

# THE **P-NET** FIELDBUS

Communication between individual units of a distributed system of intelligent sensors and actuators, field and central controllers etc, requires a high performance, but economic, fieldbus. P-NET is the only fieldbus which has large scale implementations on a worldwide basis, and possesses the following characteristics:

## HIGH SPEED

- Data rate of 76800 baud (cost / performance optimum).
- Extremely efficient protocol for all bus transactions.

## MULTI-MASTER CAPABILITY

- Up to 32 masters on 1 bus segment.
- Simplified arbitration procedure (hardware token passing), is 10-100 times more efficient than software arbitration.

## MULTI-NETWORK CAPABILITY

- Any number of P-NET fieldbuses can be networked using Controller Gateways (standard units) without further software expense.

## NOISE IMMUNITY

- Electrical isolation between bus and electronics.
- Screened cable.
- Check-sum for data security.

## ECONOMY

- Based on the RS485 standard, therefore uses standard components.
- Single chip 8-bit microprocessors provide necessary performance.
- 2-wire ring connection up to 1200 m long, dramatically reduces wiring costs.
- Up to 125 devices on 1 bus segment.

## HIGH LEVEL LANGUAGE SUPPORT

- Standard Pascal with extension for multitasking and P-NET, reduce software expenditure.
- Full support of all functions, including Multi-net capability, by means of the Process-Pascal compiler.

## IMPLEMENTATION EFFICIENCY

Compared to conventional wiring, P-NET offers demonstrated advantages when applied to industrial processes, which result in simplification of

- Planning and installation
- Maintenance
- Future expansion of industrial applications

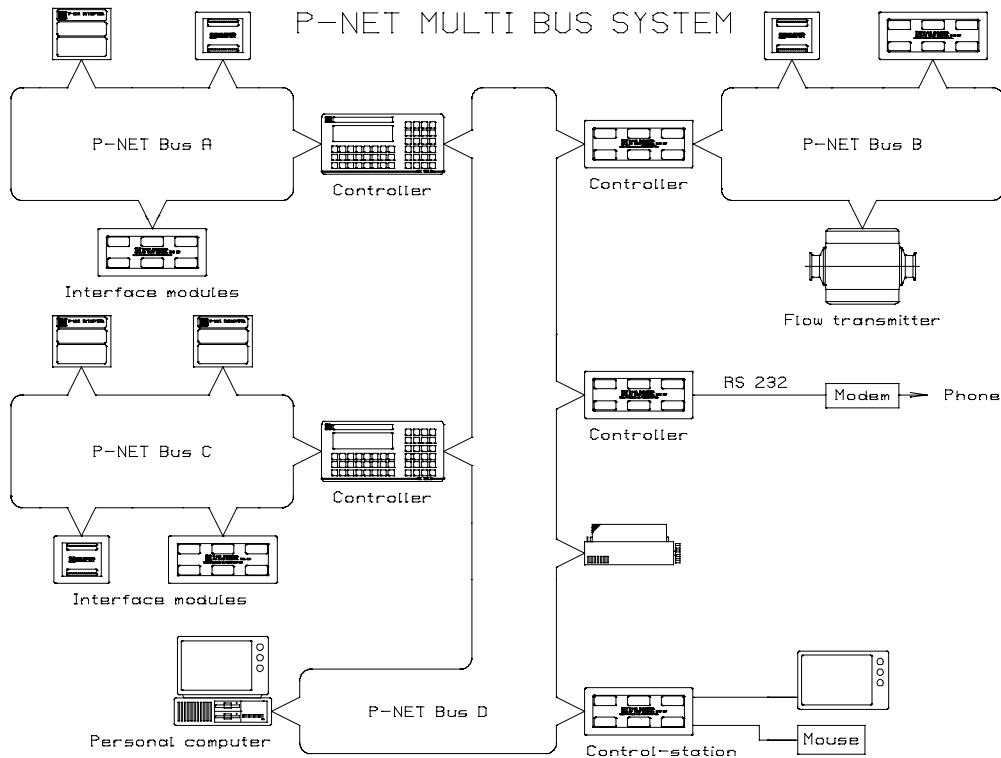
## DIAGNOSTIC CONTROL

The use of intelligent P-NET sensors and actuators offers new diagnostic capabilities. Apart from the usual measure values and status data, the bus enables a bidirectional exchange of additional information concerning limit values, actuator positioning, fault signals and internal system data. This provides new opportunities for efficient control of maintenance and system security.

## P-NET USER ORGANIZATION

The International P-NET User Organization has nearly 50 members worldwide. Some of the objects of the organization are

- to disseminate global knowledge of P-NET
- future development of the standard
- specify conformance test for products
- exchange info among the members



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## SPECIFICATIONS

### Data transmission

Asynchronous transmission  
 Data in NRZ code  
 76800 bits/sec.  
 1 start bit, 8 data bit, 1 addr/data bit,  
 1 stop bit for each byte in the frame  
 Check-sum for data security.

### Capabilities

Up to 125 devices at each bus  
 Multi-master, up to 32 at each bus  
 Multi-network  
 ISO OSI 7 layers reference model  
 High level language support

### Data types

Simple: boolean, byte, char, word,  
 integer, longinteger, real, longreal,  
 timer.  
 Complex: array, string, record, buffer.

### Electrical specification:

#### Bus structure

A physical ring without termination.

#### Medium

Shielded twisted pair cable with minimum .22 mm<sup>2</sup> area conductors and characteristic impedance of 100-120 ohm.

#### Bus length

max 1200 m (EIA RS 485).

#### Integrated transceiver

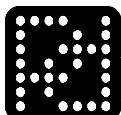
SN 75176A (TI).

#### Installation

The bus cable is connected from field device to field device, forming a physical ring.

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