GATE2MDLC SPECIFICATION SHEET

GATE2MDLC provides seamless connectivity to SCADA centers by open or standard protocols, supporting MODBUS (serial & IP) or DNP3.0 (serial & IP) or IEC60870-5-101/4 or IEC61850 protocols, enabling connectivity to ALL SCADA software available in the market. GATE2MDLC positioned delivering unprecedented capabilities as next generation of front end processors (FEP) for MOTOROLA RTU based systems.

GATE2MDLC may replace Motorola IP Gateway and discontinued products such as MCP/M, MCP/T and M-OPC. NO update nor modification of infield Motorola RTU programs or configurations is needed as migrating to GATE2MDLC solution. GATE2MDLC deployed on proof and stable ACE3600 HW & OS platform, supporting the latest Motorola OS features. GATE2MDLC CPU & Power Supply redundancy is available at failure switch over of 50msec to protect mission critical deployments in energy and water market segments.

Unlike other FEPs, GATE2MDLC supports, ALL RTU data types, 2021 updated MDLC stack and Optional processing of remote and local I/O signals. The unit's rugged design offers compliance for the requirements of most demanding SCADA system environments.

MAIN FEATURES:

- Power PC based processor provides very high performance
- VX-Works based real-time operating system
- Up to three Ethernet ports
- Up to four serial communication ports
- Up to two radio modem ports
- Up to 2 USB ports
- 0,2,3,5,7 or 8 I/O slot wall mount & 19" frames
- Expansion frames allow up to 110 I/O modules in a single unit.
- Redundant CPU and power supply
- Single and double density I/O modules
- Mixed analog input and output modules
- Hot Swap I/O replacement
- Wide operating temperature range -40 to +70 ºC
- OPTIONAL NEMA 4 / IP66 Housing
- Two-way/trunking/ digital/DMR/P25/TETRA radio models
- AC and DC controlled power supply
- AC and DC controlled power supply
- 6.5 or 10 Ah Backup battery, smart battery charger
- GPS and NTP for time synchronization
- Simple system building tool for configuration and programming
- Remote firmware and program download

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ULTIMATE MDLC FEP SOLUTION

GATE2MDLC is a powerful Communication Processor providing an advanced data protocol collection and processing unit with the intelligence required to operate in sophisticated SCADA systems. Advanced communication and networking capabilities include data transfer via two-way radio, trunked radio, digital radio, data radio, cellular modems, IP networks, line modem and more.

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INTELLIGENCE
GATE2MDLC is a microprocessor-based unit with large memory capacity that can make control decisions on-site, based on status conditions and values from local IO and or remote sources. Local intelligence permits control decisions without the need for real-time messages from other supervisory centers; GATE2MDLC can operate in sophisticated control systems.

FRONT END PROCESSOR - FEP
GATE2MDLC is Motorola FEP CENTRAL ENTITY hence it's simplifying and minimizing Motorola RTU (ACE3600, MC-EDGE, ACE1000, MOSCAD) application development time and complexity as there is no need to develop any FEP application. It has seamless visibility and control of RTU I/O and databases at all-time regardless of RTU application program.

BACKWARD COMPATIBILITY
Fully compatible with discontinued MCP/M, MCP/T and M-OPC central entities. Compatible with old IP Gateway and it's a direct replacement for all Motorola Central Entities mentioned.

NO update NOR modification of infield Motorola RTU programs or configurations is needed while migrating to GATE2MDLC solution.

SCADA PROTOCOLS
Supports industry open and standard protocols of MODBUS (Serial &IP), DNP 3.0 (Serial &IP) DF1 (Allen Bradley), IEC 60870-5-101, IEC60870-5-104 Salve and IEC61850 Server or Client protocols including GOOSE.

Each GATE2MDLC unit can process up to 250,000 I/O point for SCADA! For example a system comprise of 4 units can handle 1,000,000 I/O point (local and/or remote)

GATE2MDLC uses the OSI- based MDLC communication protocol for all data signaling with Motorola RTUs.

COMMUNICATION PORTS
Up to 9 communication ports comprise of USB, RS232/485 and/or Ethernet ports, enable flexible system design architecture.

LOCAL PROCESSING
You may use ACE3600 advanced symbolic ladder logic application & C languages to add local I/O or remote data processing rules and conditions.

DATA TYPES
Unlike other Motorola older/obsolete FEP or Gateway units, GATE2MDLC supports all ladder data types.

USER FRIENLY CONFIGURATION
Simple and easy to use automated Excel Sheet is used to configure the unit as there is no need for any programming skills to setup the system but minimal knowledge of database structure.

ENHANCED SECURITY
Apply the same state-of-the-art security features that Motorola provides for military and critical enterprise networks to your SCADA systems. Supports a full range of best-practice security options directly within the RTUs for a self-contained, autonomously secure system including: Security Policy Enforcement – Define and install a single, coherent, system-wide set of security configurations in every RTU.

CPU AND POWER SUPPLY REDUNDANCY
The redundant configuration enables installation of two redundant CPUs (CPU3680 only) and two redundant power supply modules to ensure continuous unit operation with failure switchover of less than 50msec.

NETWORKING
Unlike other Motorola older/obsolete FEP/Gateway units, GATE2MDLC may incorporate RTU to RTU communication. Communication may occur between individual units or may be broadcast to several units simultaneously.

UPLOAD/DOWNLOAD
All system units' application, OS and configuration files including GATE2MDLC unit, can be programmed locally or remotely.
A unique system feature, also enables remote firmware safe download from anywhere in the system's network. This allows remote firmware or application upgrades. It minimize site visits by maintenance personnel after the unit's initial installation saving cost and increase productivity.

