

ipEther232 Product Family

ipEther232	ipEther232.PPP
ipEther232.Modem	ipEther232.IO
ipNTP	ipEther232.Protokolldrucker

User Guide



ipcas products

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Chapter 1: Introduction

1.0 Legal Information

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All rights reserved. No part of this document may be copied out, copied, reproduced, or transferred in other form without the previous express written approval of the Data Respons GmbH. Misprint, mistakes and changes are left.

In so far as legally as possible, we cannot accept any liability for consequential damage caused by using this guide. In other respects we shall accept liability for intention and gross negligence only.

We have done our utmost to ensure that the information in this user guide is complete, accurate and up to date. We don't give any warranty for the correctness of the made details or for the applicability of the described Product for any special purpose. We cannot provide any warranty that changes to third-party equipment, which is referred to in this guide, will have no effect on the applicability of the information provided here.

The author reserves all rights, including the right to reproduce this guide in full or part in any form.

The content is subject to change without prior notification.

The product is subject to technical change without prior notification.

1.1 Registered Trademarks

All used Trademarks in this Document are stated for identification purposes and may be the property of the various holders.

1.2 Important Information

Please, pay attention to electrostatic unloadings. Use a suitable work station for the work with CMOS components. Before you consult the customer service of your supplier, you should notice the notes in this manual. Even during the warranty period, costs may arise by utilising the customer service if the concerned fault or problem can be corrected from the customer himself on the basis of this guide describing the solution or remedy. To clean the device just use dry cloth. Don't use liquid or aerosol cleaner.

Removing the serial number will void the warranty rights.

Damage caused by inappropriate packing will not be borne by the forwarding agent / insurance company.

1.3 Safety References

As is the case with all electrical equipment, there are some basic safety precautions that you should apply. These safety precautions are primarily for your safety but also to prevent damage to the device.

Settings not described in this guide and changes to the device electronics are to be carried out by an authorized vendor only.

Read the user guide carefully and keep it to hand.

Make sure that the device is placed on a stable and flat surface. Make also sure that for rail-mounted devices the top hat rail is sufficiently grounded and the rail spring has good contact.

Use the device at a tempered, dust- and vibration free place.

Excessive heat will damage the device. Therefore it should not suspend to high temperatures (No mounting near heat sources. No direct sunlight.).

Device shouldn't be used at exceptional humidity.

Make sure no liquids or particles can get into the device.

Don't place the device near to magnetic fields because this can be responsible for data loss.

(Never make any changes to the device that is not described in the user guide.) It's forbidden to run the device with another supply voltage which isn't described for the device. This could damage the device and you will have to pay for the repairs. Only the authorized vendor may change the input voltage if this should become necessary.

The power supply must be free from overloads and other malfunction. The interfaces must be free from overloads, different potential and other malfunction. Otherwise the device could become damaged.

Don't carry out any modifications in the device which are not described in this user guide. That could damage the device and the owner will be liable to pay the costs.

Make sure that the following conditions are fulfilled:

Use a suitable power supply unit. In case of any doubt, consult your supplier. The device should be used exclusively with the mains unit supplied. Using a different power supply unit may lead to the device being damaged.

If the device is damaged, disconnect it from the mains. Arrange for immediate repair.

Make sure that the mains socket is located near to the device and is easily accessible.

You have to pull the mains plug completely to disconnect.

In case of using an extension cable or multiple contact plug, the maximum power rating must not be exceeded. The mains cable must be protected against damage by yourself. Do not place anything on the cable and place it on a safe ground so that there is no danger of stepping on or tripping over it.

A damaged mains cable must be replaced immediately.

Make sure that the mains cable is disconnected before starting to clean the device. Use a dry cloth only. Do not use any liquid or aerosol cleaning agent.

1.4 Non-warranty

The Data Respons GmbH is not liable for the use of Software or Products which are mentioned in this document.

Also this company is not liable if use of these products hurt any existing or future licence or patent laws from third party. Data Respons GmbH reserves the right to execute modifications of the contents without previous announcements.

1.5 Limited warranty

The Data Respons GmbH guarantees the final consumer (purchaser) in the case of appropriate use that the device will be for a period of 24 months without any material damage and free of caused labour costs. In case of production errors or damaged material, the Data Respons GmbH will do anything to restore the normal operating status (i.e. repair or exchange parts or the whole product), within the warranty period and if the receipt is available. In free discretion of the Data Respons GmbH, the exchange may contain new or as good as new devices or parts which have the same functionality like the original device.

This warranty will expire instantly if the device is modified, used incorrect or sportive/careless damaged. This also takes effect if the product is affected through force majeure or by using the device out the proper working conditions.

Only the purchaser has claim for repair or exchange. Other pretensions do not exist. These warranty conditions substitute all other warranties or warranty services, no matter if assertive, explicit or implicit. They don't mean that the product came out for certain or economic intention or any other intention.

Not at all and in no way the Data Respons GmbH is liable for indirect or any damage or consequential damage which the customer eventually suffers.

The Data Respons GmbH doesn't give any warranty that the software / hardware match your requirements or work accurately and faultless. With the installation of the software / hardware you take not only the full responsibility for the use of the software / hardware but also for the expected results, the installation, the application and the achieved results which were made by the use of the software.

For claiming your warranty service, please approach your Vendor, who will send back the device to the Data Respons GmbH. If there's no receipt together with the device or if the whole thing isn't under the warranty period anymore, Data Respons GmbH will repair or change the damaged parts (own choice) and charge the parts and the working time. Repaired or replacement devices will be sent back to the added address.



CAUTION:

Product warranty will be void if the serial number is removed.

Through unsuitable packing caused damage wouldn't be overtaken by the carrier / insurer.

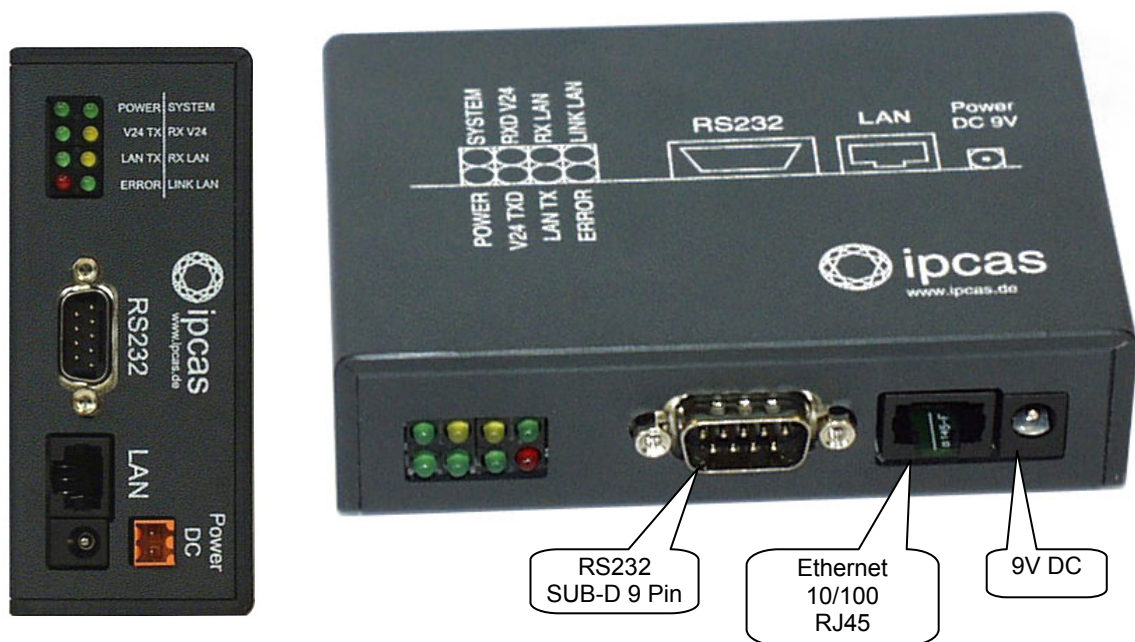
Chapter 2: The Device

2.1 Sockets ipEther232..., ipNTP

ipEther232 has three sockets:

- Ethernet (10BaseT) for a 10/100 Mbit network
- SUB-D 9 connector
- 9V DC mains supply **or**
- 24V DC or 48/60V DC protected against polarity reversal

A diagram of all connectors and their designation is displayed on the housing.



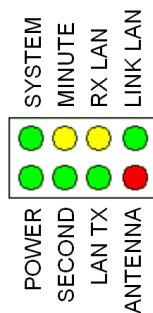
The LEDs indicate the device state and have the following meaning:

SYSTEM	• POWER	The device is switched on.
RXD V24	• System	Slow flashing indicates that at the moment there is no connection to a PC. Fast flashing indicates that the device is in use.
RX LAN	• LINK LAN	There is a physical connection to the network.
LINK LAN	• LAN RX	Packets are received by the Ethernet.
POWER	• LAN TX	Packets are sent to the Ethernet.
V24 TXD	• V24 RX	Data is received via the RS232 line.
LAN TX	• V24 TX	Data is sent via the RS232 line.
ERROR	• Error	An error has occurred in the RS232 line.

At Ethernet protocols like IPX, RIP and IGRP (MTU higher than 1500) the red LED lights up because it can't be recognized by the Ethernet protocol.

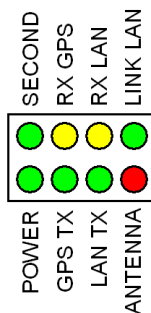
After the virtual Com-Port is closed the red LED will light up for 0.5 seconds to make it optically visible.

Exception ipNTP: here the LEDs have the following meaning up to version 10.9:



- **POWER** The device is switched on.
- **System** Slow flashing indicates that at the moment there is no synchronisation. Fast flashing indicates that the device is in use.
- **LINK LAN** There is a physical connection to the network.
- **LAN RX** Packets are received by the Ethernet.
- **LAN TX** Packets are sent to the Ethernet.
- **SECOND** Second impulse is received by the DCF-77.
- **MINUTE** Minute impulse is received by the DCF-77.
- **ANTENNA** DCF-77 signal is lost.

For the ipNTP version 10.10 or newer with DCF and GPS realization, the LEDs have the following meaning:



- **POWER** The device is switched on.
- **SECOND⁽¹⁾** Second impulses received by the DCF-77.
- **GPS RX⁽²⁾** Packets are received by the GPS.
- **GPS TX⁽²⁾** Packets are sent to the GPS.
- **LAN RX** Packets are received by the Ethernet.
- **LAN TX** Packets are sent to the Ethernet.
- **LINK LAN** There is a physical connection to the network.
- **ANTENNA** If the LED lights permanently it means that no DCF77 or GPS-Signal is received. If the LED is flashing it means no optimal transmission is established and therefore it can't be synchronized.

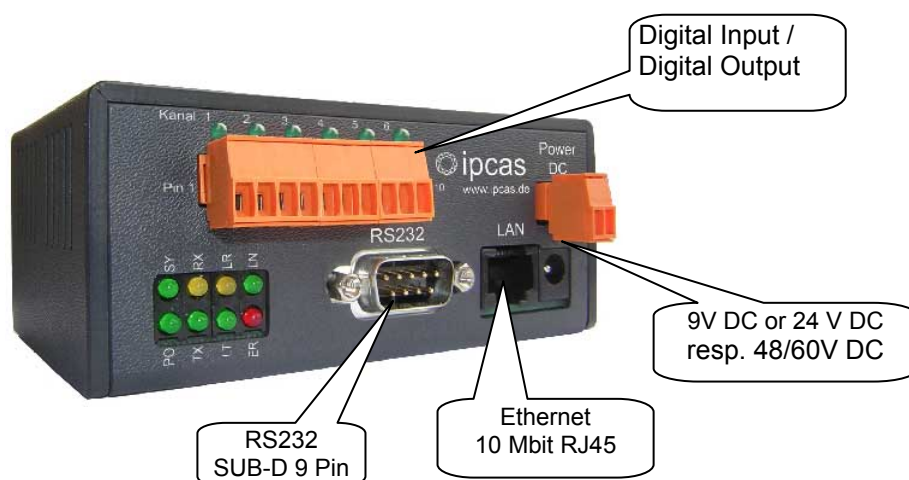
⁽¹⁾ Only for ipNTP with DCF-77-Antenna

⁽²⁾ Only for ipNTP with GPS-Antenna

2.2 Sockets ipEther232.IO

ipEther232 has four sockets:

- Ethernet (10BaseT) for a 10/100 Mbit network
- SUB-D 9 connector
- Four digital inputs and two digital outputs **or** six digital inputs
- 9V DC mains supply **or**
- 24V DC or 48/60V DC protected against polarity reversal



The LEDs indicate the device state and have the following meaning:

SYSTEM	POWER	• POWER	The device is switched on.
RXD V24	V24 TXD	• System	Slow flashing indicates that there is no connection to a PC at the moment. Fast flashing indicates that the device is in use.
RX LAN	LAN TX	• LINK LAN	There is a physical connection to the network.
LINK LAN	ERROR	• LAN RX	Packets are received by the Ethernet.
		• LAN TX	Packets are sent to the Ethernet.
		• V24 RX	Data is received via the RS232 line.
		• V24 TX	Data is sent via the RS232 line.
		• Error	An error has occurred in the RS232 line.

At Ethernet protocols like IPX, RIP and IGRP (MTU higher than 1500) the red LED lights up because it cannot be recognized by the Ethernet protocol. After the Com-Port is closed the red LED will light up for 0.5 seconds to make it optically visible.

2.3 Usage ipEther232 (virtual ComPort)

ipEther232 enables you to use serial interfaces via a TCP/IP network, LAN or WAN.

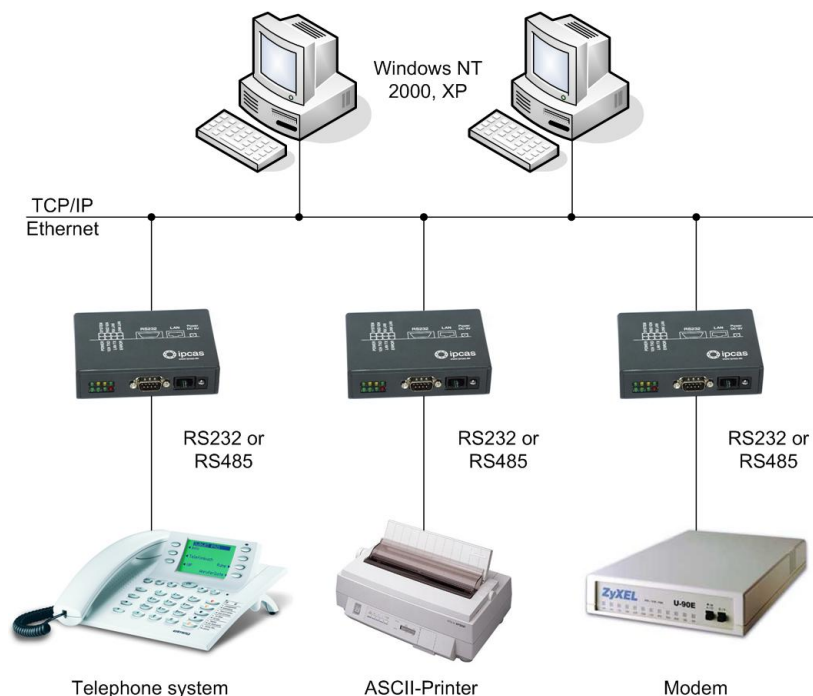
This allows you to control devices without a network interface over long distances.

Such devices are:

- modems
- printers
- SPS controls
- embedded controllers

Integration in the Windows environment is realized via a driver which supplies a virtual serial "COM" interface.

For the application the virtual COM-Interface looks like an integrated normal interface in the PC. Also the behaviour of the interface corresponds as far as possible like a physical COM interface. Up to 254 virtual interfaces can be installed on one PC.



2.4 Usage ipEther232.Modem (Ethernet modem)

ipEther232.Modem enables you to use serial interfaces via a TCP/IP network. This allows you to control devices without a network interface over long distances. In addition to the serial interface, the Ethernet modem also has a network interface. In order to connect two serial devices, simply use two modems linked via Ethernet instead of a serial cable.

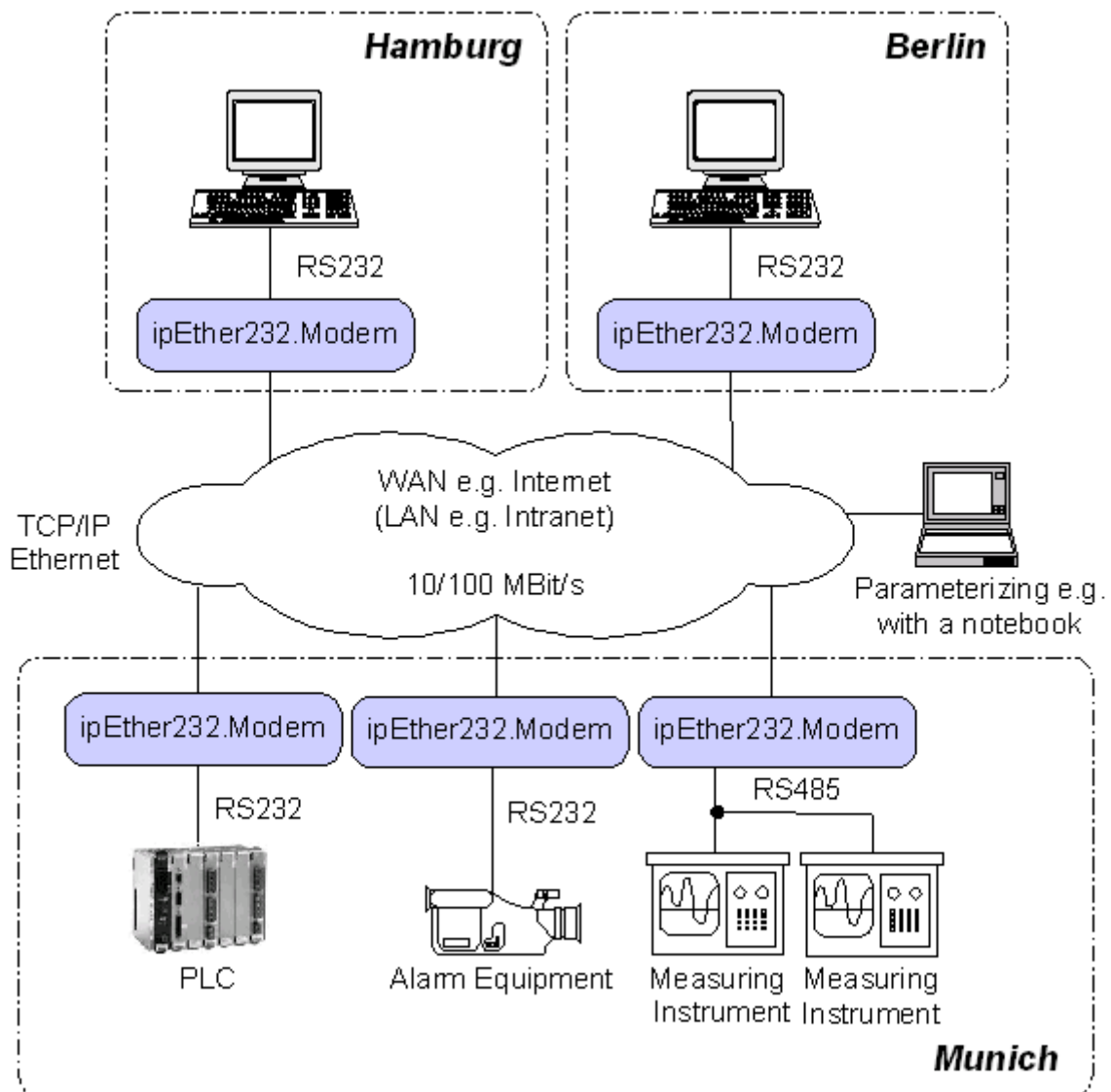
Such devices are:

- ✦ Terminals
- ✦ CNC controllers
- ✦ Counting devices
- ✦ Embedded controllers
- ✦ Industrial switches
- ✦ SPS controllers
- ✦ Card scanners
- ✦ Measuring equipment
- ✦ UPS

Thus, all applications and devices that support terminal or modem functionalities can also be used via the Ethernet. This has numerous advantages:

- lower telephone costs
- reduce the number of analogue connections (monthly fee)
- simplified logistics
- extremely low porting costs
- protects your investments by converting serial devices into network devices without requiring changes in the existing software and so additional product development costs are saved
- versatile power supply and optimal housing solutions
- automatic setup of network connection after interruptions
- easy to setup and suitable for larger installations
- simple integration of serial applications

"Networking" will soon be the global standard. However, manufacturers require expensive labour, precious time and comprehensive experience to develop network technologies. As most devices are already equipped with an RS232/485 interface, the Ethernet modem offers an instant and efficient solution for transmitting RS232/485 data via the network. The Ethernet modem not only provides added value to your product but also the value of your existing equipment may be expanded for the next generation.



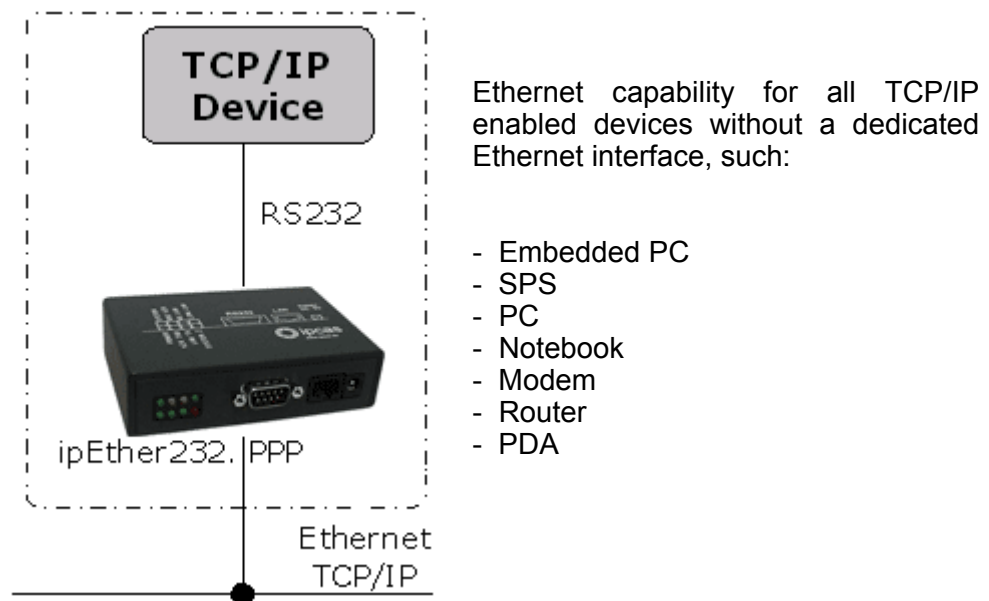
2.5 Usage ipEther232.PPP (PPP – Gateway)

The PPP / Ethernet – Converter enables the transmission of network packets via a serial interface from and to the Ethernet (PPP = Point to Point Protocol).

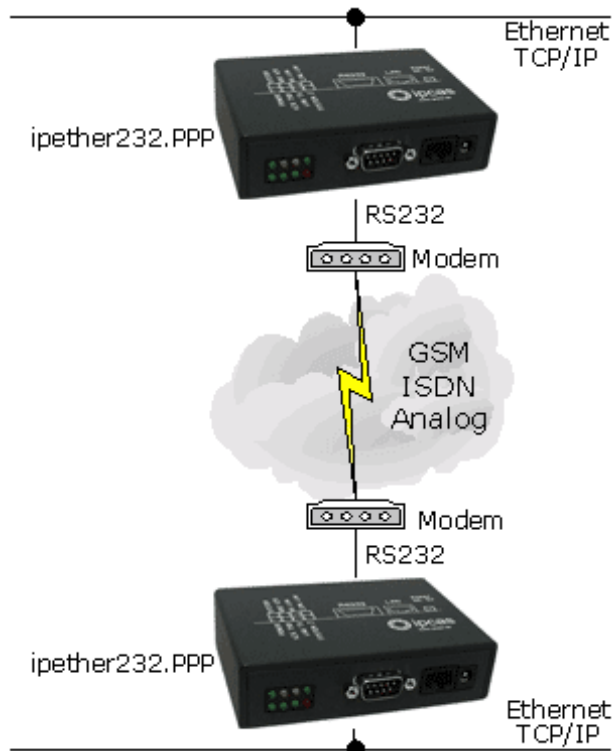
With ipEther232.PPP, all these (serial) devices can be linked up to an Ethernet LAN via TCP/IP and also to the Internet or your company intranet.

The PPP gateway solution works with all operating systems and is compatible with existing PPP applications. You can start several services (ftp, telnet, www, ssh, rsh, rcp etc) simultaneously via this transparent network connection.

1.) “Ethernet for all“

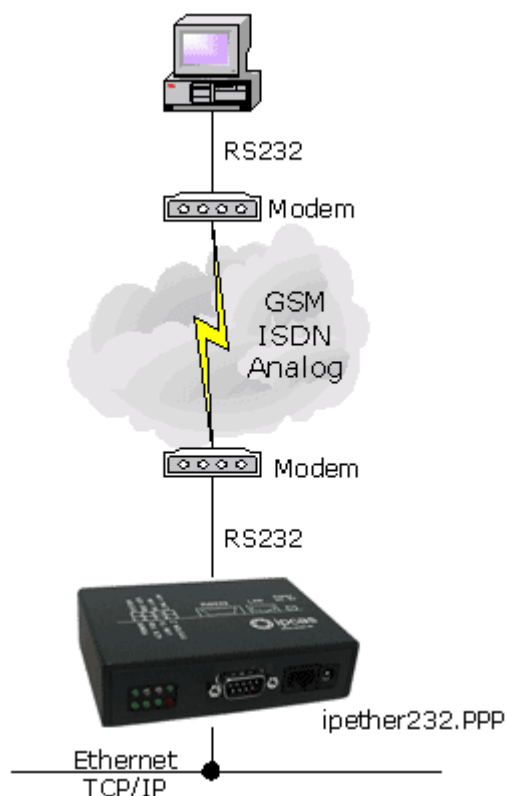


2.) "simple Network routing"



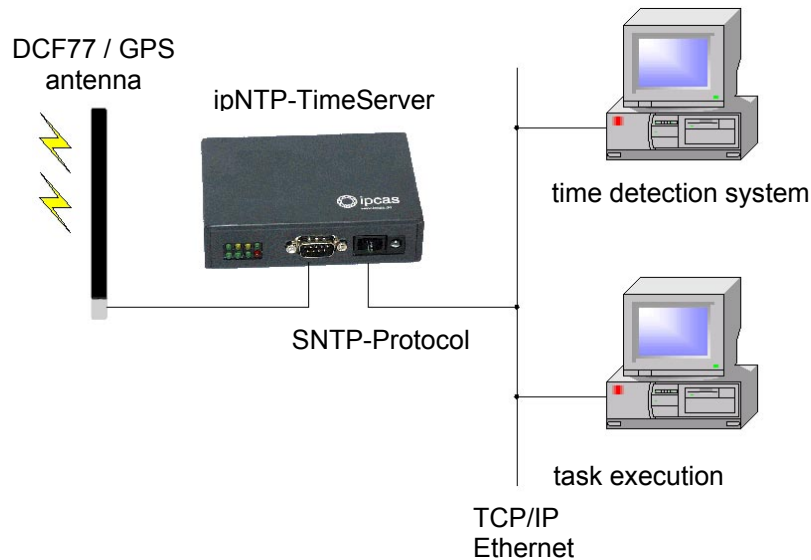
Simple routing between two networks via GSM, ISDN or analogue modems, for instance to link up a branch to the company LAN.

3.) "dial in"



Enables Company LAN access for home office, remote maintenance and company networks.

2.6 Usage ipNTP (SNTP TimeServer)



The ipNTP stand-alone time server provides DCF77 / GPS time information for computers, controllers or other dynamically critical devices / applications over the Ethernet. The client first determines the average transmission time for the data exchange with the time server. After that, the client fetches the current time and patches this value around the transmission time. The time on the client deviates only a few milliseconds from the time server.

All components in the TCP / IP network could be synchronized over the SNTP protocol with the time signal transmitter Mainflingen near Frankfurt on the Main (DCF77), or through the global satellite navigation system (GPS).

Time-precise solutions are needed in task executions, schedulers, personnel information systems, time recordings and error logging. By using the network protocols, SNTP (Simple Network Time Protocol – RFC 2030) and TCP / IP, platform independence, even in heterogenous networks, is guaranteed.

NTP Server - Information

The Network Time Protocol (NTP) is used in order to synchronize the time of a client via the Internet/Intranet with other computers or with an external clock. The primary NTP time servers via external timers are locked as correct as possible to the Coordinated Universal Time (UTC). The NTP Client synchronizes the time by NTP commands with the servers indicated as an argument.

DCF77 - Information

The DCF77 radio clocks receive the official time of the federal republic of Germany from the Physical Technical Federal Institution (PTB) in Braunschweig and transmit the signal over different interfaces to computers and systems. The long-term accuracy of the PTB calibrating standard measure is achieved by radio alignment of the sender DCF77 in Mainflingen near Frankfurt on the Main of 1×10^{-13} weekly. Due to the high accuracy, only this time is recognized as legally binding in the federal republic.

GPS - Information

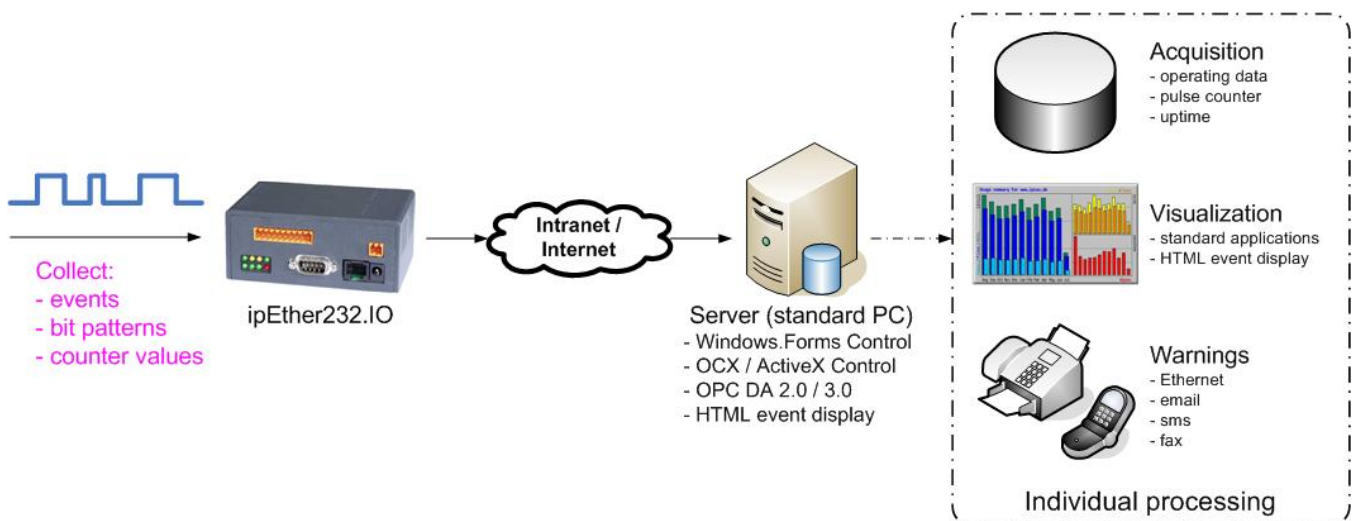
In approx. 20.000 km high satellites are moving in different orbits around the earth. In every satellite, there is an atomic clock (min. accuracy 1×10^{-12}), whose time is sent out continuously with the orbital data. The GPS-receiver registers the dates of minimum 3, maximum 6 satellites and calculates its position of these values. If the position is computed, the terms of the dates can be determined by the individual satellites. From these values, the GPS world time is determined in the timeserver and continued exactly about a variable quartz time.

2.7 Usage ipEther232.IO (Data-Logger)



The compact "ipEther232.IO" data logger / event logger enables the acquisition of digital input values, such as process and machine data, which are then automatically transferred via Ethernet to a central server (standard PC) for further processing.

Acquisition, counting, monitoring of digital signals,
processing, visualization, warnings



Its modular structure and consistent separation allow easy implementation for a wide range of uses. ipEther232.IO is highly scalable for small or high numbers of I/O channels for central or decentral digital data acquisition wherever the data is needed.

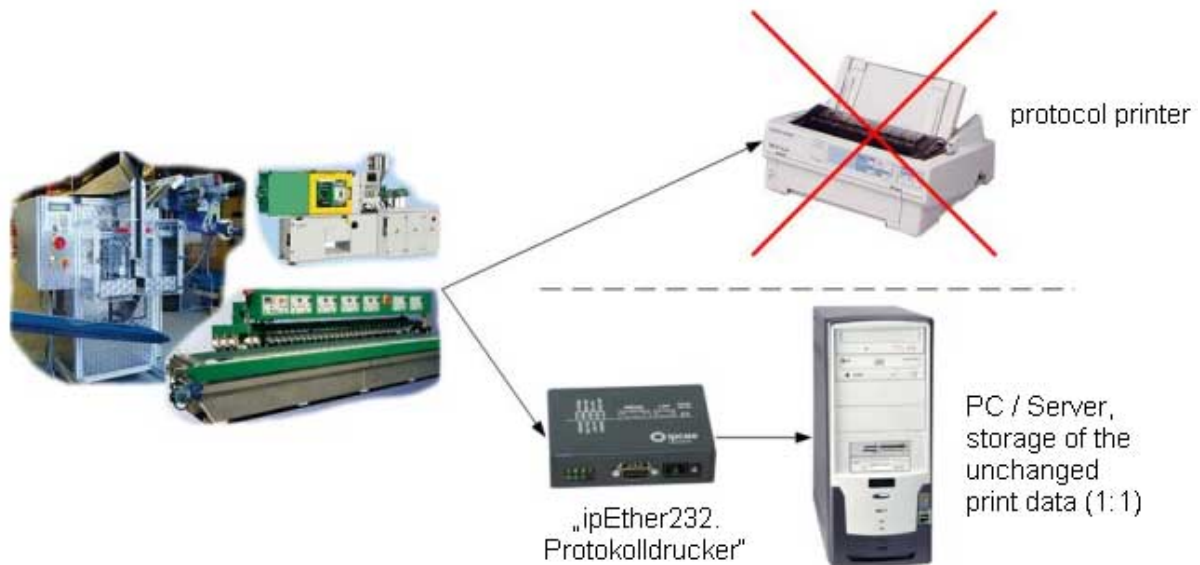
ipEther232.IO features a compact design, is easy to integrate and offers a wide range of applications including process and machine data acquisition, automation, central building control systems and measurement data acquisition.

2.8 Usage ipEther232.Protocol-Printer

Innovative substitution for protocol printers

These problems are things of the past

- Paper jams or "out of paper" errors of the protocol printer
- Unreadable printouts because of defective colour ribbon
- Printer is not switched on
- Complicated backtracking in the paper archive



Replace serial/parallel printers and transmit the captured print data via the Ethernet to a central server (on which the capture software is installed).

The service for the data collection can connect to any number of "ipEther232. Protokolldrucker" and every machine (print source) can be configured individually.

The captured print data will be stored unchanged (1:1) into files on the server. The data can be created for each page, separation sequence, per hour, daily, monthly or yearly on the central server in an output directory.

The received print data can be changed with "search&replace " option (only meaningful with text data)

- replace from a character string by another
- optional inserting of a time stamp e.g. per line

To view the unchanged print data, the following applications can be used:

- ASCII --> Editor e.g. Notepad
- Postscript --> GhostView
- Epson Compatible 24 Pin -> DosPrinter <http://www.geocities.com/DOSPrint/>

Further processing of the received print data for visualization, analysis, or long time archiving is possible in optional individual projects.

In the overview border are the following entries:

Name	Info (Comments could be very helpful to find a particular device very quickly)
IP Address	Current IP-Address
MAC	MAC-Address
Device Type	Firmware type of the device
Version	Current Firmware version
Info	Current configured ComPort (only at ipEther232 „virtual ComPort“)
In Use On ipNTP - DCF77 On ipNTP - GPS	If this entry is „True“, the device is already in use and you shouldn't configure the parameters. The device received data one minute along if this entry is "True" If this entry is "True", the device received signals from several satellites.
Ping OK	If this entry is „False“, the device couldn't be found. It is not connected, switched off or is in another network segment.
In Local Net	If this entry is „False“, the device is not in the local network segment. If the device is installed behind a router, the IP-Address couldn't be changed. This is to prevent the device from getting inaccessible by mistake.
Password required	If this entry is "True", the device is password-protected and the password has to be entered before the configuration. (Right-click "Login") If the password is forgotten, the device must be returned.
Logged in	If this entry is "False", the password (Right-click "Login") has to be entered before the configuration.
CPU ID	Identification label from the CPU ID (0000 = this feature is not supported in that firmware release)

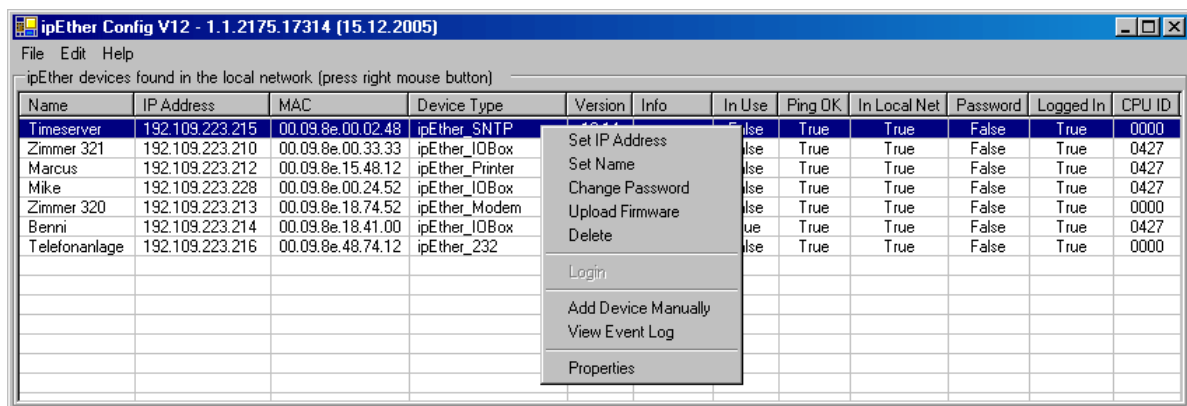
To start with, each device must be allocated with an unambiguous IP address. On delivery of ipEther232, no valid IP-Address has been set (Default: 10.10.5.1). The IP-Address can be obtained from the network administrator. It must comply with your network and cannot be assigned twice.

If you are embedded in a DHCP network, you'll have to receive a static IP-Address from your network administrator for your ipEther232.

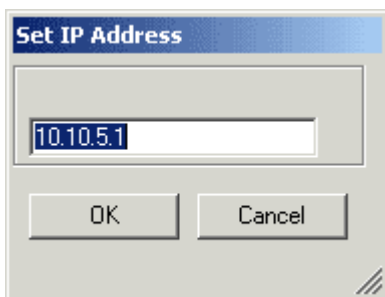
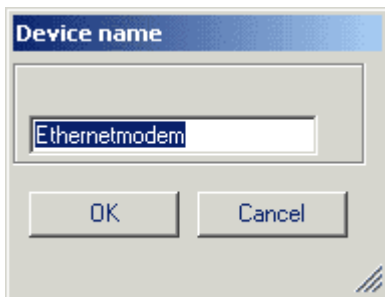



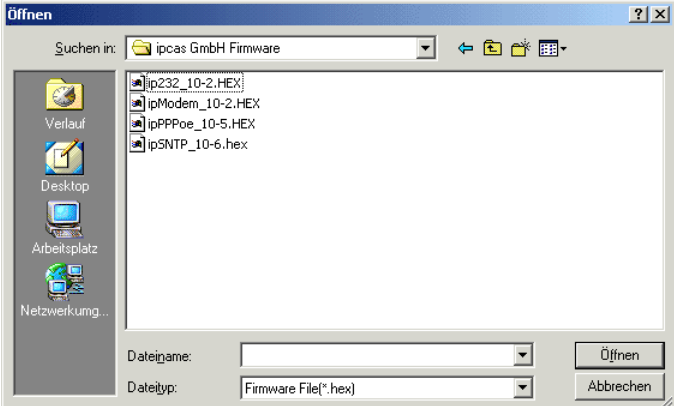
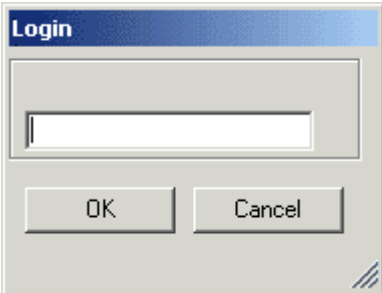
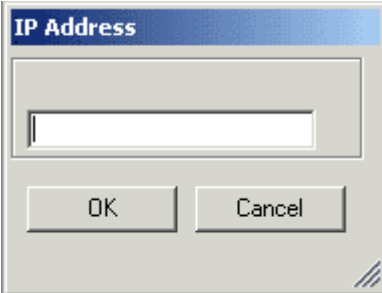
In order to set the IP Address of your ipEther232, the device **must** be connected to its **own network segment**.

If there is a need, connect the device via a "**cross over**" cable to the PC.



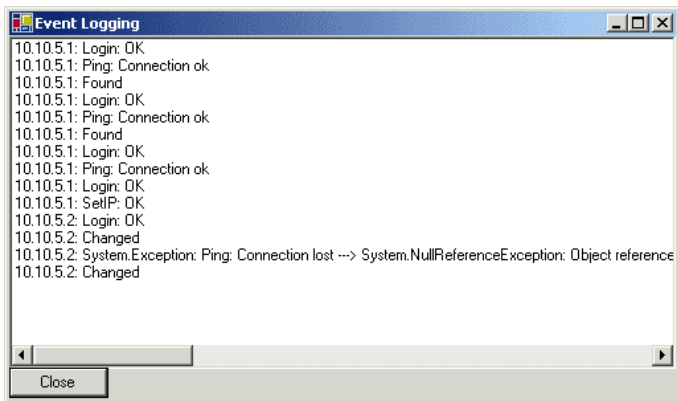
By the use of a right mouse click on an entry of a device, a dialogue is shown where you may perform further actions.

Set IP	<p>Set IP Address</p> 
Set Name	<p>Comment for overview</p> 
Change Password	<p>Set / change password</p> 

Upload Firmware	<p>Update new firmware. You can find new versions of the firmware on http://www.ipcas.de. You should only update if you really need to.</p> 
Delete Login	<p>Delete current marked entry</p> <p>If the device is password protected (Password required = "True"), you have to enter the password before the configuration.</p> 
Add Device Manually	<p>If ipEther232 is connected after a router, they are not automatically located. They have to be entered manually ("Add Device Manually"). This requires the entering of the IP Address. If the device can be accessed via this address, it is included in the list.</p> <p>If the device is installed after a router, the IP Address couldn't be changed. Otherwise, the device might become inaccessible by mistake.</p> 

Show internal Trace

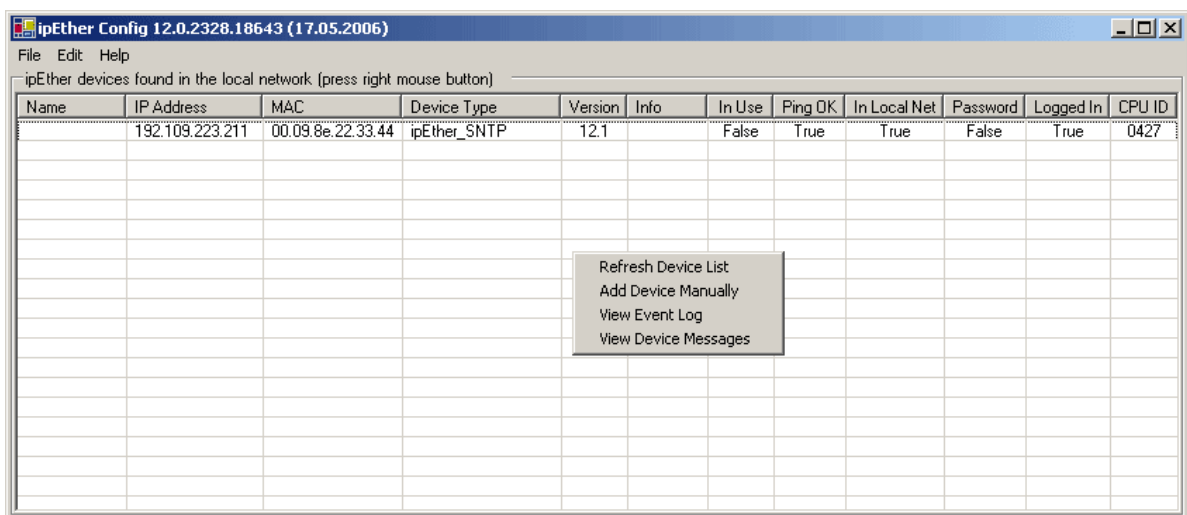
Open current log file. The messages of the configuration tool will be shown here.



Properties

Type-specific configuration surface.
Further information in the respective chapters.

A dialogue will be displayed by a right-click on **no** entry of device.



