

HY-TTC 50 Family

Freely Programmable Control Units



These cost-effective, high-performance electronic control units are targeted towards applications that need to function reliably according to automotive requirements. For example vehicle control units for electric vehicles or supervisor modules in drivetrain applications. The electronic circuits are well protected by a compact, automotive-style aluminium pressure die-cast housing. The units are programmed either in C or in CODESYS®. MATLAB® code can easily be integrated when using an according C-code-generator. The enhanced hardware abstraction layer supports powerful software in the loop testing capabilities for extensive testing with MATLAB/Simulink.

Functional Safety

HY-TTC 94, the top-level ECU of the HY-TTC 50 family, contains a main CPU executing the user application, and a smaller watchdog CPU, which continuously monitors the main CPU and the safety-critical inputs and outputs. In case of an error the internal safety switch disconnects all output stages from power, that way entering the safe state. Through this watchdog CPU, uncommanded movements of the vehicle can be avoided in order to ensure the safety of machine operators and equipment.

KEY FEATURES/BENEFITS

- 80 MHz processor (570 kB RAM, 832 kB Flash, 8 kB EEPROM)
- Eight 2 A PWM outputs
- All inputs with configurable pull-ups or pull-downs
- Flexible, range-configurable analog inputs
- Use of various analog and digital sensors
- Up to 4 CAN interfaces with 256 CAN message buffers
- Comfortable programming and debugging with CODESYS®
- Functional Safety: EN ISO 13849 PL d certified

Flexible I/Os and Modular Architecture

These ECUs were designed to make each pin of the ECU as configurable and flexible as possible. All output pins can also be configured as inputs, and the inputs have various pull-up and pull-down configuration possibilities. Analog inputs can be utilized as resistive, potentiometric or current inputs. In addition, a small daughter board makes it possible to enhance the features of the standard product with customer-specific resources. This mini-module has access to the free pins on the connector, and can communicate via serial bus with the CPU on the main board.

Supported Standards

- J1939 and CANopen communication
- Programming in ANSI C/C++ and with the CODESYS® development environment

Related Products

- I/O-modules HY-TTC 36X and HY-TTC 48X
- HY-TTC 200 ECU family

	HY-TTC 94	HY-TTC 60	HY-TTC 50
System CPU	16/32-bit Infineon XC2287M microcontroller, 80 MHz, 832 kB int. Flash, 50 kB int. RAM, 512 kB ext. RAM	16/32-bit Infineon XC2287 microcontroller, 80 MHz, 768 kB int. Flash, 82 kB int. RAM, 512 kB ext. RAM	16/32-bit Infineon XC2287 microcontroller, 80 MHz, 768 kB int. Flash, 82 kB int. RAM
	8 kB EEPROM	8 kB EEPROM	8 kB EEPROM
	Watchdog CPU Freescale HC 908, including monitoring software		
Interfaces	1 x RS-232 and 1 x LIN serial interfaces	1 x RS-232 and 1 x LIN serial interfaces	1 x RS-232 and 1 x LIN serial interfaces
	4 x CAN, up to 1 Mbit/s	2 x CAN, up to 1 Mbit/s	2 x CAN, up to 1 Mbit/s
Power Supply	1 x sensor supply 8.5V / 10 V / 14.5 V configurable	1 x sensor supply 8.5V / 10 V / 14.5 V configurable	1 x sensor supply 8.5V / 10 V / 14.5 V configurable
	Two 5 V sensor supplies	Two 5 V sensor supplies	Two 5 V sensor supplies
	Internal: monitoring of board temperature, sensor supply and supply voltage	Internal: monitoring of board temperature, sensor supply and supply voltage	Internal: monitoring of board temperature, sensor supply and supply voltage
Inputs	8 x analog IN 0 to 5 V or 4 to 20 mA / 10 bit, configured by software	8 x analog IN 0 to 5 V or 4 to 20 mA / 10 bit, configured by software	8 x analog IN 0 to 5 V or 4 to 20 mA / 10 bit, configured by software
	8 x analog IN 0 to 30 V / 10 bit, range configurable by software	8 x analog IN 0 to 30 V / 10 bit, range configurable by software	
	4 x digital IN (4 timer inputs 10 Hz to 10 kHz)	4 x digital IN (4 timer inputs 10 Hz to 10 kHz)	4 x digital IN (4 timer inputs 10 Hz to 10 kHz)
	8 x digital IN	8 x digital IN	8 x digital IN
Outputs	8 x PWM OUT 2 A high-side switches, also configurable as timer inputs	8 x PWM OUT 2 A high-side switches, also configurable as timer inputs	8 x PWM OUT 2 A high-side switches, also configurable as timer inputs
	8 x digital OUT 4 A high-side switches, also configurable as analog inputs	8 x digital OUT 4 A high-side switches, also configurable as analog inputs	8 x digital OUT 4 A high-side switches, also configurable as analog inputs
	4 x current feedback, configurable as digital outputs / low-side switches 2 A	4 x current feedbacks, configurable as digital outputs / lowside 2 A	4 x current feedback, configurable as digital outputs / lowside 2 A
Daughter Board	Mini-module, up to 8 pins for customer-specific extensions, 4 pins shared with range configurable analog inputs	Mini-module, up to 8 pins for customer-specific extensions, 4 pins shared with range configurable analog inputs	Mini-module, up to 8 pins for customer-specific extensions
Functional Safety	EN ISO 13849 PL d certified		