



GEI-100601

100mm Exciter Conduction Sensor Board IS200EMCSG_A_ _

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met during installation, operation, and maintenance. The information is supplied for informational purposes only, and GE makes no warranty as to the accuracy of the information included herein. Changes, modifications and/or improvements to equipment and specifications are made periodically and these changes may or may not be reflected herein. It is understood that GE may make changes, modifications, or improvements to the equipment referenced herein or to the document itself at any time. This document is intended for trained personnel familiar with the GE products referenced herein.

GE may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not provide any license whatsoever to any of these patents. All license inquiries should be directed to the address below. If further information is desired, or if particular problems arise that are not covered sufficiently for the purchaser's purpose, the matter should be referred to:

GE Energy
Post Sales Service
1501 Roanoke Blvd.

Salem, VA 24153-6492 USA

Phone: + 1 888 GE4 SERV (888 434 7378, United States)
+ 1 540 378 3280 (International)

Fax: + 1 540 387 8606 (All)

("+" indicates the international access code required when calling from outside the USA)

This document contains proprietary information of General Electric Company, USA and is furnished to its customer solely to assist that customer in the installation, testing, operation, and/or maintenance of the equipment described. This document shall not be reproduced in whole or in part nor shall its contents be disclosed to any third party without the written approval of GE Industrial Systems.

GE PROVIDES THE FOLLOWING DOCUMENT AND THE INFORMATION INCLUDED THEREIN AS IS AND WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

Mr. Lucian

Sales manager

Joyoung International Trading Co., Ltd

Whatsapp/Wechat: +86 18106906650

Email: Lily@htechplc.com

Mobile: +86 18106906650

Website: www.xm-dcs.com

Address: Room 1503, Building B, Diamond Coast,
No. 96 Lujiang Road, Siming District, Xiamen Fujian

Wechat



Board Description

Section	Page
Functional Description	3
Application Data	5
Renewal/Warranty Replacement.....	6
How to Order a Board	6
Handling Precautions.....	7
Replacement Procedures	8

Safety Symbol Legend



Warning

Indicates a procedure, practice, condition, or statement that, if not strictly observed, could result in personal injury or death.



Caution

Indicates a procedure or condition that, if not strictly observed, could result in damage to or destruction of equipment.

Note Indicates an essential or important procedure or statement.

Functional Description

The IS200EMCS Conduction Sensor (EMCS) board is used in the 100 mm (multibridge) EX2100™ Excitation Control to detect current flow through bus lines in the power converter. The board is powered by the IS200EHPA Exciter Gate Pulse Amplifier (EHPA) board, which also filters the output of the EMCS board before it is sent to the IS200EMIO Exciter Main Input/Output (EMIO) board. One EMCS is used in each of the six SCR bridge legs for each power converter module (PCM) in the exciter. For example, in a bridge with four PCMs in the exciter, up to 24 EMCS boards can be present in an application.

The EMCS board uses two unidirectional Hall Effect sensors facing in opposite directions to detect current. These sensors produce a logical output dependent on the presence of a magnetic field. When either sensor detects a magnetic field above the sensor's operating threshold (indicating current) the circuit produces a logical low output. The sensor will maintain this low output state until the field drops below the release point. See the following table for typical current values that produce switching in the sensor with the designed flux concentration.

Switching Current for Hall Effect Sensor

Current	Typical (A)
Operating	80.0
Release	10.0

The bus is insulated with tubing to prevent accidental contact of the rings with the energized bus.

To detect current flow, the board has gapped steel rings attached to it. The bus line passes through these rings. The Hall Effect sensors on the board measure the concentrated magnetic flux produced within the rings. A Glastic® mounting bracket is used to mount the EMCS board adjacent to the bus line and to hold the steel rings in place.

Each EMCS board requires a power supply input of +12.0 V dc $\pm 10\%$, 0.3 watts maximum, and a 12 V dc return. These are provided from the EHPA board.

The EMCS board produces two identical logical output signals (for redundancy) to the EHPA board. Logical low outputs are less than 1.2 V dc and logical high outputs are above 11 V dc. All inputs and outputs are through the 6-pin P1A connector to the EHPA board. In addition to live diagrams in the Control System Toolbox software for the EX2100, three LEDs on the EHPA board help identify whether the EMCS boards for each phase are working. For each phase, the LED is on when current is detected in that phase.

The EHPA board powers the six EMCS boards via three 4-pin connecting shielded cables, one per phase. Each cable connects to one EMCS board. From that board, an additional 4-pin shielded cable daisy chains to the EMCS of the other SCR leg for that phase. EHPA filters the output signals from each of the EMCS boards and transfers the information to the EMIO controller I/O board (refer to Figure 1).

