CONPLEKS®

Prepared by	Document No.		
Eva M. Jaffke	CI01-1779889580-197		
Approved by	Document Date	Version	Reference
Tom Simonsen and Michael K. Jensen	6/4/2021	1.0	-

ROBOTECH CONTROLLER 102
Advanced Robotics Computer

Introduction

The Conpleks Robotech Controller 102 is a compact high-performance, ruggedized vehicle computer ideal for rough outdoor robotic applications.

The controller is equipped with the standardized interfaces CAN-bus, RS232, USB and build-in Wi-Fi 802.11 bgn. In addition, it contains a high-performance Inertial Measurement Unit (IMU) and Attitude Heading Reference System (AHRS).

The controller supports the Conpleks Robotech software based on a Linux/Ubuntu operating system, ROS-based middleware and robot application software.

Robotech Controller 102 Main Features

The Conpleks Robotech Controller 102 has a set of main functions and features that makes it very suitable for any outdoor mobile robot application. The main features are:

- On-board quad-ARM processor
- Flash-based hard-drive
- Linux/Ubuntu operating system
- Compact, ruggedized enclosure, fully sealed and IP67 compliant
- A full-featured AHRS system
- High quality connectors

Description

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Conpleks Robotech Controller Software

Conpleks is able to deliver a complete software system for advanced robots and automated guided vehicles.

The software can add robotics functions to several different vehicles, for instance to remote controlled grass mowers, advanced agricultural machines, row crop machinery, high-capacity grass cutters, and other advanced implements and tools.

The possible applications are numerous as the software can provide a significant value-add to many other types of machinery such as instance robots for transportation, dispensing of chemicals etc.

The software is built with a layered architecture that enables smooth and controlled expansions and feature growth.

The software is mainly programmed in C++, and runs on an Ubuntu/Linux operating system. This secures an optimum performance on a variety of hardware platforms such as ARM or Intel Core processors.

Furthermore, the software offers good integration with standard GNSS positioning equipment, e.g. the Novatel range of EGNOS/RTK GNSS systems.
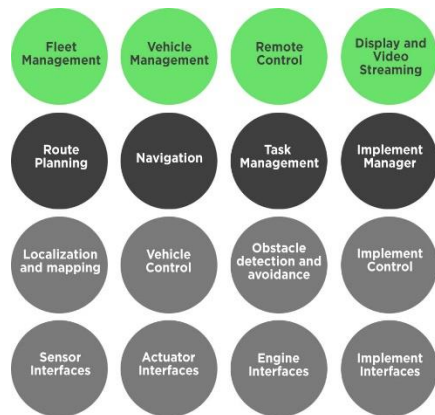
Rugged and Hardened Design

All operational interfaces are located on the same side of the controller, making it easy to install and fit the controller into almost any vehicle or other robotics application.

The controller enclosure is a rugged, powder painted, die cast aluminum box. The box cover lid is fastened by stainless screws and seals the box providing IP67 ingress protection.

In order to achieve an efficient cooling of the CPU, the heat is transferred directly to the enclosure through special designed heat-sink.

This way, the dissipated power inside the CPU is transferred directly to the enclosure, and there is no need for venting holes or fans.

Monitoring and Maintenance

The Conpleks Robotech Controller 102 is equipped with four LEDs in order to monitor the overall operational status.

By using the available USB port, it is possible to connect a local craft tool including laptops or USB memory sticks for instance for boot procedure maintenance.

External Interfaces

The Conpleks Robotech Controller 102 is equipped with a number of IP67 compliant interface connectors, all on the same side of the unit.

The controller has as default the following connectors:

- 1 CAN port (M12)
- 1 Wi-Fi Antenna port (TNC)
- 2 USB 2.0 ports
- 1 Serial port (M12)
- 12 VDC power (M12 with ignition signal)

Installation

The Robotech Controller 102 supports easy mounting in any outdoor mobile robot application. By using four mounting screws, the unit can be securely fastened to the vehicle.

Please secure adequate cooling and use optional vibrations suppressors.

Powerful Main Board

The Conpleks Robotech Controller 102 is equipped with a powerful Congatec Qseven module with ultra-low power Freescale ARM® Cortex™ A9 quad core 1GHz processor with 1MB L2 cache, 1GB onboard DDR3L memory and 4GB onboard eMMC.

The board features an eSATA slot, which allows for the mounting of ultra-compact Flash disks for storage.

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Technical Specifications

GENERAL
- Advanced, high-performance, ruggedized, embedded computer platform
- Well suited for temperature-hardened outdoor robotics.
- Pre-loaded Linux/Ubuntu operating system
- Optional ROS-based middle-ware and application software
- Rugged mechanical enclosure, die casted powder-painted aluminum
- Passive cooling through the enclosure, no venting holes, no internal fans

MAIN BOARD
- Congatec Qseven MCB
- Processor module with ultra-low power Freescale ARM® Cortex™ A9 quad core 1GHz processor with 1MB L2 cache,
- 1GB onboard DDR3L memory and 4GB onboard eMMC
- Flash-based hard-drive, eSATA +30 GB

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: 200 x 170 x 60 mm
- Weight: <1500 g

INTERFACES
- 1 CAN port (M12)
- 1 Wi-Fi ant. port (female RP-TNC)
- 2 USB ports (mini B, M12)
- 1 Serial port (M12)
- 12 VDC (M12)

ARHS System
- Access to ARHS system through internal Serial connection
- 3-axis accelerometers, 3-axis gyros and 3-axis magnetometers
- Build-in advanced filter algorithm

POWER
- Power consumption: 5-15 W
- 12 VDC automotive power (with ignition signal)
- Wide operational input voltage range: 10-30 VDC (6 and 34 VDC shutdown limits)
- Intelligent shutdown controller
- On/off motherboard control
- <1.0mA standby current

ELECTROMAGNETIC COMPATIBILITY
The Robotech Controller 102 is 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 +60 °C
- Extended temperature range available on request
- Humidity range 5% to 100 % RH, condensing

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)