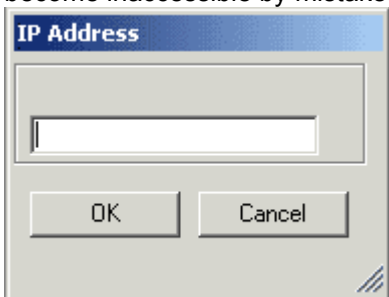
Refresh Device List

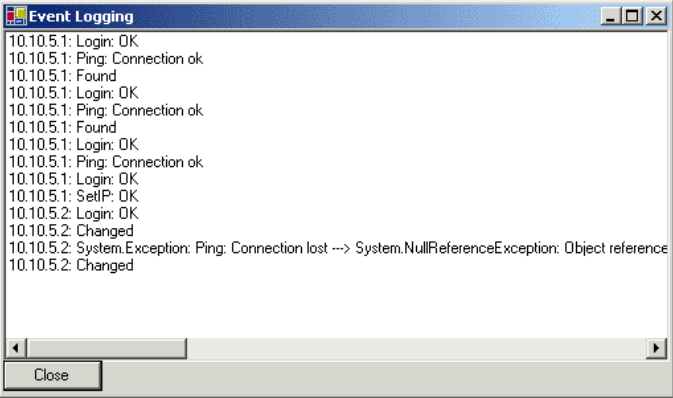
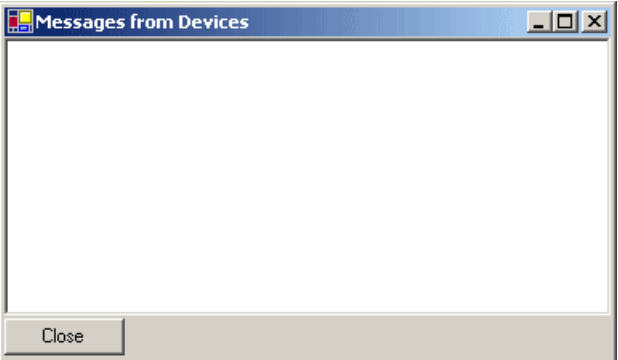
Refresh all devices

Add Device Manually

If ipEther232 is connected after a router, they are **not** automatically located. They have to be entered manually ("Add Device Manually"). This requires the entering of the IP Address. If the device can be accessed via this address, it is included in the list.

If the device is installed after a router, the IP Address couldn't be changed. Otherwise, the device might become inaccessible by mistake.

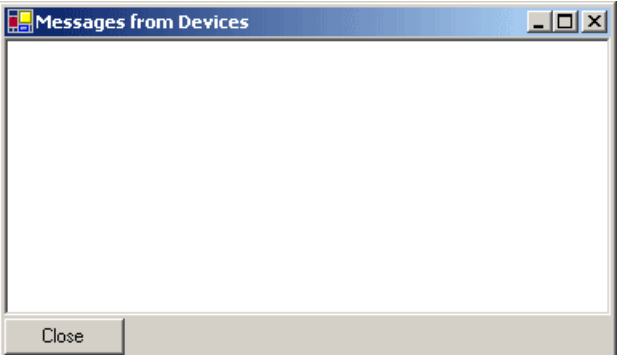


View Event Log	<p>Display current Logfile. The messages of the configuration tool will be shown here.</p> 
View Device Messages	<p>Retrieve actual Logfile. Messages from the device and the firmware are shown here. The configuration tool must be activated.</p> 

3.3 Logfiles

Like it was described in the chapter "Configuration tool", you can find the error descriptions here, which are sent from the embedded controller to the configuration tool via Ethernet.

At the same time, all errors are saved in the Windows Event-Manager by the service "ipcas.ipEther.DeviceMessagesService". For that, the configuration tool does not have to be started.

View Device Messages	<p>View current logfile. Messages of the Device / Firmware are shown here. For that, the configuration tool has to be started.</p> 
-----------------------------	---

- 0 **ERR_None**
Everything OK
Alles ist in Ordnung
- 1 **ERR_UartDataWhileNoCTS**
In spite of CTS-Signal, data has been sent
Trotz CTS-Signal, wurden Daten gesendet
- 2 **ERR_RXDBufferOverrun**
Receive buffer overflow in int. RAM -> Data loss
Überlauf im UART Empfangsbuffer des int. RAM -> Datenverlust
- 3 **ERR_TXDBufferOverrun**
Transmit buffer overflow in ext. RAM -> Data loss
Überlauf im Sendebuffer des ext. RAM -> Datenverlust
- 4 **ERR_NICOverrun**
NIC (Network Interface Controller) Overrun -> Data loss
Überlauf im NIC (Network Interface Controller) -> Datenverlust
- 5 **ERR_SETUP_BAUD**
The UART (RS232) parameter baudrate is not correct
Der UART (RS232) Parameter Baudrate ist nicht korrekt
- 6 **ERR_SETUP_PARITY**
The UART (RS232) parameter parity is not correct
Der UART (RS232) Parameter Parity ist nicht korrekt
- 7 **ERR_SETUP_DATA**
The UART (RS232) parameter is not correct
Der UART (RS232) Parameter ist nicht korrekt
- 8 **ERR_SETUP_TIMEOUT**
The UART (RS232) parameter timeout is not correct
Der UART (RS232) Parameter Timeout ist nicht korrekt
- 9 **ERR_UART_OVERRUN**
Overrun Error Bit from received Control register (UART) will be ignored.
Overrun Error Bit von empfangenen Steuerregister (UART) wird ignoriert.
- 10 **ERR_UART_FRAME**
Framing Error Bit from received Control register (UART) will be ignored.
Framing Error Bit von empfangenen Steuerregister (UART) wird ignoriert.
- 11 **ERR_PARITY**
UART: Parity error
UART: Paritätsfehler
- 12 **ERR_INVALID_232MSG**
ETH232Message: Invalid Command
ETH232Meldung: Ungültiger Befehl
- 13 **ERR_ACCESS_DENIED**
Port already open
Port bereits geöffnet
- 14 **ERR_FATAL_TXD_RING_SYNC**
TXD Ringbuffer out of sync
TXD Ringbuffer nicht synchronisiert
- 15 **ERR_FATAL_RXD_RING_SYNC**
RXD Ringbuffer out of sync
RXD Ringbuffer nicht synchronisiert
- 16 **ERR_NO_RXD_RESPONSE**
No receipt from server -> Bufferreset
Keine Rückmeldung vom Server -> Buffer reset
- 17 **ERR_FIRMWARE_UPLOAD_CRC**
Upload: CRC is wrong -> Abort
Upload: CRC ist fehlgeschlagen -> Abbruch
- 18 **ERR_NIC_INTERNAL**
NIC internal mistake: DMA operation could not be carried out
NIC interner Fehler: DMA-Betrieb konnte nicht durchgeführt werden
- 19 **ERR_SETUP_STOPBITS**
Setup: Wrong Stopbits
Setup: Stopbits falsch

- 20 ERR_WATCHDOG**
Reset because of WatchDog
Reset durch WatchDog
- 21 ERR_UDP_CRC**
UDP-CRC wrong
UDP-CRC falsch
- 22 ERR_FRAME_TO_LONG**
Ethernetframe too long
Ethernetframe zu lang
- 23 ERR_PPP_BUFFER_OVERRUN_ETH**
No space in ext. RAM for IP packets from the Ethernet
Kein Platz im ext. RAM für IP-Pakete aus dem Ethernet
- 24 ERR_PPP_BUFFER_OVERRUN_PPP**
No space in ext. RAM for IP packets from the PPP
Kein Platz im ext. RAM für IP-Pakete vom PPP
- 25 ERR_PPP_INVALID_MESSAGE**
Invalid PPP Message received. Discarded
Ungültige PPP-Nachricht erhalten (IPCP oder LCP). Verworfen (RFC1661, RFC1662, RFC1332)
- 26 ERR_PPP_ECHO_TIMEOUT**
No Answer for LCP Echo
Keine Antwort für LCP-Echo
- 27 ERR_BOOT**
Device Boot
Gerätestart
- 28 ERR_PPP_CRC**
Wrong PPP CRC received
Falsche PPP-CRC empfangen
- 29 PPP_LCP_UP**
UP LCP protocol – PPP
LCP Protokoll gestartet – PPP
- 30 PPP_LCP_DOWN**
DOWN LCP protocol – PPP
LCP Protokoll gestoppt – PPP
- 31 PPP_IPCP_UP**
UP IPCP protocol – PPP
IPCP Protokoll gestartet – PPP
- 32 PPP_IPCP_DOWN**
DOWN IPCP protocol – PPP
IPCP Protokoll gestoppt – PPP
- 33 ERR_INVALID_CONFIG**
Invalid Config found in EEPROM. Use Default
Ungültige Konfiguration im EEPROM gefunden. Verwende Standard
- 34 ERR_WDT_TIMEOUT**
The reason for the last processor reset was Watchdog Timeout
Die Ursache für den letzten Prozessor - Reset war ein „Watchdog Timeout“
- 35 ERR_NORMAL_POWER_UP**
The reason for the last processor reset was Normal Power up
Die Ursache für den letzten Prozessor - Reset war Normal Power up
- 36 ERR_MCLR_FROM_SLEEP**
The reason for the last processor reset was return from Sleep
Die Ursache für den letzten Prozessor - Reset war Aufwachen aus dem Stromsparmodus
- 37 ERR_BROWNOUT_RESTART**
The reason for the last processor reset was from Brown Out
Die Ursache für den letzten Prozessor - Reset war eine Spannungsschwankung
- 38 ERR_WRONGPASSWORD**
Wrong Password
Falsches Passwort

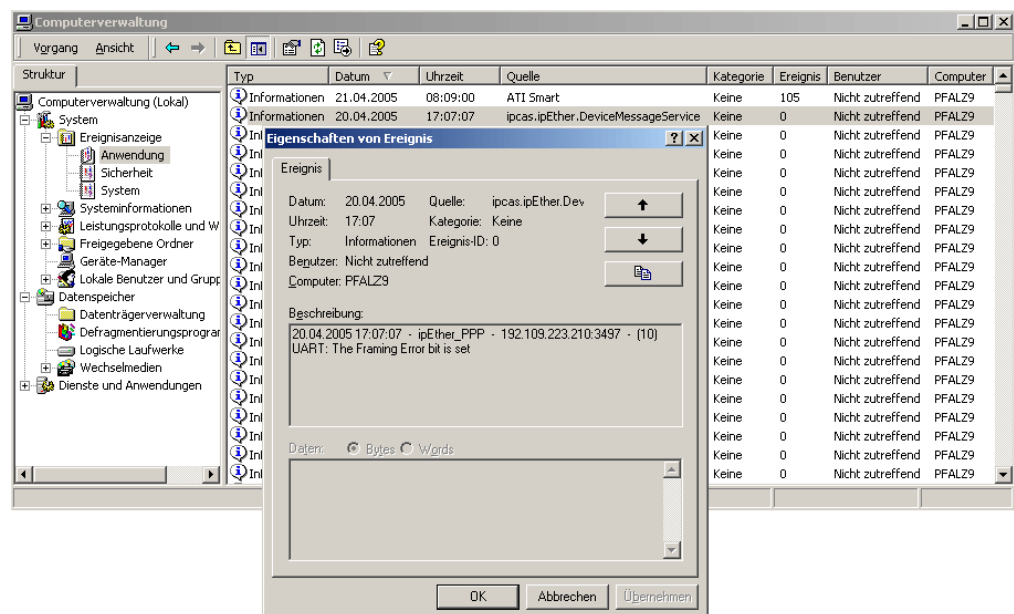
- 39 SNTP_GOOD_DCF77_SIGNAL**
The DCF77 signal is good
Der DCF77-Signal Empfang ist gut
- 40 SNTP_BAD_DCF77_SIGNAL**
The DCF77 signal is lost or has a bad quality
Der DCF77-Signal Empfang ist schlecht oder nicht vorhanden
- 41 SNTP_GOOD_GPS_SIGNAL**
The GPS signal is good
Der GPS-Signal Empfang ist gut
- 42 SNTP_GPS_SIGNAL_MISSING**
The GPS signal is missing
Der GPS-Signal Empfang ist schlecht oder nicht vorhanden
- 43 SNTP_CLOCK_SYNCHRONIZED**
SNTP Server is synchronized
SNTP Server ist synchronisiert
- 44 SNTP_CLOCK_NO_SYNCHRONIZED**
SNTP Server is not synchronized
SNTP Server ist nicht synchronisiert
- 45 ERR_PPPOE_RX_FRAME_TOLONG**
Bogus in Rx PPPoE length field (payload=1500-PPPoE Header)
Falscher Rx PPPoE Längenfeld (payload=1500-PPPoE Header)
- 46 ERR_PPPOE_CREATE_LONG_FRAME**
The Access Concentrator would create too-long PPPoE packet
Der Zugangskonzentrator erstellt ein zu großes PPPoE Paket
- 47 ERR_PPPOE_RX_NO_UNICAST_ADDR**
Ignore PADIs which don't come from a unicast address
Ignoriert PADIs die nicht von einer Unicast Adresse kommen
- 48 ERR_PPPOE_RX_NO_SERV_NAME**
RP-PPPoE: Server: No service name tag
RP-PPPoE: Server: Keine Service Namen Kennzeichnung
- 49 ERR_PPPOE_RX_INVALID_SERV_NAME**
RP-PPPoE: Server: Invalid service name tag
RP-PPPoE: Server: Ungültige Service Namen Kennzeichnung
- 50 ERR_PPPOE_MODEM_DISCONNECTED**
The modem is disconnected from the power-supply
Das Modem ist von der Stromversorgung getrennt
- 51 ERR_NIC_HALF_DUPLEX**
The NIC is in half duplex mode
Der NIC ist im Halb-Duplex Modus
- 52 ERR_NIC_FULL_DUPLEX**
The NIC is in full duplex mode
Der NIC ist im Voll-Duplex Modus
- 53 ERR_DALOG_CHANGE_PASSWORD**
System error when changing host password
Systemfehler beim Ändern des Host Passworts
- 54 ERR_DALOG_CHANGE_SUBNETMASK**
System error when changing subnet mask
Systemfehler beim Ändern der Subnet Maske
- 55 ERR_DALOG_CHANGE_GATEWAY**
System error when changing gateway
Systemfehler beim Ändern des Gateways
- 56 ERR_DALOG_NTP_RESTART**
NTP daemon cannot restart
NTP-Dienst kann nicht neustarten
- 57 ERR_DALOG_SYSCONF**
System error when updating the system configuration for next boot
Systemfehler beim Aktualisieren der Systemkonfiguration für den nächsten Start
- 58 ERR_DALOG_NTP_READ_PARAM**
System error when reading NTP parameters from filesystem
Systemfehler beim Lesen der NTP-Parameter vom Filesystem

- 59 ERR_DALOG_NTP_WRITE_PARAM**
System error when writing NTP parameters to filesystem
Systemfehler beim Schreiben der NTP-Parameter in das Filesystem
- 60 ERR_DALOG_DB_CONNECTION**
Cannot connect to the MySQL database
Kann keine Verbindung zur MySQL Datenbank herstellen
- 61 ERR_DALOG_DB_READ_DIGITAL**
Error when reading the digital parameters out of the MySQL database
Fehler beim Lesen der digitalen Parameter aus der MySQL Datenbank
- 62 ERR_DALOG_DB_WRITE_DIGITAL**
Error when writing the digital parameters into the MySQL database
Fehler beim Schreiben der digitalen Parameter in die MySQL Datenbank
- 63 ERR_DALOG_DB_READ_ANALOG**
Error when reading the analog parameters out of the MySQL database
Fehler beim Lesen der analogen Parameter aus der MySQL Datenbank
- 64 ERR_DALOG_DB_WRITE_ANALOG**
Error when writing the analog parameters into the MySQL database
Fehler beim Schreiben der analogen Parameter in die MySQL Datenbank
- 65 ERR_CAN2DB_CAN_STOP**
CAN Driver finished with Error
CAN-Treiber nach Fehler gestoppt
- 66 ERR_CAN2DB_CAN_INIT_STOP**
CAN-Driver-Init finished with Error
CAN-Treiber-Initialisierung nach Fehler gestoppt
- 67 ERR_CAN2DB_MYSQL_QUERY**
MySQL Client – Query failed
MySQL Client – Anfrage gescheitert
- 68 ERR_CAN2DB_MYSQL_CONNECT**
MySQL Client connected to the Server
MySQL Client ist verbunden mit dem Server
- 70 ERR_CAN2DB_SHUTDOWN_CTRL_C**
Shutdown with 'Ctrl+C'
Systemende nach 'Strg+C'
- 71 ERR_CAN2DB_CONFIG_TABLE_CORRUPT**
MySQL config table is corrupted
MySQL Konfigurationstabelle ist beschädigt
- 72 ERR_CAN2DB_EVENTS_TABLE_CORRUPT**
MySQL events table is corrupted
MySQL Ereignistabelle ist beschädigt
- 73 ERR_CAN2DB_MESSAGES_TABLE_CORRUPT**
MySQL messages Table is corrupted
MySQL Meldungstabelle ist beschädigt
- 74 ERR_CAN2DB_CONFIGANALOG_TABLE_CORRUPT**
MySQL configAnalog Table is corrupted
MySQL Analog-Konfigurationstabelle ist beschädigt
- 85 ERR_INVALID_SOCKET**
Socket is not available
Anschluss ist nicht verfügbar
- 86 ERR_CLOSE_CONNECTION**
Telnet connection is closed
Telnet Verbindung ist geschlossen
- 90 ERR_SAMPLE_OVERRUN**
Samples could not been processed in realtime
Die Samples konnten nicht in Realzeit verarbeitet werden
- 91 ERR_TXD_FRAME_TO_LONG**
Ethernet Frame is too long: Ignored
Das Ethernet Frame ist zu lang und wird ignoriert
- 95 ERR_MAX**
End of list
Ende der Liste

3.4 Services

With the installation of the configuration tool, the Service “ipEther Device Messages logging” is installed, which allows to do a fault diagnosis over a period of several days. In addition, the Driver-Service for the virtual COM-Interface is installed.

The service “ipEther Device Messages logging” writes all Device Messages from the configtool into the Windows Event-Display, which can be found with right mouse click on "My Computer" -> Manage -> Event-Display -> Application. An event can be announced by double-click as follows.

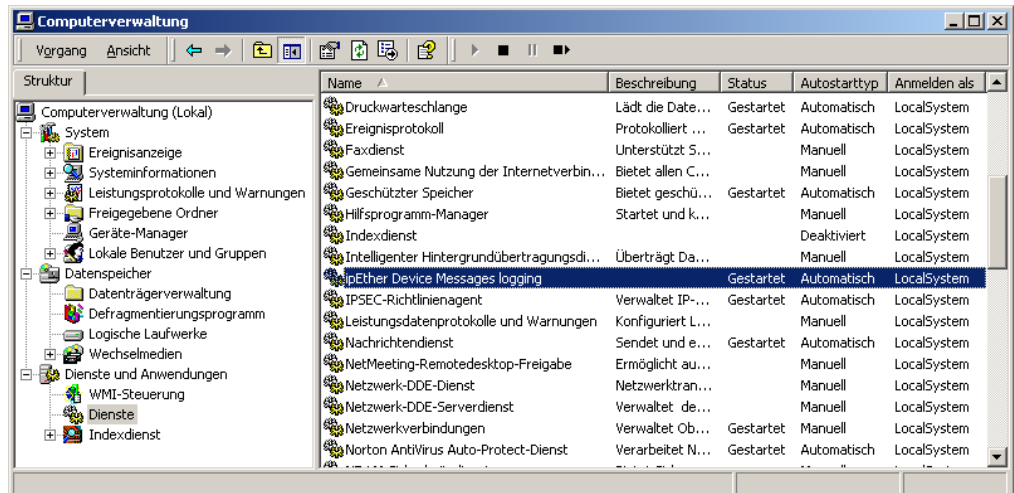


You can stop this service under "My Computer" -> Administration -> Services and Applications -> Services.

You can uninstall the service and the configuration tool under "Start" -> Administration -> Software.

Start and stop of the service in the computer administration

The service "ipEther Device Messages logging" can be activated or deactivated under "Services and applications". A list of all services is announced after a right click on "My Computer" -> administration -> services and applications -> services. With a right click on the service, you get the options to "start" or "terminate" it.



Start and stop of the service through the command shell

In the command shell, the service "ipEther Device Messages logging" can be started with the command "**net start ipcas.ipether.devicemessageservice**" and stopped with the command "**net stop ipcas.ipether.devicemessageservice**".

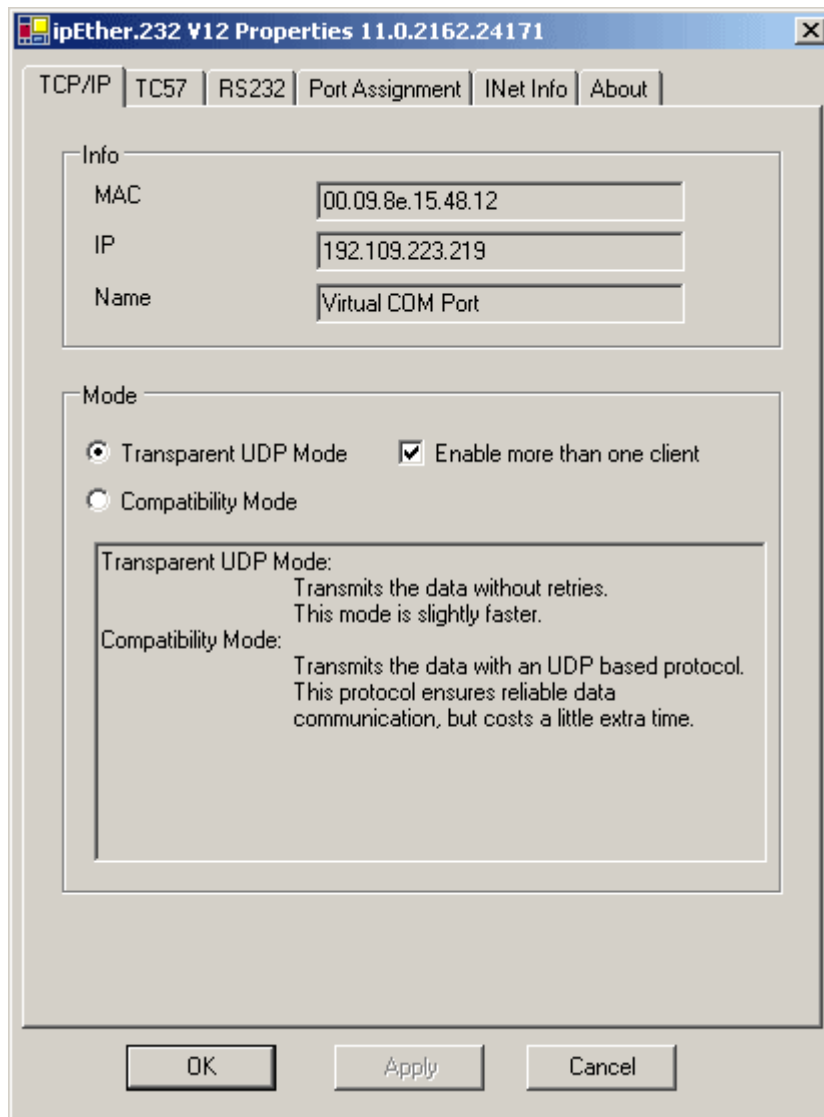
The driver-service for the virtual Com-Port can be started with the command "**net start ipether232**" and stopped with the command "**net stop ipether232**".

Chapter 4: Configuration of ipEther232

4.1 Configuration of ipEther232

As mentioned above, the configuration program recognizes all devices in its own network segment.

A double click on an entry opens the details dialog, which contains six parts.



TCP/IP:

This is where you can find the MAC-Address, IP-Address and the set device name (Set Name).

Mode:

Here you can choose between 2 supported modes.

Compatibility Mode:

On UDP based protected data transmission that makes a certain data communication possible but it costs more time by the data transmission. You use it for time-critical protocols / data

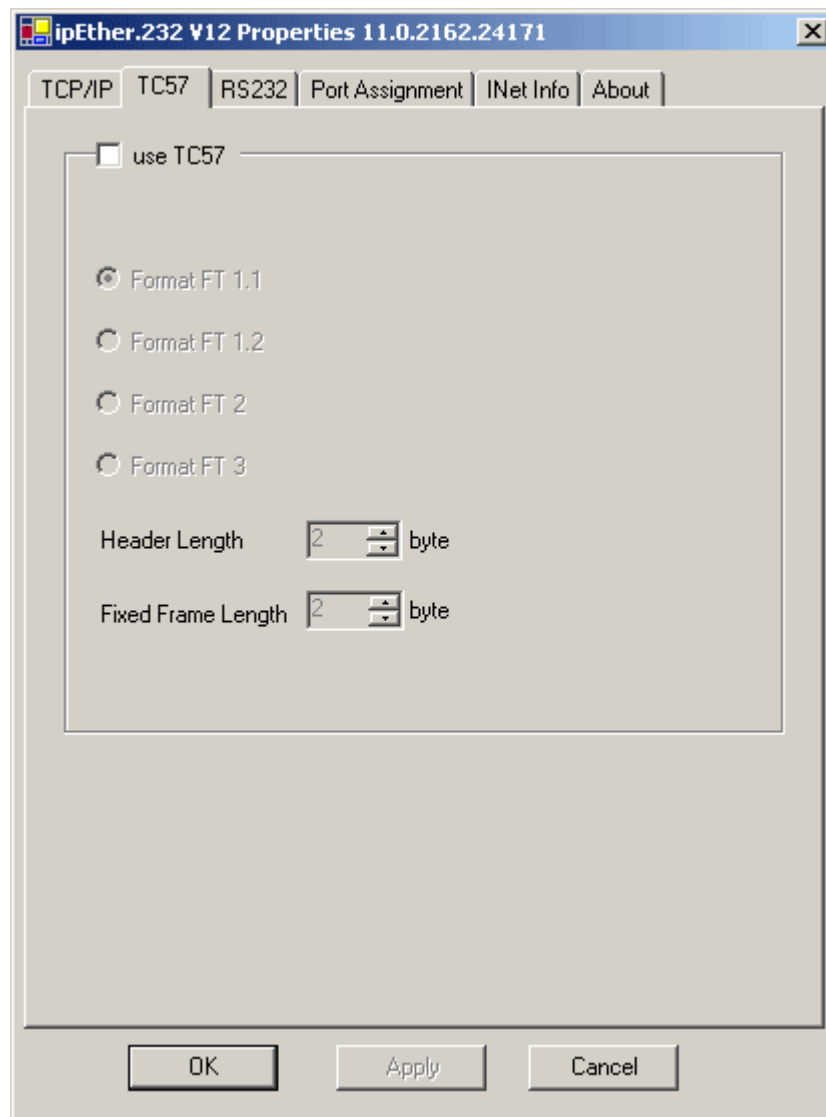
Transparent UDP Mode:

A fast UDP plain-text transmission, thus can be used for time-critical protocol / data.

Additionally, this mode makes it possible to open 4 data connections at the same time ("enable more than one PC"). Redundant installations / data connections are made possible.

The Transparent UDP Mode is perfect for your own UDP "Socket" based developments, too.

For the support of your own developments, you can find function parameters and a communication diagram in the following chapters. An example application with its source code in C# is also available.



TC 57 settings

The advantage of the TC 57 settings is that, on reception of a frame of this format (from the RS232 line), the frame is immediately sent to the Ethernet without waiting for a timeout. This greatly improves communication speed and performance.

The IEC 60870-5-1 and IEC 60870-5-2 norms define four standard frame formats for the link layer. They are:

- Format FT 1.1
- Format FT 1.2
- Format FT 2
- Format FT 3

The Frames with FT 1.2, FT 2 and FT 3 have a fixed frame length.

The Frame includes "Start character", "Length", "User Data" and "Check Sequence".

The user must select the desired Format and include values for "Fixed frame length" and "Header length" parameters.

The range of edit field "Fixed frame length" is from 2 to 255 bytes.

The range of edit field "Header length" is from 2 to 14 bytes. This value only relates to the "user data" from the header.

SEE IEC 60870-5-1 IEC 60870-5-2

ipEther.232 V12 Properties 12.0.2225.16472

TCP/IP | TC57 | **RS232** | Port Assignment | INet Info | About

COM Port: COM7

No Modem Signals: ☒ Modern signals will not be transmitted by the device. This will suppress Ethernet flooding when modem signals change frequently.

Flow Control CTS: ☐ The device will not transmit any data as long as the CTS line is 'off'.

Flow Control RTS: ☒ RTS is set to 'on' if the device is able to receive data (internal buffer < 50% filled). RTS goes to 'off' if the buffer is filled more than 90%.

Flow Control DSR: ☐ The device will not transmit any data if the DSR line is 'off'.

Flow Control DTR: ☒ The device will set DTR to 'on' as soon as a client is connected.

Flow XON/XOFF: ☐ The device will use the XON/XOFF protocol. For ASCII data only.

Half Duplex (RS485): ☐ Reception of data is disabled while transmitting data. RTS is used to switch on the transmitter.

Timeouts

Total Read Timeout: 100 ms What is this?

Char Distance: 10 ms ☐ Use Application Setting

OK Apply Cancel

RS232:

“Com-Port”: set the COM-Interface which should be used (e.g.: COM9).



The entered COM port will exist in your computer and can not be used immediately before the **configuration program is closed** (see chapter: 4.2 Checking the adjusted Com-Ports).

"NoModemSignals": Modem signals will not be transmitted between the device and a Virtual COM Port driver. In order to make possible communication with applications, which expect Handshaking, the driver sets automatically DSR and CTS in this mode.

This option is very interested in combination with the "flow control" settings, so that possibly needed Handshaking between your equipment and ipEther232 is regulated.

This will suppress Ethernet flooding when modem signals change frequently.

"Flow Control CTS": If this option is active, it will be set to CTS – signal as soon as a Client connects itself with the ipEther232.

"Flow Control RTS": If this option is active, then the ipEther232 controls the received data stream pursuant with the fill level of the internal buffer. (The RTS – signal is set when the internal buffer is less than 50% full. The RTS – signal is unset when the internal buffer is more than 90% full)

"Flow Control DSR": If this option is active, the ipEther232 will only send data to the connected device, when the DSR – signal is set.

"Flow Control DTR": If this option is active, the DTR – signal will be set as soon as a Client connects itself with the ipEther232.

"Flow XON/XOFF": The XON/XOFF protocol will be used.
Only for ASCII – data (no binary code) (XOFF>=90%; XON<=50%)

"Half duplex mode (RS485)": During the sending process to the serial interface the receiving device is switched off. All data received at this time is ignored (RS485 as a 2 wire solution). The RTS-signal is be used to switch the sender on.

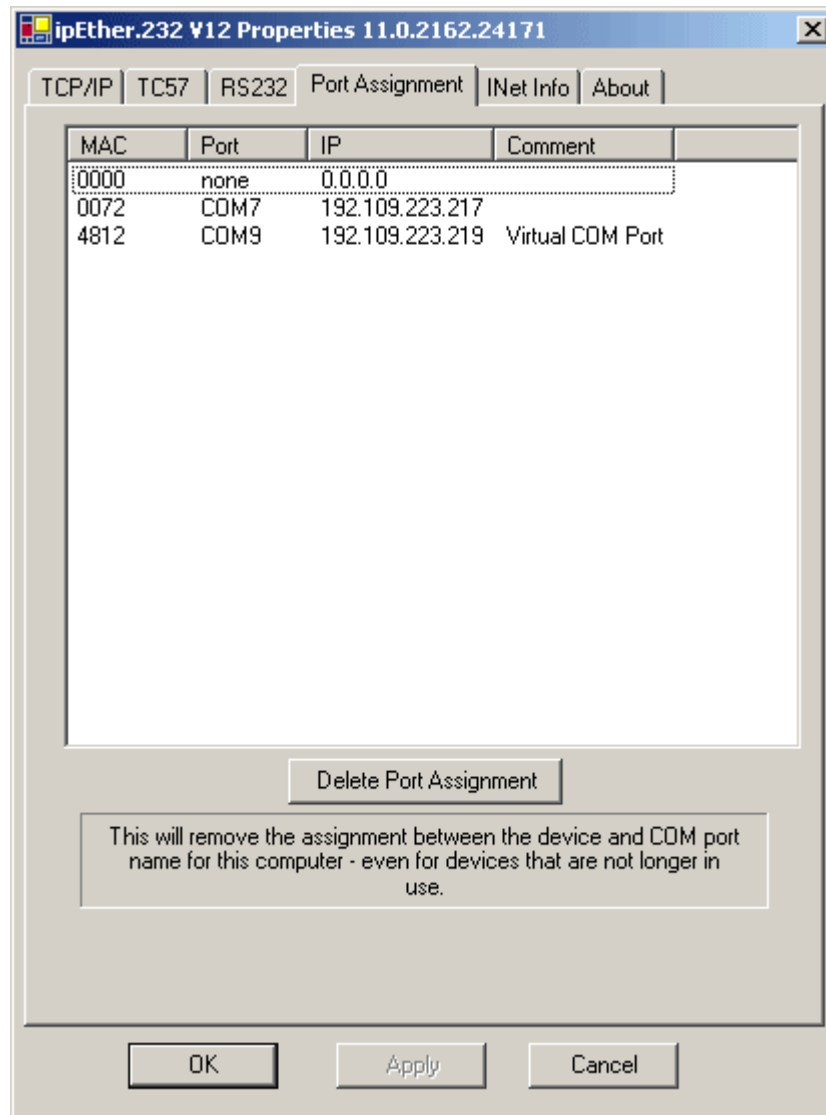
Timeouts:

"Total Read Timeout": In most cases the default value of 100 ms can remain unchanged.

"Char Distance": Only in very few cases, the default value of 10 ms need adjusting.

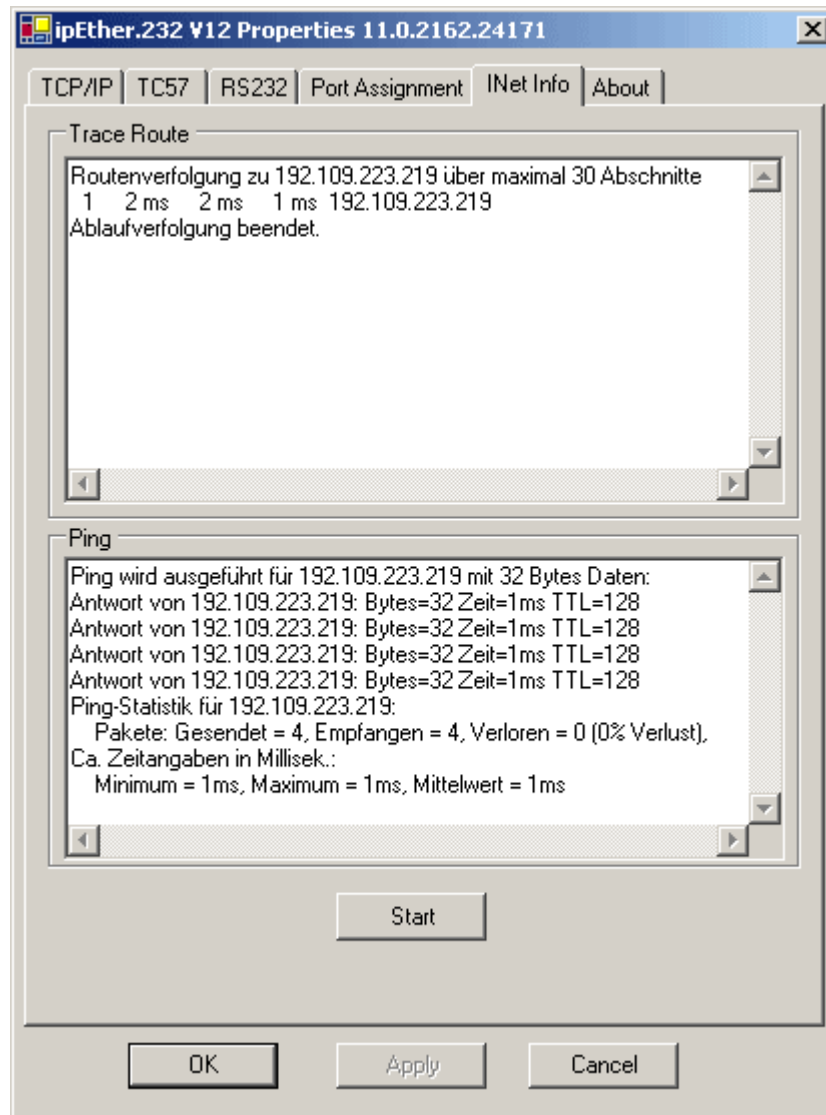
"Use Application Setting": If this option is active, the value from the application will be used instead of the adjusted "Char Distance", if available.

For further information about these two parameters, please refer to: Technical Details (Receiving).



PortAssignment

Overview of the used ComPorts (MAC-, IP-Address and comments).



Traceroute

Over traceroute you can see the data path between two servers in the Internet. Traceroute lists all servers, which are between the respective traceroute-server and the destination address.

Ping

Ping is an application of the ICMP (Internet Control Message Protocol RFC 792). This protocol (also a component of the IP protocol) transfers different administrative information and can therefore also be used for fault-tracing. If the ping signal meets an object, its reflection (echo) can be received from the appropriate transmitter again. So ping can find out whether the IP address is active (if a connection could be established) and how fast it is.



About
Information page

4.2 Checking the adjusted Com-Ports

If you want to check, if your adjusted COM-Port is really free and available, you can write the command "mode" in the command shell. After pressing the "Return" key, you will see the following output:



```
C:\WINNT\system32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>mode

Status von Gerät COM9:
-----
Baudrate:    9600
Parität:      None
Datenbits:    8
Stoppbits:    1
Fehlerwartezeit:  OFF
XON/XOFF:     OFF
CTS-Handshaking: OFF
DSR-Handshaking: OFF
DSR-Prüfung:   OFF
DTR-Signal:   OFF
RTS-Signal:   OFF
```

It will display all available and **not reserved** COM-Ports.

The Device Manager will not detect the serial interface from the ipEther232 because it is a virtual interface and not a physical COM-Interface from the PC.

You can check the virtual interface via "Hyperterm", too. This program is part of Windows and you can find it under Program / Accessories / Communication.

4.3 Sample for ipEther232 (Transparent UDP Mode)

Optionally you can install it from the Setup CD.

The standard setting of the installation path is "C:\Programme\ipcas GmbH\ipcas Ethernet Products\ipEther232 Programing Samples\....." for the described sample program, source code and **protocol - documentation** (Parameter).

Form1.cs

The file „Form1.cs“ is the C# source code for the sample application on transparent UDP Mode.

The screenshot shows a Windows application window titled "ipEther232 UDP Test". At the top, there is a text field for "IP Address:" containing "192.109.223.213", with "Open" and "Close" buttons below it. The main interface is divided into two sections: "from/to 3497 (Control)" and "from/to 3498 (Data)". The "Control" section has a "Send" text area with the text "mode" and a "Send" button, and a "Receive" text area containing the text "mode 115200,8,n,1", "T=2000 R=2000 DSR=0 CTS=0 DCD=0 RI=0", and "ok", with a "Clear" button. The "Data" section has an empty "Send" text area with a "Send" button, and an empty "Receive" text area with a "Clear" button. At the bottom right of the "Data" section, there is a checkbox labeled "just last".

4.4 Technical Details for ipEther232

During the development, the compatibility of the “virtual“ serial driver with the standard driver was a central point for us. The Ethernet makes some minor restrictions necessary:

- Data is not transmitted in bytes to the network, but Ethernet blocks are formed. This might result in minor delays.
- There are delays (Ethernet runtime)
(The device has to build Ethernet blocks from sequential serial data)
- The Xon / Xoff handshake is not supported at the moment.

The blocking function does not directly affect the application, but it can help to reduce the network load.

Windows API

The driver "Application Programing Interface" (API) is identical to the serial Windows driver. Consequently, all applications which use this interface can work with ipEther232. All functions are available but the timing might be slightly different.

UART

The UART supports transmission speed between 2400 baud and 115200 baud. Higher baud rates might result in data loss if data is transmitted continuously. 7 or 8 data bits can be used. The parities "none", "even", "odd", "1" and "0" are supported. 7 bit data does not support the parity "none".

Send

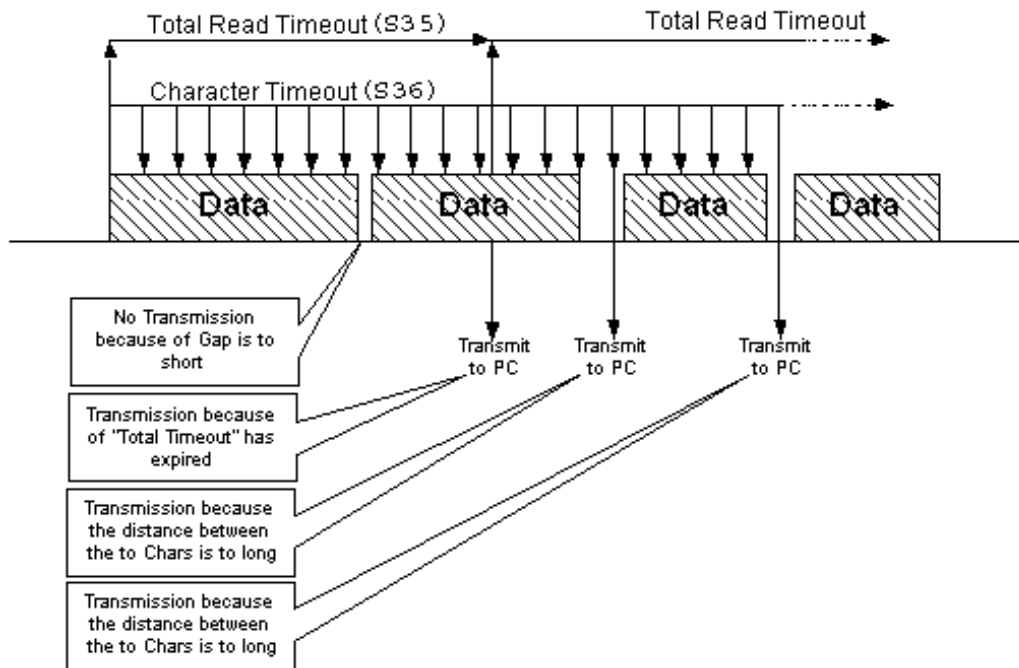
Between the call "Writefile" on the application and the appearance of the first byte at the interface, it takes approx. 5 milliseconds. All subsequent bytes of the task are shown at the interface without delay. In case of synchronous write, the call returns approx. 5 milliseconds after the last byte appears back at the interface. For each call of function, "WriteFile" function enters at least one packet to the Ethernet. If possible, only blocks should be written.

Receiving

With the reception of serial data, Ethernet blocks have to be assembled. To do this, there are two timeouts available in ipEther232.

- "Total Read Timeout"
- "Char Distance"

Fine-tuning might be required for time critical applications as well.



First byte starts the "**Total Read Time**" - parameter. After finishing, all characters received until then are sent to the PC. This value must not fall below the travel time of the UDP packet in the Ethernet. Use the "ping" tool to determine the travel time. The default value for this parameter is 100 ms.

The "**Character Distance**" is the maximum distance between two characters received. If this value is exceeded, all characters received until then are sent to the PC, even if the parameter did not run off "Total Read Timeout" yet. The default value for this parameter is 10 ms.

```

Eingabeaufforderung
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.
C:\>ping 192.109.223.180

Ping wird ausgeführt für 192.109.223.180 mit 32 Bytes Daten:
Antwort von 192.109.223.180: Bytes=32 Zeit<10ms TTL=128
Antwort von 192.109.223.180: Bytes=32 Zeit<10ms TTL=128
Antwort von 192.109.223.180: Bytes=32 Zeit<10ms TTL=128
Antwort von 192.109.223.180: Bytes=32 Zeit<10ms TTL=128
C:\>

```

runtime time + 10ms = *ideal* "Total Timeout"
 here < 10ms + 10ms = 20ms

Further Technical Details

ipEther232		Desktop	DIN-Rail Unit	OEM Version
Interfaces		1 x RS232 or 1 x RS485 – SUB-D9 (full RS232)		
		➤ Baud rate: 2.400 up to 115.200 baud ➤ Parity: None, Even, Odd, Mark, Space ➤ Data: 7 or 8 Bits ➤ Stop: 1 or 2 Bits		
		1 x 10BaseT – RJ45 (for networks at 10/100 MBit/s)		
Diagnostic LEDs		Power, System, Error, RS232 or RS485 Send/Receive Ethernet Send/Receive/Link		
Voltage		+ 8 - 14 V DC - Input Jack	+ 8 - 14 or 24 V DC ¹⁾ Input Jack and 3.5mm connector	+ 8 - 14 V DC – Input Jack 5 V DC male header on board
Housing		Plastic housing	Plastic housing	Without housing
Dimensions W/H/D		Approx. 45/108/73 mm	Approx. 45/108/73 mm	Approx. 100/20/70 mm
Operating / Storage temperature		5° C to 55° C / -10° C to 70° C		
Relative humidity		5 % to 90 % non-condensing		
Standards		CE		
Scope of delivery		ipEther232		
		External Power supply ²⁾ Input: 230 V AC Output: + 9 V DC	Without power supply (Optional)	Without power supply (Optional)
		Configuration software, Windows (NT, 2000, XP) driver, Manual (German or English documentation)		
Order number	RS232	0202014	0202014-H 0202014-H24 0202014-H60	0202014-OEM
Order number	RS485	0202015	0202015-H 0202015-H24 0202015-H60	0202015-OEM

¹⁾ Other voltages on request

²⁾ Delivery only to countries with 230 V AC 50Hz

Chapter 5: Configuration of ipEther232.Modem

5.1 Configuration of ipEther232.Modem



You can also set up your ipEther232.Modem with a serial configuration using AT commands.

(For more details, see chapter "serial configuration", "control commands" and "AT- commands".)

As mentioned above, the configuration programme recognizes all devices in its own network segment.

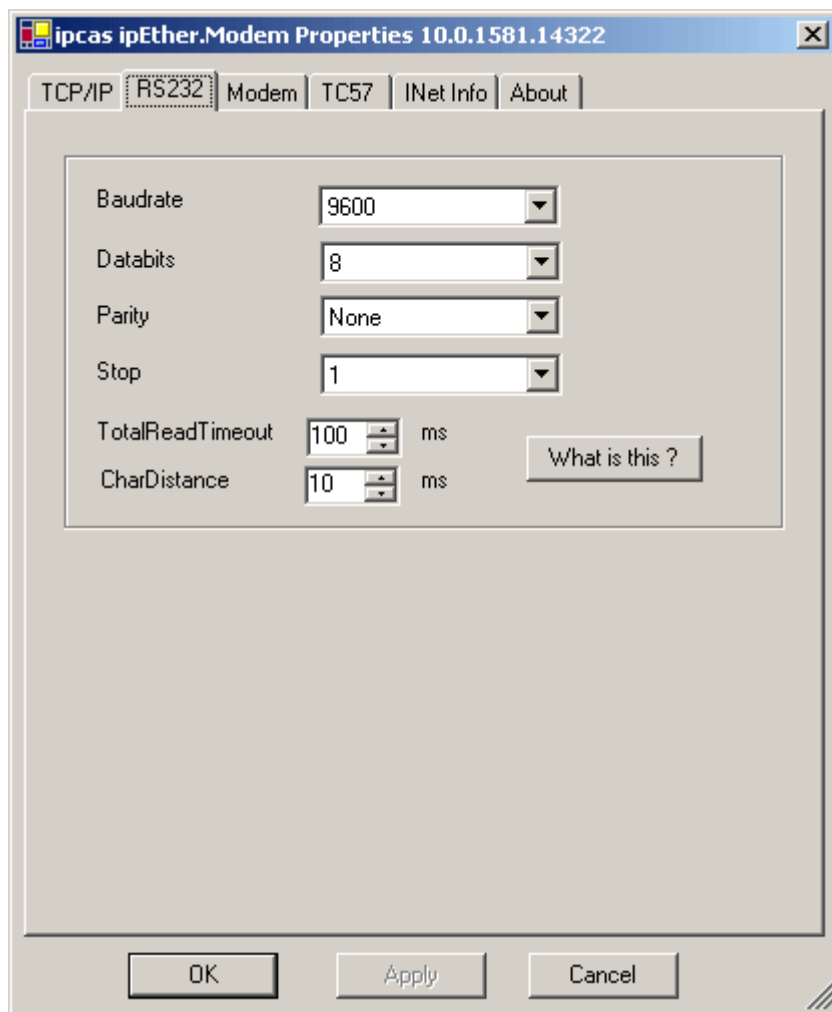
A double click on an entry opens the details dialog, which contains six parts.

