

**P-NET**

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## **Remote Access to P-NET Systems**

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**P-NET**

# Overview

# P-NET

*What's "Remote Access to P-NET" ?*

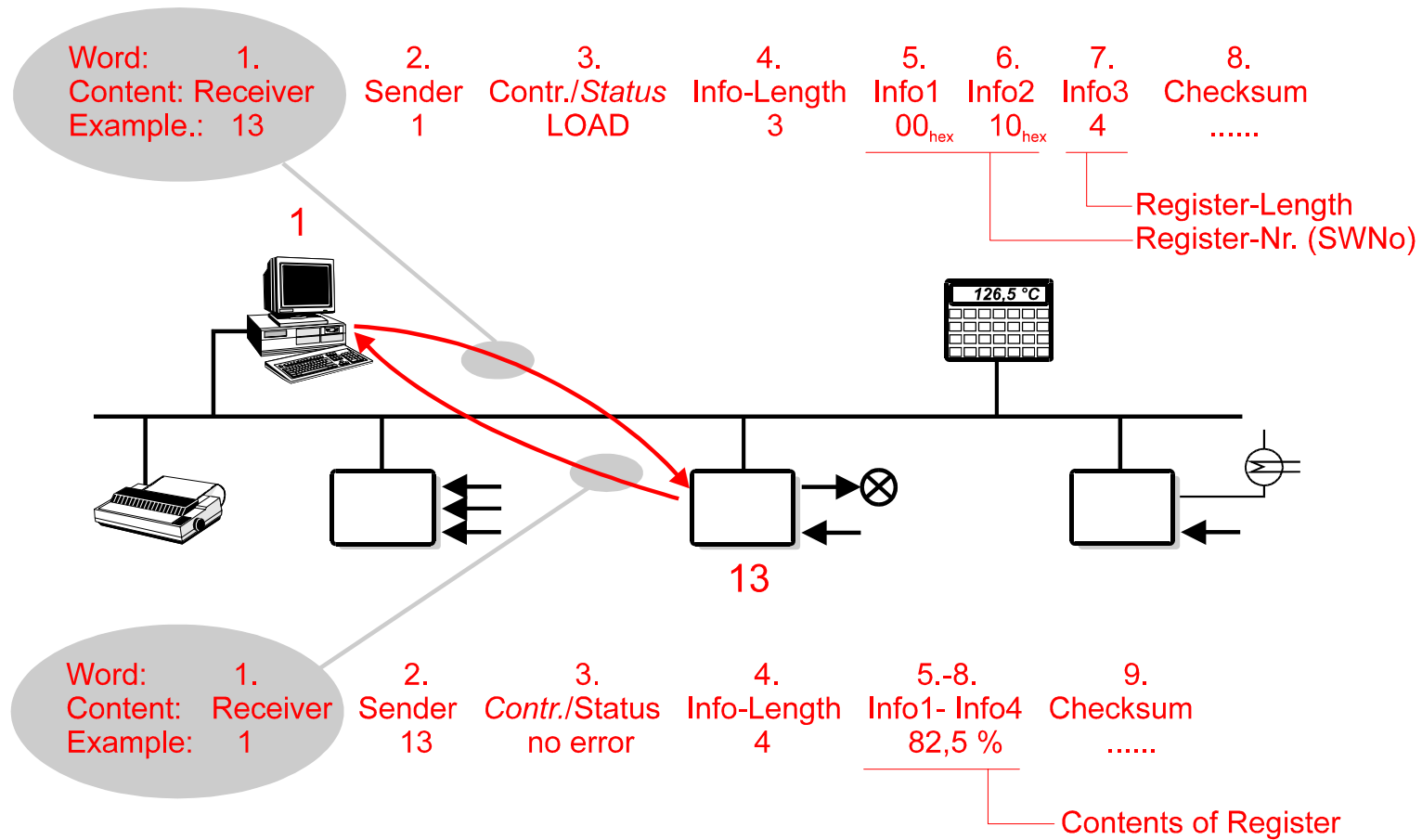
Access by a host system (typically PC) which is not coupled directly to the relevant P-NET segment as P-NET master.

