# PowerNECS

## Airborne Network Extended Realtime Control System

- PowerPC 405 Processor Based Embedded Realtime Control System for Ground and Airborne Use
- Potential Applications include Unmanned Aerial Vehicle (UAV) Flight Control Systems and Flight Data Recording/Telemetry Systems
- Standard and Application Specific I/O Modules for Aerospace Applications available
- 4 Isolated (or 8 Non-Isolated) fully Independant Controller Area Network, CANaerospace and ARINC825 Protocol Compliant Interfaces
- 10/100/1000 BaseT Ethernet Interface with UDP/IP protocol and API
- MicroSD Interface for Flight Data Acquisition Storage, System Configuration Information and Firmware Upgrades
- Rugged Aluminum Enclosure with Mounting Flanges and Nickel Finish
- Compatible with EN2282 Aircraft Electric Power Supplies (9-36VDC)
- Excellent Electromagnetic Compatibility Characteristics
- Frontpanel Activity LEDs for CAN and Ethernet
- Graphic CAN/ARINC825/CANaerospace Toolbox Software

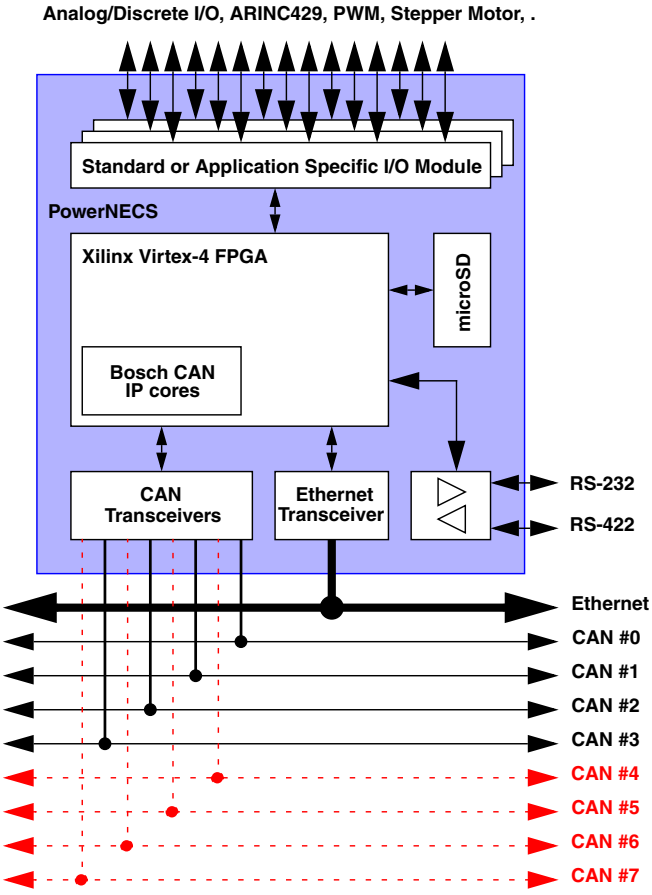
# PowerNECS

## Airborne Network Extended Realtime Control System

## Overview

PowerNECS is an embedded realtime control system for the use in airborne or ground-based aeronautical applications. Up to 200 PowerNECS units may communicate under each other or with other systems through 4 fully independent, optically-isolated or 8 fully independent non-isolated CAN/ARINC825/CANaerospace interfaces. Each module also contains a 10/100/1000 BaseT Ethernet interface for data exchange with remote host platforms.

The PowerNECS hardware uses a Xilinx Virtex-4 FPGA with two independant PowerPC 405 processors running at 200 MHz each. The CAN 2.0B interfaces are implemented with licensed Bosch C_CAN controller IP cores to ensure compatibility with the Bosch CAN standard and to allow precise hardware timing and control over the transmission and reception of CAN/ARINC825/CANaerospace messages. The Xilinx FPGAs and the PowerNECS firmware provide local buffering and 30ns time stamp resolution for all CAN messages and implement ARINC825/CANaerospace specific protocol functions. All CAN channels work under sustained 100% bus load without dropping any messages. An integrated MicroSD interface is used for data acquisition storage, system configuration information and firmware upgrades. Analog, discrete and application specific input/output is realized through internal I/O modules.