TCP/IP:

This is where you can find or set the device name (Set Name), the MAC- and IP-Address.

Here you can make further network configurations like Gateway, Subnet Mask and automatically connect to IP.

"Automatically connect to IP": Enter the IP-Address of the "communication partner" with whom a connection is to be set up **automatically** (leased line). After a connection break-off, there is an automatic attempt to restore the link.

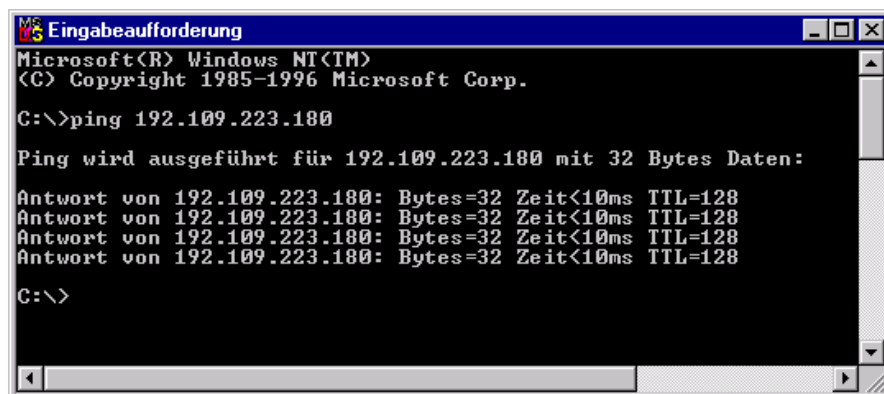


RS232:

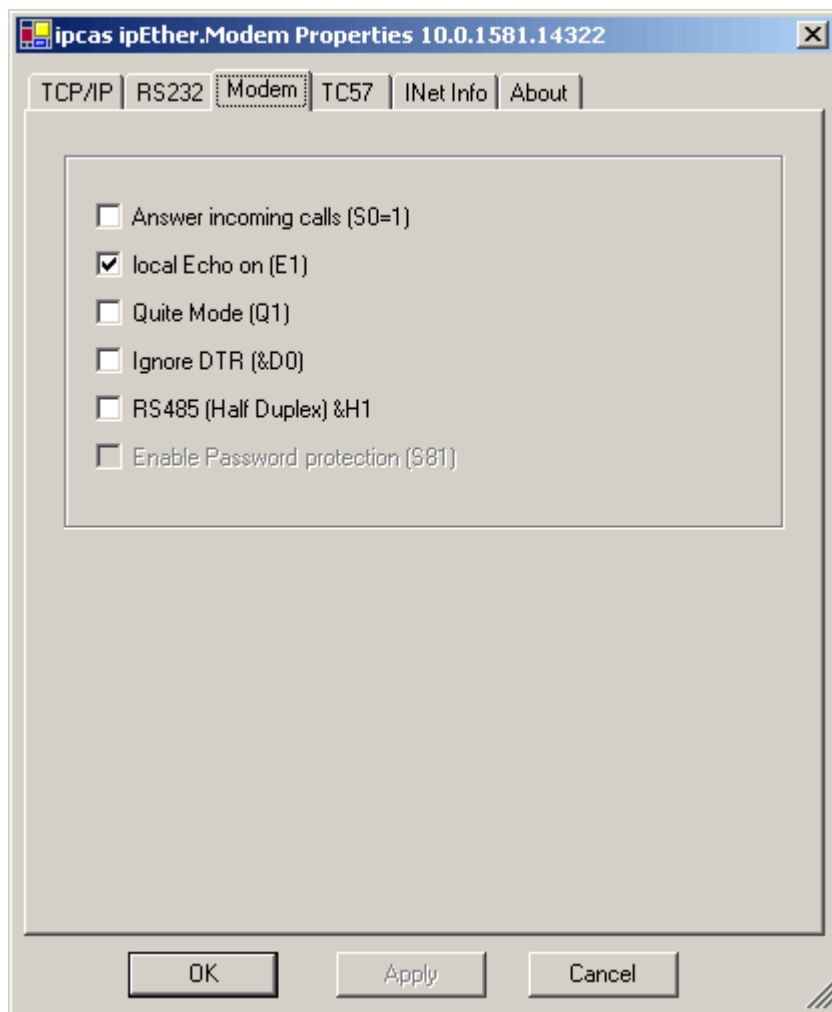
Baud rate, data bits, parity and stop bits are adjusted to the communication behaviour of the serial terminal device.

"Total Timeout": In most cases, the applied default value is 100 ms. The "ping" tool assists in determining the ideal throughput time (see below) or you may use the dialog "INet Info".

"Character Distance" with a default value of 10 ms requires adjusting only in very rare cases.



runtime	+ 10ms = <i>ideal</i> "Total Timeout"
here < 10ms	+ 10ms = 20ms

**Modem settings:**

Here you can define the modem behaviour.

“Answer incoming calls”: Automatic call acception.

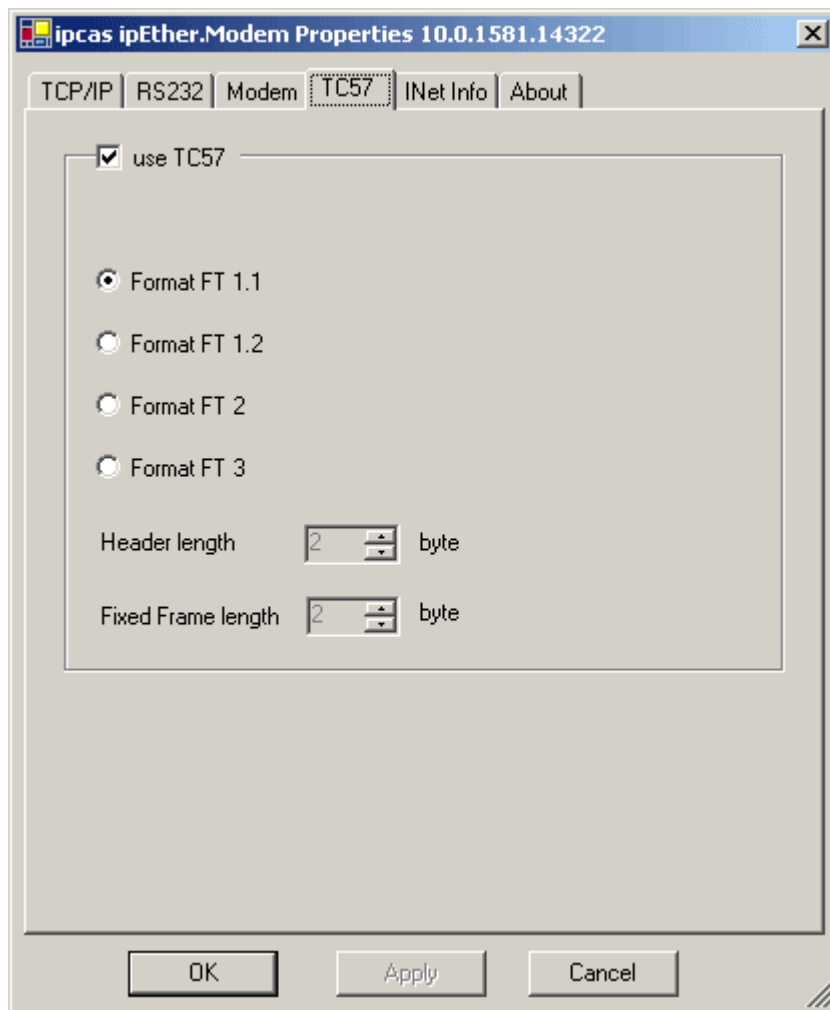
“local Echo on”: Command echo on.

“Quiet Mode”: Result codes on.

“Ignore DTR”: Ignore DTR status change.

“RS485 (Half Duplex)”: Half Duplex control for RS485 with bus system. During the sending process to the serial interface, the receiving device is switched off. All data received at this time is ignored (RS485 as a 2 wire solution).

“Enable Password protection”: Enable or disable serial password protection for connection passwords.



TC 57 settings:

If a frame is received of the TC 57 format (from RS232 line), it is immediately sent to the Ethernet without waiting for a timeout. This greatly improves communication speed and performance.

The IEC 60870-5-1 and IEC 60870-5-2 norms define four standard frame formats for the link layer. They are:

- Format FT 1.1
- Format FT 1.2
- Format FT 2
- Format FT 3

The transmission frame formats - FT 1.2, FT 2 and FT 3 have a fixed frame length.

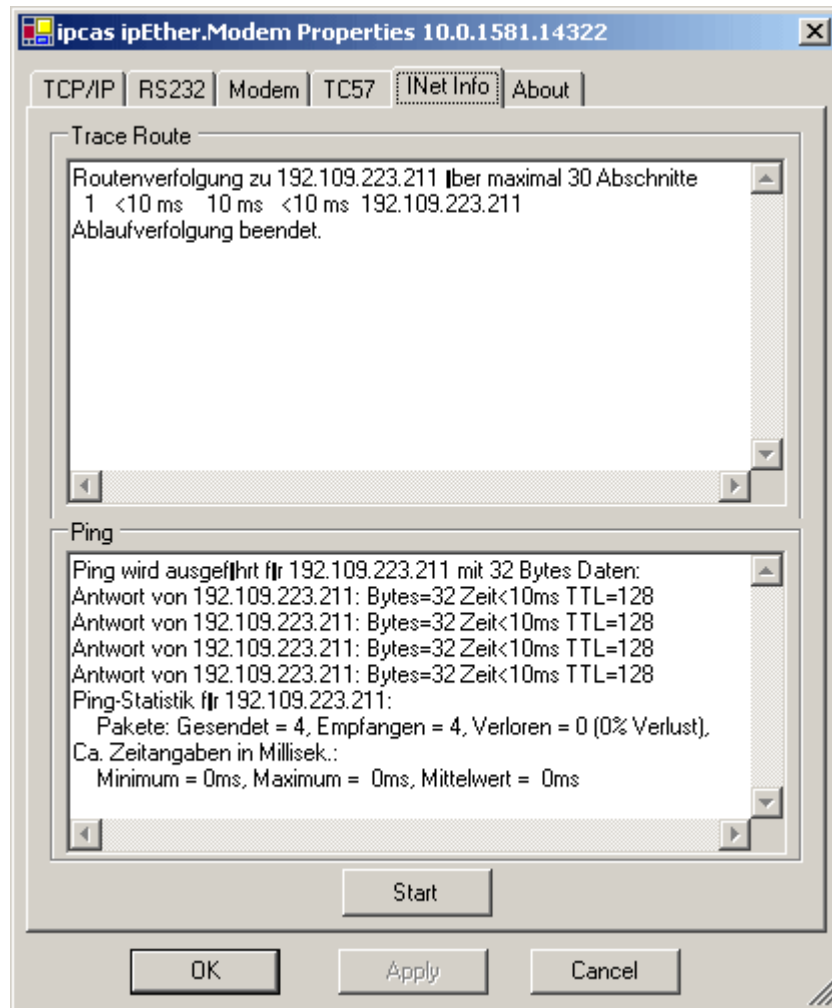
The Frame with variable length for FT 2 and FT 3 has a header of fixed length. It includes "Start character", "Length Byte", "User Data" and "Check Sequence".

The user must select the desired format and include values for "Fixed frame length" and "Header length" parameters.

The range of "Fixed frame length" is from 2 to 255 bytes.

The range of "Header length" is from 2 to 14 bytes. This value only relates to the "User Data" from the header.

See IEC 60870-5-1 IEC 60870-5-2



Traceroute

Over traceroute you can see the data path between two servers in the Internet. Traceroute lists all servers which are between the respective traceroute-server and the destination address.

Ping

Ping is an application of the ICMP (Internet Control Message Protocol RFC 792). This protocol (also a component of the IP protocol) transfers different administrative information and can therefore be used for fault-tracing. If the ping signal meets an object, its reflection (echo) can be received again from the appropriate transmitter. So, ping can find out whether the IP address is active (if a connection could be established) and how fast it is.



About
Information page

5.2 Serial Configuration

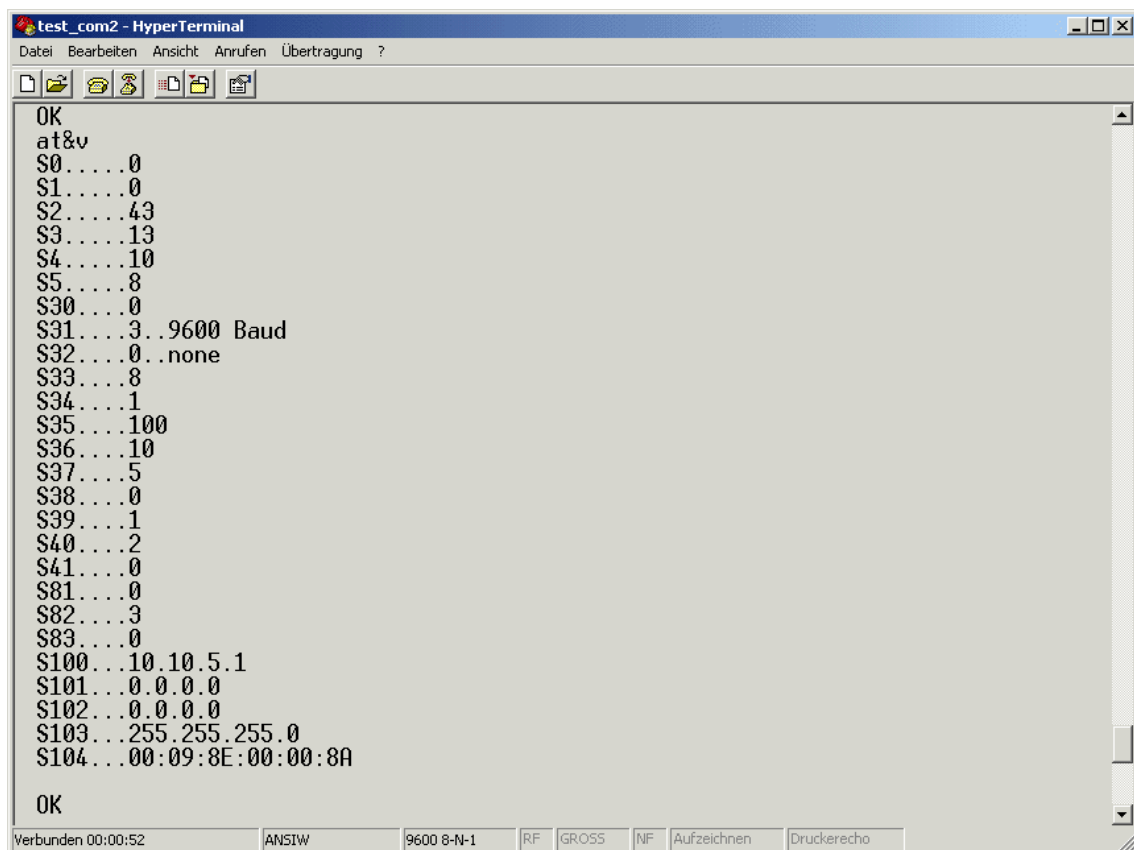
Connect the mains power supply to the device. The "power" light and the flashing "system" LED indicate that ipEther232 is operational.

The ipEther232 is connected to the PC or a serial terminal via a serial 1:1 cable.

(Basic settings: baud rate=9600, databits=8, parity=none, stopbits=1)

If the terminal tool ,e.g. HyperTerminal (this is part of the MS Windows Package, you can find it under Start → Programs → Accessories), is configured correctly for the connected Com port, the AT&V command returns the current configuration of the Ethernet modem.

For more detailed explanations about the AT commands and the registers, refer to chapter "AT- commands".



```
test_com2 - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?

OK
at&v
S0....0
S1....0
S2....43
S3....13
S4....10
S5....8
S30....0
S31....3..9600 Baud
S32....0..none
S33....8
S34....1
S35....100
S36....10
S37....5
S38....0
S39....1
S40....2
S41....0
S81....0
S82....3
S83....0
S100...10.10.5.1
S101...0.0.0.0
S102...0.0.0.0
S103...255.255.255.0
S104...00:09:8E:00:00:8A

OK
Verbunden 00:00:52  ANSIW  9600 8-N-1  RF  GROSS  NF  Aufzeichnen  Druckerecho
```

Examples:

- Set the IP address: ATS100=192.109.223.242
 - Set the baud rate to 38400: ATS31=5
 - Dial-up to the distant terminal: ATD 192.109.223.243
 - Hang up: +++ "2 sec. Pause" ATH
 - Leased line: ATS0=1, ATS102=192.109.223.243
- (Configure distant terminal as well!!!)

5.3 Configure Password Protection (Serial Devices only)

Enable the password configuration mode:

Enter the ATP master password to enter the configuration mode. The default master password is "000000".

→ ATP000000

Set up and change the passwords:

To change the master password, enter ATZ="new master password". 9 more passwords can be configured here (ATZ1...ATZ9).

→ ATZ1=ipether

Each password consists of a maximum of 8 characters (additional characters are ignored). The password is not case-sensitive (special characters are allowed).

Enter ATZ? or ATZ1?...ATZ9? to read out all the passwords.

Enable password protection:

Register 81 allows you to enable and disable the password protection (only in the password configuration mode).

→ ATS81=1 enable password protection mode

→ ATS81=0 disable password protection

Password blocking time:

Register S82 enables the setting of a password blocking time.

After three incorrect password entries, the modem waits for the blocking time, before a new password query is allowed.

→ ATS82=120 The blocking time is 2 minutes

Valid IP Addresses:

The password configuration mode allows the configuration of ten IP Addresses, for which calls are accepted. (ATR0....ATR9). If this list is empty, calls are accepted from all partner modems.

→ ATR1=192.168.10.12 Calls are accepted.

Save changes:

All changes only take effect after they have been saved.

The AT&W command starts the saving process.

→ AT&W

If the master password has been forgotten, the device must be sent in.

If the settings are not saved, all changes are lost once the ipEther232.Modem is disconnected from the power supply.

Quit the password configuration mode:

Enter ATP to exit the configuration mode.

→ ATP

The dial-up to a password protected ipEther232.Modem returns the message "PASSWORD:"

To set up a connection, the master password or one of the 9 additional passwords (if defined) must be entered.

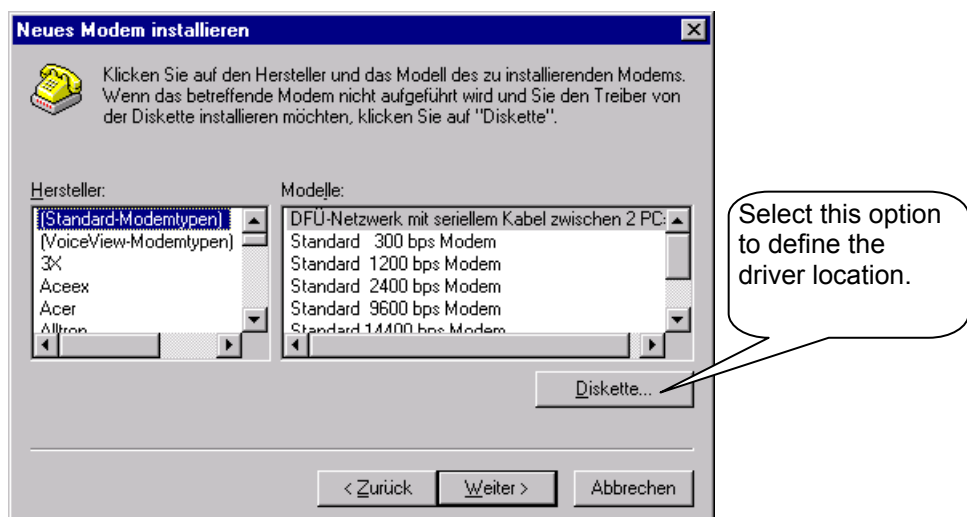
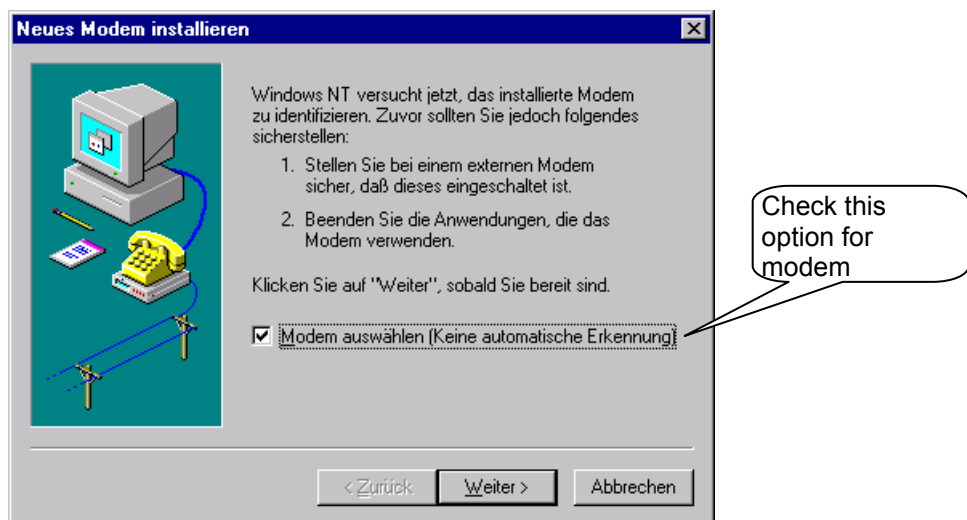
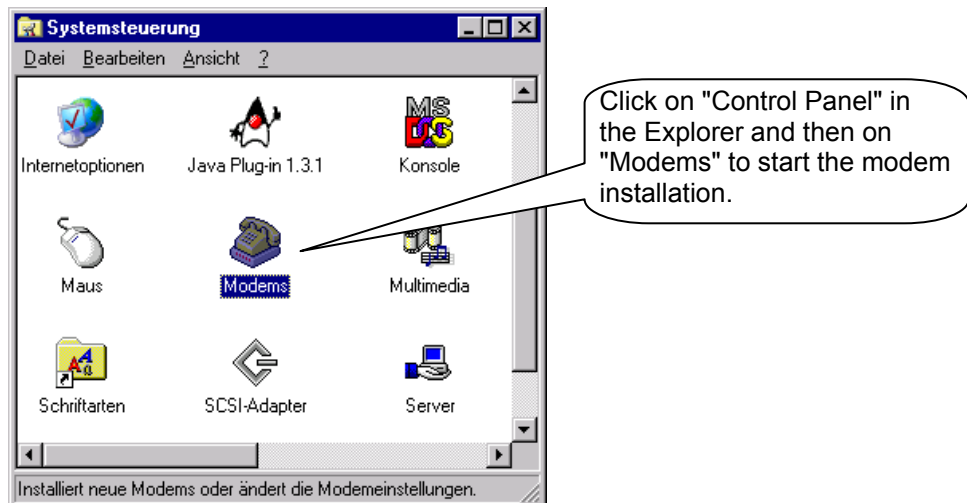
An incorrect entry leads to the "WRONG PASSWORD" message.

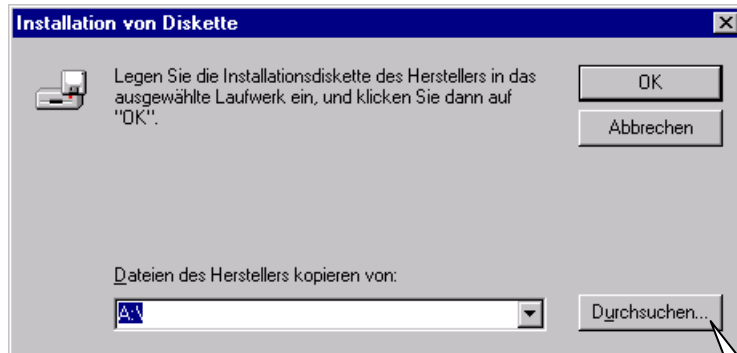
If a call from an IP protected modem is not accepted, the message "ACCESS DENIED" is shown.



5.4 ipEtherModem.inf (Driver-File)

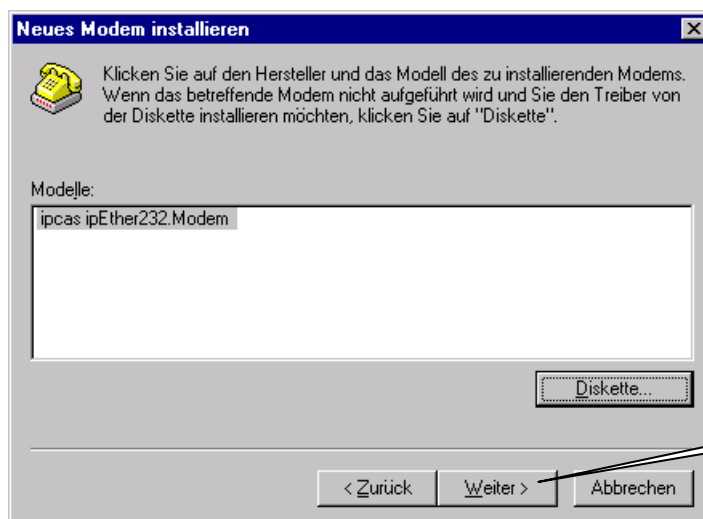
Follow these instructions to install the modem driver for ipEther232.Modem under Windows operating systems: e.g. for Win NT 4





Please, select
"Browse"...

and enter the location of the
.inf driver, after the
installation you will find it in:
C:\Program files\ipcas
GmbH\ipcas Ethernet
Products



Click on "Next"



Enter the ipEther232.Modem interface.



After the successful installation, you can adjust the modem to your particular requirements with "Properties" and "Dialing parameter"

5.5 Control Commands

Until now, there has been no standardized AT command set (AT = command prefix Attention), each manufacturer could implement his own. The V.250 command set is the first industry standard available. Microsoft recommends this command set for the PC-98 specifications and makes it a mandatory requirement for the PC-99 specifications.

With ipEther232.Modem, you have purchased a state-of-the-art "Ethernet modem" equipped with the AT command set. A terminal program enables you to enter the AT commands (e.g. "Hyper Terminal": This tool is part of the MS Windows package. You can find it under "Start - Programs - Accessories ").

5.6 AT Command Input and Execution

After power-up, the Ethernet modem is ready for command input. Only in this mode, commands can be accepted, interpreted and executed.

All commands directed at the Ethernet modem must be prefixed with the ASCII code **AT or at** (not permitted: At or aT) and followed by "Enter". If several commands are to be entered, they can be entered separately with the AT prefix and "Enter". It is just as permissible to place these commands in a single line between an introductory **AT** and finish the command input with the "Enter" key.


For readability, you might want to separate the individual commands with spaces. On reaching the end of the command line buffer, no further character entry is possible. The command line can however be edited with the "Backspace" key or executed by pressing "Enter".

5.7 Transmission Mode

After a successful connection setup to a distant terminal, the modem changes from the command mode to the on-line data mode.

The on-line data mode implies that a connection to a distant data terminal (i.e. another modem) has been established: The modem is on-line. This applies to a successful connection setup (outgoing call/ dialling) as well as to the answering of a call (call accept). In this mode, data exchange (data transmission) between two connected data terminals can take place.

To revert to command mode and back again while the connection is established, use the Escape and **ATO** commands. The Escape command consists of a sequence of three Escape characters (Default Setting: +++) and a valid command line.

The Escape character is something completely different from the  character of the ASCII character set and can be changed with the S2 register.

After the three Escape characters have been entered, the modem switches to the command mode. However, the transmission is only interrupt after a valid command line is recognized.

1. *OnlineMode*
2. *+++ [2-Second pause]*
3. *CommandMode*
4. *ATO*
5. *OnlineMode*

5.8 Quick Reference for AT Commands and Registers

This chart sorted by topic provides frequently used AT commands and registers, which enable you to modify the configuration of your Ethernet modem.

Configuration	Commands	Registers
Basic modem initialization	AT&F	
Controls the connection setup (dialling)	ATD	S37, S102
Call accept, line accept, hang up	ATA, ATD, ATH,	S0
Switch between command and on-line data mode	+++, ATO	S2
Read out modem information	ATI, ATS, AT%V, AT&V	
Employ stored initializations	AT&F, AT&W	
Controls the effect of DTR	AT&D	S37
Controls modem responses	ATE, ATQ, ATV, AT&D	S37
Controls serial speed	ATB	S31
Password protection	ATP, ATZ	S81, S82, S83
Callback	ATR	S110 – S119

5.9 Description of the AT Commands

Hayes Commands

The Hayes command set (AT commands) has over time developed into an industry standard among modem manufacturers. In addition, manufacturers use specific modem commands for their different products. To some extent, these commands are not compatible with modems of other manufacturers.

- ATA** This command makes the modem go off-hook, in order to connect to the calling remote modem. If no signal is recognized after a specified time, the modem hangs up again.
- ATB** Query and set baud rate. → ATB returns current baud rate.
Assign baud rate (ATB*value*, 2400,4800,9600,19200,38400,115200 Baud)
→ ATB Returns the current Baud rate
→ ATB9600 Adjust the Baud rate to 9600
- ATD** Dialling function. ATD*ipaddress* (ATDP and ATDT are suppressed and executed as ATD (P=pulse dial, T=tone dial)
→ ATD192.109.223.4 → ATD192,109,223,4
→ ATDP192.109.223.4 → ATDP192,109,223,4
→ ATDT192.109.223.4 → ATDT192,109,223,4
- ATE** Command echo enable/ disable:
→ ATE0 echo off → ATE1 echo on
- ATH** Modem goes on or off hook.
→ ATH0 modem hangs up (goes on-hook), the connection is broken off. Only possible in command mode. → ATH1 modem goes off hook (identical function to ATO).
- ATI** Return product information.
→ ATI0 2 (hardware code)
→ ATI1 www.ipcas.de (website)
→ ATI2 ipEther.Modem (product name)
→ ATI3 V6.3 19.12.2003 (firmware, date)
- ATN** A tool name could attached to the modem (max. 20 characters, it would be saved in capital letters).
→ ATN=*name* To give a tool name
→ ATN? Show tool name
- ATO** Return to data mode. → ATO
Note: By entering the "Escape-Sequence" (Default: +++), you can switch to command mode during a modem connection, where AT commands can be executed. This does not break off the connection. The ATO command terminates the command mode.

- ATP** Enable and disable the password configuration mode of the modem.
 After successful entry of the master password, passwords can only be set at the local RS232 interface. The master password is only for the password configuration mode and the connection passwords are only for the data communication. Passwords have a maximum length of 8 characters and their transmission is always in encrypted code. The password protection can be switched on/off in the password configuration mode by setting the register 81 (ATS81=1 enable; default = off (ATS81=0)).
 → ATP*master password* enables the password configuration mode (default: empty → ATP<Enter>)
 → AT&P quit the configuration mode
If the master password has been forgotten, the device must be sent in.
- ATQ** Enable / disable modem echo.
 → ATQ0 send echo → ATQ1 no echo
- ATR** Ten IP Addresses, for which calls are accepted, can be defined in the password configuration mode (ATR0....ATR9 (Register 110-119)). If this list is empty, calls are accepted from any partner modem.
 If a call from a modem is not accepted the "ACCESS DENIED" message is issued.
 → ATR*number=value* → ATR2=192.168.120.23
 → ATR2? read out register
- ATS** Set and query the internal Ethernet modem registers.
 Query: ATS*register?* → ATS2? (Output "+", (default)
 Set: ATS*register=value* → ATS0=2 (i.e. the modem answers a call after 2 rings)
- ATV** Return system echo of modem as character string or digits.
 → ATV0 response is a number
 → ATV1 response is a character string ("Ring", "Connect", "Busy")
 A further description can be found in chapter "Result Code".
- ATZ** Change passwords (only possible in the password configuration mode (see ATP)).
 Up to 9 passwords may be saved in the Ethernet modem.
 Passwords consist of a maximum number of 8 characters, no difference is made between small and capital letters (special characters are allowed).
 → ATZ=*master password* (change master password (default: empty))
 → ATZ1=password ... ATZ9=password (Set user password)
 → ATZ1? returns the defined password
 → ATZ=<Enter> Delete master password
 → ATZ1..9=<Enter> Delete user password
- AT&D** Interpret DTR control line.
 → AT&D0 ignore DTR ON/OFF transition
 → AT&D1 In this case the DTR transition from ON to OFF has the following effects: If the modem is in command mode, the transition has no effect. During a connection setup, the DTR transition from ON to OFF breaks off the connection set-up. If the modem is in on-line data mode (i.e. the connection is set up), it switches to the command mode.

AT&F Load default configuration. Exception Register S99. → AT&F
This command is not executed while there is a connection.

The following registers were not reset:	
Register	Definition
S1	Number of rings
S31	Baud rate
S32	Parity
S33	DataBits
S34	StopBits
S81	Password protection
S99	Time between two rings
S100	Own IP
S101	DefaultGateway
S103	Subnetmask
S104	MAC-Address
S110-119	Valid IP Addresses

AT&H Half Duplex control for RS485 as 2-wire solution.
While sending the reception of data is suppressed.
→ AT&H1 Half Duplex mode on
→ AT&H0 Half Duplex mode off (Full duplex; default)
→ AT&H? Read out Half Duplex mode

AT&P Leave password configuration mode (see ATP).

AT&R Give out a chart of all set IP-addresses receiving calls.
(see ATR) (only in passwordconfigurationmodus (see ATP) available)

AT&V Read out and display current configuration.

AT%V Display Firmware-Version (corresponds ATI3). → AT%V

AT&W Store current configuration in flash

AT&Z Give out a list of all passwords (master password and connection passwords)
(see ATZ) (only available in password configuration mode (see ATP)).

5.10 Overview of the registers

The modem has internal registers, enabling you to modify its configuration (see also ATS command).

Register	Definition	Default	Options
S0	Auto answer	0	[0..9] rings
S1	Number of rings	0	Read only
S2	Escape Character	+	ASCII
S3	CR-Character	0x0d	ASCII
S4	LF-Character	0x0a	ASCII
S5	BS-Character	0x08	ASCII
S30	Inactive-Timer	0	[0..255] ms
S31	Baud rate	3	1=2400 2=4800 3=9600 4=19200 5=38400 6=57600 7=115200
S32	Parity	0	0=None 1=Even 2=Odd 3=Mark 4=Space
S33	DataBits	8	7=7 8=8
S34	StopBits	1	1=1 2=2
S35	Rxd-Timeout	100	[5..255] ms
S36	Char-Timeout	10	[5..255] ms 0=Off
S37	Bit options	5	[0..255] decimal value
S38	Use TC57	0	[0..1]
S39	TC57 type	1	[0..3]
S40	fixed frame length	2	[2..255]
S41	User data length	2	[2..14]
S81	Password protection	0	[0..1]
S82	Password blocking time	3	[0..255] minutes 0=Off
S83	Wrong password entry	0	[0..255] in the RAM only
S99 *	Time between two rings	4	[0..255] s
S100	Own IP	10.10.5.1	xxx.xxx.xxx.xxx
S101	DefaultGateway	0.0.0.0	xxx.xxx.xxx.xxx
S102	AutoRemote	0.0.0.0	xxx.xxx.xxx.xxx
S103	SubnetMask	255.255.255.0	xxx.xxx.xxx.xxx
S104	MAC address	00:09:8E:x:x:x	Read only
S110 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S111 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S112 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S113 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S114 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S115 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S116 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S117 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S118 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx
S119 *	Valid IP address	0.0.0.0	xxx.xxx.xxx.xxx

* Registers are not issued with AT&V

S0 Automatic Call Accept

Range	0..9 rings
Default	0
Store in permanent memory	AT&W

In the S0 register, you can set the automatic call accept (auto answer). If S0 > 0, each incoming call is automatically answered. The value in S0 defines the number of rings the modem waits before it automatically answers.

If the entered value is not within the valid range, the modem automatically enters the next possible value (minimum or maximum value) defining the number of rings the modem waits. If you enter for instance 10 in Germany, the modem automatically enters 9.

S1 Ring Counter

Range	0..255 rings
Default	0
Store in permanent memory	no

The S1 register contains the number of rings of an incoming call. The value in S1 is reset to zero if no rings have arrived for a time span specified in the S99 register (default: 5 seconds). During this time, new incoming calls cannot be distinguished and the modem cannot dial.

S2 Escape Code Character

Range	0..255 decimal
Default	43 (+)
Store in permanent memory	AT&W

In the S2 register, you can define the Escape command '+++' allowing you to switch from data mode to command mode.

Values equalling 0 or >128 block the switch over to the command mode.

S3 Carriage Return Character

Range	0..127 decimal
Default	13 (Carriage Return)
Store in permanent memory	AT&W

In the S3 register, you can define the Return character.

S4 Linefeed Character

Range	0..127 decimal
Default	10 (Line feed)
Store in permanent memory	AT&W

The S4 register defines the line feed character.

S5 Backspace Character

Range	0..32, 127 decimal
Default	8 (Backspace)
Store in permanent memory	AT&W

The S5 register defines the Backspace character.

S30 Inactive Timer

Range	0..255 (10 seconds)
Default	0 (timer off)
Store in permanent memory	AT&W

In the S30 register, you can set the time span the modem waits before it kills the connection automatically if there is no reception or transmission of data in the meantime. 0 disables the inactive timer.

S31 Baud Rate

Range	1..7
Default	3 (= 9600 Baud)
Store in permanent memory	AT&W

In the S31 register, you can set the baud rate. The baud rate defines the number of state changes of the transmitted signal per second.
(1=2400 2=4800 3=9600 4=19200 5=38400 6=57600 7=115200)

S32 Parity

Range	0..4
Default	0 (no parity)
Store in permanent memory	AT&W

In the S32 register, you can set the parity bit for error detection in the case of asynchronous data transmission. Part of the data transmission format. Occasionally no parity, constantly one (mark) or zero (space). Even parity means that the bit is set if the data bit number is even and vice versa for odd parity.
0=None 1=Even 2=Odd 3=Mark 4=Space

S33 Data Bits

Range	7..8
Default	8
Store in permanent memory	AT&W

In the S33 register, you can set the number of data bits.
7=7 Bits 8=8 Bits

S34 Stop Bits

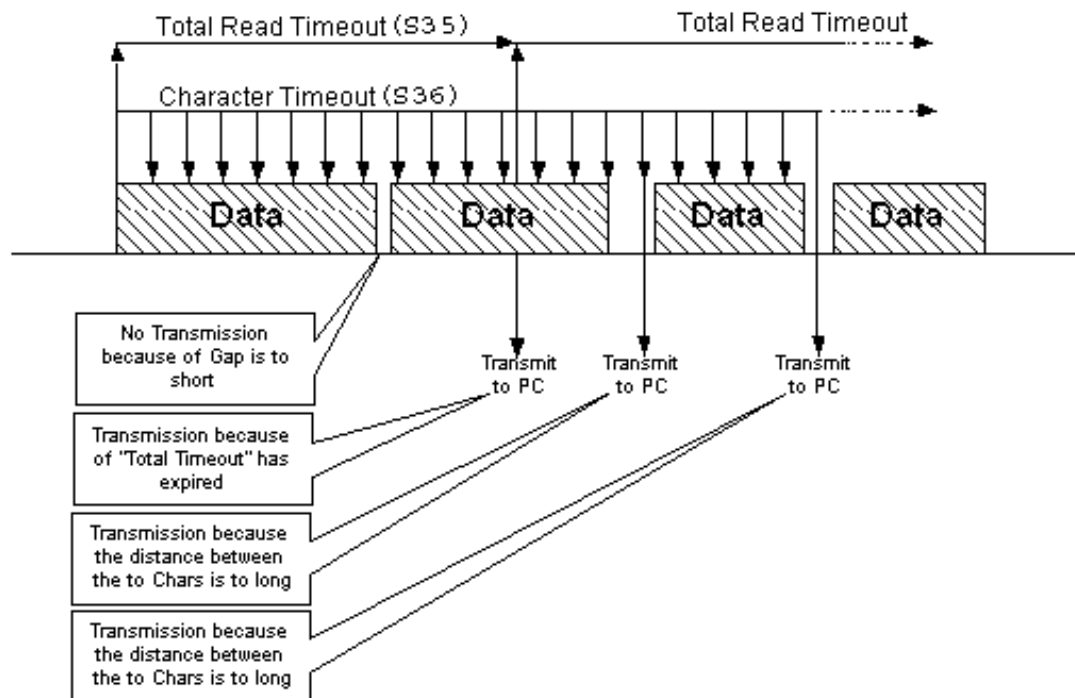
Range	1..2
Default	1
Store in permanent memory	AT&W

In the S34 register, you can set the number of stop bits. One or two bits in asynchronous transmission, indicating the end of a data word (packet).
1=1 Stop Bit 2=2 Stop Bits

S35 Rxd Timeout (Total Read Timeout)

Range	5..255 ms
Default	100 ms
Store in permanent memory	AT&W

In the S35 register, you can set the Total Read Timeout.
After the first byte has been received, "Total Read Time" starts. After it has expired, all characters received so far are sent to the PC. This value must not be lower than the delay of the UDP packet in the Ethernet. You can use the "ping" tool to determine the throughput time.



S36 Char-Timeout (Character Distance)


Range	5..255 ms
Default	10 ms
Store in permanent memory	AT&W

In the S36 register, you can set the Character Distance.
If the time span between two received characters (bytes) is greater than the defined Character Timeout, all bytes received so far are sent to the Ethernet.
After the Char-Timeout, all received characters until there are sent to the PC.
This value must not fall below the travel time of the UDP packet in the Ethernet.
Use the "ping" tool to determine the travel time.

S37 Bit Options

Range 0..255
Default 5 (binary: 0000 0101)
Store in permanent memory **AT&W**

In the S37 register, you can set the bit options echo, quiet, DTR, verbose, half-duplex controlling

Bit	Effect	Default	Definition
2 ⁷	n/c	0	
2 ⁶	n/c	0	
2 ⁵	H0 / H1	0	Half Duplex Control(see AT&H)
2 ⁴	Q0 / Q1	0	Echo (Return code) on/off(see ATQ)
2 ³	n/c	0	
2 ²	&D0 / &D1	1	DTR control line (see AT&D)
2 ¹	V0 / V1	0	System return code (see ATV)
2 ⁰	E0 / E1	1	command echo (see ATE)
			00000101 binary = 5 decimal

S38 UseTC57

Range 0..1
Default 0
Store in permanent memory **AT&W**

The advantage of the TC 57 setting is that on receiving a frame of this format (from the RS232 line) the frame is immediately sent to the Ethernet without waiting for a timeout. This greatly improves communication speed and performance.

(Default = 0, this means the registers 38-41 are inactive; 1 = register 38-41 active).

S39 TC57 type

Range 0..3
Default 1
Store in permanent memory **AT&W**

The IEC 60870-5-1 and IEC 60870-5-2 norms define four standard frame formats for the link layer. They are:

0 = Format FT 1.1
1 = Format FT 1.2
2 = Format FT 2
3 = Format FT 3

The transmission frame formats - FT 1.2, FT 2 and FT 3 have a fixed frame length.

The Frame with variable length for FT 2 and FT 3 has a header of fixed length. The Frame with variable length for FT 2 and FT 3 has a header of fixed length. It includes "Start character", "Length" byte, "User Data" and "Check Sequence". The user must select the desired format and include values for "Fixed frame length" and "Header length" parameters.

S40 TC57 Fixed frame length

Range	2..255
Default	2
Store in permanent memory	AT&W

The range of "Fixed frame length" is from 2 to 255 bytes.

S41 TC57 User data length

Range	2..255
Default	2
Store in permanent memory	AT&W

The range of "Header length" is from 2 to 14 bytes. This value only refers to "user data" from the header.

S81 Password protection

Range	0..1
Default	0
Store in permanent memory	AT&W

Register 81 allows to enable and disable the password protection.
The default value is 0 (password protection inactive).

If the password protection has been enabled, the modem displays the following behavior:

- After dial-up the modem issues the "PASSWORD:" message. The user has three trials to enter the password correctly. Then the modem is blocked for a definable time (see S82 in minutes)
- Incorrect password entries are counted (in the RAM only) ATS83.
- DCD is only activated in the remote modem after a successful password entry. After three incorrect password entries the remote modem goes on-hook without any call-back. "NO CARRIER" appears.

S82 Password blocking time

Range	0..255
Default	3
Store in permanent memory	AT&W

The blocking time is set in register 82. After three incorrect password entries, the modem allows no further password request until the blocking time expires. (0 = function disabled) (only in password configuration mode).

S83 Incorrect password entries

Range	1 Byte
Default	0

All incorrect password entries are counted in register 83 (in the RAM only).

S99 Time Distance between rings

Range	10..255
Default	4 (4 seconds)
Store in permanent memory	AT&W

In the S99 register, you can set the maximum permissible time distance between two received rings. The default value of 7.5 seconds applies in most cases.

S100 IP Address

Range	xxx.xxx.xxx.xxx
Default	10.10.5.1
Store in permanent memory	AT&W

In the S100 register, you can set your own IP Address. The factory-set value of 10.10.5.1 must be adjusted to your network.

