



Jürgen W. Hertel
Echelon



LONWORKS®

in Industry

The next challenge

Jürgen W. Hertel
Echelon Europe
j.hertel@echelon.de



Lon Users Group
Denmark
07 October 02

May I introduce myself

- Jürgen W. Hertel
- Degree in Physics (Universities of Hamburg, Rochester, N.Y. and Munich, Germany)
- more than 25 years in business (IT, Controls, Mgmt)
- MD of Echelon GmbH (since 1993)
- Member of Echelon Europe Management Team
- Business Development for the Industrial Market
- Board member of Lon Nutzer Organisation e.V.
- you can write to me at: j.hertel@echelon.de

Lon Users Group
Denmark
07 October 02






LonWorks in Industry

Jürgen W. Hertel
Echelon

1. **Essential Features and Benefits**
2. Positioning of LonWorks in Industry
3. Products and Tools
4. Selected Application
5. LNO and European Lon User Organisations
6. Summary

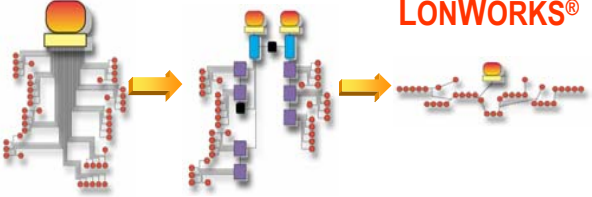
Lon Users Group
Denmark
07 October 02

LonWorks is one generation ahead


- Compared to PLC and Fieldbus
- Compared to IPC and Fieldbus
- Compared to Ethernet and Feldbus

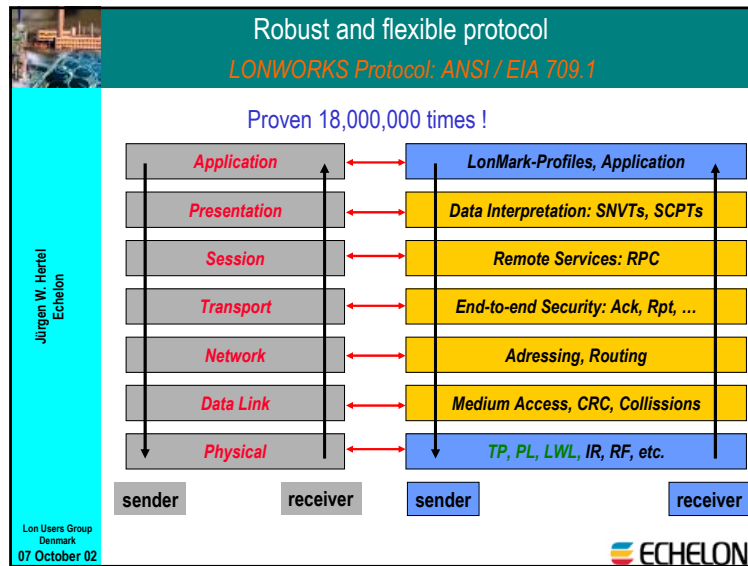
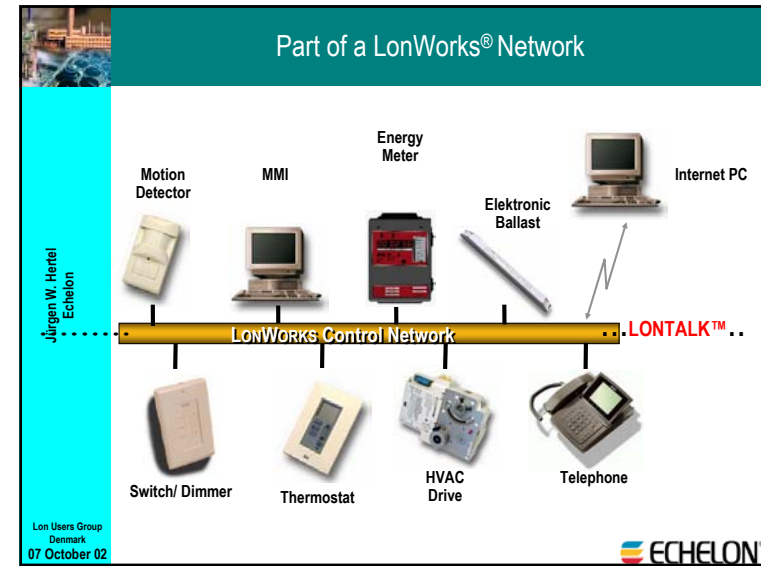
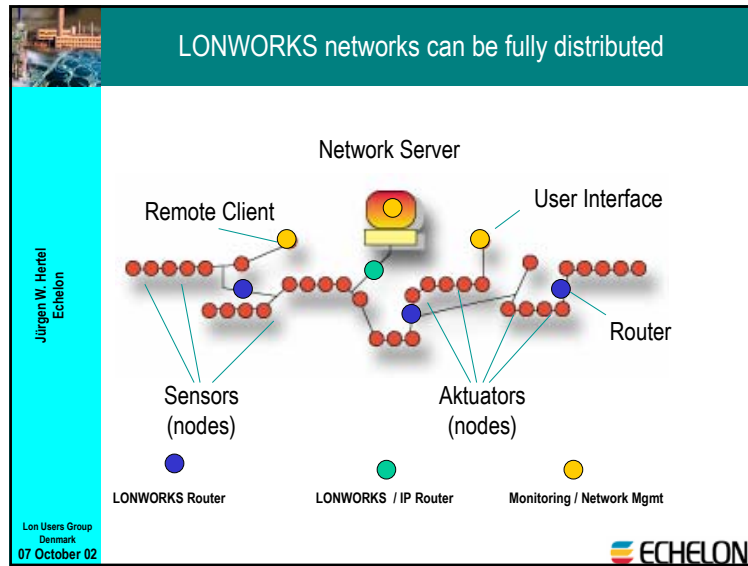
Centralized Control PLC/IPC / Fieldbus