## System Architecture

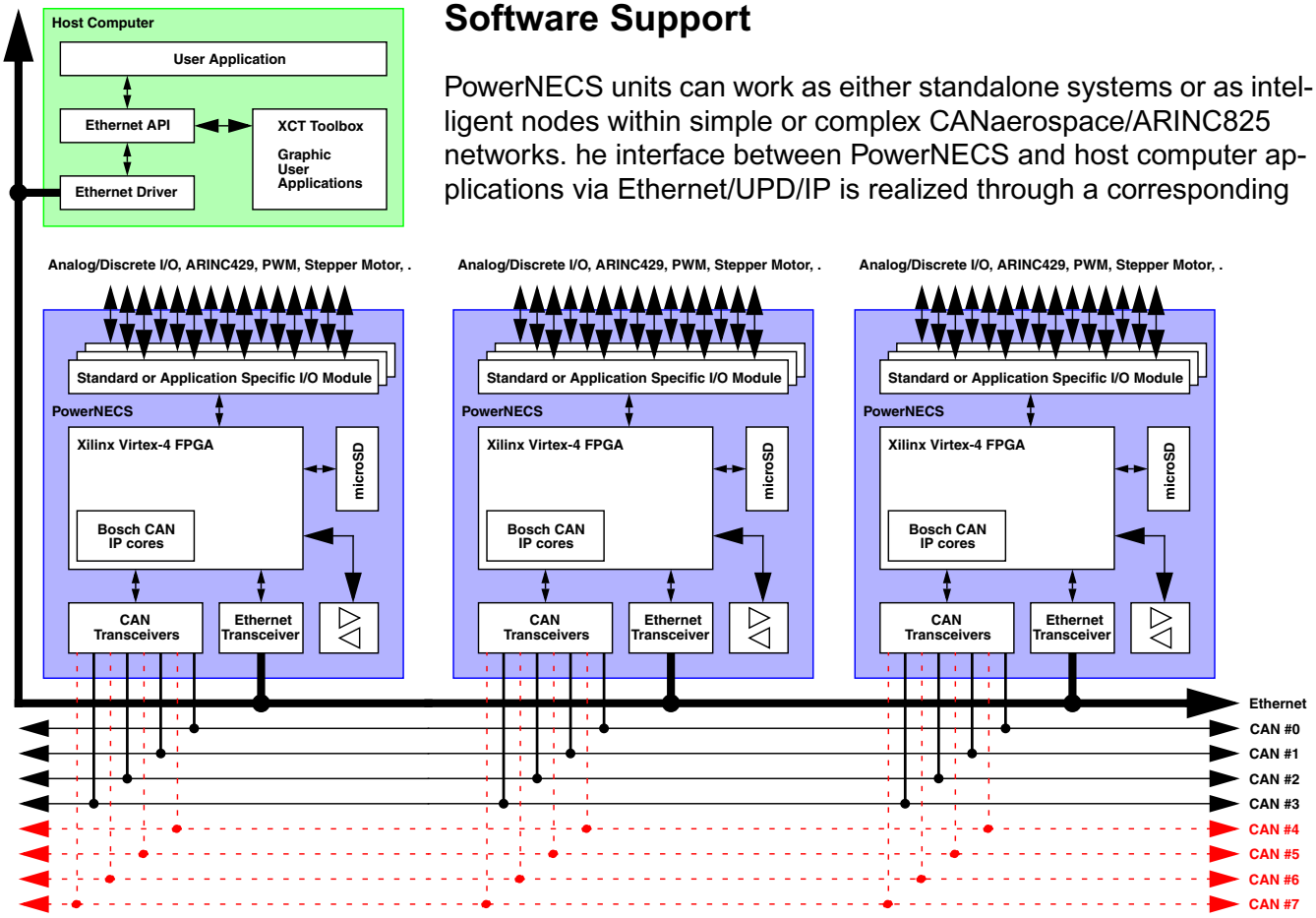
PowerNECS is a powerful standalone computer system integrated into a rugged aluminum box which can be powered from 9-36 VDC allowing it to run from standard 14V or 28V DC aircraft power buses according to the EN2282 specification. The power input lines are protected against transient overvoltage and electromagnetic interference. The total power consumption of a PowerNECS unit is between 10W and 15W depending on the actual I/O configuration.

The CAN and Ethernet interfaces are serviced by different PowerPC processors so that all interfaces may be used at the same time without any loss of data. PowerNECS units may be linked to host computers using CANaerospace/ARINC825 and the 10/100/1000 BaseT Ethernet interface with UDP/IP protocol.

# PowerNECS

## Airborne Network Extended Realtime Control System




## Software Support

PowerNECS units can work as either standalone systems or as intelligent nodes within simple or complex CANaerospace/ARINC825 networks. he interface between PowerNECS and host computer applications via Ethernet/UPD/IP is realized through a corresponding Application Programming Interface (API) for a variety of operating systems. Additionally, PowerNECS is delivered with the eXtended CAN Tool (XCT) software.

