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NI-9228

Manufacturer: National Instruments

Board Assembly Part Numbers (Refer to Procedure 1 for identification procedure):

Part Number and Revision	Description
157994A-02L or later	NI 9224, High Density Ch-Ch Isolated Voltage Input Module
157994A-01L or later	NI 9228, High Density Ch-Ch Isolated Voltage Input Module

Volatile Memory

<i>Target Data</i>	<i>Type</i>	<i>Size</i>	<i>Battery Backup</i>	<i>User¹ Accessible</i>	<i>System Accessible</i>	<i>Sanitization Procedure</i>
Module configuration	CPLD RAM	1 byte	No	Yes	Yes	Cycle Power
Module measurement data	CPLD RAM	24 bytes	No	Yes	Yes	Cycle Power
Calibration data	CPLD RAM	48 bytes	No	No	No	Cycle Power
ADC configuration	ADC On-chip	240 bytes	No	No	No	Cycle Power
ADC data	ADC On-chip	24 bytes	No	No	No	Cycle Power

Non-Volatile Memory (*incl. Media Storage*)

<i>Target Data</i>	<i>Type</i>	<i>Size</i>	<i>Battery Backup</i>	<i>User Accessible</i>	<i>System Accessible</i>	<i>Sanitization Procedure</i>
CPLD bitstream	CPLD Internal Flash	0.8 MB	No	No	No	None
Device Configuration	EEPROM	1 KB	No			
<ul style="list-style-type: none"> • Calibration metadata • Calibration data² • Device information 				Yes No No	Yes Yes Yes	Procedure 2 None None

¹ Refer to *Terms and Definitions* section for clarification of *User* and *System Accessible*

² Calibration constants that are stored on the device include information for the device's full operating range. Any implications resulting from partial self-calibration can be eliminated by running the full self-calibration procedure.

Procedures

Procedure 1 – Board Assembly Part Number identification:

To determine the Board Assembly Part Number and Revision, check the top left corner of the white label on the bottom of the module (15xxxx<REV>-0xL).

Procedure 2 – Device Configuration EEPROM (Calibration Metadata):

The user-accessible areas of the calibration EEPROM are exposed through an external calibration Applications Programming Interface (API) in LabVIEW. Follow the instructions in KB [4GHLANQE](#) for changing the calibration password and clearing the user-defined information.

Terms and Definitions

Cycle Power:

The process of completely removing power from the device and its components and allowing for adequate discharge. This process includes a complete shutdown of the PC and/or chassis containing the device; a reboot is not sufficient for the completion of this process.

Volatile Memory:

Requires power to maintain the stored information. When power is removed from this memory, its contents are lost. This type of memory typically contains application specific data such as capture waveforms.

Non-Volatile Memory:

Power is not required to maintain the stored information. Device retains its contents when power is removed. This type of memory typically contains information necessary to boot, configure, or calibrate the product or may include device power up states.

User Accessible:

The component is read and/or write addressable such that a user can store arbitrary information to the component from the host using a publicly distributed NI tool, such as a Driver API, the System Configuration API, or MAX.

System Accessible:

The component is read and/or write addressable from the host without the need to physically alter the product.

Clearing:

Per *NIST Special Publication 800-88 Revision 1*, “clearing” is a logical technique to sanitize data in all User Accessible storage locations for protection against simple non-invasive data recovery techniques using the same interface available to the user; typically applied through the standard read and write commands to the storage device.

Sanitization:

Per *NIST Special Publication 800-88 Revision 1*, “sanitization” is a process to render access to “Target Data” on the media infeasible for a given level of effort. In this document, clearing is the degree of sanitization described.