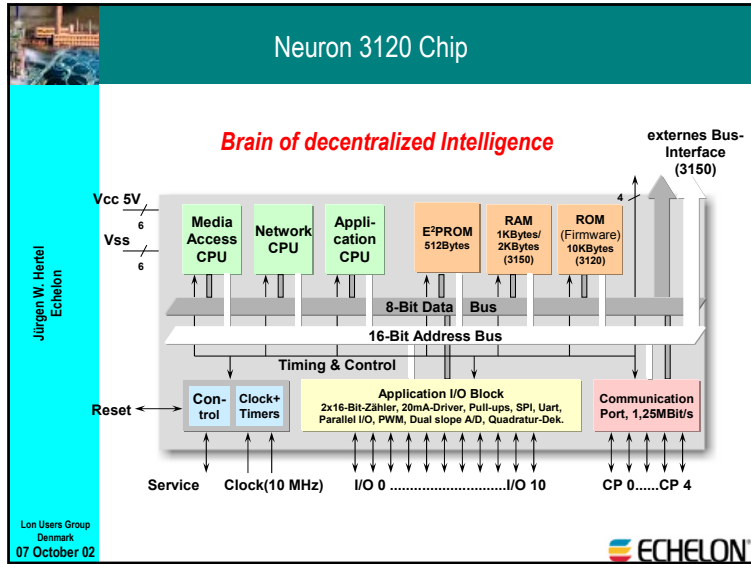
1st generation 2nd generation 3rd generation

Lon Users Group
Denmark
07 October 02





- ### The most important LONWORKS® Standards
- LONWORKS Protocol: CEN ENV 13154-2 (expires 10/2003)
 - LONWORKS Protocol: ANSI /EIA 709.1-1999 and IEEE 1473
 - Products: Neuron 3120,3150 family, Short Stack, iLON 1000, iLON 100, iLON 10, LNS 3 server / client
 - LONWORKS Powerline Channel : ANSI /EIA 709.2-A-2000
 - Product: PLT-22, compliant with CENELEC 50065-1
 - LONWORKS Free Topology Channel: ANSI /EIA 709.3-1999
 - Products: FTT-10A, FT31xx family of Smart Transceivers, LPT-10/11
 - LONWORKS Fiber-Optic Channel: ANSI/EIA 709.4
 - Products: Raytheon CBL, Compwell, UK
 - Tunneling Component Network Protocols over Internet Protocol Channels: EIA/CEA-852
 - Products: iLON 1000, LNS 3 server / client
- Lon Users Group Denmark 07 October 02
- ECHELON



Toshiba Neuron-Chip Family

	3150 B1AF	3120 B1AM	3120 A20M	3120 A20U	3120 FE3M	3120 FE3U	3120 FE5M
CPU	8 bit CPU * 3						
RAM	2,048	1,024 Byte		2,048 Byte		4,096	
EEPROM	512 Byte		1,024 Byte		2,048 Byte		3,072
ROM	-	10,240	16,384 Byte				
External Mem. I/F	Yes		No				
Inp. Clk.	0.625 - 10 MHz			0.625 - 20 MHz			
Pin /	64 Pin	32 Pin	44 Pin	32 Pin	44 Pin	32 Pin	
Package	QFP	SOP		QFP	SOP	QFP	SOP

Lon Users Group
Denmark
07 October 02

Many physical transmission media supported

- Twisted pair (RS485, 78.1kb/s, 1.25.Mb/s)
- **Free Topology, FT (78.1 kb/s)**
- **PowerLine (4.8 kb/s)**
- Fiber optics, Coax, RF, Infrared
- Ethernet (10 Mb/s, 100 Mb/s)
- Router and Web support available for all media

Lon Users Group
Denmark
07 October 02

Free Topology is a superior cabling standard

- relative to RS485 and Ethernet
- fully suited for heavy duty industrial environments
- very robust wrt electrical AND magnetic noise (FT31xx)

Bus

Star


Ring

...and any combination thereof !

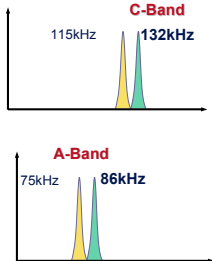
Lon Users Group
Denmark
07 October 02

"Wiring" through the 230 V Power Network with the PLT-22

- **used worldwide**
 - Supports international standards: CENELEC, FCC, Industry Canada and Japan MPT
 - corresponds to ANSI/EIA 709.2




PLT-22



- **designed for Utilities worldwide as well as for European Homes**
 - programmable carrier frequencies (A- and C-band)


Lon Users Group Denmark 07 October 02



Cost advantages & Economic benefits


- **Lower cabling costs**
 - Twisted pair replaces wiring harnesses
 - less space in distribution boxes and panels
- **low cost products / devices**
 - available from many manufacturers
- **preprogrammed / preconfigured devices**
 - no PLC/IPC programming required
- **easy installation**

