EBIPAX INCORPORATED

# *Gate2IEC* SPECIFICATION SHEET

Gate2IEC IEC61850 solution (based on ACE3600) is a state-of-the-art high performance Gateway/FEP/ RTU/PLC with exceptional communication capability. The unit is designed to provide scalability and modularity to optimize the performance of any control system acting as IEC61850 Server or Client or both. 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, 40 x 40 cm and 50 x 50 cm
- Two-way/trunking/ digital radio models
- AC and DC controlled power supply
- 6.5 or 10 Ah Backup battery, smart battery charger
- GPS and NTP for time synchronization
- System building tool for configuration and programming
- Remote firmware and program download
- Multiple Protocol Support: Modbus, DNP 3.0, DF1, IEC 60870-5-101, IEC 60870-5-104 and other 3rd party protocols

Gate2IEC

ULTIMATE IEC61850 SOLUTION

Gate2IEC is a powerful Communication Processor providing an advanced data 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.

Gate2IEC acts as versatile IEC61850 Server/Client providing connectivity to other standard, open or other 3rd party protocols. Gate2IEC interoperates across wide range of protocols such as IEC60870-5-101, DNP3.0, MODBUS and IEC60870-5-104 protocols, enabling integration of various PLCs, RTUs, Reclosers, Capacitor Banks, Protection Relays, Switches into a single or multiple IEC61850 system.

**LOCAL INTELLIGENCE**
GATE2IEC is a microprocessor-based unit with large memory capacity that can make control decisions on-site, based on status conditions and values from local and remote sources.

Local intelligence permits control decisions without the need for real-time messages from other supervisory centers; GATE2IEC can operate in sophisticated control systems.

**PROGRAMMABLE**
GATE2IEC uses an advanced symbolic ladder logic application language to develop the data base conditions, values, and unit profile that must exist for each control action, message transmission, etc. to occur. Routines written in 'C' may be executed as a whole or part of the total application.

Powerful applications may easily be defined using industry accepted ladder logic and 'C'. The task is made easier by using the SCADA application development software and a PC-style computer.

**PROTOCOLS**
GATE2IEC uses the OSI- based MDLC communication protocol for all data signaling. Third party MODBUS, DNP 3.0 DF1 (Allen Bradley) and IEC 60870-5 protocols are also supported.

MDLC was specifically developed for radio use but is completely applicable to Ethernet, wireline, and other media. It permits large volumes of data to be quickly transferred between units using packet transmission techniques.

The MDLC protocol enables adding the GATE2IEC easily to existing MOSCAD systems where system expansion is required.

**COMMUNICATIONS**
GATE2IEC permits communication to occur unit-to-central and unit-to-unit (peer-to-peer). Communication may occur between individual units or may be broadcast to several units simultaneously.
Store-&-forward may be employed to pass messages unit-to-unit throughout the system. Direct communication, where possible, or repeated messaging over one or multiple communication media, may be intermixed within the system.

**UPLOAD/DOWNLOAD**
GATE2IEC, via the MDLC data transfer capability, uploads the data collected and calculated by the application program to a central site. It also receives downloaded changes to the application program and/or to the parameters that control how the application operates.

The process being supervised does not need to be static; operational variables and limits, and the process definition itself, can be easily changed and transmitted to the unit from anywhere in the system's network.

A unique feature of GATE2IEC, also enables remote firmware safe download from anywhere in the system's network. This allows remote firmware upgrades.

The above features minimize site visits by maintenance personnel after the unit's initial installation.

**COMMUNICATION PORTS**
Connectors on the various CPU modules permit the connection for local application programming, or connection to other on-site devices to supervise their operation, and to the communication media device.

Multiple connectors, multiple communication types, and variable data speeds allow practically all external data devices to be connected to the CPU module.

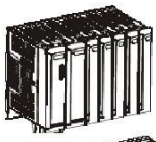
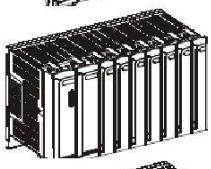
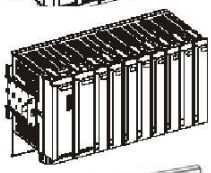
**CHASSIS AND ENCLOSURES**
GATE2IEC can be provided on a metal chassis or in a painted steel NEMA 4 (IP66) rated outdoor enclosure that can hold the unit frame, modules, battery and up to two radios (depending on enclosure size). An optional tamper switch can be ordered with the enclosure.

