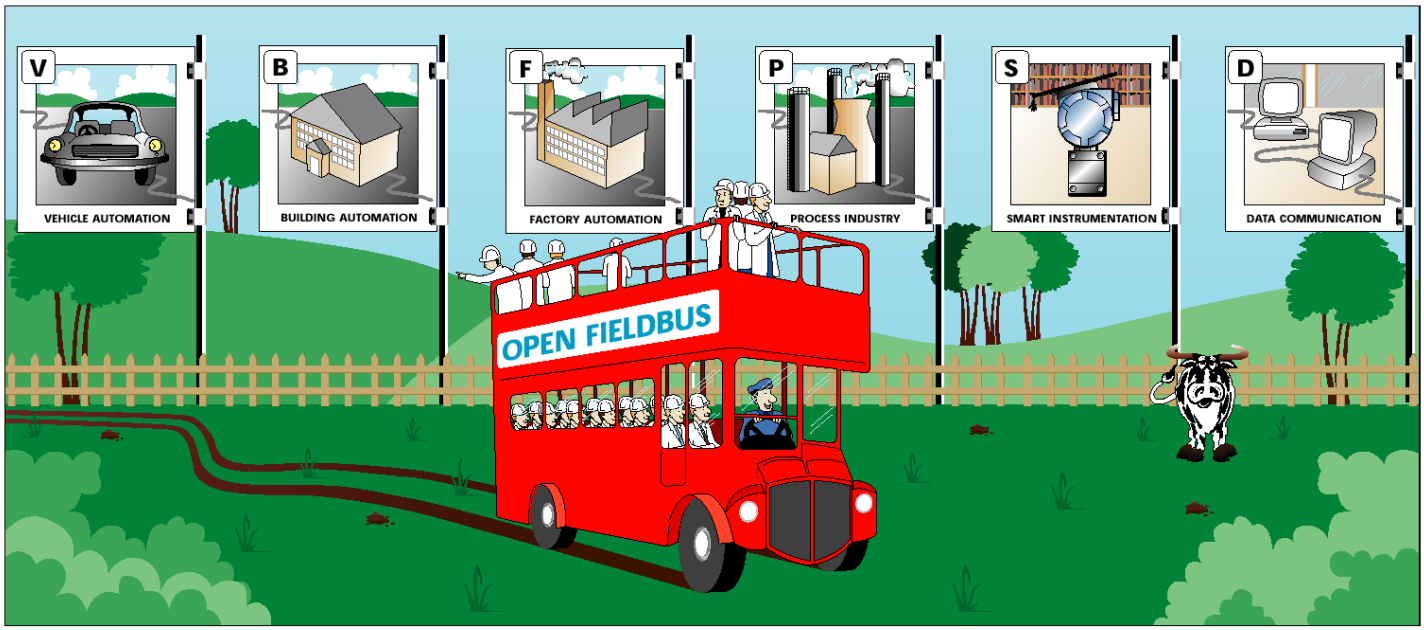
An 'open' FIELDBUS comparison



See key above	FOUNDATION™ Fieldbus				PROFIBUS *4			BITBUS*	ControlNET	Modbus ®	INTERBUS	Ethernet ®	WorldFIP *4	LONWORKS ®	CAN	HART ®	AS-Interface
	H1 *1	H2 *1	H2 *1 bus powered	H2 *1	DP *2	FMS	PA					10Base-5			(DEVICENET) (SDS) *3		
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 B 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 typ)	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 *9	Token Passing	None	CSMA/CD *5	Bus Arbiter Access	Predictive Media	CSMA/CD /NDA *5	None	Cyclic polling
Media supported	opto Planned	opto Planned		opto Planned				opto	opto		opto		opto	opto	opto		
*10 Max. No. of nodes	240 per segment, or 2^{16} per system	240 per segment, or 2^{16} per system	240 per segment, or 2^{16} per system	240 per segment, or 2^{16} 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^{11}, or 2^{29} in extended address mode	15 per loop	31 per network
*6 Deterministic?	✓	✓	✓	✓	-	-	-	✓	✓	-	✓	-	✓	-	-	-	✓
Intrinsic Safety?	✓	-	✓	-	-	-	✓	-	-	-	-	-	✓	✓	-	✓	-
Bus powered?	✓	-	✓	-	-	-	✓	-	-	-	-	-	✓	✓	-	✓	✓
*7 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	BEUG RFC's IEEE1118	BSI draft standard pr(EN 50254)	Modicon Protocol PI-MBUS-300 Rev.E	DIN E 19258 pr(EN 50254)	IEE802.3 ISO8802.3 (10Base-5)	EN 50170 (Part 3)	LonMark Interoperability Association Guidelines	ISO 11898	HART Protocol Specifiation 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 contact: beug@bitbus.org

* Notes

1. H1 and H2 are FOUNDATION Fieldbus terms not used by the IEC.
2. Profibus - DP also has an extended command set called DPV1, Extensions to EN 50170, Version 1.0, November 1996.
3. DEVICENET and SDS are application layer utilities that use CAN for the physical layer.
4. Profibus (excluding PA) and WorldFIP, together with P-Net, are formalised into European Standard EN 50170.
5. CSMA/CD: Carrier Sense Multiple Access with Collision Detection, (NDA: Non-Destructive Bitwise Arbitration)
6. Deterministic: The ability to perform predefined tasks at precise times.
7. ASIC: Application Specific Integrated Circuit
8. Various interfaces and modes of communication:
   a) Node-to-line transformer isolation, with differential Manchester encoding
   b) RS-485 Twisted Pair
   c) Single ended for Radio & Fibre operation
   d) Power line (i.e. local 'mains') interface
9. CTDMA: Concurrent Time Domain, Multiple Access.
10. 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

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SDS has no user group, but e-mail may be directed to sds@po2.il50.micro.honeywell.com
ControlNET now has an independent ControlNET User Association

Printed in EU (8/97)

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