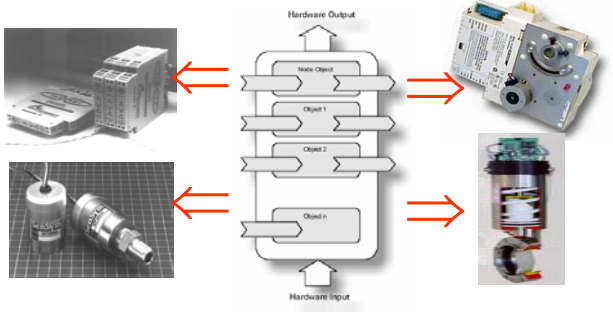
Lon Users Group Denmark 07 October 02




Interoperability through device profiles

Drives, pumps, frequency inverters, valves, sensors, power electrics, I/O modules, etc.



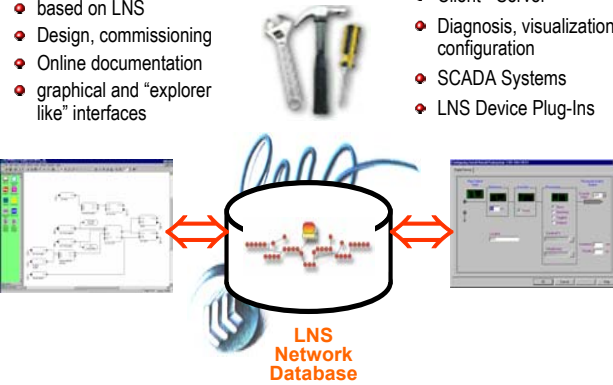


Lon Users Group Denmark 07 October 02




Modern & Open Tools

- ◆ based on LNS
- ◆ Design, commissioning
- ◆ Online documentation
- ◆ graphical and "explorer like" interfaces
- ◆ Client - Server
- ◆ Diagnosis, visualization, configuration
- ◆ SCADA Systems
- ◆ LNS Device Plug-Ins



LNS Network Database

Lon Users Group Denmark 07 October 02



Network Design and Management

LonMaker 3: graphical Tool for Design, Installation und Wartung

"Bindings"
= logical
Wiring

Lon Users Group
Denmark
07 October 02

ECHELON

LonWorks® Networks span large facilities

- More than 32,000 devices in one Network
- LNS applications can manage several domains
- Mix of several media and channels
- Integration with Ethernet, Intranet and Internet

Lon Users Group
Denmark
07 October 02

ECHELON

LONWORKS System Model in 1998

	Open Integrated LonWorks Applications	Management																				
since 1998	<table border="1" style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Tools</td> <td>LNS Plug-Ins</td> <td>Soft-Gateways</td> <td>SCADA / BMS</td> <td>SCADA</td> <td>S Client</td> <td>C Client</td> <td>A Client</td> <td>D Client</td> <td>A Client</td> </tr> <tr> <td colspan="5">Microsoft API</td> <td>WEB-Server</td> <td>OPC-Server</td> <td>DDE-Server</td> <td>JAVA VM</td> <td>XML-Server</td> </tr> </table>	Tools	LNS Plug-Ins	Soft-Gateways	SCADA / BMS	SCADA	S Client	C Client	A Client	D Client	A Client	Microsoft API					WEB-Server	OPC-Server	DDE-Server	JAVA VM	XML-Server	System / IT
Tools	LNS Plug-Ins	Soft-Gateways	SCADA / BMS	SCADA	S Client	C Client	A Client	D Client	A Client													
Microsoft API					WEB-Server	OPC-Server	DDE-Server	JAVA VM	XML-Server													
1997	LNS 1&2 Network Operating System (Windows 2000)																					
1993	LONMARK® Anwendungsprofile	Control																				
1991	LONWORKS® Basistechnologie																					

Lon Users Group
Denmark
07 October 02

ECHELON

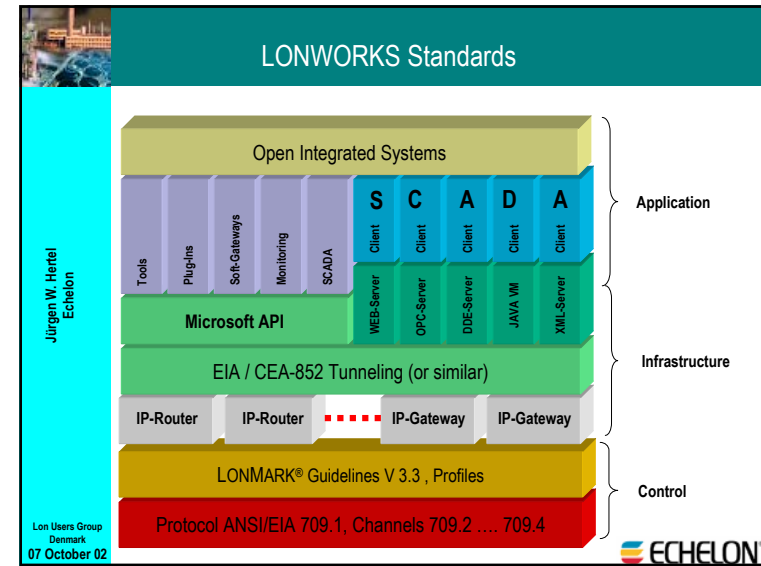
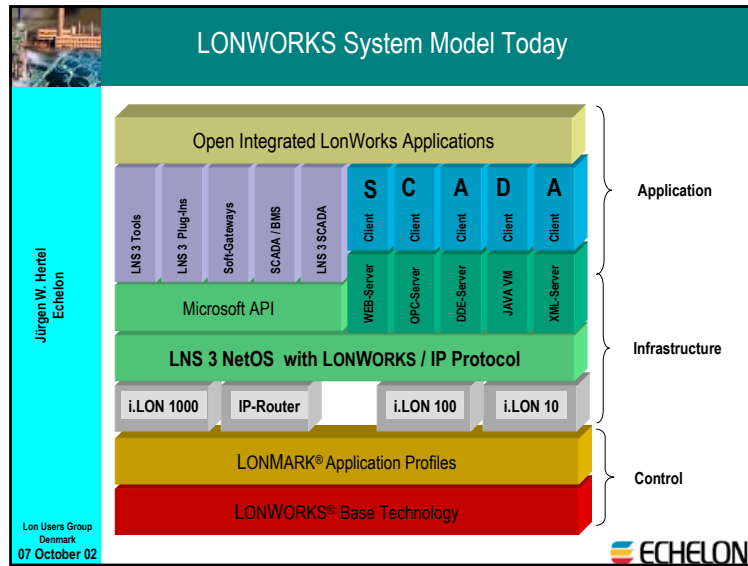
Two Separate Worlds

