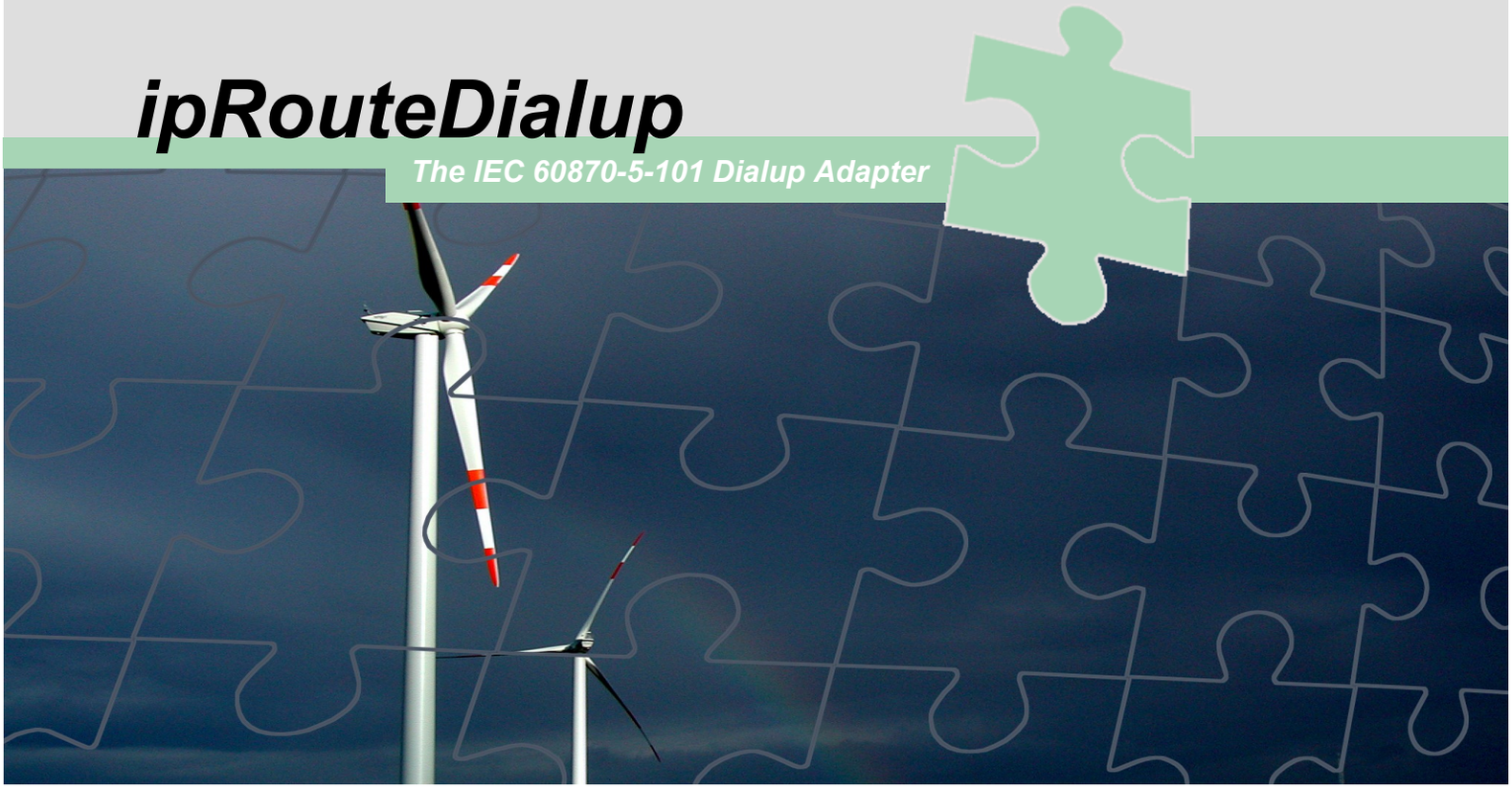
ipRouteDialup

The IEC 60870-5-101 Dialup Adapter



IPCOMM GmbH

THE MOTIVATION

In many cases, remote terminal units (slaves) cannot connect directly to the master station via networks or dedicated lines for data transmission. As a result, data has to be transmitted via dialup lines in the existing infrastructure.

For communication to be effective, master and slave(s) must all be capable of establishing the connection as and when needed. Some RTUs, however, do not support the connection via dialup modem.

