



Shaping the next generation of mobile machinery

High-performance control systems and advanced electronics for off-highway vehicles

hydac.com ↗

ttcontrol.com ↗

Providing robust solutions for innovative off-highway vehicles



TTControl is a leading company in the field of safety control systems, rugged displays and connectivity as well as IoT solutions for mobile machinery and off-highway vehicles. The joint venture of the HYDAC Group and the TTTech Group is based in Vienna (Austria) and Brixen/Bressanone (Italy) supported by HYDAC sales offices in 52 countries worldwide.

Developing highly reliable electronic control systems.

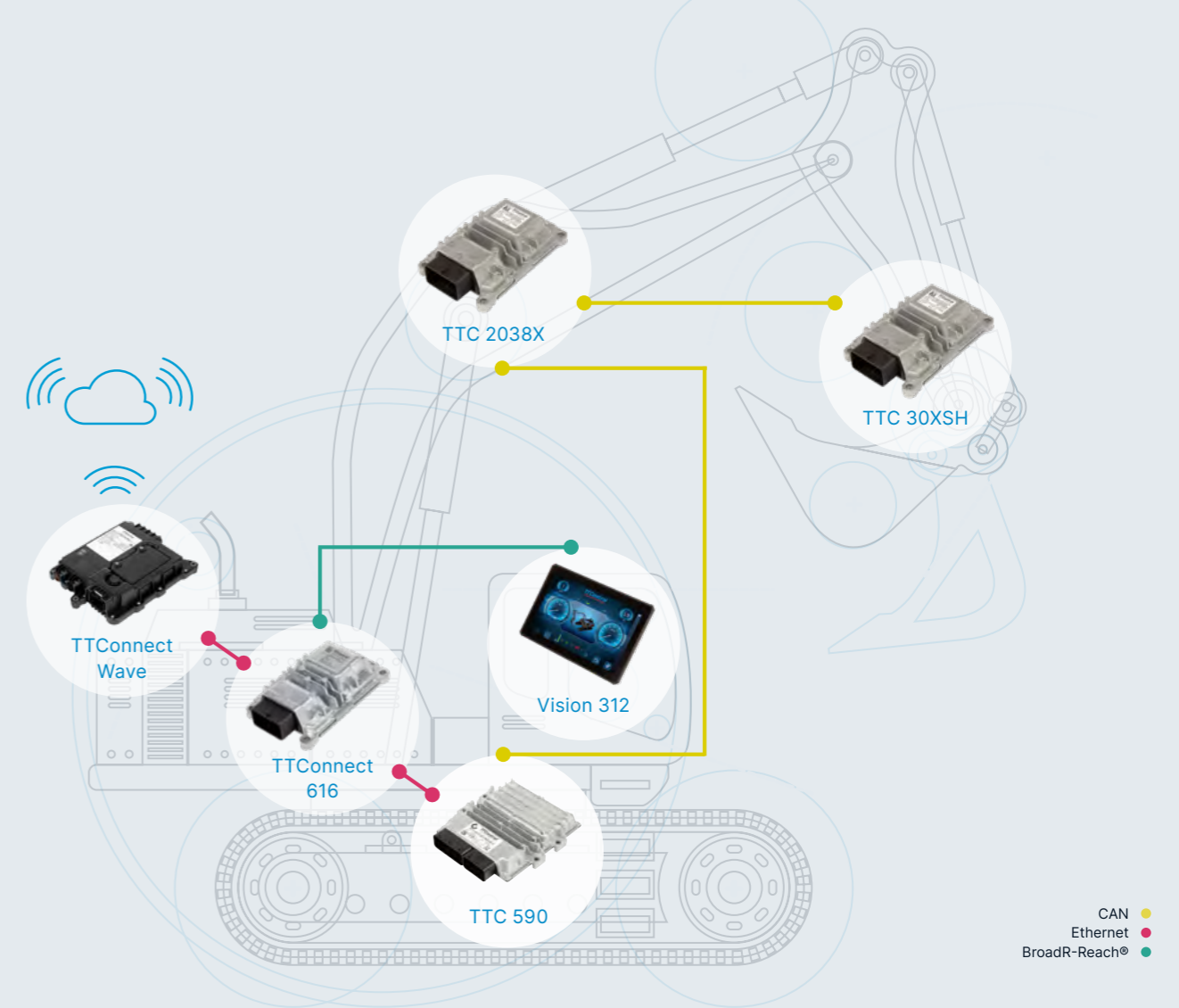
TTControl provides products that build the technological heart of construction and agricultural machines as well as lifting platforms, cranes, municipal vehicles, and other special mobile equipment. As a leading provider of functional safety products, TTControl's hardware and software platforms enable vehicle manufacturers to develop highly reliable electronic control systems efficiently and economically.