I/O SUPPORT
The GATE2MDLC unit can be expanded to include up to 110 I/O modules controlled from the CPU. The I/O expansion is based on Ethernet LAN connection between the CPU module and the I/O expansion frames. The I/O expansion frames can be co-located with unit on the main frame (installed in the same 19" rack or cabinet) or distributed in the same site up to 50 meters from the main frame location.

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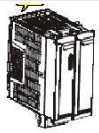
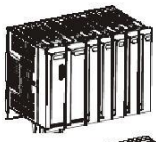
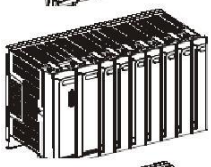
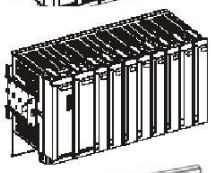
SCADA Protocols	MODBUS Salve over RS232 or RS485 MODBUS Salve over Ethernet DNP3.0 Salve over RS232-RS485 DNP3.0 Salve over Ethernet IEC60870-5-101 Salve over RS232 or RS485 IEC60870-5-104 Salve over Ethernet IEC61850 Server or Client over Ethernet www.ebipax.com/iec61850 Master protocols can be supported via customized application Optional customized third party protocols can be added per request.
Tags / IO Points	More than 200,000 points (per each GATE2MDLC unit) if more points are need, pls add additional unit RTUs data can be distributed evenly or non-evenly subject on selected protocol connectivity
Supported RTU Models	ACE3600, ACE1000, MC-EDGE (in Q3/2021), MOSCAD, MOOSCAD-L, MOSCAD-M
Max RTUs	Up to 240 remote RTU (units per each GATE2MDLC unit) To support more than 240 RTUs, pls add additional unit
Legacy FEP support	Compatible with IP Gateway, MCP/T, MCP/M and M-OPC
MODBUS Protocol Property	SCADA & GATE2MDLC databases can be partitioned into max 240 RTU units per each GATE2MDLC
DNP3.0, IEC61850 & IEC-60870-5-10X Property	SCADA & GATE2MDLC databases are partitioned into single DNP or IEC entity per each GATE2MDLC
Ladder DB mapping	RTU units data can be mapped to any of 128 Ladder DB of GATE2MDLC unit

GATE2MDLC GENERAL SPECIFICATIONS

Frames	No I/O slots - PS and CPU modules only, wall mount 117 W x 209 H x 198* D mm (4.61” x 5.30” x 7.80”*), 0.95 Kg (2.1 Lb)	
	2 I/O slots - PS, CPU and 2 I/O modules, wall mount, 194 W x 244 H x 198* D mm (7.64" x 9.61" x 7.80"*), Approx. 1.6 Kg (3.56 lb)	
	3 I/O slots - PS, CPU and up to 3 I/O modules, wall mount 234 W x 244 H x 198* D mm (9.21”x 9.61” x 7.80” *), Approx. 1.9 Kg (4.19 Lb)	
	5 I/O slots - PS, CPU and up to 5 I/O modules, wall mount 314 W x 244 H x 198* D mm (12.36”x 9.61” x 7.80” *), Approx. 2.4 Kg (5.3 Lb)	
	7 I/O slots - PS, CPU and up to 7 I/O modules 391 W x 244 H x 198* D mm (15.39” x 9.61” x 7.80” *), 3. Kg (6.6 Lb)	
	8 I/O slots - PS, CPU and up to 8 I/O modules, wall mount OR 19” rack 435 W x 244 H x 198* D mm (17” x 9.61” x 7.80” *), Approx. 3.3 Kg (7.3 Lb)	
	Redundant CPU and power supply frame - Dual PS, Dual CPU, and 4 I/O modules; wall mount OR 19" rack, 391 W x 244 H x 198* D mm (15.39” x 9.61” x 7.80” *), 3. Kg (6.6 Lb)	
	* Depth including module panel Note: All frames except No I/O Slots can be used for I/O expansion.	
I/O Expansion Frame	Number of I/O slots -	2, 3, 5, 7, or 8
	Default power supply -	Expansion power supply
	Compatible power supplies -	All except: 10.8-16V DC low-tier power supply
Metal Chassis	19" frame metal back - for PS, ACE IP Gateway, radio and 6.5 or 10 Ah backup battery, 2 accessory boxes; wall/rack mount, OR PS, CPU, radio and 6.5 or 10 Ah backup battery, 0, 3, 5, or 8 I/O slot frame, up to 2 accessory boxes, wall/rack mount, 434.5 W x 310.4 H x 200* D mm (17.11"x 12.22" x 7.88"*) Large - for PS, CPU and up to 7 I/O slot frame, two radios and 6.5 or 10 Ah backup battery, wall mount, 448 x 468 mm x 200* D mm (17.64” x 18.43” x 7.88”*) Medium - for PS, CPU and up to 3 I/O slot frame, one radio and 6.5 Ah backup battery, wall mount, 335 W x 355 H x 198* D mm (17.64” x 18.43” x 7.80”*) Small - for PS, CPU, 2 I/O slot frame, 1 radio (or 1 accessory box), and 6.5Ah backup battery, wall mount, 264 W x 365 H x 200* D mm (11.02"x 14.17" x 7.88"*). * Depth Including Frame and Module	
Housing	Large NEMA 4/IP66 painted metal - up to 7 I/O slot frame, two radios and 6.5 or 10 Ah, backup battery, 500 W x 500 H x 210 D mm (19.7” x19.7” x 8.26”) Small NEMA 4/IP66 painted metal - up to 3 I/O slot frame one radio and 6.5 Ah backup battery, 380 W x 380 H x 210 D mm (15” x 15” x 8.26”)	