The host system can be located

- within another P-NET segment (P-NET multinet)
- within another fieldbus system (e.g. Profibus, CAN, WorldFIP, DeviceNet)
- within a LAN system (e.g. Ethernet)
- on a site with ISDN, Internet or GSM access
- or within a system being a mix of those

# P-NET

## Basis: Addressing Concept of P-NET



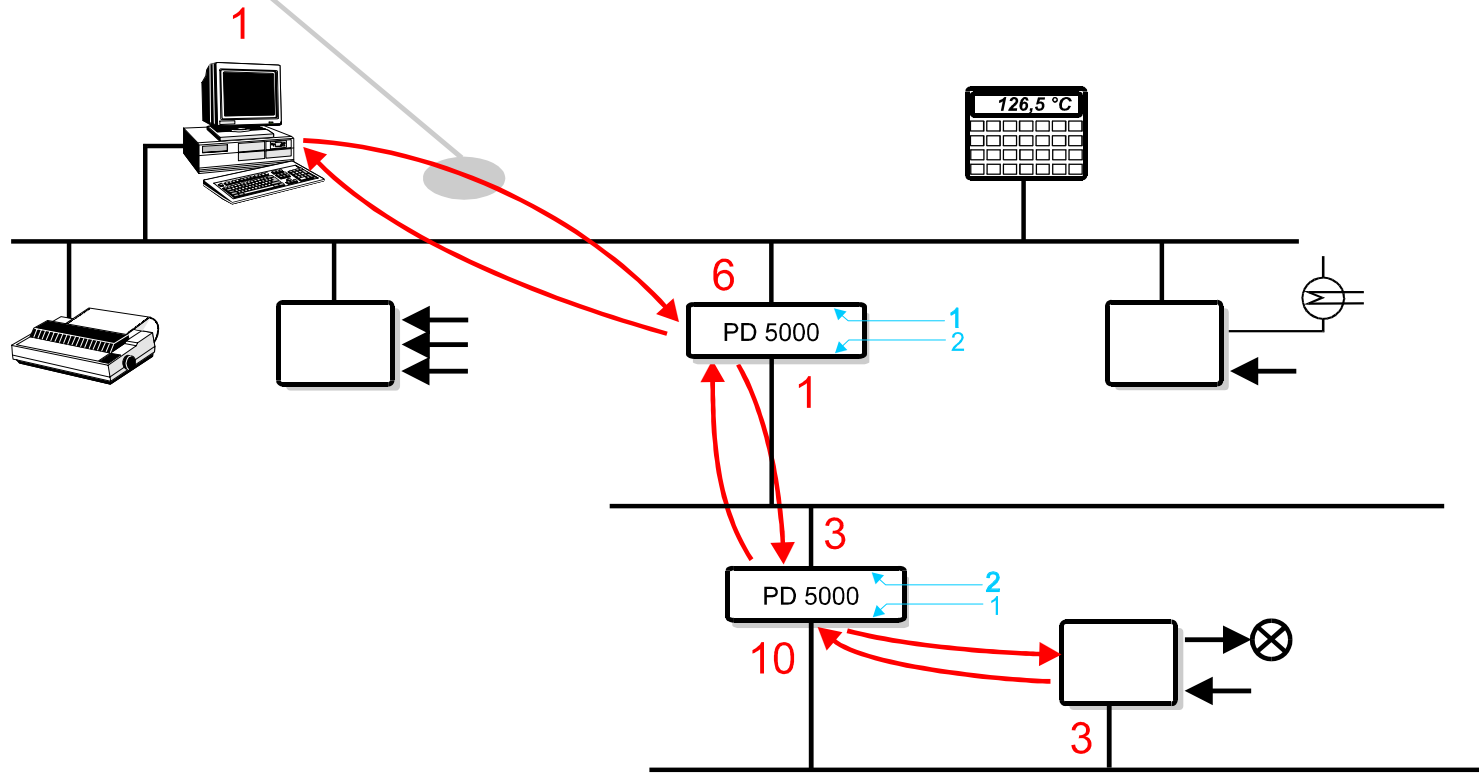
**P-NET**

## **P-NET Multinet**

# P-NET

Word: 1.  
 Content: Receiver  
 Example: 6 2 3 1 3

|        |               |             |                   |                   |       |          |
|--------|---------------|-------------|-------------------|-------------------|-------|----------|
| 6.     | 7.            | 8.          | 9.                | 10.               | 11.   | 12.      |
| Sender | Contr./Status | Info-Length | Info1             | Info2             | Info3 | Checksum |
| 1      | LOAD          | 3           | 00 <sub>hex</sub> | 10 <sub>hex</sub> | 4     | .....    |

