P-NET NEWS

News letter for International P-NET User Organization ApS. **2/1993 August.**

In this issue

P-NET Interface Chip
A P-NET Interface Chip is under development. The Interface Chip is developed for making an easy communication interface to P-NET.

Window programs for P-NET
New Windows software for P-NET available for all members of the International P-NET User Organization on the Bulletin Board, Denmark.

International standardization
The International Electrotechnical Commission (IEC) has not yet reached significant results, and it is a question, if it is possible to reach any.

A Fieldbus Work Item Group is formed in Denmark
It is a fact that the ISP50 group couldn't make one fieldbus solution, but have made different profiles, and one of these is Profibus. This information was confirmed by Udo Döbrich, Siemens.

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The P-NET Fieldbus and International Standardization

The material reported within this article is obtained by Dr. Carsten Nøkleby from a European meeting in Brussels May 1993 and from a National Fieldbus meeting in Copenhagen June 1993.

Lets take a look at the standardization bodies in Europe and on an International basis. In Europe the CENELEC is covering the fieldbus standardization, and on a world basis it is the International Electrotechnical Commission and ISA, Instrument Society of America. The specific working groups in the different standardization bodies are shown in the table to the right.

Fieldbus Standardization Committees

Fieldbus Standardization Committees (International)

IEC SC65 C WG6

IEC	International Electrotechnical Commission
SC65	Subcommittee: Industrial-Process Measurement and Control
C	Digital Data Communication for Measurement and Control
WG6	Working Group: Fieldbus

ISA SP 50

ISA	Instrument of Society of America
SP	Standard and Practices
50	Fieldbus

Fieldbus Standardization Committees (Europa)

CENELEC BT TF 62-6	Observing IEC 65 C WG6 Coordinate European Activities Initiating European Work
CENELEC TC 65 CX	Mirror to IEC 65C WG6 Editing European Standard Completing Conformance Test Conformance Test proposal to IEC Migration to IEC Standard

The International Electrotechnical Commission (IEC) has not yet reach significant results, and it is a question, if it is possible to reach any. The problem is that every IEC member wishes that their company standard is going to be the main part of the IEC standard. If that is not possible, they will use their power on stopping other company standards to be part of the IEC standard. Below a table is showing the current state of the IEC fieldbus standardization.

Many organizations such as ISP50, WorldFIP and Profibus claim, that they are

going to be the one and only International Fieldbus. Profibus is a German National Standard only. If we look at the market, there are common agreements that there will be several fieldbusses, because the demands from the market differs from area to area.

OSI Layer	**Status**
Physical Layer	IEC 65C(CO)34, Draft IEC 1158-2 Fieldbus Standard for use in industrial control systems. Part 2 Physical layer specification and Service definition. **Wire medium**, Status: Draft International Standard - vote to International Standard close on 31.05.93. **Radio Medium**, Status: Proposal available - voting for new work item closes on 30.06.93 **Fiber Optic Medium**: Status: Proposal under discussion, vote to New Work Item to be held.
Data Link Layer	65C(secretariat)105 Data Link service definition, and 65C(secretariat) 106 Data link protocol definition. Status: Circulated as committee draft, vote to Draft International Standard closed 19.07.93.
Application Layer	65(secretariat)103 Application layer specification. Status: Approved for second Committee Draft - the future is uncertain.

There is no doubt that the P-NET Fieldbus will play a significant roll within the process industry as well as in discrete part manufacturing. There is also no doubt that both FIP and ISP50 will have their market shares. This is all illustrated in the figure on page 4.

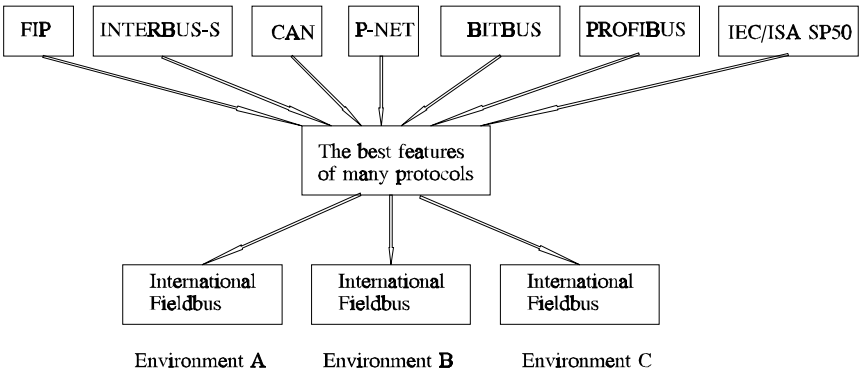
Some fieldbus organizations have taken a new name, e.g., Profibus is more or less equivalent with ISP50 (InterOperable Systems Project, 50 = Fieldbus), and FIP is now known as WorldFIP.

Lets look into the ISP50 and WorldFIP development. The work has just started in the new group ISP50 and the ISP50 standard is based on the main principle of Profibus, but also elements from FIP have been included. No ISP50 products are now available, but the ISP50 group claim that products are available April 1994.