Bear in mind, when modifying this value, that it cannot be chosen freely, but depends on the network address of the TCP/IP network. The input format follows the familiar syntax (e.g. 192.168.31.5).

S101 Default Gateway

Range	xxx.xxx.xxx.xxx
Default	0.0.0.0
Store in permanent memory	AT&W

In the S101 register, you can set the Default Gateway. Here you enter the Gateway IP address if connections to other subnetworks are to be established.

S102 Auto Remote

Range	xxx.xxx.xxx.xxx
Default	0.0.0.0
Store in permanent memory	AT&W

In the S102 register, you can set the Auto Remote Partner. Enter the IP Address of the "communication partner" for which a connection is to be established **automatically** (Leased line). After a connection break-off there is an automatic attempt to restore the connection. The connection set-up and take-down can be controlled via DTR (see AT&D).

S103 Subnet Mask

Range	xxx.xxx.xxx.xxx
Default	255.255.255.0
Store in permanent memory	AT&W

In the S103 register, you can set the Subnet Mask. The Subnet Mask only needs to be entered if the IpEther232.Modem is to connect to another subnetwork. In this case, enter the Subnet Mask for the subnetwork where the ipEther is located (e.g. 255.255.255.0). Please note: The IP Address also defines the network class. This results in a Default Subnetmask (e.g. 255.255.0.0 for a Class B network). They can only be extended "towards the right".

S104 MAC – Address

Range	00:09:8E:xx:xx:xx
-------	-------------------

This register contains the Mac address of the network interface, which cannot be changed.

S110-119 Valid IP Addresses

Range	xxx.xxx.xxx.xxx
Default	0.0.0.0
Store in permanent memory	AT&W

In register 110 to 119, IP Addresses can be set for which a call is accepted. For reading and writing the AT command, ATR has to be used. If no register contains an IP address, all calls are accepted.
If a call is not accepted by a modem, the "Access Denied" message is shown.

5.11 Result Code

System return code as a character string or digits (see AT command ATV), if not suppressed with ATQ1.

Char string	Digit	Definition
OK	0	Command line processed
CONNECT	1	Successful connection setup
RING	2	Incoming call
NO CARRIER	3	No connection established or inactivity timer expired
ERROR	4	Error in command input
NO DIALTONE	6	No Ethernet connection
BUSY	7	Dialed line busy
ACCESS DENIED	8	Call rejected due to failed password authentication
PASSWORD	11	Password OK
WRONG PASSWORD	12	Wrong password

5.12 Technical details for ipEther232.Modem

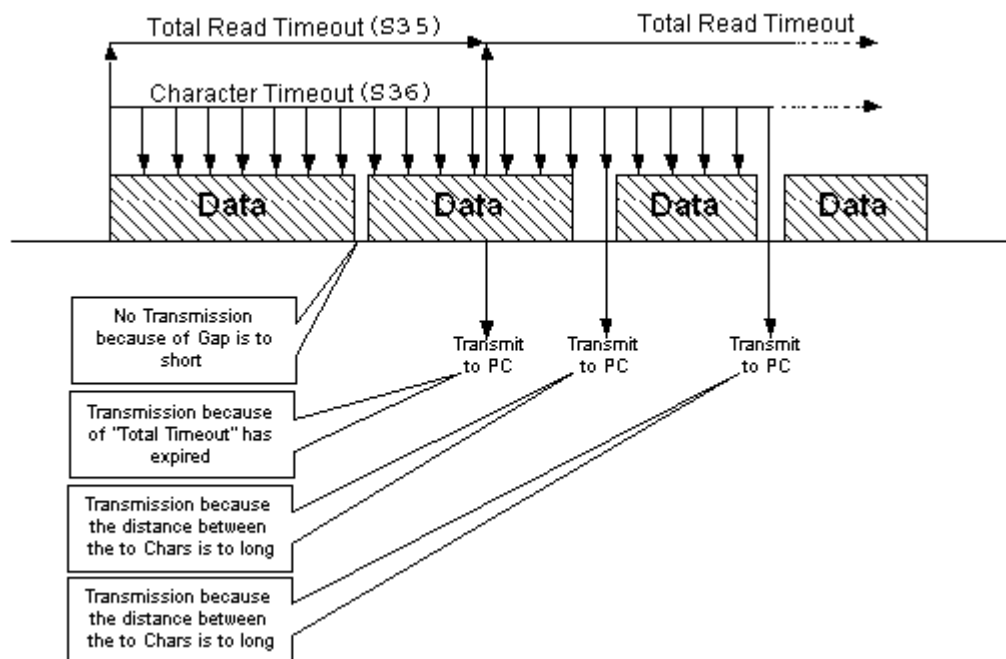
Great emphasis was placed on compatability during device design. Due to the Ethernet, there are, however, some minor restrictions.

- Data is not transmitted in bytes to the network, but Ethernet blocks are formed. This might result in minor delays.
- The blocking function does not directly affect the application but might help to reduce the network load.
- Some fine-tuning might be necessary for time critical applications as well. This involves the two timeout parameters ("Total Read Timeout", "Character Distance")

Block formation for serial data before transmission into the Ethernet

After the first byte arrives, "Total Read Time" starts. After the time expires, all characters received so far are relayed to the Ethernet. The default value is 100 ms.

"Character Distance" is the maximum distance between two received characters. If this is exceeded, all characters received so far are transmitted to the Ethernet. The default value is 10 ms.



UART

The UART supports transmission speeds between 2400 baud and 115200 baud. Higher baud rates might result in data loss if data is transmitted continuously. 7 or 8 data bits can be used. The parities "none", "even", "odd", "1" and "0" are supported. 7-bit data does not support the parity "none".

Further technical details

ipEther232.Modem		Desktop	DIN-Rail Unit	OEM Version
Interfaces		1 x RS232 or 1 x RS485 – SUB-D9 (full RS232)		
		<ul style="list-style-type: none"> ➤ Baud rate: 2.400 to 115.200 baud ➤ Parity: None, Even, Odd, Mark, Space ➤ Data: 7 or 8 Bits ➤ Stop: 1 or 2 Bits 		
		1 x 10BaseT – RJ45 (for networks at 10/100 MBit/s)		
Diagnostic LEDs		Power, System, Error, RS232 or RS485 Send/Receive Ethernet Send/Receive/Link		
Voltage		+ 8 - 14 V DC - Input Jack	+ 8 - 14 or 24 V DC ¹⁾ Input Jack and 3.5mm connector	+ 8 - 14 V DC – Input Jack 5 V DC male header on board
Housing		Plastic housing	Plastic housing	Without housing
Dimensions W/H/D		Approx. 45/108/73 mm	Approx. 45/108/73 mm	Approx. 100/20/70 mm
Operating / Storage temperature		5° C to 55° C / -10° C to 70° C		
Relative humidity		5 % to 90 % non-condensing		
Standards		CE		
Scope of delivery		ipEther232.Modem		
		External Power supply ²⁾ Input: 230 V AC Output: + 9 V DC	Without power supply (Optional)	Without power supply (Optional)
		Configuration software, Windows (NT, 2000, XP) driver, Manual (German or English documentation)		
Order number	RS232	0202014M	0202014M-H 0202014M-H24 0202014M-H60	0202014M-OEM
Order number	RS485	0202015M	0202015M-H 0202015M-H24 0202015M-H60	0202015M-OEM

¹⁾ Further voltages on request

²⁾ Delivery only into countries with 230 V AC 50Hz

Chapter 6: Configuration of ipEther232.PPP

6.1 Configuration of ipEther232.PPP

As mentioned above, the configuration program recognizes all devices in its own network segment.

A double click on an entry opens the details dialog which contains five parts.

The screenshot shows a Windows-style dialog box titled "ipcas ipEther.PPP Properties 10.0.1665.23835". It has five tabs: "TCP/IP", "RS232 & Modem", "PPP", "INet Info", and "About". The "TCP/IP" tab is active. Inside the dialog, there are two main sections. The first section, labeled "Info", contains three input fields: "MAC" with the value "68.65.6c.70.6d.65", "IP" with the value "192.109.223.210", and "Name" which is empty. The second section contains two input fields: "Default Gateway" with the value "0.0.0.0" and "Subnet Mask" with the value "255.255.255.0". At the bottom of the dialog are three buttons: "OK", "Apply", and "Cancel".

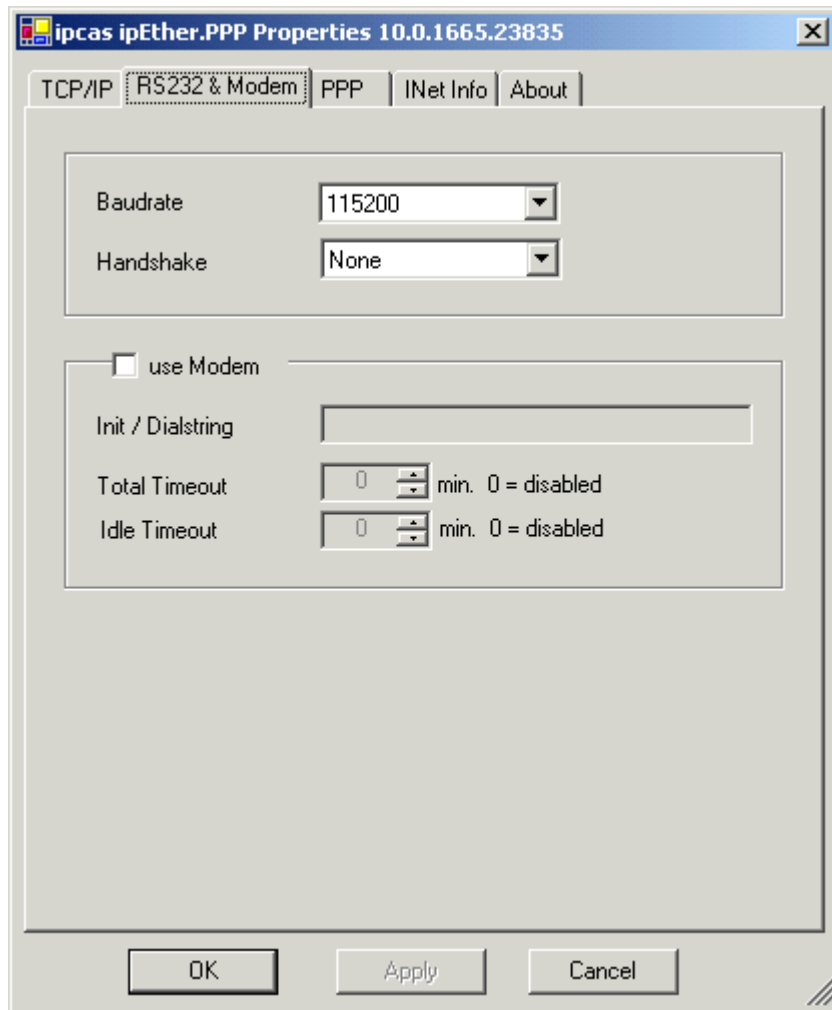
TCP/IP (Ethernet):

This is where you can find the device name (Set Name) the MAC-Address and IP-Address.

Here you can configure the default Gateway and the Subnet Mask for the Ethernet side.

(Default Gateway or no Gateway = 0.0.0.0)

(Default Subnet Mask: 255.255.255.0)



RS232:

Baud rate and Handshake are adapted to the communication behaviour of the serial terminal device.

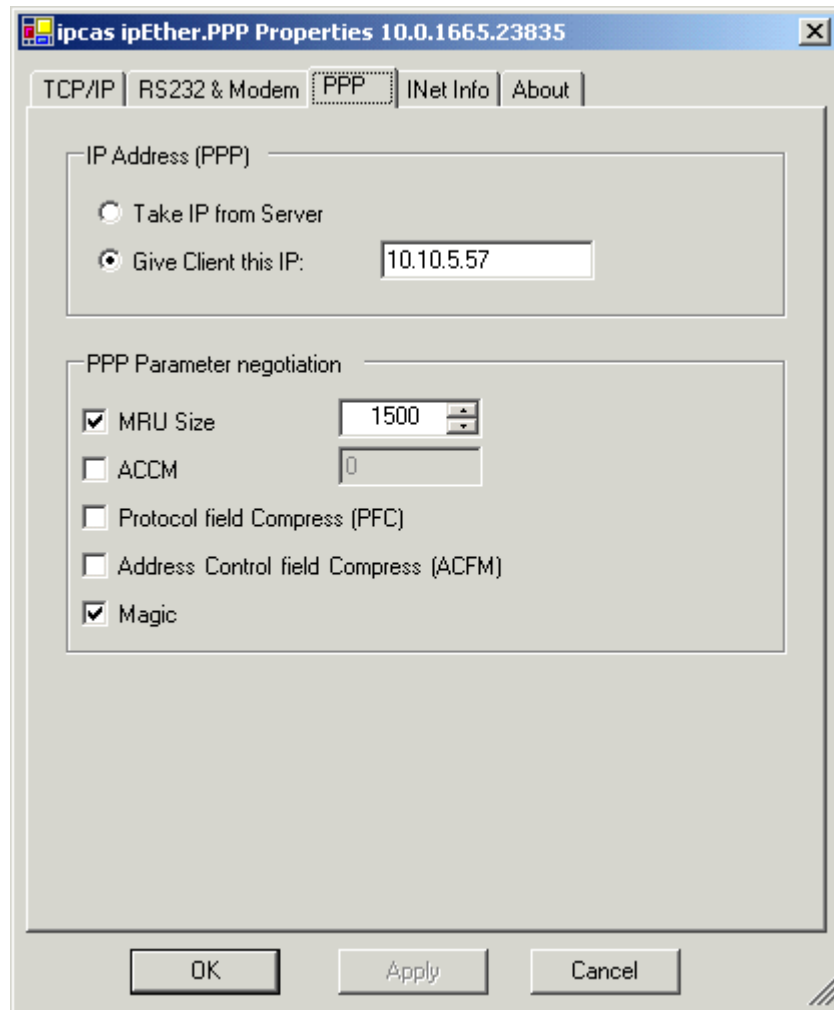
Modem settings (use Modem):

The modem behavior is defined here.

“Init Dialstring”: Typically, the Hayes commands are used in the “init string” to communicate with the modem. Please refer to the modem user guide for these commands.

“Total Timeout”: Specifies the maximum time span after which the modem connection is cut. The default 0 disables this function.

“Idle Timeout”: Specifies the time in minutes after which the modem disconnects.



IP-Address (PPP):

"Take IP from Server": This is where you can specify that the IP Address comes from a server.

"Give Client this IP": This is where you can set the IP Address of the serial side.

PPP Parameter negation:

"MRU-Size" specifies the maximum IP packet size. (Default = 1500)

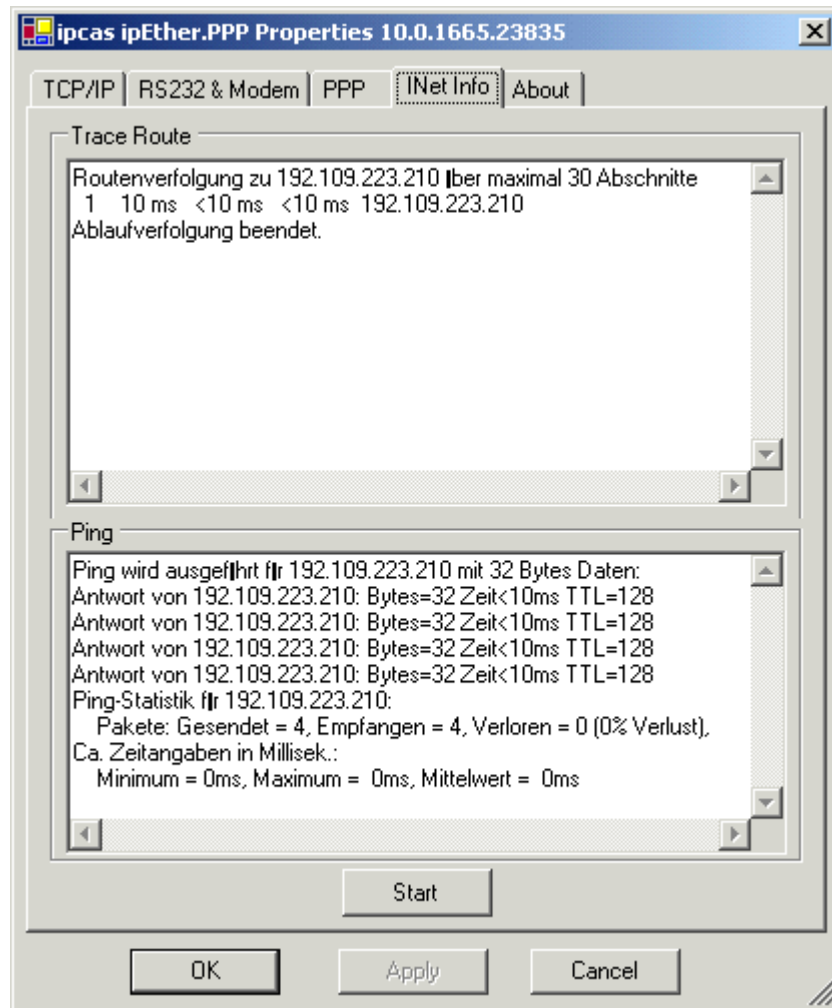
"ACCM". The entry format is hexadecimal code. (Default = 0)

"Protocol field Compress": Default: "Off"

"Address Control field Compress": Default: "Off"

"Magic": Default: "On"

The above parameters are described in more detail in the RFC-1661 and RFC-1662.

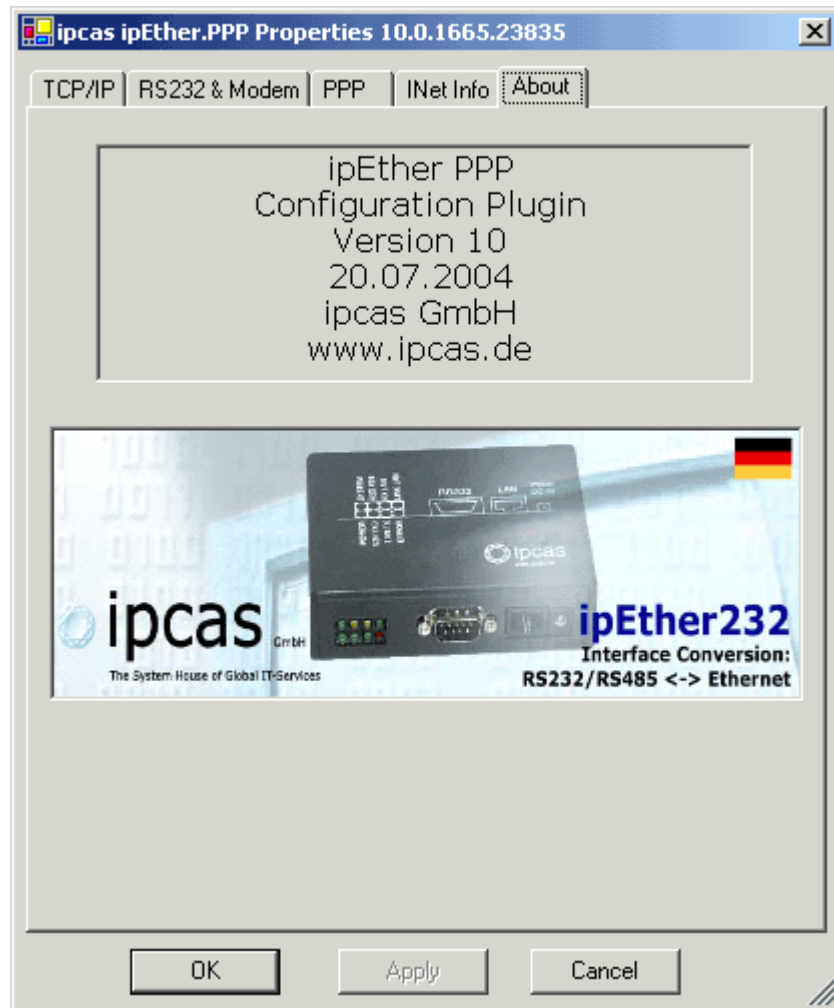


Traceroute

Over traceroute, you can see the data path between two servers in the internet. Traceroute lists all servers which are between the respective traceroute-server and the destination address.

Ping

Ping is an application of the ICMP (Internet Control Message Protocol RFC 792). This protocol (also a component of the IP protocol) transfers different administrative information and can therefore be used for fault-tracing, too. If the ping signal meets an object, its reflection (echo) can be received again from the appropriate transmitter. So ping can find out whether the IP Address is active (if a connection could be established) and how fast it is.



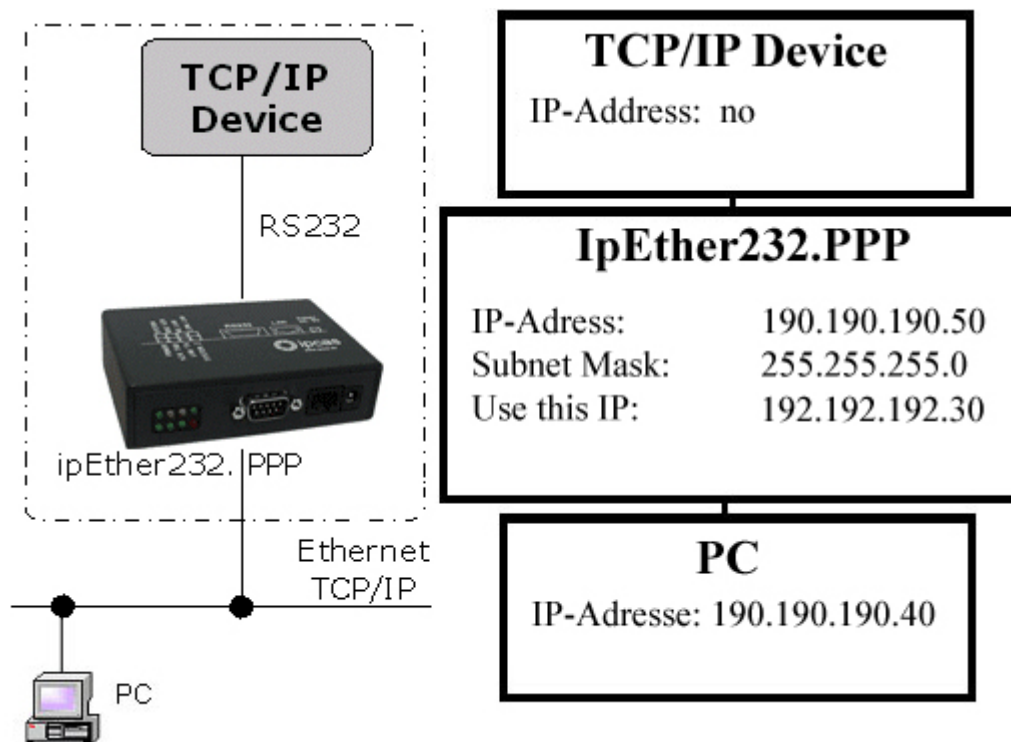
About

Information page

6.2 Configuration samples

Configuration sample 1: "Ethernet for all"

Ethernet capability for all TCP/IP enabled devices without a dedicated Ethernet interface.



Routing between two networks. A route has to be configured at the TCP/IP device and on the PC.

At the example above it would be...

...these commands are for Windows NT / 2002

- For PPP: "route ADD 190.190.190.40 MASK 255.255.255.0 190.190.190.50"
- For PC : "route ADD 190.190.190.50 MASK 255.255.255.0 192.192.192.30"

...these commands are for Linux-Systems:

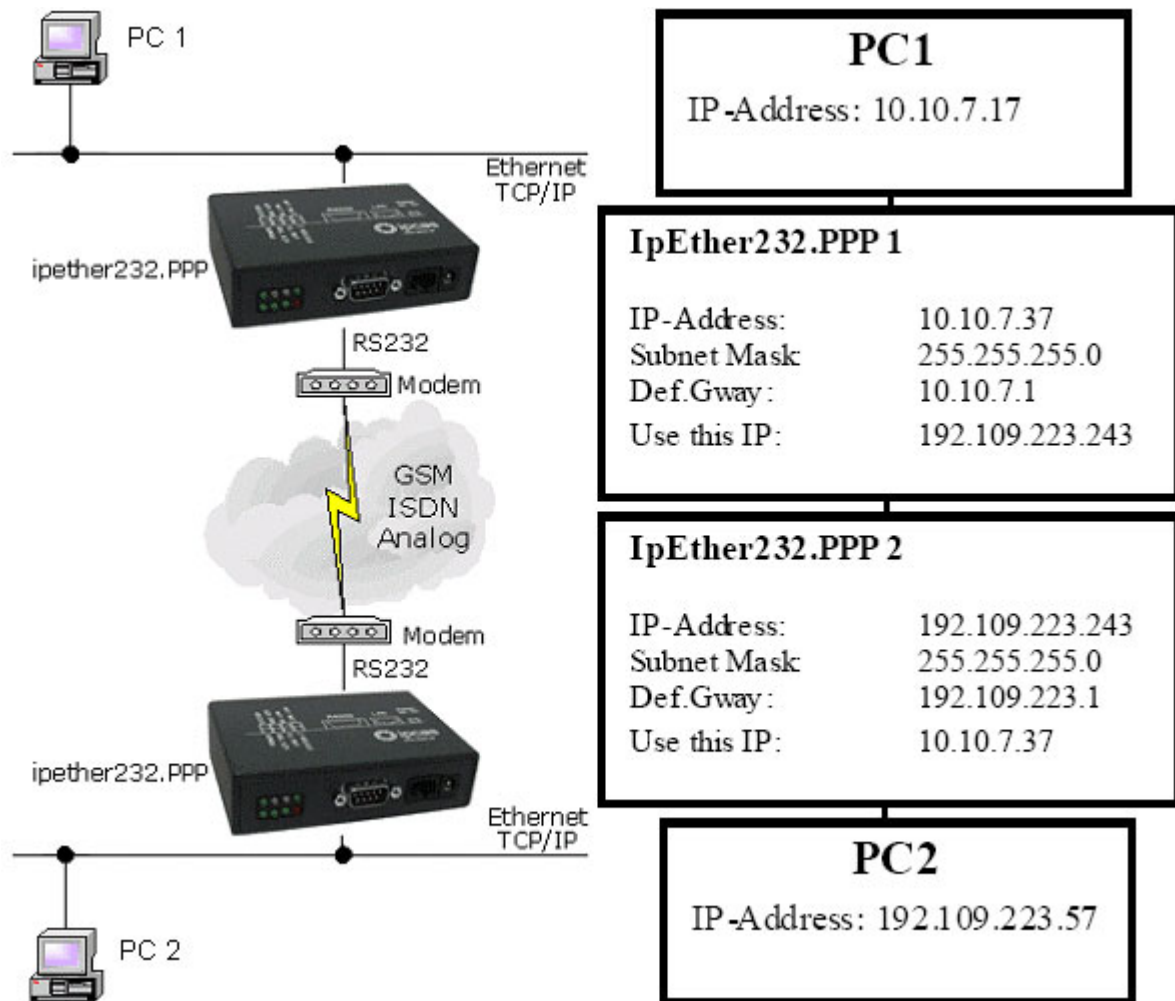
- For PPP: „route add -net 190.190.190.40 gw 190.190.190.50
netmask 255.255.255.0 dev ppp0“
- For PC : „route add -net 190.190.190.50 gw 192.192.192.30
netmask 255.255.255.0 dev ppp0“

The Configuration could be tested as follows:

- For PPP: "ping 190.190.190.50 -t"
- For PC : "ping 190.190.190.40 -t"

Configuration sample 2: “simple Network routing”

Simple routing between two networks via GSM, ISDN or analog modems, for instance to link up a branch to the company LAN.



Routing between two networks. A route has to be configured on both PC's.

At the example above it would be...

...these commands are for Windows NT / 2002:

- For PC 1: „route ADD 192.109.223.0 MASK 255.255.255.0 10.10.7.37“
- For PC 2: “route ADD 10.10.7.0 MASK 255.255.255.0 192.109.223.242”

...these commands are for Linux Systems:

- For PC 1: “route add –net 192.109.223.0 gw 10.10.7.37
netmask 255.255.255.0 dev ppp0“
- For PC 2: “route add –net 10.10.7.0 gw 192.109.223.243
netmask 255.255.255.0 dev ppp0“

The Configuration could be tested as follows:

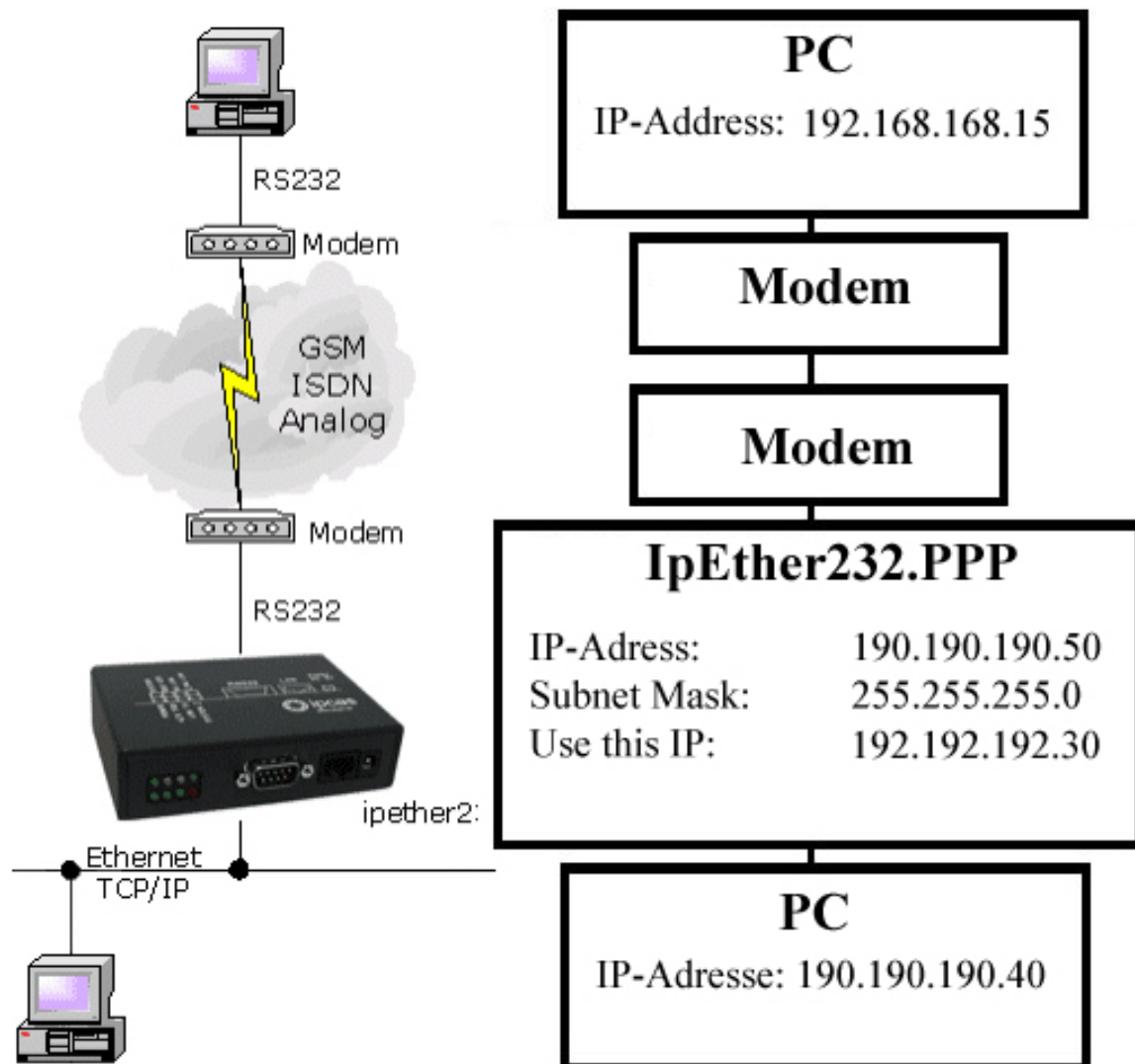
- For PC 1: “ping 192.109.223.57 -t“
- For PC 2: “ping 10.10.7.17 -t“



Both modems have to be configured to “Answer incoming calls”.
(Normally: Register S0=1)

Configuration sample 3: “dial in“

Enables company LAN access for home office, remote maintenance or for field reps.



Routing between two networks. A route has to be configured on both PC's.

At the example above it would be...

...these commands are for Windows NT / 2002:

- For PPP: "route ADD 190.190.190.40 MASK 255.255.255.0 190.190.190.50"
- For PC : "route ADD 190.190.190.50 MASK 255.255.255.0 192.192.192.30"

...these commands are for Linux Systems:

- For PPP: "route add -net 190.190.190.40 gw 190.190.190.50
netmask 255.255.255.0 dev ppp0"
- For PC : "route add -net 190.190.190.50 gw 192.192.192.30
netmask 255.255.255.0 dev ppp0"

The Configuration could be tested as follows:

- For PPP: "ping 190.190.190.50 -t"
- For PC : "ping 190.190.190.40 -t"



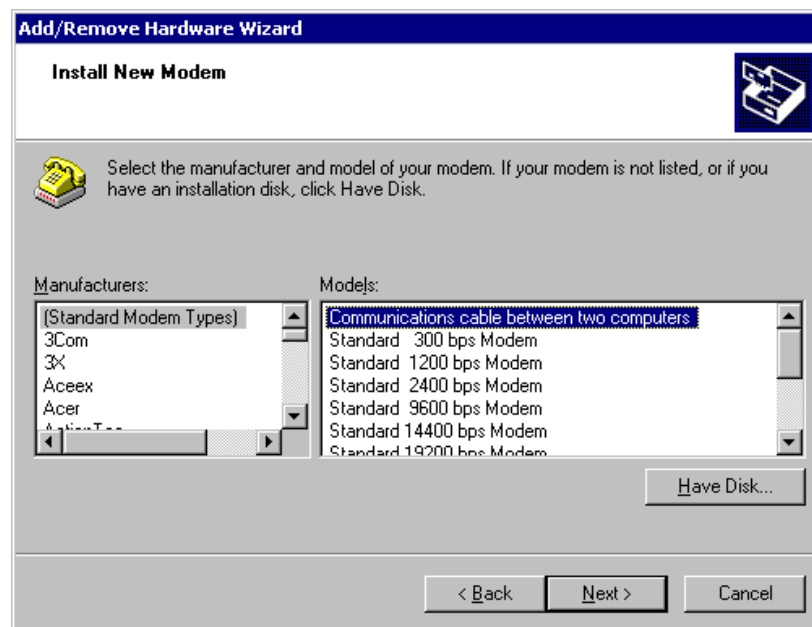
Both modems have to be configured to "Answer incoming calls".
(Normally: Register S0=1)

6.3 PPP direct connection under Windows

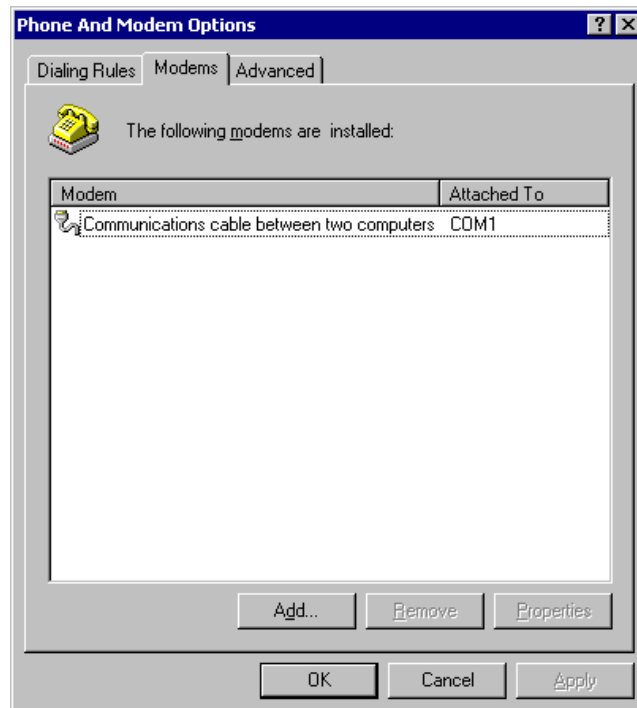
Windows 2000

The following configuration is needed to establish a PPP direct connection without modems on Windows 2000.

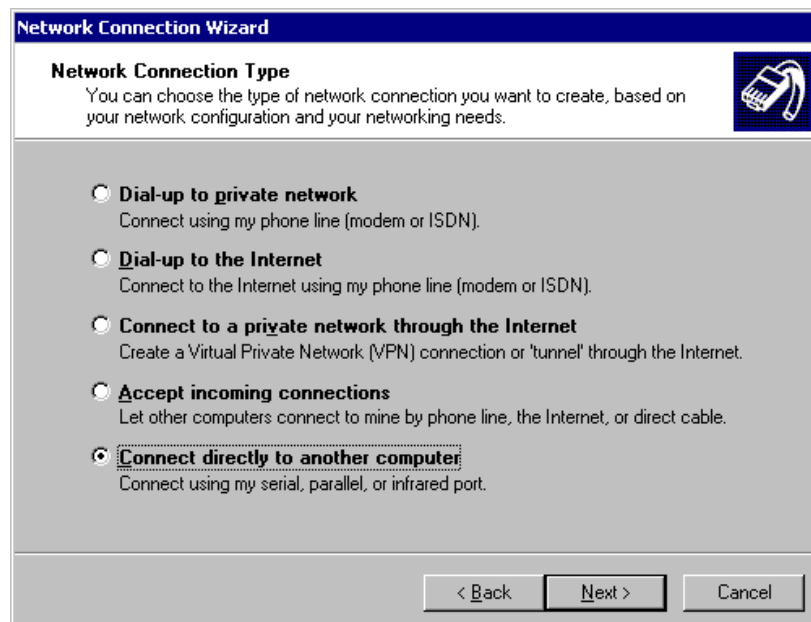
In order to create a dial-up connection, Windows needs a modem. We would like to implement a PPP direct connection without modems, therefore we have to create a modem ("Communications cable between two computers") before it. Start in the Control Panel the "Phone and Modem Options". Click on "Modems" and then on the "Add" Button. Mark the option "Don't detect my modem ..." in the new opened dialogue and click on "Next". After that, configure as follows.



In the following dialogue, you have to decide on which physical connection the modem (finally the ipEther232.PPP) should be installed. After a successful creation, the modem should be registered in “Phone and Modem Options”.

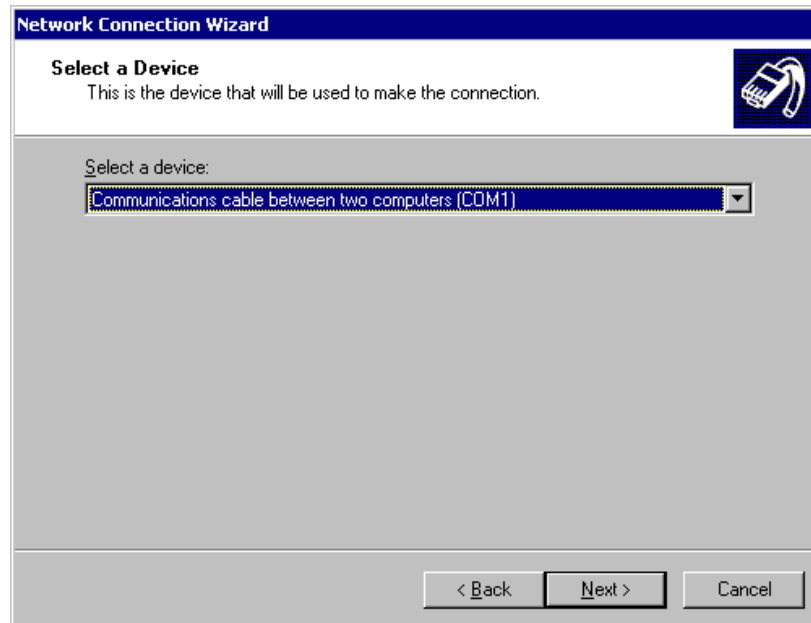


Double click on “Make New Connection” in the “Network and Dial-up Connections”. Click on the button “Next” up to the following dialogue.



After choosing the option “Connect directly to another computer”, click on “Next”.

In the next dialogue the role of this computer at this connection had to be selected. Choose “Guest” and click on “Next”.

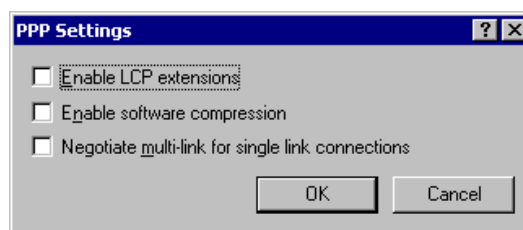


The created “connection cable” has to be selected as device. In the following dialogues, the availability and the name of the connection has to be set. These inputs are optional.

After completing, the connection can be found in the “Network and Dial-up Connections”.

Right-click on the “Dial-up Connection” and click on “Properties”. In the “General” menu click on “Configure...” and select a fitting “Maximum Speed” appropriate to the configured baud rate of the ipEther232.PPP.

In the “Networking” menu click on “Settings” and configure as follows.

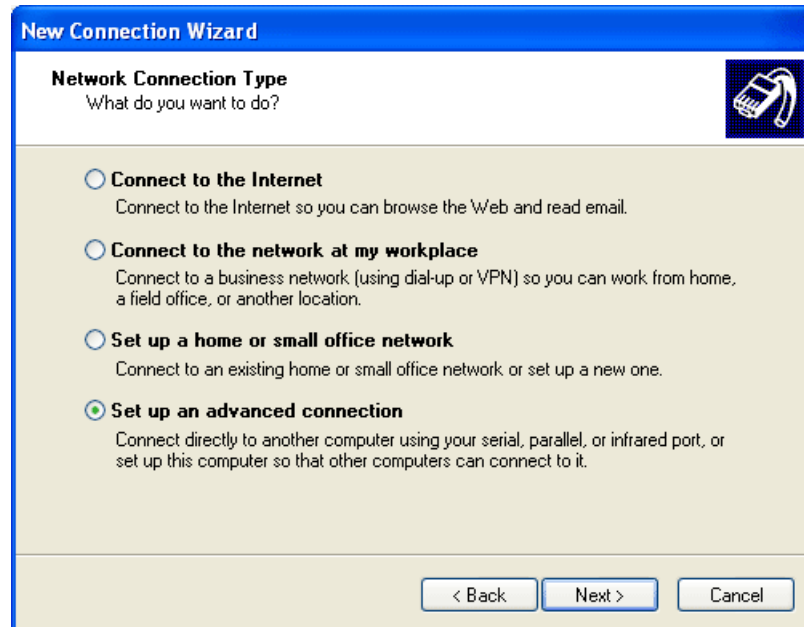


It is not necessary to set a login or password because the PAP / CHAP protocols are not supported.

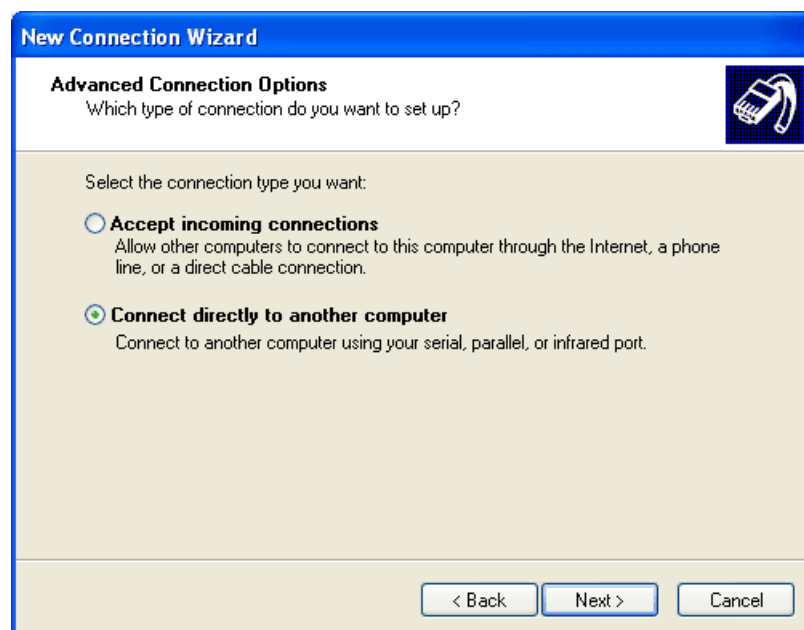
Windows XP

The following configuration is needed to establish a PPP direct connection without modems on WINDOWS XP.

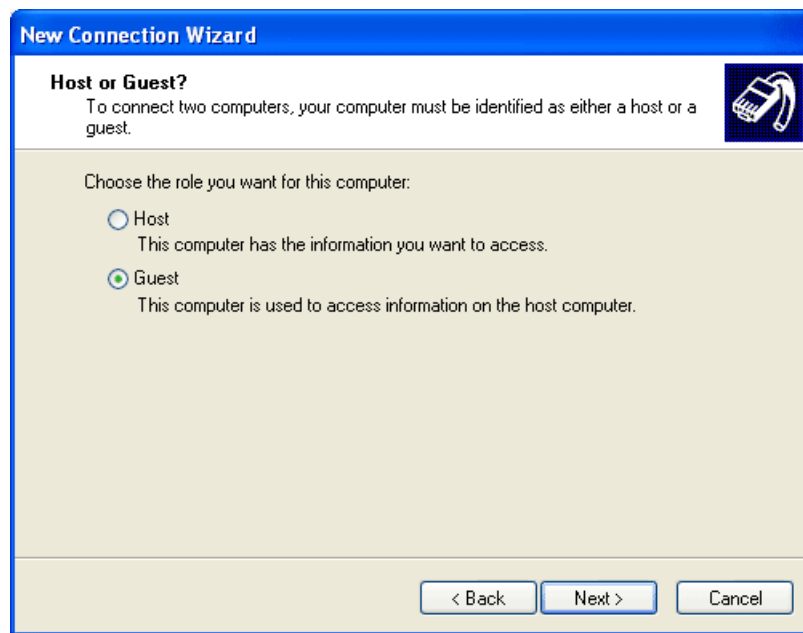
First, open the WINDOWS XP top-menu and click on "Settings". Then click on the button "Network and Dial-up Connections". Here, you open the network-assistant and choose "Set up an advanced connection".