With over 20 years of experience, TTControl accompanies their customers and partners throughout the entire development process, providing extensive know-how about system architectures, functional safety and application software. TTControl, in partnership with lead customers, is working towards making autonomous operation a reality.



Advancing safe technologies, improving human lives

Find out more: ttcontrol.com



Anticipating the demands of tomorrow

Based on our long-standing industry experience and extensive functional safety know-how, TTControl creates products for the current challenges of our customers while also developing new solutions for future mobile machinery.

Safe, robust and readily available hardware components

- ⊕ High-performance ECUs
- ⊕ Robust, automotive proven hardware components
- ⊕ Intuitive HMI gesture function
- ⊕ Fast boot-up times

High-performance computing platforms for automated and autonomous operations

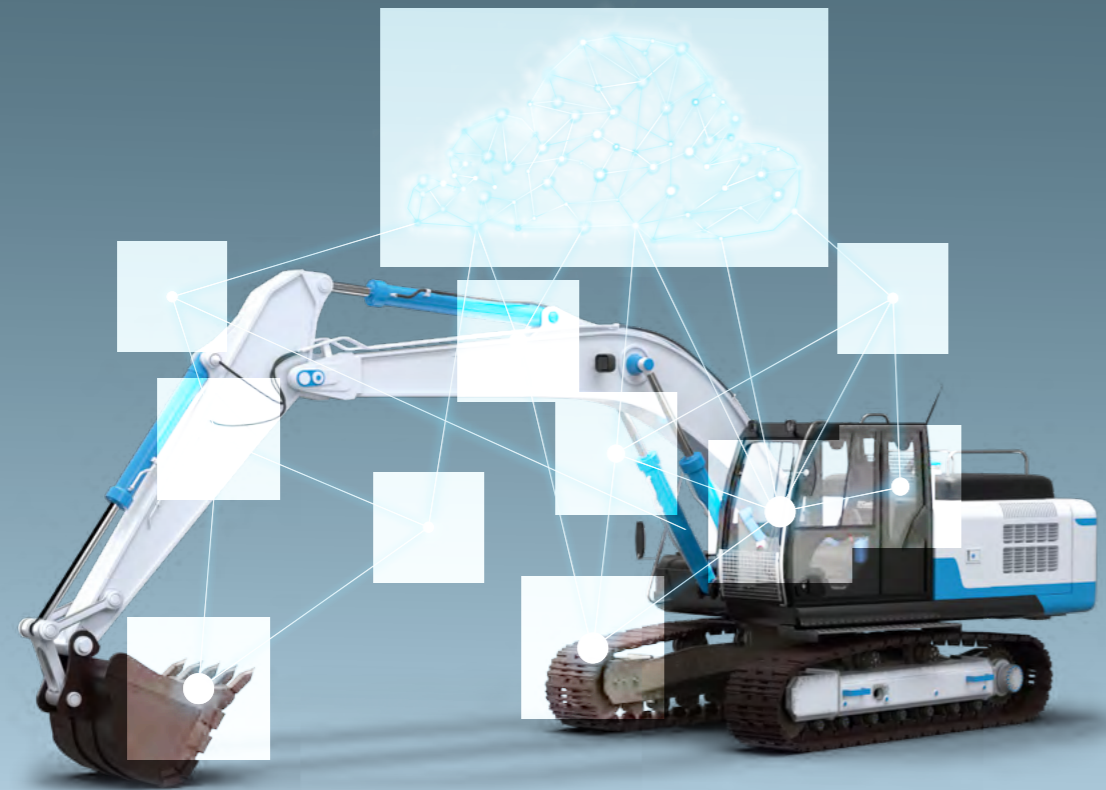
- ⊕ Object and people recognition
- ⊕ Top view applications
- ⊕ Deepening human-machine collaboration
- ⊕ Sensor fusion