The experiences from the International P-NET User Organization tells us that many problems will not appear until the equipment is put into practical applications.

We are curious to see when stable ISP50 products will be available.

The ISP50 standard is very broad, and many features from e.g. Profibus and FIP are included making it possible for the single vendor to select part of the standard so it doesn't fit the other ISP50 implementations. Furthermore, the price level is very high, e.g., a starter kit containing three PC cards and a software development kit costs about 20-25.000 DM.

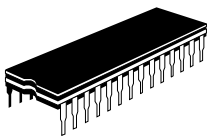


The current view of the future Fieldbus Standardization.

Concerning WorldFIP, they are expecting a new chip to be available in September 1993 with Full FIP protocols. The FIP chip for slave modules should be available in early 1994.

The P-NET fieldbus have one big advantage, it has been on the market for many years and has shown to be a stable, reliable and open fieldbus standard. Furthermore the development costs are very low compared to other fieldbusses. The new P-NET interface chip makes it even more easy to integrate P-NET to existing equipment. The Interface chip will guaranty that all products follow the P-NET protocol, and this aspect is especially important for master implementations because of the real-time synchronization via the bus.

It is expected that the P-NET Fieldbus will play a significant roll in the future fieldbus environment in competition with Profibus, ISP50 and WorldFIP.

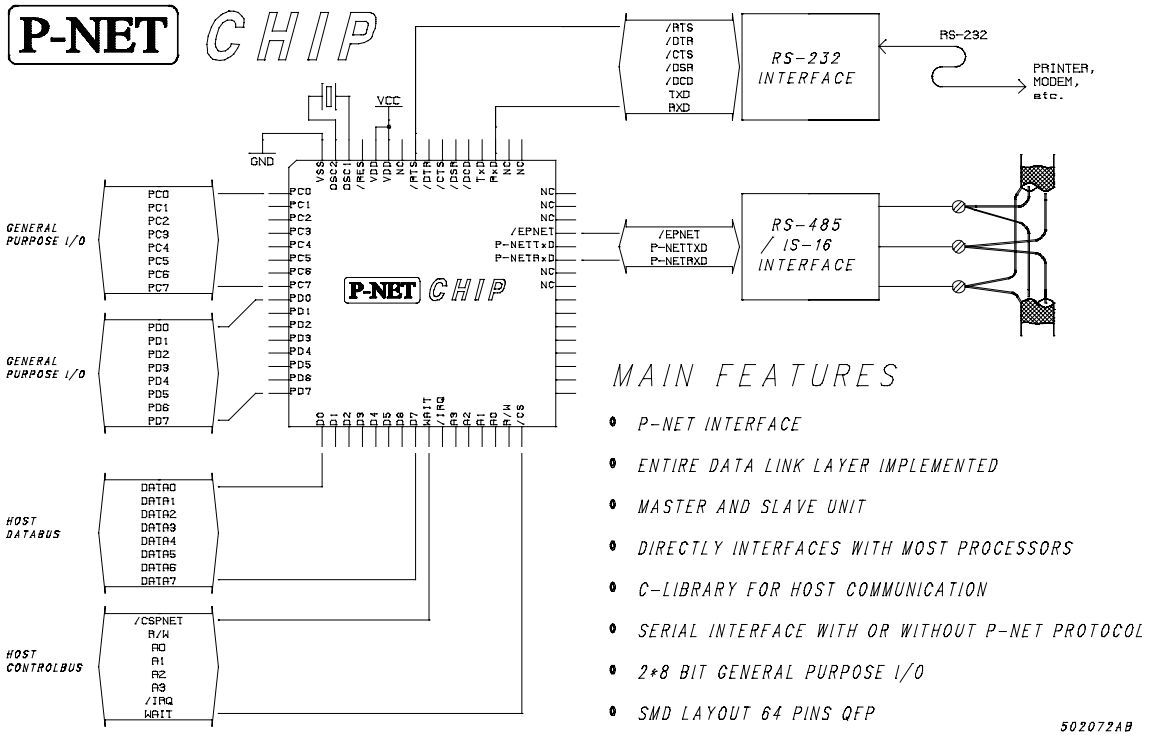


P-NET Interface Chip

Within the P-NET Fieldbus environment, one of the basic demands for a protocol was feasible implementation using standard single chip micro processors from all major vendors. A new demand from the market for a more integrated solution has appeared. This integrated solution should ease the protocol implementation. In consequence it has been decided to make a P-NET Interface Chip.

The P-NET Interface Chip is being developed for making an easy communication interface to P-NET. Both multi-master and slave features will bee implemented in the P-NET Chip. The device performs all the functions of layer 2, the Data Link Layer, which includes the most time critical functions in P-NET. The P-NET Interface Chip controls the bus access, which includes both slave bus access and multi-master bus access, and synchronization of the bus. The P-NET Interface Chip creates and recognizes the frames on the bus and performs the transmission error control.

The Network Layer and the Service Layer functions (Layer 3 and 4) are performed by software in the Host processor. A development kit that includes the necessary interrupt-procedures and conversion-procedures for layer 3 and 4 will bee available with the P-NET Interface Chip.
These procedures are written in ANSI C and can therefore be included directly in a Host-program written in C. In case the Host-program is written in assembler, the C procedures can be used as a guideline for an equivalent assembler program.



