

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official GE Vernova pages

GE MARK VIE CONTROL

151X1202YE03SA04

IS200STAIH2ADC

STAI ANALOG I/O TERMINAL BOARD

OFFICIAL SOURCES

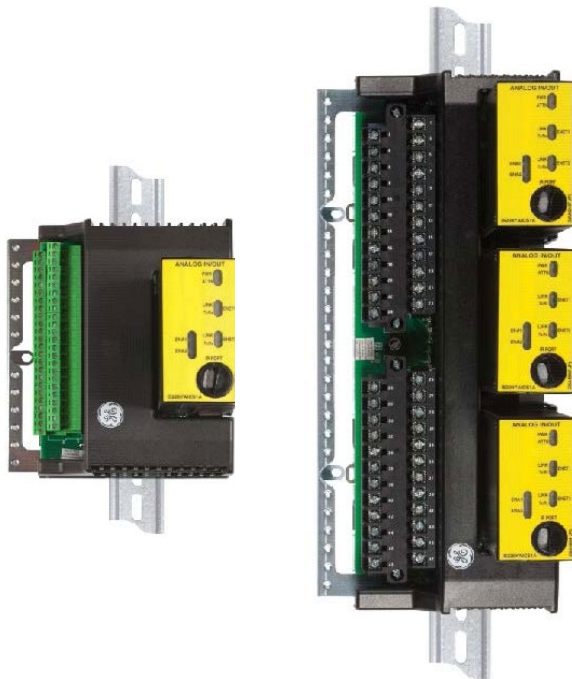
GEA35311 Mark Vle Control Product Description and GE declaration 116T4889. Selected pages retain their original content, color and aspect ratio.

TERMINAL BLOCKS

Signal flow begins with a sensor connected to a terminal block on an I/O module. The terminal board mounts to the cabinet and is available in two basic types: T-type and S-type modules.

T-type modules typically fan the inputs to three separate I/O packs. They contain two removable 24-point, barrier-type terminal blocks. Each point can accept two 3.0 mm² (#12,AWG) wires with 300 V insulation per point and spade or ring-type lugs. Captive clamps are also provided for terminating bare wires. Screw spacing is 9.53 mm (0.375 in) minimum, center-to-center. T-type modules are normally surface mounted, but may also be DIN-rail mounted.

A shield strip is provided next to each block, which is actually the left-hand side of the metal base where the module is mounted. Wide and narrow modules are arranged in vertical columns of high and low-level wiring that can be accessed from top and/or bottom cable entrances. An example of a wide module is a module containing magnetic relays with fused circuits for solenoid drivers.



Box-type and Barrier-type Terminal Blocks in Simplex and Triple Redundant Configuration

S-type modules provide a single set of screws for each I/O point and allows a single I/O pack to condition and digitize the signal. This board is used for simplex, dual, and dedicated triple modular redundant (TMR) inputs by using one, two, or three boards. They are half the size of T-type modules and are DIN-rail or surface mounted. Two versions of the S-type modules are available: fixed terminal blocks and removable terminal blocks.

Fixed box-type terminal blocks accept one 3.0 mm² (#12 AWG) wire or two 2.0 mm² (#14 AWG) wires with 300 V insulation per point. Screw spacing is 5.08 mm (0.2 in) minimum, center-to-center. Removable box terminals may be replaced with spring-cage-clamp, insulation displacement, or crimp-and-stab terminals. A shield strip is provided on each terminal block and is tied to functional ground.

TEMPERATURE RATINGS

Mark Vle electronics are packaged in different locations world-wide and customized for a variety of protection classifications with and without ventilation and cooling. Controllers, I/O modules, power supplies, etc. are rated for -30 to 65°C (-22 to 149°F) at the electronics. To compliment the Mark Vle Control's native I/O modules, a variety of fieldbus solutions are available with master communication gateways on the I/O network. These modules have slightly reduced operating temperature ratings:

- PROFIBUS® Master Gateway: -20 to 55°C (-4 to 131°F)
- CANopen® Master Gateway: -20 to 55°C (-4 to 131°F)
- FOUNDATION Fieldbus™ Linking Device: 0 to 55°C (32 to 131°F)

Modules with reduced operating temperatures should be mounted lower in the cabinet to avoid the natural temperature gradient from the bottom to the top of the enclosure. Control room equipment such as operator stations has an operating temperature range of 20 to 30°C (68 to 86°F). For shipping and storage, the controllers, I/O modules, power supplies, etc. are rated -40 to 85°C (-40 to 185°F), and control room equipment is rated 0 to 30°C (32 to 86°F).

I/O MODULES

I/O modules can be categorized as generic and application-specific. As an example, discrete inputs (contact inputs) are used in virtually all applications and differ primarily in their voltage rating. Other considerations in selecting a module are its redundancy, isolation (group or point), terminal block type, availability for safety applications (IEC 61508), and approval for hazardous locations.