Electronic in-vehicle architectures

- ⊕ Knowledge transfer from the automotive to the off-highway domain
- ⊕ Ethernet as the future in-vehicle architecture technology
- ⊕ Higher bandwidths for enormous data flows
- ⊕ Standard Ethernet (100-BASE-TX) or

BroadR-Reach® Ethernet interfaces (100BASE-T1) Connectivity and telematics

- ⊕ Data collection for analysis purposes
- ⊕ Predictive and preventive maintenance
- ⊕ Remote diagnostics
- ⊕ ECU updates over the air




IoT solutions and advanced connectivity platforms

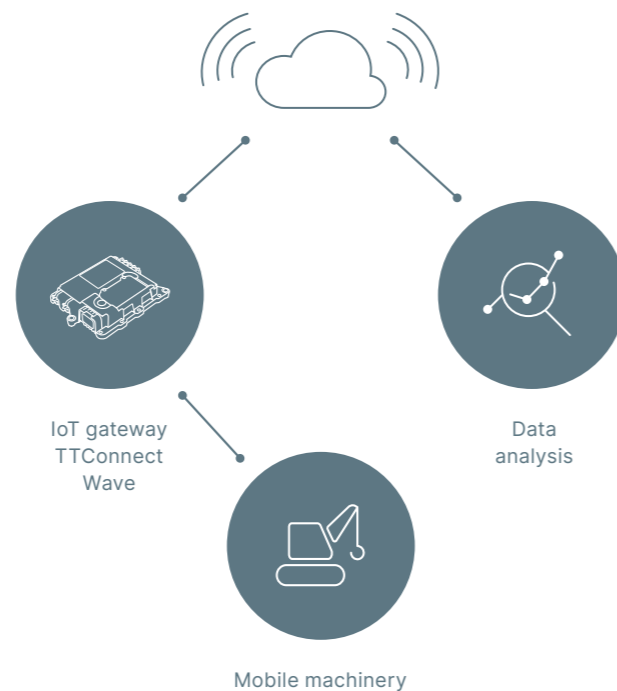
TTControl has developed future-proof connectivity solutions that enable our customers to enter the era of IoT. Our advanced connectivity platforms take care of managing in-vehicle networks, while our TTConnect Cloud Service empowers our customers to make the most of machine data.

TTConnect Cloud Service connects our customers via a web portal to their mobile machinery. Using the TTConnect Cloud Service and the ruggedized IoT gateway TTConnect Wave, off-highway vehicles can be monitored and managed around the world at any time. Remote access to all data available on the vehicle's CAN buses allows for continuous system monitoring, fleet maintenance, theft protection and the optimization of future machine design.

Our connectivity platform **TTConnect 616** is designed for the management of network architectures of vehicles and machines in rugged operating environments. It combines and manages all in-vehicle interfaces such as CAN-FD, FlexRay, LIN and Ethernet. The TTConnect 616 can be used as a configurable switch.



