

# Profile

## Personal Data

### Name and Address

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### Date of Birth

May 30<sup>th</sup>, 1953

### Nationality

German

## Practicum

### Siemens

Siemens AG, Berlin

1977-1978

Electro mechanics and machine tools

## Education

1979-1982

Study of Information Technology at the „Technische Fachhochschule Berlin“  
Final Work: „Digital Transversal Filter“

## Professional Work

### Stadttheater

Stadttheater Giessen GmbH.

1974-1977

Sound technician in the main building and technical coaching of a theatre studio

### Schering AG

Schering AG, Berlin

1979-1982

Freelancer: Development and assembly of electronic devices for the research laboratories

1982

Technical assistant: Development and assembly of electronic devices for the research laboratories

### Endress+Hauser

Endress+Hauser GmbH.+Co. KG, Maulburg

1982-1985

Project manager development: Humidity measurement

1985-1988

Team manager: Digital communications, smart devices, gate arrays, microcomputer

1988-1991

Department manager: Digital communications, system parts, software and firmware, fieldbus technology

1991-1992

Department manager: New information technologies, fieldbus, fuzzy logic, artificial intelligence

### Self-employed

1992-2013

Engineering consultancy ‚Borst Automation‘

## Knowledge/Skills

|                                |  |
|--------------------------------|--|
| <b>Programming Languages</b>   | FORTRAN, PASCAL, VB, C, C++, C#, SQL, Java, Assembler, Phyton  |
| <b>Application Languages</b>   | DDL, HTML, XML, Java Script, VB Script, UML  |
| <b>Source Code Maintenance</b> | MKS, CVS, Clear Case   |
| <b>Operating Systems</b>       | DOS, Windows 3.1/3.11/98,NT,2000,XP, CP/M, MicroC OS-II, EmbOS   |
| <b>Microcontrollers</b>        | 6800, 6805, 6809, 6811, 680xx, 8080, 8085, Z80, 8086-80386, 8031/51/52, H8, M16C, PIC, ARM, Stellaris  |
| <b>Platforms/Interfaces</b>    | GEM, MFC, COM, DCOM, Borland Builder, Delphi, Visual Basic, Visual Studio.net, Eclipse, Netbeans   |
| <b>Application (Windows)</b>   | Word, Publisher, Access, Project, Power Point, Excel, FrontPage, Webexpression, Installshield, Advanced Installer  |
| <b>Hardware</b>                | Gate-Array Design,<br>intrinsically safe electronic circuits,<br>microcomputer design,<br>electronics for data acquisition (A/D converters etc.),<br>electronics to connect to fieldbus  |
| <b>Communication Technique</b> | HART, CAN/CANOpen, PROFIBUS, FF, 802.x, TCP/IP, Modbus   |
| <b>Coaching and Mentoring</b>  | I am used to establish teams and to lead them. Even under time pressure I manage it to distribute work meaningful, to hide the pressure from the team and to keep the team in a positive mood.<br>To catch crashed projects and to get them back to where they were targeted to or to stop them it's also part of my work. |
| <b>Languages</b>               | German, verhandlungsfest in Wort und Schrift   |
| <b>Referees</b>                |  |
| <b>On request</b>              | Please send email or call.   |

## Borst Automation

### Services

#### Consulting

- Fieldbus Systems
- Microcomputer Systems
- Project Planning
- Platform Design
- Technology Analysis

#### Project Management

- Consulting
- Coaching
- Mentoring

#### Development

- Embedded Systems (hardware but no layout)
- Measurement Electronics (no layout)
- Software Frameworks for Embedded Systems
- Complete Firm- and Software for Microsystems
- Driver and Middleware for Windows
- Windows Application Programs
- Device Descriptions for HART and Profibus
- Databases for the Generation of Source Code
- Databases for the Generation of DDs
- PC-Simulations<sup>1</sup> for Embedded Systems

