

smar

SYSTEM302

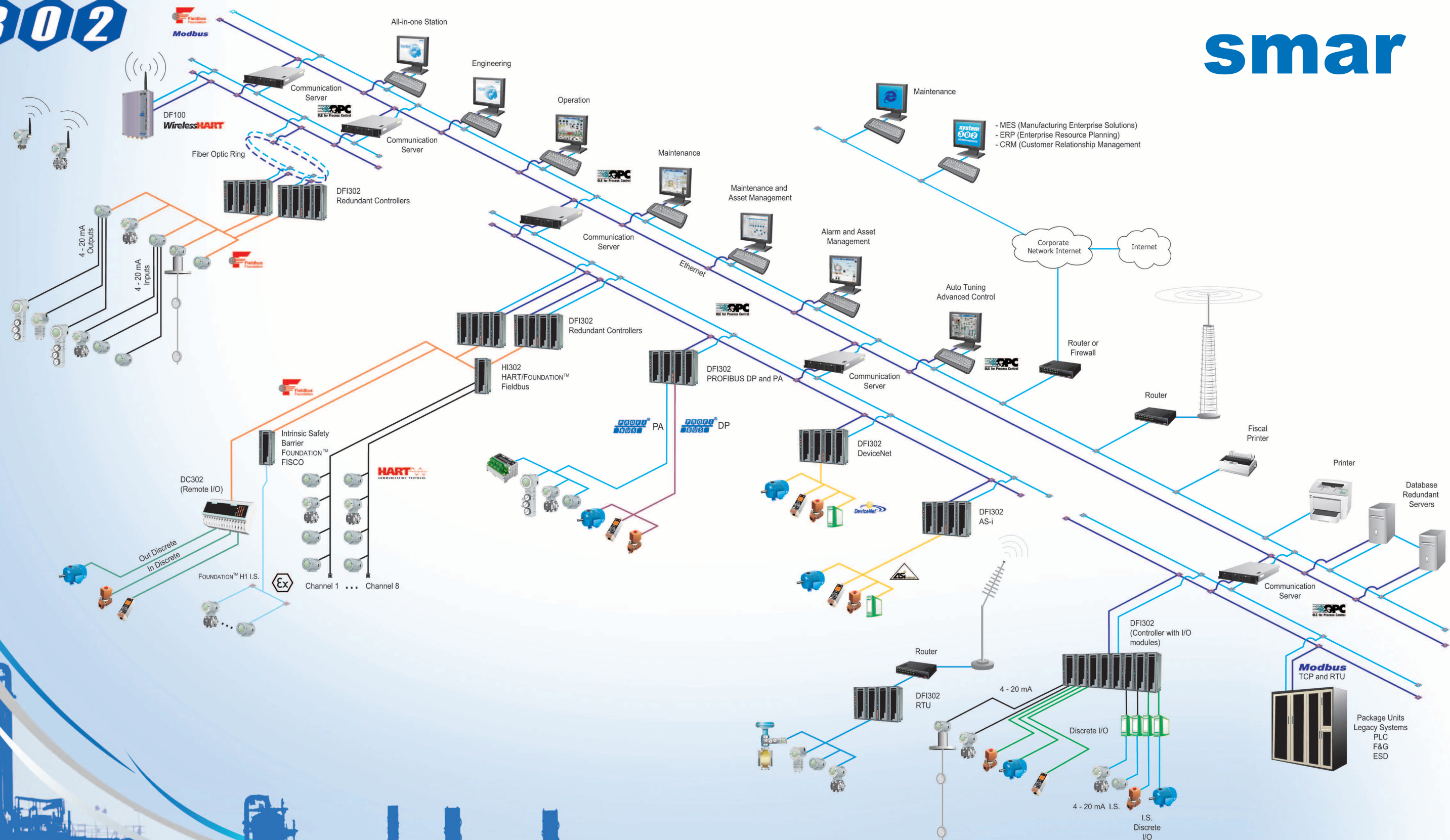
system **302**



ARCHITECTURE

system 302

smar



SPECIFICATIONS

1	System Manufacturer	SMAR
2	System Model	SYSTEM302
2.1	Version	7
3	Workstations	
3.1	Workstation Models	Operation Workstation, Engineering Workstation, Maintenance Workstation, All-In-One Workstation.
3.2	Description	Each workstation can be dedicated to a single function, or functions can be combined as necessary in the All-In-One workstation.
3.3	Manufacturer	Dell or similar
3.4	Processor Type	Pentium IV or higher
3.5	Main Memory (RAM)	2 GB or higher
3.6	Hard Drive (HDD) Capacity	80 GB or higher
3.7	Standard Monitor (size / type)	19", LCD or higher
3.8	Standard Monitor Resolution	1280 x 1024
3.9	Data Updating Cycle Min./Typical	1 s - 2 s
3.10	Optical Drive	48X CD-RW/DVD Internal Combo Drive or better
3.11	Data Storage Device	CD-RW, DVD-RW or DAT (digital audio tape)
3.12	Keyboard	104 keys qwerty keyboard, with user's function key and key lock feature included; industrial membrane keyboards are also available.
3.13	Redundancy of the Operator Console	All workstations can be configured to access all data, allowing full workstation redundancy. The amount of network adapters varies according to the adopted architecture.
3.14	Power Supply	90~240 Vac (50~60 Hz)
3.15	Accessories	External speakers, mouse, keyboard
3.16	Optional	Monitors and touch screens from 15" to 21", membrane keyboard, industrial mouse, industrial trackball. Matrixes from 2 to 4 monitors for a single workstation are available.
4	Database and Communication Servers	
4.1	Description	Database - contains all configuration files: alarm database, trend database and web server. Communication - gateway used to create two isolated networks: one for control and another for supervision where all workstations are connected. Optional for small systems where the engineering and operation workstation can perform the OPC gateway function.
4.2	Manufacturer	Dell or similar
4.3	Processor Type	Up to 2 Dual-Core processors are available.