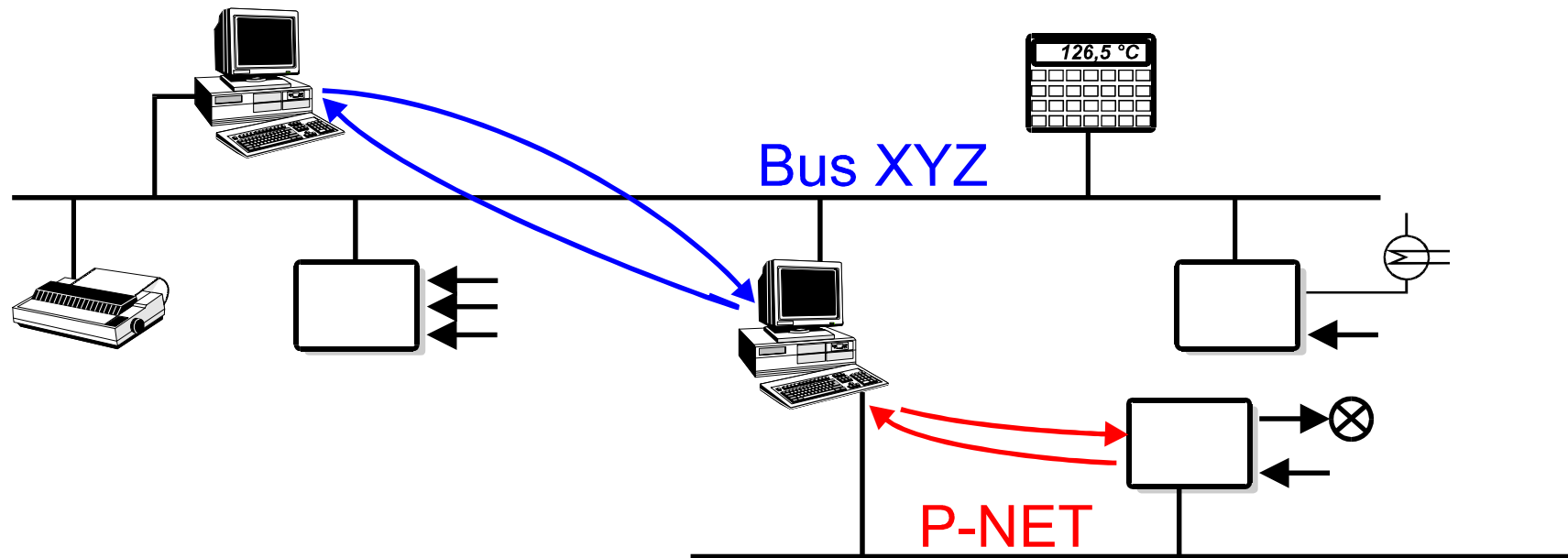


**P-NET**

## **Access via Other Fieldbus**

# P-NET

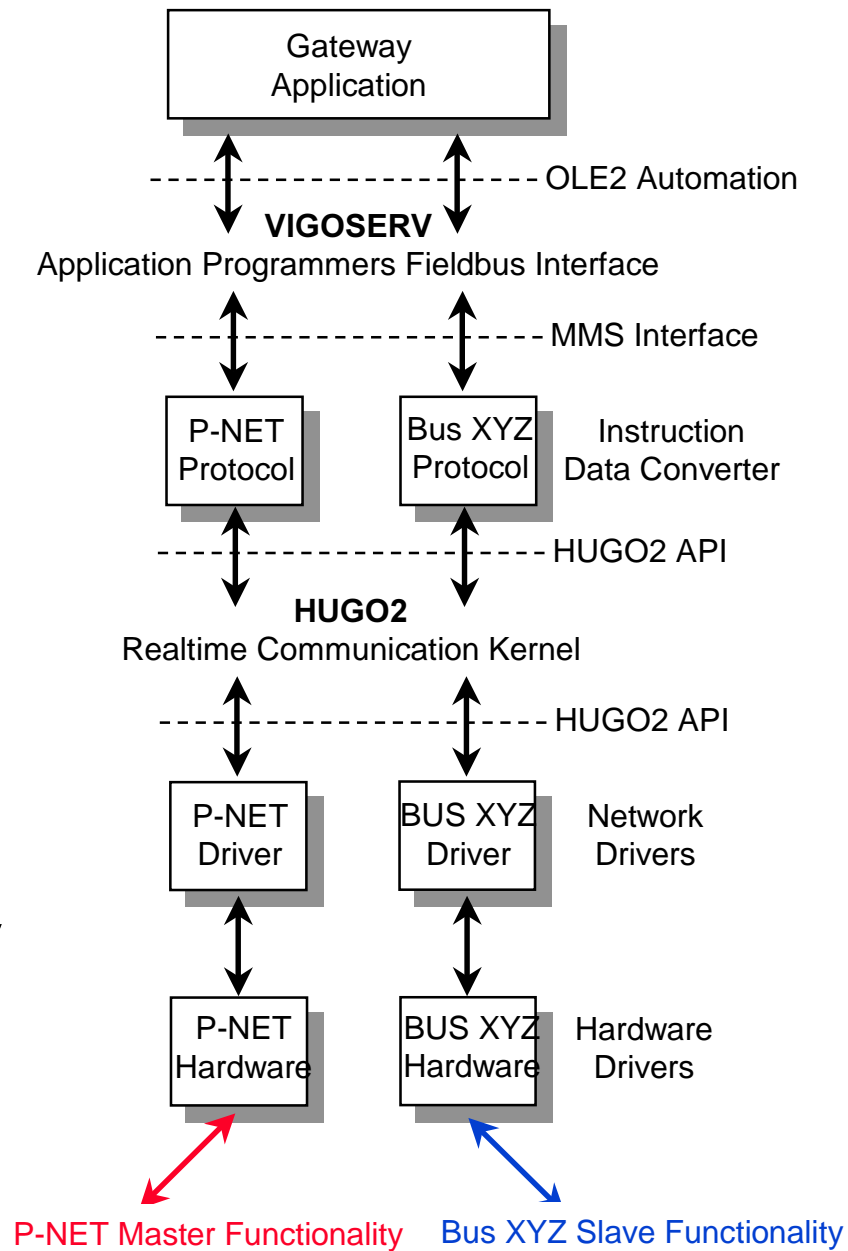
A gateway transferring on layer 7 (application layer) is needed ...