**19" RACK MOUNT**
GATE2IEC may be ordered with frame and mounting accessories that permit direct mounting onto standard 19" equipment racks. The frame contains space for power supply, CPU module and up to eight I/O modules. Optionally, a 19" metal back can be ordered for installation of backup battery, accessories and up to two radios.

**I/O EXPANSION**
The GATE2IEC 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.

**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 and voltage.

## GATE2IEC GENERAL SPECIFICATIONS

| | | |
|---|---|---|
| Frames | No I/O slots - PS and CPU modules only, wall mount<br>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,<br>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<br>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<br>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<br>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<br>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<br>4 I/O modules; wall mount OR 19" rack,<br>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<br>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<br>Default power supply - Expansion power supply<br>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<br>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"*)<br>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”*)<br>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”*)<br>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"*).<br>* 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” )<br>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<br>10.8-16 V DC low-tier<br>18-72 V DC<br>18-72 V DC with 12 V smart battery charger<br>100- 240 V AC, 50-60 Hz<br>100- 240 V AC, 50-60 Hz, with 12 V smart battery charger |
| Backup Battery | 6.5 Ah - Sealed Lead-Acid<br>10 Ah - Sealed Lead-Acid |
| Operating Temperature | -40 ºC to +70 ºC (-40 ºF to 158 ºF)<br>Notes: (1) when using a metal housing option, the maximum operating temp. outside the housing is +60 ºC (140 ºF).<br>(2) Motorola radios and ACT module operating temp. range is: -30 ºC to +60 ºC (-22 ºF to 140 ºF)<br>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:<br>• 50°C (122°F) - when installed inside a metal chassis or closed cabinet.<br>• 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<br>Note:100-240 V AC and 18-72 V DC PS operating altitude is -400m to +3000 meter (-1312 ft to + 6560 ft) |

## 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 GATE2IEC 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) |
| 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: slave on RS-232 |
| User Protocol (user program) | Possible on RS-232, RS-485 and Ethernet ports |

## CPU 3610*/CPU 3640 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: 16 MB /3 MB free for user<br>DRAM: 32 MB /10 MB free for user<br>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)<br>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:<br>- RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- 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:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-wire, up to 230.4 kb/s<br>- Ethernet 10/100 Mb/s |
| Plug-In Port 2 | Supports the following Plug-In ports:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-Wire up to 230.4 kb/s<br>- Ethernet 10 Mb/s |
| LEDs Display | 4 CPU diagnostics LEDS, port status LEDs and user application LEDs |
| Power Consumption | See GATE2IEC 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) |

* The CPU 3610 model has been discontinued.