THE SOLUTION

Our dialup adapter ipRouteDialup can set up a dialup connection to a master station. ipRouteDialup can be connected to any IEC 60870-5-101 device (slave) that does not have its own dialup functionality.

THE SOFTWARE

- **General**

  ipRouteDialup supports "Hayes compatible" analog modems, ISDN and GSM modems. Data transmission is based on the IEC 60870-5-101 protocol, either in balanced or unbalanced mode. The transmission mode (balanced or unbalanced) may be chosen for each direction - uplink (slave - master) and downlink (master - slave) - independently.

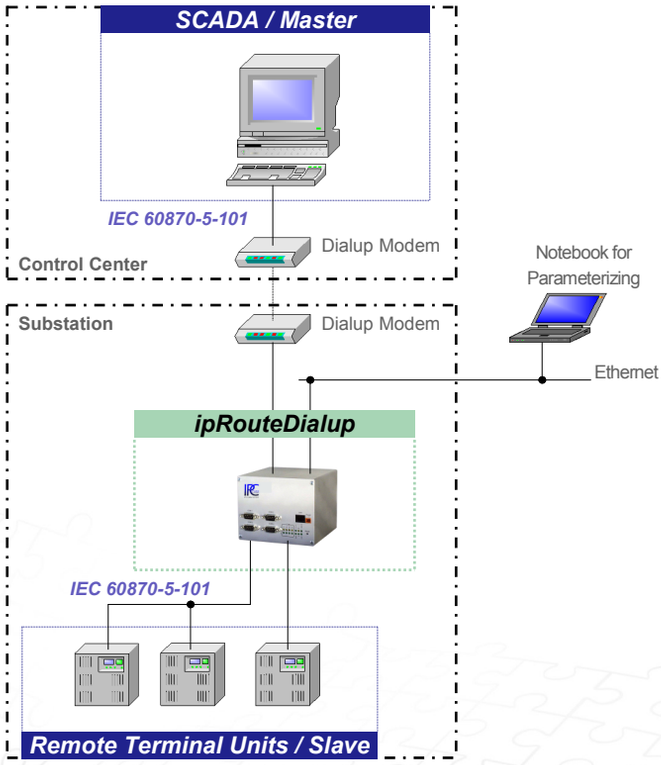
  As one serial interface is reserved for the uplink modem connection, there are three interfaces for connecting the slaves. These may be operated either in point-to-point or party line communication (unbalanced mode).

- **Scope of Functions**

  Data is temporarily buffered in the dialup adapter until the connection to the master or control station is established. Connection setup is only initialized after one of the following conditions has been met:

  - The dialup adapter has received an ASDU (Application Service Data Unit) - for instance a spontaneous indication - the type of which qualifies for setting up a connection, as defined in the configuration. In addition to the ASDU type, a specific cause of transmission may be configured, which then initiates the dialup.
  - The telegram buffer (as allocated in the size parameter) has been filled to a defined limit.
  - In defined cyclic intervals (configurable).

  If ipRouteDialup cannot "dispose" of the data in uplink direction (towards the master) and the telegram buffer limit has been reached, data transmission in control direction (towards the slave) is suspended to avoid buffer overflow.



Measured values are entered in a separate impulse buffer and do not result in the dialup of the master. Using initiation mode for data transmission reduces the amount of transmitted data, as only the most recent status change of a measured value is transmitted.

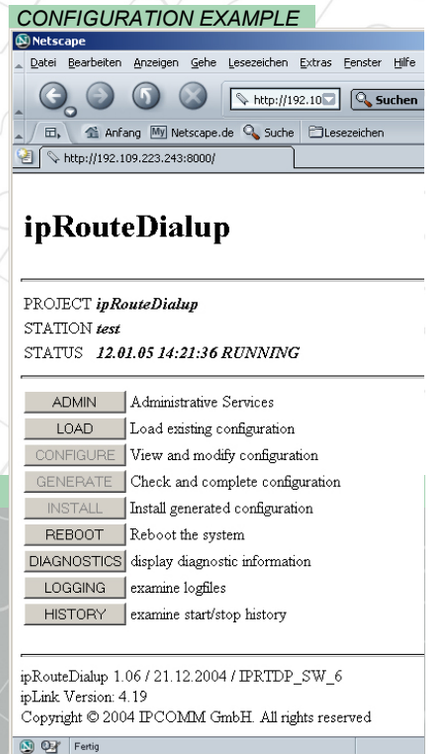
TTL (time to live) monitoring ensures that commands in control direction do not remain in the buffer any longer than needed. This feature is particularly useful when the connection to the slave breaks down.

