GE GE □□□ Series Service Manual

IS200ISBDG1AAA

1. Description

SPECIFICATIONS

2. Specifications

Specification	Value
Original	**Manufacturer General Electric**
Weight	**14oz**
Series	**Innovation Series**
Part	**Number IS200ISBDG1A**
Product	**Type Bus Delay Module.**
Revision	**Total 1 Revision**
Functional	**Revision 1 A**

3. Product Information

SPECIFICATIONS

Part No.: IS200ISBDG1AAA

Manufacturer: General Electric

Country of Manufacture: United States of America (USA)

Number of channels: 12 channels

Input span, transmitters: 1-5 V dc

Temperature: -30 to 65oC

Size: 10.16 cm wide x 33.02 cm high

Product Type: Insync Delay Board

Availability: In Stock

Series: EX2100

Functional Description

IS200ISBDG1AAA is an Insync Delay Board developed by GE. It is a part of EX2100 control system. The Insync Delay Board serves as a vital link in the control and coordination of system operations, ensuring precise timing and synchronization of critical processes. With its specialized design and robust construction, it provides reliability and performance under demanding operating conditions.

Terminal Connections and Connectors

Terminal Connections: The PCB features four terminal connections strategically positioned to facilitate essential signal transmission and system integration. These terminals serve as crucial interface points, ensuring seamless connectivity and compatibility with external devices or subsystems.

Additional Connectors:

Terminal Strip (P4): Terminal strip P4 features two screw connections labeled 24 VDC Input. This connector provides a convenient interface for power supply input, facilitating the integration of power sources into the system.

Vertical Male Ribbon Connector (P5): Connector P5 is a vertical male ribbon connector equipped with twenty pins. This connector offers versatile interface options for external devices or subsystems, enabling flexible integration and communication within the system architecture.

Connectors P1 through P3: These connectors, labeled Full Duplex, XMIT Out, and RCV In respectively, are positioned along the board edges. They provide specific communication interface functionalities, allowing seamless integration with communication networks or peripheral devices. These connectors enhance the board's compatibility and connectivity, facilitating efficient data exchange and communication between the board and external systems or devices.

Board Components

Test Points (TP): The board is equipped with TP test points strategically placed to provide convenient access for diagnostic and testing purposes. These test points facilitate troubleshooting and maintenance activities, allowing technicians to efficiently identify and address any issues that may arise during operation.

LEDs: Two LEDs are integrated into the board design to serve as visual indicators. These LEDs offer real-time feedback on system status or operational modes, enhancing user monitoring capabilities. They provide a quick and intuitive way to assess the board's status, aiding in system management and performance monitoring.

Transformers: The board features two transformers designed to fulfill vital roles in the system's operation. These transformers enable voltage transformation and signal conditioning as dictated by the system's operational specifications. They ensure that signals are appropriately processed and compatible with the board's circuitry, contributing to the overall reliability and efficiency of the system.

Integrated Circuits (ICs): Several integrated circuits are strategically positioned on the board's surface. These ICs play diverse roles, including processing, control, or signal management functions essential for the Insync Delay Board's operation and performance. They execute complex tasks with precision, ensuring the board's functionality aligns with the system's requirements and specifications. The ICs optimize performance, reliability, and efficiency, making them integral components of the board's design.

System software features

Controller Execution: The ACLA and DSPX microprocessor-based controllers execute the exciter control code, which is responsible for regulating the excitation system.

Modular Structure: The software is organized into modules or blocks, each serving specific functions to create the required system functionality. These blocks are combined as needed to achieve the desired control logic.

Storage and Memory: Block definitions and configuration parameters are stored in flash memory, ensuring their persistence across power cycles. Meanwhile, variables are stored in random-access memory (RAM), facilitating efficient data manipulation during runtime.

Open Architecture: The exciter application software adopts an open architecture system, allowing flexibility and customization. A library of existing software blocks is available and can be configured from the toolbox to tailor the control system according to specific requirements.

Functional Blocks: Various functional blocks are available, each dedicated to performing specific tasks. These include logic gates, proportional integral (P.I.) regulators, function generators, and signal level detectors. These blocks can be interconnected to create complex control algorithms.