## 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<br>DRAM: 128 MB /100 MB free for user<br>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)<br>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:<br>- RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- 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:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-wire, up to 230.4 kb/s<br>- Ethernet 10/100 Mb/s |
| Plug-In Port 2 | Supports the following Plug-In ports:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-Wire up to 230.4 kb/s<br>- 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 GATE2IEC 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<br>AUX1A/AUX1B: equal to input voltage, max. 8 A, on/off controlled by user program<br>AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default)<br>OR equal to AUX1A/AUX1B output voltage max. 8A<br>**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<br>AUX1A/AUX1B: equal to input voltage max. 8A<br>**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<br>AUX1A/AUX1B: 13.2 V DC ±20%, max. 8 A, on/off controlled by user program<br>AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default)<br>OR equal to AUX1A/AUX1B output voltage max. 8A<br>**Note:** max. 8 A total current consumption from all outputs |
| Battery Charger | 12 V Lead-Acid battery charger (in PS model with charger)<br>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<br>AUX1A/AUX1B user connectors: 13.2V DC ±20%, max. 8 A, on/off controlled by user program<br>AUX2A/AUX2B (configurable): 3.3, 5, 7.5, 9 V DC ±10%, max. 2.5A, on/off (default)<br>OR equal to AUX1A/AUX1B output voltage max. 8A<br>**Note:** max. 8 A total current consumption from all outputs |
| Battery Charger | 12 V Lead-Acid battery charger (in PS with charger)<br>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<br>32 DI |
| Input Arrangement | Isolated groups of 16 inputs with shared common |
| Fast Counter Inputs | Inputs that can be used as fast counters:<br>- All inputs in 16 DI module<br>- 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<br>(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<br>(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 GATE2IEC 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<br>32 DI |
| Input Arrangement | Isolated Groups of 16 inputs with shared common |
| Fast Counter Inputs | Inputs that can be used as fast counters:<br>- All inputs in 16 DI<br>- 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<br>(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<br>(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 GATE2IEC 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<br>(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 GATE2IEC 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<br>At 230VDC 0.4 to 2.0 mA<br>At 110VAC > 2.0 mA RMS<br>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 GATE2IEC 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<br>16 EE relay outputs<br>8 ML relay outputs<br>16 ML relay outputs |
| Output Arrangement | 8 DO: 3 X Form C (SPDT) and 5 X Form A (SPST)<br>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,<br>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 GATE2IEC 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,<br>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 GATE2IEC 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<br>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,<br>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 GATE2IEC 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<br>16 AI, ±20 mA<br>8 AI, ±5 V<br>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<br>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<br>±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,<br>Common mode rejection > 100 dB,<br>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<br>The module Overflow and Underflow levels can be configured to:<br>Current inputs: ±20mA/4-20 mA<br>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 GATE2IEC 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<br>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 GATE2IEC 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 | Better than ±25 PPM/°C |
| Stability AO Internal | Max. 1 ms |
| Settling Time 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<br>(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<br>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<br>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,<br>Common mode rejection > 100 dB,<br>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<br>AI - Overflow and Underflow LED per each input, 24V Plug-in status LED<br>The module Overflow and Underflow levels can be configured to: ±20mA/4-20 mA or ±5 V/0-5 V/1-5 V<br>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 GATE2IEC 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<br>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 GATE2IEC 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<br>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<br>DO: Between open contacts: 1kV, between output and module logic: 1.5 kV, per IEC60255-5<br>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 GATE2IEC Maximum Power Ratings below.<br>EE Relay on : 0.2 W typical (15 mA @ 13.8 V DC at PS)<br>(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) |

## EXPANSION POWER SUPPLY MODULE

| | |
|---|---|
| Input Voltage | DC 10.8-16 V |
| Outputs | To Motherboard connector – +10.80 to +16.00 VDC, max. 4A<br>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<br>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 GATE2IEC 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 GATE2IEC 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) |

## ACE IP GATEWAY (CPU 4600) MODULE

| | |
|---|---|
| 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<br>DRAM: 128 MB |
| Real-Time Clock | Full calendar with leap year support (Year, Month, Day, Hours, Minutes, Seconds)<br>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:<br>- RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- 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:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-wire, up to 230.4 kb/s<br>- Ethernet 10/100 Mb/s |
| Plug-In Port 2 | Supports the following Plug-In ports:<br>- 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<br>- RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface<br>- RS-485, multi-drop 2-Wire up to 230.4 kb/s<br>- 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 GATE2IEC 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) |

## GATE2IEC MAXIMUM POWER RATINGS

The tables below list the typical maximum power consumption (at room temperature) for each of the GATE2IEC unit building blocks (CPU, Power Supply, I/O modules, radios, etc.) and the maximum peak power allowed for a fully loaded unit, based on the housing type. The values in the tables below are derived by using the power supply (AC: 100 to 240 VAC or DC: 18 to 72 VDC and 13.8 VDC) and have the power supply efficiency factor included in them.

Before deploying your unit, add up the power consumption of all components of your system to verify that it is within the maximum peak power for your housing type. In systems with I/O expansion, consider all modules which consume power from their respective AC/DC main power sources when calculating the required power requirements.

