GE GE □□□ Series Service Manual

IS200DSPXH1DBD

1. Description

IS200DSPXH1DBD Technical Specifications

2. Specifications

Specification	Value
Manufacturer	**General Electric**
Series	**Mark VI Speedtronic**
Functional	**Description Digital Signal Processor Control Board**
Functional	**Part Number IS200DSPXH1DBD**
Functional	**Abbreviation DSPX**
Revision	**Total 3 Revisions**
Backwards-Compatibility	**1st two revisions**
Assembly	**Type Normal Assembly**
Frequently	**Asked Questions about IS200DSPXH1DBD**
What	**styles of Mark VI Series revisions does this IS200DSPXH1DBD PCB utilize?**

3. Product Information

IS200DSPXH1DBD Technical Specifications

Manufacturer General Electric

Series Mark VI Speedtronic

Functional Description Digital Signal Processor Control Board

Functional Part Number IS200DSPXH1DBD

Functional Abbreviation DSPX

Revision Total 3 Revisions

Backwards-Compatibility 1st two revisions

Assembly Type Normal Assembly

Frequently Asked Questions about IS200DSPXH1DBD

What styles of Mark VI Series revisions does this IS200DSPXH1DBD PCB utilize?

This IS200DSPXH1DBD Device makes use of two functional revisions and an artwork configuration revision rated at grades of D, B, and D, respectively.

Would this IS200DSPXH1DBD product be protected by any warranty upon my purchase here?

Yes. This IS200DSPXH1DBD PCB would be protected by a guaranteed three-year PCB warranty upon any purchase here at AX.

About the IS200DSPXH1DBD

The IS200DSPXH1DBD is a printed circuit board component manufactured and originally distributed by GE as part of their Mark VI Speedtronic line. The Mark VI was created as a control system for gas and steam industrial turbine systems, often used for energy systems. The IS200DSPXH1DBD specifically is used in Innovation Series drives and EX2100 exciters. This IS200DSPXH1DBD printed circuit board product offering's greater Mark VI Series, as you might have been able to deduce solely based off of its full extended product series title, exists as a significant functional upgrade upon the previous industry-standard Mark V Turbine Control System Series of more or less the same full extended product series title, as the Mark VI Series added the wind turbine-focused possible application onto the gas and steam-based turbine environments established previously through this IS200DSPXH1DBD device's prior Mark V Series mentioned before. This IS200DSPXH1DBD PCB's Mark VI Series is also seen as desirable due to its status as one of the final-developed Mark Series utilizing the patented Speedtronic control system technology across a number of product offerings.

Hardware Tips and Specifications

The IS200DSPXH1DBD is a small rectangular board with an attached front faceplate. It functions as a Digital Signal Processor Control Board and is designed with a digital signal processor connected to an ASIC (application-specific integrated circuit) that performs custom logic functions. The board is loaded with onboard firmware that is stored in its flash memory. The board has several input/output connectors, including two in its connected front faceplate. The faceplate also has two embedded LED indicators (one green and one red) that help annunciate alarms for the processor. Additionally, the board has a right-angled backplane connector with multiple functions. These include a data bus, address bus, control output signals, keypad interface, tool interface, and VCO inputs. The IS200DSPXH1DBD is a static-sensitive board. The use of a grounding strap is suggested at all times when handling the board or board components. To prevent damage to the board and to prevent possible electric shock, the board should only be removed or replaced when the rack is de-energized. The board should only be installed in the proper rack position by qualified personnel. Proper installation procedures can be found in GE manuals or data sheets originally provided with the IS200DSPXH1DBD.

This IS200DSPXH1DBD printed circuit board product offering is not surrounded by all to many originally-printed instructional manual materials on the internet, as the Mark VI Turbine Control System Series truly exists as a now-obsolete legacy product series that is not currently in active production by GE. With this being the truth, the IS200DSPXH1DBD functional product number itself can be defined as a decent functional source of IS200DSPXH1DBD Board hardware component and component specification information, as it codes for a number of relevant IS200DSPXH1DBD Board details through a series of consecutively-arranged functional naming elements. For instance, the IS200DSPXH1DBD product number itself begins with an instance of the dual-functional IS200 series tag that was specially designed by General Electric to assert this IS200DSPXH1DBD device's normal Mark VI Series assembly version on top of its typical domestic location of original GE manufacture. Some of the other important IS200DSPXH1DBD Board hardware details exposed in this manner include the IS200DSPXH1DBD device's:

DSPX functional product acronym

Group one Mark VI Series grouping

Conformal PCB coating style

Three-fold revision total

SPECIFICATIONS

Part No.: IS200DSPXH1DBD

Manufacturer: General Electric

Country of Manufacture: United States of America (USA)

Size: 33.0 cm high x 17.8 cm wide

Technology: Surface mount

OperatingTemperature : -30 to 65 oC

Product Type: DSP Control Board

Availability: In Stock

Series: EX2100

Functional Description

IS200DSPXH1DBD is a DSP control board developed by GE. It is part of the EX2100 series. The Digital Signal Processor Control Board (DSPX) serves as the primary controller for multiple critical functions within the Innovation Series drives and the EX2100 Excitation Control system. Its functionalities encompass the control of bridge and motor regulator operations, gating functions, and oversight of generator field control functions for the EX2100 Excitation Control. Responsible for managing essential control functions within the Innovation Series drives and EX2100 Excitation Control system. Its capabilities encompass logic processing, interface functions, specialized control via FPGA or ASICs, and interface points allowing communication with the backplane, DSP emulator, and engineering monitoring tools for efficient system control and diagnostics.

