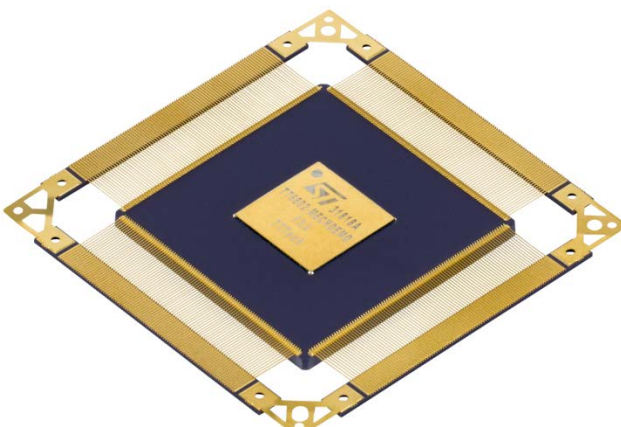




# TT6802-1-SE

The TTEnd System Controller Space



- ✓ **Key Benefits**
  - ✓ Three supported traffic classes
    - Standard Ethernet (IEEE 802.3)
    - Rate-constrained traffic (ARINC 664 p7)
    - Time-triggered traffic (SAE AS6802)
  - ✓ 3 Ethernet channels, full duplex at 10/100/1000 Mbit/s
  - ✓ 1 MByte of internal memory
  - ✓ 352 pin CQFP package
  - ✓ Junction temperature: -40 °C to +125 °C
  - ✓ Rad-hard design

The TTEnd System Controller Space is an integrated communication controller that supports standard Ethernet, rate-constrained traffic according to ARINC664 part 7, and time-triggered traffic according to the SAE AS6802 Time-Triggered Ethernet Standard. Three different host interfaces (SPI, PCI and SpaceWire) provide flexibility to connect the TTEthernet controller to different CPUs or FPGAs. The chip is based on a radiation hardened design process and packaged in a hermetic housing that provides the necessary radiation tolerance for use in the harsh space environment.

## TT6802-Device Family for Synchronized and Non-Synchronized Functions over Ethernet

The TTEnd System Controller is part of the TT6802-device family that includes communication controllers and switches available as both industrial- and space-graded products, which are usable as a building block for TTEthernet data networks. TTEthernet enables the integration of synchronized and non-synchronized functions in Ethernet-based distributed systems. TTEthernet allows hard real-time functions to enjoy reserved bandwidth, full determinism and delivery jitter below 1  $\mu$ s, by simultaneously operating ARINC 664 part 7 and standard IEEE 802.3 Ethernet traffic

without impact on time-critical and synchronized functions.

## Support for Single to Triple-Channel Networks Architectures

TTEthernet supports single to triple-channel multi-hop networks with system synchronization, redundancy management, fault-tolerance, fault isolation and recovery capability. Distributed functions can utilize scalable QoS for different data streams and share a common Ethernet network without unintended interactions for critical traffic.



© NASA

### Application Fields

- Space Application

## TTEnd System Controller Benefits

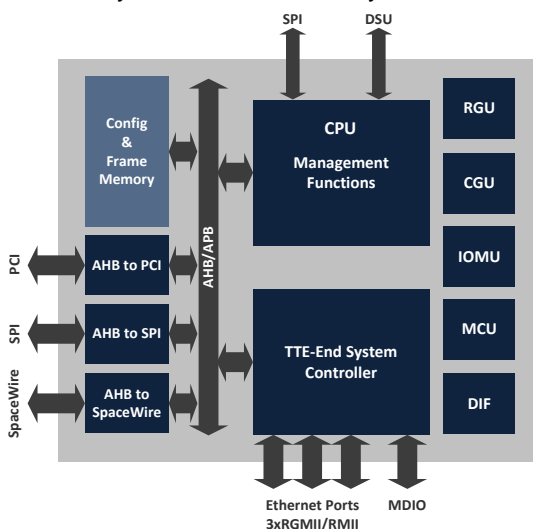
The TTEnd System Controller provides support for fault-tolerant, up to 1000 Mbit/s high-speed data communication in a single device. The end system controller offers superior reliability for the full temperature and radiation range required for space applications and is qualifiable according to international space standards.

## Quality of Service and Partitioning

The TTEnd System Controller supports 256 send- and 512 receive virtual links which can be fully separated via 8 memory partitions, which allows using standard Ethernet traffic and time-triggered or rate-constrained traffic on the same network without interference.

## General Product Features

- Suitable for highly dependable, distributed real-time systems with guaranteed response time
- Support of the three TTEthernet traffic classes:
  - Standard Ethernet traffic (IEEE 802.3)
  - Rate-constrained traffic (according to ARINC 664 part 7)
  - Time-triggered traffic (according to SAE AS6802)
- 256 send VLs, 512 receive VLs
- 2048 send COM ports, 4096 receive ports
- Flexible configurable periods (1µs granularity)
- Profiled IP/UDP, sampled and queued ports
- IP/UDP handled on hardware ICMP handling
- Diagnosis and status registers
- 1 MByte of internal memory



## Network Connectivity

- 3x 10/100/1000 Mbit/s via RGMII interface
- 3x 10/100 Mbit/s via RMII interface

## Power Supply and Consumption

- Power supply 1.2 V core and 2.5, 3.3 V I/O
- Maximum power consumption of 1.2 W

## Host Interfaces

- PCI 32 Bit / 33MHz
- Quad-/Dual-/Single-SPI with clock frequency up to 62.5MHz
- SpaceWire supporting RMAP protocol

## Management CPU

- Integrated Leon2 CPU operating at 125MHz
- Usable for device management and status monitoring

## Environmental

- Junction temperature range -40 °C to +125 °C
- Radiation tolerance for total dose up to 100 krad
- Latch-up immunity up to 60 MeV/cm2/mg

## Package & Quality Level

- CQFP with 352 pins
- QML V and ECSS

## Related Products

- TTETools is a PC based tool chain that supports the generation of configuration files
- The TTEnd System Controller is compliant to all other TTEthernet products of TTTech
- TTESwitch Controller Space TT6802-1-SW

## Order Number

- 13337



TTTech Europe, Austria (Headquarters)  
Phone: +43 1 585 34 34-0

TTTech North America Inc.  
Phone: +1 978 933-7979

TTTech Japan  
Phone: +81 52 485-5898