#### Miscellaneous Services

- Code Inspections
- Task Analyses
- Feasibility Studies
- Test Design and Testing
- Editing of Specifications
- System and Software Documentation

### Salary

98.- Euro/hour

### Products

- Windows .NET Control for the HART Protocol (HartX)
- HART Slave in C for Embedded Systems 8/16/32 Bit
- HART Communication DLL for Windows
- HART Protocol Analyser (FrameAlyst)

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<sup>1</sup> Almost all device software can be developed in Visual Studio by using a Simulation on the PC

## Customers for Consulting and Projects

Bebro-Elektronik, Frickenhausen  
Embex, Freiburg  
Endress+Hauser, Gerlingen  
Endress+Hauser, Manchester  
Endress+Hauser, Nesselwang  
Endress+Hauser, Maulburg  
Endress+Hauser, Reinach  
Force Computers, München  
Inor Transmitter, Vantaa  
IMTT, Oulu  
Integriti Solutions, Aberdeen  
Fischer & Porter, Göttingen  
Hartmann & Braun, Frankfurt  
Liebherr, Bad Schussenried  
Mettler-Toledo GmbH., Urdorf  
MTL, Luton  
Pepperl+Fuchs, Mannheim  
Phoenix Contact, Blomberg  
Rosemount, Chanhassen (Emerson)  
Samson, Offenbach  
Sensycon, Alzenau  
Siemens, Karlsruhe  
VEGA Griesshaber, Schiltach  
Yokogawa Electric Corporation, Tokoy

## Work in Standards

**1994-2001** Delegate of NAMUR(Germany) into the German standards committee (UK 951.3 of DKE, Fieldbus)  
**1993-1994** German delegate into the international standards committee IEC SC65C WG6  
**1994-1999** German delegate into the European standards committee TC65CX  
**1988-1992** Contributions to IEC SC65C WG6 (as guest)  
**1988-1992** Contributions to ISA SP50

## Patents

**2005** Method for the Calibration of non-Linear Sensors  
**2004** Method<sup>2</sup> for the Operation of a Modular Built Field-Device for Plant Automation

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<sup>2</sup> Software Options

## Publications

- 2004 Method for the Operation of a Field Device in Automation<sup>3</sup>
- 2003 Method to Transfer Data between two Measurement Devices<sup>4</sup> WO 2005/045782 A2
- 1990 Arrangement for Digital Voltage Measurement<sup>5</sup>, BRD-Patent 36 17 936 / 6.9.1990
- 1989 Method to Transfer Binary Coded Information in a Measurement System<sup>6</sup>, US-Patent 4.777.331 / Ovt 11.1988
- The articles are all in German language. The titles have been translated for your information.
- 1994 W. Borst, R. Patzke: „Sensor-/Actorbus as IEC Gateway“, industrie-elektrik+elektronik 1994, No 4, P. 32-36
- 1994 W. Blome, W.Borst: „Fieldbus Protocols in Comparison“, Elektronik 1994, No 1, P 48-58
- 1992 W. Borst: „The Fieldbus in Factory and Plant Automation“, Franzis-Verlag 1992, ISBN 3-7723-4621-9
- 1991 W. Borst: „Communication at the Instrumentation Level“, Elektronik 1991, No 18, P 72-81 and Elektronik 1991, No 20, P. 82-86
- 1990 W. Borst: „CIP is Approaching“, Elektronik 1990, No 13, P. 42-49
- 1989 W. Borst: „New Technology fully Integrated“, Konstruktion & Elektronik 1989, No 42, P. 4
- 1989 W. Borst: „Digital Communication in Process Measurement“, mikro elektronik 1989, No 4, P. 158-162
- 1988 W. Borst, K.P. Lindner, M. Ziesemer: „The EUREKA Field for the Instrumentation in the 90s“, Automatisierungstechnische Praxis 1988, No 9
- 1987 W. Borst, B. Gut, E. Pfündlin, M. Ziesemer: „'Intelligent' Transmitters for Plant Automation“, Automatisierungstechnische Praxis 1987, No 11, P. 526-532
- 1985 W. Borst: „Real Time Monitor for Measurement and Control Engineering“, Elektronik 1985, No 23, P. 79-83
- 1985 W. Borst: „Curve Approximation by Additive Segmentation“, Elektronik 1985, No 20, P. 91-93

