ROBOTECH CONTROLLER 701

Advanced Robotics Computer

Introduction

The Conpleks Robotech Controller 701 is an advanced, high-performance, ruggedized computer platform for temperature-hardened outdoor robotics.

The controller is equipped with a wide selection of external interfaces making it possible to connect the controller to all the sensors and controls used in your specific robotics or automation application.

All interfaces are supported by the Robotech Controller software package that includes ROS-based middle-ware and a Linux/Ubuntu operating system.

Conpleks Robotech Controller for advanced robotics applications

The Robotech Controller is placed at the core of any autonomous robot equipped with Conpleks' Robotech technology. The Robotech controller has four main logical interfaces areas:

- Navigation sensors
- Navigation actuators
- Function sensors
- Function actuators

The interfaces towards the navigation parts are more or less generic, whereas the interfaces towards the functional parts are application specific.

Robotech Controller 701 Main Features

The Conpleks Robotech Controller 701 has a set of main functions and features that makes it very versatile for any AGV robotics application.

The main features are:
- On-board 3rd generation Intel Core I7 processor
- Flash-based hard-drive
- Linux/Ubuntu operating system
- Compact design, IP67 compliant, fully sealed mechanics
- Can-bus interfaces for sensor connectivity
- GE and FE Ethernet and USB 3.0/2.0 ports
- GPS prepared
- WiFi and Bluetooth supported
- Serial ports
- Automotive 12 VDC supply (6-30 V range)
- $0 - 40\ ^{o}C$ operational temperature range

Robotech Software and ROS

Conpleks uses ROS-middleware (Robot Operating System) in order to efficiently develop and implement the software needed for various supported automation and robotics applications.

- ROS is an open source robotics platform providing software tools and infrastructure for robotics development.
- ROS enables rapid development of prototypes with high reuse of already available components and provides a short path between state of the art research algorithms and production ready software.
- ROS is supported by a large community of both industrial companies and research institutions which are all contributing to the ROS eco-system.

The middleware is fully integrated with the 701's hardware interfaces giving the basis needed for rapid prototyping and easy interfacing to existing systems.

Developers can easily connect their own sensors and actuators and start to code their application instead of worrying about device drivers and compatibility etc.

Rugged and hardened design

The Conpleks Robotech Controller 701 is built into a rugged, powder painted, die cast aluminum box. The box cover (lid) is fastened by stainless screws and sealed by a neoprene gasket that secures the IP67 ingress protection.
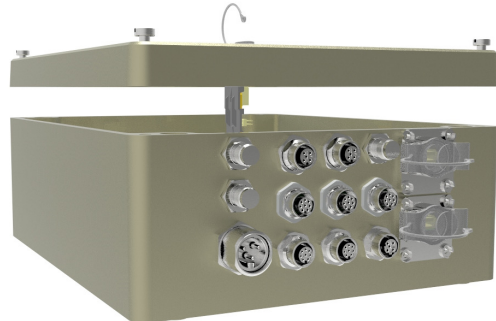
All operational interfaces are located on a single side of controller, making it easy to install and fit the controller into almost any vehicle or other robotics application.

Monitoring and Maintenance

The Conpleks Robotech Controller 701 is equipped with LED's in order to monitor the overall operational status.


Beside the LED's, there is easy access to an auxiliary USB port that enables the connection of a local craft tool, either a laptop or a USB memory stick for e.g. maintenance boot procedures.

External Interfaces

The Conpleks Robotech Controller 701 is equipped with the following industrial grade interface connectors, all IP67 compliant:

- 1 GPS antenna port (TNC)
- 1 WiFi antenna port (TNC)
- 1 Bluetooth antenna port (TNC)
- 2 USB ports (+ 1 USB for maintenance on the lid) can be changed to Firewire if required
- 3 Ethernet ports (2 GE 4 pair, 1 FE 2 pair)
- 3 Serial ports
- 1 CAN bus port
- 1 Aux port (either CAN bus no. 1 or Serial no. 4)
- 12 VDC power (with ignition signal)
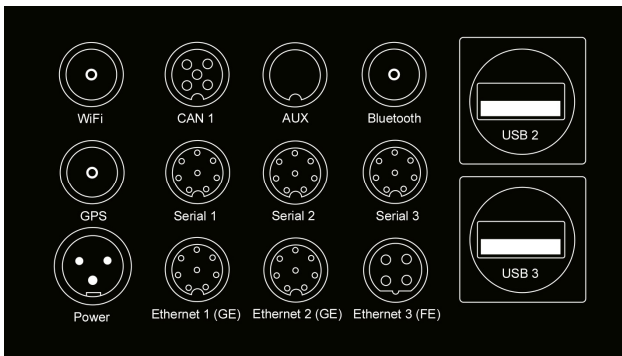
Box specifications and dimensions