Control

Data

Lon Users Group
Denmark
07 October 02

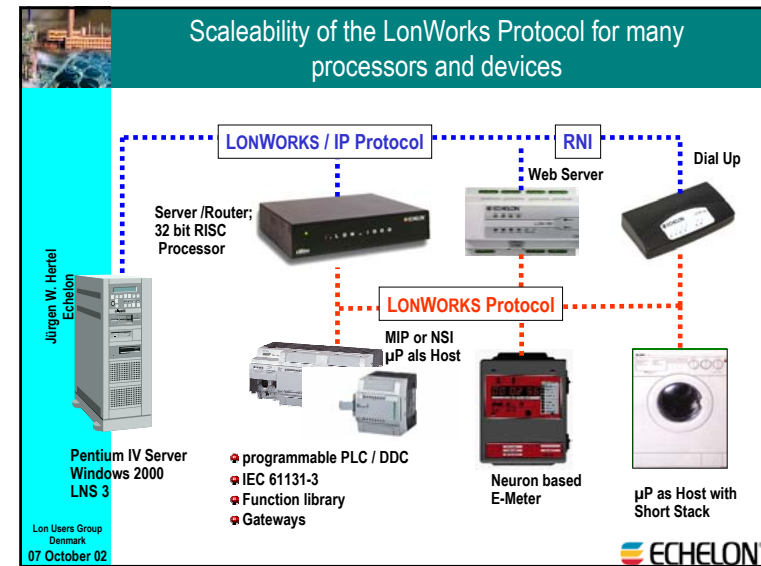
ECHELON



Cost advantages, Economic benefits

- WISYWIG project design with open tools
- easy modifications and expandability
- remote diagnosis and maintenance
 - down to the device and I/O level !
- easy integration with other systems
 - via Industrial Ethernet
 - via OPC
- price advantages through widespread acceptance in building automation

Vertical text on the left: Jürgen W. Hertel, Echelon. Bottom left: Lon Users Group Denmark, 07 October 02. Bottom right: ECHELON logo.



Echelon's Infrastructure Products

- i.LON 10 Dial Up**
- i.LON 1000 Internet Server**
- i.LON 100 Web&E-mail Server Datalogger Scheduler Alarm Handler**
- Interface cards Serial Adapters**
- LonMaker 3 for Windows**
- Scheduler Datalogger DM-21**
- LonBuilder / NodeBuilder**
- LNS 3 Network Operating System**
- Data Concentrator / Data Router**
- LonPoint Router**

ECHELON

Lon Users Group Denmark 07 October 02

i.LON Family – Key Design Point

- i.LON 1000**
 - High Performance
- i.LON 100**
 - Web access to applications
- i.LON 10**
 - Lowest cost customer premise equipment (CPE) available in the world

Lon Users Group Denmark 07 October 02

i.LON 10 Remote Network Interface (RNI)

- Lowest cost customer premise equipment (CPE) for LONWORKS networks
- Connects LONWORKS networks to TCP/IP Ethernet networks for residential, commercial, and utility applications
- Power line (PL-20) or twisted pair (TP/FT-10) LONWORKS channel support
- Supports NAT, DNS, DHCP, TCP, MD5, HTTP remote configuration & high speed LNS connection
- Uses less than 2% of Ethernet bandwidth at bus saturation

ECHELON

Lon Users Group Denmark 07 October 02


i.LON 100 Internet Server

All the features of an i.LON 10 plus:

- 2 digital inputs, 2 high voltage, high current relay outputs, and 2 metering inputs suitable for reading electric, gas or water meters
- **Scheduling, Data Logging, Alarm detection and dispatch apps built-in**
- Built-in Web Server and e-mail Client
- XML/SOAP interface to legacy systems and Microsoft.NET
- Supports NAT, DNS, DHCP, TCP, MD5, PPP, remote configuration & high speed LNS connection
- Power line (PL-20) or twisted pair (TP/FT-10) LONWORKS channel support
- 10/100 BaseT and (optional) built-in V.90 56K modem