Typically this is a PC (office PC, industrial PC, black box PC) with two fieldbus cards.

# P-NET

In order to optimize realtime behaviour VIGO can be used. Because of different application layers a simple gateway application program must be written. It may contain additional functions like temporary storage of P-NET process data.



# P-NET

Very important is the right mapping between the specific addressing structures used in P-NET and in the other fieldbus.

E.g. DeviceNet - P-NET gateway:

## **DeviceNet**

<object for measurement values>

<instance 0, 1, 2, ...>

<attribute 1, 2, 3, ...>

## **P-NET**

<one P-NET device>

<channel 0, 1, 2, ... of the P-NET device>

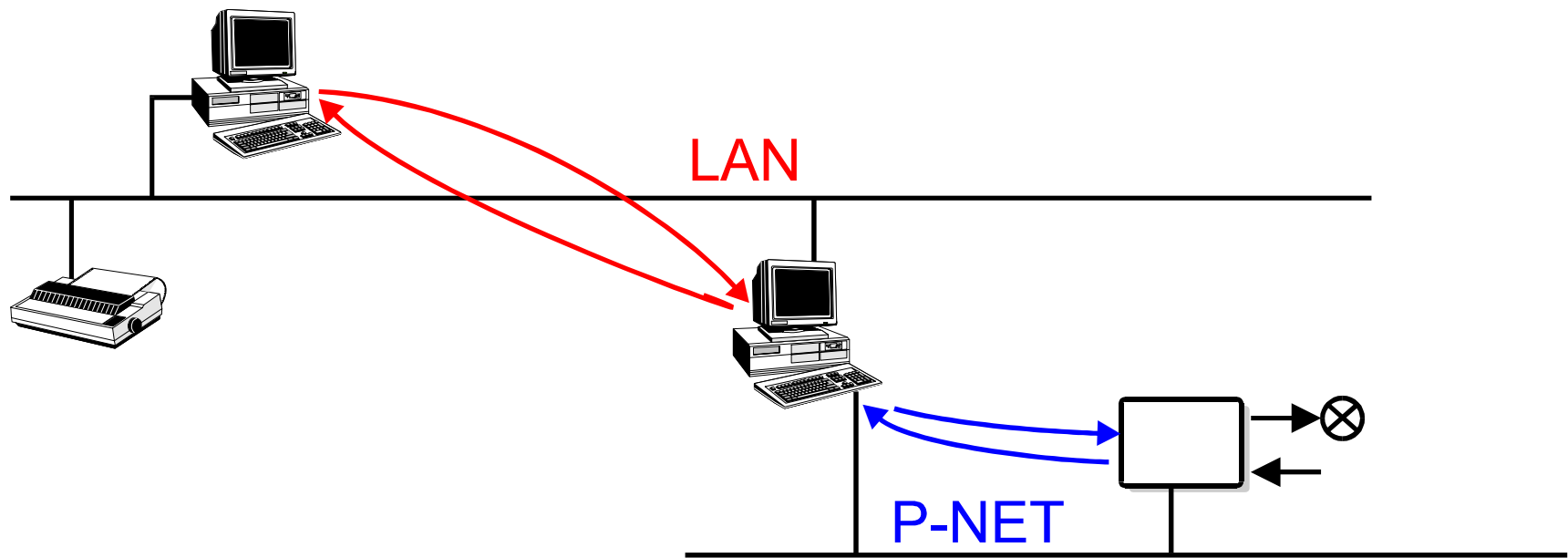
<process value of one P-NET channel = reg. X0>