P-NET Chip interface connections

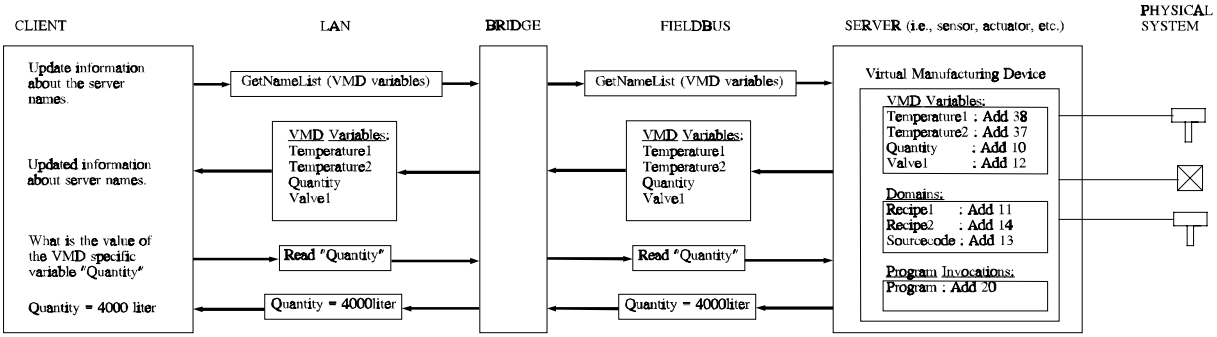
It is expected that the first chip-set samples will be available late 1993 and the final P-NET Interface chip with C software will be available middle 1994.

Note: It is not a demand to use a specific chip-set in the future, because P-NET nodes can still be implemented using single chip processors, e.g., Intel 8051, 80851, Motorola 6805, 68HC11, Hitachi 6301 etc. with built-in UART.

News about Manufacturing Message Specification

Dr. Carsten Nøkleby is participating at the European Workshop for Open Systems (EWOS) within the MMS Expert Group. The MMS expert group is working on different implementation profiles for different environments. A profile is used for the Process industry environment.
The idea presented at these meetings is briefly illustrated below, and reflects the main part of the P-NET manager in relation to Local Area Network Communication.

IMPLEMENTATION
Because of the stringent real-time requirement for process control MMS services are not very suitable, whereas the P-NET services are suitable for that task. The response time for a confirmed service on the P-NET is about 3ms, whereas the MMS implementation will give response times of about 100ms - 200ms.



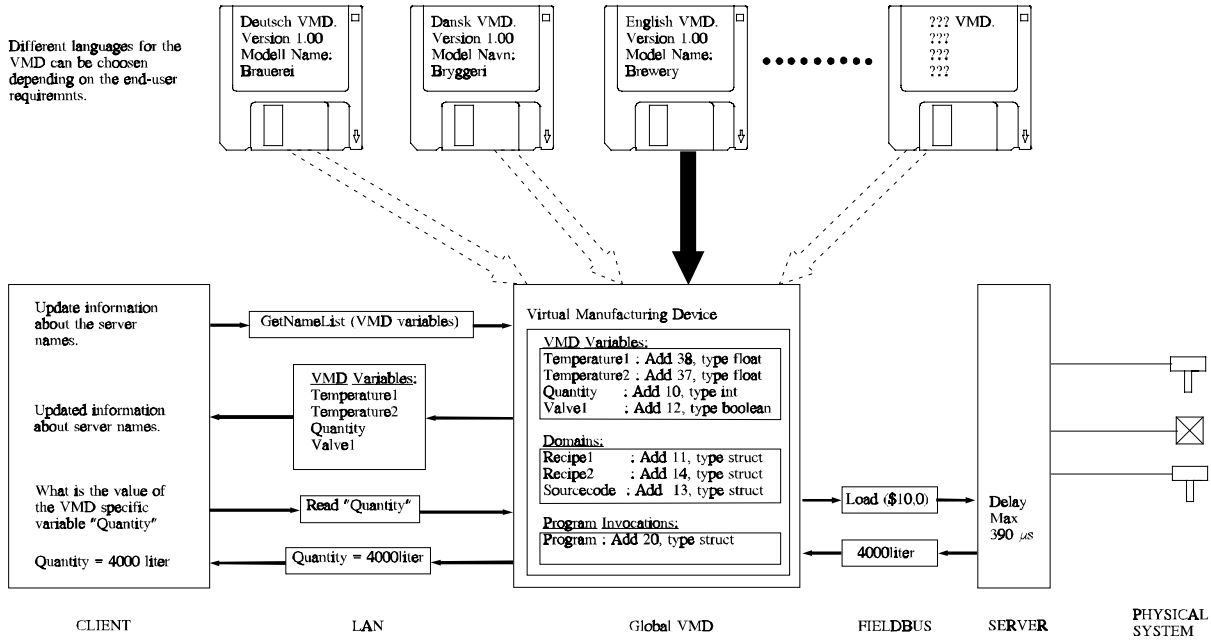
The VMD is represented within the slave module.

