ipDIO

The polyglot digital I/O Module

***ipDIO* - the compact, high-performance I/O module with direct integration of remote protocols.**
Many different protocols can be used simultaneously to control and manage engineering systems. Multiple connections and redundant communication paths are self-evident. The pure value of a data point can be transferred or processed along with the attributes quality and time stamp (protocol dependent).

ipDIO records and reflects switching states, serves as a visualization-, monitoring-, logging- and alarm reporting system and assumes control and regulation tasks.

SUPPORTED PROTOCOLS

IEC 60870-5-101 Master / Slave

- Balanced / unbalanced
- Redundant communication paths
- IEC 101 slave KEMA certified
- Value, time stamp, quality

IEC 60870-5-104 Client / Server

- Multiple parallel connections (control centers) possible
- Redundant communication paths
- IEC 104 server KEMA certified
- Value, time stamp, quality

IEC 61850 Server

- Multiple parallel connections (control centres) possible
- SCL (CID) file export
- Flexible, free configurable data model
- Value, time stamp, quality

Modbus RTU Master / Slave

- Multiple parallel connections over up to four RS-232 interfaces

Modbus TCP Client / Server

- Multiple parallel connections (control centres) possible

OPC DA XML Server

- Direct access from WinCC, InTouch, WEBfactory and others
- Small configuration effort
- WEB based communication

DNP 3.0 Serial Master / Slave
DNP 3.0 TCP/IP Client / Server

- Multiple parallel connections (control centres) possible
- Redundant communication paths
- Value, time stamp, quality

SNMP Client

Reading of network elements variables such as routers, switches, servers, printers, etc.

Ping Modul

Monitoring the network elements to ensure and log the operational readiness.

THE FUNCTIONS

- **Configuration**

  Configuration is easily carried out via the Ethernet interface using an integrated web server.
  A number of templates is available for even easier configuration.
  The most important communication standards are supported to ensure a simple integration into existing telecontrol system.

- **Templates / Functions**

  MirrorDevice
  The digital outputs are controlled by the digital inputs of a second *ipDIO*. In this way, switching signals between two locations are transferred.

  PingModule
  PING - monitoring of network components with visualization and alerting

  SNMPClient
  SNMP - monitoring of network components with visualization and alerting

  EventRecorder
  All information of interest can be recorded over a period of several weeks, depending on the amount of data.

- **Quality recognition**

  Information objects include quality descriptors based on the current connection state. All information objects dispatched after a connection failure are transmitted as “invalid” or “not topical”.

- **User Functions**

  User-defined processing functions enable the linking of input values in any desired way to produce an output value.

- **Time stamp transmission**

  Each normalized information is transmitted with a time stamp. The time stamp is part of the process information, if supported by the protocol and it specifies the actual time of information change, as detected by the respective remote terminal.

- **Time synchronization**

  The internal real-time clock can be synchronized via the NTP or communication protocol, e.g. IEC104.

- **Alarming**

  Alarm triggering is possible via email, remote protocol, optical (LED) or a digital output.

- **Multiple simultaneous connections**

  Data can be fed to the control station individually or simultaneously to all.

- **Transmission of normalized single and double indications**

  Normalized single and double indications or commands can be received or transmitted over the digital inputs and outputs of the controller.

- **Logical AND/OR links**

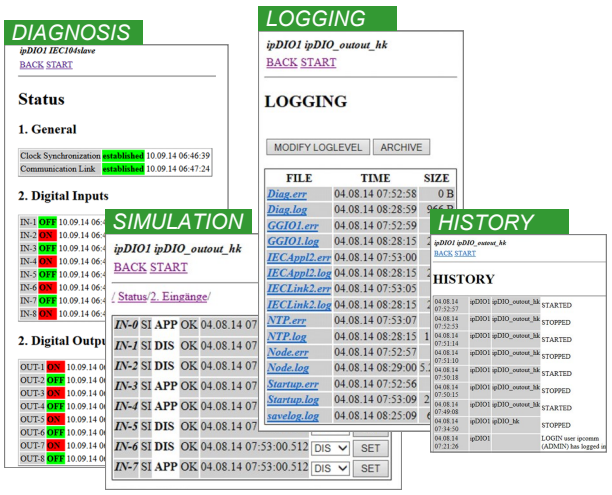
  It is possible to realize a logical AND/OR conjunction between several single indications.

- **Redundancy**

  To meet increased requirements, *ipDIO* is with a second device fully redundant. Redundant devices are interlinked either via serial interface or Ethernet.

- **Analysis**

  The features diagnosis, logging, simulation and history are relevant for a clear and easy analysis.



THE HARDWARE

As hardware platform the industrial controller SEC I/O is used.
The SEC I/O is easy to maintain and offers a high degree of user-friendliness, reliability and an optimal price-performance ratio. The hardware provides many different interfaces; its cooling is completely passive and there are no rotating parts.
The SEC I/O is mountable on a DIN rail.

Variant 1	8 digital inputs 8 digital outputs
Variant 2	4 digital inputs 4 digital outputs 4 analog inputs (voltage measurement)
Variant 3	4 digital inputs 4 digital outputs 4 analog inputs (current measurement)

ipDIO is optionally delivered with one or two supported protocols. Other communication protocols are available on request.

TECHNICAL DATA

Digital inputs	4 or 8 channels* Logical high: 5 ~ 24 V DC Logical low: 0 ~ 1.5 V DC Input resistor: 1.2k Ω @0.5W Opto-Isolation: 2500 V RMS Sample rate: 25ms / 40 Hz
Digital outputs	4 or 8 channels* Source voltage (VDD): 5~50 V DC Output current: 500 mA max. Isolation: 2500 V RMS Switch rate: 25ms / 40 Hz
Analog inputs	0 or 4 channels*, multiplexed/differential Sample rate: 100ms / 10 Hz Resolution: 16-bit Isolation protection: 1500 V RMS
Voltage measure-ment*	Input range (selected by software): 0~150mV, 0~500mV, +/- 150mV, +/- 500mV 0~1V, 0~5V, 0~10V, +/-1V, +/-5V, +/-10V Voltage input mode : differential, 100db CMR Voltage input impedance : 20 M Ω
Current measure-ment*	Input range: 0~20mA Current input impedance: 120 Ω
Interfaces	
Serial	2 x RJ45 for RS-232 2 x RJ45 as RS-232 or RS-485 (terminal block)
Ethernet	2 x 10/100 Base-T
Diagnostic LEDs	Power, CPU state, LAN, RS-232 8 x DI / 8 x DO (variant 1)

* depending on the variant

Detailed technical data to the SEC I/O can be found on www.ipcomm.de

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