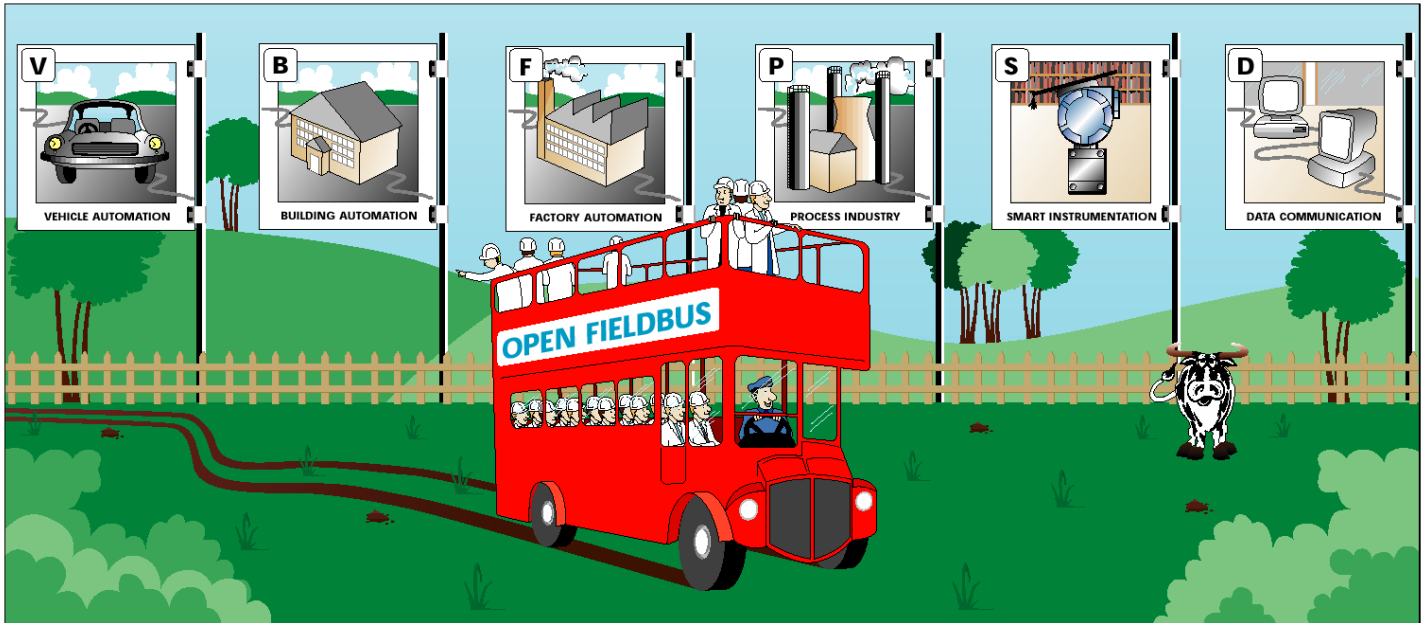


# An 'open' *FIELD*BUS comparison



	FOUNDATION™ Fieldbus				PROFIBUS <sup>4</sup>			BITBUS <sup>5</sup>	ControlNET	Modbus	INTERBUS	Ethernet	WorldFIP <sup>6</sup>	LonWorks	CAN	HART	AS-Interface
	H1 <sup>1</sup>	H2 <sup>1</sup>	H2 <sup>1</sup> bus powered	H2 <sup>1</sup>	DP <sup>2</sup>	FMS	PA					10Base-5			(DEVICENET) (SDS) <sup>3</sup>		
Typical Applications	P S F	P F	P	P F	P F	P F	P S	S B F	P F	P B F	P F	P D	P S B F	P F	P V B F	S	P B F
Data Rates bits/s	31.25k	1.0M	1.0M	2.5M	To 1.5M & 12M	500k	31.25k	62.5k, 375k, 1.5M	5M	Not specified (1.2k-115.2k, 192)	500k	10M	31.25k, 1M & 2.5M	300 to 1.25M	To 1M	1200	167k
Comms. technique	Single/Multi-Master	Single/Multi-Master	Single/Multi-Master	Single/Multi-Master	Master/Slave, Peer to Peer	Master/Slave, Peer to Peer	Master/Slave, Peer to Peer	Master/Slave	Producer/Consumer	Master/Slave	Master/Slave	Master/Slave, Peer to Peer	Producer/Consumer	Master/Slave, Peer to Peer	Producer/Consumer, Peer to Peer	Master/Slave	Master/Slave
Media access algorithm	Token Passing	Token Passing	Token Passing	Token Passing	Token Passing	Token Passing	Token Passing	None	CTDMA <sup>9</sup>	Token Passing	None	CSMA/CD <sup>5</sup>	Bus Arbiter Access	Predictive Media	CSMA/CD/NDA <sup>5</sup>	None	Cyclic polling
Media supported																	
Max. No. of nodes	240 per segment, or 2 <sup>16</sup> per system	240 per segment, or 2 <sup>16</sup> per system	240 per segment, or 2 <sup>16</sup> per system	240 per segment, or 2 <sup>16</sup> per system	127 per network	127 per network	256 per network	249 per network	99 per link	247 per network	256 stations	400 per segment	256 per network	32,768 per domain	2 <sup>11</sup> , or 2 <sup>29</sup> in extended address mode	15 per loop	31 per network
Deterministic?	✓	✓	✓	✓	-	-	-	✓	-	-	✓	-	✓	-	-	-	✓
Intrinsic Safety?	✓	-	✓	-	-	-	✓	-	-	-	-	-	✓	✓	-	✓	-
Bus powered?	✓	-	✓	-	-	-	✓	-	-	-	-	-	-	✓	✓	✓	✓
ASICs available?	Planned	Planned	Planned	Planned	✓	✓	✓	IA8044	✓	-	✓	✓	✓	✓	✓	Partial	✓