## eXtended CAN Toolbox (XCT) Software

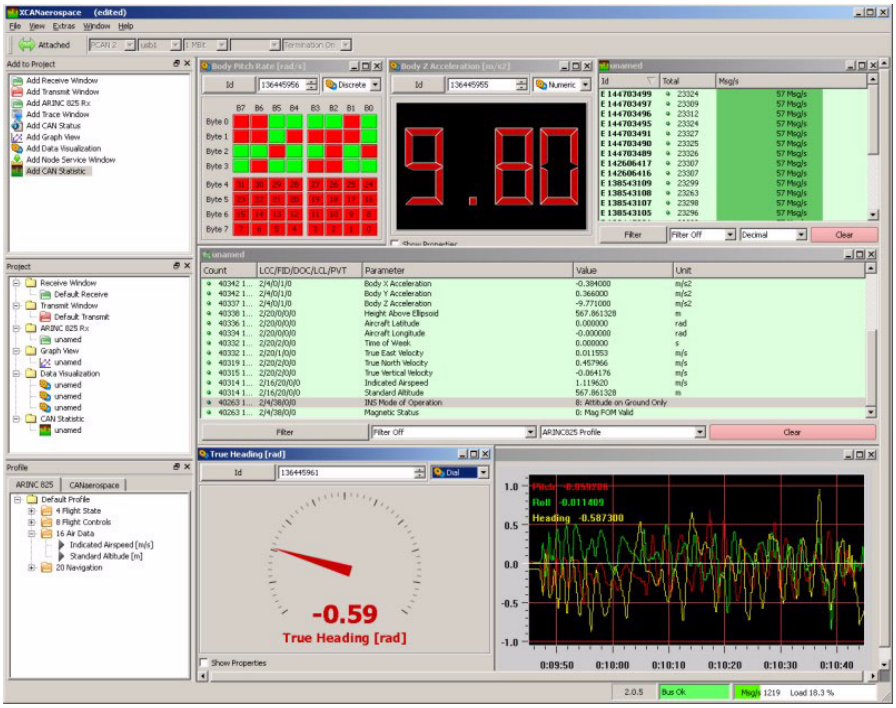
PowerNECS is delivered with the eXtended CAN Tool (XCT) software, a powerful window-oriented CAN/ARINC825/CANaerospace network toolbox for Linux and Windows XP/7. Among other features, XCT contains an ARINC825 Communication Profile reader and editor, realtime data visualization in raw and ARINC825/CANaerospace formats, network traffic/error statistics and an interface for CANaerospace/ARINC825 Periodic Health Status Messages and Node Services. XCT also provides full support for the CANaerospace protocol and the ARINC specifications 812 and 826 which are both based

# PowerNECS

## Airborne Network Extended Realtime Control System

on ARINC825. XCT provides all necessary functions for ARINC825 network compatibility verification, CANaerospace/ ARINC825 end system testing, CAN network analysis and ARINC825 communication profile generation and analysis. XCT allows to trigger on events like CAN identifier and/or message payload content, provides real-time record and playback of CAN data and supports synthetic CAN/ARINC825/CANaerospace signal generation. XCT project configuration files allow to save and reload XCT configurations and exchange them with other XCT users.




## Internal I/O Modules

The standard internal I/O module available for PowerNECS has the following features:

- 16 Electrically Isolated Discrete Inputs (36VDC input range)
- 16 Electrically Isolated Discrete Outputs (500mA@36VDC output) with PWM Functionality
- 16 Electrically Isolated Analog Inputs (16 Bit Resolution, +/10V input range)
- 8 Electrically Isolated Analog Outputs (16 Bit Resolution, 0-5V output range)

A human-readable configuration file on MicroSD card specifies the CANaerospace/ARINC825 messages controlling the I/O module.

Custom I/O modules are available on request. Signals which may be handled by custom I/O modules include bidirectional RS-232/422 lines, ARINC429 data buses, stepper motor interfaces, strain gage/ RTD, thermocouple and linear/rotary variable differential transducer (LVDT/RVDT) inputs.

# PowerNECS

## Airborne Network Extended Realtime Control System

### Ordering Information and Pricing

| Ordering Number | Product | Price |
|---|---|---|
| TP2104-901 | PowerNECS with 4 optically isolated CAN channels, Ethernet API and XCT toolbox | € 8.950,-- |
| TP2108-901 | PowerNECS with 8 optically non-isolated CAN channels, Ethernet API and XCT toolbox | € 8.950,-- |
| TP2109-901 | Standard Internal I/O module for TP2104-901 or TP2108-901 | On Request |
| TP2109-9xx | Custom Internal I/O module for TP2104-901 or TP2108-901 | On Request |
| TP2109-8xx | Custom firmware for TP2104-901 or TP2108-901 | On Request |

**Stock Flight Systems**
Schützenweg 8a
82335 Berg/Farchach
Germany
phone: +49-8151-9607-0
fax: +49-8151-9607-30
e-mail: info@stockflightsystems.com
website: www.stockflightsystems.com