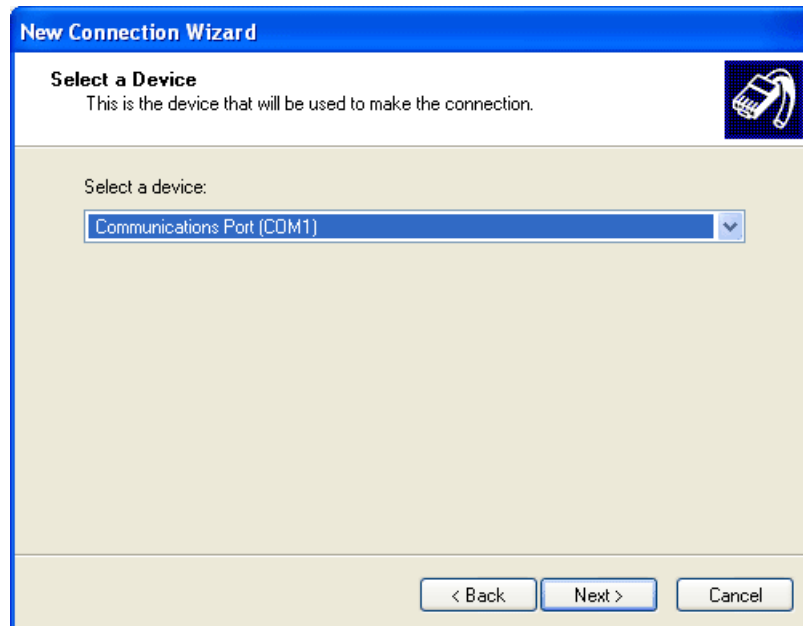
In this dialog, you choose "Connect directly to another computer".



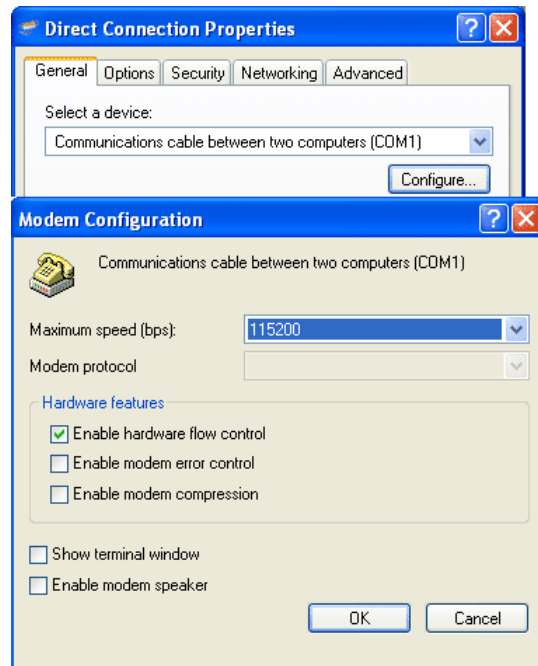
In this dialog you choose the option "Guest".



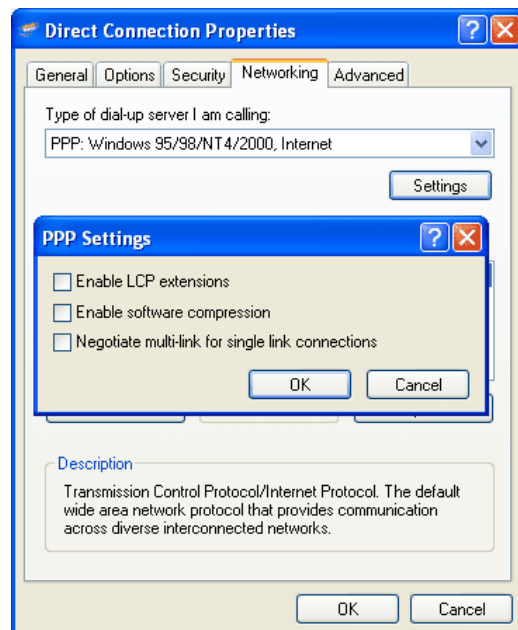
Now you have to choose the Com-Port to which you connected the ipEther232.PPP. (In the example, Com1 is use).



Now you should see a new connection in the window "Network and Dial-up Connections". You have to click on this and choose the register "Properties". In the "General" menu, click on "Configure..." to set the transfer rate of the ipEther232.PPP. (You have to set the same baud rate, which is in the configuration tool in the Property Page of the ipEther.PPP that is to be used).



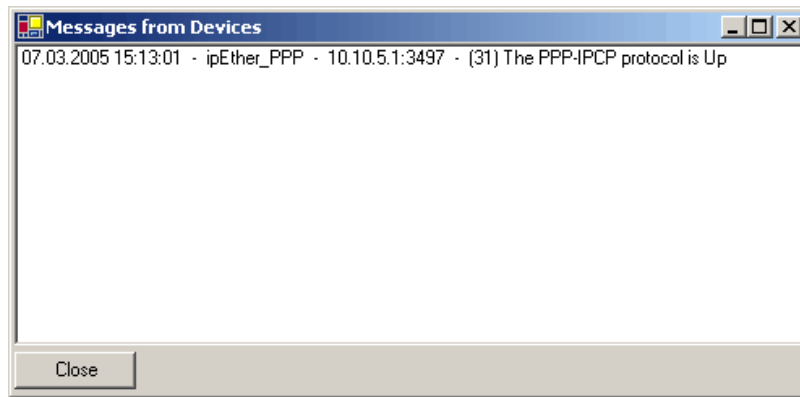
Now choose the register network and click to "configuration" to delete all options in the window "PPP-settings".



It is not necessary to set a login or password because the PAP/CHAP protocols are not supported.

6.4 Logfile

After a successful PPP connection in the “Messages from Devices” dialog (right click in the configtool under the option “Device messages”) contains the following:



Any occurred errors during the communication could be analysed under the option “Device messages”. You can find an overview of the error messages in chapter 3.3 logfiles. Simultaneously all errors are stored in the “Event viewer” of Windows.

6.5 Technical Details for ipEther232.PPP

Great emphasis was placed on compatability during device design. There are, however, some minor restrictions:

- ipEther232.PPP can store 20 Ethernet packets that are then transmitted to the RS232 or the Ethernet side. If additional packets arrive before memory has been freed, the packet is discarded. This is however reported and written to the error logfile (see Configtool). The problem only occurs if too many connections are open at the same time or too many unacknowledged packets are sent at the same time (Windows size too large or UAP connections).
- The ARP cache can hold 20 entries. If the PPP side requires more ARP entries, the oldest entry is deleted. This might however have an adverse effect on the performance.
- ipEther232.PPP principally uses the "hardware handshake".
- Should problems arise, we recommend testing the connection with Linux PPPD.
- CCP (Compression Control Protocol) is not supported.

UART

The UART supports transmission speeds between 2400 baud and 115200 baud. Higher baud rates might result in data loss if data is transmitted continuously. The device uses 8 data bits and "no parity".

Further technical details

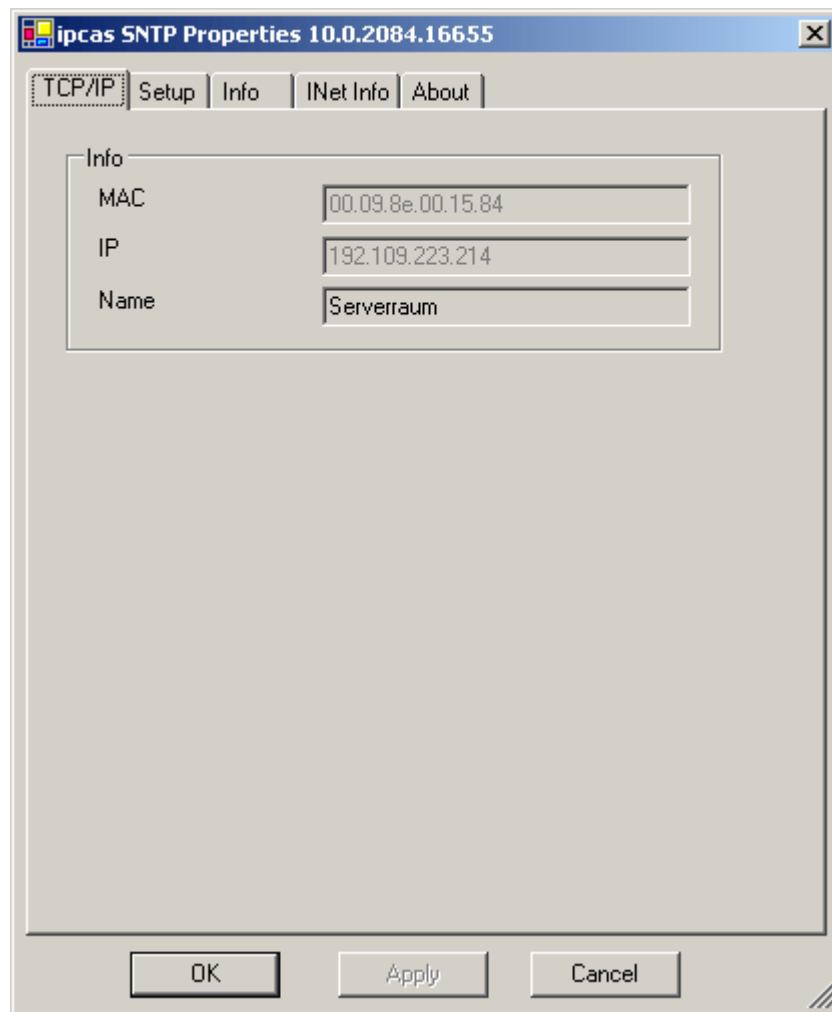
ipEther232.Telnet		Desktop	DIN-Rail Unit	OEM Version
Interfaces ipEther232.Telnet		Alternatively 1 x RS232 or 1 x RS485 – SUB-D9 (full RS232)		
		➤ Baudrate: 2.400 to 115.200 baud ➤ Parity: None, Even, Odd, Mark, Space ➤ Data: 7 or 8 Bits ➤ Stop: 1 or 2 Bits		
		1 x 10BaseT – RJ45 (may be operated in 10/100 Mbit/s networks))		
Diagnosis (LED)		Power, System, Error, RS232 or RS485 Transmit/Receive Ethernet Transmit/Receive/Link		
Supply voltage		+ 8 - 14 V DC – Input Jack	+ 8 - 14 or 24 V DC ¹⁾ Input Jack and 3,5mm connector	+ 8 - 14 V DC – Input Jack 5 V DC on-board connector
Gehäuse		Plastic housing	Plastic housing	Without housing
Dimensions W/H/D		Approx. 110/30/75 mm	Approx. 45/108/73 mm	Approx. 100/20/70 mm
Operating- / storage temperature		5° C to 55° C / -10° C to 70° C		
Relative humidity		5 % to 90 % non-condensing		
Standards		CE		
Scope of delivery		ipEther232.Telnet		
		Power supply ²⁾ In: 230 V AC Out: + 9 V DC	Without power supply (Optional)	Without power supply (Optional)
		Configuration software, Driver for Windows (NT, 2000, XP), Manual (German or English documentation)		
Order number	RS232	0202020	0202020-H 0202020-H24 0202020-H60	0202020-OEM

¹⁾ Further voltages on request

²⁾ Delivery only into countries with 230 V AC 50Hz

Chapter 7: Configuration of ipNTP

7.1 Configuration of ipNTP



TCP/IP:

This is where you can find or set the device name (Set Name) the MAC-Address and IP-Address.

The screenshot shows the 'ipcas SNTP Properties' window with the 'Setup' tab active. The 'UDP-Port' is set to 123. The 'Broadcast / Multicast Interval' is 64 seconds. The 'Multicast' checkbox is checked, and the 'Multicast Address' is 224.0.1.1. The 'Localtime instead of UTC' checkbox is also checked, with the 'Timezone' set to UTC. Below this, the 'Zone' is also set to UTC. The 'Bias to GMT', 'Bias - Standard Time', and 'Bias - Daylight Time' are all set to 0 minutes. The 'Start Daylight Time' and 'End Daylight Time' are both set to 'none'. The 'OK', 'Apply', and 'Cancel' buttons are at the bottom.

UDP-Port

Here you can configure the UDP-Port. (Default = 123)

Broadcast / Multicast Interval

Here you can configure the Broadcast / Multicast interval. Broadcast / Multicast interval is the time period in which the NTP server transmits the alignment information to all clients. Clients and server must be in the same Subnet.

Multicast

Here you can deactivate or activate the Multicast and set the Multicast address. The Multicast mode requires that the server and the clients have multicast at their disposal and configured.

Local time instead of UTC

Here you can configurate any desired time zone on which the time of the server is to depend.

Then the difference is indicated to GMT, the difference from summer time respectively winter time to the GMT and the start time / end time of the summer time.

To create an own time zone with *tzedit*

With the programm tzedit, you can create your own time zone and edit existing time zones.

You can configure the difference to GMT, the difference from summer time respectively winter time to the GMT and the start time / end time of the summer time.

You can download the programm under <http://www.microsoft.com>.

Edit Time Zone

Time Zone Name:

Abbreviation:

Offset from GMT:

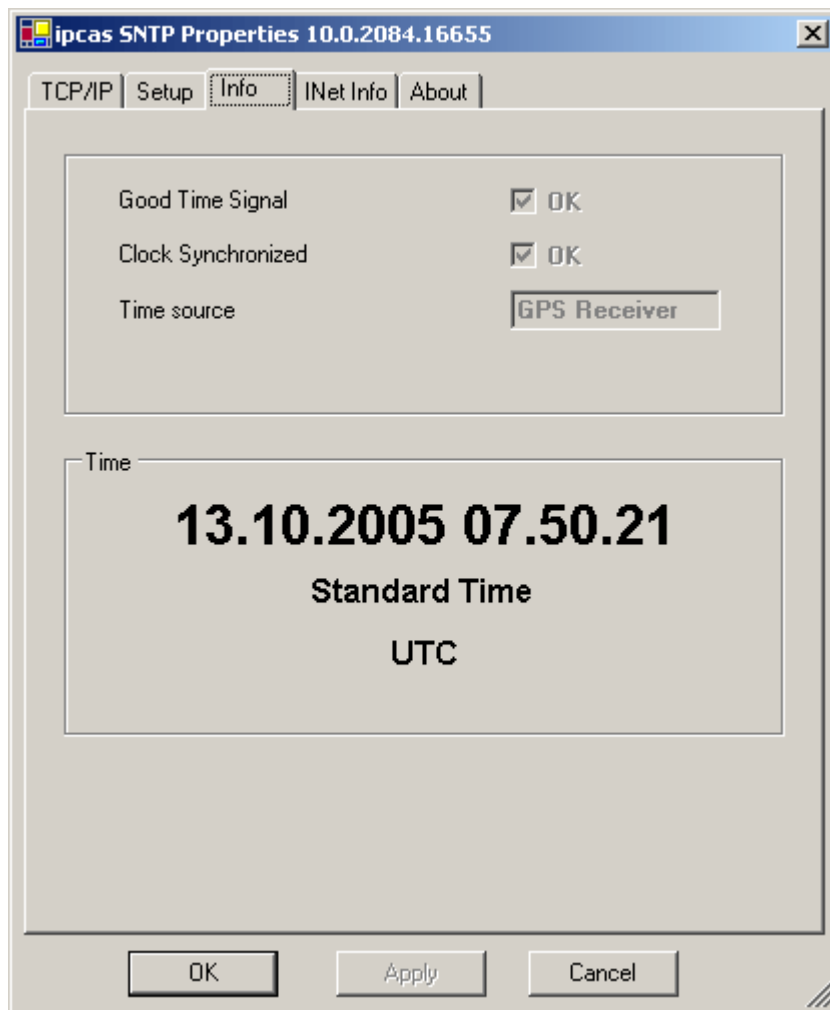
☒ Automatically set Daylight Saving Time

Start Day: of at

Last Day: of at

Abbreviation: Daylight Bias:

OK Cancel Help

**Good DCF77 Signal**

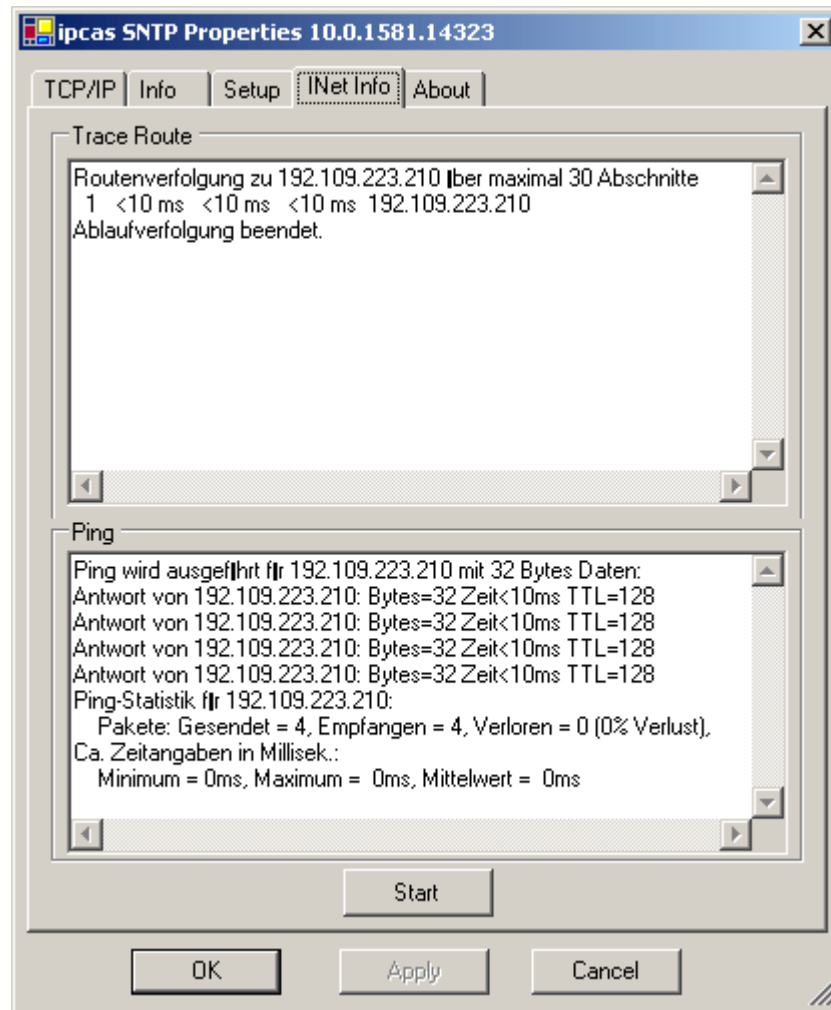
Shows whether the DCF77 signal is received.

Clock Synchronized

Shows if the synchronization of the clock is working. This box is marked first after receiving a good DCF77 signal for 60 seconds.

Time

Shows the current UTC (Universal time code), this is the current Greenwich time (Zero degrees longitude). The individual clients equalize their time with the UTC of the server and tune the time of the clients with the corresponding time zone selection.



Traceroute

Over traceroute you can see the data path between two servers in the internet. Traceroute lists all servers which are between the respective traceroute-server and the destination address.

Ping

Ping is an application of the ICMP (Internet Control Message Protocol RFC 792). This protocol (also a component of the IP protocol) transfers different administrative information and can therefore be used for fault-tracing, too. If the ping signal meets an object, its reflection (echo) can be received again from the appropriate transmitter. So ping can find out whether the IP address is active (if a connection could be established) and how fast it is.

For Windows systems, you type „ping *IP-Address*“ on the command shell.
 For Linux systems, you type „ping -s *IP-Address*“ on the command shell.
 For Solaris systems, you type „ping -s *IP-Address* 32“ on the command shell.



About

Information page

7.2 SNTP-Clients


To synchronize the time of your computer with the time of the NTP server, you'll need a SNTP client.

NTPTime

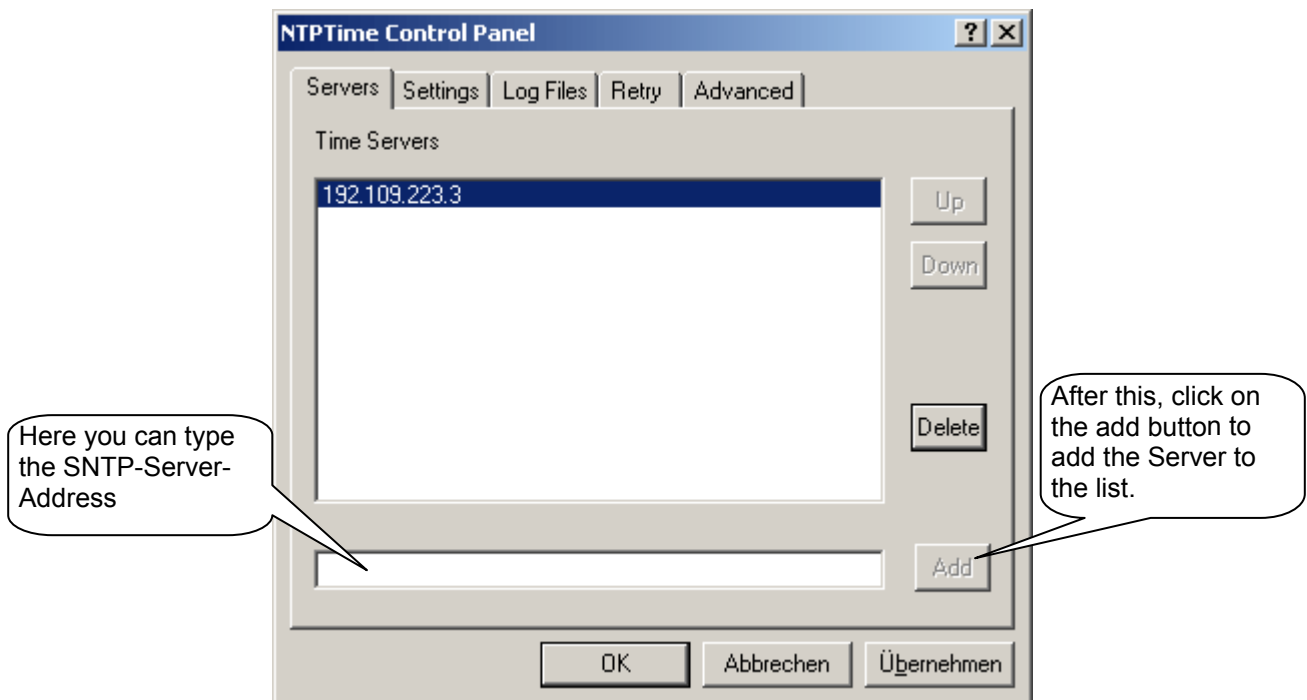
NTPTime is easy and free. You can find it on this link http://www.tu-braunschweig.de/afs/tu-bs.de/public/ntp_win/ntp41bin.zip and you can find a detailed English documentation on this link http://www.tu-braunschweig.de/afs/tu-bs.de/public/ntp_win/ntp41doc.zip

Installation under Windows systems

1. Create a temp directory(e.g. C:\temp\ntp\bin).
2. Copy(.../public/ntp_win/) ntp41bin.zip to C:\temp\ntp\bin and extract it.
3. From the bin-Directory, copy ntptime.cpl to the SysRoot-Directory (e.g. C:\winnt\system32).If you have done the last steps right, you will see a new

NTP icon in the control panel that looks like this sign here→ . On the control panel is this icon to control the NTP Settings.

4. Copy ntptime.exe to C:\Programm\NTP from bin directory.
5. In the control panel, start the NTP-Controller and make your individual settings like Timeserver-Address, logfile directory or how often the device should be synchronized.
6. Open a Command Shell and type the following commands:
C:\Programme\
Change the directory with ntptime.exe
. \ntptime -install implement the ntptime as Windows service
net start ntptime start the ntp-time-service
The logfiles will create on your chosen folder. You can control the logfiles with Notepad.

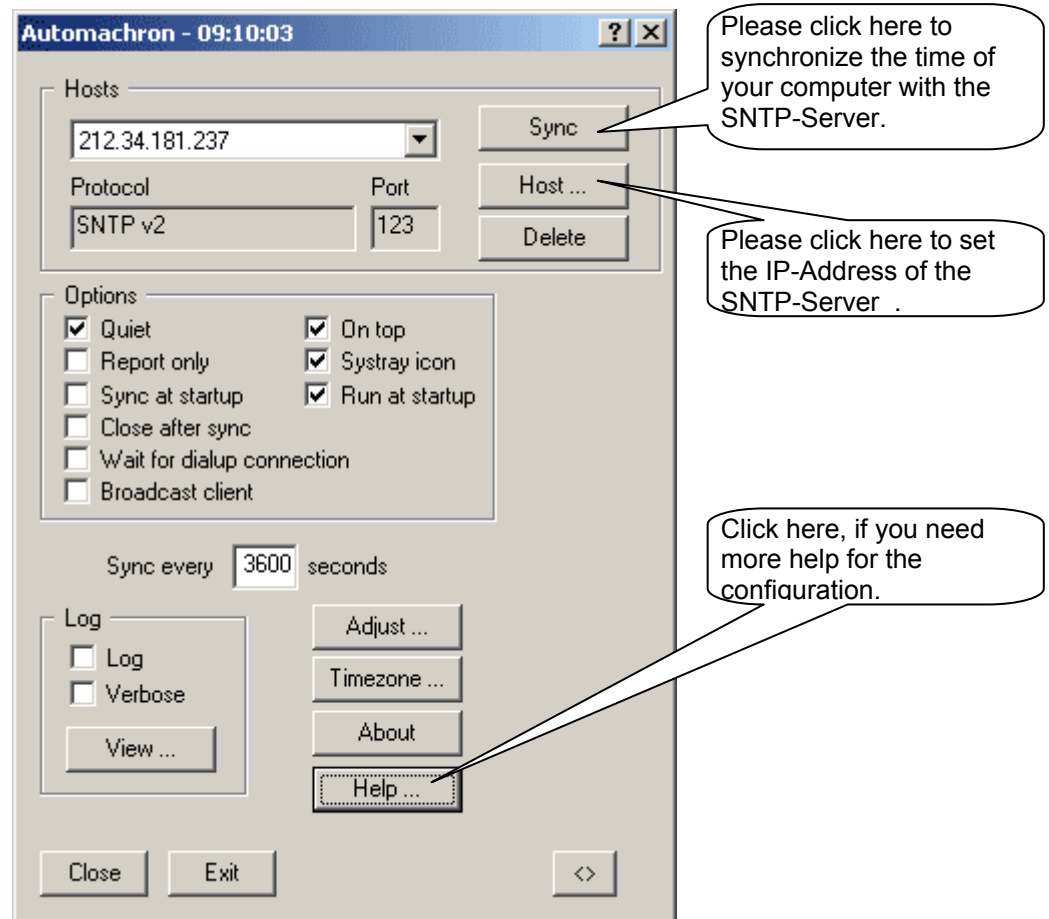


If only the time server is indicated, NTPTime synchronizes at every start of the computer and finishes the service after this.

If the PC should often synchronize, you must set up your PC. For further configurations, please read the detailed manual.

Achron5

Achron 5 is freeware and available in the internet. Please consider the license conditions of the manufacturer.



On the internet are other freely NTP-Clients like Net Time, Atomsync and Tardis 2005

Synchronization of the time on Windows NT, Windows 2000 and Windows XP in the Command Prompt / Shell

First of all, open the command prompt with Start | Programs | Accessories | Command Prompt and test the connection to the NTP server (in our example the server IP is: 212.34.181.237) with the ping function by typing the following command `C:ping 212.34.181.237`.

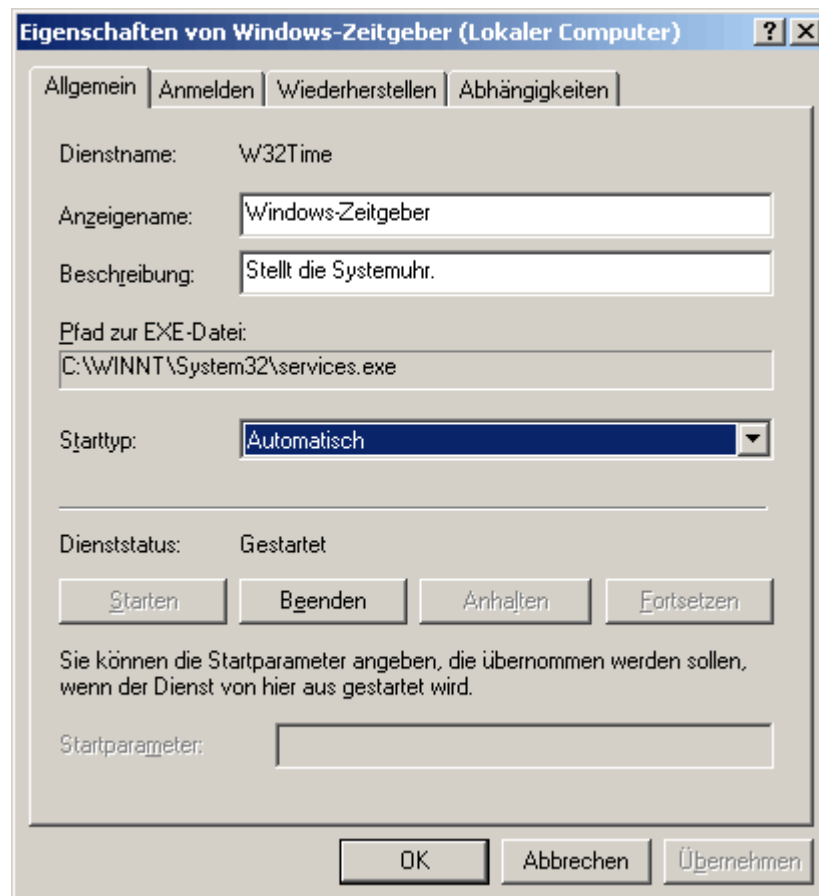
If this test was completed successfully, you have to enter the command `C:net time /setsntp:212.34.181.237` to set the NTP server IP.

To test the synchronization with the timeserver, you have to type `C:w32tm -once` for a single synchronization. The time on the PC deviates then only a few milliseconds from the timeserver.

To synchronize the PC regularly, you can write the commands in a batch file and put it into the "Task Planer" of Windows. In this case, there always has to be a connection to the timeserver.

Synchronising the time under Windows 2000

Right-click on "My Computer" and click in the following dialog on "Manage", in "Services and Applications" click on „Services“. After a double-click on "Windows time", the following window opens.



The startup time must be set to Automatic. After that, you have to open the command prompt with Start | Programs | Accessories | Command prompt and test the connection to the NTP server (in our example the server IP is: 212.34.181.237) with the ping function by typing the following command:
`C:ping 212.34.181.237`.

If this test was completed successfully you have to enter the command
`C:net time /setsntp:212.34.181.237` to set the NTP server IP.

To test the synchronization with the timeserver, you have to type `C:w32tm -once` for a single synchronization.

The time on the PC deviates then only a few milliseconds from the timeserver.

To carry out automatic synchronization in regular distances, you have to type the following command:

`C:w32tm -period <Intervalcode>`

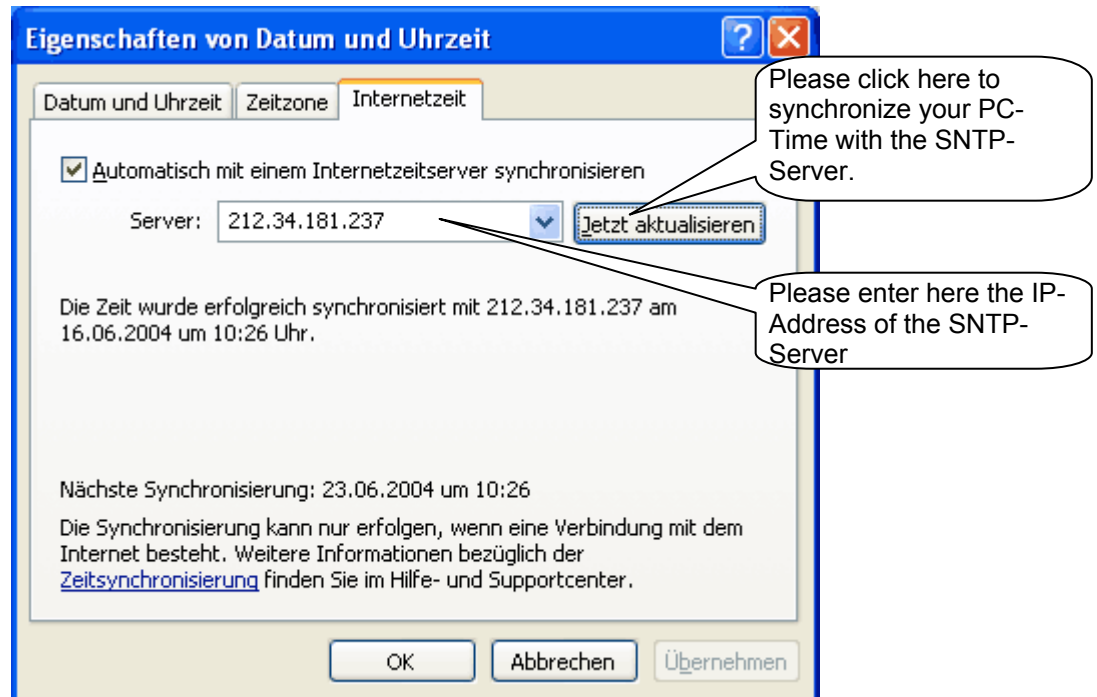
There are following codes for updating intervals:

0	Daily
65535	Every second day
65534	Every third day
65533	Weekly
65532	Every 45 minutes

With the last function, the system attempts to synchronize the clock every 45 minutes until it worked three times. After that it synchronizes daily.

Synchronisation of the time under Windows XP

By double-clicking onto the system clock, the dialog "Options of date and time" opens. In the card index rider "Internet time" you must do the following settings now.



The default updating interval is one week and could only be adapted in the registry under
"Hkey_Local_Machine\System\ControlSet001\Services\W32Time\TimeProviders\NtpClient" with the new DWORD Entry „SpecialPollInterval“, where you may enter the desired seconds as a decimal value.

Caution:



We have the information for this registry entry from the Internet and do not take over any liability for possible damages.

General:

A change in the Windows-Registry at an inappropriate procedure can lead to not properly shutting down or start the system. Data losses are also possible. Computer newcomers should not carry out such changes themselves.

Synchronizing the time under Linux

You can synchronize the system time under Linux distribution, too. Please type the following commands.

Before you set up the service you should try the ipNTP connection with a ping. For Linux systems, please type the command „ping -s 32 *IP-Address*“ in the command shell.

For Solaris systems please type the command „ping -s *IP-Address* 32“ in the command shell.

With the command `/usr/sbin/ntpdate "Server IP or Server Name"`, the system time is synchronised once with the Server. If you want your system time to be regularly synchronized with the NTP-server, it exists some possibilities, for example you can make a registered cronjob at the crontab. If you want to synchronize your system time daily at 3:30, please type follow command:

```
30 3 * * * /usr/sbin/ntpdate "Server-IP or Server Name"
```

For further information, please read the manpages:

```
man ntpdate  
man crontab  
man ntpd  
man xntpd
```

Redundant synchronization

On Windows systems, you can synchronize redundant only with a client like Achron 5. For this, you have to enter a second IP of a NTP server in the host window. If a connection to the first server is not possible, the client tries to connect to the second server.

On linux systems, you can configure this with the ntpdeamon. For a full documentation of NTP, please enter the command *man ntpd*.

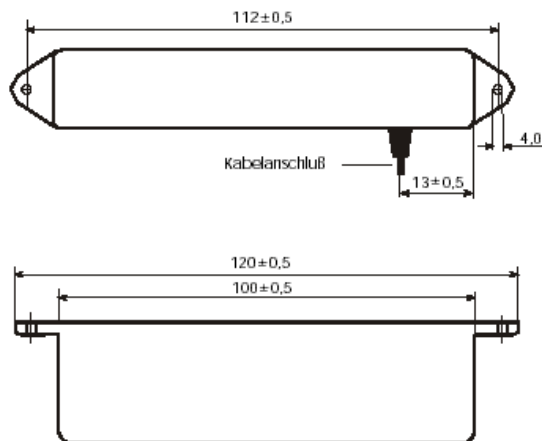
Further information

You can find a detailed documentation to the theme of NTP on the Internet under <http://www.ntp.org> ("Home of the Network Time Protocol").

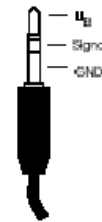
7.3 DCF77-Antenna and DB9 Clutch

The active voice antenna obtains the amplitude modulated signals of the time indication transmitter DCF77. It provides the demodulated signals over an open collector driver. To increase the noise immunity, the antenna is provided with a selective entry filter, with this it could also be used in environment of stroger disturbance. The connection occurs over a cable with DB9 plug.

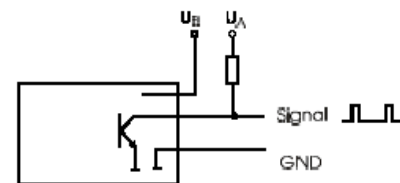
Abmessungen:



Anschlußbelegung:



Beschaltung:



If you want to improve your reception, move the longside of the antenna to the transmitter (Frankfurt)

Mainflingen near Frankfurt

7.4 GPS-Antenna and DB9 Clutch

The GPS-Receiver calculates the exact position through the measurement of distance. The GPS-Antenna receives the UTC (Universal Time Code) time from up to 12 satellites depending on the enviroment and the calculation of the local time in UTC.



The norm IEC 60529 says that the GPS-Antenna is weatherproof and you can use it in temperatures from - 30°C to + 80°C. A special feature is the mounting possibility with an integrated magnet or a screw thread on the back.

7.5 Technical Details for ipNTP

Great emphasis was placed on compatability during device design. Nevertheless, there are some minor restrictions.

- The DCF77-Reception has an accuracy of ± 8 msec.
- The GPS-Reception has an accuracy of ± 1 msec.
- Free running quality: ± 10 ppm at a static temperature of $+10^{\circ}\text{C}$ to $+50^{\circ}\text{C}$.
- The emergency clock has an accuracy of 50ppm at a temperature of $+10^{\circ}\text{C}$ to $+50^{\circ}\text{C}$.

Technical Details DCF77-Antenna

Technical characteristics	Min.	Typical	Max.	Unit
Receive frequency		77,5		kHz
Connection cable length		2,5		m
Power supply	3		12	V
Power supply range	2,2		15	V
Reception sensivity		30	50	$\mu\text{V/m}$
Output voltage	3		30	V
Output current			2	mA
Output level at 100% 77,5kHz			0,4	V
Output level at 25% 77,5kHz		U_{output}		V
Output impulse range at Transmit impulse range: 100ms 200ms	80 170		130 230	ms ms
Power consumption		1,3		mA
Bandwith of the filter		350		Hz
Attenuation at $\pm 3 \times \text{BW}$		-20		dB
Store temperature	-40		80	$^{\circ}\text{C}$
Operating temperature	0		50	$^{\circ}\text{C}$

Technical Details GPS-Antenna

Power supply	4.0V to 5,5V
signal level; supply voltage	60 mA at 5V
output level	0V to V_{Eingang}
GPS receiver sensitivity	min. 165 dBW
Correction data	WAAS / EGNOS
Data format version	NMEA 0183 v2.00 or v3.00
Time impulse	1pps, +/- 1 μsec
update rate	1 Synchronisation per seconds
Synchronization time	New synchronisation : < 2 sec Warm: ca. 15 sec Cold: ca. 45 sec Auto Locate™: 5 min Sky Search: 5 min
Weight without cables	115,6g
Weatherproof case	Polycarbonate Thermoplastic, waterproof to IEC 60529
Work temperature range	- 30 $^{\circ}\text{C}$ to + 80 $^{\circ}\text{C}$
Storage temperature range	- 40 $^{\circ}\text{C}$ to + 90 $^{\circ}\text{C}$
Measurements in mm	19,5 x 61
Cable length	3 meters

Further technical details

ipNTP - DCF77	Desktop	DIN-Rail Unit
Interfaces	1x antenna DCF77 1 x 10BaseT - RJ45 (can be operated in networks with 10/100 Mbit/s)	
Diagnosis-LEDs	Power, DCF77 Takt, Time Sync, Ethernet Transmit /Receive/Link	
Supply voltage	+ 8 - 14 V DC – Input Jack	+ 8 - 14 or 18 – 36 (24V) V DC ¹⁾ Input Jack and 3,5 mm connector
Accuracy	DCF77 receipt: ± 2 msec. Free-running properties: ± 2 ppm after VCO regulation at constant temperature (+10°C to +50°C) emergency clock: ± 25 ppm	
Housing	Plastic housing	Plastic housing
Dimensions W/H/D	Approx. 110/30/75 mm	Approx. 45/108/73 mm
Operating/storage temperature	5° C to 55° C / -10° C to 70° C	
Relative humidity	5% to 90 % non-condensing	
Standards	CE	
Scope of delivery	ipNTP & DCF77 antenna approx. 2,5 m, Configuration software, Driver for Windows (NT, 2000, XP), Documentation (German or English)	
	Power supply ²⁾ In: 230 V AC Out: + 9 V DC	Without power supply (optional)
Order number	0202018	0202018-H24

ipNTP - GPS	Desktop	DIN-Rail Unit
Interfaces	1x GPS receiver 1 x 10BaseT - RJ45 (can be operated in networks with 10/100 Mbit/s)	
Diagnosis-LEDs	Power, DCF77 Takt, Time Sync, Ethernet Transmit /Receive/Link	
Supply voltage	+ 8 - 14 V DC – Input Jack	+ 8 - 14 or 18 – 36 (24V) V DC ¹⁾ Input Jack and 3,5 mm connector
Accuracy	GPS impulse: ± 300 nsec. Free-running properties: ± 2 ppm after VCO regulation at constant temperature (+10°C to +50°C) emergency clock: ± 50 ppm	
Housing	Plastic housing	Plastic housing
Dimensions W/H/D	Approx. 110/30/75 mm	Approx. 45/108/73 mm
Operating/storage temperature	5° C to 55° C / -10° C to 70° C	
Relative humidity	5% to 90 % non-condensing	
Standards	CE	
Scope of delivery	ipNTP & GPS Receiver approx. 2,5 m, Configuration software, Driver for Windows (NT, 2000, XP), Documentation (German or English)	
	Power supply ²⁾ In: 230 V AC Out: + 9 V DC	Without power supply (optional)
Order number	0202019	0202019-H24

¹⁾ Further voltages on request

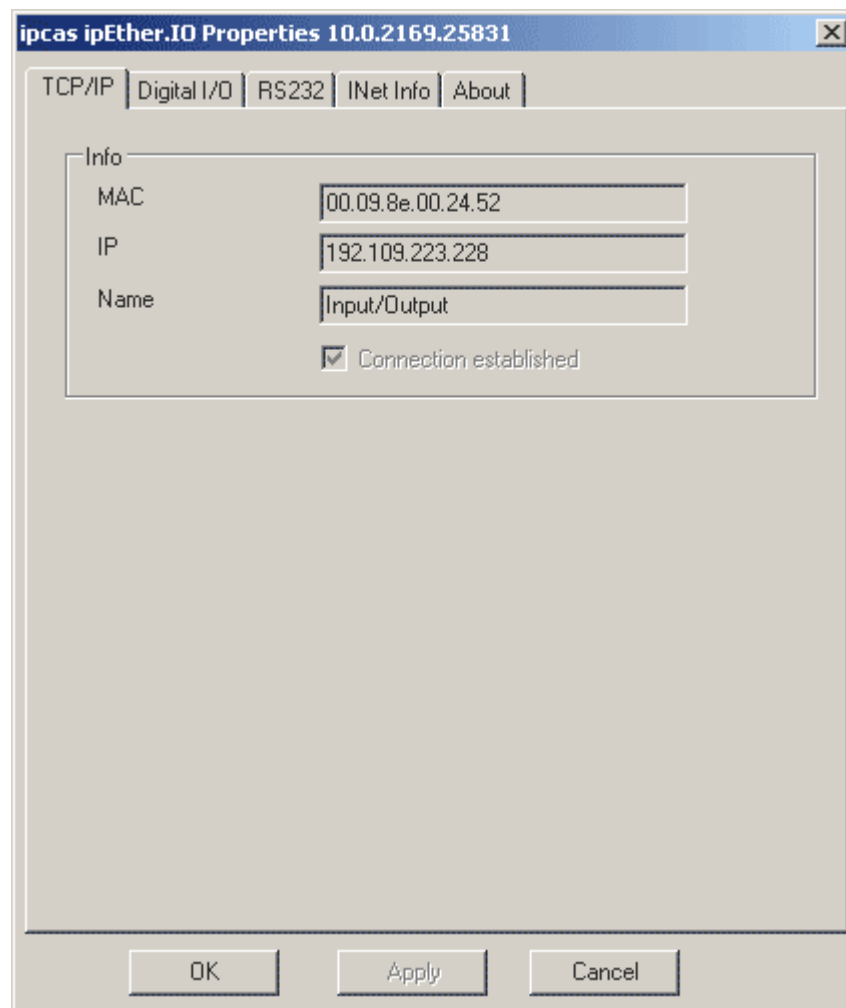
²⁾ Delivery only at countries with 230V AC 50Hz

Chapter 8: Configuration of ipEther232.IO

8.1 Configuration of ipEther232.IO

As mentioned above, the configuration program recognizes all devices in its own network segment.