## Memberships

- 1993–20013 HCF (HART Communication Foundation)
- 1993–2006 VDI/VDE (Association of German Engineers)

<sup>3</sup> Smart Device Management in Profibus

<sup>4</sup> HART Input, a HART Slave understands Burst Messages

<sup>5</sup> Ultra Low Power A/D-Converter

<sup>6</sup> Ultra Low Power Data Transfer

## Relevant Project Work

|           |  |
|-----------|--|
| 2013      | Development of a communication software as HART 7.4 for Windows and embedded systems. The components had been master, slave and analyser.  |
| 2013      | Development of a thermal mass flow meter.  |
| 2012-2013 | Development of a software for the calculation of fluid properties for liquids and gases.   |
| 2011-2013 | Development of a Vortex flow meter.  |
| 2010-2012 | Development of a software platform for the pc-simulation of field devices in VS 2005.  |
| 2007-2009 | Development of a software platform for embedded systems. Design and development of a test system with integration of a pc-simulation in Visual Studio.   |
| 2008-2009 | Development of a multiplexer software for Windows (40 measured values/second).   |
| 2008-2009 | Development of a Windows CE driver for the Hart protocol.  |
| 2006      | Development of a complex pump control software for an embedded system.   |
| 2006      | Development of a special measurement arrangement (hardware and software) for measuring the profile of a magnetic field of the sensor of a flow transmitter.  |
| 2005-2006 | Development of a TCP/IP stack for embedded controllers 8/16 bit  |
| 2004-2005 | Software project management, system design and development: Thermal mass flow meter with HART, Profibus PA und MODBUS  |
| 2004-2005 | System design and development: Two wire <sup>7</sup> measurement transmitter for Profibus and FF.  |
| 2001-2004 | System design and development: Software platform for two wire transmitters with variable I/O structure, design of a PC simulation for the firmware development in Visual Studio, support for the integration of the platform in various devices. |
| 2001-2003 | System design and development: Porting of a software platform for two wire devices to a new hardware structure, integration of a fuzzy logic regulator.  |
| 2002-2003 | Software project management, system design and development: Two wire flow transmitter Vortex with temperature measurement, 4..20 mA, HART, Profibus and FF.  |

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<sup>7</sup> A two wire device is propagating data (e.g. measured value) on the same wires which are used for the power supply. Because the supply current could be as low as 3.6 mA the resources are very restricted.

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|------------------|---|
| <b>2001-2002</b> | Software project management, system design and development: Two wire flow transmitter Vortex, 4..20 mA, HART and Profibus.  |
| <b>2000-2001</b> | Development: Windows application für the calibration of mass flow meters, ActiveX for digital communication with a proprietary protocol.  |
| <b>1999-2000</b> | Software system design and development; Two wire MID flow meter, porting of a software platform for four wire devices <sup>8</sup> in the two wire environment.   |
| <b>1999</b>      | Software design and development: Contribution to the software development for a mass flow meter based on the coriolis effect, contribution to the design of a function block model as software structure. |
| <b>1998-1999</b> | „Single Source“ concept design: Development of a database to generate device descriptions, XML descriptions and source code for a target system.  |
| <b>1998-1999</b> | Development of an ActiveX (OCX) for the HART protocol.  |
| <b>1998-1999</b> | Development of a HART slave for an embedded systems   |
| <b>1998-1999</b> | Development of the field device configuration program PARASOFT for pressure transmitter<br>Operating system: Windows<br>Communication: HART   |
| <b>1994-1999</b> | Active contribution and consultance for the standardization of the Interbus-S   |
| <b>1995-1998</b> | Development of the configuration program K-SK1 for I/O multiplexer<br>Operating system: Windows<br>Communication: specific  |
| <b>1995-1998</b> | Development of the configuration program Smart Vision for field devices (pressure, temperature, flow)<br>Operating system: Windows<br>Communication: HART, Profibus and specific                          |
| <b>1995-1996</b> | Design and development: Gateway system for an I/O multiplexer<br>Communication: Profibus  |
| <b>1995</b>      | Development: Manchester decoder encoder for HART<br>Microcontroller: PIC  |
| <b>1994-1995</b> | Design and development: Hard- and software platform for gateways in a 19" system (VEGACOM)  |