Therefore, it is of no interest to implement the MMS elements on the P-NET fieldbus itself. The MMS implementation for very simple applications, such as a single sensor, is also of no interest, because the costs for the interface will be more expensive than the application itself.

By using MMS the bandwidth of the bus has to increase dramatically to reach the same performance as repressed by P-NET, approx. 300 confirmed services

per second. For other fieldbusses with a bandwidth up to 1Mb/s it is difficult to reach the same performance. It is worth mentioning that P-NET has a standardized application layer interface. MMS is suitable for representing the line between management application and a greater part of a total Process Control System, and the P-NET is suitable for communication between Process Applications.

A global VMD is chosen to separate the Local Area Network and the Fieldbus. The global VMD design will give the possibility to include VMD objects, such as sensor/actuator objects and programmable controller objects for the automatic generation of the VMD.



The global VMD idea with simple but fast slave modules.

Furthermore, the idea of the global VMD will insure a more homogeneous and standardized interface. This global VMD idea will reduce the costs and the time used for designing VMDs for different Process Control Systems, as well as insure the similarity between the VMD model and physical system.

TEST FACILITIES

Test facilities for MMS might be available from the Fraunhofer-Institute für Informations- und Datenverarbeitung (FhG) in Germany. The Institute is developing conformance test and interoperability test tools. Proces-Data Silkeborg have been interviewed by Mr. Wolfgang Ballin (FhG) concerning an

ESPRIT project dealing with test tools for MMS. Mr. Ballin offered Proces-Data Silkeborg the possibility to get their MMS interface tested at the Fraunhofer-Institute.

New P-NET Channels.

Proposals for additional general purpose channel types have been sent to the International P-NET User Organization. The new channels are a Program Channel and a Barcode Channel.

The Program Channel is intended for use in programmable devices, which has the possibility to execute programs, e.g. calculator, pulse processor, Controller Program, etc. The Program Channel will contribute to ensure a uniformity in handling programs, i.e. controlling program states by commands and to upload/ download application programs to a device. New devices may have several ways to store the program, e.g., flash, ROM, RAM, EPROM, Disk, Memory card, etc.

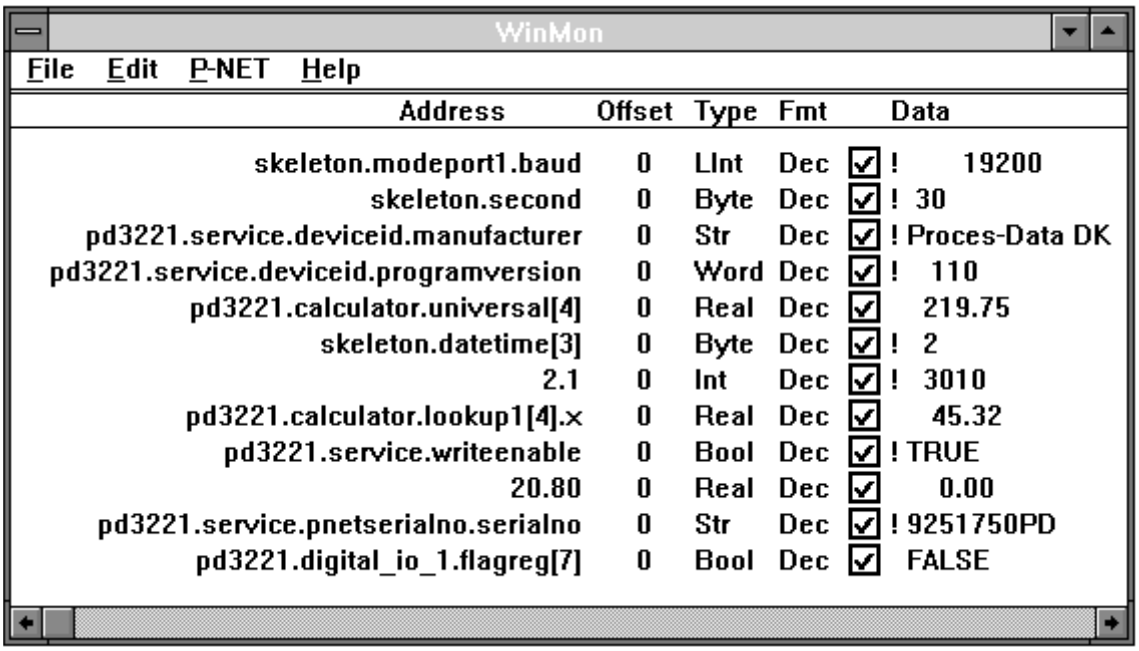
The barcode channel is to be used for barcode readers, where different code formats can be selected (e.g. 2/5 interleaved code, alfa 39 code, codabar, 2/5 datalogic, UPC/EAN, code 128, code 93, etc.).

The proposed channels will be sent out for comments to the members of the International P-NET User Organization.

