ACE SKYHOOK

ACE IoT'S DATA ACQUISITION GATEWAY:
SPECS, CAPABILITIES, AND INTEGRATIONS

The ACE SkyHook gateway is a powerful tool, containing a configured Eclipse VOLTTRON image, for connecting to the site's network and acquiring data from HVAC systems, power meters, Distributed Energy Systems (DERS), and other connected equipment in smart buildings.

SkyHook integrates seamlessly into legacy systems and enables rapid onboarding of buildings into ACE IoT's FlightDeck, Sentinel, and/or into a system like SkySpark.

Our Customer Success Team handles pre-configuration of the hardware, and provides ongoing system maintenance, supporting your business from install to everyday usage.

Technical Specifications. For standard deployments, ACE IoT uses an x86 processor powered industrial PC with dual ethernet connectivity to contain the ACE SkyHook image. The gateway has the following design specifications:

- **CPU:** Intel® Celeron® J4125 Processor; 2.0 - 2.7GHz Quad Core , 4 Cores / 4 Threads, 10W TDP, 4MB L2 Cache, 64-bit
- **Memory:** 8GB x 204-pin DDR4 SODIMM
- **Storage:** 256GB mSATA SSD
- **Connectivity:** 2x GbE LAN ports (Intel® i211-AT and Realtek® RTL8111HS)
- **Expansion Slots:** LTE capable Mini PCI-E Slot
- **Physical Interfaces:** 2x RJ45 Ethernet, 1x RS232/422/485, 4x USB 3.0 , 1x 12V Locking DC-IN
- **Case Dimensions:** 118mm x 110mm x 45mm (4.65" x 4.31" x 1.75")

Capabilities. ACE IoT SkyHook is deployed at the edge to enable to following capabilities:

- **Effective Network Segmentation.** Dual Ethernet configuration allows ACE IoT customers to keep process control networks segmented. Effective network segmentation improves performance of the data acquisition solution and enhances network security.
- **Configurable and Adaptable Technology.** The Gateway's design supports effective connectivity and reliable data acquisition in an array of campus, building and factory environments. Moreover, the Gateway establishes an edge compute platform that our customer can use to support applications other than ACE IoT's data acquisition solution.
- **Local, on-prem storage of collected data for at least 5-days.** The Gateway's large, fast data storage enables caching of collected data in the event of cloud connectivity issues.

Integrations. ACE IoT's deployment of VOLTTRON integrates with the following protocols:

- BACnet
- Modbus
- MQTT
- Allen Bradley Ethernet/IP
- Siemens S7
- oBIX
- LoRaWAN
- IEEE 2030.5
- OpenADR
- DNP3
- Custom APIs
- Sunspec
- SkySpark
- DALi

Software. The standard ACE IoT Gateway ships with the following network configuration:

Network security is provided by:

- HTTPS TLS 1.3 security for provisioning and control
- Zero-Trust overlay network, provided using Tailscale software which is based on Wireguard. The VPN overlay enforces a zero trust, deny-by-default, encrypted, point to point communications between the edge computer and the cloud infrastructure. All data is encrypted with the Noise protocol. (Additional reading here: https://www.wireguard.com/protocol/)
- Outbound NAT traversal compatible with most firewall infrastructures, occasionally granular rules are required to allow outbound-only access for edge to cloud communications.

Network traffic from the edge computer is protected within a secure overlay network. The overlay is established by:

- The edge computer uses an outbound (HTTPS TLS 1.3 protected) connection to a coordination server (see below).

- The edge computer deposits its public key, and its public IP address with the co-ordination server.
- The edge computer polls the co-ordination server for the public key and public IP addresses for the monitoring and data processing servers.
- The edge computer attempts to access the monitoring and data processing servers, using the overlay protected by the ephemeral public keys.
- All software is running on Ubuntu 20.04 LTS as the operating system, with regular patches and updates applied remotely. System images are hardened in accordance with CIS Benchmark Guidelines.

For more information about ACE IoT Solutions, please visit www.aceiotsolutions.com.

tailscale
Tailscale Cloud

ACE AERODROME
ACE IoT Cloud

Regional Tailscale Coordination Servers

ACE Cloud Orchestration

ACE Cloud Monitoring

ACE Cloud VOLTTRON

HTTPS TLS 1.3

TLS 1.3

CurveZMQ (ED25519 ECC)

HTTPS TLS 1.3

Provisioning and Control Plane

TailScale Private Overlay Network
(Noise Protocol Encrypted)

ACE SkyHook Gateway

For the ACE IoT SkyHook (Edge Node), we need connections:

TO :443 TCP,
TO :3478 UDP, and
TO :41641 UDP connected to the following hosts:

- gateway.aceiot.cloud
- manager.aceiot.cloud
- flightdeck.aceiot.cloud
- login.tailscale.com
- controlplane.tailscale.com
- log.tailscale.com
- log.tailscale.io

- derp*.tailscale.com (if wildcard subdomains are supported, otherwise the following):
- derp1-all.tailscale.com
- derp2-all.tailscale.com
- derp5-all.tailscale.com
- derp9-all.tailscale.com
- derp17-all.tailscale.com
- derp21-all.tailscale.com

ACE IoT SOLUTIONS