GE GE □□□ Series Service Manual

IS200EMIOH1ACA

1. Description

Technical Specifications

2. Specifications

Specification	Value
Model	**Number: IS200EMIOH1A**
Unit	**Series: EX2100 Excitation Control**
Produced	**By: GE Industrial Systems**
Board	**Type: Exciter Main I/O Board**
Group:	**H1**
Slot	**Design: Single**
Board	**Style: VME**
Board	**Height: Double**
Manual	**Number: GEI-100453**
Functional	**Revision: A**
Manufacturer	**General Electric**
Series	**Mark VI Speedtronic**
Functional	**Part Number IS200EMIOH1ACA**
Functional	**Description IS200EMIOH1ACA Printed Circuit Board**
Revision	**Total 3 Revisions**
Backwards-Compatibility	**1st two revisions**
Assembly	**Type Normal Assembly**

3. Product Information

Technical Specifications

Model Number: IS200EMIOH1A

Unit Series: EX2100 Excitation Control

Produced By: GE Industrial Systems

Board Type: Exciter Main I/O Board

Group: H1

Slot Design: Single

Board Style: VME

Board Height: Double

Manual Number: GEI-100453

Functional Revision: A

SPECIFICATIONS

Part Number: IS200EMIOH1ACA

Manufacturer: General Electric

Country of Manufacture: United States (USA)

Number of relay channels: 12

Size: 8.26 cm high x 4.19 cm wide x 12.1 cm deep

Technology: Surface-mount

Series: EX2100

Function: Exciter Main I/O Board

Functional Description

IS200EMIOH1ACA is a Exciter Main I/O Board developed by GE. It is part of the GE Speedtronic EX2100 gas turbine control system. The Main I/O board is an essential component designed to handle input and output operations within the control rack.

Board Design and Mounting

Single Slot, Double-Height VME Style Design: The board adopts a single slot, double-height VME (Versa Module Eurocard) style design, ensuring compatibility with standard control rack configurations. This design choice allows the board to fit snugly into the control rack setup without occupying excessive space, optimizing the utilization of available rack space.

Seamless Integration into Control Rack: By adhering to the VME standard, seamlessly integrates into the control rack alongside other compatible modules and components. Its standardized dimensions and mounting points facilitate straightforward installation, eliminating the need for custom modifications or adjustments to the rack structure.

Compact Form Factor: Despite its robust functionality, maintains a compact form factor, minimizing its physical footprint within the control rack. This compactness is essential for optimizing space utilization and ensuring efficient airflow management within the rack enclosure, contributing to overall system reliability.

Ease of Installation and Maintenance: The standardized design and mounting simplify both installation and maintenance tasks. Installation involves securely mounting the board within the designated slot in the control rack, while maintenance activities such as component replacement or troubleshooting can be performed with ease due to accessible mounting points and clear labeling of board features.

Robust Construction for Reliability: Constructed from high-quality materials and components, engineered to withstand the rigors of industrial environments. Its robust construction ensures long-term reliability and performance, even in demanding operating conditions.

Input/Output Handling

Versatile Input and Output Management: The primary function of the board revolves around the management of input and output operations from various terminal boards, including EPCT, ECTB, EACF, and EXTB. These terminal boards interface with a wide array of sensors, actuators, and control devices, generating diverse signals and data types critical for system operation.

Comprehensive Signal Processing: The board is designed to handle a broad spectrum of signals and data types, ranging from analog and digital inputs to relay outputs and trip relay drives. This comprehensive approach enables the board to accommodate the diverse needs of industrial applications, ensuring seamless integration and compatibility with different types of equipment and devices.

Control and Monitoring Capabilities: By effectively managing input and output operations, facilitates comprehensive control and monitoring capabilities within the system. It enables real-time monitoring of process variables, equipment status, and environmental conditions, empowering operators to make informed decisions and take prompt action as needed.

Enhanced System Functionality: The seamless integration of input and output operations by the board enhances system functionality and performance. It enables precise control of industrial processes, automation of tasks, and implementation of safety protocols, contributing to increased efficiency, reliability, and safety in industrial environments.

Scalability and Flexibility: Versatility extends to its scalability and flexibility, allowing it to adapt to evolving system requirements and accommodate future expansions or modifications. Its modular design and compatibility with a variety of terminal boards make it an ideal choice for diverse industrial applications, from manufacturing and power generation to transportation and infrastructure.

Supported Signals and Inputs

Potential Transformer (PT) and Current Transformer (CT) Signals: The board is equipped to process PT and CT signals, which are vital for measuring voltage and current levels in power systems. These signals provide crucial insights into the electrical parameters of the system, enabling precise monitoring and control of power generation, distribution, and consumption processes.

Contact Inputs: The board accommodates contact inputs, which serve as binary indicators of equipment status, operational states, or alarm conditions. These inputs allow the system to detect and respond to changes in the environment or equipment conditions, facilitating timely action and ensuring operational integrity and safety.

Output Relay Drivers:Output relay drivers on the board enable the control and actuation of relay devices, which in turn control the operation of various components. These drivers provide the necessary power and signals to activate relays, facilitating the execution of control commands and automation processes.