**Maximum Peak Power Allowed for Fully Loaded unit**

| Housing Type Description | Maximum Input Power into Power Supply Module (Watts) |
|---|---|
| 19" Rack (w/out metal enclosure) | 100 |
| Large NEMA metal housing (50x50 cm) | 120* |
| Small NEMA metal housing (40x40 cm) | 105* |

**Power Consumption per unit Module**

| Module Name | Self Power Consumption, no active I/O (Watts) | Maximum Power Consumption, per Active I/O (Watts) | Self Power Consumption, no active I/O (Watts) | Maximum Power Consumption, per Active I/O (Watts) | Maximum Power Consumption, all I/Os, LEDs Active (Watts) |
|---|---|---|---|---|---|
| | AC: 100 to 240 VAC<br>DC: 18 to 72 VDC | | Vin = +13.8 VDC | | |
| Power Supply (maximum) | 12.60 | N/A | 2.20 (156 mA) (12 VDC Power Supply Module ONLY) | N/A | N/A |
| Power Supply (Expansion) | 0.0 | N/A | 0.0 | N/A | N/A |
| CPU (3640/3610) | 5.20 | N/A | 4.20 (304 mA) | N/A | 4.00 (290 mA) |
| Expansion Module | 5.20 | N/A | 4.20 (304 mA) | N/A | 4.00 (290 mA) |
| Expansion LAN Switch | 1.50 | 0.220 | 1.20 (87 mA) | 0.176 (12.75 mA) | 3.10 (225 mA) (x8 ports ON) |
| Digital Input Fast 24V (x16/x32) | 0.100 | 0.100 (powered by internal 24V PS) | 0.080 (5.8 mA) | 0.100 (7 mA) (powered by internal 24V PS) | 3.50 (254 mA) (x32 inputs ON powered by x1 internal 24V PS) |
| Digital Input Fast 24V IEC Type 2 (x16/x32) | 0.100 | 0.230 (powered by internal 24V PS) | 0.080 (5.8 mA) | 0.230 (17 mA) (powered by internal 24V PS) | 8.20 (594 mA) (x32 inputs ON powered by x2 internal 24V PS) |
| Digital Input Fast 48V | 0.100 | 0.100 | 0.080 (5.8 mA) | 0.100 (7 mA) | 3.50 (254 mA) (x32 inputs ON) |
| Digital Input 120/230V | 0.100 | 0.015 | 0.080 (5.8 mA) | 0.012 (1 mA) | 0.524 (38 mA) (x16 inputs ON) |
| Digital Output ML Relay (x8/x16) | 0.120 | 0.010 | 0.100 (7.2 mA) | 0.008 (0.5 mA) | 0.483 (35 mA) (x16 relays ON) |
| Digital Output EE Relay (x8/x16) | 0.170 | 0.200 | 0.136 (10 mA) | 0.160 (11.6 mA) | 3.26 (236 mA) (x16 relays ON) |
| Digital Output SBO EE Relay (x8) | 0.170 | 0.400 | 0.136 (10 mA) | 0.320 (23.6 mA) | 3.26 (236 mA) (x8 relays ON) |