4.4	Main Memory (RAM)	2 GB or higher
4.5	Hard Drive (HDD) Capacity	100 GB or higher
4.6	Hard Drive Redundancy	RAID 5 (only for database servers)
4.7	Standard Monitor (size & type)	No monitor
4.8	Data Updating Cycle Min./Max.	1 s - 2 s
4.9	Optical Drive	48X CD-RW/DVD Internal Combo Drive or better
4.10	Data Storage Device	CD-RW, DVD-RW or DAT (digital audio tape)
4.11	Keyboard	104 keys qwerty keyboard, with user's function key and key lock feature included; industrial membrane keyboards are also available.
4.12	Power Supply	90~240 Vac (50~60 Hz)
4.13	Accessories	External speakers, mouse, keyboard
4.14	Optional	Monitors and touch screens from 15" to 21", membrane keyboard, industrial mouse, industrial trackball.
4.15	Redundancy	1:1 complete redundancy for the communication server
4.16	Max. No. of Controllers / Server	Up to 32 redundant controllers per server.
5	Printers	
5.1	Dot Matrix, Laser or Ink-Jet Printers	For alarms and events reports, screen copies
6	System Data Network	
6.1	Bus Type	Ethernet (FOUNDATION™ fieldbus HSE)
6.2	Media Type	STP CAT 5 (twisted pair), fiber optics, wireless
6.3	Redundancy	Complete 1:1 redundancy with two separate backbones.
6.4	Data Transmission Speed	10/100 Mbps
6.5	Max. Length	100 m, considering CAT 5 cable, 30 km considering optical fiber.
6.6	Typical Communications Load	Less than 70%
6.7	Supported Protocols	Non-proprietary Ethernet-based protocols are accepted: FOUNDATION™ HSE, Modbus TCP/IP, TELNET, HTTP, SNMP, SNTP, and others.
7	Panels	
7.1	Network Panels	Accommodate all the network equipment, such as switches, cables, and power supplies.
7.2	Power Distribution Panels	Accommodate power circuits, breakers, transformers, UPS, and main power supplies.
7.3	Controller Panels	Accommodate all controllers, FOUNDATION™ linking devices, communications modules, and their power supplies.
7.4	I/O Panels	Accommodate all I/O cards and terminal blocks.
7.5	Intrinsically Safe Panels	Accommodate all intrinsically safe hardware, such as galvanic isolators, I.S. barriers, and power supplies.