The Conpleks Robotech Controller is built into a rugged, powder painted die cast aluminum box. The box lid is fastened by stainless screws and sealed by a neoprene gasket that secures the IP67 ingress protection.
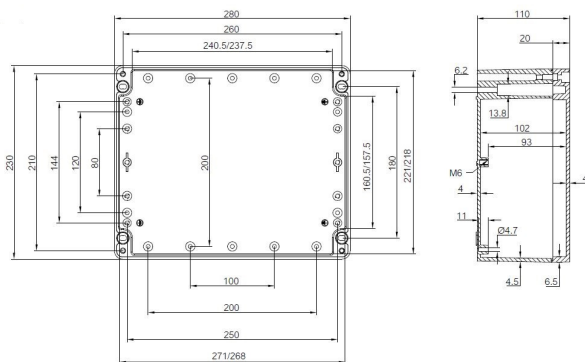
Powerful Main Board

The Conpleks Robotech Controller 701 is equipped with a powerful Kontron KTQM77/mITX embedded Mini ITX board that supports the 3rd Generation Intel® i7-,i5,-i3 2Core and 4Core CPU technology with long-term availability.
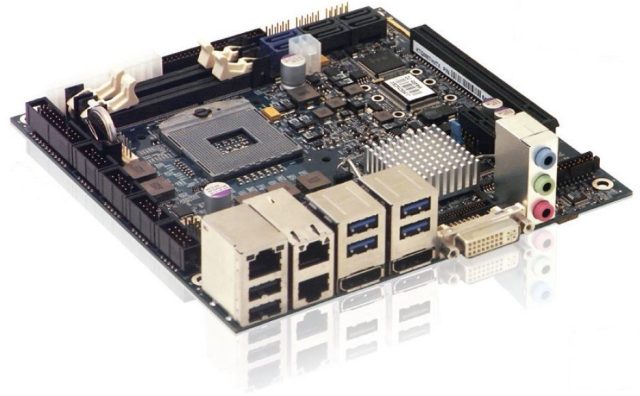
Based on the Mobile 3rd generation Intel® chipset, the motherboard offers an ideal performance-per-watt ratio and the very latest interface technology, e.g. 3rd generation PCI Express x16.

Legacy interfaces are also supported, 6 x SATA (incl. 2 x SATA III) interfaces alongside the 4x USB 3.0 & 10x USB 2.0 interfaces. A unique multi-purpose feature connector supports up to 160 GPIO's.

The motherboard is implemented using more PCB layers than conventional motherboards in order to achieve excellent signal qualities and optimize electromagnetic compatibility, EMC/EMI. The on board mSATA interface allows to use space-saving high-speed compact SSD storage devices.

The motherboard also supports Intel Active Management Technology (Intel AMT 8.0) for remote management and easy maintenance resulting in higher system availability and lower total costs.

Technical specifications

GENERAL

- Advanced, high-performance, ruggedized computer platform
- Well suited for temperature-hardened outdoor robotics.
- ROS-based middle-ware
- Linux/Ubuntu operating system
- Rugged mechanical enclosure, die casted powder-painted aluminum

MAIN BOARD

- Kontron KTQM77
- 3rd generation Intel Core I7 processor, i7-3610QE/QM
- Flash-based hard-drive, SSD 60 GB
- RAM, 4 GB
- WiFi Intel WLAN 6235 Mini PCIE half card 802.11B/G/N BT4.0

RADIO OPTIONS

- WiFi supported according to IEEE 802.11a, IEEE 802.11b/g, IEEE 802.11n, 300 Mbit/s, 2.4 GHz, 5 GHz
- Bluetooth v4.0 supported
- GPS prepared (connector mounted)

INTERFACES

- 1 GPS antenna port (TNC)
- 1 WiFi antenna port (TNC)
- 1 Bluetooth antenna port (TNC)
- 2 USB ports (+ 1 USB for maintenance on the lid)
- 3 Ethernet ports (2 GE 4 pair, 1 FE 2 pair)
- 3 Serial ports
- 1 CAN bus port
- 1 Aux (either CAN 2 or Serial 4)

MECHANICS

- Material: Aluminum
- Color: RAL 7001
- Cover screws: Stainless Steel
- Cover gasket: Neoprene
- Ingress Protection: IP67 (according to EN 60529)

DIMENSIONS

- L x W x H: 280 x 230 x 110 mm
- L x W x H: 11.0 x 9.1 x 4.3 inch
- Weight: 5.3 kg

POWER

- Power consumption: 20-75 W (35W typical)
- 12 VDC automotive power (with ignition signal)
- Wide 6-30V input voltage range
- Intelligent shutdown controller
- On/Off motherboard control
- Battery deep discharge prevention
- <1.5mA standby current

ELECTROMAGNETIC COMPATIBILITY

The Robotech Controller 701 product built to comply with the following:
- 2004/108/EC Electromagnetic Compatibility Directive (EMC)
- EN 55022:2010 (EMC)

ENVIRONMENTAL

Operational environment
- Temperature range +0°C to +40 °C, Humidity range 5% to 100 % RH, condensing (at 40% constant processor load and 35 W power consumption).

Storage (packaged)
- Temperature range -20°C to +55 °C, Humidity range 10% to 95% RH, non-condensing

RoHS compliance
- The product meets the requirements in the European RoHS directive: 2011/65/EU, RoHS6.

End-of-life treatment – WEEE directive
- Requirements meeting the WEEE-directive (2002/96/EC)

All content and specifications are subject to change without notice.