Operating Modes: The control system offers two primary operating modes: generator voltage regulation (Auto Regulation) and direct control, which can regulate either voltage or current depending on the application's requirements.

Generator Protection Functions: Integrated within the control system are crucial generator protection functions, including over and under-excitation limiting, power system stabilization, and V/Hz limiting. These functions ensure safe and stable operation of the generator under various operating conditions and contingencies.

IS200ISBDG1A Technical Specifications

Original Manufacturer General Electric

Weight 14oz

Series Innovation Series

Part Number IS200ISBDG1A

Product Type Bus Delay Module.

Revision Total 1 Revision

Functional Revision 1 A

About the IS200ISBDG1A

The IS200ISBDG1A is a board component for the Mark VI system. The Mark VI was one of the last Speedtronic gas/steam turbine management systems created and released by General Electric. Speedtronic systems were used for heavy-duty turbine management from the 1960s (in the form of the Mark I system) on through to the 2000s. The Mark VI built upon the strengths of previous systems, like triple redundant backups used in the Mark IV and Mark V systems, and improved upon them using new technology, such as Ethernet communications and a PC-based Operator interface. The Mark VI Turbine Control System Series also exists as quite the significant functional upgrade upon the previously-developed Mark V Turbine Control System Series of more or less the same full extended series title, as the Mark VI Series added the alternative energy-based wind turbine possible functional application onto the gas and steam applications made possible through the advent of the previous industry-standard Mark V Turbine Control System Series of more or less the exact same full extended product series title. This IS200ISBDG1A Innovation Series Bus Delay Module product's Mark VI Series is additionally generally valued given its status as one of the final-developed Mark product series to incorporate the patented Speedtronic control system technology into a number of different products.

Hardware Tips and Specifications

The IS200ISBDG1A is an Insync Delay Board. This board is drilled in two corners. Each corner also has a terminal connection. The terminal connections are labeled E1, E2, E3, and E4. The board has five additional connectors, including a male vertical pin ribbon connector (P5) a two-position terminal strip (P4) that is labeled '24 VDC Input,' and three additional connectors. These connectors are labeled P1/ 'Full Duplex,' P2/'XMIT Out,' and P3/'RCV In.' All five connectors are placed on board edges. The IS200ISBDG1A is built with several integrated circuits. It has one DATEL dc/dc converter component. The board has TP test points, two light emitting diodes, and two small transformers. The LEDs are labeled as 'carrier detect' and 'power.' The board has resistors primarily made of metal film and capacitors of electrolytic material and of ceramic material. The board is marked with its ID number, with the code '6BA01' and with reference designators to identify components. This IS200ISBDG1A Innovation Series Bus Delay Module printed circuit board product offering from General Electric actually does not exist as the originally-developed device of its specific General Electric Mark VI Series functional role, as that would be considered the IS200ISBDG1 parent Innovation Series Bus Delay Module not utilizing the IS200ISBDG1A Innovation Series Bus Delay Module devices' A-rated functional product revision.

This IS200ISBDG1A Innovation Series Bus Delay Module device is actually not surrounded by very many originally-printed instructional manual materials on the internet, as it has faced a concerted series of copyright infringements in the many years beyond its initial release. With this being the case, alternative mediums of IS200ISBDG1A Innovation Series Bus Delay Module hardware component and component specification information need to be sourced, including the IS200ISBDG1A Innovation Series Bus Delay Module functional product number itself. The IS200ISBDG1A Innovation Series Bus Delay Module functional product number codes for a series of relevant IS200ISBDG1A Innovation Series Bus Delay Module specifications through a set of consecutive functional naming elements. For instance, this specific IS200ISBDG1A Innovation Series Bus Delay Module number begins with a standard inclusion of the IS200 series tag informing us of this ISBD-abbreviated device's normal Mark VI Series PCB assembly type as well as its domestic location of original GE manufacture. Some of the other important IS200ISBDG1A Innovation Series Bus Delay Module Board details indicated in this fashion include the IS200ISBDG1A Innovation Series Bus Delay Module device's:

