

Thermo.OS: Quick Start Guide

Welcome to the Thermodynamic Truth Protocol.

This guide provides the essential information for operating the **Thermo.OS** dashboard, a high-fidelity instrument panel designed for monitoring the thermodynamic state of your consensus network.



1. Primary Telemetry (Top Row)

The top row of the dashboard displays the immediate “vital signs” of the network, allowing for at-a-glance health assessment.

Metric	Description	Interpretation
Network Energy	Total “work” (Joules) currently invested in the system.	A rising value indicates strong Sybil resistance, representing the physical cost required for an attacker to revert the chain.
Consensus Error	Deviation between the network’s consensus value and ground truth.	Target: < 0.05°C. If this exceeds 0.1°C, investigate for high-latency nodes or network partition events.
Threat Level	Real-time Byzantine detection status.	● SECURE: Normal operation. ● WARNING: Localized entropy spikes. ● CRITICAL: Active attack detected.

2. The Oscilloscope (Main Chart)

The **Thermodynamic Consensus Trajectory** visualizes the collective “temperature” (truth value) of the network over time. This chart serves as the primary visual indicator of stability.

A **smooth line** indicates a low-entropy, highly coherent state where the network is in strong agreement. Conversely, a **jagged or erratic line** indicates high entropy, suggesting the network is struggling to reach consensus. This instability is typically caused by network partitions (communication failure), active Byzantine interference (conflicting values), or high measurement noise.

3. System Internals (Right Panel)

These gauges monitor the internal physics of the protocol, providing deeper insight into the mechanism’s performance.

System Entropy measures the disorder or uncertainty in the network. The protocol actively works to minimize this value. **Spikes in entropy often precede consensus divergence**, making this a key leading indicator for predicting instability.

Proof-of-Work Load visualizes the computational expenditure required to maintain the current security level, showing the dynamic response of the system to perceived threats.

4. Spatial Coherence Map (Bottom Grid)

The 3x3 grid represents the physical topology of your 9-node cluster. Each cell displays the current reported value of a node in amber.

The **Green Indicators** signify that a node is **spatially coherent** (mathematically consistent) with its neighbors. You can hover over any node to inspect its specific peer-to-peer trust scores. A disabled indicator means the node is being rejected by its peers due to incoherence, effectively isolating it from the consensus process.

Operator Note: The dashboard utilizes a “dark mode” industrial aesthetic to minimize visual fatigue during long monitoring sessions, mimicking the UX of critical infrastructure control rooms.