ECHELON

Lon Users Group Denmark 07 October 02




LON 1000 Internet Server

- Highest performance solution for seamlessly connecting LONWORKS networks to IP networks
 - Thousands of updates / second
- True layer 3 routing
- Built-in web server
- TP/XF-1250 or TP/FT-10 LONWORKS channel support
- Adjustable aggregation and bandwidth cap regulate IP bandwidth utilization
- Tested and certified by Cisco Systems



Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02



Overview LonWorks in Industry

1. Essential Features and Benefits
2. **Positioning of LonWorks in Industry**
3. Products and Tools
4. Application Areas
5. LNO and European Lon User Organisations
6. Summary

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02




Requirements for a factory / plant network (1)

- ♦ dispersed over a large area in a plant
- ♦ support of many (thousands of) devices
- ♦ flexible, inexpensive wiring
- ♦ peer to peer communication on device level
- ♦ Robust, standard protocol
- ♦ Standardized data objects > Interoperability !

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02



Requirements for a factory / plant network (2)

- ♦ connectivity to a plant Ethernet
- ♦ connectivity to PLC / IPC / fieldbus systems
- ♦ connectivity to Corporate IP and ERP systems
- ♦ integrateability through OPC
- ♦ worldwide acceptance


However:

- ♦ **not time critical**
- ♦ **not mission critical**

Revival of CIM concept !

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02



Manufacturing control and Process Automation today

Lon Users Group
Denmark
07 October 02

ECHELON

Positioning of LONWORKS in Industry

Lon Users Group
Denmark
07 October 02

ECHELON

Coherent, modern system System standard

Client - Server WAN (LNS 3)
IP Tunneling (i.LON 1000)
Web Server (e.g. i.LON 100)
Enterprise End-to-end Solutions

Lon Users Group
Denmark
07 October 02

ECHELON

Integration with other IA systems through OPC

- PLC / IPC plus Field Bus
- Plant Ethernet
- OPC (OLE for Process Control)

Lon Users Group
Denmark
07 October 02

* available from various European SW houses: Newron, who, TLO, ECHELON

Overview LonWorks in Industry

1. Essential Features and Benefits
2. Positioning of LonWorks in Industry
- 3. Products and Tools**
4. Selected Applications
5. LNO and European Lon User Organisations
6. Summary

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02


Requirements are different from BA

- very few smart sensors available
- every project is different
- few standard I/O module types „for everything“
- efficient I/O module programming
- preprogramming in the lab
- Flexible changes in the field
- Precise documentation of logic in module
- yet „LonMark“ compliant behavior
- proven for harsh environments (IP classes)
- Semi-decentralized power and controls installations


Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02


Process Control and Material Handling at the AIXTRON Semiconductor Material Factory in Aachen, Germany




- Direct Communication of the Operating Control Panel with the SCADA / Monitoring system
- Monitoring and Assignment of Materials
- One Operating Panel in each Production Zone



- One Control Unit contains four Lonworks® Nodes.
- One Unit manages one production zone
- Monitoring of gases runs on a separate Lonworks® Network



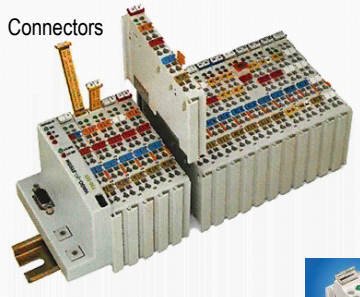
- Multi level Security concept, based on SEMI guidelines.
- Control of High voltages
- Control of gases, air and cooling water




Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02


WAGO I/O TOPLOK A highly flexible, modular I/O System




Connectors




Analog Input
2 / 4-Channel
0 - 10 / ±10 V DC
0 - 20 / 4 - 20 mA




Analog Output
2-Channel
0 - 10 / ±10 V DC
0 - 20 / 4 - 20 mA



Special connectors
Power Supply, Counter,
Interfaces and other
functions



Digital Input
2 / 4 / 8-Channel
5 / 24 / 48 V DC
24 / 120 / 230 V AC
0.2 / 3 / 50 ms

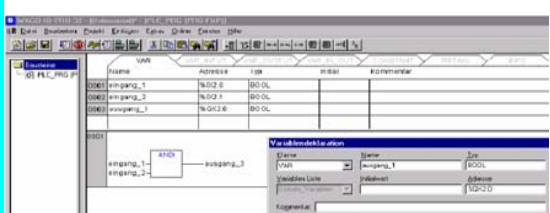


Digital Output
2 / 4-Channel
5 / 24 V DC
24 / 120 / 250 V AC
0.02 / 0.3 / 0.5 / 1 / 2 A


Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

WAGO I/O SYSTEM TOPLON Programmable with Neuron C or IEC 61131-3




- ◆ Programming Tool for all programmable Fieldbus Controllers from WAGO
- ◆ Application programming according to IEC 61131-3.
- ◆ Test (On/Offline), error diagnosis

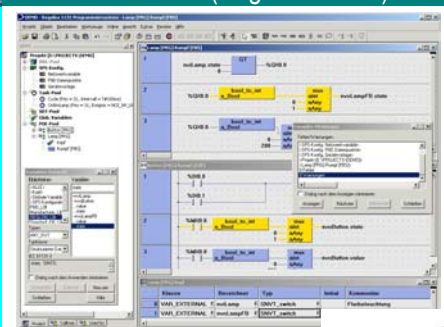


- ◆ LONWORKS® Coupler Programmable in Neuron C
- ◆ LONWORKS® Controller Programmable with IEC 61131-3