POWER SUPPLY	10.8-16 V DC 10.8-16 V DC low-tier 18-72 V DC 18-72 V DC with 12 V smart battery charger 100- 240 V AC, 50-60 Hz 100- 240 V AC, 50-60 Hz, with 12 V smart battery charger
Backup Battery	6.5 Ah - Sealed Lead-Acid 10 Ah - Sealed Lead-Acid
Operating Temperature	-40 ºC to +70 ºC (-40 ºF to 158 ºF) Notes: (1) when using a metal housing option, the maximum operating temp. outside the housing is +60 ºC (140 ºF). (2) Motorola radios and ACT module operating temp. range is: -30 ºC to +60 ºC (-22 ºF to 140 ºF) The full operating temperature range is supported when using redundant 12V power supplies. When using dual AC power supply or dual 18-72 V DC power supply, the maximum ambient operating temperature of the unit is limited to: • 50°C (122°F) - when installed inside a metal chassis or closed cabinet. • 60°C (140°F) - when installed without enclosure or closed cabinet.
Storage Temperature	-55 ºC to +85 ºC (-67 ºF to 185 ºF)
Operating Humidity	5% to 95% RH @ 50 ºC without condensation
Mechanical Vibrations	Per EIA/TIA 603 Base station, Sinusoidal 0.07mm @ 10 to 30 Hz, 0.035 mm @ 30-60 Hz
Operating Altitude	-400m to +4000 meter (-1312 ft to + 13120 ft) above sea level Note:100-240 V AC and 18-72 V DC PS operating altitude is -400m to +3000 meter (-1312 ft to + 6560 ft)

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REGULATORY STANDARDS

Safety	UL 60950-1:2001
	CSA 22.2-60950-1
	IEC 60950-1
	AS/NZS 60950
	FM/cFM certified as Nonincendive Class I, Division 2 - standard FM 3611
	(Note: FM approval refers to model F7509 only and most of the GATE2MDLC options.)
Emission	Emission standards per:
	CFR 47 FCC part 15, subpart B (class A)
	EN55022:2003 Class A
	EN61000-3-2
	EN61000-3-3
Immunity	Immunity standards for industrial environments per EN50082-2 /IEC 61000-6-2
	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-8
	IEC 61000-4-11

COMMUNICATIONS

Communication Ports:	Up to 5 ports per CPU (CPU 3640), up to 8 ports per CPU (CPU 3680/4600)
	Serial - up to 4 x RS-232 ports
	Multi-drop – up to 3 x RS-485 ports
	Ethernet - up to 2 x 10/100 MB ports and 1 x 10 MB port (CPU 3640/3680)
	Two-way radio/analog trunked radio - up to 2 x modem ports
	USB Host for MotoTrbo- up to 2 ports (CPU 3680/4600)
	Internal Ethernet 100 Mb/s port (for redundant CPU configuration) (CPU 3680 only) Overall USB - up to 2 x USB Host ports and 1 USB device port
Motorola Radio Support	Mobile conventional two-way radios - CM200, CM340, GM3188, EM200, CDM750
	Portable conventional two way radios – HT750, GP320, GP328, PRO5150
	Analog Trunk radios – XTL5000, XTL2500
	Digital Trunk radios – XTL5000, XTL2500, XTS2500, MTM800 (Tetra)
	MotoTrbo radios –XPR4350/4380, DM3400, XiR M8220, DGM4100
Third Party Radio Support	Two way radios, data radios, TETRA radio (PD)
Modem Support	Dial-up modems, cellular modems (dial mode & PD)
Protocols	MDLC, TCP, UDP, IP, PPP, NTP, DHCP
Third Party Protocol Support	MODBUS unit: master & slave on RS-232 / RS-485 / Ethernet
	DF1 (Allen Bradley): master on RS-232
	DNP 3.0 Plus: master & slave on RS-232 / RS-485 / Ethernet
	IEC 60870-5-101: Master or Slave on RS-232 IEC 60870-5-104: Master or Slave on Ethernet IEC 61850: Client or Server or Server on Ethernet – EBIPAX GATE2IEC solution https://www.ebipax.com/iec61850/
User Protocol (user program)	Possible on RS-232, RS-485 and Ethernet ports

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CPU 3640/CPU 3680 MODULES SPECIFICATIONS

Microprocessor	Freescale – Power PC II, MPC8270, 32-bit, extended communication capability, DMA and floating point Calculation support
Microprocessor Clock	200 MHz
Memory	Flash: CPU3640 16 MB /3 MB free for user - CPU3680 32MB DRAM: CPU3640 32 MB /10 MB free for user CPU3680 128MB SRAM plug-in board (optional): 4 MB total /all free for user
Real-Time Clock	Full calendar with leap year support (Year, Month, Day, Hours, Minutes, Seconds) Time drift: max. 2.5 seconds per day (when power is on)
SRAM and RTC Retention	3 V Rechargeable lithium backup battery
Serial Port 1	Configurable RS-232C or RS-485 port: - RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-Wire up to 230.4 kb/s
Serial Port 2	RS-232C, Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
Ethernet Port 1	10/100 Mb/s (on CPU 3640 only)
Plug-In Port 1	Supports the following Plug-In ports: - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-wire, up to 230.4 kb/s - Ethernet 10/100 Mb/s
Plug-In Port 2	Supports the following Plug-In ports: - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s and - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-Wire up to 230.4 kb/s - Ethernet 10 Mb/s
Plug-In Port 2	Supports the following Plug-In ports: - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s and - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-Wire up to 230.4 kb/s - Ethernet 10 Mb/s
LEDs Display	4 CPU diagnostics LEDS, port status LEDs and user application LEDs
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Operating Voltage	10. 8 -16 V DC (from the motherboard connector)
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.38 Kg (0.84 Lb)