**P-NET**

**Access via LAN**

# P-NET

Again, a PC based solution is the alternative with the smallest development time.



The PC has to be equipped with one P-NET card and with one LAN card.

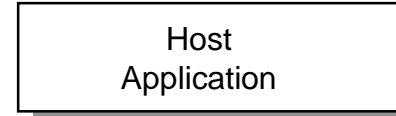
# P-NET

LANs (and WANs) are only transporting amounts of data. Therefore the realtime kernel HUGO2 of VIGO can be used to built very fast LAN - P-NET- bridges.

Whereas within the gateway only HUGO2 without any additional application program is needed in the host PC one complete "VIGO stack" including the P-NET Instruction Data Converter resides.

# P-NET

Host site

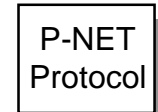


----- OLE2 Automation

**VIGOSERV**

Application Programmers Fieldbus Interface

----- MMS Interface



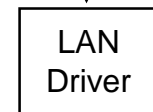
Instruction Data Converter

----- HUGO2 API

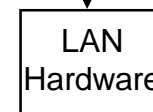
**HUGO2**

Realtime Communication Kernel

----- HUGO2 API



Network Drivers



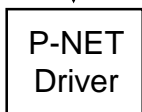
Hardware Drivers

P-NET site

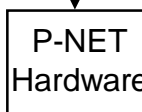
**HUGO2**

Realtime Communication Kernel

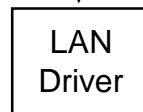
----- HUGO2 API



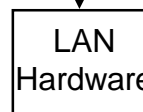
Network Drivers



Hardware Drivers



Network Drivers



Hardware Drivers

P-NET Master Functionality

LAN "Slave" Functionality

LAN "Master" Functionality

**P-NET**

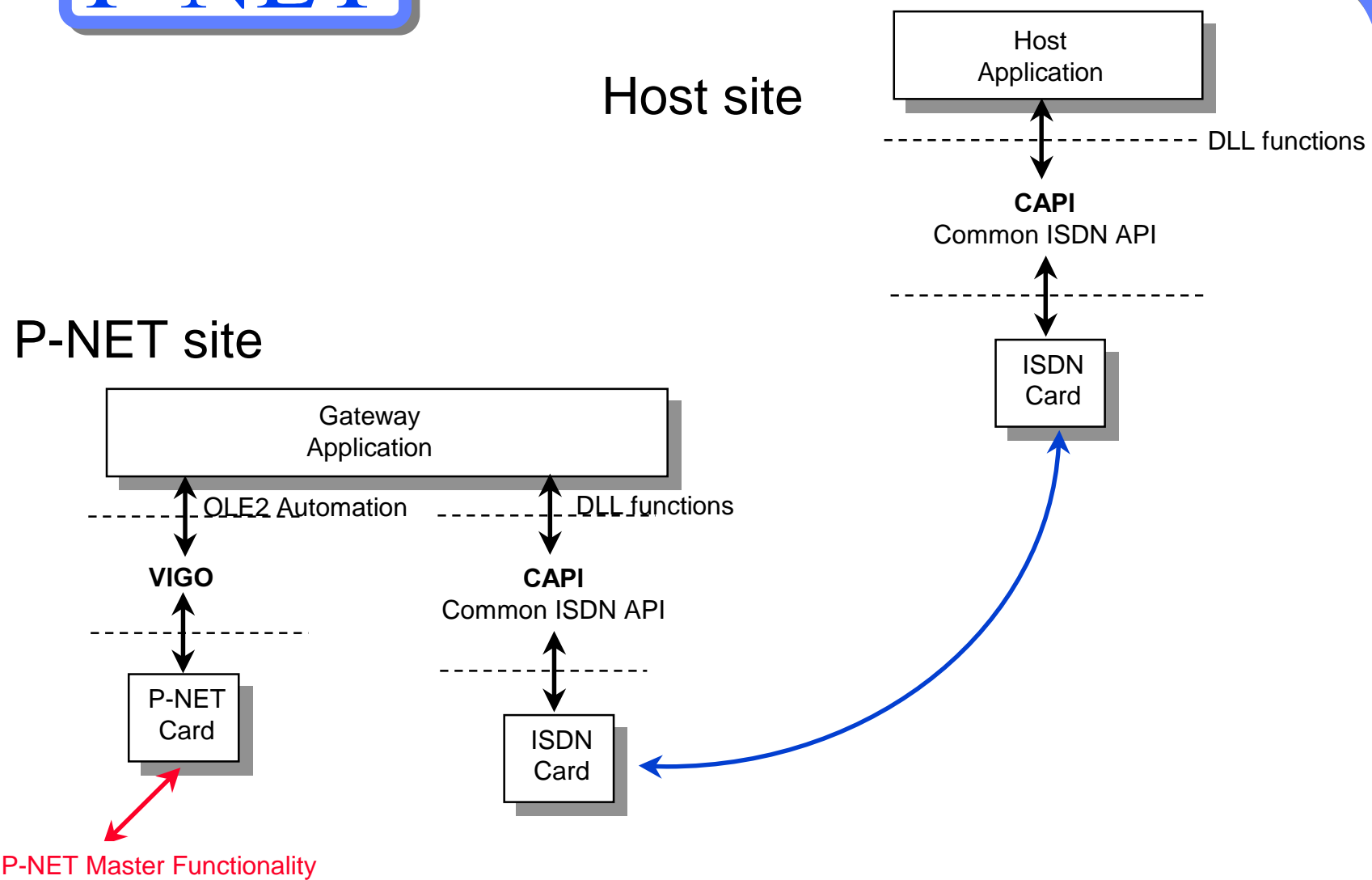
**Access via ISDN**

# P-NET

## Possibility I: PC to PC

- Host PC with ISDN card and CAPI interface
- Remote PC with
  - ISDN card and CAPI
  - P-NET card and VIGO

# P-NET



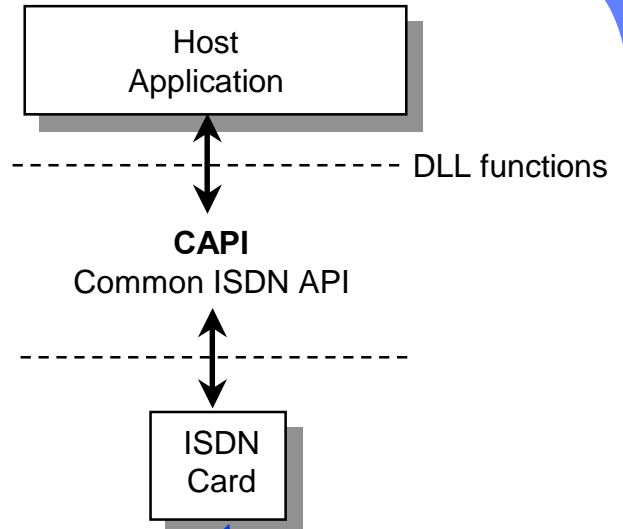
# P-NET

## Possibility II: PC to Terminal Adapter

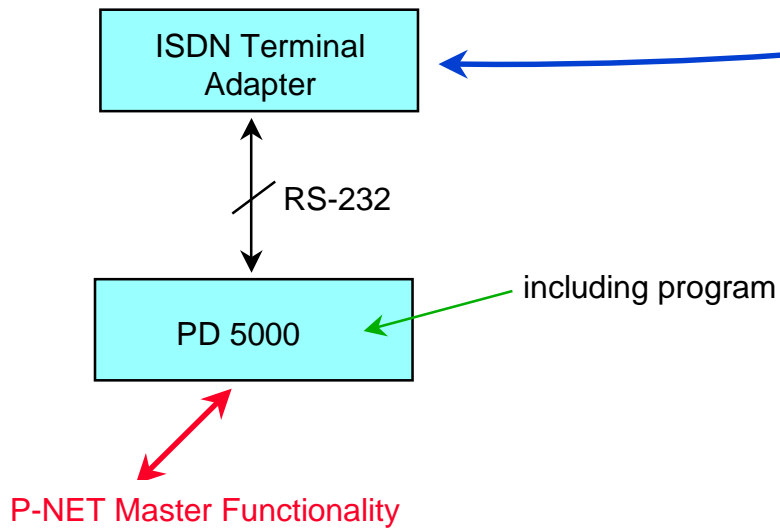
- Host PC with ISDN card and CAPI interface  
(or with terminal adapter, too)
- P-NET site with
  - ISDN terminal adapter
  - PD 5000