Lon Users Group Denmark
07 October 02



Visual Node Programming with IEC 61131 (Regulex GmbH)




- ◆ long tradition with IEC 61131
- ◆ works with NodeBuider 3 field compiler
- ◆ Supports Node object and online configuration




Transponder reader

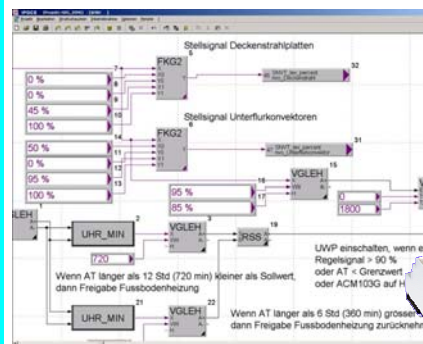
Snap on plate like LonPoint modules



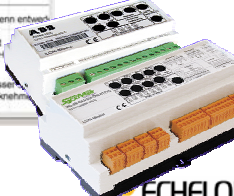
Lon Users Group Denmark
07 October 02



The graphical Programming Tool IPOCS (SysMik)




- ◆ free programmable LON devices
- ◆ Runtime kernel
- ◆ Graphical Programming Tool
- ◆ Simulation mode
- ◆ Online configuration

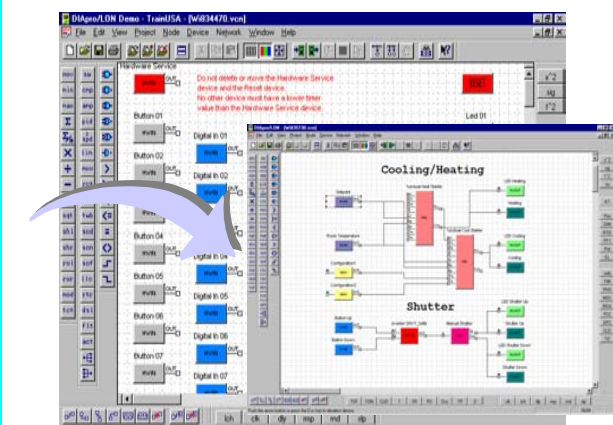


...used by ABB, Sauter, etc.


Lon Users Group Denmark
07 October 02



Node Programming with Visual Control (Dayton General)



Lon Users Group Denmark
07 October 02



Panel PC – LNS Client (DH electronics)

DH electronics GmbH
www.xlon.de

Lon Users Group
Denmark
07 October 02

LNS Server Embedded (DH electronics)

DH electronics GmbH
www.xlon.de

Lon Users Group
Denmark
07 October 02

Overview LonWorks in Industry

1. Essential Features and Benefits
2. Positioning of LonWorks in Industry
3. Products and Tools
4. **Applications Areas**
5. LNO and European Lon User Organisations
6. Outlook

Lon Users Group
Denmark
07 October 02

Many Opportunities in identified Market Segments

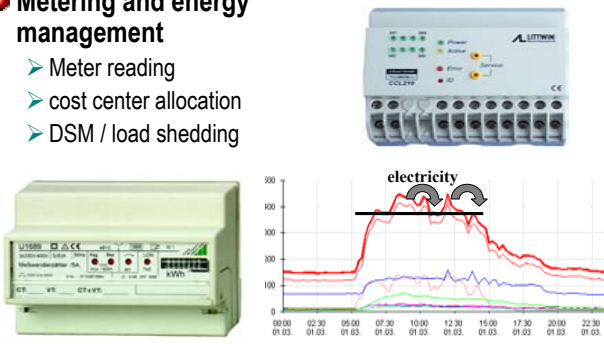
- Sewage treatment plants
- Plant construction and maintenance
- Automotive Industry
- Waste disposal: Waste water, garbage, etc.
- Manufacturing Industries
- Semiconductor Industry
- Food industry
- Machine building
- Public and private infrastructure
- Process industries: Chemical pharmaceutical, oil
- Gas stations
- Utilities: electricity, gas, water

Lon Users Group
Denmark
07 October 02


AMR and Energy Management

Jürgen W. Hertel
Echelon

- ◆ **Metering and energy management**
 - Meter reading
 - cost center allocation
 - DSM / load shedding



Lon Users Group
Denmark
07 October 02



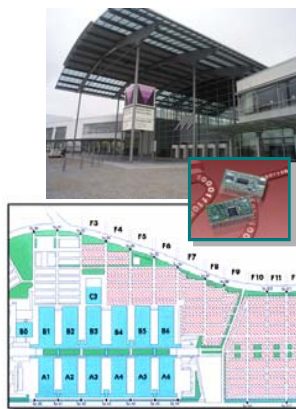
Powerline Submetering Neue Messe München

Jürgen W. Hertel
Echelon


- ◆ International Congress Center München
- ◆ 12 Exhibition Halls
280,000 m² Area
- ◆ more than 5,000 Electronic Meters made by Finnish Co.

ENERMET

- ◆ installed by Moeller
- ◆ communication via PLT-22 powerline
- ◆ separate reading of exhibitor and subtenants



Lon Users Group
Denmark
07 October 02



Messe Köln (Cologne)

Jürgen W. Hertel
Echelon





Ingenieurbüro
für MSR-Technologie GmbH

- ◆ 40 international Trade Shows and Exhibits p.a.
- ◆ 38.000 exhibiting companies
- ◆ 2 Millionen visitors from 170 countries
- ◆ 286.000 m² exhibition space
- ◆ 52.000 m² outdoor space
- ◆ 14 exhibition halls




Lon Users Group
Denmark
07 October 02



Why was LonWorks chosen by Messe Köln ?