| Module Name | Self Power Consumption, no active I/O (Watts) | Maximum Power Consumption, per Active I/O (Watts) | Self Power Consumption, no active I/O (Watts) | Maximum Power Consumption, per Active I/O (Watts) | Maximum Power Consumption, all I/Os, LEDs Active (Watts) |
|---|---|---|---|---|---|
| | **AC: 100 to 240 VAC<br>DC: 18 to 72 VDC** | | **Vin = +13.8 VDC** | | |
| Digital Output ML Relay 120/230V | 0.200 | 0.006 | 0.160 (11.6 mA) | 0.005 (0.4 mA) | 0.248 (18.0 mA) (x12 relays ON) |
| Digital Output EE Relay 120/230V | 0.290 | 0.260 | 0.232 (17 mA) | 0.210 (0.15 mA) | 3.12 (226 mA) (x12 relays ON) |
| FET Digital Output/Digital Input | 0.120 | DI = 0.014 (per input channel)<br>DO = 0.014 (per output channel) | 0.100 (7.2 mA) | DI = 0.011 (per input channel)<br>DO = 0.011 (per output channel) | 0.552 (40 mA) (x32 LEDs/ inputs ON) |
| Mixed I/O (DO ML +DI IEC Type 2) | 0.480 | DI = 0.250 (powered by internal 24V PS)<br>DO = 0.010 | 0.384 (28 mA) | DI = 0.250 (powered by internal 24V PS)<br>DO = 0.008 | 4.70 (341 mA) (x4 relays ON, x16 inputs ON, x4 AI ON, powered by internal 24V PS) |
| Mixed I/O (DO EE + DI IEC Type 2) | 0.480 | DI = 0.250 (powered by internal 24V PS)<br>DO = 0.200 | 0.384 (28 mA) | DI = 0.250 (powered by internal 24V PS)<br>DO = 0.160 | 5.50 (400 mA) (x4 relays ON, x16 inputs ON, x4 AI ON, powered by internal 24V PS) |
| Analog Output | 1.10 | 0.600 (per output channel @20.0 mA) | 0.880 (64 mA) | 0.480 (35 mA) (per output channel @20.0 mA) | 3.33 (241 mA) (x4 outputs sourcing 20.0 mA) |
| Mixed Analog Current/Voltage | 1.40 | 0.600 (per output channel @20.0 mA) | 1.12 (81 mA) | 0.480 (35 mA) (per output channel @20.0 mA) | 3.61 (261 mA) (x4 outputs sourcing 20.0 mA) |
| Analog Input Current/Voltage (x8/x16) | 0.530 | N/A | 0.440 (32.0 mA) | N/A | 0.870 (63.0 mA) |
| 24V Floating Plug-In Power Supply (No load) | 0.410 | N/A | 0.328 (24 mA) | N/A | N/A |
| 24V Floating Plug-In Power Supply (externally loaded 150 mA) | 4.80 | N/A | 3.84 (278 mA) | N/A | N/A |

## Ordering Information

*Note: For detailed ordering information, refer to the GATE2IEC Catalog.*

### GATE2IEC MODELS

All unit models include no I/O slots frame, 10.8-15.5 V DC PS and CPU 3640. All radio models require Metal Chassis or Housing option.

**No Radio Model**

| | |
|---|---|
| • GATE2IEC Basic Model No Radio | F7509 |

**Conventional VHF Radio Models**

| | |
|---|---|
| • GATE2IEC CM200/CM140/EM200/GM3188 VHF | F7573 |
| • GATE2IEC with CDM750 136-174 MHz | F7563 |
| • GATE2IEC with HT750/GP320/GP328 /PRO5150 VHF | F7553 |

**Conventional UHF Radio Models**

| | |
|---|---|
| • GATE2IEC with CM200/CM140/EM200/GM3188 UHF | F7574 |
| • GATE2IEC with CDM750 403-512 MHz | F7564 |
| • GATE2IEC with HT750/GP320/GP328 /PRO5150 UHF | F7554 |

**Analog Trunked VHF Radio Models**

| | |
|---|---|
| • GATE2IEC with XTL2500 136-174 MHz Analog | F7533 |
| • GATE2IEC with XTL2500 136-174 MHz Digital | F7593 |
| • GATE2IEC with XTS2500 136-174 MHz Digital | F7543 |

**Trunked UHF Radio Models**

| | |
|---|---|
| • GATE2IEC with XTL2500 380-520 MHz Analog | F7534 |
| • GATE2IEC with XTL2500 380-520 MHz Digital | F7594 |
| • GATE2IEC with XTS2500 380-520 MHz Digital | F7544 |

**Trunked 800 MHz Radio Models**

| | |
|---|---|
| • GATE2IEC with XTL2500 800 MHz Analog | F7538 |
| • GATE2IEC with XTL2500 800 MHz Digital | F7598 |
| • GATE2IEC with XTS2500 800 MHz Digital | F7548 |

**MotoTrbo Digital Models**

| | |
|---|---|
| • GATE2IEC with XPR4350/ XPR4380/DM3400/XiR M8220/DGM4100 VHF | F7583 |
| • GATE2IEC with XPR4350/ XPR4380/DM3400/XiR M8220/DGM4100 UHF | F7584 |
| • GATE2IEC with XPR4380 800 MHZ | F7588 |