7.6	Relay Panels	Accommodate all relays and terminal blocks.
7.7	Marshalling Panels	Accommodate all terminal blocks for cable rearrangement.
7.8	General Panel Specifications	
7.8.1	Standard Panel Size (mm)	2000H x 800W x 800D or 1800H x 800W x 600D.
7.8.2	Standard Panel Color	N 6.5 gray munsell. Different options are available.
8	Controllers	
8.1	Description	Expandable control platform consists of sets of independent processors, distributed in a high-speed horizontal communication.
8.2	Functionality	Process and manufacturing control
8.3	CPU Redundancy	Hot standby and FOUNDATION™ D3 class
8.4	Supported Process Control Protocols	FOUNDATION™ (H1/ HSE), PROFIBUS (DP/ PA), Modbus (TCP/ RTU), DeviceNet, AS-Interface, and WirelessHART.
8.5	Communication Redundancy	Dual redundant Ethernet.
8.6	Power Supply Redundancy	Redundancy with automatic and bumpless switchover.
8.7	Processor Scanning Time	10 ~ 500 ms, user configurable
8.8	CPU Memory Backup Capacity	10 years
8.9	Power Supply	DF50: 90~264 Vac (50~60 Hz) or 127~135 Vdc DF56: 20~30 Vdc
8.10	Typical CPU Load	Less than 70%
8.11	System Restart Method	Automatic after power reestablishment.
9	Input and Output Modules	
9.1	Analog signals	
9.1.1	Input	4~20mA/ 0~20mA/ 0~5V/ 1~5V/ 0~10V/ -10 ~ 10V
	Output	4~20mA/ 0~20mA/ 0~5V/ 1~5V/ 0~10V/ -5 ~ 5V/ -10 ~ 10V
9.1.2	No. of Channels	8 for analog input modules 4 for analog output modules
9.1.3	Signal Isolation	1500 Vrms between channel and IMB (Inter-Module Bus)
9.2	Temperature Signals	
9.2.1	RTD	Cu10 (GE), Ni120, Pt50, Pt100, Pt500 (IEC), Pt50 and Pt100 (JIS)
	TC	B, E, J, K, N, R, S, T, L and U (DIN)
	mV	-50 to 500 mV
	Resistance	0 to 2000 Ohm
9.2.2	No. of Channels	8
9.2.3	Signal Isolation	1500 Vrms between channel and IMB
9.3	Discrete Signals	
9.3.1	Input	30 Vdc, 60 Vdc, 75 Vdc, 140 Vdc, 120 Vac, 140 Vac, 240 Vac, 264 Vac
	Output	Transistor - Sink, Transistor - Source, Triac, NO/NC Relays (250 Vac/110 Vdc/5 A)
9.3.2	No. of Channels	8 or 16
9.3.3	Signal Isolation	5000 Vac optical isolation
9.4	Pulse Signals	
9.4.1	Types	Up to 10 kHz
9.4.2	No. of Channels	16
9.4.3	Signal Isolation	5000 Vac optical isolation
9.5	HART Input and Output Modules	
9.5.1	Signal Types	HART + 4-20 mA
9.5.2	No. of Channels	8
9.5.3	Signal Isolation	1000 Vrms galvanic isolation.
10	FOUNDATION™ Fieldbus	
10.1	HSE/ FOUNDATION™ Linking Device	DF62 and DF63 - DFI302 platform processors provide full-featured FOUNDATION™ HSE linking device and system control (HOST) capabilities for conventional I/O.
10.2	I/O Modules	Up to 16 racks (up to 4 modules per rack)
10.3	Communication Ports	
10.3.1	4 ports	FOUNDATION™ H1 (31.25 Kbps)
10.3.2	1 port	Specially designed for redundancy.
10.3.3	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE / Modbus TCP)- (except for DF62 - 1 port)
10.3.4	1 port	EIA-232 (Modbus RTU and local diagnostics)
10.3.5	1 port	IMB to access I/O modules.
10.4	No. of Devices per FOUNDATION™ H1 Port	Up to 16 (8 devices recommended per port for initial projects).
10.5	Block Instantiation	Yes
10.6	Flexible Function Block	Yes, configured through ladder logic.
10.7	FOUNDATION™ Function Blocks	Support up to 100 function blocks, including control, mathematics, I/O, and advanced algorithms.
10.8	Redundancy	Ethernet and H1 networks - Dual redundancy, including the power supply.
10.9	Power Supply for Fieldbus	DF52: 90~264 Vac (50~60 Hz) or 127~135 Vdc DF60: 20~30 Vdc
10.10	Power Supply Impedance for Fieldbus	DF98: Impedance for 2 FOUNDATION™ H1 ports DF53: Impedance for 4 FOUNDATION™ H1 ports