# P-NET

Host site



P-NET site



**P-NET**

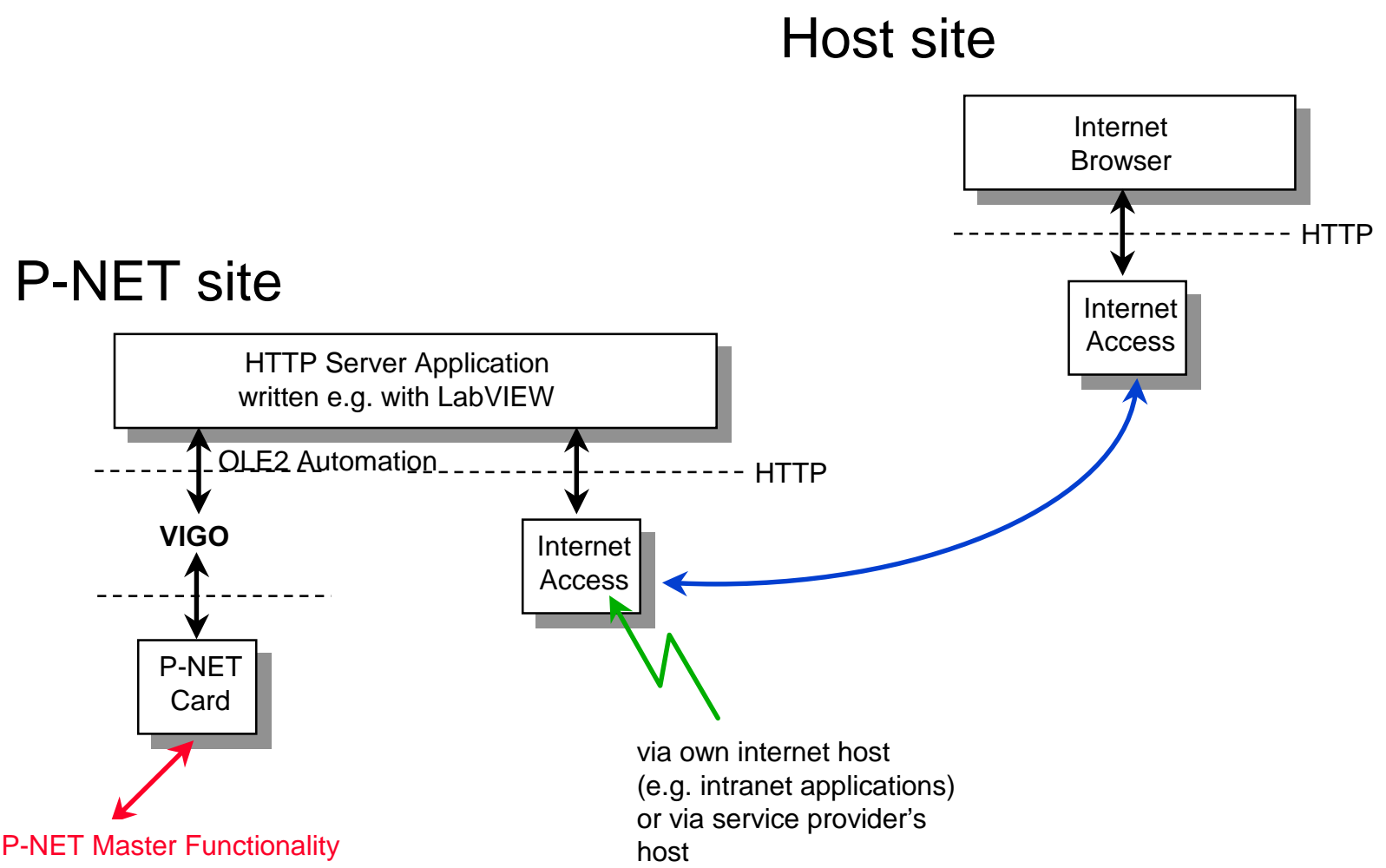
## **Access via Internet**

# P-NET

Example: Building HTTP Server for P-NET with LabVIEW

- Host PC: Internet Browser like Netscape, Microsoft Explorer etc. and Internet access
- Remote PC:
  - P-NET card with VIGO
  - http server program written with LabVIEW including Internet Developers Toolkit

# P-NET



# P-NET

## Functionality of HTTP Server:

- can handle multiple connections
- transfer of “virtual instruments” by HTML format  
(static snapshot or animated with specified update rates)
- control access to “virtual instruments” by mouse clicks

## LabVIEW elements to be used:

- VIs (= LabVIEW functions)

The server application is a CGI (Common Gateway Interface) program and supports security mechanism like login passwords.