Jürgen W. Hertel
Echelon



Ingenieurbüro
für MSR-Technologie GmbH

Requirements:

- ◆ No company specific bus / network
- ◆ Support of several communication media (e.g. FTT)
- ◆ components from many suppliers
- ◆ Use of existing cabinet space and cabling
- ◆ Online Documentation of Floor Layout with devices
- ◆ Applicability to HVAC and other industries


Contenders: ◆ EIB, M-Bus, HART, LONWORKS

Results:

- ◆ EIB bit oriented bus; little integration capability
few or no components for remote meter reading (AMR)
- ◆ HART Industrial protocol for TP communication only
- ◆ M-Bus very special bus for AMR
protocol for the various M-Bus devices needs to be programmed individually

➤ **Decision for LonWorks !**

Lon Users Group
Denmark
07 October 02



Messe Köln AMR project

TEC TROL
Ingenieurbüro für MSR-Technologie GmbH

Jürgen W. Hertel Echelon

- Meters with pulse output
- AMR module
- BK-Modem
- RJ54 / Broad band
- Visualisation / InTouch
- LON Meter
- iLON 1000
- Broad band network
- SQL-Database
- Service tool

Lon Users Group Denmark
07 October 02

- 45 i.LONs 1000 installed
- to be enhanced with other functions

ECHELON

Alarm and fault annunciation and recording

- Transformer stations
- Substations
- Machines
- Plants
- Security and emergency services

Jürgen W. Hertel Echelon

Lon Users Group Denmark
07 October 02

ECHELON

Visualization of Voltages in a HV Switching Field

Citec

Reichmann unito
STÖRMELDESISTEME
LON-Bus Technologie

Jürgen W. Hertel Echelon

Lon Users Group Denmark
07 October 02

Special I/O Modules for High Voltage Environments

ECHELON

Simulation Control Room for Training Operators in Nuclear Power Plants

Projekt: Simulations-Schaltwarte für ein Kernkraftwerk in Japan

Reichmann unito
STÖRMELDESISTEME
LON-Bus Technologie

Jürgen W. Hertel Echelon

Year	Location	Owner	Application	No of signals
1999	Kashiwazaki	TEPCO	K5 Plant Simulator	3826 DI, 6093 DO, 1 AI, 639 AO
2001	Fukushima	TEPCO	2F2 Plant Simulator	3338 DI, 4561 DO, 1 AI, 667 AO

Lon Users Group Denmark
07 October 02

ECHELON

Decontamination process of ground water

Stadttor Düsseldorf

ECHELON

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

Networking Production Halls

- Heating and Cooling
- Ventilation and Exhaustion
- Daylight Control, Lighting, Emergency Lighting
- Simulation and test of fire scenarios
- Light barriers, Warning beacons, smoke detection, Emergency Off
- Fire detection and fighting, emergency signalling, controlled areas, doors

© THEN

ECHELON

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

Environmental Ventilation Systems: Odour Abatement

- Cost efficient solution, easy and intuitive network configuration
- Highly adaptable and scalable
- High Voltage Power Supplies controlled and monitored over local LonWorks network
- Start / stop from factory PLC
- Local PC with InTouch displays trends and user interface
- Removing odours from industrial emissions
- System installed in several continents

Applied Plasma Physics, Norway

ECHELON

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

Generating and monitoring of clean air

- Clean room applications
 - Semiconductor industry
 - Pharmaceutical industry
- Laboratory ventilation
- Agriculture

© M+W Zander, Stuttgart

ECHELON

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

Streetlighting Control via RF and Powerline Comm

RF and Powerline Controller Main Station

PC Main Station (RS 232)

Control Station (RF Transmission)

Intron-Powerline-Controller (Gateway, I-PLC 23.00, Powerline)

Street Lighting (PL-PLC, Energieversorgungskabel)

Lon Users Group Denmark
07 October 02

Street Lighting System based on LonWorks RF and Powerline Technology (Intron Engineering)

Principle

Netzstation 1, Netzstation 2, Gateway, PC mit Steuerprogramm, LON-PLC-Netzwerk, LON-Powerline-Netzwerk

Installed System

© Intron/Intronic Leuchttechnik, Standart 01.02001

Lon Users Group Denmark
07 October 02

Crane camera system control via LONWORKS RF

Camera

Camera and damper are installed On the top of the crane

Damper

TFT Monitor

TFT monitor and video monitor Are installed in the crane cabine

Video monitor

Benefit:
Camera axis and picture remain in stable position independent of the crane jip position.

Lon Users Group Denmark
07 October 02

PLC-PLC Radio transmission

RF transmission based on LON

Radio tranceiver with Profibus-DP interface

Profibus-DP Connention

PLC

Benefits:

- Reduced cabling costs
- Reduced installation costs
- Reduced engineering costs

Lon Users Group Denmark
07 October 02

Surveillance of Outdoor premises

Jürgen W. Hertel
Echelon

- Security of Buildings and premises
- Access Control for persons and vehicles
- Parking lots
- Evacuation in case of emergencies & catastrophies



Munich Airport Terminal 2

- Trade Show areas
- Public and private outdoor installations




Lon Users Group
Denmark
07 October 02




Modernisation of Deutsche Bahn facilities


Jürgen W. Hertel
Echelon

- Decision for LonWorks in 1997
- Approx. 5.700 Train Stations and Train Stops with very diverse technical equipment
- 55 Operational Management Centers (3 S-Centers)
- managed by 80 Facility Managers
- FM recently outsourced to one company

Die Bahn  Station und Service

Lon Users Group
Denmark
07 October 02



Overview LonWorks in Industry

Jürgen W. Hertel
Echelon

1. Essential Features and Benefits
2. Positioning of LonWorks in Industry
3. Products and Tools
4. Application Areas
5. **LNO and European Lon User Organisations**
6. Summary

Lon Users Group
Denmark
07 October 02



Lon Nutzer Organisation e.V.