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10.11	Optimized Supervision via MVC- FOUNDATION™	Yes
10.12	FOUNDATION™ System Interoperability	
10.12.1	HOST in according to HIST - FOUNDATION™	Yes
10.12.2	Field Devices	All devices registered on Fieldbus Foundation can be connected to the SYSTEM302
10.13	I.S. FOUNDATION™ Isolators	Models: "SB312", "DF47-12 and DF47-17"
10.13.1	FISCO Compliant	Yes
11	Fieldbus Converters	
11.1	FOUNDATION™ Fieldbus (or PROFIBUS-PA) to 4-20 mA Converter	
11.1.1	Model	FI302 (FI303)
11.1.2	Signal Type	4-20 mA
11.1.3	Signal Isolation	Galvanic isolation up to 1000 Vac.
11.1.4	No. of Channels	3
11.2	4-20 mA to FOUNDATION™ Fieldbus (or PROFIBUS-PA) Converter	
11.2.1	Model	IF302 (IF303)
11.2.2	Signal Type	4-20 mA
11.2.3	Signal Isolation	Galvanic isolation up to 1000 Vac.
11.2.4	No. of Channels	3
11.3	HART to FOUNDATION™ Fieldbus Converter	
11.3.1	Model 1	HI302-I: HART/4-20 mA to FOUNDATION™ Converter
11.3.2	Model 2	HI302-O: FOUNDATION™ to HART/4-20 mA Converter
11.3.3	Model 3	HI302-N: HART to FOUNDATION™ Converter
11.3.4	Signal Type	HART + 4-20 mA
11.3.5	No. of Channels	8
11.3.6	Max. No. of Devices per Module	32 in multidrop mode
11.4	FOUNDATION™ Fieldbus (or PROFIBUS-PA) to Pressure Converter	
11.4.1	Model	FP302 (FP303)
11.4.2	Signal Type	3-15 or 3-30 psi
11.4.3	No. of Channels	1
12	PROFIBUS	
12.1	HSE/ PROFIBUS-DP Gateway	DF73 - DFI302 platform processor that is a Class 1 and 2 master gateway between HSE (High Speed Ethernet) and PROFIBUS-DP including system control (HOST) capabilities for conventional I/O.
12.2	No. of Devices per PROFIBUS-DP Port	124
12.3	I/O Modules	Up to 16 racks (up to 4 modules per rack)
12.4	Communications Ports	
12.4.1	1 port	PROFIBUS-DP V1 supporting up to 12 Mbps
12.4.2	1 port	Specially designed for redundancy.
12.4.3	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE/ Modbus TCP)
12.4.4	1 port	EIA-232 (Modbus RTU and local diagnostics)
12.4.5	1 port	IMB to access I/O modules.
12.5	Block Instantiation	Yes
12.6	Flexible Function Block	Yes, configured through ladder logic.
12.7	FOUNDATION™ Function Blocks	Support up to 250 function blocks, including control, mathematics, I/O, and advanced algorithms.
12.8	Redundancy	Ethernet Network - Dual redundancy, including the power supply.
12.9	HSE/PROFIBUS 1DP/2PA Gateway	DF95 - DFI302 platform processor that is a Class 1 and 2 master gateway between HSE (High Speed Ethernet) and PROFIBUS-DP including system control (HOST) capabilities for conventional I/O. It eliminates the need for couplers or gateways DP/PA.
12.10	No. of Devices per PROFIBUS-DP Port	124
12.11	I/O Modules	Up to 16 racks (up to 4 modules per rack)
12.12	Communications Ports	
12.12.1	1 port	PROFIBUS-DP V1 supporting up to 12 Mbps
12.12.2	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE/ Modbus TCP)
12.12.3	2 ports	PROFIBUS-PA integrated of 31.25 kbps
12.12.4	1 port	EIA-232 (Modbus RTU and local diagnostics)
12.12.5	1 port	IMB to access I/O modules.
12.13	Block Instantiation	Yes
12.14	Flexible Function Block	Yes, configured through ladder logic.
12.15	FOUNDATION™ Function Blocks	Support up to 250 function blocks, including control, mathematics, I/O, and advanced algorithms.
12.16	Redundancy	Ethernet Network - Dual redundancy, including the power supply.
12.17	HSE/PROFIBUS 1 DP/4PA Gateway	DF97 - DFI302 platform processor that is a Class 1 and 2 master gateway between HSE (High Speed Ethernet) and PROFIBUS-DP including system control (HOST) capabilities for conventional I/O. It eliminates the need for couplers or gateways DP/PA.
12.18	No. of Devices per PROFIBUS-DP Port	124
12.19	I/O Modules	Up to 16 racks (up to 4 modules per rack)
12.20	Communications Ports	
12.20.1	1 port	PROFIBUS-DP V1 supporting up to 12 Mbps