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CPU 3680 MODULES SPECIFICATIONS

Microprocessor	Freescale – Power PC II, MPC8270, 32-bit, extended communication capability, DMA and floating point calculation support
Microprocessor Clock	200 MHz
Memory	Flash: 32 MB /19 MB free for user DRAM: 128 MB /100 MB free for user SRAM plug-in board (optional): 4 MB /all free for user
Real-Time Clock	Full calendar with leap year support (Year, Month, Day, Hours, Minutes, Seconds) Time drift: max. 2.5 seconds per day (when power is on)
SRAM and RTC Retention	3 V Rechargeable lithium backup battery
USB Host Port 1, 2	Type A host full speed 12 Mbs ports for MDLC over IP communication via the MotoTrbo digital mode radio system. For MotoTrbo radio only; No other USB devices or USB Hubs are supported.
Serial Port 1	Configurable RS-232C or RS-485 port: - RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-Wire up to 230.4 kb/s
Serial Port 2	RS-232C, Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
Ethernet Port 1	10/100 Mb/s
Plug-In Port 1	Supports the following Plug-In ports: - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-wire, up to 230.4 kb/s - Ethernet 10/100 Mb/s
Plug-In Port 2	Supports the following Plug-In ports: - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s and - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface - RS-485, multi-drop 2-Wire up to 230.4 kb/s - Ethernet 10 Mb/s
USB Device Port 1	USB device port, Type B connector (for future use)
LEDs Display	4 CPU diagnostics LEDS, port status LEDs and user application LEDs
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Module Replacement	Hot swap replacement – module extraction/insertion under voltage in redundant systems only.
Operating Voltage	10. 8 -16 V DC (from the motherboard connector)
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.38 Kg (0.84 Lb)

12 V DC POWER SUPPLY MODULE (DEFAULT)

Input Voltage	10.8 - 16 V DC
Outputs	Motherboard connector (to CPU and I/O modules): equal to input voltage, max. 4 A AUX1A/AUX1B: equal to input voltage, max. 8 A, on/off controlled by user program AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default) OR equal to AUX1A/AUX1B output voltage max. 8A **Note:** max. 8 A total current consumption from all outputs
No Load power consumption	Max. 50 mA
Diagnostics LEDs	Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules
Input Protection	Internal Line Fuse, replaceable
Output Protection	AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.43Kg (0.95 Lb)

12 V DC LOW-TIER POWER SUPPLY MODULE

Input Voltage	10.8 - 16 V DC
Outputs	Motherboard connector (to CPU and I/O modules): The same as input voltage / max. 4 A AUX1A/AUX1B: equal to input voltage max. 8A **Note:** max. 8 A total current consumption from all outputs
Input Protection	Internal Line Fuse, replaceable
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.4Kg (0.9 Lb)

18-72 V DC POWER SUPPLY MODULES

Input Voltage	18-72 V DC
Total Power	18-72 V DC: Max. 60 Watt continuous, Max. 105 Watt peak @ 25% duty cycle
Outputs	Motherboard connector (to CPU and I/O modules): 13.2 V DC ±20%, max. 4 A AUX1A/AUX1B: 13.2 V DC ±20%, max. 8 A, on/off controlled by user program AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default) OR equal to AUX1A/AUX1B output voltage max. 8A **Note:** max. 8 A total current consumption from all outputs
Battery Charger	12 V Lead-Acid battery charger (in PS model with charger) Automatic charging of 6.5 or 10 Ah backup battery, battery temperature sensing, overcharging protection, battery capacity test and diagnostics, automatic battery switch-over
Diagnostics LEDs	Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules and battery
No Load power consumption	Max. 250 mA
Efficiency	80% typical, 76% with full load
In-rush Current	10 A maximum, for 2 mSec. Max, cold start at 25°C
Protection	Internal line input fuse (replaceable), Short Circuit automatic recover
Output Protection	AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
Insulation	Input to case: 500 V DC, input to output: 500 V DC
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 1Kg (2.2 Lb)

AC POWER SUPPLY MODULES

Input Voltage	100-240 V AC, 50/60 Hz
Total Power	Max. 60 Watt continuous, Max. 105 Watt peak @ 25% duty cycle
Outputs	Motherboard connector (to CPU and I/O modules): 13.2 V DC ±20%, max. 4 A AUX1A/AUX1B user connectors: 13.2V DC ±20%, max. 8 A, on/off controlled by user program AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default) OR equal to AUX1A/AUX1B output voltage max. 8A **Note:** max. 8 A total current consumption from all outputs
Battery Charger	12 V Lead-Acid battery charger (in PS with charger) Automatic charging of 6.5 or 10 Ah backup battery, battery temperature sensing, overcharging protection, battery capacity test and diagnostics, automatic battery switch-over
Diagnostics LEDs	Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules and battery
No Load power consumption	130 mA @ 220 V AC
Efficiency	80% typical @230 V AC, 76% typical @115 V AC (full load)
Inrush Current	25 A maximum, for 2 mSec. Max, cold start at 25°C
Power Factor	0.98 typical at 230 V AC, 0.99 typical at 115 V AC
Protection	Internal Line Fuse, replaceable
Output Protection	AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
Insulation	Input to case: 1500 V AC, input to output: 3000 V AC
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 1Kg (2.2 Lb)

24 V DC PLUG-IN POWER SUPPLY

Input Voltage	10.8-16V (from I/O module)
Output	24V floating, max. 150 mA
Efficiency	75% typical
Protection	Automatic output shut down on over-voltage and over-current
Insulation	Input to output: 1500 V AC
Dimensions	78 mm W x 15 mm H x 68 mm D (3.1“ W x 0.6“ H x 2.7“ D)
Weight	Approx. 0.04 Kg (0.09 Lb)

EXPANSION POWER SUPPLY

See below.

