TransAir™ DTS-2000 Series

Dynamic Telematics System for Machine-to-Machine Wireless Connectivity Applications

Features

- Proven design for rugged applications in mobile and fixed environments
- Modularity for extensible connectivity
- Module options for Wi-Fi, 4G LTE, and GPS
- Integrated application engine with Ethernet switch and router
- Compliant with AAR Standard S-9401 and EN-50155

- Compact, fanless design -40 to +70 ºC operation
- Virtual IP KVM support for remote management
- Advanced Intelligent Power Management
- Low power consumption
- Integrates with commercial network management systems

Introduction

The DTS-2000 Series from Lilee Systems provides an interoperable communications gateway for mobile and fixed communications networks. The DTS-2000 features an integrated communications management application that provides a consistent IP address and network connectivity to remote assets when roaming across service provider networks or wireless technology. This application dynamically selects the preferred communications path to a centralized facility using user-selectable performance metrics. This unique functionality enables the DTS-2000 to aggregate bandwidth simultaneously across 4G LTE cellular, Wi-Fi, and Ethernet interfaces as these services are available, allowing the greatest amount of throughput at the lowest possible cost.

For third party system integrators, the DTS-2000 includes an internal x86 application processor that allows users to develop their own value added applications without worrying about network availability. The applications can always be reached from the control center through any of the configured communication links. The Policy Engine selects Wi-Fi (the most economic link) to deliver the packets when both Wi-Fi and cellular are available. For applications that demand high reliability, the DTS-2000 offers intelligent link selection according to the internal policy engine configuration. Intelligent link management significantly improves train safety for Positive Train Control applications by delivering the train control commands more reliably when using lossy wireless links.

Capabilities

- Provide an intelligent wayside platform for Wayside Interface Unit (WIU) message queuing, trackside sensor readings, and remote message processing and caching
- Provide a constantly connected locomotive platform with Mobile-IP technology regardless of the wireless technology used
- Enable a high degree of confidence that the train control commands will be delivered reliably by using Lilee Systems' Policy Engine for QoS

- Balance cellular data plan usage among multiple cellular carriers to avoid overage charges
- Connect legacy devices at the wayside or in the mobile environment to centralized dispatch using the built-in analog / digital input and output interfaces
- Act as a data aggregation management gateway for HBDs, AEIs, and various sensors in the field

Specifications

Processor / Memory / Storage
x86 Application Processor
1 GB on-board memory and 8 GB CFast flash disk storage allocated to the VM
App-Engine
Certified Red Hat Linux OS

Ethernet Interface
IEEE 802.3u for 10/100 BaseT(X), Auto-Negotiation, Auto-MDI/MDIX

Protocol Support
IP Routing, DHCP, SNMPv2, SMS (Short Message Service), NTP, NAT

ITC Protocol Support
ITCM, ATCS, AMQP, Class C/D, EMP

Security
IPsec, AES Encryption, SSH, DTLS

Remote Management
Virtual IP KVM remote management
Lilee Mobility Controller (LMC) based centralized management
Restful API and SNMP (host and interface MIBs) for commercial network management
integration

Local Management
Serial console port
Ethernet maintenance port

Serial Interface
Optional RS-232/422/485 Serial port via DB-9

I/O Interface Connectors
1 x Analog I/O connector (6 analog-in, 2 analog-out, 2 GND)
    12-bit resolution
    Programmable data rate from 128 SPS to 3.3 KSPS
    Continuous mode or one-shot mode
    Two differential or four single-ended
    Output voltage range from 0 to 3.3 V
    Less than 12uS output voltage settle time
1 x Digital I/O connector (4 digital-in, 4 digital-out, 2 GND)
1 x CFast slot with pre-installed 8 GB CFast card (6 GB allocated to VM
App-Engine storage)
3-port 10/100 Mbps Ethernet managed switch (RJ45)
1 x 10/100 Mbps maintenance Ethernet port (RJ45) for dedicated diagnostic connection
1 x Reset button
1 x RS-232/422/485 Serial port via DB-9
1 x Serial console port via RJ45
1 x USB 2.0 for SSM
1 x 4-pin WakeOn connector (toggle, throttle, on/off, GND)
1 x 3-pin terminal block power connector
LED indicators: PWR, HEALTH, CPU, VOLT, TEMP, AUX

Physical Characteristics
Fanless design
Housing	Metal housing
Dimensions (H x W x L)	1.7 x 6.6 x 9.8 in (44 x 167 x 250 mm)
Net Weight	5.12 lbs. (2.32 kg)
Installation	Shelf, Wall, and optional DIN-rail mounting

Environmental Limits
Functional Operating Temperature	-40 to 70 °C (-40 to 158 °F)
Safe Operating Temperature	-40 to 50 °C (-40 to 122 °F)
Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Ambient Relative Humidity	5% to 100% (non-condensing)

Power
Input Voltage	10 to 30 VDC
Power Connector	3-pin terminal block
Power Consumption	1.7 A @ 12 VDC (typical operation)
	0.6 A @ 12 VDC (idle)
	0.3 A @ 12 VDC (sleep)

Certifications
FCC Part 15 Subpart B
PTCRB
AT&T, Verizon, and Sprint (Pending Certifications)
Red Hat Hardware Certification
RoHS compliant

Ordering Information (subject to change)

SKU	Description
DTS-2000-P2R2DAS	DTS-2000 Chassis
CF-8G	8G Cfast Flash Card
IC-GPS-P	Precision GPS Interface Card
IC-LTE	4G Cellular Interface Card (USA)
IC-LTE-G	4G Cellular Interface Card (Global)
IC-LTE-GPS	4G Cellular + GPS Interface Card (USA)
IC-LTE-GPS-G	4G Cellular + GPS Interface Card (Global)
IC-WIFI-11N	802.11b/g/n Wi-Fi Interface Card
IC-BLANK	IC Blank
SSM-1G	SSM card
DTS-2000-MNT-DIN	DIN Rail Mount