighting for extended periods. The ambient-light sensor may falsely trigger daylight calibration, producing a skewed offset for the first 24 hours of field operation.

3.2. Mounting Procedure

1. Select a pole or wall location between 1.5 m and 3 m above grade, clear of overhanging vegetation.
2. Attach the mounting bracket using the supplied M8 bolts, torqued to 4.5 N·m.
3. Orient the enclosure so the solar panel faces true south (±15°) and is tilted to the site latitude.
4. Insert sensor probes into the desired bay ports and hand-tighten the compression glands.
5. Close and latch the enclosure door; confirm the tamper switch reads *closed* on the status LED.

DANGER

Never mount the Atlas-7 within 3 m of overhead power lines. The mounting bracket is conductive stainless steel and provides no electrical isolation.

3.3. Network Provisioning

Step	Action
1	Power on the unit; hold the pairing button for 3 seconds until the status LED pulses blue.
2	In Nexa Cloud, open **Fleet** > **Add Device** and scan the QR code on the enclosure label.
3	Select the communications profile: `LTE-PRIMARY`, `LORA-ONLY`, or `DUAL-FAILOVER`.
4	Confirm first telemetry packet arrives in the console (typically within 90 seconds).
5	Lock the configuration to prevent accidental profile changes from the local button.

FIELD TIP

If first telemetry does not arrive within five minutes, check signal strength on the status LED (see Table 4.1 in Chapter 4) before assuming a network fault — most delayed first-packets are solar-panel shading issues, not radio problems.

Chapter 4.

Operation

4.1. Startup Sequence

On power-up, the Atlas-7 performs a self-test lasting approximately 45 seconds: sensor bay enumeration, battery health check, and a radio handshake attempt. The status LED reports progress as summarized in Table 4.1.

LED State	Color	Meaning
Solid	Amber	Self-test in progress
Slow pulse	Blue	Pairing mode, awaiting Nexa Cloud handshake
Solid	Green	Normal operation, strong signal
Slow pulse	Green	Normal operation, marginal signal
Fast pulse	Amber	Sensor fault detected, telemetry continues
Solid	Red	Battery critical or radio failure

Table 4.1.: Status LED reference.

4.2. Operating Modes

- **Continuous mode** — reports all sensor channels every 5 minutes. Highest power draw; recommended only where solar exposure exceeds 4 peak-sun-hours daily.
- **Scheduled mode** — reports at configurable intervals (default 30 minutes), with event-triggered reports for threshold breaches.
- **Low-power mode** — reports every 4 hours and disables the failover radio. Automatically engaged when battery state of charge falls below 25%.

NOTE

Mode transitions are logged to Nexa Cloud with a timestamp and triggering condition, allowing post-deployment review of power events without a site visit.

Chapter 5.

Maintenance and Troubleshooting

5.1. Scheduled Maintenance

Interval	Task	Notes
Monthly	Visual inspection	Check for debris on solar panel, gland integrity
Quarterly	Sensor probe cleaning	Use soft brush; never use solvents on probe housings
Annually	Battery capacity test	Via Nexa Cloud **Diagnostics** tab; replace below 80% rated capacity
Annually	Enclosure gasket check	Replace if compression set exceeds 30%

5.2. Troubleshooting Reference

Symptom	Probable Cause	Recommended Action
No telemetry, LED off	Battery fully discharged	Verify solar panel is unshaded; check panel output with a multimeter (>14 V DC in daylight expected)
LED red, radio failure	SIM or LoRaWAN key mismatch	Re-run provisioning in Section 3, Network Provisioning
Sensor reads `NULL`	Probe not seated or compression gland loose	Reseat probe; hand-tighten gland, then quarter-turn with strap wrench
Erratic humidity readings	Condensation inside sensor bay	Inspect gasket seal; replace desiccant sachet (Part No. NX-DES-04)
Frequent low-power mode	Panel shaded or misaligned	Re-check southern exposure per Section 3

WARNING

Never open the enclosure while the internal battery is under active solar charge in direct sunlight. Disconnect the panel lead at the MC4 connector first, or perform maintenance in shade / after dusk.

FIELD TIP

Keep a spare desiccant sachet (Part No. NX-DES-04) in your field kit — condensation is the single most common cause of erratic sensor readings reported to Nexa support.

Appendix A.

Technical Specifications

Category	Detail
Mechanical	Polycarbonate enclosure, IP66, UV-stabilized; 340 × 220 × 118 mm; 2.4 kg unpopulated
Environmental	−30 °C to +60 °C operating; −40 °C to +70 °C storage; up to 100% RH condensing
Power	12 V DC nominal input; 8 W integrated monocrystalline solar panel; 18 Ah LiFePO4 battery, field-replaceable
Sensor bay	6 × screw-terminal ports, hot-swappable, 0–5 V and 4–20 mA compatible
Communications	LTE-M/NB-IoT (3GPP Rel. 13); LoRaWAN 1.0.3 (EU868/US915); RS-485 optional add-on card
Data retention	30 days on-device buffer (flash), synced on reconnect after outage
Certifications	CE, FCC Part 15, IP66 (IEC 60529)
Warranty	3 years, hardware; battery consumable, 1 year

Appendix B.

Quick Reference Card

Status LED

Green solid — normal, strong signal
Green pulse — normal, weak signal
Amber pulse — sensor fault
Red solid — battery / radio failure

Power Notes

Low-power mode below 25% charge
Full recharge: approx. 6 sunlight hours
Replace battery below 80% rated capacity
Panel output check: >14 V DC in daylight

Torque Values

Mounting bracket bolts: 4.5 N·m
Sensor compression glands: hand-tight + 1/4 turn
Enclosure latch: hand-tight only, do not overtighten

Support

Nexa Systems Field Support
Reference this unit's Device ID (enclosure label)
Have Nexa Cloud diagnostics export ready before calling