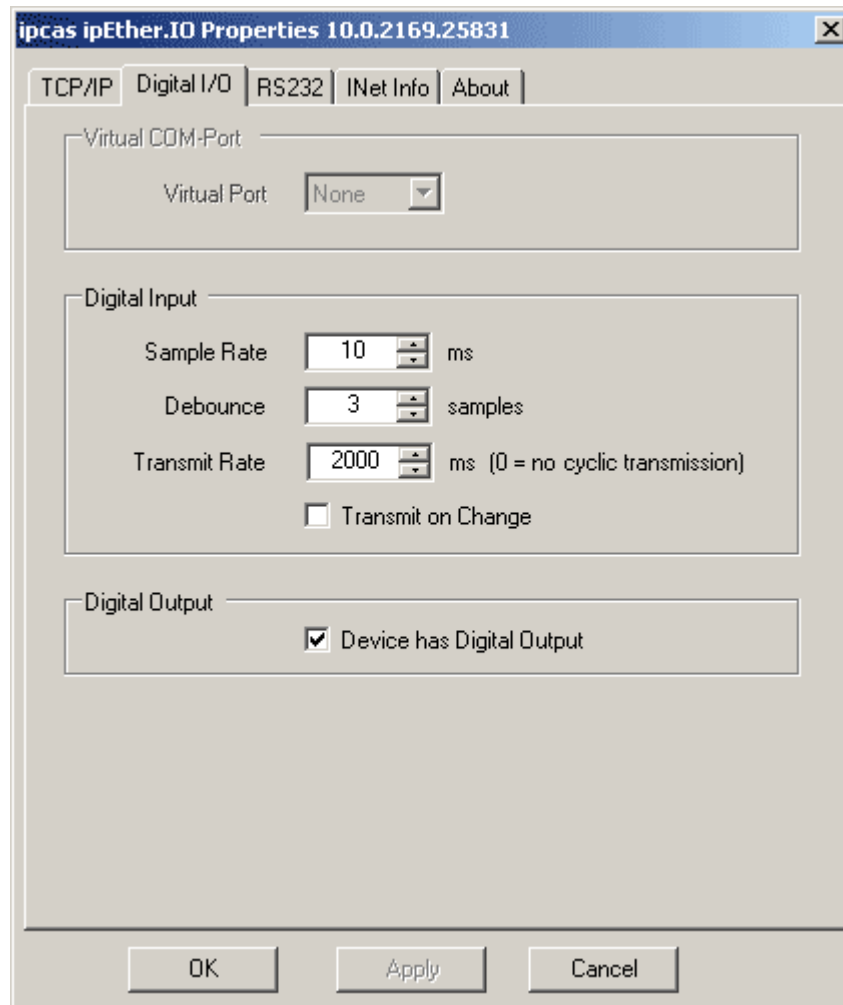
A double click on an entry opens the details dialog.



TCP/IP (Ethernet):

This is where you can find the MAC address, IP Address and the setted device name (Set Name).

"Connection established": The Ethernet conection (UDP – open) to the ipEther232.IO has been achieved and you can continue with the configuration. If the Ethernet connection cannot be achieved, the configuration cannot be changed (device busy or not attainable).



Virtual COM-Port:

This functionality will be available with the next version.

Digital Input:

“Sample Rate”: Sample rate from the digital inputs.

“Debounce”: Number of consistent samples (Sample Rate) before the pin state is accepted.

“Transmit Rate”: Cyclic send rate from the digital inputs to the server.
(or when the buffer is full)

“Transmit on Change”: Transmit with any changes from the digital inputs to the server (minimal all 100 ms).

Digital Output:

If the I/O module has two digital outputs (4x Input & 2x Output), it is activated with this „checkbox“.

ipcas ipEther.IO Properties 10.0.2169.25831

TCP/IP | Digital I/O | RS232 | INet Info | About

Virtual COM-Port

Virtual Port: None

Mode

Baud Rate: 9600

Data Bits: 8

Parity: None

Stop Bits: 1

Fire and Forget: ☒ The device does not require a receive confirmation from the client.

Timeouts

RxD Timeout: 300 ms

Character Timeout: 0 ms

OK Apply Cancel

Virtual COM-Port:

This functionality will be available with the next version.

Mode:

Baud rate, databits, parity and stopbits are adjusted to the communication behaviour of the serial terminal device.

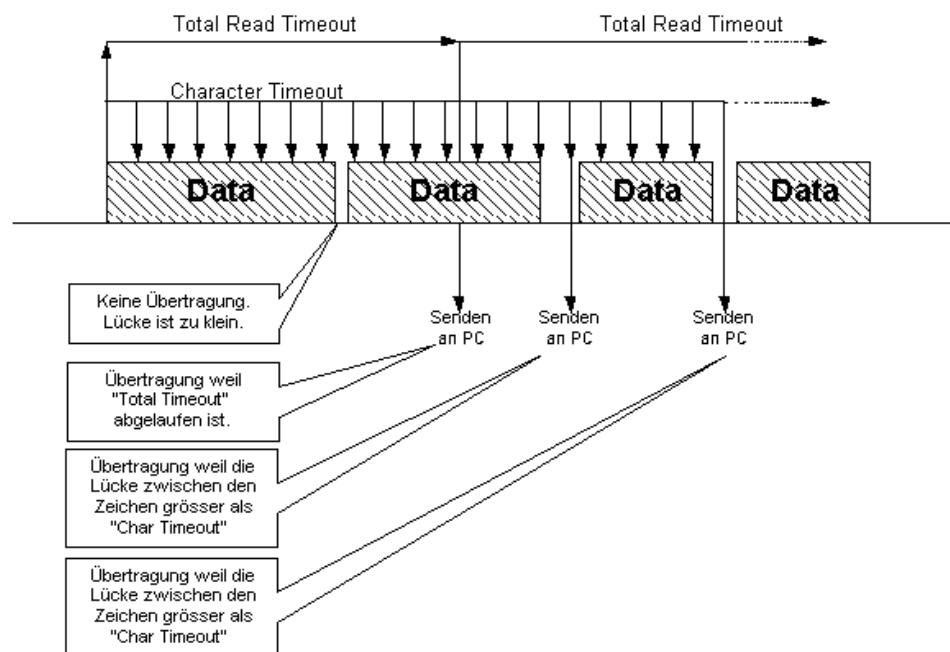
„Fire and Forget“: No Ethernet packet is sent back for confirmation. The serial data do not have to store temporarily. Fast UDP plain text transmission, therefore can be used with time-critical protocols / data.

Timeouts:

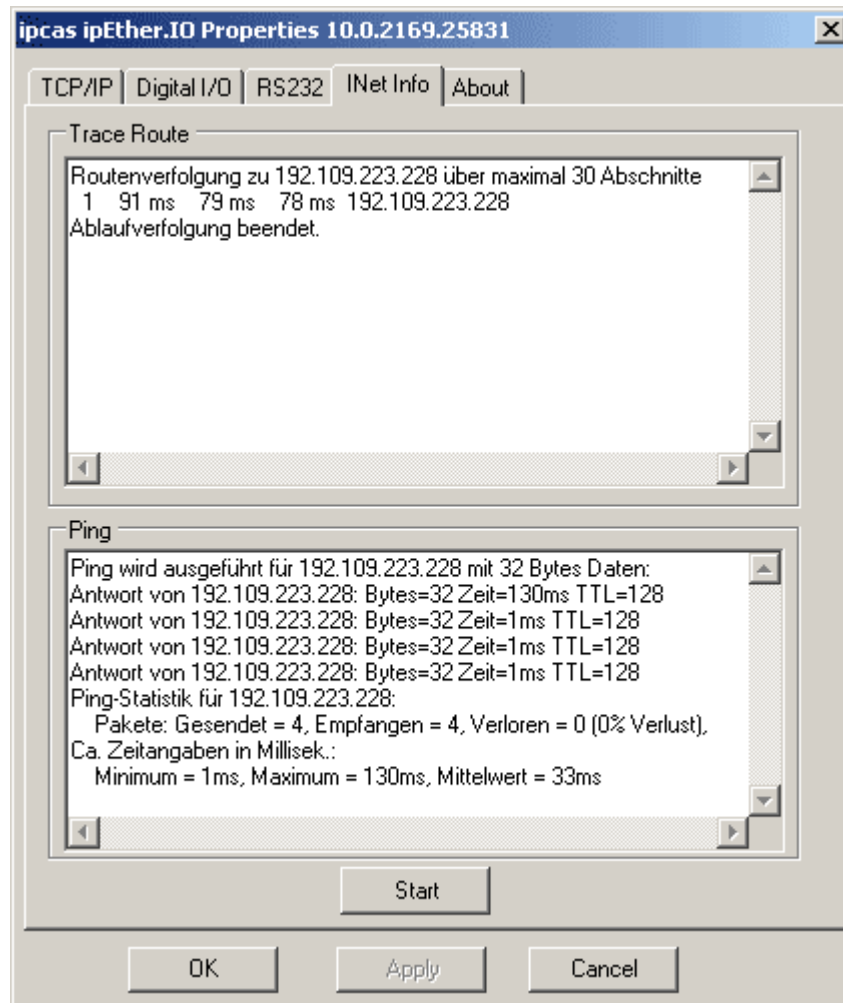
"RxD Timeout": First byte starts the "**Total Read Time**". After this has expired, all characters received until then are sent to the PC. This value must not fall below the travel time of the UDP packet in the Ethernet. Use the "ping" tool to determine the travel time. The default value for this parameter is 100 ms.

"Character Timeout": The "**Character Distance**" is the maximum distance between two characters received. If this value is exceeded, all characters received until then are sent to the PC, even if the parameter did not run off "Total Read Timeout" yet. The default value for this parameter is 10 ms.

With the reception of serial data, Ethernet blocks have to be assembled. To do this, two timeouts are available in ipEther232.



Fine tuning might be required for time critical applications as well.



Traceroute

Over traceroute, you can see the data path between two servers in the internet. Traceroute lists all servers which are between the respective traceroute-server and the destination address.

Ping

Ping is an application of the ICMP (Internet Control Message Protocol RFC 792). This protocol (also a component of the IP protocol) transfers different administrative information and can therefore be used for fault-tracing, too. If the ping signal meets an object, its reflection (echo) can be received again from the appropriate transmitter. So ping can find out whether the IP address is active (if a connection could be established) and how fast it is.

For Windows systems you type "ping *IP-Address*" on the command shell.
 For Linux systems you type "ping -s *IP-Address*" on the command shell.
 For Solaris systems you type "ping -s *IP-Address* 32" on the command shell.



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8.2 Communication with the ipEther232.IO

The default settings for installation path (optonal, install it from the Setup CD) and follow described samples, source code and documentation is

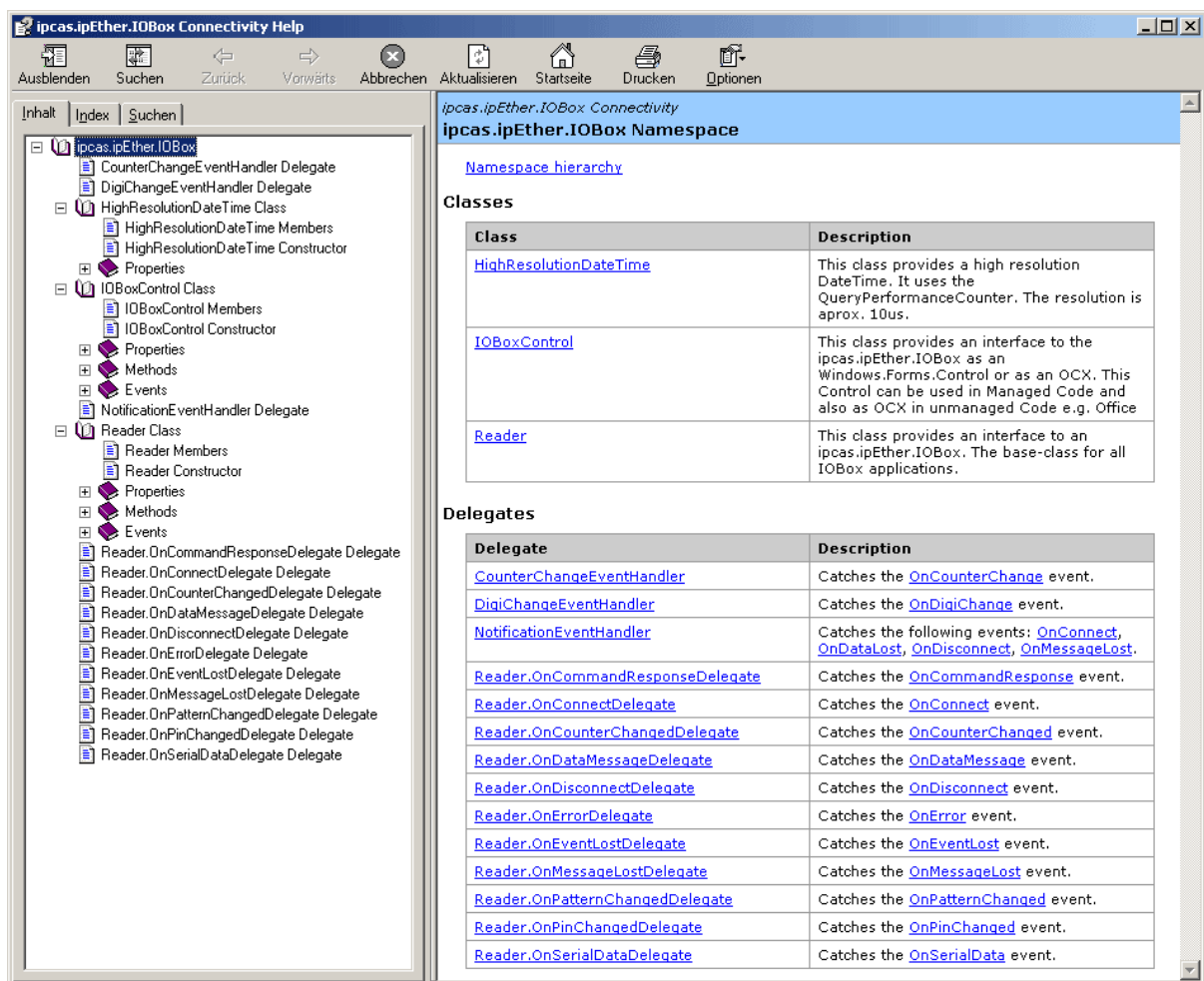
„C:\Programme\ipcas GmbH\ipcas Ethernet Products\IOBox\Samples\.....“

ipcas.ipEther.IOBox.Reader.cs

The file contains “ipcas.ipEther.IOBox.Reader.cs” the basic class for all sample applications in the C# sourcecode.

It will control the access on the ipEther232.IO.

For further information, please read the help file.



ipcas.ipEther.IOBox Connectivity Help

ipcas.ipEther.IOBox Namespace

[Namespace hierarchy](#)

Classes

Class	Description
HighResolutionDateTime	This class provides a high resolution DateTime. It uses the QueryPerformanceCounter. The resolution is approx. 10us.
IOBoxControl	This class provides an interface to the ipcas.ipEther.IOBox as an Windows.Forms.Control or as an OCX. This Control can be used in Managed Code and also as OCX in unmanaged Code e.g. Office
Reader	This class provides an interface to an ipcas.ipEther.IOBox. The base-class for all IOBox applications.

Delegates

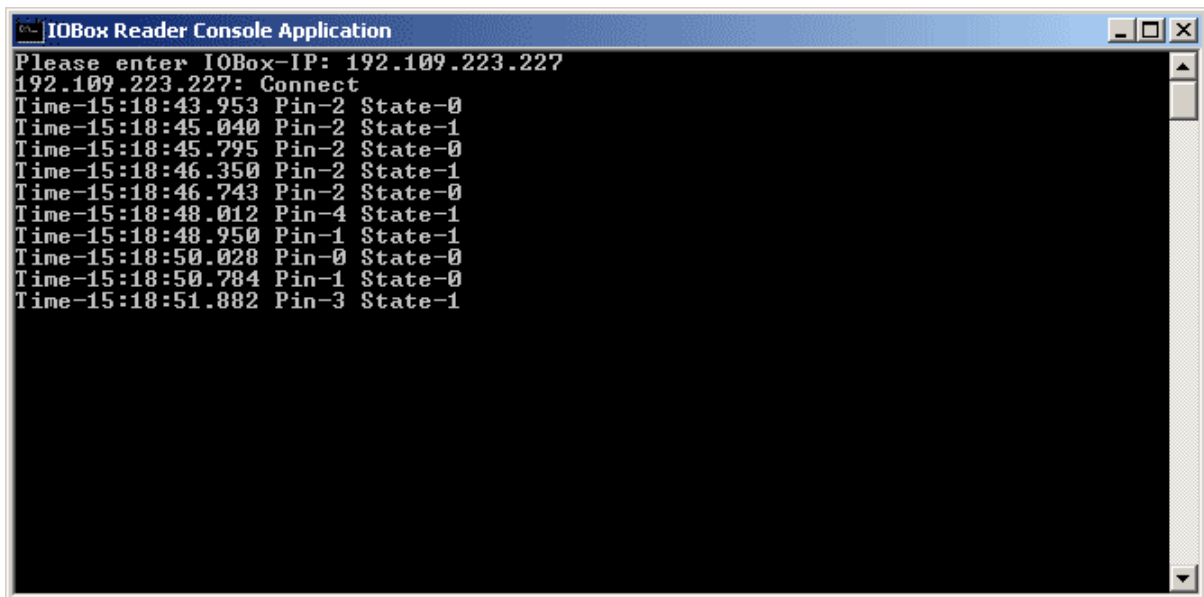
Delegate	Description
CounterChangeEventHandler	Catches the OnCounterChange event.
DigiChangeEventHandler	Catches the OnDigiChange event.
NotificationEventHandler	Catches the following events: OnConnect , OnDataLost , OnDisconnect , OnMessageLost .
Reader.OnCommandResponseDelegate	Catches the OnCommandResponse event.
Reader.OnConnectDelegate	Catches the OnConnect event.
Reader.OnCounterChangedDelegate	Catches the OnCounterChanged event.
Reader.OnDataMessageDelegate	Catches the OnDataMessage event.
Reader.OnDisconnectDelegate	Catches the OnDisconnect event.
Reader.OnErrorDelegate	Catches the OnError event.
Reader.OnEventLostDelegate	Catches the OnEventLost event.
Reader.OnMessageLostDelegate	Catches the OnMessageLost event.
Reader.OnPatternChangedDelegate	Catches the OnPatternChanged event.
Reader.OnPinChangedDelegate	Catches the OnPinChanged event.
Reader.OnSerialDataDelegate	Catches the OnSerialData event.

Library

A .Net classes-library which bind the „ipcas.ipEther.IOBox.Reader.cs“.
(ipcas.ipEther.IOBox.Reader.dll)

Console Application

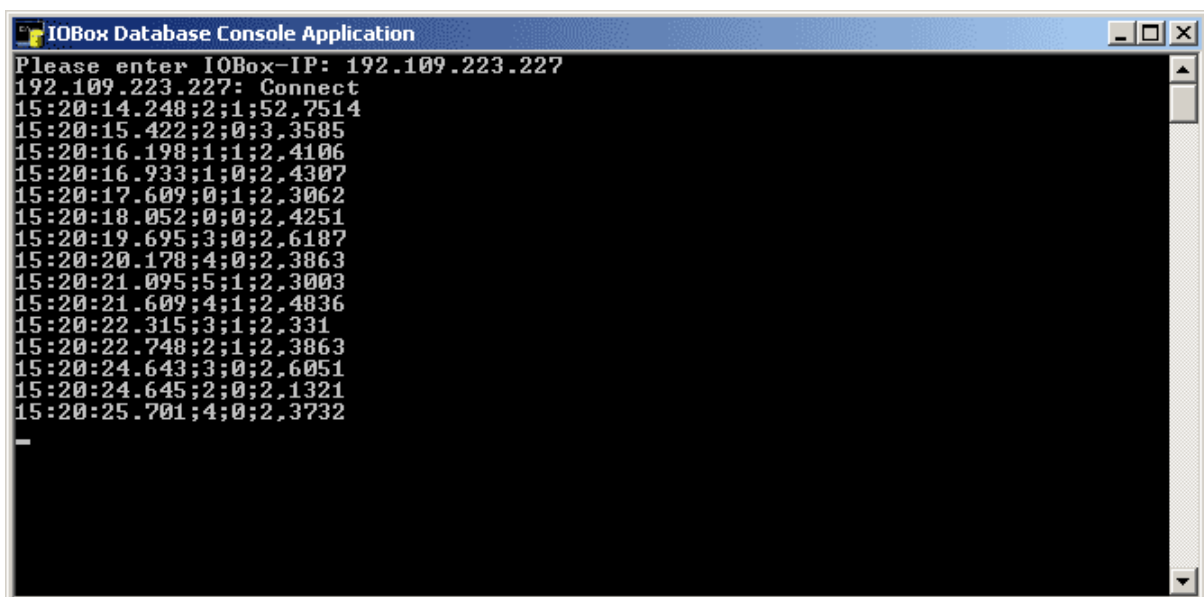
A little console application which demonstrate how you can use the
"ipcas.ipEther.IOBox.Reader.cs"



```
IOBox Reader Console Application
Please enter IOBox-IP: 192.109.223.227
192.109.223.227: Connect
Time-15:18:43.953 Pin-2 State-0
Time-15:18:45.040 Pin-2 State-1
Time-15:18:45.795 Pin-2 State-0
Time-15:18:46.350 Pin-2 State-1
Time-15:18:46.743 Pin-2 State-0
Time-15:18:48.012 Pin-4 State-1
Time-15:18:48.950 Pin-1 State-1
Time-15:18:50.028 Pin-0 State-0
Time-15:18:50.784 Pin-1 State-0
Time-15:18:51.882 Pin-3 State-1
```

Database Application

This sample will show you how you can write events in a database. The demo
use the Microsoft OleDb Technology. The sample was tested with MS-
Access2003, MS SQLServer 2000 and Oracle 8.1.7

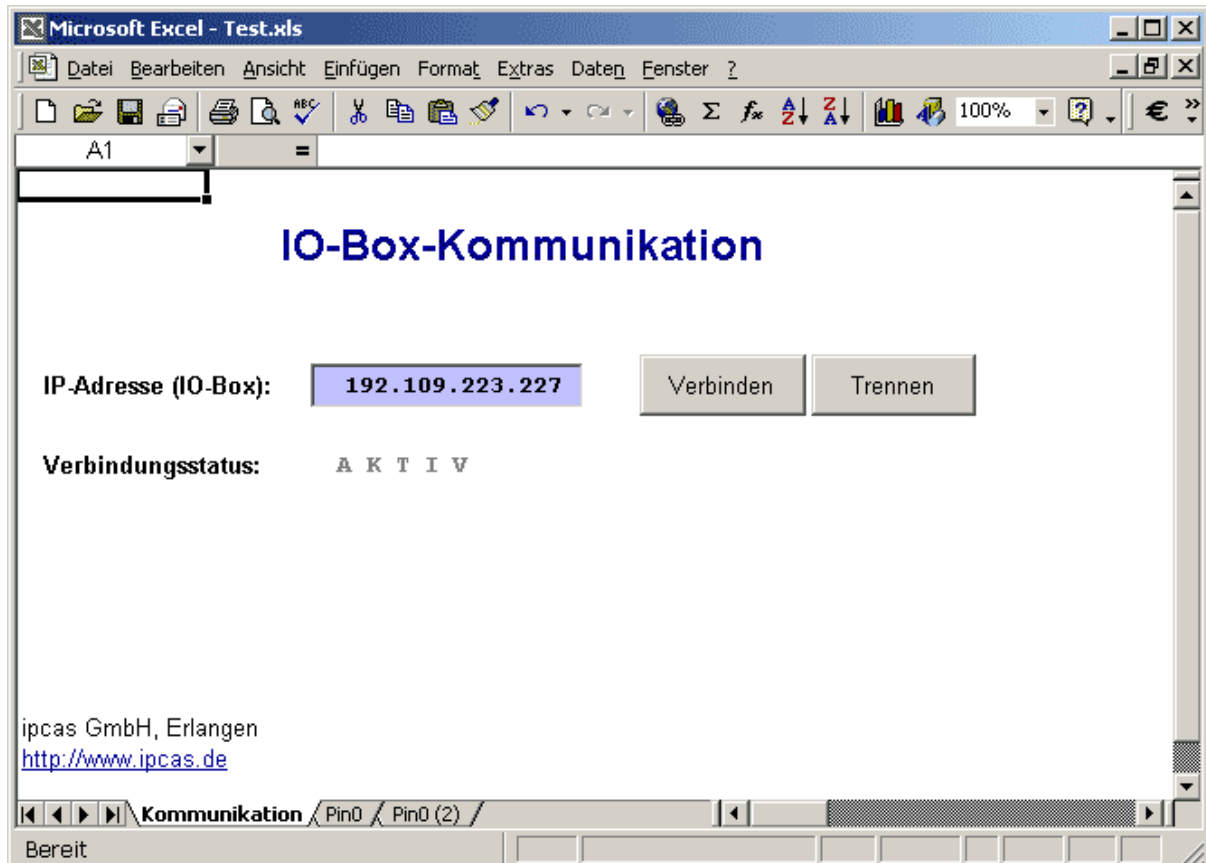


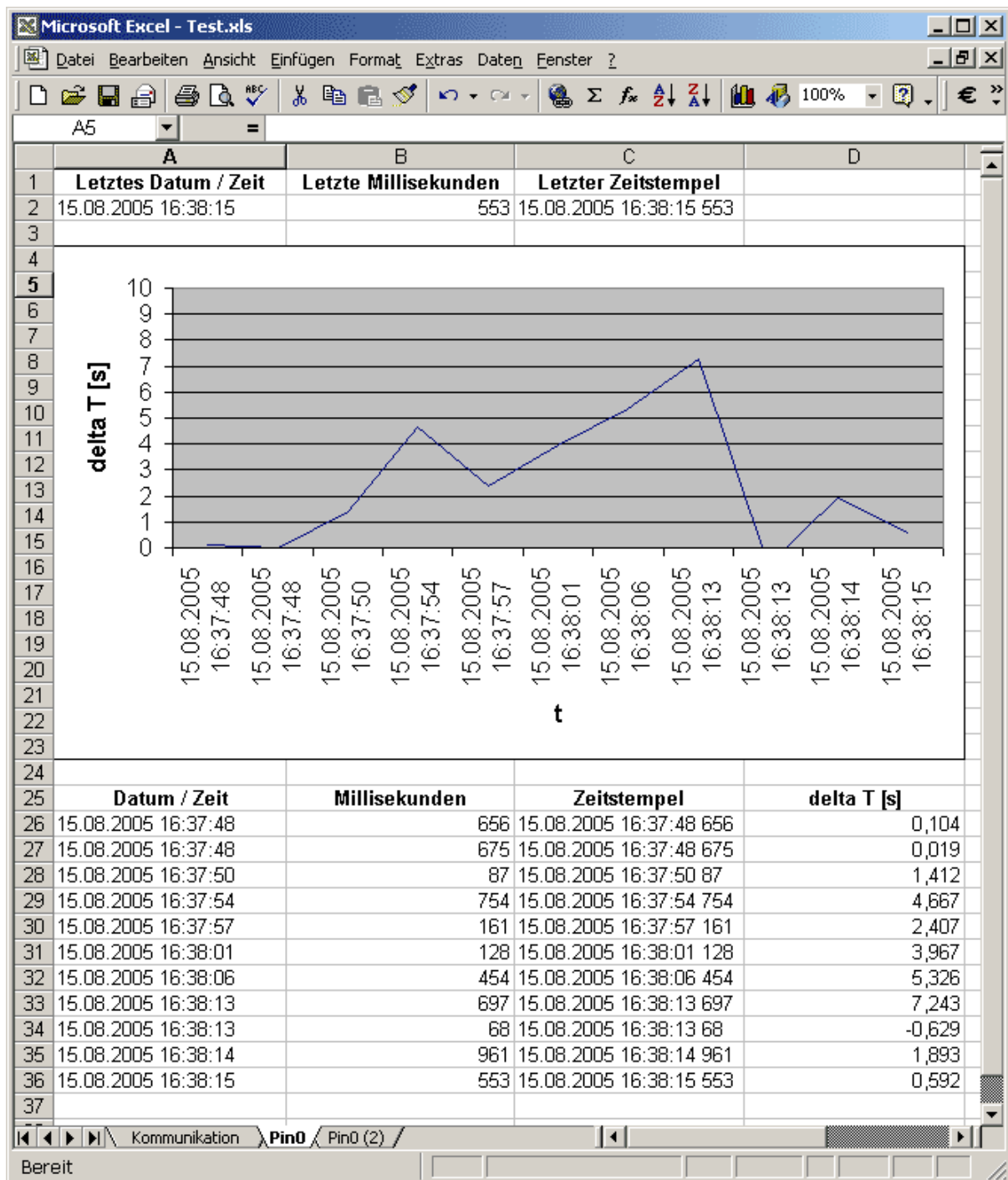
```
IOBox Database Console Application
Please enter IOBox-IP: 192.109.223.227
192.109.223.227: Connect
15:20:14.248;2;1;52,7514
15:20:15.422;2;0;3,3585
15:20:16.198;1;1;2,4106
15:20:16.933;1;0;2,4307
15:20:17.609;0;1;2,3062
15:20:18.052;0;0;2,4251
15:20:19.695;3;0;2,6187
15:20:20.178;4;0;2,3863
15:20:21.095;5;1;2,3003
15:20:21.609;4;1;2,4836
15:20:22.315;3;1;2,331
15:20:22.748;2;1;2,3863
15:20:24.643;3;0;2,6051
15:20:24.645;2;0;2,1321
15:20:25.701;4;0;2,3732
```

ipcas.ipEther.IOBox.Control

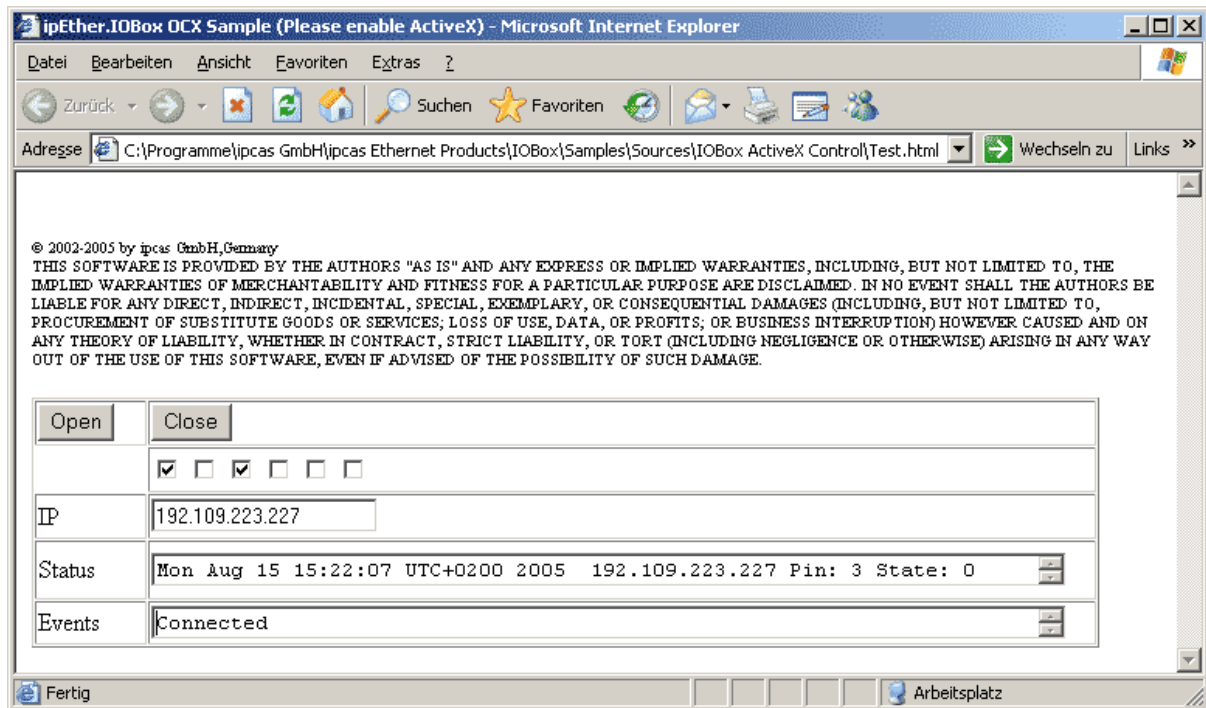
ipcas.ipEther.IOBox.Control supports the interface with “.NetWindows Form Control” and OCX-Control. You can use this Controller in your VB, Office or .Net application.
(ipcas.ipEther.IOBox.Control.dll)

Example application for Microsoft Excel





Event display on an HTML Site



Windows Application

A small Windows.Forms application which based on the base-class.

The screenshot shows a Windows application window titled "ipEther.IOBox - Sample". The interface is divided into several sections:

- Device:** Contains an IP address field with "192.109.223.228", "Open" and "Close" buttons, and a checkbox labeled "Device has Outputmodule".
- Communication Status:** Displays "Messages Received", "Messages lost", and "Out of Sync", all with a value of 0.
- Command (try ?):** Includes a text input field with "mode" and a "Send" button. Below it is a text area showing "ok".
- Serial TxD:** Includes a text input field with "x" and a "Send" button. Below it is a text area showing "x".
- Serial RxD:** Includes a checkbox labeled "Write to 'serial.txt'" and a large text area.
- Events:** A text area showing "Connected".
- UDP Message:** A text area displaying various fields: [Version] 01, [ID] 00C1, [Pattern] 000000, [RS 232] RX=7000, TX=0FFF, [Counter] 00000000, [Events] 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0, 00.0.0.
- Counter:** A vertical stack of six digital displays, all showing "00000".
- Pattern:** A vertical stack of six green square indicators.
- Output:** A vertical stack of two square buttons.
- Error:** A large text area at the bottom with a "Clear" button.

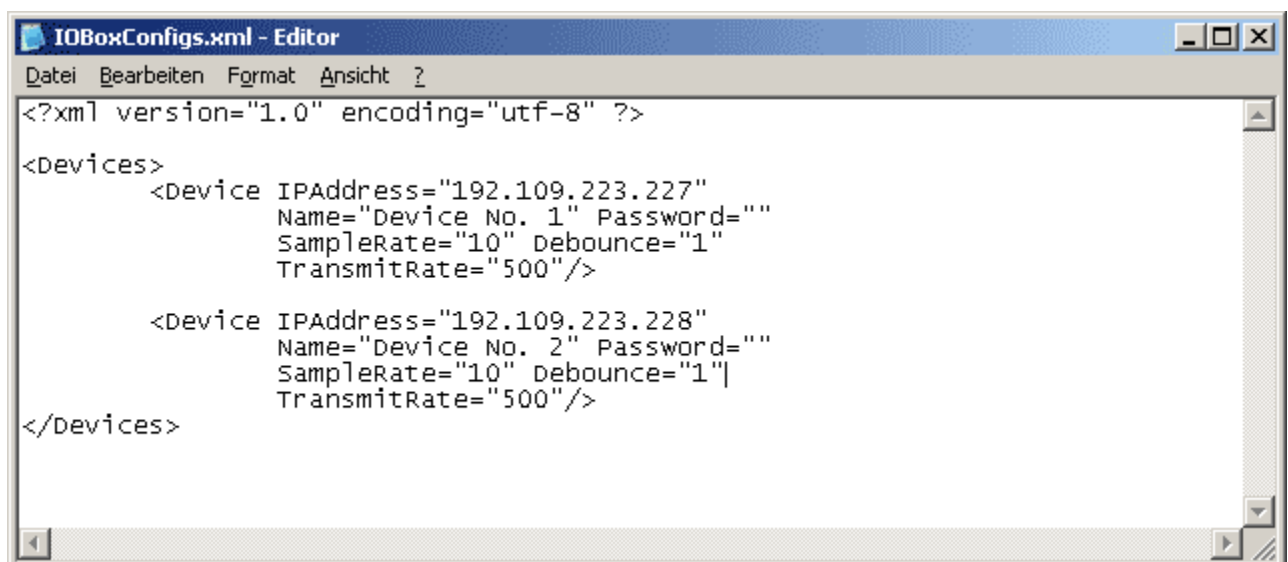
8.3 OPC-Server

OPC means "OLE for Process Control". It is a standard Software-Interface that should make possible to exchange data for applications from different producers.

With the help of this technology, you can exchange data between different automation systems without using different drivers. Thus it is possible to use different visualisation systems or you can take hold with MS-Office to your process data.

For the OPC server, the installation path is "C:\Programme\ipcas GmbH\ipcas ipEther IOBox OPCServer\....." (optional, install it from the set-up CD)

The file "IOBoxConfigs.xml" is the configuration file that can be edited with a simple "Editor". In this file, you have to type all ipEther232.IO which should work with the OPC-Server together.



The following parameters are available

IPAddress="192.109.223.227"	IP-Address
Name="Device No. 1"	comment for the device
Password=""	valid password
SampleRate="10"	sample rate
Debounce="1"	debounce rate
TransmitRate="500"	transmit rate

With any OPC- Client (Version DA2.0/DA 3.0), you can convert the received events as you wish, for example visualise, alert or save.

The screenshot shows the Matrikon OPC Explorer application window. The main pane displays a tree view of the OPC server structure under 'test'. The 'Contents of 'test'' pane shows a list of items with their current values and timestamps. The bottom status bar provides information about the server connection and the group 'test'.

Item ID	Access Path	Status	Value	Timestamp	Quality
test opc geraet.Counter.Counter 0		Active	5	23.08.2005 10:40:34	Good, non-specific
test opc geraet.Counter.Counter 1		Active	19	23.08.2005 10:40:40	Good, non-specific
test opc geraet.Counter.Counter 2		Active	12	23.08.2005 10:40:36	Good, non-specific
test opc geraet.Counter.Counter 3		Active	0	23.08.2005 10:37:53	Good, non-specific
test opc geraet.Counter.Counter 4		Active	14	23.08.2005 10:40:41	Good, non-specific
test opc geraet.Counter.Counter 5		Active	6	23.08.2005 10:40:42	Good, non-specific
test opc geraet.Pins.PIN 0		Active	0	23.08.2005 10:40:35	Good, non-specific
test opc geraet.Pins.PIN 1		Active	-1	23.08.2005 10:40:40	Good, non-specific
test opc geraet.Pins.PIN 2		Active	0	23.08.2005 10:40:38	Good, non-specific
test opc geraet.Pins.PIN 3		Active	0	23.08.2005 10:37:53	Good, non-specific
test opc geraet.Pins.PIN 4		Active	-1	23.08.2005 10:40:41	Good, non-specific
test opc geraet.Pins.PIN 5		Active	-1	23.08.2005 10:40:42	Good, non-specific
test opc geraet.Statistics.NumberOfConnects		Active	1	23.08.2005 10:40:26	Good, non-specific
test opc geraet.Statistics.NumberOfDisconnects		Active	0	23.08.2005 10:37:53	Good, non-specific
test opc geraet.Statistics.NumberOfLostEvents		Active	0	23.08.2005 10:37:53	Good, non-specific
test opc geraet.Statistics.NumberOfLostMessages		Active	0	23.08.2005 10:37:53	Good, non-specific
test opc geraet.Statistics.NumberOfTotalEvents		Active	16	23.08.2005 10:40:42	Good, non-specific
test opc geraet.Status.IsConnected		Active	-1	23.08.2005 10:40:26	Good, non-specific

Server Info:
 Server: ipcas.ipEther.IOBox.OPCServerDA.1
 Connected: Yes
 State: Running
 Groups: 1
 Current Local Time: 23.08.2005 10:43:22
 Last Local Update Time: 23.08.2005 10:40:42

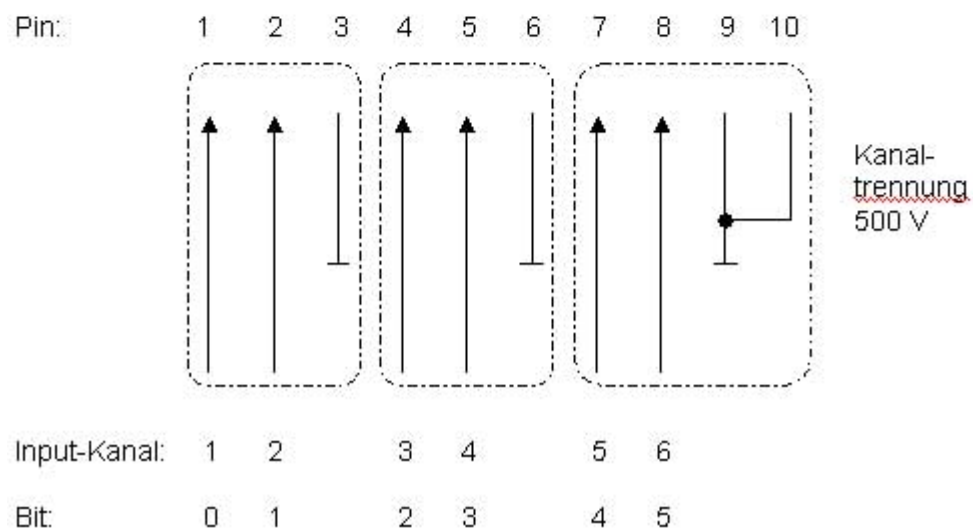
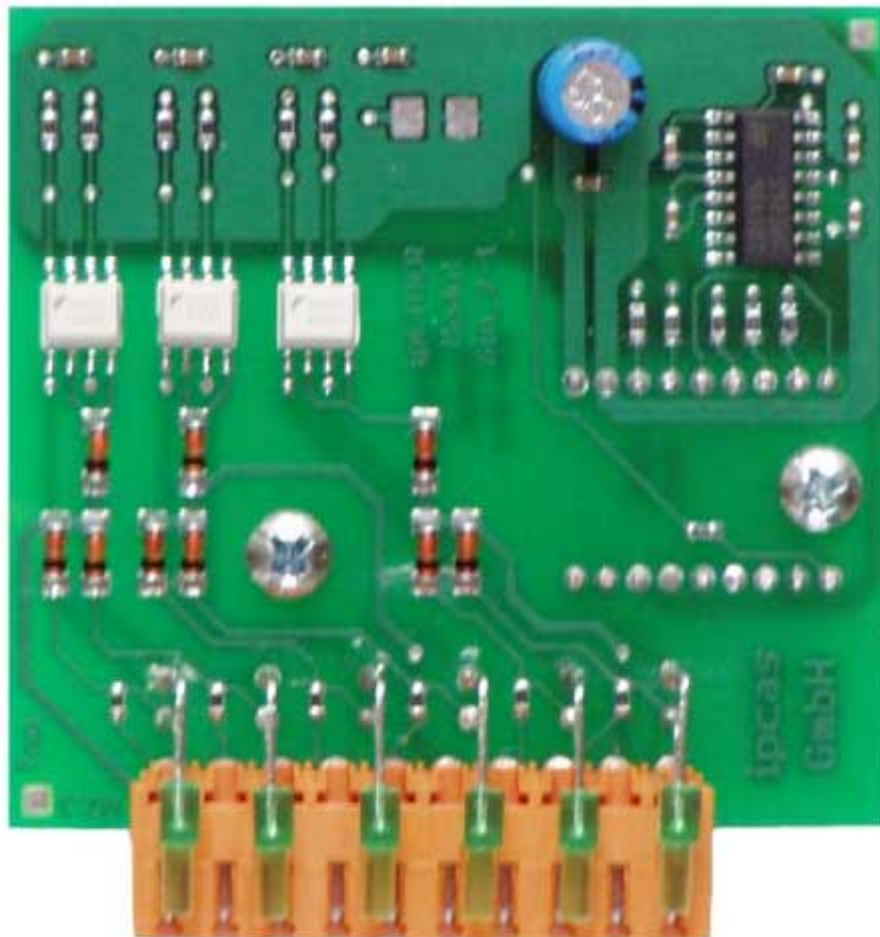
Group Info:
 Group: test
 Connected (Async I/O): Yes (2.0)
 Active: Yes
 Items: 18
 Current Update Rate: 100 ms
 Percent Deadband: 0,00%

Matrikon OPC Archiver Process Historian
 unlimited data
 unlimited tags

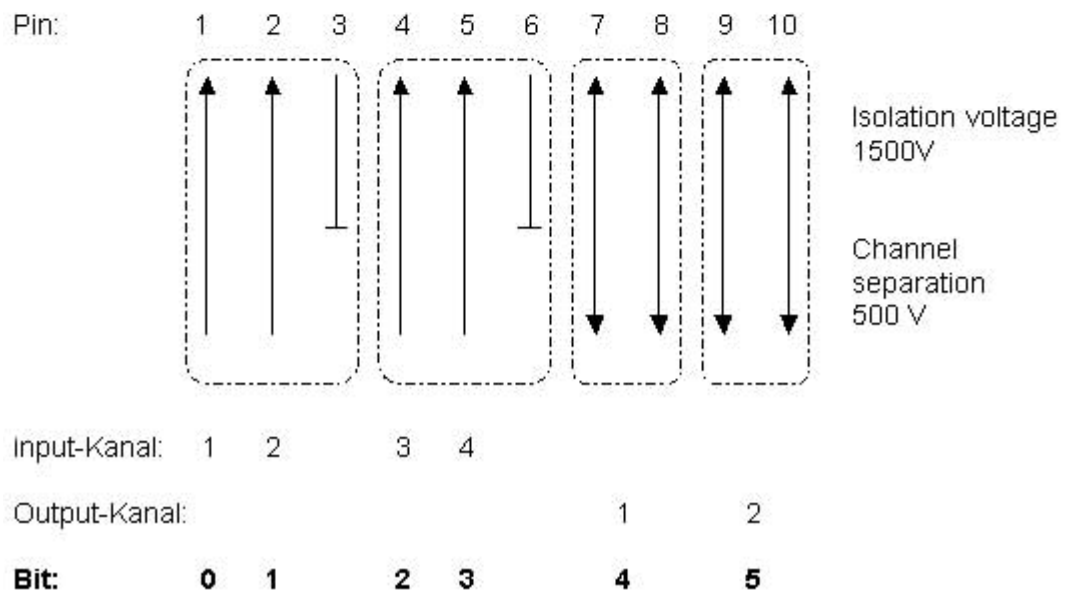
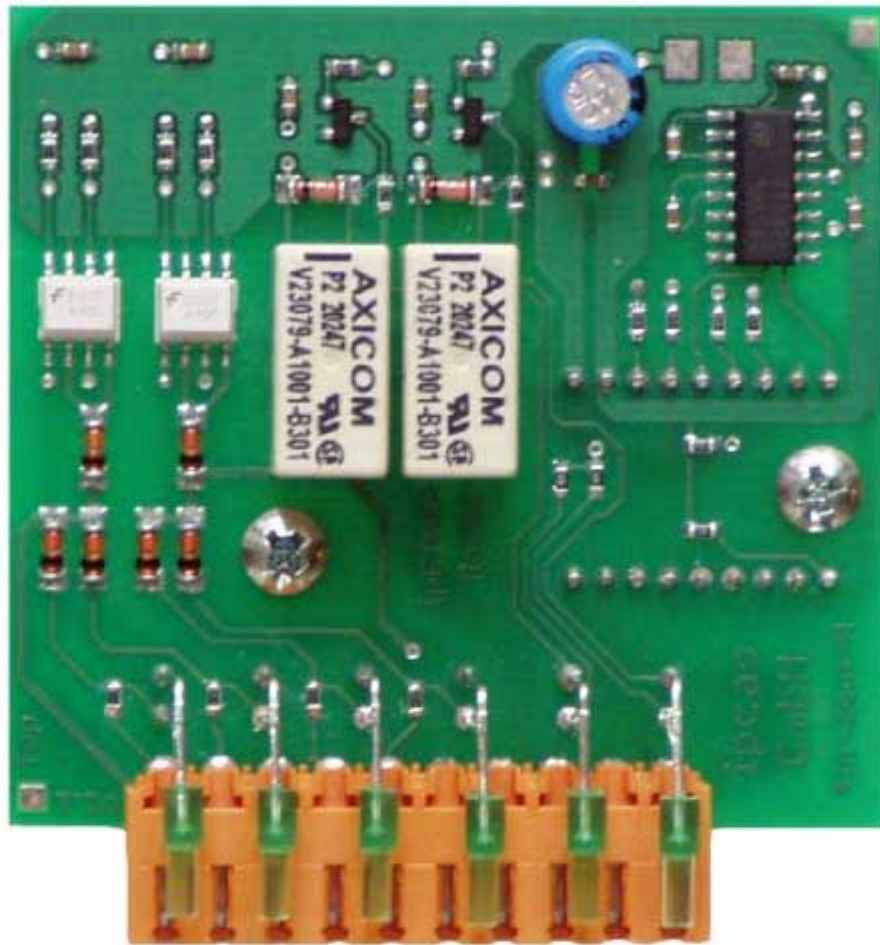
Matrikon We Make Connections