Windows programs for P-NET

Nearly all the of DOS programs for P-NET from the International P-NET User Organization, such as Monitor, Downloader, Calculator and Pulse Processor Editor are now available for Windows 3.1.
The Windows programs are easy to use and have a more integrated environment. This means that it is possible to have several programs running simultaneously. This makes it possible to run the Monitor and simultaneously have an editor as the Windows Notebook program running, e.g., searching within a MAP file for identifiers to enter in the Monitor.

In the Monitor program for Windows, more features have been added compared



Screen picture of the Monitor program WinMon.

to the DOS version. New features are the error recording, covering historical errors, actual errors, and P-NET errors. Below a screen picture is shown for the Monitor program WinMon.

The Windows software package is available for all members of the International P-NET User Organization at the bulletin Board System (DK).

P-NET at the C&I exhibition in Birmingham, May 25th - 27th 1993

Once again the International P-NET User Organization was represented at an international exhibition.
This time it was at the Control & Instrumentation exhibition in Birmingham. The exhibition took place in the National Exhibition Centre in Birmingham, United Kingdom from the 25th to 27th May 1993.

This years C&I show had more than 400 exhibition stands, representing the products of over 1000 companies. C&I 93 was the forum for the latest world developments in Fieldbus.
The Exhibition was the biggest showcase for process and industrial measurement and control in 1993 in United Kingdom.

Once again big success for the P-NET Fieldbus.

The participation was a big success for the organization, and the exhibition really showed the advantages of the P-NET Fieldbus compared to other fieldbusses.

In addition to the exhibition a number of conferences took place. Chris Jenkins, FMA, local chairman in UK, presented the International P-NET User Organization at the Conference "International End-user Fieldbus Forum". Nearly 200 delegates were attending the conference, with 15 speakers from five countries.

Other fieldbusses were presented, but no doubt that the P-NET Fieldbus was some of the very best, especially if we compare on running installations as well as on available products, which can be ordered from stock.

The stand material from INTERKAMA 92 exhibition was reused for this stand.

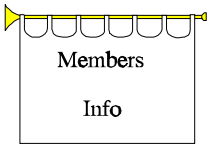
The stand was 60 sqm., and four members of the organization showed their products as well as the interoperability between the different vendors products. The four companies at C&I 93:

Fluid Management Technology LtD
Proces-Data Silkeborg ApS
Ultrakust Electronic GmbH
F.M.A Limited

Each company had its own individual area for showing their products and applications, but the stand goal to promote the P-NET Fieldbus was in focus, as shown at the picture.

A new P-NET overview available

Some changes have been made to the old version of the paper "An overview of the P-NET Fieldbus". Significant changes have been made in the following sections: The history of P-NET, Ease of P-NET Implementation, and literature references. Small changes have been made all over in the document.
The new version has the same title "An Overview of the P-NET Fieldbus", but the registration number is changed to 504500 01.
One free copy of the new version is available for each member of the International P-NET User Organization on request.



Information from the members

Coupling between P-NET and RS 232/Centronics
by Dr.-Ing. Jörg Böttcher, ULTRAKUST Electronic GmbH, Gotteszell (Germany)

Very often devices with RS 232 interface should be coupled to P-NET. E.g. most barcode and magnetic card readers, laboratory measurement devices and smart sensor transmitters have one RS 232 connector. By using this point to point communication line all data of the device like measured values and parameters can be accessed. ULTRAKUST Electronics offers a new version of the P-NET / V.24 (RS 232) converter 4386-2 which can connect each kind of RS 232

device to P-NET. The new module has a smaller housing and can handle two RS 232 lines. Normally the slave module works as a buffer between P-NET and the device. All data sent to the converter over P-NET will be internally stored in a FIFO (first in first out) memory and sent automatically to the device. Vice versa the converter stores the data sent from the device in another FIFO memory where it can be read by P-NET. The communication parameters like bitrate and frame format can be set over P-NET.

Following the same principle the 4386-1 can interface between P-NET and all printers with Centronics connector. Both control mechanisms are possible: The automatic handling of the status lines by the converter and the reading of each status line over P-NET.

Very often a standard matrix printer should be connected to P-NET. In this case we recommend the 6863-5 which is the standard EPSON LQ-570 including a P-NET interface developed and manufactured by EPSON. All facilities which can be initialized by pressing the printer control keys can be also done over P-NET. The printer works as a standard P-NET slave. This printer is in use on oil trucks in a high number of pieces for the on-board generation of delivering documents and invoices.