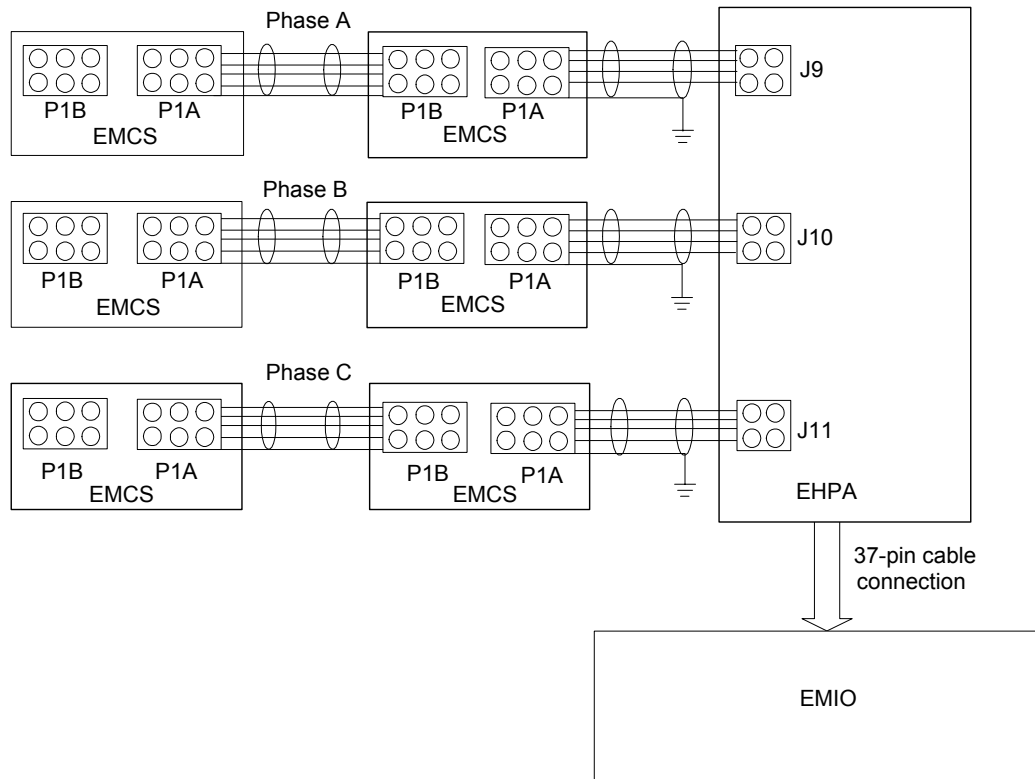


Figure 1. EMCS Circuit Interconnect Diagram

Application Data

The EMCS board is mounted in the Power Conversion Module (PCM) cabinet and has no fuses, testpoints, LED indicators, or adjustable hardware. The board has two 6-pin connectors, P1A and P1B. See the following table and figure for a board layout diagram and for connector pin signal descriptions. The connectors are duplicates; the same signals are on each corresponding pin.

P1A & P1B Connector Pins

Pin Number	Signal Name	Description
1	P12	+12 V dc
2	CONSEN0	Logical Output (Low = 0 V, High = +12 V) (0 V = Conduction)
3	Shield	Connects to ground
4	PCOM	0 V dc
5	CONSEN0	Logical Output (Low = 0 V, High = +12 V) (0 V = Conduction)
6	NC	

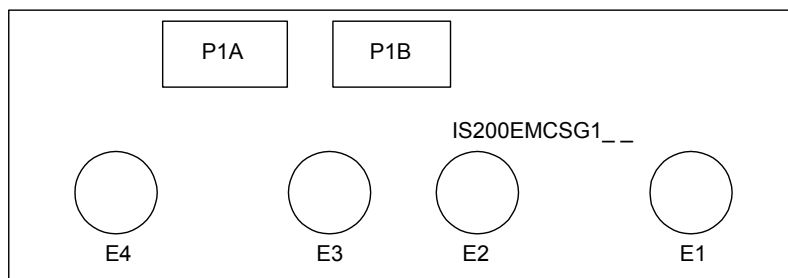


Figure 2. EMCS Board Layout Diagram

Renewal/Warranty Replacement

This information helps ensure that GE can process the order accurately and as soon as possible.

How to Order a Board

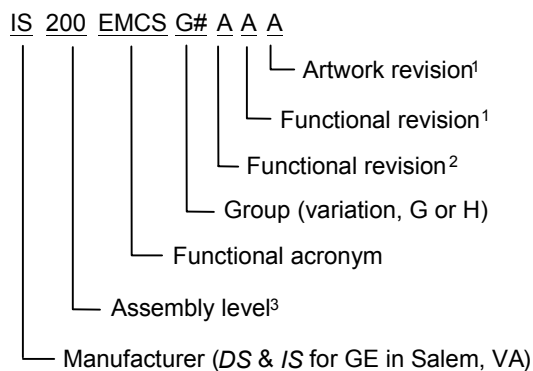
When ordering a replacement board for a GE exciter, you need to know:

- How to accurately identify the part
- If the part is under warranty
- How to place the order

Board Identification

A printed wiring board is identified by an alphanumeric **part (catalog) number** located near its edge. Figure 3 explains the structure of the part number.

The board's functional acronym, shown in Figure 3, is normally based on the **board description**, or name. For example, the EMCS board is described as the 100 mm Exciter Conduction Sensor Board.