8.4 Pin allocation

ipEther232.IO with 6x 24 V DC inputs



ipEther232.IO with 4x 24 V DC inputs and 2x relay output channels



You can find the interface allocation of the serial and Ethernet interface in
Chapter: 10.2 Pin allocation

8.5 Technical Details for ipEther232.IO

Hardware 6x digital input

- Table- or DIN Rail assembly
- 9 V DC or 24 V DC or 48, 60 V DC power supply
- 10BaseT Ethernet Interface
- 6 digital input channels with reverse voltage protection
 - Input voltage 0 to 24 DC Volt
 - Low level on < 5V ; High level on > 10V
 - Input current by 24V ca. 5mA per input channel
 - Input cycle 1 ... 255 ms
 - Input debouncing off / or 1 ... 15 fold scan cycle
 - Connection profile 0,08 ... 1,5 mm (AWG 28 ... 16)
 - Channel separation 500 V galvanic separately in three groups
 - Galvanic separation 1.5 KV
- RS232 with 2400 up to 115200 Baud and 32 KByte data buffer
- LED state for RS232, LAN and the state of device
- LED state for all input channels

Hardware 4x digital input 2x digital output

- Table- or DIN Rail assembly
- 9 V DC or 24 V DC or 48, 60 V DC power supply
- 10BaseT Ethernet Interface
- 4 digital input channels with reverse voltage protection
 - Input voltage 0 to 24 DC Volt
 - Low level on < 5V ; High level on > 10V
 - Input current by 24V ca. 5mA per input channel
 - Input cycle 1 ... 255 ms
 - Input debouncing off / or 1 ... 15 fold scan cycle
 - Connection profile 0,08 ... 1,5 mm (AWG 28 ... 16)
 - Channel separation 500 V galvanic separately in three groups
 - Galvanic separation 1.5 KV
- 2 digital relay output channels
 - Switching voltage 24V / 1A
 - Switching cycles typ. 1.000.000 (24V/1A)
 - Response time typ. 5 ms
 - Connection profile 0,08 ... 1,5 mm (AWG 28 ... 16)
- RS232 with 2400 up to 115200 Baud and 32 KByte data buffer
- LED state for RS232, LAN and the state of device
- LED state for all input and output channels

Firmware

- Input – Scan cycle 1...255ms
- debouncing off / or 1..15fold scancyclic
- output switching cycles typ. 5 ms
- memory 50 Changes
- count value 6 * 32 Bit count value
- RS232 Transparent read / write via UDP
aprox. 32 kByte RS232 Data buffer

acquisition

- Bit Pattern
- Count value
- Event

transmission

- secured UDP transmission
- cyclic or triggered event
- max. 4 Clients (PC Connections) at the same time
- password-protected access
- documented plain language transmission (open interface)

Software

Installable Example program

- Example with Microsoft Excel
- Database application
(save the event in Access / SQL-Server or Oracle)
- Example with Windows User Interface
- Console-Programme
- Event display on HTML Page

Software Interfaces

- Windows.Forms Control
- OCX/ActiveX Control for the adoption in..
 - own development
 - Office Application
- OPC DA 2.0 / 3.0 in future
- Delivery inclusive documented Source-Code in Microsoft .NET
- MSDN compatible help-Files
- Documented Ethernet Interface
- Transparency access on the RS232 with
 - Windows.Forms Control
 - OCX/ActiveX Control

Further Technical Details

ipEther232.IO		Desktop	DIN-Rail Unit	OEM Version
Interfaces		<div>➤ 1 x RS232 SUB-D9 (RX / TX / GND)</div> <div>➤ 6 x 24 V DC input channel or</div> <div>➤ 4 x 24 V DC input channel, 2 x relay output channels 24V/1A</div> <div>➤ Isolation voltage: 1.5 KV</div> <div>➤ Channel separation: 500 V (galvanic in three groups isolated)</div> <div>➤ Input scan cycle: 1 ... 255 ms</div> <div>➤ Input debouncing: 1 ... 15 fold Scan cycle</div>		
		1 x 10BaseT – RJ45 (for networks at 10/100 MBit/s)		
Diagnostic LEDs		Power, System, Error, 6x digital I/O status, RS232 Send/Receive Ethernet Send/Receive/Link		
Voltage		+ 8 - 14 V DC - Input Jack	+ 8 - 14 or 24 V DC ¹⁾ Input Jack and 3.5mm connector	+ 8 - 14 V DC – Input Jack 5 V DC male header on board
Housing		Plastic housing	Plastic housing	Without housing
Dimensions W/H/D		Approx. 45/108/73 mm	Approx. 45/108/73 mm	Approx. 100/20/70 mm
Operating / Storage temperature		5° C to 55° C / -10° C to 70° C		
Relative humidity		5 % to 90 % non-condensing		
Standards		CE		
Scope of delivery		ipEther232.IO		
		External Power supply ²⁾ Input: 230 V AC Output: + 9 V DC	Without power supply (Optional)	Without power supply (Optional)
		Configuration software, Windows (NT, 2000, XP) driver, Manual (German or English documentation)		
Order number	6x Input 1x RS232	0202023	0202023-H 0202023-H24 0202023-H60	0202023-OEM
Order number	4x Input 2x Output 1x RS232	0202024	0202024-H 0202024-H24 0202024-H60	0202024-OEM

¹⁾ Further voltages on request

²⁾ Delivery only at countries with 230 V AC 50Hz

Chapter 9: Konfiguration von ipEther232.Protokolldrucker (German Chapter)



This Chapter is only for german speaking countries

9.1 Konfiguration von ipEther232.Protokolldrucker

Wie beschrieben werden von dem Konfigurationsprogramm alle Geräte im eigenen Netzwerksegment gefunden.
Ein Doppelklick auf einen Eintrag öffnet den Detaildialog der aus acht Teilen besteht.



TCP/IP (Ethernet):

Hier finden sie die MAC-Adresse, IP-Adresse und den vergebenen Gerätenamen (Set Name) des ipEther232.Protokolldrucker.

Service information:

Aufruf der Service Information/Status Seite wenn der „ipcas.ipether.printer“-Dienst (Druckdatenerfassungssoftware) installiert wurde. Weitere Informationen zu dem Dienst siehe Kapitel „Serverdienst“

Zeigt für jede Druckquelle (Gerät) den aktuellen Status (Online = true bedeutet das Gerät ipEther232.Protokolldrucker ist eingeschaltet und über das Ethernet erreichbar) und in welche Datei (Verzeichnispfad \ Dateiname) geschrieben wird.

Name	IP Address	Online	Current File	Current File Length kB	Total received kB	Buffer Usage	Overruns
Maschine1	192.109.223.222	true	C:\tmp\output\Maschine1\2006\20060504-150750968.dat	0	2	0 %	0
COM23	192.168.88.23	false		0	0	0 %	0
COM24	192.168.88.24	false		0	0	0 %	0
COM25	192.168.88.25	false		0	0	0 %	0
COM26	192.168.88.26	false		0	0	0 %	0
TestDevice	192.109.223.221	false		0	0	0 %	0

[Display as XML](#)

ipcas ipEther.Printer Properties 10.0.2294.16069

TCP/IP | Device Settings | Output | Log | Notification | Devices | INet Info | About

General

State: Connected

Name: Maschine1

Mode

Baud Rate: 57600

Data Bits: 8

Parity: None

Stop Bits: 1

Fire and Forget: ☐ The device does not require a receive confirmation from the client.

Flow Control: ☐ None ☒ RTS ☐ DTR ☐ Both

Timeouts

RxD Timeout: 500 ms

Character Timeout: 0 ms

OK Apply Cancel

General:

„State“: Eine Ethernetverbindung (UDP – open) zu dem ipEther232.IO konnte hergestellt werden und Sie können mit der Konfiguration fortfahren. Konnte die Ethernetverbindung nicht hergestellt werden, können Sie die Konfiguration nicht ändern. (Gerät nicht mehr erreichbar.)



„Name“: Der zu verwendende Gerätenamen für die lokale Konfiguration ist hier einzutragen. Dieser ist zur Unterscheidung bei mehreren Geräten unbedingt zu vergeben.

(Bitte nicht verwechseln mit dem Gerätenamen für das Konfigurationstool)

Mode:

Baudrate, Databits, Parity und StopBits werden dem Kommunikationsverhalten des seriellen Endgerätes angepasst.

„Fire and Forget“: Es wird kein Ethernetpaket zur Bestätigung zurückgesendet. Die seriellen Daten müssen nicht zwischengespeichert werden. Schnelle UDP Klartextübertragung und kann daher bei zeitkritischen Protokollen / Daten verwendet werden.

„Flow Control“: Konfiguration der Flusskontrolle

- None Keine Flusskontrolle (Modemsignale, Hardwarehandshake)
Für die Flusskontrolle werden die Signale RTS oder DTR benötigt die den Druckprozess gegebenenfalls bremsen. Da die Daten schneller gedruckt werden können, als über das Ethernet übertragen. Ohne Flusskontrolle kann es dadurch zu Datenverlusten kommen. Der Treiber setzt in diesem Modus automatisch RTS und DTR.



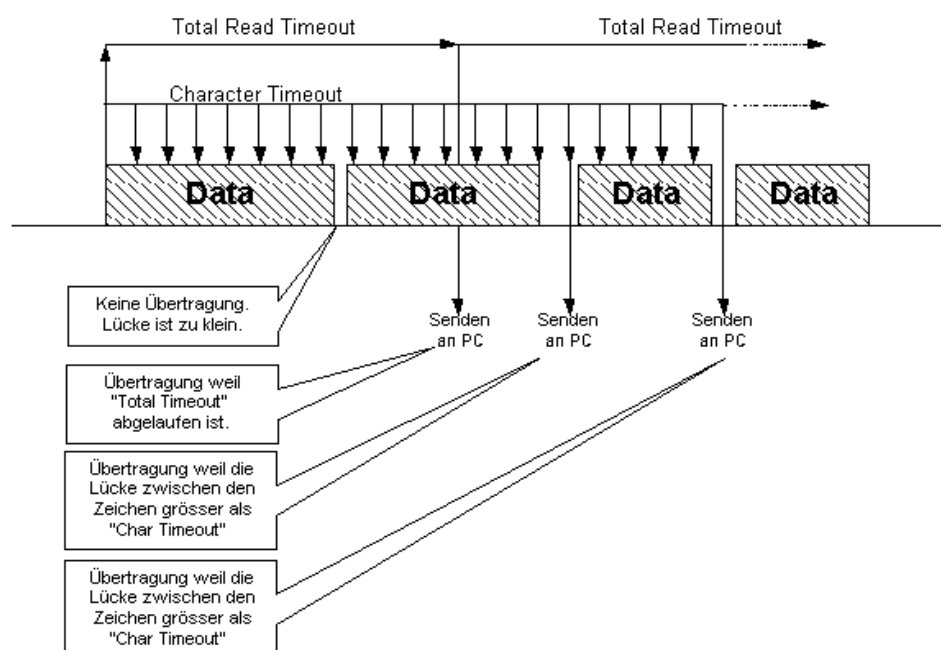
- RTS Wenn diese Option aktiviert ist, steuert ipEther232 den eingehenden Datenfluss über das RTS-Signal gemäß dem Füllstand des internen Datenpuffers. (Das RTS-Signal wird gesetzt, wenn interner Puffer kleiner 50% belegt. Das RTS-Signal wird zurückgesetzt, wenn der interne Puffer mehr als 90% gefüllt ist.)
- DTR Wenn diese Option aktiviert ist, steuert ipEther232 den eingehenden Datenfluss über das DTR-Signal gemäß dem Füllstand des internen Datenpuffers. (Das DTR-Signal wird gesetzt, wenn interner Puffer kleiner 50% belegt. Das DTR-Signal wird zurückgesetzt, wenn der interne Puffer mehr als 90% gefüllt ist.)
- Both Die Flusskontrolle kann über RTS oder DTR erfolgen.

Timeouts:

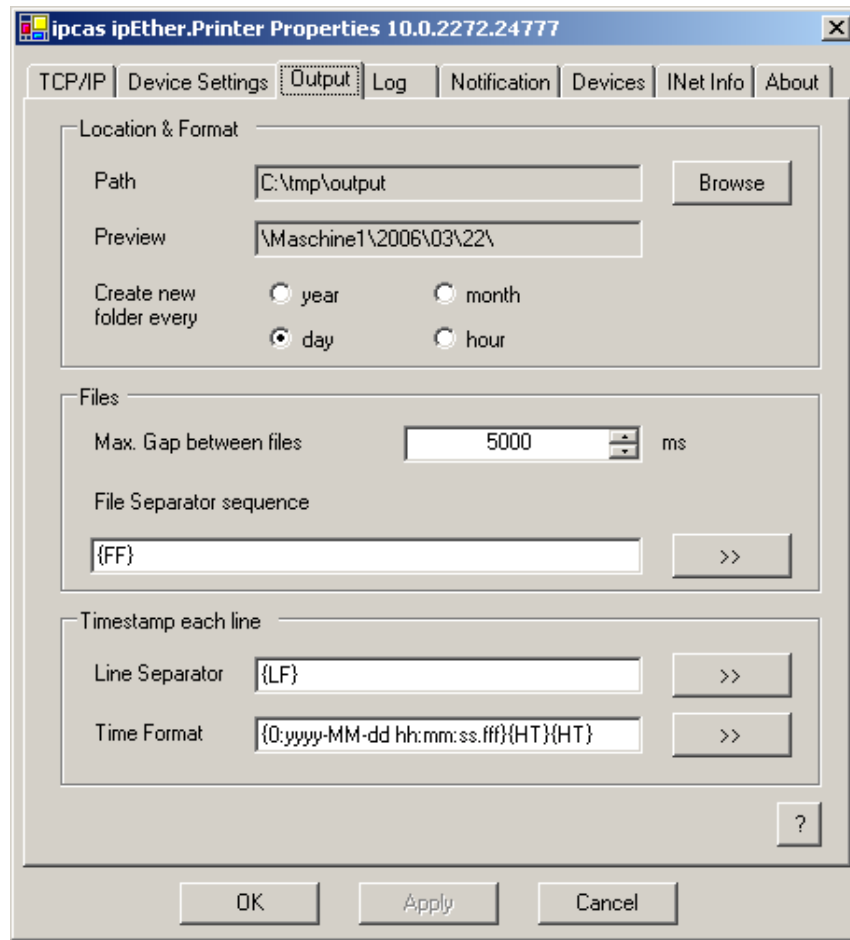
„RxD Timeout“: Nach dem Empfang des ersten Bytes beginnt der Timeout - Parameter zu laufen. Nach Ablauf dieser Zeit werden alle bis dahin empfangenen Zeichen an den Server versendet. Dieser Wert darf nicht kleiner sein als die benötigte Laufzeit des UDP - Paketes im Ethernet zu dem Server.

„Character Timeout“: Die Daten werden versendet weil eine Lücke von xxx ms im Datenstrom vorhanden ist. (0=deaktiviert)

Bei dem Empfang von seriellen Daten müssen Ethernetblöcke gebildet werden. Dafür gibt es zwei Timeout - Parameter.



Bei zeitkritischen Applikationen kann es notwendig sein, ein „Feintuning“ vorzunehmen.



In diesen Dateien werden die empfangenen Druckdaten vom installierten Service zu dem aktuellem Gerät (hier Maschine1) abgelegt.

Location & Format:

Hier kann ein existierender Pfad auf dem PC eingegeben werden, also z.B.: C:\tmp\output, um die Output-Dateien in diesem Verzeichnis abzulegen.

Auswahl wann eine neue Logdatei angelegt werden soll.

(Logrotation: jährlich, monatlich, täglich, stündlich)

Files:

„Max. Gap between files“: wenn in diesem Zeitraum keine Daten empfangen werden, wird eine neue Datei begonnen

„File Separator sequence“: wenn diese Sequenz im Datenstrom empfangen wird, wird eine neue Datei begonnen. (erfordert Kenntnis der empfangenen Daten)

Timestamp each line:


Einfügen eines Zeitstempels vor eine Zeile die mit einem bestimmten Zeilenseparator - Zeichen abgeschlossen wurde.

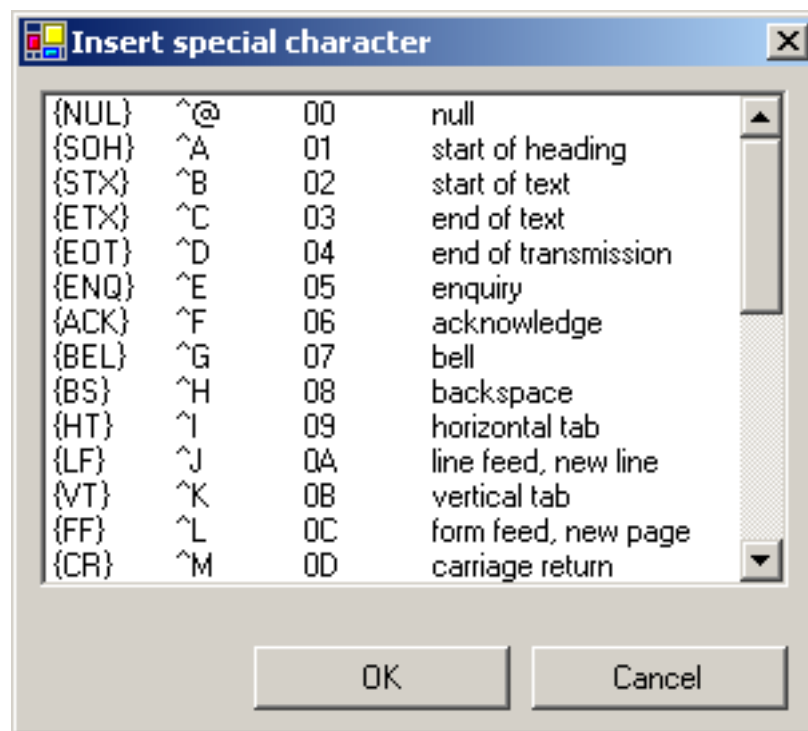
(nur bei reinen textbasierenden Daten möglich)

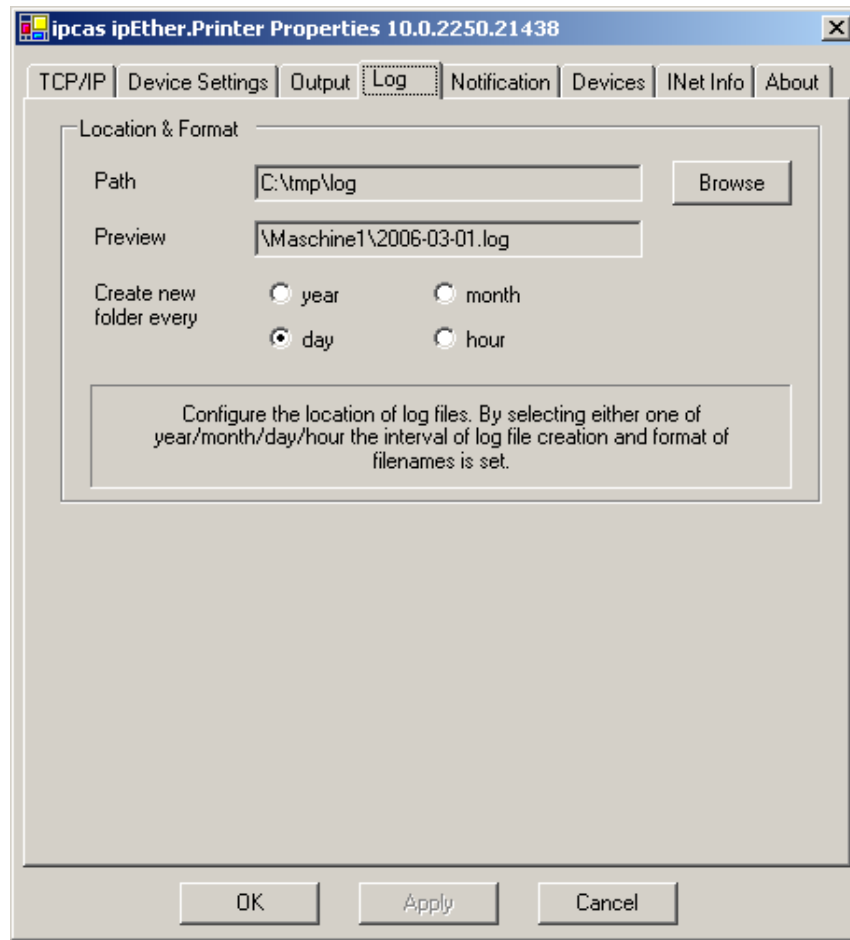
„Line Separator“: Darf nur ein Zeichen enthalten das den Zeilenumbruch markiert, also z.B. nur {LF}

“Time Format“: Zeitstempelformat z.B.: {0:yyyy-MM-dd HH:mm:ss.fff}{HT}{HT}

Das Ergebnis wäre z.B.: \n2006-03-22 14:23:45.234\t\t

Die  Buttons öffnen ein Fenster, zum Auswählen von Sequenzen von Sonderzeichen, zum Einfügen an die aktuelle Cursorposition in dem aktuellem Feld.

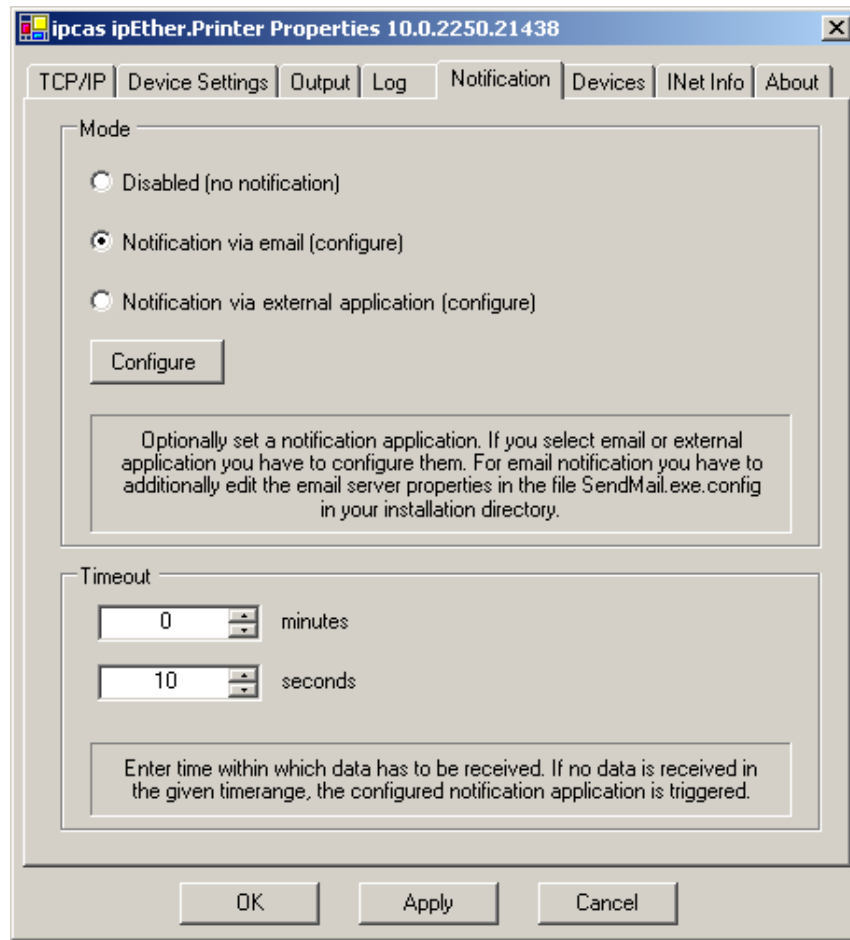




In diesen Logfiles werden Meldungen vom installierten Service zu dem aktuellem Gerät (hier Maschine1) abgelegt.

Location & Format:

Hier kann ein existierender Pfad auf dem PC eingegeben werden, also z.B.: C:\tmp\log, um die Log-Dateien in diesem Verzeichnis abzulegen. Zusätzlich kann ausgewählt werden wann eine neue Logdatei angelegt werden soll. (Neue Logdatei erstellen: jährlich, monatlich, täglich, stündlich)



Eine Benachrichtigung ist bei folgenden Ereignissen vorgesehen:

- Ereignis 0 Connected - Verbindung zum Gerät wurde aufgebaut
 Status 0 - disconnected
 Status 1 - connected
- Ereignis 1 InformationLost - Nutzdaten sind verloren gegangen
 Status 1 - Nutzdaten sind verloren gegangen
- Ereignis 2 DeadmanTimeout - während eingestelltem Deadmantimeout wurden keine Daten empfangen
 Status 1 - während eingestelltem Deadmantimeout wurden kein Daten empfangen

Mode:

„Disabled“: Keine Benachrichtigung bei Ereignissen

„Notification via email“: Eigener Konfigurationsdialog zum Einrichten von einem Mailclient zum versenden von E-Mails (Tool: Sendmail.exe ; Mailserverkonfiguration wird lokal in der XML-Datei SendMail.exe.config gespeichert).

Bild bitte mit zwei E-Mail Empfängern

Configure email notification

SMTP-Server: mailserver.yourdomain

Username: username

Password: xxxxxxxx

From: sender@yourdomain.com

To: recipient1@yourdomain.com;recipient1@yourdomain.com

Subject: Notification for Device1

Text:
ip: {IP}
name: {Name}
reason: {ReasonString}
reasonid: {ReasonID}
state: {State}

Parameters: {State}

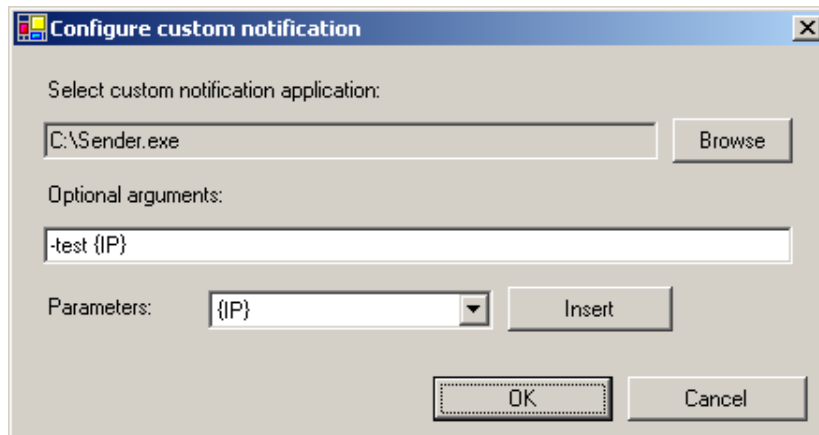
SMTP-Server, Username und Password sind Serverangaben um über einen Mailserver die E-Mails zu versenden.

From, To, Subject sind Absender, Empfänger (mehrere Empfänger durch Semikolon getrennt) und Subjekt der Email.

Es können ein freier Text folgende Parameter und übermittelt werden:

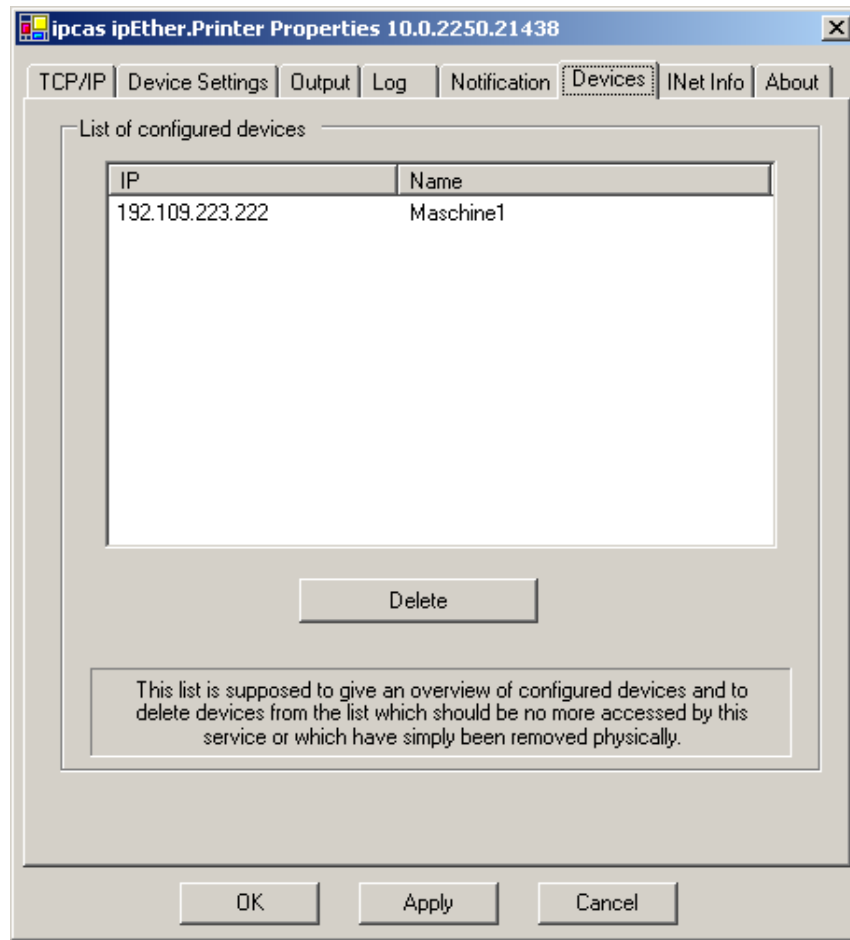
IP	IP-Adresse des Gerätes
Name	Der vergebene Gerätenamen
ReasonString	Ereignistext warum benachrichtigt wurde
ReasonID	Nummer des Ereignisses
State	Status der aktuellen Meldung (des Ereignisses)

„Notification via external application“: Konfigurationsdialog zum Einrichten von einer eigenen Kommunikations-Applikation (*.exe) und optionaler Kommandozeilen Parameterübergabe.



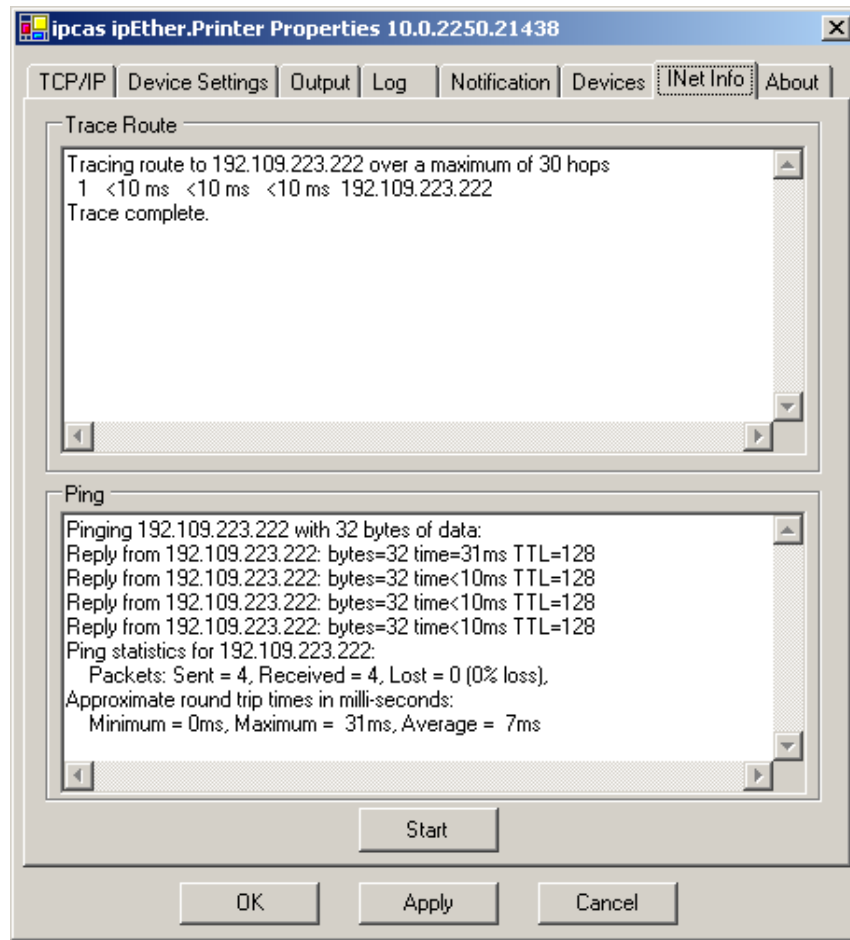
Timeout:

Wenn in der angegebenen Zeit keine Daten empfangen werden, und die Benachrichtigungsfunktion nicht ausgeschaltet ist, dann wird die Ereignisbenachrichtigung ausgelöst. (DeadmanTimeout Minimum 1 Sekunde)

**Devices:**

Liste aller konfigurierten Geräte aus dem lokalem XML Konfigurationsfile, von allen hier gelisteten Geräten werden Daten gesammelt.

Möglichkeit ein Gerät aus der Konfiguration zu entfernen wenn dieses nicht mehr erforderlich ist.



Traceroute

Über Traceroute kann man sich den Datenweg zwischen zwei Servern im Internet anzeigen lassen. Traceroute listet alle Server auf, die zwischen dem jeweiligen Traceroute-Server und der Zieladresse liegen.

Ping

Ping ist eine Anwendung des ICMP (Internet Control Message Protocol RFC 792). Dieses Protokoll (das auch Bestandteil des IP-Protokolls ist) überträgt verschiedene Verwaltungsinformationen und lässt sich deswegen auch zur Fehlerdiagnose einsetzen. Trifft dieses Ping-Signal auf ein Objekt, kann dessen Reflexion (Echo) wieder vom entsprechenden Sender empfangen werden. So kann Ping ermitteln, ob die angesprochene IP-Adresse aktiv ist (ob eine Verbindung aufgebaut werden kann) und wie schnell diese ist.

Der Ping kann auch manuell ausgeführt werden wenn man wie folgt vorgeht. Unter Windows Betriebssystemen gibt man hierfür in der Eingabeaufforderung den Befehl „ping *IP-Adresse*“ ein.

Unter Linux Betriebssystemen gibt man hierfür den in der Kommandozeile den Befehl „ping -s 32 *IP-Adresse*“ ein.

Unter Solaris Betriebssystemen gibt man hierfür den in der Kommandozeile den Befehl „ping -s *IP-Adresse* 32“ ein.



About
Informationsseite

9.2 Der Serverdienst

Die Druckdatenerfassungssoftware „ipcas.EthernetPrinter.Setup.msi“ muss zusätzlich zu dem Konfigurationstool installiert werden.

Wenn die Konfiguration eines ipEther232.Protokolldruckers geändert wird, startet der Dienst automatisch neu, um die veränderte Konfiguration zu verwenden.

Der aktuelle Status des Dienstes „ipcas.ipether.printer“ kann in der Eigenschaftsseite (TCP/IP unter Service Information) von dem ipEther232.Protokolldrucker eingesehen werden.

Dieser Dienst „ipcas.ipether.printer“ kann unter „Rechtsklick auf den Arbeitsplatz -> Verwalten -> Dienste und Anwendungen -> Dienste“ gestoppt werden.

Unter „Start -> Einstellungen -> Systemsteuerung -> Software“ kann der Dienst und das Konfigurationstool deinstalliert werden.

9.3 Steckerbelegung

Für die Verbindung der Protokolldruckerschnittstelle mit dem ipEther232.Protokolldrucker werden Anschlusskabel benötigt.

Zum Anschluss einer seriellen Protokolldruckerschnittstelle (9 pol. oder 25 pol.) wird folgender Kabelsatz mitgeliefert:

Seriellles Kabel DB9 Buchse auf DB9 Buchse 3m

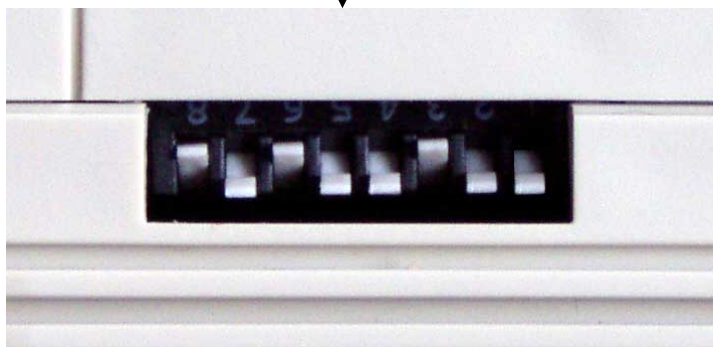
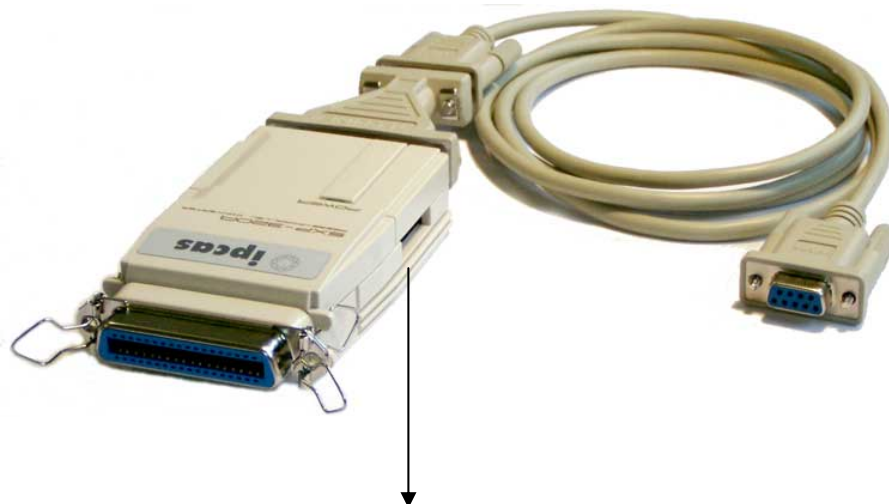


Adapter DB25 Buchse auf DB9 Stecker



Zum Anschluss einer parallelen Protokolldruckerschnittstelle wird optional folgender Kabelsatz mitgeliefert:

Seriell-Kabel DB9 Buchse auf DB25 Stecker 3m
Seriell-parallel Konverter
Gender-Changer 36pol. Centronics Buchse auf Buchse



Die Grundeinstellung des parallel-seriell Wandlers darf nicht verändert werden.

9.4 Technische Details für ipEther232.Protokolldrucker



Für die Flusskontrolle werden die Signale RTS und DTR benötigt die den Druckprozess gegebenenfalls bremsen. (Die Daten können schneller gedruckt werden, als über das Ethernet übertragen.)

Mindestanforderung an den Server:

- Windows NT4, 2000, XP, 2003
- CPU: 1000MHz
- 512MB RAM
- 1GB freier Festplattenspeicher
- 4x CD-ROM

Weitere Technische Details

ipEther232.Protokolldrucker		Hutschienengerät
Schnittstellen		1 x RS232 oder 1x parallel
		<ul style="list-style-type: none"> ➤ Baudrate: 2.400 bis 115.200 baud ➤ Parity: None, Even, Odd, Mark, Space ➤ Data: 8 Bits ➤ Stop: 1 oder 2 Bits
		1 x 10BaseT – RJ45 (kann in Netzwerken mit 10/100 MBit/s betrieben werden)
Diagnose-LEDs		Power, System, Error, RS232 Send/Receive, Ethernet Send/Receive/Link
Spannungsversorgung		+ 8 - 14 oder 24 V DC oder 60 V DC ¹⁾ Rundbuchse und 3,5mm Buchsenleiste
Gehäuse		Kunststoffgehäuse
Abmessungen B/H/T		Ca. 45/108/73 mm
Betriebs- / Lagertemperatur		5° C bis 55° C / -10° C bis 70° C
Rel. Feuchte		5 % bis 90 % nicht kondensierend
Normen		CE
Lieferumfang		ipEther232.Protokolldrucker mit Kabelsatz für Serielle oder Parallele Schnittstelle
		Ohne Netzteil (Optional)
		Konfigurationssoftware, Treiber für Windows (NT, 2000, XP), Handbuch (Deutsch oder Englisch)
Bestellnummer	Seriell	0202025-H 0202025-H24 0202025-H60
	Parallel	0202026-H 0202026-H24 0202026-H60

1) Andere Spannungen auf Anfrage

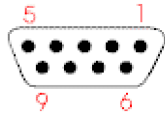
Chapter 10: General technical details

10.1 Technical Data

Constructional execution	
Housing	Plastic
Dimensions	see Dimensions
Weight:	
Desktop	Approx. 150 g
DIN-Rail-Unit	Approx. 180 g
External power supply	Approx. 180 g
Supply voltage	
Desktop	(AC – Versions on request)
DIN-Rail-Unit -H24	9 V DC (8 – 14 V DC \pm 5 %)
DIN-Rail-Unit -H60	24 V DC (18 – 36 V DC \pm 5 %)
	60 V DC (18 – 72 V DC \pm 5 %)
Capacity	
Desktop	Rated voltage (typical value)
DIN-Rail-Unit -H24	9 V DC 80 mA ca. 0,8 W
DIN-Rail-Unit -H60	24 V DC 60 mA ca. 1,44 W
	60 V DC 40 mA ca. 2,4 W
External power supply 1	
Alternating voltage	230 V AC 50 Hz approx. 6,3 VA
Direct voltage	9 V DC approx. 2,25 VA
Operating temperature	0°C to +40°C
Relative humidity	5 % to 90 % non condensing
External power supply 2	
AC-voltage	100 / 240 V AC 50 / 60 Hz approx. 12,6 VA
DC-voltage	9 V DC approx. 8,1 VA
Operating temperature	0°C to +40°C
Relative humidity	5 % to 90 % non condensing
Protection class	
Galvanic Separation	II / III (Protection insulation, Protection separation) 1,5 KV
Thermal shock tests	
Recommended operating temperature	+10°C to +50°C
Limit temperature while operating	+5°C to +55°C
Store- and Transport temperature	-10°C to +70°C
Relative humidity	5 % to 90 % non condensing
Serial Interface	
Socket	9-pin Sub-D connector full RS232
Pin allocation	see Pin allocation
Options	
Baud rate	2400 to 115200 Baud
Parity	None, Even, Odd, Mark, Space
Databits	7 or 8 Bits (Exception 7N1)
Stopbits	1 or 2 Bits
Cabel length in the office	RS232 up to 10 m RS485 up to 500m
At RS485	2 / 4 wire solution Transmit signals optionally insertable (RTS or CTS)
Ethernet Interface	
Socket	10BaseT RJ45
TCP/IP	UDP Port 3497, ICMP, ARP
Display	
	Power, System, Error, Link, EthRxD, EthTxD Rs232 RxD, TxD
Firmware	
	Updateable
Driver	
	Setup & Configuration tool for Windows NT4 / 2000 / XP .Net Framework 1.1
Standards	
	EN 55022/1998 EN 50082-2/1997

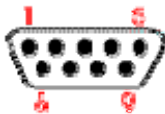
10.2 Pin allocation

SERIAL PORT RS232 DCE (Modem) DB9 Connector (female)



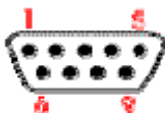
Pin	Direction	Description
1	OUTPUT	DCD Data Carrier Detect
2	OUTPUT	RXD Receive Data
3	INPUT	TXD Transmit Data
4	INPUT	DTR Data Terminal Ready
5		GND Ground
6	OUTPUT	DSR Data Set Ready
7	INPUT	RTS Request To Send
8	OUTPUT	CTS Clear To Send
9	OUTPUT	RI Ring Indicator

SERIAL PORT RS232 DTE (Computer) DB9 Connector (male)



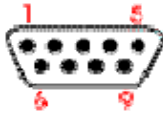
Pin	Direction	Description
1	INPUT	DCD Data Carrier Detect
2	INPUT	RXD Receive Data
3	OUTPUT	TXD Transmit Data
4	OUTPUT	DTR Data Terminal Ready
5		GND Ground
6	INPUT	DSR Data Set Ready
7	OUTPUT	RTS Request To Send
8	INPUT	CTS Clear To Send
9	INPUT	RI Ring Indicator

SERIAL PORT RS232 DTE (Computer) DB9 plug for ipEther232.IO



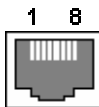
Pin	Direction	Description
1		NC
2	INPUT	RXD Receive Data
3	OUTPUT	TXD Transmit Data
4		NC
5		GND mass
6		NC
7		NC
8		NC
9		NC

**SERIAL PORT
RS485
DB9 Connector (male)**



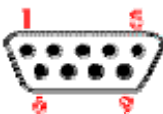
Pin	Direction	Description
1		NC
2	OUTPUT	Transmit Data+
3	OUTPUT	Transmit Data-
4		NC
5		GND Masse
6	INPUT	Receive Data+
7	INPUT	Receive Data-
8		NC
9		NC

**Ethernet Connector
RJ45**



Pin	Direction	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4		NC
5		NC
6	RX-	Receive Data-
7		NC
8		NC

**DCF77 PORT
DB9 Connector (male)**



Pin	Direction	Description
1		NC
2		NC
3		NC
4		NC
5		GND Ground
6		NC
7	INPUT	Signal Antenna
8		NC
9		VCC Antenna

10.3 RS232 Connection Cable

Whichever device is used, you have to choose the complying connection cable.
From the following graphics, you can extract the information to your needed connection cable.