Ordering Information (for technical data see data sheets, prices including 20 % special allowance for members of the International P-NET User Organization):

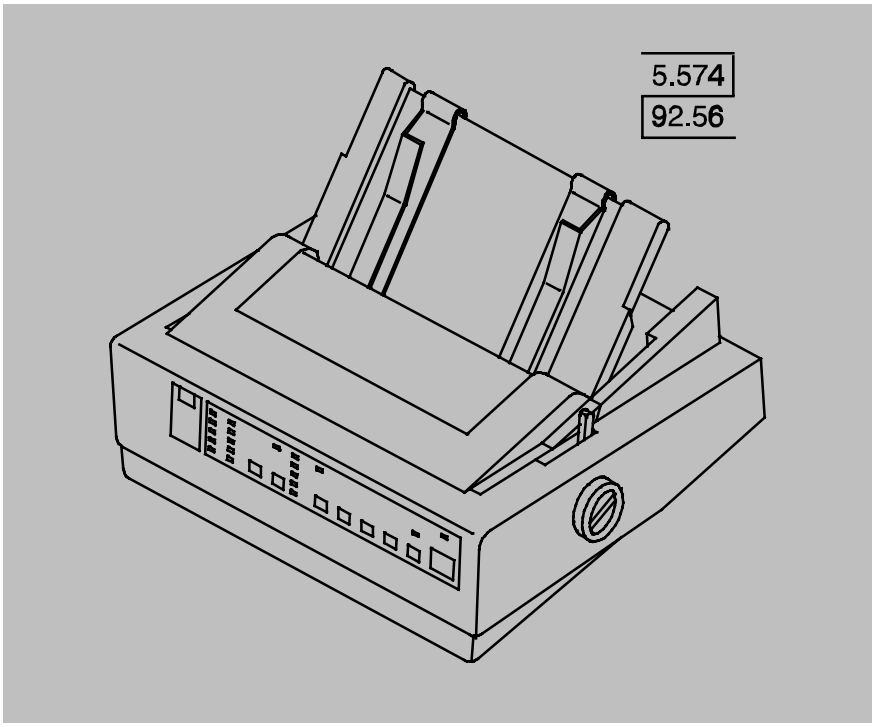
Order no. 690143861	Centronics converter 4386-1	DM 843 ,--
Order no. 690143862	V.24(RS 232) converter 4386-2	DM 843 ,--
Order no. 69014386103	Mounting set for converters	DM 70 ,--
Order no. 5301168635	Printer 6863-5, 230 V AC	DM 1365 ,--
Order no. 5301768635	Printer 6863-5, 24 V DC	DM 2149 ,--

For ordering please send a fax or letter to

ULTRAKUST Electronic GmbH, Verkauf IMR, Schulstr. 30, 94239 Gotteszell (Germany)

24-pin Terminal Dot-Matrix Printer

EPSON LQ-570 P-NET
Type 6863-5



The 24-pin terminal printer type 6863-5 is an efficient dot matrix printer for the application in the P-NET fieldbus network. It records and protocols measuring values, error values and other data supplied via P-NET.
The compact device produces high-quality printouts and offers a variety of layout possibilities. Particularly advantageous is its operating facility which includes a. o. new paper handling pointing the way. Moreover, the printer is appropriate for verification and is applicable in volume measuring facilities, where verification is obligatory.

First of all, the following functions and facilities are to emphasize:

• Extremely error-free P-NET interface for data transmission and control of the printout (fieldbus RS 485).

• Alphanumeric and graphical character sets including 14 international character sets, Legal, OCRA- and Eastern European character set.

• Several lettering styles and hights of letters, various print effects and print modi for demanding documents. A.o. 9 copy book letterings, 13 hights of letters for SansSerif- and Roman lettering, narrow and wide lettering, italic, bold face- and shadow print, etc.

• Draft mode for the quick print, speed up to 252 characters per second.

• Appropriate for graphics, resolution up to 360 x 360 points/inch.

• Suitable for single leaf paper 148....257 mm wide and reel papers with 101...254 mm. The change from one sort of paper to the next is no problem.

• Versatile paper handling with 4 paper ways. Single leaf paper may be supplied from above or from the front, reel paper from the front, from behind or from underneath.

• Paper saving separation automatics. After separating the last printed page, the printer automatically transports the following leaf to the print start position.

• Adjustment possibilities for various sorts of paper, number of copies, etc. guarantee a reliable paper transport.

• Homologation according to PTB number 1.32.4-5.574-ULT92.56

A universal dot-matrix printer, appropriate for verification, for data recording in the P-NET data network.

- **Individual data protocol**
- **Softwire protocol processing**
- **Tabular protocols with alphanumeric and region-specific characters**
- **A number of letterings and print modi**
- **Graphical presentations**
- **Reel- and single leaf paper**
- **Paper pull-in from above, below, the front or from behind**
- **User optimized and low-noise operation**

Technical Data

Printing procedure:
24-pin terminal dot-matrix printing

Printing format:
Alphanumerical and graphical character set with 14 international character sets, Legal-, OCRA- and Eastern European character set. 1 italic- an 5 graphic character tables.

9 letterings:
Draft, Courier, Roman, Sans Serif, Prestige, Script, Script C, Orator, Orator S und OCR-B.

5 width of lettering:
10 cpi (80 characters/line)
12 cpi (96 characters/line)
15 cpi (120 characters/line)
10 cpi narrow (137 characters/line)
12 cpi narrow (160 characters/line)

13 hights of lettering:
8/10/12/14/16 etc. upto 32 points
for the lettering Roman and Sans Serif.

Line distance:
1/6", 1/8" or programmable
(in 1/360"-steps).

Print direction:
Bidirectional, way optimization for the text and graphics
(also unidirectional for the graphics)

Printing paper:
Single leaf paper:
148 ... 257 mm wide (pull-in at the top) and/or 182 ... 257 mm (pull-in at the front).
Max. print width 203 mm.