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<sup>8</sup> Four wire devices use two wires for the power supply and two wires for the measuring signal and/or digital comms. The restriction of resources is less problematic with these devices.

- 1994-1995** Contribution to the development of the configuration program CMD for Interbus-S devices  
Operating system: Windows
- 1994-1995** Design and development of a gateway system for Interbus-S devices  
Communication: ISP<sup>9</sup> (Profibus)
- 1993-1995** Training courses under contract of ISP in USA, Japan and Europe
- 1994** Development of a configuration program for a temperature transmitter  
Operating system: DOS
- 1993-1994** Development of a HART driver for Windows
- 1992-1994** Contribution and consultancy for the international fieldbus standardization  
Introduction of the so called 'Delegated Token' into the FF comms
- 1993** Development: Driver for the communication in a 19" system (RACKBUS)
- 1993** Development of configuration program COMMUWIN I  
Communication: Specific (RACKBUS)
- 1992** Publication of the book, „The Fieldbus in Factory and Plant Automation“
- 1991-1992** Contribution to the international project FICIM<sup>10</sup> to build a completely automated process by using Profibus and WorldFIP (the EUREKA Fieldbus)
- 1991-1992** Study of the usage of Fuzzy Logic in ultrasonic level meters
- 1986-1992** Development and production introduction of the gateways ZA672, ZA673 (RS232, PROFIBUS, MODBUS und FIP<sup>11</sup>) for the RACKBUS system
- 1990-1991** Contribution to IFG<sup>12</sup>  
Design and specification of the Device Description Language, which was mainly based on the work of Craig Tielens(Rosemount) and Walter Borst(Endress+Hauser)
- 1988-1989** Project management, system design and development: "Multivendor-Demonstration<sup>13</sup>" on Interkama 1989
- 1986-1987** Design, development and production introduction: Hand held configurator COMMUTEC VU160 for RACKBUS and INTENSOR

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<sup>9</sup> Interoperable Systems Project

<sup>10</sup> Fieldbus Integration into Computer Integrated Manufacturing

<sup>11</sup> At that time Factory Instrumentation Protocol

<sup>12</sup> International Fieldbus Group

<sup>13</sup> The companies Eckardt AG, Endress+Hauser, Esters Elektronik, Krohne, Neles-Jamesbury, Rosemount, Samson and Valmet Automation showed a completely equipped application with fieldbus. At this demo it was 802.4.



- 1985-1987** Design: Consistent and uniform configuration interfaces for hand helds, gateways, 19" units and PCs. The solution was called 'the Matrix'
- 1985-1986** Basics development: INTAU<sup>14</sup> with 4..20 mA two wire technique. Later the communication protocol was named INTENSOR.
- 1985-1986** System design: Common hard- and software platform for 19" (7 RU) measurement devices. Today this platform is called COMMUTEC  
Introduction of gate arrays for microcomputer systems
- 1983-1984** System design: Common hard- and software platform for microprocessor devices in a 19" system(28 RU)
- 1983-1984** Project management and development: Measurement device WMY770 for ultra low humidity
- 1982-1983** Project management and development: Humidity measurement device based on microwave

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<sup>14</sup> Intelligenter Aufnehmer(Converter)