16/32 DI FAST 24 V MODULES

Total Number of Inputs	16 DI 32 DI
Input Arrangement	Isolated groups of 16 inputs with shared common
Fast Counter Inputs	Inputs that can be used as fast counters: - All inputs in 16 DI module - First 20 inputs in 32 DI module
AC Input Frequency	45 – 65 Hz
AC Input Delay	Maximum 0.2 mS
Fast Counter Input Frequency	0 - 12.5 KHz, minimum pulse width 40 µS
Max. DC Input Voltage	Max. ±40 V DC (relative to input common)
“ON” DC Voltage Range	+9 to +30 V DC, -30 to -9 V DC
“OFF” DC Voltage Range	-3 to +3 V DC
“ON” AC Voltage Range	10 to 27 V AC (RMS)
“OFF” AC Voltage Range	0 to 5 V AC (RMS)
Input Current	Max. 3.5 mA
Fast Capture Resolution	1 mS (Interrupt upon change of state)
Event Time Tagging Resolution	1 mS (Interrupt upon change of state)
Input Filtering	0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
Counter Input Filtering	0 to 12.75 mS (Programmable in 0.05 mSec steps for inputs configured as high speed counters)
24 V DC Output	Supports optional isolated 24 V plug-in “Wetting” Power Supply (One in 16 DI, two in 32 DI)
Diagnostics LEDs	Status LED per each input, module error LED, Plug-In 24V status LED
User Connection	2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 or 40 Wire cable with Terminal Block Holder connector, 26 AWG wires
Module Replacement	Hot swap replacement – module extraction/insertion under voltage
Input Isolation	2.5 k V RMS between input and module logic per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	16 DI: approx. 0.28 Kg (0.62 Lb), 32 DI: approx. 0.29 Kg (0.63 Lb)

16/32 DIGITAL INPUT FAST 24 V IEC 61131-2 TYPE II MODULES

Total Number of Inputs	16 DI 32 DI
Input Arrangement	Isolated Groups of 16 inputs with shared common
Fast Counter Inputs	Inputs that can be used as fast counters: - All inputs in 16 DI - First 20 inputs in 32 DI
Fast Counter Input Frequency	0 - 10 KHz, minimum pulse width 50 µS
Max. DC Input Voltage	Max. ±40 V DC
“ON” DC Voltage Range	+11 to +30 V DC, -30 to -11 V DC
“OFF” DC Voltage Range	-5 to +5 V DC
Input Current	6-10 mA
Fast Capture Resolution	1 mS (Interrupt upon change of state)
Event Time Tagging Resolution	1 mS (Interrupt upon change of state)
Input Filtering	0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
Counter Input Filtering	0 to 12.75 mS (Programmable in 0.05 mSec steps for inputs used as high speed counters)
24 V DC Output	Supports isolated 24 V plug-in “Wetting” Power Supply (one in 16 DI, two in 32 DI)
Diagnostics LEDs	LED per each input status, module error LED, 24V Plug-In status LED
User Connection	2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input Isolation	2.5 kV RMS between input and module logic per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	16 DI: approx. 0.28 Kg (0.62 Lb), 32 DI: approx. 0.29 Kg (0.63 Lb)

32 DIGITAL INPUT FAST 48 V MODULES

Total Number of Inputs	32 DI
Input Arrangement	Isolated Groups of 16 inputs with shared common
Fast Counter Inputs	Inputs that can be used as fast counters: First 20 inputs in 32 DI
Fast Counter Input Frequency	2.0 KHz (minimum pulse width 250 µS)
Max. DC Input Voltage	Max. ±72 V DC
"ON" DC Voltage Range	+36 to +60 V DC
"OFF" DC Voltage Range	0 to +6 V DC
Input Current	Max. 3 mA
Fast Capture Resolution	1 mS (Interrupt upon change of state)
Event Time Tagging Resolution	1 mS (Interrupt upon change of state)
Input Filtering	0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
Counter Input Filtering	0 to 12.75 mS (Programmable in 0.05 mSec steps for inputs used as high speed counters)
Diagnostics LEDs	LED per each input status, module error LED
User Connection	4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input Isolation	2.5 kV RMS between input and module logic per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
Weight	16 DI: approx. 0.28 Kg (0.62 Lb), 32 DI: approx. 0.29 Kg (0.63 Lb)

16 DIGITAL INPUT 120/230V MODULE

Total Number of Inputs	16 DI
Input Characteristics	IEC 61131-2 Type 1
Input Arrangement	Two isolated groups of 6 inputs and one isolated group of 4 inputs.
AC Input Frequency	47 - 63 Hz
AC Input Delay	Maximum 25.0 mS
Max. DC Input Voltage	Max. ±264 V DC (relative to input common)
“ON” DC Voltage Range	+79.0 V DC to +264.0 V DC, -79.0 V DC to -264.0 V DC
“OFF” DC Voltage Range	-40 to +40 V DC
“ON” AC Voltage Range	79.0 to 264.0 V AC (RMS)
“OFF” AC Voltage Range	0 to +40 V AC (RMS)
Input Current	At 110VDC 1.0 to 3.0 mA At 230VDC 0.4 to 2.0 mA At 110VAC > 2.0 mA RMS At 230VAC > 3.0 mA RMS
Input Filtering	0 to 50.8 mS (DC, programmable in 0.2 mSec steps), minimum effective filter value - 7.0 msec.
Diagnostics LEDs	LED per each input status, module error LED
User Connection	3 Terminal Blocks (5.00mm pitch), Maximum 14 AWG
Cable & TB Holder	30 Wire Cable with Terminal Block Holder connector, 20 AWG wires
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input Isolation	2.5 kV RMS between input and module logic per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC
Operating Voltage	10.8 -16 V DC and 3.3 V DC ±10% (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	approx. 0.367 Kg (0.80 Lb)

