General Purpose Mobile Control
Powerful Building Blocks for Electronic Control Architectures

TTControl specializes in electronic control systems and smart operator interfaces for off-highway vehicles, such as construction and utility equipment, and forestry and mining machinery. These systems control and monitor hydraulic circuits or other actuators and various input devices such as joysticks or keypads. TTControl's solutions are easy to apply and to program. They offer levels of flexibility unrivalled by any competitor. The electronic control units can all be used in CAN networks, and are designed for superior performance and reliability. Some of the ECUs were developed to comply with ISO 13849 and IEC 61508 safety standards. Board support packages are offered for all controllers.

KEY FEATURES/BENEFITS
- **Large choice of robust ECUs and I/O modules with sufficient performance for a wide range of off-highway control purposes**
- **Flexible operator interface solutions**
- **Programming in C and CoDeSys®**
- **Networked solutions can be built using CAN (including CANopen)**
- **Pre-certified safety platforms**

Electronic Control Unit	CPU	Number of I/Os (Max. I_{out}=2...4A**)	Field Bus/ Interfaces	Safety Certification/ SIL Level	Programming Support
HY-TTC 50	16/32-bit, 80 MHz	20 inputs (analog & digital), 20 outputs* (8 x PWM, 4 current feedback inputs)	2 CAN, 1 LIN, 1 RS-232		CoDeSys, C programming
HY-TTC 60	16/32-bit, 80 MHz	28 inputs (analog & digital), 20 outputs* (8 x PWM, 4 current feedback inputs)	2 CAN, 1 LIN, 1 RS-232		CoDeSys, C programming
HY-TTC 90	16/32-bit, 80 MHz	28 inputs (analog & digital), 20 outputs* (8 x PWM, 4 current feedback inputs)	2 CAN, 1 LIN, 1 RS-232	Both IEC 61508 SIL 2 and EN ISO 13849 PL d	CoDeSys, C programming
HY-TTC 100	32-bit, 40 MHz	33 inputs (analog & digital), 13 outputs* (8 x PWM , 4 with current feedback)	2 CAN, 1 RS-232	IEC 61508 SIL 2 (EN ISO 13849 PL d on request)	CoDeSys, C programming, MATLAB/Simulink
HY-TTC 200	32-bit, 40 MHz	33 inputs (analog & digital), 36 outputs* (12 x PWM, 8 with current feedback)	2 CAN, 1 TTP, 1 RS-232	IEC 61508 SIL 2 and SIL 3 with TTP (EN ISO 13849 PL d on request)	CoDeSys, C programming, MATLAB/Simulink
HY-TTC 37XH	32-bit, 20 MHz	20 inputs (analog & digital), 25 outputs (digital)	1 CAN, 1 RS-232		No programming – attached to a master controller via J1939 as slave unit
HY-TTC 36X HY-TTC 48X	16/32 bit, 80 MHz	Up to28 inputs (analog & digital), 12 outputs (4 x PWM with current feedback)	1 CAN		No programming – attached to a master controller via CANopen as slave unit

Product	Number of I/Os	Field Bus / Interfaces	Monitor and Display Sizes	Programming
HY-Vision	No I/Os	2 CAN, 1 RS-232, 2 x RS-485, 1 LIN, 1 Ethernet	6.5" (external monitor) 7.0", 8.4" and 10.4" (LCD only) **10.4" (integrated = HY-eVision 10.4)**	CoDeSys, C
HY-Vision^{**Plus**}	26 inputs (digital), 24 outputs (digital)	2 CAN, 1 RS-232, 2 x RS-485, 1 LIN, 1 Ethernet	6.5" (monitor) 7.0", 8.4" and 10.4" (LCD only)	CoDeSys, C
HY-eVision² 7 HY-eVision² 10.4	No I/Os	2 CAN (HY-eVision² 7) – 4 CAN (HY-eVision² 10.4), 1 RS-232, 1 Ethernet	**7.0" (integrated) 10.4" (integrated)**	**CoDeSys 3**, C

HY-TTC 50 ECU Family – Great Performance and Flexibility at a Competitive Price

This is a proven family of freely programmable controllers that offer 32-bit performance at a 16-bit price. The HY-TTC 50, 60 and 90 can easily be configured in CoDeSys. This ease of use together with competitive pricing and the optional ISO 13849 safety certification (the HY-TTC 90 comes with a watchdog CPU) have led to a fast adoption of these compact control units for use in construction, agricultural and utility vehicles.

HY-TTC 200 ECU Family – Enhanced Performance and Programmability for Safety-Critical Applications

HY-TTC 100 and 200 are advanced programmable electronic control units for sensor/actuator management in the off-highway industry. They are based on a well-established MCU with floating point units and are therefore ideally suited for complex control algorithms or use of MATLAB/ Simulink for simulation and subsequent automated C-code generation.

HY-TTC 100 and 200 were designed to comply with the IEC 61508 international standard: Stand-alone units fulfill SIL 2 requirements, HY-TTC 200 achieves SIL 3 in a networked version.

HY-Vision and HY-eVision/HY-eVision² – More Flexibility for Multi-Functional Cockpit Control

The Vision product family comes in two formats – a modular version with separate display controller, display and keyboard, and fully-integrated all-in-one terminals with built-in display and programmable soft keys.

The first generation HY-Vision/HY-Vision^{Plus} display controllers can drive a variety of LCDs from 16.4 cm/6.5" up to 26.4 cm/10.4" color for the display of images, virtual indicators such as bars or arrows, and text of different sizes and colors. They are equipped with two digital LVDS interfaces for display control over larger distances and use an external video adapter card that also reads in camera images.

The **second generation HY-eVision²** products are based on an ARM Cortex A8 multimedia processor with built-in hardware acceleration. This allows higher display resolutions and – together with a dedicated target visualization in CoDeSys 3 – stunning graphical effects like transparency or tilting/3D. The integrated HY-eVision² operator terminals come in two sizes and can be customized. They offer up to 4 CAN channels and powerful add-ons like an integrated GPS/GSM module.

References

More information can be found in separate flyers for the individual product families and in product data sheets available through our website via www.ttcontrol.com/products.