Physical layer standard	IEC 1158	IEC 1158	IEC 1158	IEC 1158	RS485	RS485	IEC/ISA/FF IEC 1158-2	RS485	See * 8 a)	Not Specified	RS485	Unbalanced voltage	IEC/ISA/FF IEC 1158-2	See * 8 a), b), c) & d)	Balanced differential voltage	4-20mA pair (f.s.k. current modulation)	Balanced differential voltage
Applicable Standards	IEC 1158 ISA S50	IEC 1158 ISA S50	IEC 1158 ISA S50	IEC 1158 ISA S50	EN 50170 (Part 2) DIN 19245	EN 50170 (Part 2) DIN 19245	DIN 19245	IEC 61158-1 IEE1118	BSI draft standard pr(EN 50254)	Modicon Protocol P-ARBUS-300 Rev E	DIN E 19258 pr(EN 50254)	IEE802.3 ISO802.3 (10Base-5)	EN 50170 (Part 3)	LonMark Interoperability Association Guidelines	ISO 11898	HART Protocol Specification Rev. 5.1 Physical layer Rev. 8.0	IEC947-5-2/D EN 60 947 DIN VDE 0660/208

\* BITBUS added by BEUG – BITBUS European Users Group e.V.: [www.bitbus.org](http://www.bitbus.org) contact: [beug@bitbus.org](mailto:beug@bitbus.org)

**\* Notes**

- H1 and H2 are FOUNDATION Fieldbus terms not used by the IEC.
- Profibus - DP also has an extended command set called DPV1. Extensions to EN 50170, Version 1.0, November 1996.
- DEVICENET and SDS are application layer utilities that use CAN for the physical layer.
- Profibus (excluding PA) and WorldFIP, together with PNet, are formalised into European Standard EN 50170.
- CSMA/CD: Carrier Sense Multiple Access with Collision Detection, (NDA: Non-Destructive Bitwise Arbitration)
- Deterministic: The ability to perform predefined tasks at precise times.
- ASIC: Application Specific Integrated Circuit
- Various interfaces and modes of communication:
  - Node-to-line transformer isolation, with differential Manchester encoding
  - RS-485 Twisted Pair
  - Single ended for Radio & Fibre operation
  - Power line (i.e. local 'mains') interface
- CTDMA: Concurrent Time Domain, Multiple Access.
- This is the number of addressable nodes - the number of physical nodes may be significantly smaller.