8/16 RELAY OUTPUT MODULES

Total Number of Outputs	8 EE relay outputs 16 EE relay outputs 8 ML relay outputs 16 ML relay outputs
Output Arrangement	8 DO: 3 X Form C (SPDT) and 5 X Form A (SPST) 16 DO: 6 X Form C (SPDT) and 10 X Form A (SPST)
Contact Voltage Ratings	Max. 60 V DC, or 30 V AC RMS (42.4 V peak).
Contact Power Ratings	2A @ 30 V DC, 0.6A @ 60V DC or 0.6A @ 30V AC (resistive load)
Relay Back Indication	Contact position - hardware back indication
DO Frequency	Max. 10 Hz
Diagnostics LEDs	LED per each output status, module error LED
User Connection	2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
Fail State	Configurable relay state on CPU fail: On, Off or 'last value'
All Relays Disable/Enable	Selectable per module, controlled from the power supply
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Output Isolation	Between open contacts: 1kV, between contact and coil: 1.5 kV, between contact sets: 1.5 kV
Insulation	Insulation resistance 100 MΩ @ 500 V DC per IEC60255-5, Insulation impulse 1.5 kV per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
Weight	8 DO: approx. 0.29 Kg (0.64 Lb), 16 DO: approx. 0.32 Kg (0.7 Lb)

8 SBO RELAY OUTPUT MODULES

Total Number of Outputs	8 EE relay outputs
Output Arrangement	2 X Form A (SPST) - (two Normally Open contacts per DO)
Contact Voltage Ratings	Max. 60 V DC, or 30 V AC RMS (42.4 V peak).
Contact Power Ratings	2A @ 30 V DC, 0.6A @ 60V DC or 0.6A @ 30V AC (resistive load)
Relay Back Indication	Contact Back Indication: Indicating contact position
Relay Select Back Indication	Indicating relay selection before relay activation
DO Frequency	Max. 10 Hz
Diagnostics LEDs	LED per each output status, module error LED
User Connection	4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	40 Wire Cable with Terminal Block Holder connector, 26 AWG
Fail State	Configurable relay state on CPU fail: On, Off or 'last value'
All Relays Disable/Enable	Selectable per module, controlled from the power supply
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Output Isolation	Between open contacts: 1kV, between contact and coil: 1.5 kV, between contact sets: 1.5 kV
Insulation	Insulation resistance 100 MΩ @ 500 V DC per IEC60255-5, Insulation impulse 1.5 kV per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
Weight	Approx. 0.29 Kg (0.64 Lb)

12 RELAY OUTPUT 120/230V MODULES

Total Number of Outputs	12 EE relay outputs 12 ML relay outputs
Output Arrangement	12 x 1 Form A
Contact Power Ratings	3A @ 250 V AC, 3A @ 30 V DC, or 0.20A @ 125 V DC (resistive load).
Minimum Contact Load Current	10.0 mA @+5.00 V DC.
Maximum Switching Current	3.00 A
Relay Back Indication	Contact position - hardware back indication
DO Frequency	Max. 10 Hz (resistive load)
Diagnostics LEDs	LED per each output status, module error LED
User Connection	3 Terminal Blocks (5.00mm pitch), Maximum 14 AWG
Cable & TB Holder	30 Wire Cable with Terminal Block Holder connector, 20 AWG wires
Fail State	Configurable relay state on CPU fail: On, Off or 'last value'
All Relays Disable/Enable	Selectable per module, controlled from the power supply
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Output Isolation	Between output and module logic: 2.5 kV, per IEC60255-5
Insulation	Insulation resistance 100 MΩ @ 500 V DC per IEC60255-5, Insulation impulse 5 kV per IEC60255-5
Operating Voltage	10.8 -16 V DC and 3.3 V DC ±10% (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
Weight	approx. 0.423 Kg (0.90 Lb)

8/16 ANALOG INPUT MODULES

Total Number of Inputs	8 AI, ±20 mA 16 AI, ±20 mA 8 AI, ±5 V 16 AI, ±5 V
Input Configuration	Isolated (floating) analog inputs
A to D Resolution	16 Bit (including sign)
Input Accuracy	±0.1% of full scale
Input Sampling Time	10 mSec @ 50 Hz filtering 8.33 mSec @ 60 Hz filtering
Smoothing	Selectable input averaging: 1, 2, 4, 8, 16, 320, 64 or 128 samples (x10 mS)
Permitted potential between Inputs	75 V DC, 60 V AC (RMS)
Input Impedance	±20 mA input: Rin < 250 Ω ±5 V input: Rin > 1 MΩ
Crosstalk Rejection	Better than 80 dB between any pair of inputs
Temperature Stability	Better than ±25 PPM/ºC
Interference Suppression	Selectable 50 or 60 Hz filtering, Common mode rejection > 100 dB, Differential mode rejection > 50 dB
24 V DC Output	Supports optional isolated 24V Plug-in Power Supply (one in 8 DI, two in 16 DI)
Diagnostics LEDs	Overflow and Underflow LED per each input, module error LED, 24V Plug-In status LED The module Overflow and Underflow levels can be configured to: Current inputs: ±20mA/4-20 mA Voltage inputs: ±5 V/0-5 V/1-5 V
User Connection	2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input Isolation	1.5 kV RMS between input and module logic, per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-5
Operating voltage	10.8-16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	8 AI: approx. 0.32 Kg (0.71 Lb), 16 AI: approx. 0.34 Kg (0.75 Lb)