**P-NET**

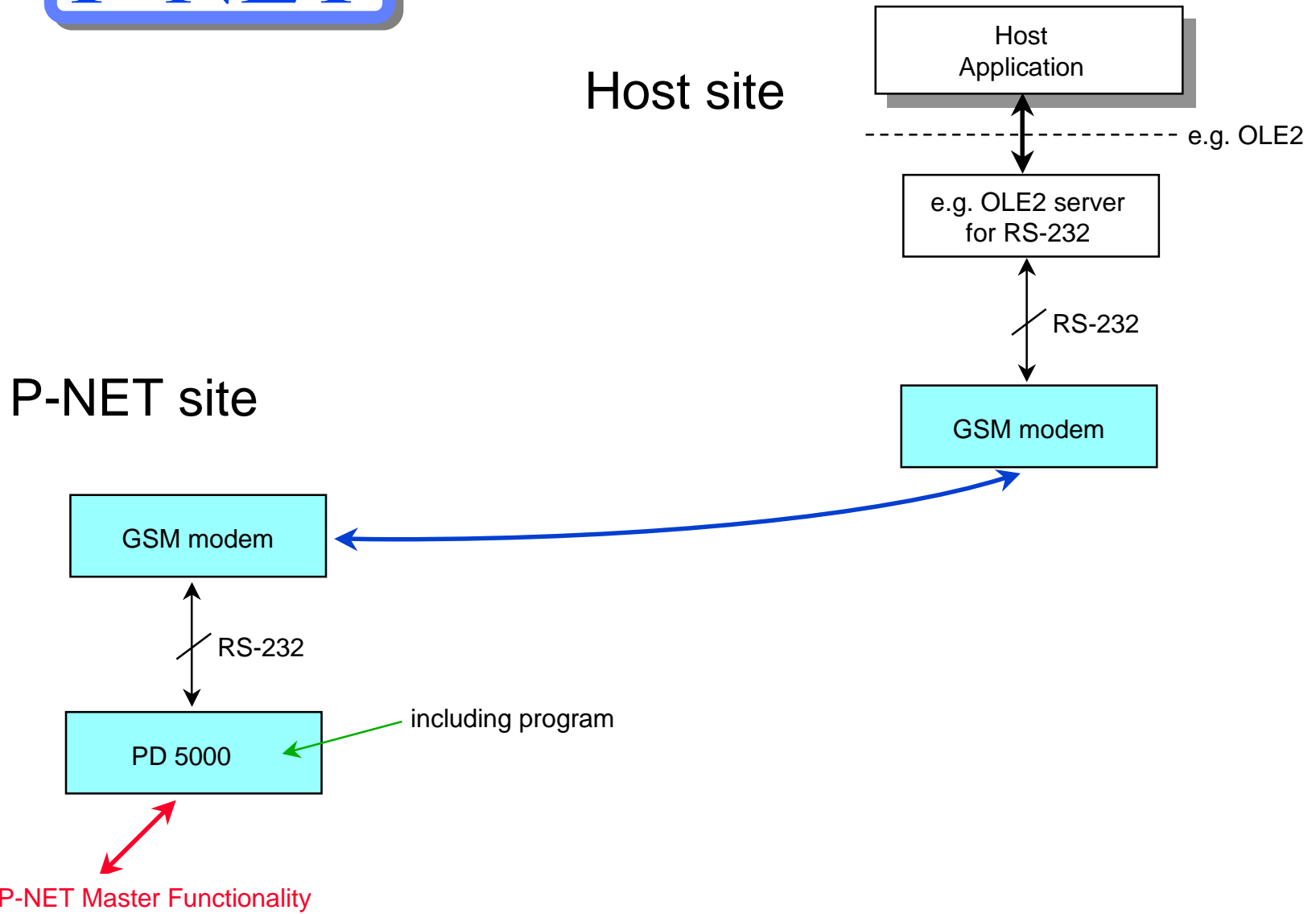
**Access via GSM**

# P-NET

Global structure:

- Host PC with GSM modem via RS-232 and monitoring program
- Remote PC with GSM modem coupled via PD 5000

# P-NET



**P-NET**

## **The End**

In case of interest please contact the German Local Society of the International P-NET User Organization at b-plus Meßsysteme GmbH, Deggendorf:

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