**Symbols**

- Twisted Pair
- Optical Fibre
- Co-axial Cable
- Radio Propagation

**User Groups (and their locations)**

<p><b>Fieldbus Foundation</b> Tel: +1 512 794 8890 Fax: +1 512 794 8893 web page: <a href="http://www.fieldbus.com">www.fieldbus.com</a></p>	<p><b>WorldFIP Europe Hq</b> Tel: +33 (0)1 46 11 44 30 Fax: +33 (0)1 46 11 44 31 web page: <a href="http://www.worldfip.org">www.worldfip.org</a></p>	<p><b>AS-Interface</b> Tel: +49 (0) 2174 40756 Fax: +49 (0) 2174 41571 web page: <a href="http://www.as-interface.com">www.as-interface.com</a></p>
<p><b>LonMark Interoperability Assoc.</b> Tel: +1 415 855 7400 Fax: +1 415 856 6153 web page: <a href="http://www.lonmark.org">www.lonmark.org</a></p>	<p><b>OpenDeviceNet Vendor Association</b> Tel: +1 954 340 5412 Fax: +1 954 340 5413 web page: <a href="http://www.industry.net/ODVA">www.industry.net/ODVA</a></p>	<p><b>HART Communication Foundation</b> Tel: +1 512 794 0369 Fax: +1 512 794 3904 web page: <a href="http://www.fieldbus.com/hart">www.fieldbus.com/hart</a> web page: <a href="http://www.ccsi.com/hart">www.ccsi.com/hart</a></p>
<p><b>Profibus Nutzer Organisation</b> Tel: +49 (0) 7219 658590 Fax: +49 (0) 7219 658589 web page: <a href="http://www.profibus.com">www.profibus.com</a></p>	<p><b>INTERBUS-S Club</b> Tel: +49 (0) 631 79424 Fax: +49 (0) 631 97658 web page: <a href="http://www.ilsclub.com">www.ilsclub.com</a></p>	<p><b>CAN in Automation</b> Tel: +49 (0) 9131 601091 Fax: +49 (0) 9131 601092 web page: <a href="http://www.can-cia.de">www.can-cia.de</a></p>

SDS has no user group, but e-mail may be directed to [sds@po2.iiso.micro.honeywell.com](mailto:sds@po2.iiso.micro.honeywell.com)  
ControlNET now has an independent ControlNET User Association

The information on this chart is inevitably subject to change, but was believed correct at the date of issue.

Printed in EU (8/97)

**The MTL Instruments Group plc**  
Power Court, Luton, Bedfordshire, England LU1 3JJ  
Telephone: +44 (0)1582 723633 Fax: +44 (0)1582 422283  
Email: [enquiry@mtl-inst.com](mailto:enquiry@mtl-inst.com) Web site: <http://www.mtl-inst.com>

**Worldwide MTL contacts:**  
USA: +1 800 835 7075 (toll free), +1 703 361 0111,  
Canada: +1 905 840 7850  
Western Australia: +61 (0)89 455 2994  
Singapore: +65 743 8669  
Japan: +81 (0)3 5420 1281

India: +91 (0)44 496 0552  
Germany: +49 (0)2131 168016  
France: +33 (0)4 78 64 98 32  
The Netherlands: +31 (0)26 3622030  
Belgium: +32 (0)9 242 8844