If needed, ipRouteDialup can automatically send a general interrogation to the slave station after connection setup.

- **Configuration**

  The system can be configured via web interface and browser (e.g. MS Internet Explorer or Mozilla Firefox). No further tools are needed for configuration. Configuration of all parameters is easy and quick using the online help, this also applies to the various modem types. The system automatically recognizes and initializes a connected modem.

CONFIGURATION EXAMPLE



- **Diagnosis**

  Comprehensive diagnostic information can be accessed via web browser.

  The diagnostic display shows the communication status at a glance for all configurable connections. In addition, communication traffic on all lines can be logged and called up in easily readable plain text representation. This significantly facilitates the debugging process.

THE HARDWARE

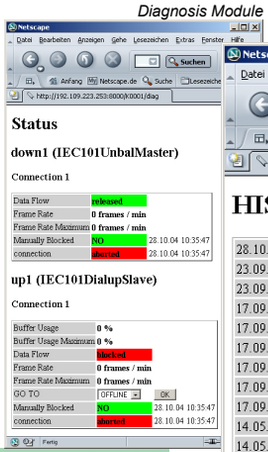
Our DIN-Rail Embedded PC (ipHEC) is used as the hardware platform. In addition to a 10BaseT Ethernet interface the HEC also has four V.24 interfaces. Send and receive LED signals on the front panel enable communication monitoring, and also show the software status.

Neither the hardware nor the CompactFlash used as a storage device contain any rotating parts. Hardware cooling for the HEC is completely passive. The hardware components are in a chromated or passivated aluminum housing known in particular for its excellent electromagnetic compatibility.

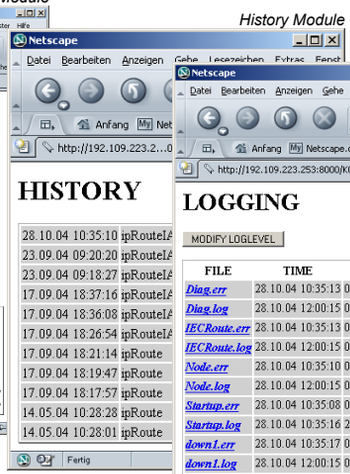
Depending on the type, HEC operates with voltages ranging from +5 V DC to +72 V DC.