12.20.2	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE/ Modbus TCP)
12.20.3	4 ports	PROFIBUS-PA integrated of 31.25 kbps
12.20.4	1 port	EIA-232 (Modbus RTU and local diagnostics)
12.20.5	1 port	IMB to access I/O modules.
12.21	Block Instantiation	Yes
12.22	Flexible Function Block	Yes, configured through ladder logic.
12.23	FOUNDATION™ Function Blocks	Support up to 250 function blocks, including control, mathematics, I/O, and advanced algorithms.
12.24	Redundancy	Ethernet Network - Dual redundancy, including the power supply.
13	High Speed Ethernet Controller	
13.1	HSE Controller	DF75 - DFI302 platform processor including system control (HOST) capabilities for conventional I/O.
13.2	I/O Modules	Up to 16 racks (up to 4 modules per rack)
13.3	Communications Ports	
13.3.1	1 Port	Specially designed for redundancy.
13.3.2	2 Ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE/ Modbus TCP)
13.3.3	1 Port	EIA-232 (Modbus RTU and local diagnostics)
13.3.4	1 Port	IMB to access I/O modules.
13.4	Block Instantiation	Yes
13.5	Flexible Function Block	Yes, configured through ladder logic.
13.6	FOUNDATION™ Function Blocks	Support up to 100 function blocks, including control, mathematics, I/O and advanced algorithms.
13.7	Redundancy	Dual redundancy in the same backplane including the power supply.
13.8	HSE/Modbus controller	DF89 - DFI302 platform processor including system control (HOST) capabilities for conventional I/O.
13.9	I/O Modules	Up to 16 racks (up to 4 modules per rack)
13.10	Communications Ports	
13.10.1	1 Port	Specially designed for redundancy.
13.10.2	2 Ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE/ Modbus TCP)
13.10.3	1 Port	EIA-232 (Modbus RTU and local diagnostics)
13.10.4	1 Port	IMB to access I/O modules.
13.11	Block Instantiation	Yes
13.12	Flexible Function Block	Yes, configured through ladder logic.
13.13	FOUNDATION™ Function Blocks	Support up to 100 function blocks, including control, mathematics, I/O, and advanced algorithms.
13.14	Redundancy	Dual redundancy in the same backplane including the power supply.
14	DeviceNet	
14.1	HSE/ DeviceNet Gateway	DF79 - DFI302 platform processor that works as a gateway between DeviceNet and FOUNDATION™ HSE including control (HOST) capabilities for conventional I/O.
14.2	DeviceNet Connections Supported	Polled, cyclic, bit strobe, change of state, and explicit messaging.
14.3	Instrument Parameterization	Yes
14.4	Baud Rate Supported	125, 250, and 500 Kbps
14.5	No. of Nodes	63
14.6	DeviceNet I/O	Maps up to 2048 discrete and 512 analog I/O points.
14.7	I/O Modules	Up to 16 racks (up to 4 modules per rack)
14.8	Communications Ports	
14.8.1	1 port	DeviceNet Master
14.8.2	1 port	Specially designed for redundancy.
14.8.3	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE / Modbus TCP)
14.8.4	1 port	EIA-232 (Modbus RTU and local diagnostics).
14.8.5	1 port	IMB to access I/O modules.
14.9	Block Instantiation	Yes
14.10	Flexible Function Block	Yes, configured through ladder logic.
14.11	FOUNDATION™ Function Blocks	Support up to 250 function blocks including control, mathematics, I/O, and advanced algorithms.
14.12	Redundancy	Ethernet networks - Dual redundancy, including the power supply.
14.13	Network Power Supply	External power supply compatible with DeviceNet network 24V.
15	AS-Interface	
15.1	HSE/ AS-Interface Gateway	DF81 - DFI302 platform processor that works as a gateway between AS-Interface bus and FOUNDATION™ HSE including control (HOST) capabilities for conventional I/O.
15.2	No. of Devices per AS-Interface Port	62
15.3	Communications Ports	
15.3.1	2 ports	AS-Interface Master
15.3.2	1 port	Specially designed for redundancy.
15.3.3	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ fieldbus HSE / Modbus TCP)
15.3.4	1 port	EIA-232 (Modbus RTU and local diagnostics)

