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iNET AP480-G4

ABB Procontrol P13 bus interface

Overview

The iNET AP480-G4 Ethernet to Procontrol P interface brings the proprietary P13 local bus to an open communication standard.

Incorporated in the fourth generation (G4) interface is a new communication engine with Gigabit Ethernet and extremely fast data processing for specialised applications. The integrated bus protocol controller ensures unprecedented performance levels and error free operation independent of the main processor.

Dual processing units ensure real-time constraints are met while supporting a standard Linux kernel and TCP/IP communication protocols. An Ethernet architecture ensures support for existing network infrastructure and operating systems.

Key Benefits

Proven Leading–edge performance

An evolution of the iNET AP480-G3 Ethernet interface provides the same level of performance. Precise time information is provided by a network based time master with all events being time-stamped at source. This offers a precision of better than 1 millisecond.

The new processing unit features a dual core ARM processor and a standard Linux operating system which provides a robust and flexible data exchange with the networked data servers. Real-time constraints are met by the second processing unit which communicates with the Procontrol bus and all the I/O modules available on the local bus.

Timing issues are resolved by utilising time-stamping at source coupled with buffering for a limited period in the G4 interface even while the client computer has been disconnected.

Scalable solutions

The iNET AP480-G4 has additional capacity to include advanced processing functions.

Time stamping is realised in the iNET AP480-G4 with a NTP time base. This ensures a precise sequence of events which are not affected by transmission and software delays in upper level drivers and systems. Due to the finite precision of the P13 bus absolute precision is limited to 5ms or the relevant bus cycle time.

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Fault tolerant systems

Fault tolerant systems may be built up using dual hosts which utilise the Procontrol bus for monitoring. This ensures a continuous ability to control and maintain set-point information to the bus participants even if one of the server communication links is not available or a card is removed.

Diagnostics

Several bus diagnostics are available. Each P13 bus protocol communication validates the following:

- Bus clock activity
- Address and Data frame presence
- Inverted and normal comparison
- Address parity check

The Bus diagnostics provide additional information related to the Procontrol bus. I/O disturbances, Bus cycle monitor and operations log.

Internal errors such as time synchronisation failure are monitored and actively reported to the server.

Statistics are kept for monitoring purposes and include protocol error counters which are permanently active.

Software

Standard communication between the iNET AP480-G4 and any networked server uses TCP/IP. This provides a hardware architecture longevity without the obsolescence factor.

In addition to direct TCP/IP API communication, OPC DA and UA Servers are available or the flexible Modbus TCP. Custom protocols can be implemented and are easy to integrate due to the Linux and ARM architecture.

Specialised functions are available as options and include:

Diagnostic Station.

High speed data analyser (5ms to 40ms cycle time).

Engineering station support.

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Technical Specifications	
Hardware	• Triple Ethernet LAN with 10/100/1000 Mbit/s auto detect • Dual core 32 Bit ARM processor • 1GB RAM • 32 GB FLASH • 1 Real-Time processor for Procontrol P13 bus
Software	• DHCP or fixed IP address allocation • Messaging protocol over TCP/IP • Modbus-TCP • Windows OPC Server on Windows XP or newer platform • Native OPC UA on interface
External connections	• Triple TP RJ45 connectors for LAN and diagnostic / time LAN • Procontrol P13 bus connector via backplane. • Mini USB port for console
Performance	• Internal throughput; more than 200 000 binary signals per second Throughput over Ethernet, 60000 analogue or binary events per second peak, 20000 events per second sustained. • Processing time per incoming data word < 1 microsecond. • Relative time synchronisation variation between other iNET AP480-G4 interfaces < 1 millisecond. This is dependent on Ethernet network and time source. • Optional support for IEEE 1588 Precision Time Protocol (PTP)
Environmental	• Power supply range 12-30V DC. • Power consumption typical < 2W Max 5W. • Ambient operating temperature 0-60 C. • Integral P13 rack mounting. • Dimensions 150mm x 205mm x 16mm. • Weight 270g
Conformance	• IEC 61000-4-3 • IEC 61000-4-4 • IEC 61000-4-5 • IEC 61000-4-6 • IEC 61000-4-9