Pilot Trip Relay Drives: Pilot trip relay drives play a crucial role in initiating protective actions or shutdown sequences in response to abnormal conditions or fault events detected within the system. The board's support for pilot trip relay drives ensures the implementation of effective protective measures, safeguarding equipment and personnel from potential

hazards.

Gate Pulse Signal Transmission

Logic-Level Gate Pulse Signals: The board generates logic-level gate pulse signals, which serve as crucial commands for controlling power conversion processes. These signals are typically used to trigger the switching of power electronic devices such as thyristors or transistors, facilitating the regulation and conversion of electrical power within the system.

Transmission Over the Backplane: The generated gate pulse signals are transmitted over the control backplane, which serves as a communication pathway connecting various control boards within the system. The backplane ensures efficient and reliable transmission of signals between different modules and components, enabling seamless coordination of system functions.

Interface with ESEL Board: Upon reaching the ESEL board, the gate pulse signals are received and processed accordingly. The ESEL board serves as an intermediary interface between the control system and the power conversion cabinet, facilitating the routing and distribution of control signals to the appropriate components.

Control of Power Conversion Processes: Once received, the gate pulse signals are further transmitted to the EGPA (Excitation Gate Pulse Amplifier) located in the power conversion cabinet. The EGPA amplifies and conditions the signals as necessary before applying them to the power electronic devices responsible for power conversion processes.

Facilitating Power Regulation and Control: By transmitting gate pulse signals, the board enables precise control and regulation of power conversion processes within the system. This control is essential for maintaining stable and efficient operation, optimizing energy utilization, and ensuring compliance with operational requirements and safety standards.

IS200EMIOH1ACA Technical Specifications

Manufacturer General Electric

Series Mark VI Speedtronic

Functional Part Number IS200EMIOH1ACA

Functional Description IS200EMIOH1ACA Printed Circuit Board

Revision Total 3 Revisions

Backwards-Compatibility 1st two revisions

Assembly Type Normal Assembly

About the IS200EMIOH1ACA

The IS200EMIOH1ACA is a board component made by General Electric as part of its Speedtronic MKVI system. The Mark VI is designed with a Control Module for monitoring and control processes. The system has a Windows-based HMI (human-machine interface) that allows operators to access data from one point. This HMI is a non-essential component that can be reinitialized or replaced with zero impact on the actual control of the system. This IS200EMIOH1ACA Printed Circuit Board device's greater Mark VI Turbine Control System Series, as is inlcuded here with its full extended product series titile, has to be deemed as quite the significant functional upgrade upon the previous industry-standard Mark V Turbine Control System Series of just about the same full extended series title, as the Mark VI Series added the alternative energy-based wind turbine possible functional application onto the more simple steam and gas-based turbine applications introduced with the previously-mentioned Mark V.

Hardware Tips and Specifications

The IS200EMIOH1ACA is a double-height single-slot VME style board. It manages the input and output signals from several other boards, including the EXTB, EACF, ECTB, and EPCT boards. These signals include PT and CT signals or Poterntial Current and C Cureent signals, output relay drivers, contact inputs, and pilot trip relay drivers. The IS200EMIOH1ACA has two LED indicators mounted into the front faceplate mounted to the front of the circuit board. The LEDs are used as Power and Status indicators. The faceplate has clips to keep the board secure within the rack once it is installed, and is marked with the board id number and the manufacturer’s logo. One the back edge of the IS200EMIOH1ACA, there are two backplane connectors. These are labeled P1 and P2. The surface of the board is heavily populated with over 400 resistors, 400 capacitors, and many diodes, along with close to 80 integrated circuits. Circuits on the board include FPGAs (field-programmable gate arrays.) There are also transistors and test points on the board. The board is marked with several codes and with reference designators to allow for easy identification of components.

This IS200EMIOH1ACA Printed Circuit Board device's above-mentioned collection of diodes, resistors, capacitors, and integrated circuits should all have been included in this IS200EMIOH1ACA Printed Circuit Board product's normal Mark VI Series assembly version as part of a broader voltage regulation strategy that has been standardized to the rest of this IS200EMIOH1ACA Printed Circuit Board product's greater Mark VI Turbine Control System Series. This IS200EMIOH1ACA Printed Circuit Board device's Mark VI Series, as it is known for short, is not surrounded by very many originally-printed pieces of instructional documentation on the internet, as the Mark VI Series is one of the final-developed GE Mark Series iterations to incorporate the patented Speedtronic control system technology into a number of relevant product options. Given the lack of Mark VI Series materials online, this IS200EMIOH1ACA Printed Circuit Board product's IS200EMIOH1ACA Printed Circuit Board functional product number can be treated as a decent research option for hardware details, as it actually codes for a number of significant IS200EMIOH1ACA Printed Circuit Board hardware qualities through its series of consecutive functional naming elements. For example, this IS200EMIOH1ACA Printed Circuit Board product number in specific begins with an iteration of the dual-functional IS200 series tag delegating this EMIO PCB's normal Mark VI Series assembly and its domestic original manufacture location. Some of the other relevant IS200EMIOH1ACA Printed Circuit Board qualities indicated this way include its:

EMIO functional product acronym

Group 1 Mark VI Series grouping

Conformal PCB coating style

Three-fold revision history