

# 800G/400G/200G Taurus Smart Cable Module™

## Portfolio Brief

Asteralabs is a worldwide leader in purpose-built connectivity solutions for AI and cloud infrastructure. It is at the forefront of software-defined architectures that are both scalable and customizable. With PCIe®, CXL®, and Ethernet-based semiconductor solutions, Asteralabs addresses data, memory, and networking bottlenecks while fostering trusted partnerships with hyperscalers and the broader data center ecosystem.

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## Benefits and Features

- Supports 100G PAM4 (106.25 Gbps), 50G PAM4 (53.125 Gbps), 25G NRZ (26.5625 Gbps and 25.78125 Gbps), and other ethernet line rates
- Enables cost-effective switch-to-server and switch-to-switch interconnects over thin-gauge copper
- OSFP, QSFP-DD, and QSFP-DD800 form factors
- Supports up to 3-Meter, 34-AWG cable reach
- Supports multiple cable vendors' assembly flows
- Up to 50% lower power consumption compared to AOCs
- Low-latency data path end-to-end < 100 ns
- Supports fanout buffering of pulse per second signals for precision time protocol applications
- Per-lane control of rate, PAM4/NRZ mode select, and aggregation/disaggregation mode select
- Module-level features for deep in-cable diagnostics, fleet management, and security: Eye metric readout, PRBS bit error rate, loopback modes, firmware security, and more
- Conforms to standard QSFP-DD/OSFP mechanical and common management interface specifications, supporting up to 1-MHz I2C
- Non-disruptive module firmware update capability
- Future-proof portfolio across 200G, 400G, and 800G Taurus Smart Cable Modules

## Applications

- ToR Switch to Server NIC (X-DAC)
- ToR Switch to Leaf Switch (Straight)
- ToR Switch breakout to multiple Server NICs

## Product Family Information

Application Use Case	Part #	Cable Line Rate	Cable Reach
200G QSFP-DD	EM200-QDX-A	25G/Lane	3m 34AWG
400G QSFP-DD	EM400-QDX-A	50G/Lane	3m 32AWG
		100G/Lane	3m 30AWG
400G OSFP	EM400-EPS-A	50G/Lane	3m 32AWG
		100G/Lane	3m 30AWG
800G QSFP-DD	EM800-QDX-A	100G/Lane	3m 30AWG
800G OSFP	EM800-EPS-A	100G/Lane	3m 30AWG

## Description

The 800G/400G/200G Taurus Smart Cable Module™ (SCM) is a smart and active solution that enables extended reach over thin copper cables that provide advanced fleet management and robust security. The Taurus SCM™ integrates seamlessly into an Active Copper Cable (ACC) assembly, enabling cost-effective copper interconnects between switches and servers.

Rack infrastructure in hyperscale data centers require cost-effective interconnects which are thin, bendable, and up to three meters in length. Higher switch port density enables broader scale-out architectures requiring fanout or cross-connect interconnects between top-of-rack (ToR) switches and servers. The Taurus Smart Cable Module make these architectures possible by enabling 800G/400G/200G connectivity over thin-gauge (30/32/34 AWG) copper cables up to three meters.

Fleet management and diagnostics are just as important as cable reach, cable bulk, and interconnect cost. Taurus Smart Cable Modules incorporate diagnostic features to enable continuous monitoring of critical switch-to-server and switch-to-switch links. Parameters such as eye opening, adaptation coefficients, signal-to-noise ratio (SNR), junction temperature, and more are monitored and interrupts to the host can be enabled whenever configurable limits are crossed. A full set of self-test features—host-side loopback, pseudo-random bit sequence (PRBS) generation and checking, etc.—enable rapid troubleshooting to minimize link down time and accelerate fault isolation.

The Taurus SCM incorporate security features to prevent malicious attacks in the form of unauthorized firmware loading, unauthorized module diagnostics access, and unauthorized module configuration. On-the-fly firmware updates over a fast (up to 1-MHz I2C) interface enables seamless in-system upgrades while ensuring only trusted entities are granted access.

*Typical Taurus Smart Cable Module*