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15.3.5	1 port	IMB to access I/O modules.
15.4	Block Instantiation	Yes
15.5	Flexible Function Block	Yes, configured through ladder logic.
15.6	FOUNDATION™ Function Blocks	Support up to 100 function blocks including control, mathematics, I/O, and advanced algorithms.
15.7	Redundancy	Ethernet networks - Dual redundancy, including the power supply.
15.8	Network Power Supply	External power supply compatible with AS-Interface networks.
16	WirelessHART	
16.1	HSE/ WirelessHART Gateway	DF100 - DF1302 platform processor that works as gateway between the WirelessHART and FOUNDATION™ HSE network.
16.2	Conventional I/O Modules	It does not support modules via IMB.
16.3	No. Devices per WirelessHART Channel	Up to 100
16.4	Ports and Channels for Communication	
16.4.1	1 channel	WirelessHART (HART 7)
16.4.2	2 ports	Ethernet 10/100 Mbps (FOUNDATION™ HSE / Modbus TCP)
16.4.3	1 port	EIA-485 (Modbus RTU)
16.5	Block Instantiation	Yes
16.6	FOUNDATION™ Function Blocks	Supports up to 170 blocks, including resource, transducers and function blocks. Among the function blocks the input, control and mathematics blocks are supported. Most transducers and input function blocks are based on HSE ROM technology, which maps the WirelessHART devices and provides their points to other function blocks and Modbus, respectively.
16.7	Redundancy	Ethernet network - Path redundancy for control and supervision. Mesh network - Path redundancy for WirelessHART field devices.
16.8	Protection	IP66
16.9	Operation Temperature	-40° to 60° C
16.10	Radio Frequency (according to HART 7 specifications, WirelessHART)	
16.10.1	Operation Frequency	2.4000-2.4835 GHz
16.10.2	Modulation	IEEE 802.15.4 Direct sequence spread spectrum (DSSS)
16.10.3	No of Channels	15
16.10.4	Channel Separation	5 MHz
16.10.5	Bandwidth per Channel	2.7 MHz
16.10.6	Communications Rate	250 kbps
16.10.7	Receptor Sensitivity	-90 dBm
17	Serial Communications Module	
17.1	Model	MB700
17.2	Communications Protocol	Modbus RTU and Modbus TCP/IP

17.3	Communications Speed	9600 to 115200 bps for serial ports 10 Mbps for Ethernet
17.4	Max. Transmission Distance	1200 m
17.5	Gateway Redundancy	Dual redundancy in different backplanes with different power supplies.
17.6	Data Concentration	Concentrates data from different sources to make it available as a package to the system.
18	Software Packages	
18.1	Operating System Platform	Windows Server 2003 x86 SP3, Windows XP Professional x86 SP3, Windows 7 64-bit Professional /Ultimate/Enterprise (run in 32-bit compatibility mode), Windows Server 2008 64-bit SP3 and R2 (run in 32-bit compatibility mode)
18.2	System Management	Studio302
18.3	Plant Information Management	Process Equipment Database
18.4	Eng. Package for Process Control	Syscon
18.5	Eng. Package for Discrete Control	LogicView
18.6	Field Device Asset Management Package	AssetView
18.7	Standard Operation Package	ProcessView
18.7.1	Supervision Package	GraphWorX
18.7.2	Alarm Package	AlarmWorX
18.7.3	Historical Trend Package	TrendWorX
18.7.4	Redundancy	OPC DA, OPC HDA, and OPC A/E
18.8	Any OPC-compliant supervision package can be used	
18.9	FOUNDATION™ Bus Analyser	FBView
18.10	Auto-Tuning	Expertune, Inca PID Tuner, or any OPC compliant auto-tuning package
18.11	Database	MS MSDE or MS SQL
18.12	Standard Screen Types	Main, Overview, Control (Group Screen), Tuning Screen, Process Mimic, Alarm Summary, Real Trend, Network Status, System Status, Field Device Status.
18.13	Max. No. of Operation Screens	Limited by workstation memory.
18.14	Window Display Update Period	1 s - 2 s
18.15	Alarm Management Capacity	Unlimited
18.16	Alarm Priority Levels	999
18.17	System Security	Multiple levels of passwords and user IDs
18.18	OPC	Included - server and client
18.19	Log Report Options	On demand, hourly, daily, weekly, monthly, shift report
18.20	Self-documentation Function	Included
18.21	Electronic Instruction Manual	Included
18.21.1	File Format	Acrobat PDF
18.21.2	Supplied Media	DVD
18.21.3	Software Platform	Adobe Acrobat Reader



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