Core Components

High-Performance Digital Signal Processor: The board houses a high-performance DSP, a specialized processing unit capable of executing complex mathematical operations and signal processing tasks efficiently.

Standard Memory Components: Complementing the DSP, standard memory components facilitate storage and retrieval of data, configurations, and operational parameters.

Application-Specific Integrated Circuit (ASIC): An ASIC is embedded within the board, designed explicitly to execute custom logic functions tailored to the specific requirements of the system.

Functional Capabilities

Logic and Processing Functions: The board encapsulates logic, processing, and interface functions essential for regulating, controlling, and managing various aspects of the drives and excitation control system.

Bridge and Motor Regulation: It orchestrates the regulation of the bridge and motor functions, ensuring optimal performance and control over the motorized components.

Generator Field Control: Additionally, the DSPX manages and oversees the control functions related to the generator field within the EX2100 Excitation Control system.

Controller for Multiple Functions: Manages bridge, motor regulator, gating functions in Innovation Series drives, and generator field control in the EX2100 Excitation Control.

Core Components: Houses a high-performance DSP, standard memory units, and an ASIC tailored for executing custom logic functions.

Logic and Interface Capabilities: Provides logic, processing, and interface functions crucial for system operations and integration.

Regulation and Control: Ensures efficient regulation of bridge and motor operations while overseeing control functions for the generator field.

Interrupts and Signal Handling

During normal operation, the DSPX board is equipped with four external interrupts designated for specific functions:

Stack Overflow (INT0): Indicates a stack overflow situation.

Inner Loop Load Pulse (INT1): Used to handle inner loop load pulse functionalities.

Configurable Inputs (INT2, INT3): Two inputs that can be configured based on specific system requirements or custom functionalities.

Memory Types

Integrates different types of memory, each serving distinct purposes within the system:

FLASH Memory: Used for storing DSP boot images, code execution, configurable item storage, and maintaining system history records.

RAM (Random Access Memory): Utilized for both data storage and execution of code, providing temporary working storage during system operations.

NVRAM (Non-Volatile RAM): Dedicated to nonvolatile data storage, ensuring that crucial information remains stored even during power loss or system shutdown.

Add-Only Memory: Specifically reserved for board revision identification, facilitating the tracking and identification of the board's revision history.

Memory Types and Interrupt

DSP Clock Speed: Operates at 60 MHz, managing various system tasks and operations.

Interrupts: Four external interrupts (INT0, INT1, INT2, INT3) available for specific functionalities and system event handling.

Memory Types: FLASH memory for boot images, code execution, and storage; RAM for temporary data storage and code execution; NVRAM for nonvolatile data storage; Add-Only Memory for board revision identification.

Primary Functions

The DSPX board acts as the central controller for essential operations, including bridge and motor regulator control for Innovation Series drives, as well as overseeing gating functions critical to their operation. Additionally, it manages generator field control functions integral to the EX2100 Excitation Control.

Logic, Processing, and Interface Functions

Beyond its primary control functionalities, the DSPX board provides logic processing and interface capabilities, ensuring efficient communication and coordination between various system components and functions.

Customized Functions via Field Programmable Gate Arrays (FPGA) or ASICs

Specialized functions on the DSPX board are facilitated through custom logic implemented in Field Programmable Gate Arrays (FPGA) or Application-Specific Integrated Circuits (ASICs). These components are equipped with supporting circuits as needed to carry out specific operations efficiently.

Integration into Board Rack via Connector (P1)

The DSPX board is installed in the board rack and interfaces with the system's backplane through a 4-row, 128-pin DIN connector labeled as P1. This connector serves as a primary point of connection, enabling communication and data transfer between the DSPX board and other system components through the backplane.

Additional Connectors for External Communication

The DSPX board features two additional connectors for external communication and monitoring purposes:

P5 - DSP Emulator Port: This port allows connectivity for a DSP emulator, enabling debugging, testing, and emulation of the DSPX board for development or troubleshooting purposes.

P6 - Engineering Monitor Port: This port serves as an interface for engineering monitoring tasks, providing access to monitoring and diagnostic functions related to the DSPX board's operations.

Indicating Lights

DS1 - FAULT LED (Red):

ON or Flashing: Indicates the occurrence of a fault in the system or when the system is undergoing a reset process. The red LED illuminates steadily or blinks to alert operators about the presence of a fault or during system reset procedures.

OFF: Indicates the absence of any faults within the system. When the red LED remains off, it signals that no faults are currently detected or active.

DS2 - STATUS LED (Green):

Flashing: Signifies that the system is operational and running. The green LED flashes intermittently when the system is in operation, providing a visual cue of its active status.

ON: Indicates that the system has stopped or is currently not running. When the green LED remains steadily illuminated, it denotes a stopped state of the system or that the system is not currently operational.

OFF: Informs about the occurrence of a fault in the system or during a reset process. Similar to DS1, the green LED remains off when a fault is present or during system reset procedures.