A typical application-specific module is a servo module that is used for fast closed-loop control of a turbine's servo valve actuator or a complete emergency over-speed trip system for a turbine. These unique modules will not be described in the following tables. However, some application-specific modules such as a vibration module is commonly applied in monitoring radial and axial shaft displacement of rotating machinery in plant distributed control systems and will be described in a separate table.

I/O modules are mounted in local clusters and distributed remotely for packaging in a variety of protection classifications. Therefore, temperature ratings are provided for the ambient at the electronics.

Analog Input (AI) and Analog Output (AO) Modules

- V/I designates a voltage / current input
- TC designates thermocouples
- RTD designates resistance temperature device

Qty.	Input Type	Input Isolation	Output Type	Output Isolation	TB Type	Removable Term. Block	I/O Packs Per Module	Safety Version Available	Hazardous Location Approval
[†] 10 AI 2 AO	V / I	Group	0-20ma 0-20ma 0-20/0-200ma 0-20/0-200ma	Group Group Group Group	Barrier Box Barrier Box	Yes Yes or No Yes Yes or No	1 or 3 1 1 or 3 1	Yes Yes No No	Yes Yes No No
10 AI 2 AO	V / I	Point	0-20ma 0-20/0-200ma	Group Group	Box Box	Yes or No Yes or No	1 1	No No	No No
16 AO 8 AO			0-20ma 0-20ma	Group Group	Barrier Box	Yes Yes or No	1 or 3 ^{††} 1	No No	Yes Yes
12 12 24	TC TC TC	Group Group Group	N/A N/A N/A	N/A N/A N/A	Barrier Box Barrier	Yes Yes or No Yes	1, 2, 3 ^{†††} 1 1, 2 ^{††††}	Yes Yes Yes	Yes Yes Yes
16	RTD	Group	N/A	N/A	Barrier Box	Yes Yes or No	1, 2 ^{†††††} 1	No No	Yes Yes
[†] HART Communications is available ^{††} 8 AO outputs are driven by each of two I/O Packs ^{†††} Each TC is monitored by all 3 I/O Packs. Extended range option available for EPRI compliance. ^{††††} 12 TCs are monitored by each of 2 I/O Packs. Extended range option available for EPRI compliance ^{†††††} 8 3-wire RTDs are monitored by each of 2 I/O Packs									

Analog I/O modules typically contain 10 analog inputs and 2 analog outputs. 8 inputs can be configured for 1-5Vdc, ± 5 Vdc, ± 10 Vdc, or 0-20ma with jumpers on the module, and the remaining 2 inputs can be configured for 0-20ma or ± 1 ma with 250 Ω / 5,000 Ω burden resistors respectively. For applications with a high concentration of analog outputs, dedicated output modules are available for 0-20ma and others for 0-20ma / 0-200ma selection for valve actuators (800 Ω / 50 Ω output loads respectively). Transducers can be externally powered (differential inputs) or internally powered from the I/O module with +24Vdc current limited per point. I/O modules are available with point isolation for externally powered transducers.

In general, RTDs are useful for precision temperature measurements below 800°C, and thermocouples are cost effective devices for monitoring a wider temperature range. RTD modules provide a 10 ma multiplexed excitation current to each RTD, which can be grounded or ungrounded. They support 100 and 200 Ω platinum, 10 Ω copper, and 120 Ω nickel 3-wire RTDs with software linearization per point. The linearization includes scaling for specific RTD standards such as a MINCO-CA or CU10 10 Ω copper RTDs. RTDs can be located up to 300 meters (984 feet) from the I/O module with a maximum two-way cable resistance of 15 Ω .

TABELLE 2, TAULUKKO 2, ТАБЛИЦА 2, ΠΙΝΑΚΑΣ 2, TABLEAU 2, TABULKA 2, TABLA 2, TABLICA 2, TABEL 2, TÁBLÁZAT 2, TABELLA 2, TABELA 2, TAVOLA 2, LENTELÉ 2, TABUĽKA 2, TABULA 2, TABELL 2, Tafla 2