(also shown at Chapter Pin Allocation)

For *ipEther232* and *ipEther232.PPP* "**DTE-Device**"

For *ipEther232.Modem* "**DCE-Device**"

Modem Cable - Straight Cable DB9 to DB9

DTE Device (Computer) DB9				DTE to DCE Connections				DCE Device (Modem) DB9			
Pin#	DB9	RS-232 Signal Names		Signal Direction				Pin#	DB9	RS-232 Signal Names	
#1		Carrier Detector (DCD)	CD					#1		Carrier Detector (DCD)	CD
#2		Receive Data (Rx)	RD					#2		Receive Data (Rx)	RD
#3		Transmit Data (Tx)	TD					#3		Transmit Data (Tx)	TD
#4		Data Terminal Ready	DTR					#4		Data Terminal Ready	DTR
#5		Signal Ground/Common (SG)	GND					#5		Signal Ground/Common (SG)	GND
#6		Data Set Ready	DSR					#6		Data Set Ready	DSR
#7		Request to Send	RTS					#7		Request to Send	RTS
#8		Clear to Send	CTS					#8		Clear to Send	CTS
#9		Ring Indicator	RI					#9		Ring Indicator	RI
Soldered to DB9 Metal - Shield								Soldered to DB9 Metal - Shield			
FGND								FGND			

Modem to Modem Cable - Crossover Cable DB9 to DB9

DCE Device (Modem) DB9				DCE to DCE Connections				DCE Device (Modem) DB9			
Pin#	DB9	RS-232 Signal Names		Signal Direction				Pin#	DB9	RS-232 Signal Names	
#1		Carrier Detector (DCD)	CD					#1		Carrier Detector (DCD)	CD
#2		Receive Data (Rx)	RD					#2		Receive Data (Rx)	RD
#3		Transmit Data (Tx)	TD					#3		Transmit Data (Tx)	TD
#4		Data Terminal Ready	DTR					#4		Data Terminal Ready	DTR
#5		Signal Ground/Common (SG)	GND					#5		Signal Ground/Common (SG)	GND
#6		Data Set Ready	DSR					#6		Data Set Ready	DSR
#7		Request to Send	RTS					#7		Request to Send	RTS
#8		Clear to Send	CTS					#8		Clear to Send	CTS
#9		Ring Indicator	RI					#9		Ring Indicator	RI
Soldered to DB9 Metal - Shield								Soldered to DB9 Metal - Shield			
FGND								FGND			

The two standard configurations of null modem cable:

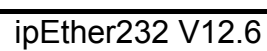
Null Modem Cable - Crossover Cable DB9 to DB9

DTE Device (Computer) DB9			DTE to DTE Connections	DTE Device (Computer) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
		FGND				FGND

Null Modem Cable - Crossover Cable DB9 to DB9

DTE Device (Computer) DB9			DTE to DTE Connections	DTE Device (Computer) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
		FGND				FGND

Subject to change without prior notice



J1: LAN-Interface			
1	TX+	3	RX+
2	TX-	6	RX-

J4: RS232- / RS485-Interface			
1	CD / -	6	DSR / RX+
2	RXD / TX+	7	RTS / RX-
3	TXD / TX-	8	CTS / -
4	DTR / -	9	RI / -
5	GND/GND		

J6: LAN-Interface (OEM)			
1	TX+	3	RX+
2	TX-	4	RX-

J7: LED-Interface (OEM)			
1	+5V	6	LED_LAN_RXD
2	LED_POWER	7	LED_LAN_TXD
3	LED_SYSTEM	8	LED_SYSTEM2
4	LED_COM_TXD	9	LED_LAN_LINK
5	LED_COM_RXD	10	GND

J8: Module-Interface (RS232 / RS485 SNTP)				
1	CD		6	RTS / RX- Antenna
2	DSR / RX+		7	TXD / TX-
3	RXD / TX+		8	DTR
4	CTS		9	DTR_TTL Antenna Loopback
5	RI	VCC Antenna		

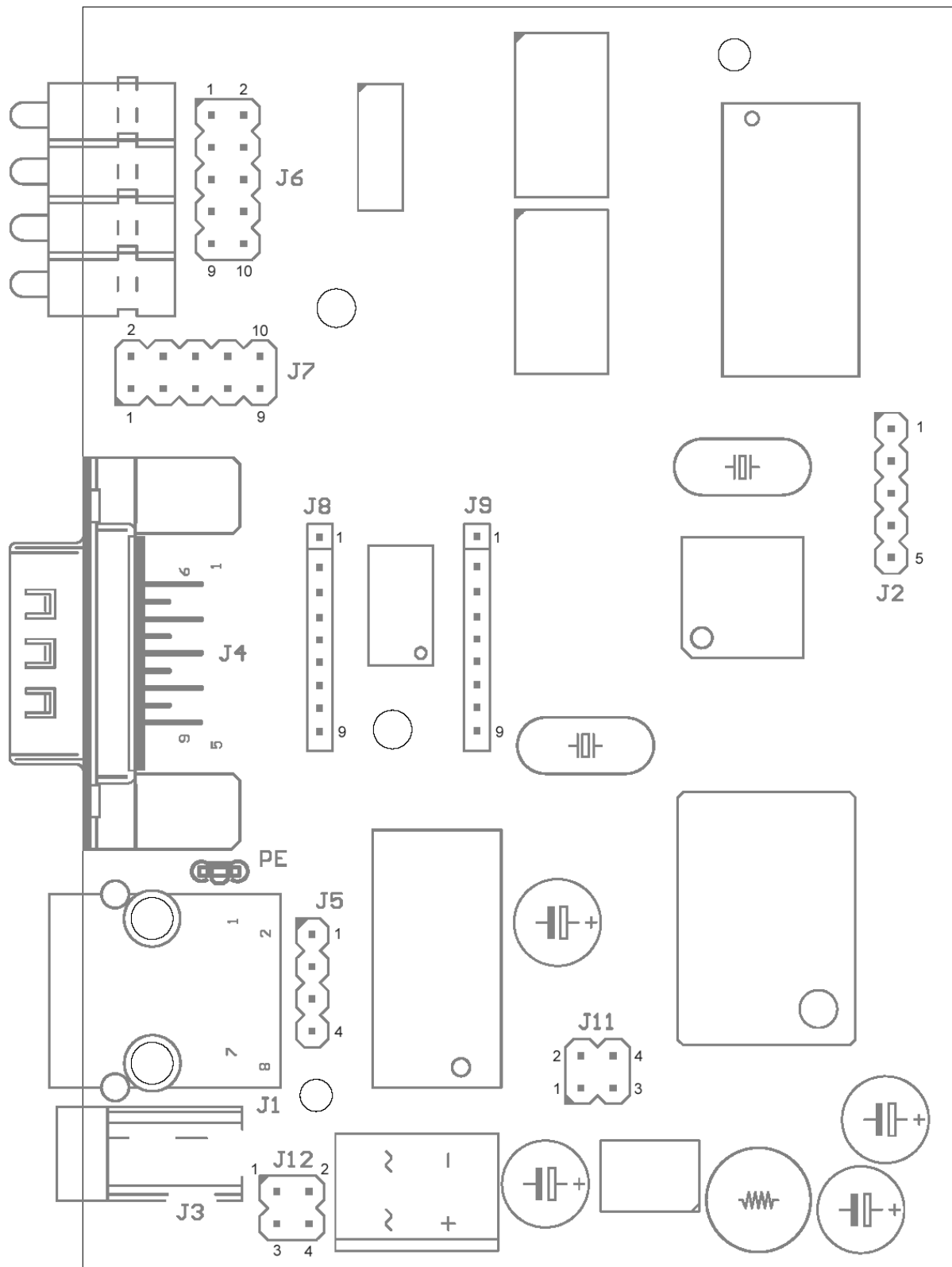
J9: Module-Interface (RS232 / RS485 SNTP)				
1	+5V	+5V	6	CTS_TTL
2	GND	GND	7	RI_TTL
3	CD_TTL	SCL	8	RTS_TTL Antenna
4	DSR_TTL	SDA	9	TXD_TTL
5	RXD_TTL			

J10: RS232- / RS485-Interface (OEM)			
1	CD / -	6	CTS / -
2	DSR / RX+	7	DTR / -
3	RXD / TX+	8	RI / -
4	RTS / RX-	9	GND
5	TXD / TX-	10	n/c

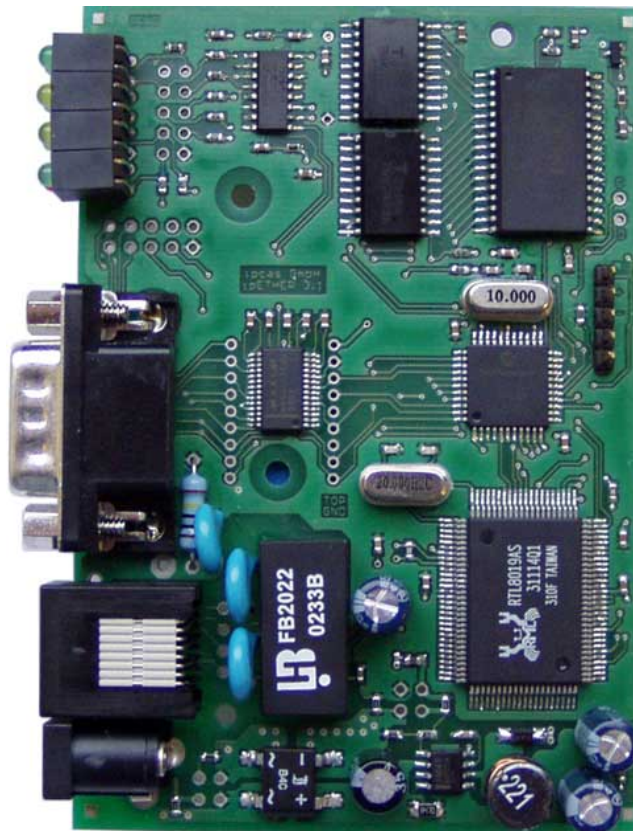
JP6: Supply voltage input (OEM)			
1	GND	2	Vin+ (8 – 14 VDC)

JP7: 5V Supply voltage input (OEM)			
1	GND	2	+5V

10.5 Pin allocation for ipEther232 mainboard v3.1



ipEther232 V3.1 with RS232 without Socket for a bus driver module



J1: LAN-Interface RJ45	
1	TX+
2	TX-
3	RX+
4	-
5	-
6	RX-
7	-
8	-

J4: SUB D9 connector with RS232	
1	CD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

J5: internal LAN-Interface (OEM)	
1	TX+
2	TX-
3	RX+
4	RX-

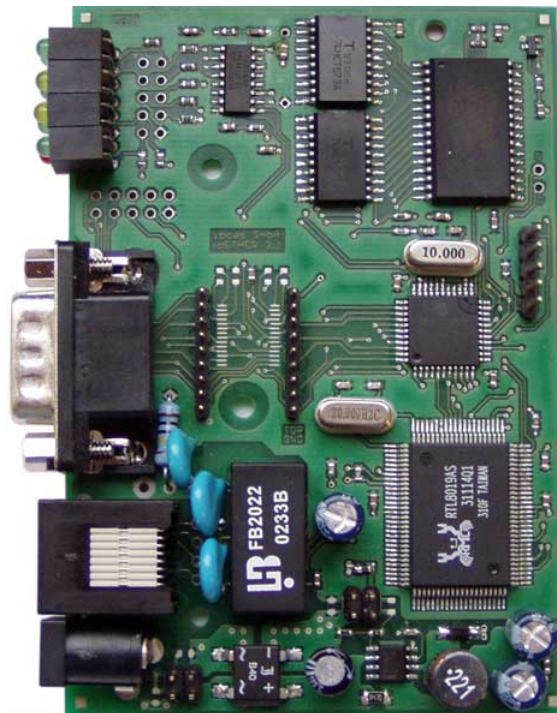
J6: LED-Interface (OEM)	
1	+5V
2	LED_POWER
3	LED_SYSTEM
4	LED_COM_TXD
5	LED_COM_RXD
6	LED_LAN_RXD
7	LED_LAN_TXD
8	LED_SYSTEM2
9	LED_LAN_LINK
10	GND

J7: internal RS232 connector (OEM)	
1	CD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	-

J11: Supply voltage input (OEM)	
1-2	GND
3-4	Vin+ (8 – 14 VDC)

J12: 5V Supply voltage input (OEM)	
1-2	GND
3-4	+5V

ipEther232 V3.1 with RS232 with Socket for a bus driver module



J1: LAN-Interface RJ45

1	TX+
2	TX-
3	RX+
4	-
5	-
6	RX-
7	-
8	-

J4: SUB D9 connector (allocation dependent from used bus driver module)

	RS232	RS485	DCF77 / GPS	RS232 for ipEther232.IO
1	CD	-	-	-
2	RXD	TX+	RX GPS	RXD
3	TXD	TX-	TX GPS	TXD
4	DTR	-	+ 5V	-
5	GND	GND/GND	GND	GND
6	DSR	RX+	-	-
7	RTS	RX-	-	-
8	CTS	-	-	-
9	RI	-	PPS	-

J5: internal LAN-Interface (OEM)	
1	TX+
2	TX-
3	RX+
4	RX-

J6: LED-Interface (OEM)	
1	+5V
2	LED_POWER
3	LED_SYSTEM
4	LED_COM_TXD
5	LED_COM_RXD
6	LED_LAN_RXD
7	LED_LAN_TXD
8	LED_SYSTEM2
9	LED_LAN_LINK
10	GND

J7: internal connector (allocation dependent from used bus driver module)				
	RS232	RS485	DCF77 / GPS	RS232 for ipEther232.IO
1	CD	-	-	-
2	DSR	TX+	RXD GPS	RXD
3	RXD	TX-	TXD GPS	TXD
4	RTS	-	+ 5V	-
5	TXD	GND/GND	GND	GND
6	CTS	RX+	-	-
7	DTR	RX-	-	-
8	RI	-	-	-
9	GND	-	PPS	-
10	-	-	-	-

J8: internal module connector (allocation dependent from used bus driver modul)
internal usage for bus driver module

J9: internal module connector (allocation dependent from used bus driver modul)
internal usage for bus driver module

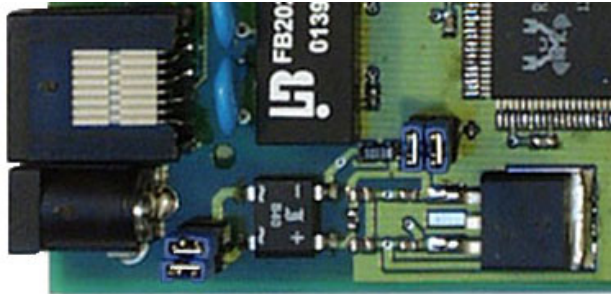
J11: Supply voltage input	
1-2	GND
3-4	Vin+ (8 – 14 VDC)

J12: 5V Supply voltage input	
1-2	GND
3-4	+5V

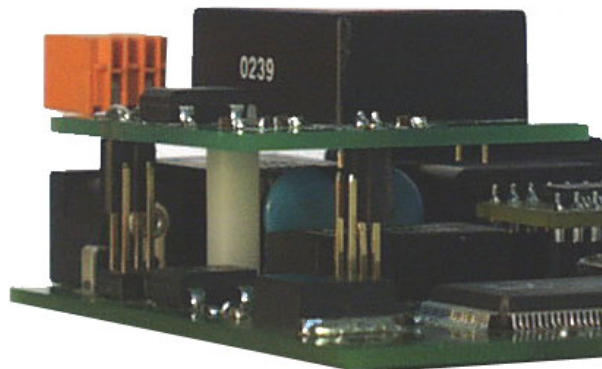
10.6 Power supply modules

(18-36 V DC or 18-72 V DC with reverse voltage protection)

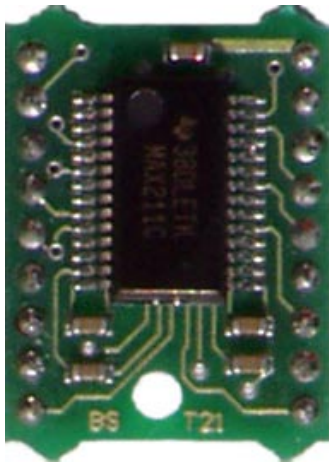
(AC – Versions on request)



Remove all 4 jumpers (JP6 & JP7) and mount power supply module with spacer sleeve and mounting screw.



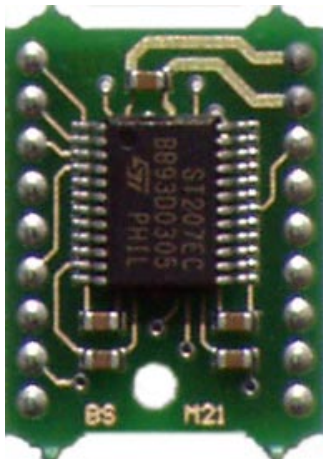
10.7 RS232 Module



ipEther and this module are described in the ipEther232 manual and are only mentioned here to complete the picture.

No adjustment options available.

10.8 RS232.Modem Module



ipEther232.Modem is described in this manual together with this module.

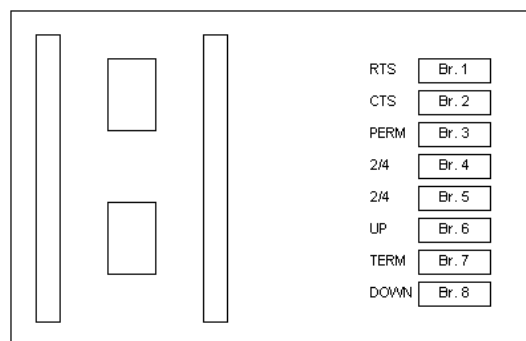
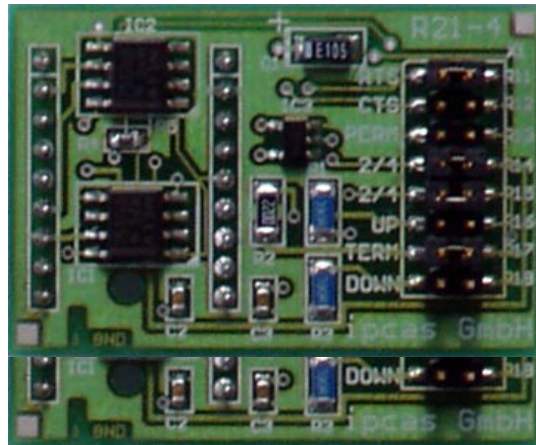
No adjustment options available.

10.9 RS485 Module

With this module, ipEther232 is covered in this manual for ipEther232 with RS485 interface (here only mentioned for completeness).

The RS485 sender can either be used in continuous operation, e.g. for point-to-point connections, or it may be called by the software. These options are set via solder - jumper.

The default configuration at ipEther232 is sender switch on with RTS, at ipEther232.Modem it is sender switch on with CTS.



Function	Br. 1	Br. 2	Br. 3
Switch on sender with RTS	X	-	-
Switch on sender with CTS	-	X	-
Switch on sender for continuous use	-	-	X

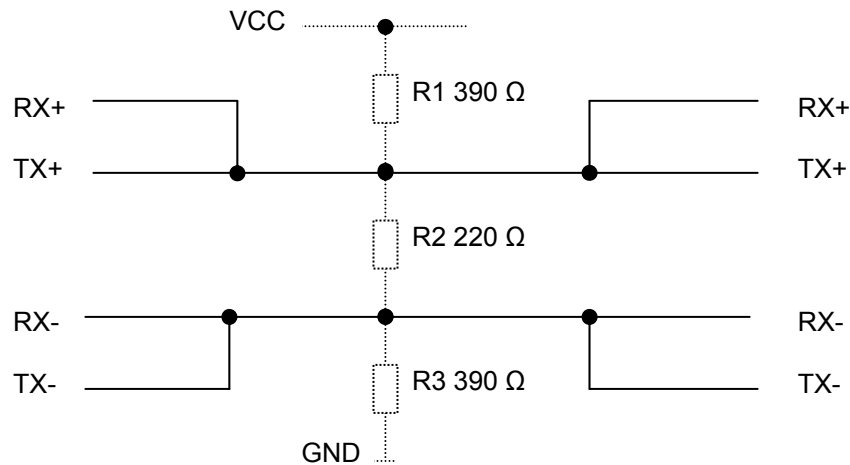
Function	Br. 4	Br. 5
2 wire solution	X	X
4 wire solution	-	-

Function	Br. 6	Br. 7	Br. 8
Termination	-	X	-
Term. with Pull UP / DOWN	X	X	X

X = closed
- = open

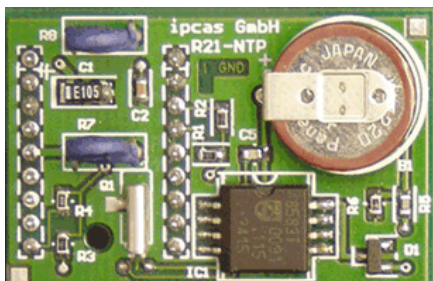
10.10 RS485 as a 2 wire solution

A closing of the cables with termination-networks is needed at RS485-connections to force the silence level on the bus system while no data transmitter is active. This termination network will be set with the Jumper 6, 7 and 8.



*Please take the pin allocation from the chapter Pin allocation
Please take the Jumper configuration from the chapter RS485 Module*

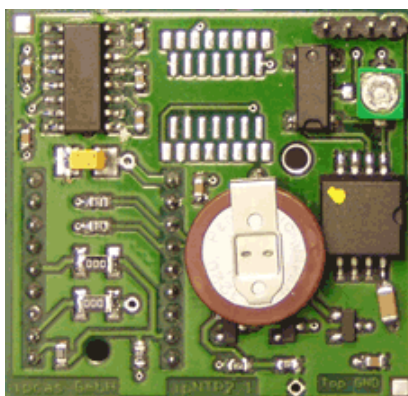
10.11 DCF77 Module



With this DCF77 Module, the ipNTP with DCF77-Antenna is the subject of the description.

No adjustment options available.

10.12 GPS / DCF77 Module



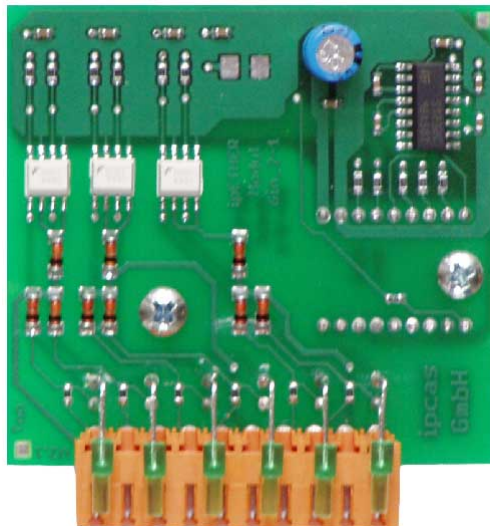
With this GPS / DCF77 Module, the ipNTP with DCF77- or GPS-Antenna is the subject of the description.

No adjustment options available.

10.13 I/O Module 6x input

This 6x 24V DC Input Module is the subject of the ipEther232.IO description. The module contains an internal state LED per each I/O channel for a “faster” diagnosis.

No adjustment options available.

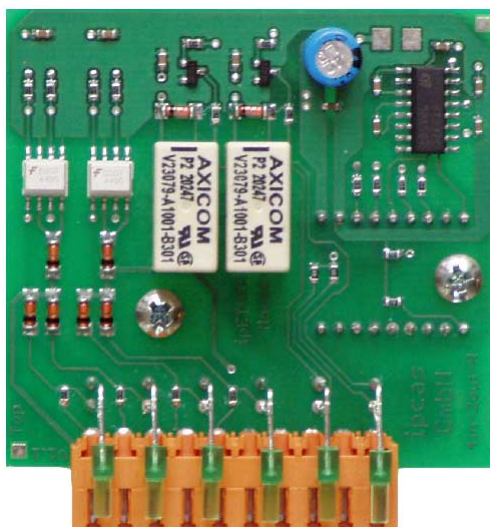


You can see the pin allocation in the chapter ipEther232.IO – pin allocation

10.14 I/O Module 4x input and 2x output

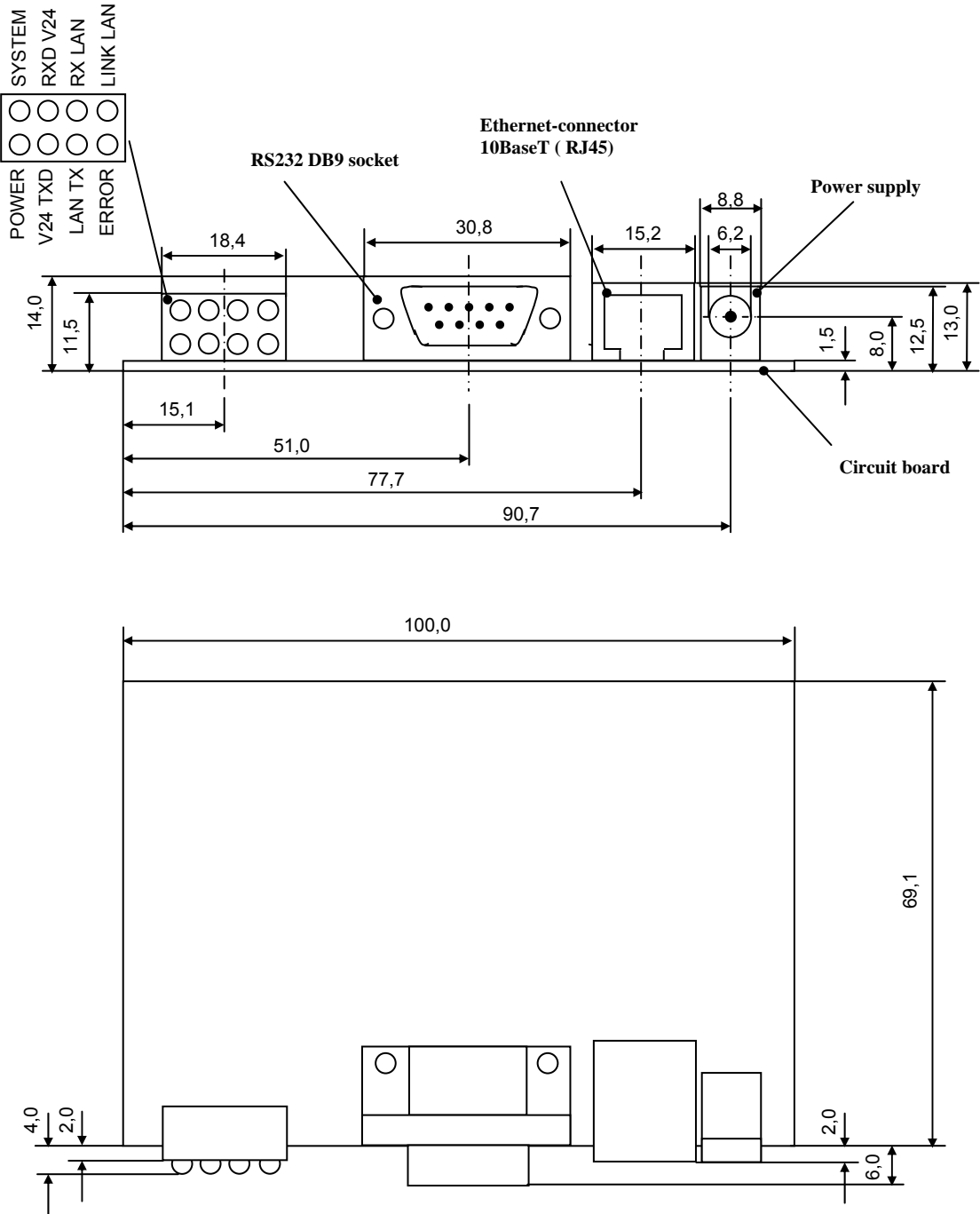
This 4x 24V DC Input and 2x relay output module is the subject of the ipEther232.IO description. The module contains an internal state LED per each I/O channel for a “faster” diagnose.

No adjustment options available.



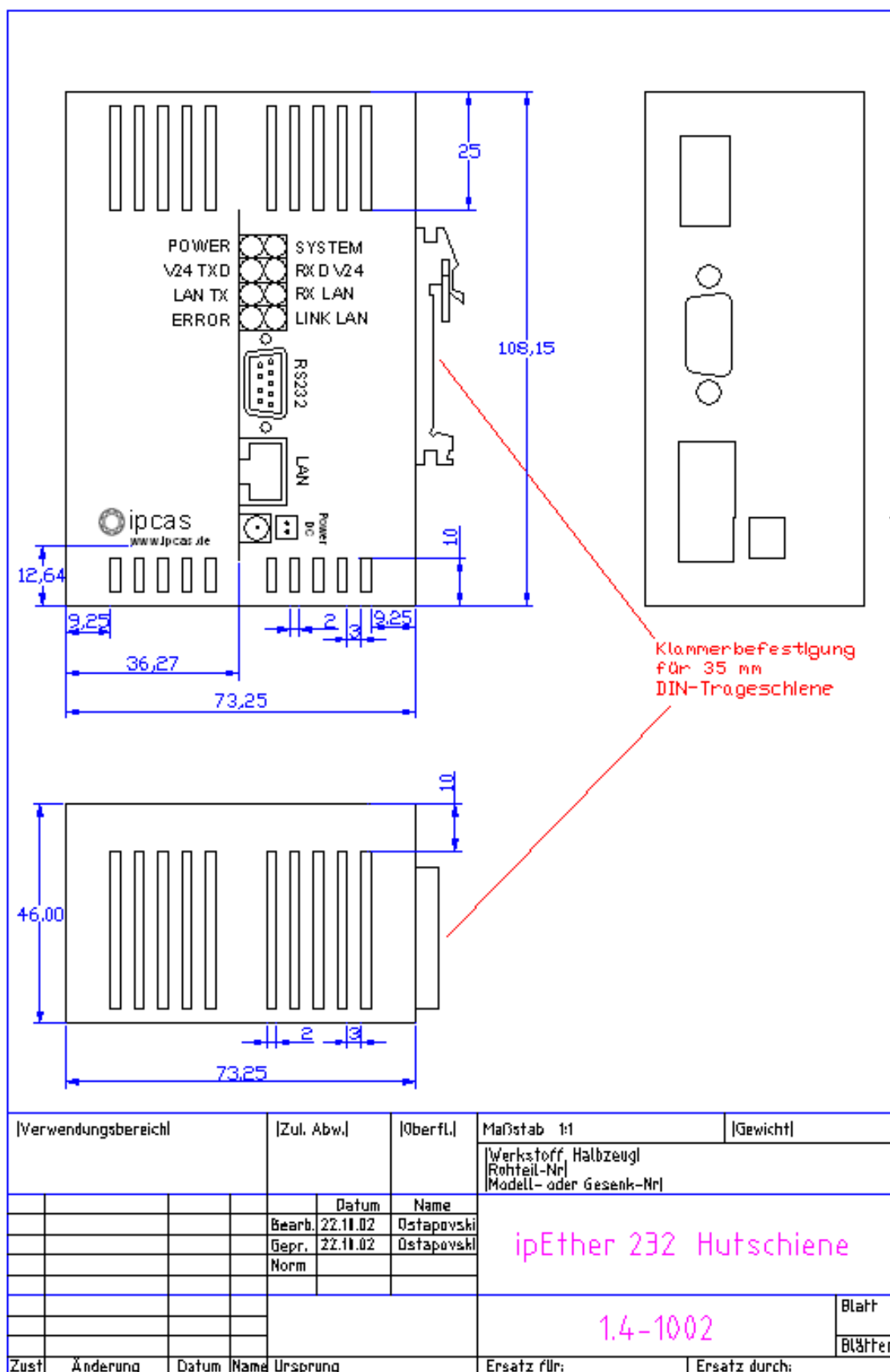
You can see the pin allocation in the chapter ipEther232.IO – Pin allocation

Diagnosis panel with 8 LEDs :



Future changes reserved

10.15 Dimensions				Chang.	15.03.02	P. Felbinger	ipEther232 (OEM V1)	
				Appr.				
			1.009	Page 1				
				Page. Created by:				
			For:					
St.	Change	Date	Name	Orig.				



10.16 Statement of EEC Compliance

With respect to the product specified below

ipEther232

it is hereby confirmed that it complies with the main specifications laid down in the Council Guidelines on Harmonizing the Statutory Regulations of the Member States for Electromagnetic Compatibility (89/336/EEG).

Any changes to the Channel Switch not authorized by this company invalidates this declaration.

The evaluation of this product for electromagnetic compatibility was carried out in accordance with the following standards:

EN 55022/1998
EN 50082-2/1997

Place/Date/Manufacturer's Signature: Erlangen, 09.04.2002

Title of the undersigned: Managing director, Dipl.-Ing. Suganda Sutiono



Statement of EEC Compliance

With respect to the product specified below

ipEther232 v3.1

it is hereby confirmed that it complies with the main specifications laid down in the Council Guidelines on Harmonizing the Statutory Regulations of the Member States for Electromagnetic Compatibility (EMC) (89/336/EEG).

Any changes to the Channel Switch not authorized by this company invalidates this declaration.

The evaluation of this product for electromagnetic compatibility was carried out in accordance with the following standards:

European standards (for CE):

EN/IEC 60950-1:2001	Standard for safety
UL94 V-0	Fire protection classification
EN 55022 (Class A)	Standard radio disturbance characteristics
EN 55024	Standard immunity characteristics
EN61000-3-2	Harmonic current emissions
EN61000-3-3	Voltage fluctuation and flicker
EN61000-4-2	Electrostatic discharge
EN61000-4-3	Radio-frequency electromagnetic field
EN61000-4-4	Electrical fast transient / burst
EN61000-4-5	Surge
EN61000-4-6	Conducted disturbances induced by radio-frequency field
EN61000-4-8	Magnetic Field
EN61000-4-11	Voltage Dips

North American standards (für FCC):

ANSI C63.4 (2001)
FCC 47 CFR Part 15 Subpart B Class B

Place/Date/ Manufacturer's Signature: Erlangen, 30.07.2006

Title of the undersigned: Managing director, Dipl.-Ing. Suganda Sutiono



10.17 FAQ's

- 1. General:** **Do I have to configure the IP address (Virtual Com Port) on each workstation when configuring the Ethernet Converter?**
No, only at first installation, the IP of the Serial Ethernet Converter needs to be configured. For any further workstation however you still have to install the Virtual COM Port driver. The IP Address has to remain the same to ensure that all COM Ports already installed work properly.
- 2. General:** **Does ipEther232 function over routers?**
Yes, but for the first configuration, you have to connect the Ethernet-Converter to the own Subnet. Then, you may also have Router access over the Configuration Tool (Add Device manually).
- 3. General:** **Where can I configure the "subnet mask"?**
That is not necessary because the Virtual COM-Port driver uses the Network-environment standard gateway and subnet mask.
- 4. General:** **Is alternately used mode RS232/485 possible? How does one switch between RS232 and RS485? Do the two modes run over the same DB9 Port?**
Alternatively, it is not to be switched between these modes. RS232 and RS485 have different bus drivers within the devices. But there are separate devices and order numbers.
- 5. General:** **How many ipEther232 can be managed with one workstation?**
Up to 254 Serial-Ethernet converter (256 Com-Ports are possible but Com1 and Com2 are physically already present).
- 6. General:** **Why isn't the serial interface of the ipEther232 indicated in the device manager?**
The serial interface of the ipEther232 is not recognized in the device manager because it concerns a virtual interface and not around a physical COM interface in the PC.
- 7. General:** **Can serial devices be used with ipEther232 also via Internet?**
Yes, the ipEther232 makes the access to the serial device possible over the local Ethernet. The TCP/IP protocol is used for it. TCP/IP forms the basis of the Ethernet.
- 8. General:** **Is it possible to build communication between the RS485 interface of the ipEther232 and serial device with only 2 wires?**
It is possible. Please look in our manual in the section RS485 as a 2 wire solution.
- 9. General:** **Are there 2 wire solution for the ipEther232 with RS232 interface, too?**
Yes. Only pin 2 (RXD Receiver Data), pin 3 (TXD Transmit Data) and mass (GND) are needed. In addition, it can be necessary to activate "NoModemSignals" in the Configtool. This can take place alternatively via durable bridging of pin 4 (DTR Data Terminal Ready) and pin 6 (DSR Data Set Ready). For Pin allocation, please see the manual.
- 10. General:** **Why does the ipEther232 not function with 1200 baud?**
The ipEther232 supports the speeds of 2400-115200 Baud. If you need 1200 Baud, please contact us.
- 12. General:** **Which supply voltages are offered for ipEther232?**
9V DC, 18-36V DC, 18-27V DC
Other tensions on request.

12. General:

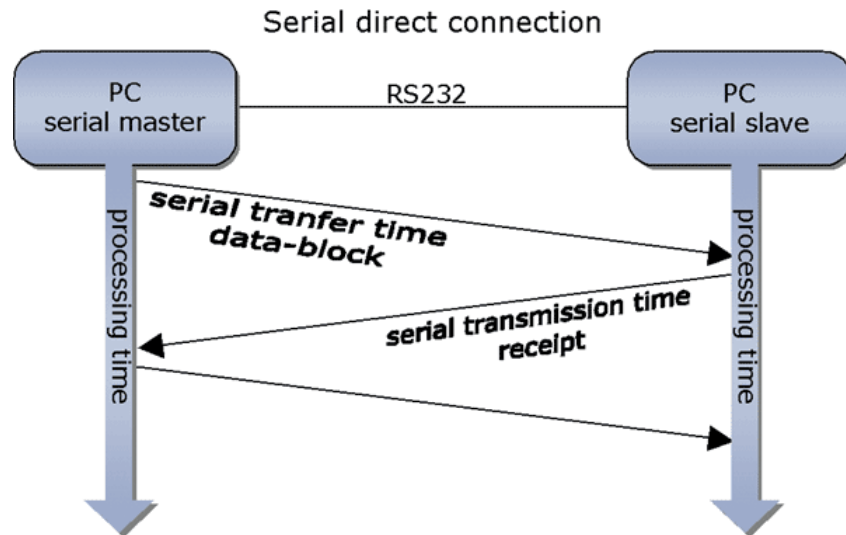
How can I accomplish an analysis of my serial connection over ipEther232?

You can use tools like PortMon(serial connection) and CommView or Ethereal (network connection) for this.

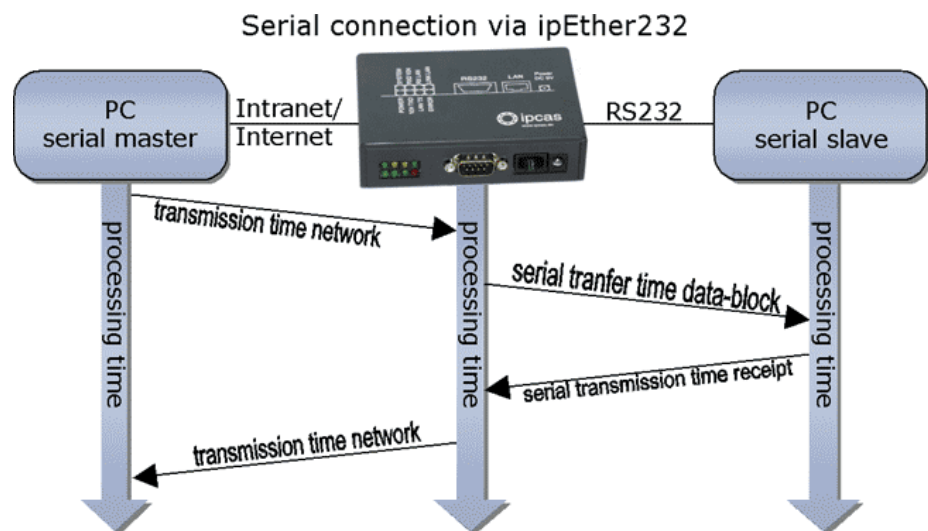
13. General:

Why do delays occur at ipEther232 during the serial transmission?

Fig. 1 shows the delays during a serial direct connection.



With the serial connection with ipEther232, an additional slight time delay is caused. This delay is caused through the package running time in the Ethernet during the transmission over the network and their packing and unpacking. These short delays do not occur because byte by byte are sent on the network, but Ethernet blocks are formed.



14. General RS232:

Which cable do I have to use for the connection of ipEther232?

Depending upon which device is used, you must select the appropriate lead. From the diagrams below, please take the information of your needed cable.

For *ipEther232* and *ipEther232.PPP* "DTE-Device"

For *ipEther232.Modem* "DCE-Device"

Null Modem Cable - Crossover Cable DB9 to DB9

DTE Device (Computer) DB9			DTE to DTE Connections	DTE Device (Computer) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
FGND				FGND		

Modem Cable - Straight Cable DB9 to DB9

DTE Device (Computer) DB9			DTE to DCE Connections	DCE Device (Modem) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
FGND				FGND		

Modem to Modem Cable - Crossover Cable DB9 to DB9

DCE Device (Modem) DB9			DCE to DCE Connections	DCE Device (Modem) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
FGND				FGND		

Null Modem Cable - Crossover Cable DB9 to DB9

DTE Device (Computer) DB9			DTE to DTE Connections	DTE Device (Computer) DB9		
Pin#	DB9	RS-232 Signal Names	Signal Direction	Pin#	DB9	RS-232 Signal Names
#1	Carrier Detector (DCD)	CD		#1	Carrier Detector (DCD)	CD
#2	Receive Data (Rx)	RD		#2	Receive Data (Rx)	RD
#3	Transmit Data (Tx)	TD		#3	Transmit Data (Tx)	TD
#4	Data Terminal Ready	DTR		#4	Data Terminal Ready	DTR
#5	Signal Ground/Common (SG)	GND		#5	Signal Ground/Common (SG)	GND
#6	Data Set Ready	DSR		#6	Data Set Ready	DSR
#7	Request to Send	RTS		#7	Request to Send	RTS
#8	Clear to Send	CTS		#8	Clear to Send	CTS
#9	Ring Indicator	RI		#9	Ring Indicator	RI
Soldered to DB9 Metal - Shield				Soldered to DB9 Metal - Shield		
FGND				FGND		

15. General RS485:

How long may the line be?

The RS485 line may be maximally 500 meters.

16. General RS485:

How many participants can be attached to the RS485 bus system?

It can be attached up to 32 participants.

- 17. General RS485:** **Does every RS485 interface receive its own IP Address?**
No. Because several senders work together at the same line, it must be protected via a protocol that maximum one data sender is active on the same time. All other senders must be in high-impedance status at this time.
- 18. General RS485:** **I added an ipEther232 with RS485 to the bus system. Why does it not work?**
During the installation, correct polarity of the pairs of veins must be paid attention as a wrong polarity leads to inverting the data signals. Particularly with difficulties in connection with the installation of new end devices, each error location should be begun with the examination of the bus polarity.
- 19. ipEther232:** **Is it possible to be accessed from several computers at the same time to one virtual Com-Port?**
No, only one computer has access ability at the same time. All further ones receive the message: "ACCESS Denied" (program-specific expenditure).
- 20. ipEther232.PPP:** **Is it possible to handle the announcing information (username and password) over ipEther232.PPP?**
No, password examinations such as PAP or Chap are momentarily not yet supported by ipEther232.PPP.
- 21. ipEther232.PPP:** **Can I connect two networks with your products?**
Yes, with two ipEther232.PPP, which steer a simple routing via GSM -, ISDN -, or analog modems.
- 22. ipEther232.PPP:** **How can I make a serial device Ethernet able (TCP/IP-able)?**
With ipEther232.PPP, PPP must be configured for this (under Linux: pppd, under Windows: Telecommunications connection.) P.S.: If only the serial device can accessed, it can be used ipEther232 (virtual Com Port), too.
- 23. Tools:** **PortMon (GUI-Tool for monitoring all serial port activity on a system.)**
PortMon. Sometimes with all serially attached devices, it can come to groundless communication problems. In such a case, it is helpful to supervise and analyze the data communication to the serial device to eliminate possible errors.
Portmon is a GUI/device driver combination that monitors and displays all serial and parallel port activity on a system. (For a clear analysis, only one device should be monitored.) Download PortMon:
<http://www.sysinternals.com/ntw2k/freeware/portmon.shtml>
- 24. Tools:** **Ethereal or CommView (programs for monitoring the network (LAN).)**
Ethereal or CommView. In some cases communication between network and ipEther232 functions are not as desired. To find out why, there are software tools such as Ethereal or CommView.
Ethereal is a free network protocol analyzer. It allows you to examine data from a live network or from a capture file on disk. (For a clear analysis, monitored transmission paths should only be indicated.)
Download Ethereal: <http://www.ethereal.com/distribution/win32/>
CommView is a program for monitoring Internet and Local Area Network (LAN) activity in capable of capturing and analyzing network packets.
Download CommView: <http://www.tamos.com/download/>

10.18 Glossary

ARP	Address Resolution Protocol
BDE	<i>Betriebsdatenerfassung</i> (operating data logging)
BPS	Bits per second (also known as the baud rate)
CCP	Compression Control Protocol
CTS	Clear to Send
DHCP	Dynamic Host Configuration Protocol
DCE	Data Communication Equipment
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
HTML	Hyper Text Markup Language
HTTP	HyperText Transfer Protocol
ICMP	Internet Control Message Protocol
IEEE	Institute (of) Electrical (and) Electronic Engineers
IP	Internet Protocol
LAN	Local Area Network
MAC	Media Access Control
MDE	<i>Maschinendatenerfassung</i> (machine data logging)
PC	Personal Computer
RFC	Request for Comments
RS232	Serial Interface (e.g. COM-Port) according to the RS232 Standard
RTS	Request To Send
RXD	Receive Data
SNMP	Simple Network Management Protocol
SQL	Structured Query Language
SUB-D9	9-pol. connector
TCP	Transmission Control Protocol
TFTP	Trivial File Transfer Protocol
TXD	Transmit Data
UART	Universal Asynchronous Receiver/Transmitter
UDP	User Datagram Protocol
UTC	Universal Time Code
XML	eXtensible Markup Language



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