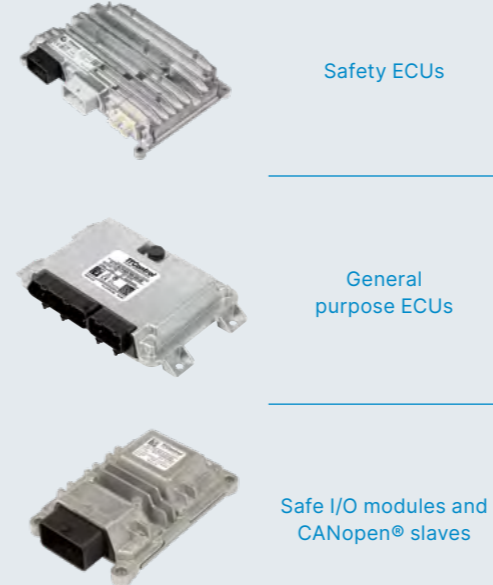
TTConnect 616



Find out more about our connectivity offering:
ttcontrol.com/connectivity

ECUs and I/O modules for demanding work environments

TTControl's off-the-shelf products cover the requirements of a large range of different mobile machinery and were designed to meet their specific needs. Our portfolio includes powerful high-end controllers, as well as cost-efficient small or mid-size ECUs. We offer a range of safety certified controllers as well as high-performance ECUs. Our safety certified I/O modules are protected by a compact, automotive-style housing and our general purpose I/O modules provide a cost-effective solution for different demands. All our devices have been tested under extremely harsh environmental conditions.



Safety ECUs

General purpose ECUs

Safe I/O modules and CANopen slaves

- ⊕ EN ISO 13849 (PL d) and IEC 61508 (SIL2) certifications
- ⊕ ISO 25119 AgPLd certification
- ⊕ ISO 26262 ASIL C
- ⊕ Programming environments C and CODESYS®
- ⊕ C programming extended with SAFERTOS® Integration
- ⊕ CANopen and CANopen Safety compliance
- ⊕ Automotive-style aluminum housing
- ⊕ ISOBUS standard compliant



Learn more about our controller portfolio:
ttcontrol.com/electronic-control-units



Rugged operator interfaces

TTCControl's rugged operator interfaces are especially designed to meet the requirements of the harsh and more and more digitized off-highway environment. Features like four simultaneous video streams, support of hardware accelerated 3D animations, user inputs through multi-touch capable screen and acoustic feedback via integrated loudspeaker ensure a perfect interaction of the operator with the vehicle for safe and efficient machine operation.



- Four display sizes (12.1", 7.0" and 5.0")
- Excellent sunlight readability
- Capable of displaying up to 4 simultaneous video streams
- Up to 4 CAN interfaces
- ISOBUS-compliant CAN interfaces
- Ethernet interface (Standard or BroadR-Reach®)
- Integrated buzzer or loudspeaker
- Sleep mode - wake up within < 0.5 sec
- C/C++ or CODESYS programming

Learn more about our operator interface portfolio:
ttcontrol.com/visualization-hmi

Service, support and trainings

Functional safety, support and service

As a functional safety expert, we are able to support our customers in fulfilling the requirements of the machinery directive 2006/42/EC in two ways. Firstly, TTCControl products fulfill the necessary prerequisites in order to comply with the directive. Secondly, with the TTC Academy we offer comprehensive functional safety trainings for your employees and contribute our know-how to your project.



- Safety training seminar
- Implementation of functional safety in practice
- Customer support from risk analysis to application development

Working together with experts in our TTC Academy seminars

TTC Academy offers training courses ranging from one-day sessions to an entire week, covering functional safety as well as product trainings for our customers.



- Inhouse TTC Academy
- Several standard training weeks around the world
- TÜV proven certified safety engineer
- Customized trainings at customers' site
- Dedicated training materials for highest level of output

Find out more about functional safety and our trainings:
ttcontrol.com/services-support





● TTControl / TTTech Group
● HYDAC International

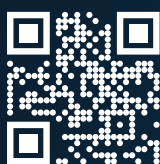
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