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Tracewell 5-Slot Full Mesh for AdvancedTCA™

5U, 5-slot Replicated Full Mesh ATCA™ Central Office System

Description

Tracewell Systems introduces the 5-slot Full Mesh for AdvancedTCA™, a low profile 5U system platform providing superior features and performance, all in a highly robust package. Designed to meet NEBS Level III, the system focuses on high reliability, high availability, easy maintenance, and low cost of ownership. Features include an advanced high capacity push-pull cooling scheme, high performance shelf management and a replicated mesh backplane optimized for 3.125Gb/s and beyond.

The Tracewell 5-slot Full Mesh combines a high-pressure push-pull fan configuration with advanced software control, allowing operation at 200W per slot even in the event of a fan failure. The 5-slot Full Mesh includes active RTM cooling for up to 30W per slot. Under normal operating conditions, fans speeds are reduced to provide quiet operation. In the event of a fan failure, fans speeds are increased to 130% to compensate for lost airflow. Fan trays also include an MTBF tracking sensor, alerting the host when fans approach the end of rated operating life. This unique feature allows fans to be replaced before failure, reducing unscheduled maintenance.

At the heart of the design is an advanced triple-replicated full mesh backplane, which provides three fabric channels per slot to effectively triple data throughput. The fabric layout has been characterized and tested to provide link performance well beyond 3.125 Gb/s. For maximum reliability, the backplane includes bussed IPMB management connectivity. The shelf configuration board resides on the backplane and also contains an IPMC and is an active FRU. The backplane also serves as the main interconnect point for all FRU devices, nearly eliminating internal wire harness.

The primary shelf management system is the Motorola M100, due in part to very low power consumption and small footprint. The M100 includes is an HPI and SNMP interface, as well as on-board RMCP server. The M100 provides redundant IPM controllers for IPMB0-A and IPMB0-B for exceptional reliability. M100 shelf management has proven interoperability with all available ATCA-compliant IPMI management schemes. Other shelf management systems can also be supported.

The Tracewell 5-slot Full Mesh is designed for high reliability with an emphasis on eliminating single points of failure. This goes beyond simply providing redundant fan trays or PEMs. Each shelf-level FRU also includes redundancy at the control circuit level, where an IPM Controller is located on both IPMB-A and IPMB-B buses. To ensure an even higher level of redundancy each IPM bus has a separate control processor with information sharing. These characteristics ensure that shelf reliability meets or exceeds 99.999%.

Features

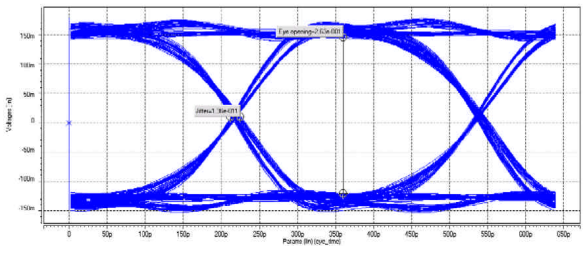
- Central Office 5-slot, 5U AdvancedTCA™ system
- Advanced push-pull cooling; 200W/slot with redundancy
- Redundant Shelf Managers support SNMP and RMCP
- Replicated Mesh backplane supports >3.125Gb/s
- Intelligent power entry modules - redundant power entry
- Multiple redundancy modes including predictive indicators
- NEBS, Telecordia, UL, CE (pending)
- High reliability, availability & maintainability

Physical

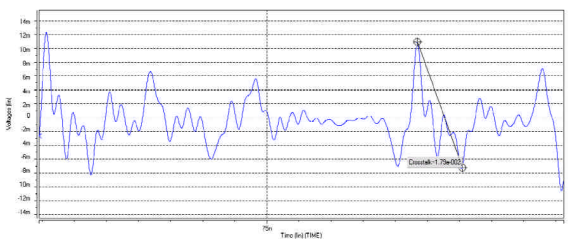
Construction:	Plated steel, non-structural trim components are aluminum
Cardcage:	Front 8U x 280mm; Rear 8U x 70mm
Dimensions:	15.35" D (390 mm) 19.00" W (483 mm, including rack flanges) 8.74" H (222 mm, 5U)
Weight:	35.2 lbs. (16 kg, base version)
Finish:	Textured paint, light gray on front/rear panels, black on all remaining exterior surfaces
Other:	Front rack flanges Front and rear ESD ground points

Backplane

Bus Structure:	5 slot, ATCA compliant, replicated full mesh, bussed IPMB
Base Interface:	Dual Star, with support 10/100/1000 BASE-T Ethernet; base hub slots are located in logical slots 1 & 2, base channel 1 is allocated to ShMC
Fabric Interface:	Redundant full mesh fabric connectivity optimized for performance at 3.125Gb/s+ per link
Update Channels:	10 differential signal pairs in a point-to-point connection between adjacent boards/slots. Slot 5 does not have an update connection
Sync. Clocks:	Use of the clock interface is user dependant
Other signals:	Metallic test and ring voltages through an optional connector on the PEM
Assembly:	SMT/ press-fit assembly
PCB:	FR4 epoxy-glass laminate, multilayer, all-stripline, SMOBC, 1 oz. copper signal and power planes minimum, UL 94V-0
Zone 3:	Unpopulated on standard designs; includes removable filler panels in backplane area



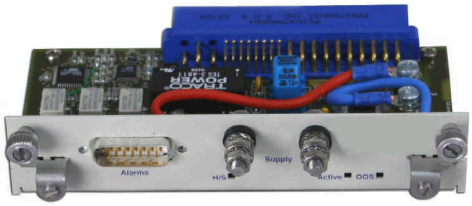
Measured Backplane Performance at 3.125 Gbps