Reel paper:
101 ... 254 mm wide,
Max. print width 203 mm.

Weight:
52 ... 82 g/m² (single leaf) and/or
40 ... 58 g/m² (multiple form).

Copies: max. 3 copies.

Ribbon:
Ribbon cassette black, #7753,
print capacity max. 2 x 10^6 characters.

P-NET port:
Serial fieldbus interface,
P-NET (RS 485), 76.800 bit/s.,
length of line max. 1200 m,
galvanically separated.

Power supply:
24 V DC ± 10 %, max. 2,5 A,
ripple ≤ 150 mV eff.
or
220/240 V AC ± 10 %, 50 - 60 Hz, max. 1 A
or
120 V AC ± 10 %, 50 - 60 Hz, max. 2 A

Ambient conditions:
Admiss. operating temp. 0 ... 40 °C,
admiss. storage temp. -30 ... +60 °C,
admiss. air humidity max. 80 % (without condensation),
climatic class LYF acc. to DIN 40040.

Housing:
Desk-top device 434 x 151 x 368 mm (B x H x T)

Connection:
9-pole plug (P-NET),
3 m cable for power supply with open ends (24 V DC) or
1,5 m mains cable (220/110 V AC).

Weight:
approx. 61 N (= 6,1 kg)

Printing speed:

Printing quality	Width of printing	Characters/Seconds/Line
Draft quick	10 cpi	225
Draft	10 cpi 12 cpi	210 252
Letter Quality	10 cpi 12 cpi	70 84

Order specifications

24-pin terminal dot-matrix printer,
type 6863-5 / 24 V DC . . . . . order no. 530 17 68635
type 6863-5 / 220 ... 240 V AC . . . . order no. 530 11 68635
type 6863-5 / 120 V AC . . . . . order no. 530 12 68635

Accessories

Reel paper with perforation,
250 mm wide, 1 box . . . . . order no. 19 00 13

Ribbon cassette black,
(EPSON # 7753) . . . . . order no. 49 57 46

A Fieldbus Work Item Group is formed in Denmark

A national fieldbus work Item group is formed in Denmark, and the aim is to follow the International developments within the fieldbus environment.

The group is formed by the Danish Automation Society. At the first meeting the following companies were participating: Schneider MGTE, Lanng & Stelmann, Danfoss, Softcom, ABB Industry, NovoNordisk Engineering, Cowi Consult, CRI, Haldor Topsøe, Moog-Buhl Automation, J. Pontoppidan Elektronik, The Technical University of Denmark, Rosemount, Proces-Data Silkeborg, Aalborg Technical University, Avedøreværket, Siemens and Danish Technological Institute.

At the fieldbus meeting in Denmark it appeared that even ISP50 couldn't make one fieldbus solution, but have made different profiles for different environments. The same situation is the fact for the IEC fieldbus. E.g., at the Data Link Layer (DLL), there are several possible solutions. This makes conformance testing inadequate, and further requirements for interoperability test are necessary, because of the combination of protocols.

At the same meeting in Denmark Mr. Udo Döbrich, Siemens Karlsruhe said that the Profibus will be a full subset of the ISP50 fieldbus. The question is then when the Profibus no longer will be advertised and sold, because of the equivalence with ISP50.

The large companies will try to stress their ideas, to become the most important, and therefore the group will mainly follow the ISP50 work. The first meeting was held at Siemens Denmark A/S, and Siemens and Rosemount had the idea that the ISP50 is the most important topic to follow on an international plan.
There were many discussions, because other de facto fieldbus standards such as WorldFIP and of course P-NET were of interest. The discussions on the meeting reflected the situation on a world basis, many companies are interested but no specific fieldbus gives the complete solution. So still, and maybe for several years - one big chaos.

News concerning standardization.

The International P-NET User Organization has received two proposed amendments to the standardized Digital I/O Channel. The digital I/O channel can implement different special output-functions, selected in the ChConfig.Functions variable and specified in ChType.Functions.

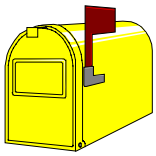
One proposed amendment concerns an additional function called **Timer output**, Functions = $50. This function is similar to the One-shot output function, but operates without presetting the OutTimer. The description to add in the standard is as follows:

Timer output.
This automatic function is selected by setting ChConfig.Functions = $50. When the Control Flag is TRUE, the output will be set TRUE if OutTimer is greater than zero. The time can be varied by reloading the OutTimer. Output is reset if the Control Flag is set to FALSE and the output may be controlled directly via P-NET.
Precise Function description:

```
Loop
    If InternalState and NOT FlagReg[Control] then (* Negative edge *)
      FlagReg[OutFlag]:=False;
    InternalState:=FlagReg[Control];
    If FlagReg[Control] then
      If OutTimer > 0 then
        FlagReg[OutFlag]:=true ELSE FlagReg[OutFlag]:=false
End
```

The other proposed amendment concerns the ChError.Act[Overload] flag. The overload error is now set if the current in the output load exceeds MaxCurrent, but when the output is switched off, the overload error is always cleared, according to the function description. This result in that you can never read the overload error as an actual error.
Proposal: ChError.Act[Overload] remains set after an overload condition, until a **Write** operation is performed on the **FlagReg** variable.