¹Backward compatible

²Not backward compatible

³200 indicates a base-level board; 215 indicates a higher-level assembly or added components (such as PROM)

Figure 3. Board Part Number Conventions

Warranty Terms

The GE *Terms and Conditions* brochure details product warranty information, including **warranty period** and **parts and service coverage**. The brochure is included with customer documentation. It may be obtained separately from the nearest GE Sales Office or authorized GE Sales Representative.

Placing the Order

Parts still under **warranty** may be obtained directly from the factory:

GE Energy
Product Service Engineering
1501 Roanoke Blvd.
Salem, VA 24153-6492 USA

Phone: + 1 888 GE4 SERV (888 434 7378, United States)
+ 1 540 378 3280 (International)

Fax: + 1 540 387 8606 (All)

Renewals (spares or those not under warranty) should be ordered by contacting the nearest GE Sales or Service Office.

Be sure to **include the following** when ordering any warranty or renewal parts:

- Complete part number and description
- Exciter serial number
- Exciter Material List (ML) number

Note All digits are important when ordering or replacing any board. The factory may substitute later versions of replacement boards based on availability and design enhancements. However, GE Industrial Systems ensures backward compatibility of replacement boards.

Handling Precautions



Caution

To prevent component damage caused by static electricity, treat all boards with static sensitive handling techniques. Wear a wrist-grounding strap when handling boards or components, but only after boards or components have been removed from potentially energized equipment and are at a normally grounded workstation.

Printed wiring boards may contain static-sensitive components. Therefore, GE ships all replacement boards in antistatic bags. Use the following guidelines when handling boards:

- Store boards in antistatic bags or boxes.
- Use a grounding strap when handling boards or board components (per above *Caution* criteria).

“+” indicates the international access code required when calling from outside of the USA.

Replacement Procedures

The EMCS boards are located in the PCM cabinets. In 100mm (multibridge) exciters that include the online repair option, it is possible to de-energize the affected PCM and replace an EMCS while the remaining PCM cabinets are energized and online. Refer to the Online repair manual for proper procedures to de-energize the PCM before proceeding with EMCS replacement.



Warning

To prevent electric shock, turn off power to the exciter, then test to verify that no power exists in the board before touching it or any connected circuits.



Caution

To prevent equipment damage, do not remove, insert, or adjust board connections while power is applied to the equipment.

➤ To replace the EMCS board

1. Make sure that the exciter has been de-energized. (Refer to the EX2100 Installation and Startup Guide, *GEH-6631*, for complete de-energizing procedures and follow all local practices of lock-out/tag-out). Or, for online repair, be sure the affected PCM has been de-energized per online repair procedures.
2. Open the PCM cabinet door, and using equipment designed for high voltages, test any electrical circuits **before touching them** to ensure that power is off.
3. Each EMCS is located above its associated SCR heat sink, near the front of the cabinet. Phase A positive leg (SCR #1) is in the upper left, phase A negative leg (SCR #4) is in the upper right, and so forth. Remove the Glastic strip and LEXAN® shield, to gain access to the appropriate EMCS.
4. Remove the small L-shaped bus piece in front of the EMCS by removing the three 5/16-inch bolts that connect it to the heat sink, and the three 5/16-inch bolts that connect it to the bus piece that passes through the conduction sensor magnetic rings.
5. Carefully disconnect the P1A and P1B (if present) cables from the EMCS board by squeezing and pulling the cable connectors loose from the board. Verify the cable is labeled with the correct connector name (as marked on the board) to simplify reconnection.



Warning

Avoid dropping any mounting hardware into the equipment as this could cause damage or personal injury when power is reapplied.

6. Remove the screws that hold the EMCS assembly to the PCM sidewall and carefully slide the assembly forward and out of the cabinet.
7. Remove the four screws that hold the EMCS board and magnetic rings to the plastic mounting bracket and remove the board.

8. Orient the new EMCS board the same as the original board and secure it with the magnetic rings to the plastic mounting bracket with the four screws removed in the previous step. Be careful not to damage the sensor devices on the EMCS. Before tightening the screws, hold the magnetic rings so as to minimize the gap at the sensors.
9. Slide the assembly back into the cabinet and mount it in place. Be sure the magnetic rings are not touching any exposed bus, and that the insulating tubing over the bus is properly positioned to protect the rings from bus contact.
10. Reconnect the P1A and P1B cables that were disconnected in step 5.

**Caution**

Be sure to reinstall any LEXAN baffles that may have been removed to access the board. These baffles are essential for proper air flow cooling of the PCM.

11. Install the L-shaped bus piece which was removed in step 4. The six 5/16-inch bolts must be torqued to 115 inch-pounds.
12. Install the LEXAN and Glastic pieces removed in step 3.
13. Close the PCM cabinet door and proceed with re-energization procedures.



GE Energy

*General Electric Company
1502 Roanoke Blvd.
Salem, VA 24153-6492 USA*

*GEI-100601
031007*

*+1 540 387 7000
www.geenergy.com*