**I/O Expansion**

| | |
|---|---|
| • GATE2IEC Expansion Frame Unit | F7510 |

**Other Models**

| | |
|---|---|
| • CPU 3640 | F7502 |
| • GATE2IEC IP Gateway CPU 4600 | F7507 |
| • GATE2IEC CPU 3680 | F7508 |

**Software Tools**

| | |
|---|---|
| • GATE2IEC System Tools Suite (STS) | F7500 |
| • GATE2IEC C Toolkit (CTK) | F7600 |
| • GATE2IEC Enhanced PID | FVN5680 |

**STS Add-on Software**

- GATE2IEC AGA 3+8 CD FVN5809
- GATE2IEC AGA 7+8 CD FVN5510
- AGA History Upload Tool FVN5810
- GATE2IEC DNP 3.0 Plus Master Drivers CD FVN5511
- GATE2IEC DNP 3.0 Plus Slave Drivers CD FVN5512
- GATE2IEC IEC60870-5-101 Slave driver CD FVN5513

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### Regional Radio Options

**CM200/CM140/EM200/CM3188**

One of the following options must be ordered for models F7573 and F7574:

| | |
|---|---|
| • CM200 | V851 |
| • CM140 | V852 |
| • GM3188 | V853 |
| • EM200 | V854 |

**XPR4350/XPR4380/DM3400/XiR M8220/DGM4100**

| | |
|---|---|
| • XPR4350/XPR4380 | V751 |
| • DM3400 | V752 |
| • XiR M8220 | V753 |
| • DGM4100 | V754 |

**HT750/GP320/GP328/PRO5150**

One of the following options must be ordered for models F7553 and F7554.

| | |
|---|---|
| • HT750 | V951 |
| • GP320 | V952 |
| • GP328 | V953 |
| • PRO5150 | V954 |

**Frames**

| | |
|---|---|
| • 2 I/O slots frame | V102 |
| • 3 I/O slots frame | V103 |
| • 5 I/O slots frame | V105 |
| • 7 I/O slot frame | V107 |
| • 8 I/O slots frame | V108 |
| • 19" rack adjustable installation brackets | V051 |

**Metal Chassis**

| | |
|---|---|
| • 48 x 48 cm Metal Chassis (up to 7 I/O slots) | V056 |
| • 38 x 38 cm Metal Chassis (up to 3 I/O slots) | V214 |
| • 28 x 36 cm Metal Chassis (up to 2 I/O slots) | V229 |
| • 8 I/O (Expanded 19”) Metal Chassis | V269 |
| • 19" Frame Metal Back | V120 |

**Housing**

| | |
|---|---|
| • 50 x 50 cm Metal Housing (up to 7 I/O slots) | V228 |
| • 50 x 50 cm Metal Housing with padlock accessory | VA00405 |
| • 40 x 40 cm Metal Housing (up to 3 I/O slots) | V276 |
| • 40 x 40 cm Metal Housing with padlock accessory | VA00406 |
| • Housing Tamper Switch | V224 |

**Power Supply, Battery Charger and Backup Battery**

*Note: The default PS is 10.8-16 V DC input*

| | |
|---|---|
| • AC Power Supply 100-240 V | V346 |
| • AC PS 100-240 V with Battery charger | V261 |
| • DC Power Supply 18-72 V | V251 |
| • DC PS 18-72 V with Battery charger | V367 |
| • DC Low Tier PS 10.8 -16 V | V149 |
| • 6.5 Ah Backup Battery | V114 |
| • 10 Ah Backup Battery | V328 |

**CPU Upgrade**

*Note: The default CPU is CPU 3640 except for MotoTrbo models F7573/F7574 and Expansion Frame model F7510*

| | |
|---|---|
| • Plug-in 4 MB SRAM | V447 |
| • GATE2IEC CPU 3680 | V448 |
| • ACE IP Gateway CPU 4600 | V449 |

**CPU Plug-in Ports**

| | |
|---|---|
| • Plug-in RS-232 Port | V184 |
| • Plug-in RS 485 Port | V440 |
| • Plug-in Ethernet 10 M Port | V204 |
| • Plug-in Ethernet 10/100 M Port | V212 |
| • Plug-in Radio Port | VA00362 |
| • | |

