



## HY-TTC 500 Family

Freely Programmable High-End Automotive Control Units



### Key Benefits

- ✓ High performance: 32 bit dual-core lockstep CPU with 180 MHz and floating point unit, 12 bit ADCs
- ✓ Extensive I/O set with multiple software configuration options per pin
- ✓ Open programming environment C, CODESYS® V3.x and CODESYS® V3.x Safety SIL 2
- ✓ IEC 61508 (SIL 2) and EN ISO 13849 (PL d) TÜV certified
- ✓ Connectivity: Up to 7 CAN interfaces
- ✓ Ethernet
- ✓ Up to 2.3 MB RAM / 11 MB Flash

The HY-TTC 500 product family is a high-end electronic control solution equipped for upcoming needs. The controller with its powerful TMS570 dual-core lockstep CPU is designed for use in demanding safety-relevant automotive applications. The HY-TTC 580 and the HY-TTC 540 fulfill safety requirements up to SIL 2 (IEC 61508) / PL d (EN ISO 13849). They are part of a complete and compatible product family and can be programmed either in C or in CODESYS® Safety SIL 2.

### Flexibility and Usability

The extensive I/O set with various configuration options makes the HY-TTC 500 controllers suitable for a wide range of high-end applications: For example, a group of 8 I/O pins can be individually configured for use as PVG output, voltage output, digital output or analog input.

Commissioning time can be improved by using Ethernet for download and debugging purposes.

### Safety

A high percentage of the run-time tests that are needed to achieve the diagnostic coverage required for SIL 2 / PL d is performed in hardware by the dual-core lockstep CPU and its safety companion. This keeps much more processing power available for the application in

comparison with solutions that implement the safety measures in software.

The available memory protection mechanisms allow to execute safety and non-safety software on the same ECU without interference. The time-consuming validation of non-safety software is therefore no longer necessary. Safe data communication is achieved by the standardized CANopen® Safety protocol of the control units. In case of a safety-relevant failure, outputs can be shut off in 3 groups allowing limp-home functionality.

The safety certified CODESYS® Safety SIL 2 with its validated compiler and code generator speeds up application development significantly.



### Application Fields

- Buses
- Electric Power Train
- Trucks
- Cars

## Connectivity

While in smaller vehicles a single HY-TTC 500 controller can take over the control of the whole vehicle, in more demanding applications several ECUs will be necessary. For these vehicles the ideal master ECU not only supports multiple CAN interfaces, but also connectivity for all other commonly used communication technologies: Therefore the HY-TTC 580 is equipped with 7 CAN channels, Ethernet, RS232 and LIN.

## Robustness and Performance

The freely programmable high-end control units with a powerful dual-core ARM Cortex®-R4 lockstep processor are protected by a compact, automotive-style housing suited for harsh environments.

## Variant Overview

	HY-TTC 510	HY-TTC 540	HY-TTC 580
<b>CPU Core</b>	32-Bit TI TMS570, ARM cortex-R4F based, dual-core lockstep CPU and memory protection for safety-relevant applications		
	3 MB int. Flash, 256 KB int. RAM, 2 MB ext. RAM		
			8 MB ext. Flash
	64 KB ext. EEPROM		
	Safety Companion		
<b>Interfaces</b>	3 x CAN, up to 1 Mbit/s	4 x CAN, up to 1 Mbit/s	7 x CAN, up to 1 Mbit/s
			1 x Ethernet, up to 10 Mbit/s for download and debugging
			1 x RS-232
	1 x LIN serial interface		1 x LIN serial interface
<b>Sensor Supply</b>	1 x sensor supply 5 - 10 V / max. 2.5 W / configurable by SW in 1 V steps		
	2 x sensor supplies 5 V / max. 500 mA		
<b>RTC</b>			1 x RTC
<b>Internal</b>	Internal monitoring of board temperature, sensor supply and supply voltage Power-On via K15 or Wakeup-Pin		
<b>Software</b>	C-Programming / CODESYS® Safety SIL 2 / CODESYS®		
<b>Functional Safety</b>	IEC 61508 SIL 2		
	EN ISO 13849 PL d		

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