4 ANALOG OUTPUT MODULE

Total Number of Outputs	4
Output Configuration	Isolated floating channels, each channel can be connected as 0 -20 mA or 0-10 V DC voltage
D to A Resolution	14 Bit
Output Accuracy	±0.1% of full scale @25°C
Temperature Stability	Better than ±25 PPM/°C
Internal Settling Time	Max. 1 ms
Output Load	Voltage: > 1.0 kΩ, < 1.0 µf, Current: < 750 Ω (internal power source)
Crosstalk Rejection	Better than 50 dB between any pair of outputs
Interference Suppression	Common Mode Rejection: > 60 dB
Output protection	Voltage output: short-circuit current, max. 30 mA Current output: No-load voltage max. 22 V DC
Diagnostics LEDs	Module Error LED. Voltage mode LED, Current mode LED, Calibration LED per channel
User Connection	2 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Isolation	1.5 kV between output and module logic
Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-5
Operating voltage	10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	0.29 Kg (0.64 Lb)

MIXED 4 ANALOG OUTPUT 8 ANALOG INPUT MODULES

Total Number of I/Os	4 AO + 8 AI (AI: ±20 mA or ±5 V DC)
I/O Arrangement	AO - each channel can be connected as 0 -20 mA or 0-10 V, AI - Isolated (floating) analog
AO D to A Resolution	inputs 14 Bit
AO Accuracy	±0.1% of full scale @25°C
AO Temperature Stability	Better than ±25 PPM/°C
AO Internal Settling Time	Max. 1 ms
AO Load	Voltage: > 1.0 kΩ, < 1.0 µf, Current: < 750 Ω
AO Crosstalk Rejection	Better than 50 dB between any pair of
AO Interference Suppression	outputs Common Mode Rejection: > 60 dB
AO Voltage Output Protection	Short-circuits protection, max. 30 mA (all other operating channels remain fully
AO Current output no-load	functional) Max. 22 V DC
voltage AO Isolation	1.5 kV between output and module logic
AO Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-
AI A to D Resolution	5 16 Bit (including sign)
AI Accuracy	±0.1% of full scale @ -40ºC to +70ºC
AI Sampling Time	10 mSec @ 50 Hz filtering 8.33 mSec @ 60 Hz filtering
AI Smoothing	Selectable input averaging: 1, 2, 4, 8, 16, 32, 64 or 128 samples (x10 mS)
Permitted Potential between	75 V DC, 60 V AC (RMS)
Inputs AI Input Impedance	±20 mA input: Rin < 250 Ω ±5 V input: Rin > 1 MΩ
AI Crosstalk Rejection	Better than 80 dB between any pair of inputs
AI Temperature Stability	Better than ±25 PPM/ºC
AI Interference Suppression	Selectable 50 or 60 Hz filtering, Common mode rejection > 100 dB, Differential mode rejection > 50 dB
24 V DC Output	Supports one optional isolated 24V Plug-in Power Supply
Diagnostics LEDs	AO - Voltage mode LED, Current mode LED, Calibration LED per channel AI - Overflow and Underflow LED per each input, 24V Plug-in status LED The module Overflow and Underflow levels can be configured to: ±20mA/4-20 mA or ±5 V/0-5 V/1-5 V General - Module error LED
AI Input Isolation	1.5 kV between input and module logic
AI Input Insulation	Insulation resistance 100 MΩ @ 500 V DC, per IEC60255-
User Connection	5 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under
Operating Voltage	voltage 10.5-16 V DC and 3.3 V DC (from the motherboard
Power Consumption	connector) See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.34 Kg (0.75 Lb)

16/32 DIGITAL OUTPUT/DIGITAL INPUT MODULES (16/32 DO/DI)

Total Number of Inputs/Outputs	16/32
I/O Arrangement	2/4 groups of 8 I/Os with shared common Each group can be configured to function as FET DO or dry contact DI
Counter Inputs	20 first inputs can be used as counter inputs
Counter Input Frequency	0 - 1 KHz, minimum pulse width 500 µS
Max. DC Input Voltage	Max. 30 V DC (relative to input common)
Input “ON” Resistance	0-4 kΩ
Input “OFF” Resistance	≥50 kΩ
Fast Capture Resolution	1 mS (Interrupt upon change of state)
Event Time Tagging Resolution	1 mS (Interrupt upon change of state)
Input Current	Max. 0.3 mA (when the input is shorted)
Input Filtering	0 to 50.8 mS (programmable in 0.2 mSec steps) Not relevant, minimum allowed is 1mSec
Counter Input Filtering	0 to 12.75 mS (programmable in 0.05 mSec steps) Not relevant, minimum allowed is 1mSec
Output Type	MOSFET
Output Voltage Range	5-30 V DC (user-supplied voltage)
DO Frequency	Max. 1 KHz (resistive load)
DO Output current	Max. 500 mA sink current (resistive load)
Output Fail State	Configurable output state on CPU fail: On, Off or ‘last value’
Diagnostics LEDs	LED per each input/output status, module error LED
User Connection	4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input/Output Isolation	1.5 kV between input/output and module logic
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC per IEC60255-5
Operating Voltage	10.8-16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.25 Kg (0.55 Lb)