Comments and protests to the above proposals will be taken into consideration if received by mail or fax before 30th September 1993.



"Postbox 192"

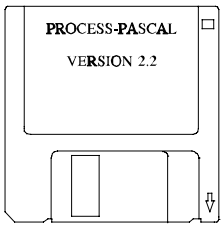
It is the intention with this correspondence column to have a forum where members can bring up some news, problems and send in possible solutions to other members problems, or even how old problems have been solved. Each article in the postbox will get an unambiguous number. The number is constructed in the following way. 1/2/93 that means: article number 1 / P-NET News number 2 / Year 1993.
This makes it possible to refer to a particular article.

Initiating this "Postbox 192", we have the following articles:

1/2/93 A student from FHTW-Berlin, Germany is working on a PC P-NET driver for QNX, the Unix operating system for PC's. It is expected that the driver will be available from the International P-NET User Organization at the beginning of 1994.

2/2/93 There have been exposed some communication problems with the PC PD3920 Card from Proces-Data Silkeborg ApS. Some users of the PC PD3920 have realized that the card can only run as a master. The missing slave feature makes it impossible to make a direct system involving two PC's communicating together. The problem can be solved by having a P-NET Controller PD3000 with a share memory area for the two PC's.

Please send your article to
International P-NET User Organization



Process-Pascal log report.

An overview and the corresponding latest version number for all the files included in a Process-Pascal library is now available. The log report also includes a list, showing errors which are found and corrected in various files and the corresponding version number.

The log report is available on the BBS and will be updated while new updates or additional files are put in the Process-Pascal files area on the BBS.

Denmark full member of the European Communities

Some EC member countries have been confused about Denmark's status in the EC. After the first voting in Denmark in 1992 about the Mastricht contract it was obvious that the Danish citizens voted NO. After that result some partners in the EC thought that Denmark was redrawn from EC, but that was not true.
Today Denmark is a full member of EC and Denmark voted YES to the Edinburgh contract.

Editorial.

The message was clear - **Fieldbus is on its way**.
This was one of the splash headlines in the *C&I Exhibition Daily*, a daily news magazine on the C&I 93 exhibition in Birmingham. Fieldbus is in great demand, even though it is evident that many people with the automation field have knowledge on Fieldbus's, but a lot more have not the slightest idea of this new phenomenon. Several people, of which many have attended the conference "International End-user Fieldbus Forum", came to our P-NET stand and pulled me into a corner while whispering "Please explain the fundamental concepts of Fieldbus".

Still, a lot of experts attended the C&I show and many visited our stand. It was a clear feeling that this exhibition initiated a fieldbus-wave. As the conference chairman for the "International End-user Fieldbus Forum", Alan Reeve said "It is not just a question of buying a new plug and socket. Fieldbus will influence the entire process plant."

On the C&I 93 the International P-NET User Organization obtained a very good press coverage, both in the technical magazines as well as in the exhibition catalogue. Once more a step in the right direction to disseminate the knowledge of the P-NET Fieldbus.

The last issue of P-NET NEWS mentioned a work-shop on a combined fieldbus trade-fair and conference in June in Karlsruhe, Germany. Unfortunately, this work-shop was cancelled.

Please note that the telephone number for the German Bulletin Board System has been changed. See below.

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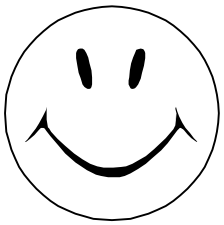

New members

Since the last publication of the members list, additionally 15 companies have joined the International P-NET User Organization:

Windy Technology Company	P.R. China
Hightron Corporation	USA
FHTW-Berlin / FB2	Germany
FF-Elektroniikka Fredriksson KY	Finland
Tirax AG	Switzerland
Muuntosahko OY - Trafox	Finland
Eltomatic	Denmark
Scantrade	Denmark
Prime Mess-u. Regeltechnik gmbh	Germany
Nottingham Triwt University	England
University of Wales, Aberystwytm	England
Dansk Teknologisk Institut	Denmark
Bonus Energy A/S	Denmark
University of Patras	Greece
Inst. für Technik Informatik und Systeme	Germany

We would like to welcome these companies.
The total number of members is now close to 60. The members list is found on the Bulletin Board System. The list is updated each month.

From a small news letter "DISP News", California, the following translation of the IBM abbreviation is taken:

IBM - I Blame Microsoft	IBM - Inferior, But Marketable
IBM - I Buy Macintosh	IBM - Institute of Black Magic
IBM - I’ve Been Mislead	IBM - Intl. Brotherhood of Magicians
IBM - I’ve Been Moved	IBM - It’s Backwards Man
IBM - I’ve Been Mugged	IBM - It’s Better Manually
IBM - Incompatible Business Machines	IBM - It Barely Moves
IBM - Incredibly Boring Machine	IBM - I Buy Mainframes