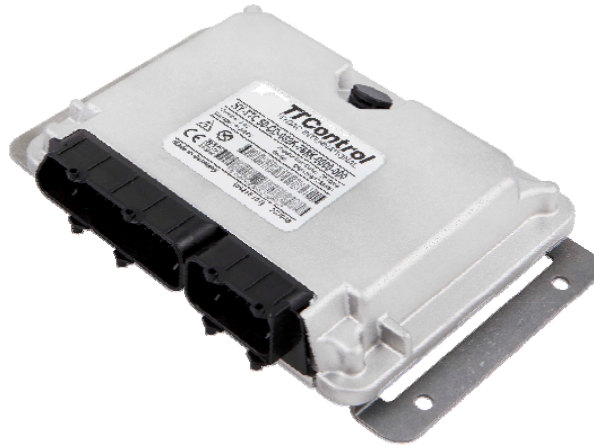


HY-TTC 50 Family

Freely Programmable Off-Highway Control Units



These cost-effective, high-performance electronic control units are targeted towards applications that need to function reliably under harsh environmental conditions. The electronic circuits are well protected by a compact, automotive-style aluminium pressure die-cast housing. In more demanding applications, several electronic control units can be interconnected via CAN bus to form a network. The units are programmed either in C or in CoDeSys®.

Functional Safety

HY-TTC 90, 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 Parameters		Unit
Dimensions	147.6 x 180.3 x 39.8	mm
Weight	650	g
Operating temperature	- 40 to + 85	°C
Supply voltage	9 to 32	V
Current	25	A _{max}

Supported Standards

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

KEY FEATURES/BENEFITS

- **Performance:** Fast 80 MHz processor with sufficient memory (570 kB RAM, 832 kB Flash, 8 kB EEPROM)
- **Eight 2A PWM outputs**
- **Flexibility:** Almost all outputs can also be used as inputs
- **Flexible, range-configurable analog inputs**
- **Use of various analog and digital sensors**
- **2 CAN interfaces with 128 CAN message buffers**
- **Very comfortable programming and debugging with CoDeSys**
- **Functional Safety:** IEC 61508 and ISO 13849 reliability with sophisticated self-diagnosis; watchdog CPU and safety certificate optional

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 options. 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.

Application Examples

- Utility vehicles such as street cleaning machines and fire trucks
- Construction equipment (drilling machines, mobile cranes, concrete pumps and similar)

Related Products

- I/O-modules HY-TTC 36X and HY-TTC 48X
- HY-TTC 200 ECU family
- New HY-eVision² operator terminals

	HY-TTC 50	HY-TTC 60	HY-TTC 90
System CPU	16/32-bit Infineon XC2287 microcontroller, 80 MHz, 768 kB int. Flash, 82 kB int. 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 XC2287M microcontroller, 80 MHz, 832 kB int. Flash, 58 kB int. RAM, 512 kB ext. RAM
	8 kB EEPROM	8 kB EEPROM	8 kB EEPROM
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
	2 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 14.7 V/10.1V/18.6 V configurable	1 x sensor supply 14.7 V/10.1V/18.6 V configurable	1 x sensor supply 14.7 V / 10.1 V / 18.6 V configurable
	Two 5 V sensor supplies	Two 5 V sensor supplies	Two 5 V sensor supplies
Inputs	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
	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 SW	8 x analog IN 0 to 30 V / 10 bit, range configurable by SW
	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)
Outputs	8 x digital IN	8 x digital IN	8 x digital IN
	8 x digital OUT 2 A high-side switches, PWM, also configurable as timer inputs	8 x digital OUT 2 A high-side switches, PWM, also configurable as timer inputs	8 x digital OUT 2 A high-side switches, PWM, 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
Daughter Board	4 x current feedback, configurable as digital outputs/lowside 2 A	4 x current feedbacks, configurable as digital outputs/lowside 2 A	4 x current feedback, configurable as digital outputs / low-side switches 2 A
	Mini-module, up to 8 pins for customer-specific extensions	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
Functional Safety			IEC 61508 SIL 2, EN ISO 13849 PL d

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