Jürgen W. Hertel
Echelon

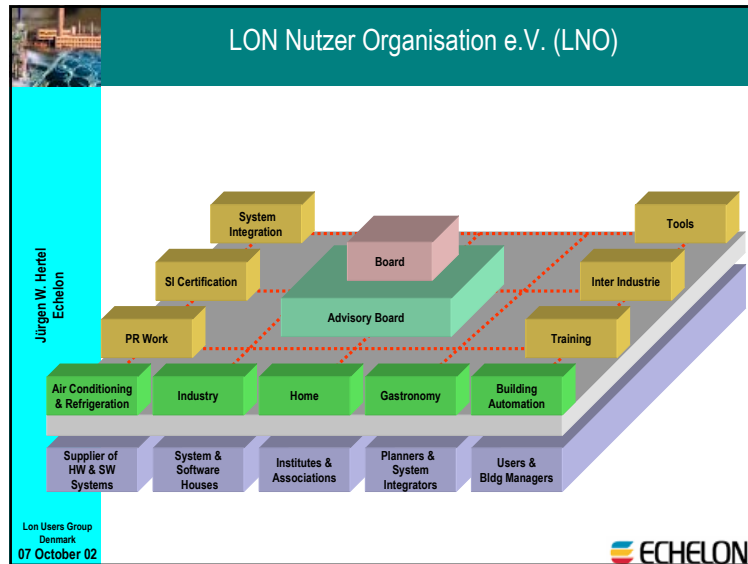
- Founded in 1993
- Non-profit Organisation: statutes, bylaws, etc.
- Approx. 165 paying members
- Budget 2002: approx. 250 k€ (50% member fees)
- Board (3):
 - Martin Wenzel (Hörburger Gruppe): Chairman
 - Dr. Gert-Ulrich Vack (SysMik): Finances
 - Dr. Jürgen Hertel (Echelon): Secretary
- LNO Brief (24 Issues), LNO Specials (Products, References), Conferences, Tradeshow, Press Conferences

11 LNO Working Groups

- Public Relations,
- Building Automation,
- LonWorks in Industry
- Living with LON (HA)
- Certification of SIs
- Air Conditioning and Refrigeration
- Gastronomy,
- System Integration
- Tools,
- Inter Industry,
- Training

Lon Users Group
Denmark
07 October 02





The LNO Working Group AKI

Jürgen W. Hertel
Echelon

- ◆ (re) established in 11/2000
- ◆ 15+ members
- ◆ Definition of strategy for LonWorks in Industry
- ◆ Positioning vis a vis Industrial Automation
- ◆ Public relations and marketing
- ◆ Creating reference applications
- ◆ Working on Industrial LonMark profiles
- ◆ Working on efficient solutions for Programmed I/O

Lon Users Group
Denmark
07 October 02

Books on LONWORKS in German and English

Jürgen W. Hertel
Echelon

Lon Users Group
Denmark
07 October 02

The „LNO-Brief“


Jürgen W. Hertel
Echelon

- ▶ Products
- ▶ Projects, References
- ▶ Applications
- ▶ Technology
- ▶ Hot Information
- ▶ Trends
- ▶ Advertisement

Lon Users Group
Denmark
07 October 02

European User Organisations

Jürgen W. Hertel
Echelon



LONWORKS is the Esperanto for Open Control Networking in Europe !


Status:

- 11 User Organisations
- > 750 members (approx. 25% LNO)
- 1st Meeting in Prague
- 2nd Meeting on L&B, dedicated to Standardisation
- LNO opens up for European members
- LNO Brief European Edition

Objectives:

- Cooperation related to European Standardisation (CEN TC247)
- Lon Users Europe Homepage
- Promotion of paneuropean Business opportunities

Lon Users Group
Denmark
07 October 02



Europe is a 300+ Million people market

Jürgen W. Hertel
Echelon



Lon Users Group
Denmark
07 October 02




Overview LonWorks in Industry

Jürgen W. Hertel
Echelon

1. Essential Features and Benefits
2. Positioning of LonWorks in Industry
3. Products and Tools
4. Application Areas
5. LNO and European Lon User Organisations
6. **Summary**

Lon Users Group
Denmark
07 October 02



Summary

Jürgen W. Hertel
Echelon

- LONWORKS has the potential to become a global standard in Industry similar to BA
- There is a high similarity to BA regarding the advantages of LONWORKS for covering large facilities: large area, high number of nodes, FT wiring, standardized data objects, IP connectivity
- The number and variety of applications is huge
- Gateways play a much bigger role
- Free programming of Neuron based I/O devices is a must
- Competition from small, distributed PLCs is very strong (Pricepoints coming down !)
- LONWORKS has been „undermarketed“ for its value

Lon Users Group
Denmark
07 October 02