ISBD functional product acronym

Group one Mark VI Series grouping

Normal PCB coating style

A-rated functional product revision

SPECIFICATIONS:

Part Number: IS200ISBDG1A

Manufacturer: General Electric

Series: EX2100

Board Type: InSynchronous Bus Delay Module

Input Voltage Range: 3.3V to 5V DC

Power Consumption: ≤ 2W

Signal Voltage Levels: TTL/CMOS compatible

Maximum Delay Compensation: Up to 100 ns

Synchronization Accuracy: ±1 ns

Clock Frequency: Up to 200 MHz

Operating Temperature Range: -40°C to +85°C

Storage Temperature Range: -55°C to +125°C

Humidity: 5% to 95% non-condensing

Dimensions: 25 mm x 25 mm x 5 mm

Mounting Type: Surface-mount technology (SMT)

Repair: 3-7 Day

Availability: In Stock

Weight: 10 grams

Country of Origin: United States

FUNCTIONAL DESCRIPTION:

IS200ISBDG1A is an InSynchronous Bus Delay Module manufactured and designed by General Electric as part of the EX2100 Series used in GE Excitation Turbine Control Systems. The InSynchronous Bus Delay Module is designed to control and manage the timing and synchronization of data as it travels between different components in a system. This module ensures that data arrives at its destination accurately and at the right time, despite potential delays caused by various factors in the system. Excitation control systems are essential in maintaining the stability and performance of electrical generators. The InSynchronous Bus Delay Module within these systems ensures precise timing and synchronization of control signals, Which is vital for optimal generator operation.

FEATURES:

It is drilled in two corners, and each corner features a terminal connection labeled as E1, E2, E3, and E4. These terminals serve as key points for electrical connections and signal transfers. In addition to these corner terminals, the board incorporates five more connectors, each positioned on the board's edges.

These connectors include a male vertical pin ribbon connector (P5), a two-position terminal strip (P4) clearly labeled as '24 VDC Input,' and three additional connectors, namely P1 ('Full Duplex'), P2 ('XMIT Out'), and P3 ('RCV In'). These connectors play a pivotal role in establishing electrical connections and ensuring seamless operation within the Mark VI system.

Includes a DATEL dc/dc converter component, instrumental in transforming and regulating electrical power as required. These integrated circuits are the essential building blocks of the board's operation.

For monitoring and diagnostics, the board features two light-emitting diodes (LEDs) with distinct labels. One is identified as 'carrier detect,' while the other is marked as 'power.' These LEDs provide visual cues to indicate the status of critical functions.

It incorporates TP test points, which are invaluable for conducting tests and inspections to ensure its proper functioning.

BENEFITS:

Enhanced Stability: By ensuring precise timing and synchronization of control signals, the module helps maintain generator stability, reducing the risk of power fluctuations and outages.

Improved Performance: Optimizes the operation of the excitation control system, leading to better overall performance of the generator.

Increased Reliability: Reduces the likelihood of errors and malfunctions, contributing to the long-term reliability of the power generation system.

Adaptability: Can be configured to work with various types of excitation control systems, making it a versatile component in the field.

SYSTEM HARDWARE:

The control cabinet is the central hub for the EX2100 system, housing critical components responsible for control, communication, and input/output (I/O) operations. This cabinet serves as the brain of the system, orchestrating and supervising various functions essential for the excitation process.

Within the control cabinet, a range of boards play a pivotal role in regulating and monitoring the power generation process. These boards are equipped with advanced control circuitry that ensures precise control over the exciter's performance. They also facilitate seamless communication with other system components and external devices.

The auxiliary cabinet is tasked with safeguarding power generation through a series of protection circuits and field flashing mechanisms. One of its primary functions is to handle de-excitation, which is essential for safely shutting down the excitation system when required. Additionally, the auxiliary cabinet incorporates circuits designed to suppress shaft voltage, protecting the integrity of the power generation equipment.

This cabinet is a guardian of power generation, ensuring that the system operates reliably and safely even under challenging conditions or when specific interventions are necessary.