MIXED I/O 16DI + 4DO + 4AI MODULES

Total Number of Inputs/Outputs	16 Digital Inputs + 4 EE Relay Outputs + 4 Analog Inputs, ±20 mA 16 Digital Inputs + 4 ML Relay Outputs + 4 Analog Inputs, ±20 mA
I/O Arrangement	1 group of 16 DIs with shared common, 4 relay outputs - Form C, 4 isolated analog inputs
DI Counter Inputs	The first 12 inputs can be configured as fast counters.
DI Frequency	0 - 1 KHz
DI Fast Counter Frequency	0 - 5 KHz minimum pulse width 100 µS
DI Max. DC Voltage	Max. 40 V DC
DI “ON” DC Voltage Range	+11 to +30 V DC, -30 to -11 V DC
DI “OFF” DC Voltage Range	-5 to +5 V DC
DI Current	6-10 mA
Fast Capture Resolution	1 mS (Interrupt upon change of state)
Event Time Tagging Resolution	1 mS (Interrupt upon change of state)
DI Filtering	0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
DI Counter Filtering	0 to 12.75 mS (programmable in 0.05 mSec steps for inputs configured as high speed counters)
DO Contact Voltage Ratings	Max. 60 V DC or 30 V AC RMS (42.4 V peak).
DO Contact Power Ratings	2A @ 30 V DC, 0.6A @ 60V DC or 0.6A @ 30V AC (resistive load)
DO Relay Back Indication	Contact position - hardware back indication
DO Fail State	Configurable relay state on CPU fail: On, Off or ‘last value’
AI Resolution	16 Bit (including sign)
AI Accuracy	±0.1% @ -40ºC to +70ºC
AI Sampling time	10 mSec @ 50 Hz filtering, 8.33 mSec @ 60 Hz filtering
AI Smoothing	Selectable input averaging: 1, 2,4,8, 16, 32, 64 or 128 samples (x10 mS)
AI max. Potential between AIs	75 V DC, 60 V AC (RMS)
AI Impedance	Rin < 250 Ω
AI Crosstalk Rejection	Better than 80 dB between any pair of inputs
AI Temperature Stability	Better than ±25 PPM/ºC
AI Interference Suppression	Selectable 50 or 60 Hz filtering, common mode rejection > 100 dB, differential mode rejection > 50 dB
Diagnostics LEDs	LED per each input/output status, module error LED, 24V Plug-in status LED
24 V DC Output	Supports one isolated 24V plug-in ”Wetting” Power Supply
User Connection	4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
Cable & TB Holder	40 Wire Cable with Terminal Block Holder connector, 26 AWG
Module Replacement	Hot swap replacement– module extraction/insertion under voltage
Input / Output Isolation	DI: 2.5 kV RMS between input and module logic per IEC60255-5 DO: Between open contacts: 1kV, between output and module logic: 1.5 kV, per IEC60255-5 AI: 1.5 kV between input and module logic per IEC60255-5
Input Insulation	Insulation resistance 100 MΩ @ 500 V DC per IEC60255-5
Operating Voltage	10.8-16 V DC and 3.3 V DC (from the motherboard connector)
Power Consumption	See GATE2MDLC Maximum Power Ratings below. EE Relay on : 0.2 W typical (15 mA @ 13.8 V DC at PS) (Not including 24 V Plug-in Power Supply)
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5“ W x 8.7“ H x 7.1“ D)
Weight	Approx. 0.31 Kg (0.68 Lb)

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EXPANSION POWER SUPPLY MODULE

Input Voltage	DC 10.8-16 V
Outputs	To Motherboard connector – +10.80 to +16.00 VDC, max. 4A To cascaded expansion power supply - +10.80 to +16.00 VDC, max. 8A
Over Current Protection	4.0 A (Slow blow fuse), protecting the expansion frame 8.0 A (Slow blow fuse), protecting the cascaded expansion power supply
Maximum Current via Power IN/OUT circuit	8.0 A (Slow blow fuse)
Over Voltage Protection	+17.00 ±1 VDC (protecting the expansion frame)
Absolute Maximum Voltage	+18.00 VDC
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
Weight	Approx. 0.43Kg (0.94 Lb)

EXPANSION MODULE

Microprocessor	Freescale – Power PC II, MPC8270, 32-bit
Microprocessor Clock	200 MHz
Serial Port	RS232C Asynch, Full Flow Control port, up to 230.4 kb/s; used for STS only
Ethernet Port	10/100 Mb/s – connection to the main frame
LAN Cable	Category 5E shielded (FTP), up to 50 meter
LEDs Display	4 CPU diagnostic LEDs, Port status LEDs and Expansion Address LEDs
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Operating Voltage	10.8-16 V DC (from the motherboard connector)
Dimensions	56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
Weight	Approx. 0.38 Kg (0.84 Lb)

EXPANSION LAN SWITCH

Ethernet Port 1-8	8 on board 10/100 Mb/s Ethernet ports (Auto crossover)
LEDs Display	Error LED, Port status LEDs
Power Consumption	See GATE2MDLC Maximum Power Ratings below.
Module Replacement	Hot swap replacement – module extraction/insertion under voltage
Operating Voltage (from the motherboard connector)	10.8-16 V DC, 3.30 VDC +/-10%
User Connection (Ethernet Ports)	8 shielded RJ45 connectors
LAN Cable	Category 5E shielded (FTP), up to 50 meter
Operating Voltage	10.8-16 V DC (from the motherboard connector)
Dimensions	37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
Weight	Approx 0.32 Kg (0.7 Lb)