**Digital Input Modules**

| | |
|---|---|
| • 16 DI FAST 24V DC | V265 |
| • 32 DI FAST 24V DC | V379 |
| • 16 DI FAST 24V IEC TP2 | V117 |
| • 32 DI FAST 24V IEC TP2 | V959 |
| • 32 DI FAST 48V | V474AB |
| • 16 DI 120/230V | VA00331AA |

**Relay Output Modules**

| | |
|---|---|
| • 8 DO EE relay 2A | V508 |
| • 16 DO EE relay 2A | V616 |
| • 8 DO ML relay 2A | V314 |
| • 16 DO ML relay 2A | V516 |
| • 12 DO EE 120/230V | VA00348 |
| • 12 DO ML 120/230V | VA00332 |
| • 8 SBO DO 2 FormA EE relay 2A | VA00343AB |

**Analog Modules**

| | |
|---|---|
| • 8 AI ±20 mA | V318 |
| • 16AI ±20 mA | V463 |
| • 8 AI ±5 V | V741 |
| • 16AI ±5 V | V742 |
| • 4 AO | V118 |
| • 4 AO / 8 AI (AI = ±20 mA) | V562 |
| • 4 AO / 8 AI (AI = ±5 V) | V460 |

**Mixed Input/Output Modules**

| | |
|---|---|
| • 16 DI/DO FET | V480 |
| • 32 DI/DO FET | V481 |
| • 16 DI 4 DO EE 4 AI, ±20 mA | V245 |
| • 16 DI 4 DO ML 4 AI, ±20 mA | V453 |

**I/O Modules Cables and Accessories**

| | |
|---|---|
| • 20 wire cable with TB holder 3 m | V253 |
| • 30 wire cable with TB holder 3 m | V202 |
| • 40 wire cable with TB holder 3 m | V358 |
| • 20 pin TB holder kit | V158 |
| • 30 pin TB Holder kit | V203 |
| • 40 pin TB holder kit | V153 |
| • Blank I/O module | V20 |

**I/O Expansion**

| | |
|---|---|
| • Expansion LAN Switch | VA00226 |
| • LAN Cable 60cm length | V529 |
| • LAN Cable 2m length | V648 |
| • LAN Cable 3m length | V666 |
| • LAN Cross Cable | V665 |

**CPU and PS Redundancy**

| | |
|---|---|
| • GATE2IEC Redundancy | VA00433 |
| • Secondary DC PS 10.5-15.5V | V275 |
| • Secondary CPU Plug-In RS-232 Port | V185 |
| • Secondary CPU Plug-In Ethernet 10M Port | V205 |
| • Secondary CPU Plug-In Ethernet 10/100 M Port | V215 |
| • Secondary CPU Plug-In RS 485 Port | V441AF |
| • Secondary CPU Plug-In Radio Port | VA00364 |
| • Secondary CPU Plug-In 4 MB SRAM | V444 |

**Communications Interface**

| | |
|---|---|
| • RS-485 Junction Box | V186 |

**Radio Installation Kits**

| | |
|---|---|
| • CM200/CM140/EM200/GM3188 Installation kit | V148 |
| • CDM750 Installation kit | V143 |
| • HT750/GP320/GP328 /PRO5150 Installation kit | V154 |
| • XTL5000/XTL2500 Digital Installation kit | V681 |
| • XTL5000/XTL2500 Analog Installation kit | V157 |
| • XTS2500 Digital Installation kit | V156 |
| • MDS X710/9810 installation kit | V152 |
| • MDS iNET900/Transnet Installation kit | V680 |
| • XTL5000/2500 Digital Installation kit | V681 |
| • XPR4350/4380/DM3400/XiR M8220/DGM4100 Installation kit | V682 |
| • Transnet 900 OEM Installation kit | VA00225 |

**Software License (unit options)**

| | |
|---|---|
| • 3rd Party Protocol License (ModBus, DF1) | V377 |
| • AGA License | V284 |
| • DNP3 License master/slave - unit | V283 |
| • IEC 60870-5 License | V242 |