HEC

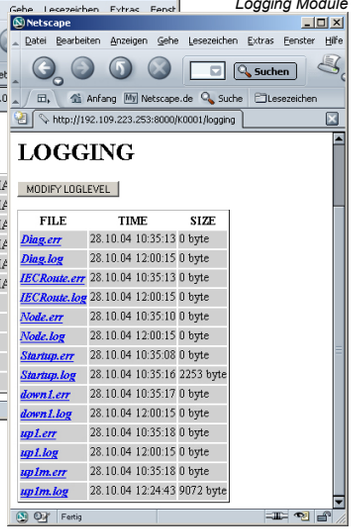
Diagnosis Module



History Module



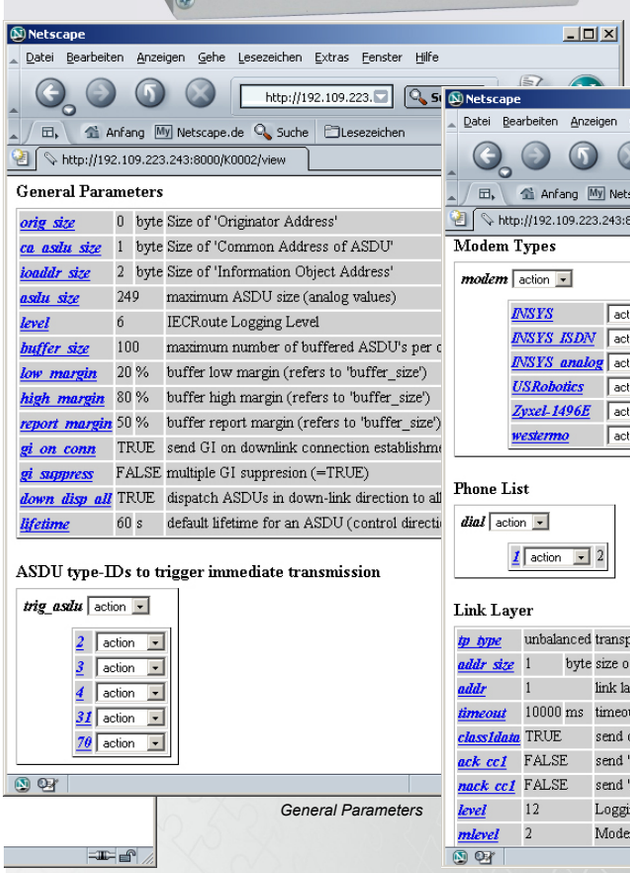
Logging Module



DIAGNOSIS

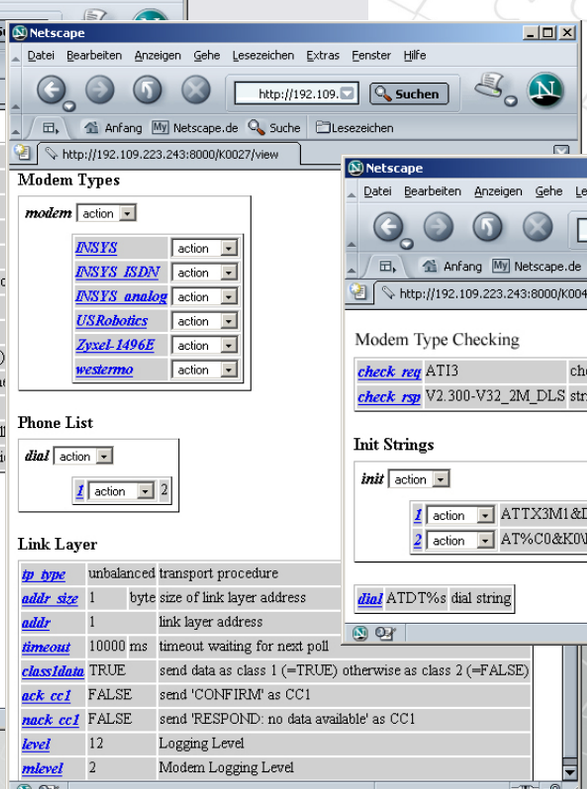
TECHNICAL DATA

RS-232 Interfaces	4 x IEC 60870-5-101
Ethernet Adapter	1 x 10BaseT
Send / Receive Indicator	RS232 Ethernet
Power Supply	5 – 72 V DC, depending on the type
Mounting	35 mm DIN-rail
Environmental / Storage Temperature	0° C to 55° C / -10° C to 70° C 32° F to 131° F / 14° F to 158° F
Relative Humidity	5 % to 90 % non condensing
Standards	CE
Dimensions W/H/D	125/105/133 mm
Scope of Delivery	ipRouteDialup Documentation: German or English

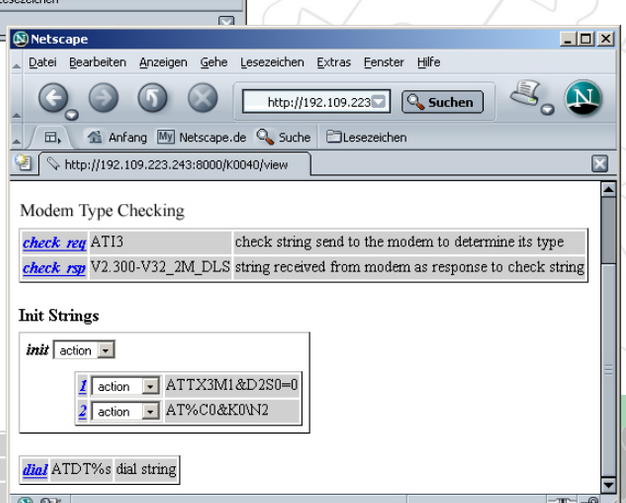


General Parameters

Main Window



List of Modem Types



Modem Type Check

THE COMMISSIONING

Commissioning can easily be done by the customer's personnel, if they are familiar with the IEC 60870-5-101 protocol.
We recommend a one-day training session that has been proven most useful and may include an example configuration or integration test. This guarantees a fast start, as it will then take your personnel only a few hours to complete the commissioning.

THE REQUIREMENTS

These requirements ensure successful integration of the dialup adapter:

- The common address of ASDU (CA = Common Address of ASDU) and the information object address (IOA) must be of the same length.
- The originator address sizes must be of the same length.
- The ASDU types used in the master and slave station must be compatible. This can be ensured by matching their inter-operability lists.

We gladly offer our support to assist you in checking these requirements.

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