Product, продукт, výrobek, Produkt, προϊόν, Producto, Toode, Tuote, Produit, Proizvod, Termék, Prodotto, Gaminys, Produkts, Prodott, Produto, Prodsul, Výrobok, Proizvod	Accessories, Приспособления, Accesorios, Příslušenství, Tillbehör, Zubehörteile, Abiseadmed, των εξαρτημάτων, Accessoires, Pribor, Accessori, Paligiericēm, Reikmenimis, Tartozék, Ačcessorji, Hulpstukken, Osprzęt, Acessórios, Accessoriiler, Príslušenstvo, Dodatki, Lisävarusteiden, Tillbehör	Ex II 3 G	EN IEC 60079-0:2018	EN 60079-7:2015+A1:2018	EN 60079-11:2012	EN 60079-15:2010
-30°C < Ta < 65°C						
IS220PTCCH1B (Mark Vle Control Thermocouple Input Module)	IS200STTCH1A, IS200STTCH2A, IS200BTCH1B, IS200BTCH1C	Ex nA [ic] IIC T4 Gc	X		X	X
IS220PRTDH1B, IS221PRTDH1B (Mark Vle Control Resistance Temperature Device (RTD) Input Module)	IS200TRTDH2D, IS200SRTDH1A, IS200SRTDH2A, IS201TRTDH2D, IS201SRTDH1A, IS201SRTDH2A					
IS220PDIH1B, IS221PDIH1B (Mark Vle Control Discrete Input Module)	IS200STCIH1A, IS200STCIH2A, IS200STCIH8A, IS200TBCIH2C, IS200TBCIH4C, IS400STCIH1A, IS400STCIH2A, IS400STCIH8A, IS201STCIH1A, IS201STCIH2A, IS201STCIH8A, IS201TBCIH2C, IS201TBCIH4C, IS400TBCIH2C, IS401TBCIH2C					
IS220PDOAH1B, IS221PDOAH1B (Mark Vle Control Discrete Output Module)	IS200TRLYH2E, IS200TRLYH3E, IS200TRLYH1F, IS200TRLYH2F, IS201TRLYH2E, IS201TRLYH3E, IS201TRLYH1F, IS201TRLYH2F, IS200SRLYH1A, IS200SRLYH2A, IS400SRLYH1A, IS400SRLYH2A	Ex ic nA IIC T4 Gc	X		X	X
IS220PSVOH1B (Mark Vle Servo Control Module)	IS200TSVCH2A and accessory servo driver board Cat. No. IS210WSVOH1A					
IS220YSILS1A, IS220YSILS1B (Mark VleS Core Safety Protection Module)	IS200TCSAS1A, IS200WCSAS1A and IS200SCSAS1A					
IS220PAICH1B (Mark Vle Control Analog I/O Module)	IS200STAIH1A, IS200STAIH2A, IS200TBAIH1C, IS400STAIH1A, IS400STAIH2A, or IS400TBAIH1C	Ex ic nA [ic] IIC T4 Gc	X		X	X
IS220PCLAH1B (Mark Vle Control Core Analog Module)	IS210SCLSH1A, IS200SCLTH1A					
IS220PDIOH1B (Mark Vle Control Discrete I/O Module)	IS200TDBSH2A, IS200TDBSH8A, IS200TDBTH2A, IS200TDBTH8A					
IS220PAOCH1B (Mark Vle Control Analog Output Module)	IS200STAOH1A, IS200STAOH2A, IS200TBAOH1C	Ex nA IIC T4 Gc	X			X
IS220PDIIH1B (Mark Vle Control Isolated Discrete Input Module)	IS200SDIIH1A					
IS220PPRAS1B (Mark Vles Control PPRA Emergency Turbine Protection Module)	IS200TREAS1A and IS200WREAS1A					
IS220PPROS1B (Mark Vle Backup turbine protection I/O Module)	IS200SPROH1A, IS200SPROH2A, IS200TPROH1C, IS200TPROH2C, IS200TPROS1C, IS200TPROS2C, IS200TREA1A, IS200TREA3A					
IS220PTURH1B (Mark Vle Turbine Specific Primary Trip I/O Module)	IS200TRPAH1A					
IS220PHRAH1B, IS221PHRAH1B (Mark Vle HART enabled I/O Module)	IS200SHRAH1A, IS200SHRAH2A, IS201SHRAH1A, IS201SHRAH2A					
-20°C < Ta < 55°C						
IS220PCNOH1B (Mark Vle Control CANopen® Master Gateway Module)	IS200SPIDG1A					
IS220PPRFH1B (Mark Vle Control PROFIBUS® Master Gateway)	IS200SPIDG1A					
-40°C < Ta < 70°C						
IS220PSCAH1B, IS221PSCAH1B (Mark Vle PSCA Serial Communications Module)	IS200SSCAH1A, IS200SSCAH2A, IS201SSCAH1A, IS201SSCAH2A, IS400SSCAH1A, IS400SSCAH2A	Ex nA IIC T4 Gc	X			X
IS420PVIH1B (Mark Vle Control Vibration Monitor Module)	IS200TVBAH2A, IS200WNPISH1A, IS400WNPISH1A, IS400TVBAH2B					
IS220PPDAH1B, IS221PPDAH1B (Mark Vle Power Distribution System Feedback Module)	IS200JPDSG1A, IS201JPDSG1A, IS400JPDSG1A, IS200JPDGH1A, IS400JPDGH1A	Ex ec IIC T4 Gc	X	X		
IS41yBAPBH1A (Mark Vle Analog Processor)	IS21ySAMBH1A	Ex ic ec [ic] IIC T4 Gc	X	X	X	
IS42yPDASH1A, IS42yYDASS1A (Mark Vle DATA ACQUISITION SYSTEM)	IS40yTCDMS1A	Ex ic ec [ic] IIC T4 Gc	X	X	X	

If translation is different from English, the English version takes precedence.