Crosstalk Performance at 3.125 Gbps

Power Input

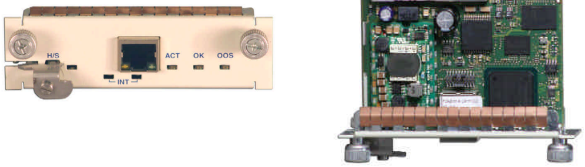
General:	Designed for redundant primary A and secondary B 48Vdc input feeds through two redundant rear-plugging power entry modules (PEMs)
Input voltage:	36 – 72Vdc
Working current:	5.1A to each slot
Max. current:	20A maximum to a single slot without damage to the backplane
Fault current:	220A maximum can be sustained on a single slot for up to 4mS
Input Monitoring:	M4 threaded studs; one feed per PEM (A or B)
Filtering:	PEMs include onboard IPMC; input voltage and current monitoring
	PEMs provide common mode and differential mode filtering for conducted emissions, reducing differential to common mode conversion



Rear Power Entry Module

Management

General:	Includes two front accessible redundant Shelf Management Controllers (ShMCs) to provide IPMI based management, monitoring, and control of payload boards, fans trays, PEMs, and alarm functions
IPMB routing:	IPMB is bussed for maximum reliability
ShMC routing:	Left ShMC connects to base channel of logical slot 1; right ScMC connector to logical slot 2; ShMC includes two internal redundant high-speed connections for fault protection
ShMC interface:	SNMP interface is compliant to SAF HPI; an RMCP interface is available
Shelf identity:	Configuration board with onboard IPMC provides vendor, serial number and backplane connectivity information to the ScMC
IPM devices:	ScMC (2), Fan trays (4), PEMs (2), Configuration board (1), LED alarm panel (1)
Reliability:	Redundant on-board IPMCs on the M100 ShMCs further eliminate single point failures



Front Accessible M100 Shelf Management Module

Indicators and Controls

Telco alarms:	Each PEM includes three contract closures to indicate Critical, Major, and Minor alarms; two current driven telco alarm inputs are also supported (all functions are user assigned and controlled)
LED alarm panel:	Includes four high brightness LEDs to indicate Critical, Major, Minor alarms, and Power Good (all functions are user assigned and controlled); includes an IPMC interface
ShMC:	RG-45 10/100Mb/s Ethernet interface; LEDs for Active, H/S, OOS, OK, and INT
IPMC indicators:	Each IPMC device includes LEDs for Active, H/S, and OOS

Cooling

General:	Redundant push-pull cooling provided by two front and two rear plugging fan trays
Airflow path:	Left side intake, right side exhaust
Cooling capacity:	230W per slot based on 200W per front slot and 30W per rear slot
Fans:	*Front fans:* four 150 CFM, high pressure tube-axial, +24Vdc (2 fans per fan tray) *Rear fans:* four 33 CFM, tube-axial, +24Vdc (2 fans per fan tray)
Air filter:	Washable media, 30 PPI, flame rated material; filter installed on intake (right-side) fan trays
Accessibility:	Fans contained in removable, hot-plugging trays; tool accessible
Monitor/Control:	Each front fan tray includes onboard IPMC; fan speed control handled by ShMC; rear fan trays controlled by respective front tray; each fan tray also includes onboard temperature sensor
Fault protection:	Fan fault detection at >15% below demand speed; during a fan fault condition, all remaining fans increase to 120% of normal full speed operation
MTBF tracking:	Fan trays include an MTBF sensor to monitor fan hours; provides indication as fans approach end of rated operating life to allow scheduled replacement

Environmental

Temperature:	0ºC to +55ºC operating; -40ºC to +70ºC non-operating
Humidity:	5 – 95% non-condensing at 40ºC operating, 0 – 95% non-operating
Acoustic:	Low noise during normal operation; max 60dBa (1 meter)
NEBS:	Designed to meet NEBS environmental requirements for GR-63-CORE

Compliance [1]

Safety:	Designed to meet EN, UL and IEC 60950
EMC:	Designed to meet FCC Part 15 and CISPR 22 class B conducted and radiated emissions

Pre-qualification program is in process with planned completion by end of 2005

Warranty

1 year limited warranty

Removable Front and Rear Fan Trays

Front Fan Tray Access

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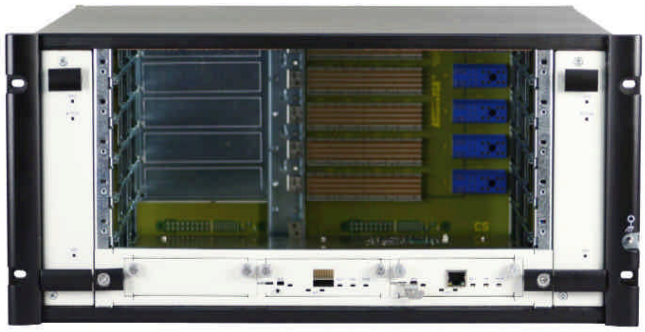

Front View

Rear View

Ordering Information

The Tracewell ATCA 5U is available in the following configurations (consult factory for additional versions and options):

537-6020-F00-00 ATCA 5U,5-SL,4-FT,2-PEM,2-M100 ShMC
537-6021-F00-00 ATCA 5U,5-SL,4-FT,2-PEM,2-PPS ShMC[2]
Note: Shelf management type must be specified at time of order and is not interchangeable

Accessories
137-6001-000-0C SLOT FILLER BOARDS,ATCA,FRONT
137-6002-000-0C SLOT FILLER BOARDS,ATCA,REAR

Notes:
[1] Tracewell Systems can test and certify for agency compliance on customer specific integrated products. Consult factory for more details.
[2] Pigeon Point Systems (PPS) based shelf management availability early 2006

request a quote at our web site:
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