LUNET

Lunar Utility Node & Exchange Terminal

A Standardized Infrastructure for Lunar Mobility

1. Overview

The LUNET system provides a scalable, standardized network of **surface and orbital utility nodes** designed to support the Aegis Short Hopper and compatible hardware. Each node enables **refueling, recharging, diagnostics**, and **logistical coordination** across the lunar surface and in orbit.

LUNET transforms the Short Hopper from a single-use lander into a **true inter-base mobility platform**, capable of operating routinely, autonomously, and at scale.

2. Node Types

Type	Location	Primary Role
ISRU Base Node	Shackleton, etc.	Fuel production, recharge, logistics hub
Static Midrange Node	Mare Imbrium, Lalande	Refuel & recharge only
Mobile Node	Deployable sites	Temporary field ops or scout support
Orbital Node	Aegis Station	Recharge and propellant interface (LOX/LH_2)

Each node is modular, upgradable, and deployable via rover, Hopper, or lander.

3. Standard Capabilities

- **Refueling**:
    - Supports LOX/LH_2 in cryogenic tank format
    - Compatible with cartridge swap or direct pump transfer
    - Thermal management: passive boil-off + optional active cooling
- **Recharging**:

    - Solar + battery or RTG-based electrical recharge
    - Standardized high-voltage connection port
- **Diagnostics**:
    - Local telemetry upload
    - Health check relay to Aegis Station or mission control
- **Optional Utilities**:
    - Water refill (life support, thermal use)
    - Navigation beacon or comms relay
    - EVA shelter or rover interface

4. Compatibility

LUNET nodes are designed for interoperability with:

- **Aegis Short Hopper** (Commercial + Retail)
- **Lunar Surface Propellant Tanker (LSPT)**
- **Aegis Mammoth Car** (node and tank module delivery)
- **3rd-party landers** (if using standard LUNET interfaces)

Standard interfaces include:

- **LUNIFUEL™ Coupler** (LOX/LH_2 connection)
- **LUNELINK™ Port** (power + data)
- **Node Cartridge Format**: Cryo-compatible 2.5m dia × 10m length tank

5. Deployment Logistics

Node Type	Delivered By	Refueled By
ISRU Base Node	Heavy lander / Rover	Onsite cracking
Static Midrange	Lander / Short Hopper	LSPT tanker

Mobile Node	Hopper or Rover	Prefilled or LSPT
Orbital Node	Aegis docking array	Aegis water → LOX/ LH_2

Deployment kits are pre-assembled or flat-packed for on-site unfolding. Each node includes autonomous startup procedures.

6. Example Route Architecture

Pole → Mid-Latitudes → Equator

- Hop 1: Shackleton → Mare Imbrium Node
- Hop 2: Mare Imbrium Node → Equator Site

Node Network Functionality:

- Enables low-delta-v, repeatable hops
- Supports civilian and commercial Hoppers
- Keeps vehicles light — only carry enough propellant for the next leg

7. Scalability & Licensing

LUNET can scale with increasing lunar traffic via:

- **Franchise-ready deployment kits**
- **Third-party compatibility certification**
- **Automated resupply via LSPT or landers**
- **Node network maps and telemetry sync**

Aegis Station Infrastructure will publish and maintain **LUNET interface standards** for partners, licensees, and agencies.

8. Strategic Impact

- Makes the **Short Hopper the definitive way to move around the Moon**
- Builds a reusable network for **lunar commuting, exploration, and logistics**

- Allows standardization across hardware types and vendors
- Unlocks water-to-fuel integration from Aegis ISRU pipelines

9. Appendices (to be attached as needed)

- Cartridge specs (LOX, LH_2)
- Electrical and data interface diagrams
- Cryo system margin tables
- Deployment footprint by node class
- Resupply scenarios