Manufacturer: National Instruments

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

Part Number and Revision	Description
159323C-01L or later	**STS-DC-01**
142002B-01L or later	**STS-DC-02**

Volatile Memory

Target Data	*Type*	*Size*	*Battery Backup*	*User[1] Accessible*	*System Accessible*	*Sanitization Procedure*
None						

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

Target Data	*Type*	*Size*	*Battery Backup*	*User Accessible*	*System Accessible*	*Sanitization Procedure*
Board identification and user memory space (“IDPROM”)	EEPROM	4K x 8 (32 Kbit)	No	Yes	Yes	Procedure 2
Chicklet identification and user memory space (“Chicklet IDPROM”) x40	EEPROM	4K x 8 (32 Kbit each, 1280Kbit total)	No	Yes	Yes	Procedure 3

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

Procedures

Procedure 1 – Board Assembly Part Number identification:
To determine the Board Assembly Part Number and Revision, find it with the serial number that is visible on a sticker affixed to the board stiffener that faces the front side of the tester when installed. This information can also be found in the STS Maintenance Software, in the "Load Board" tab when the board is installed on the system.

Procedure 2 – IDPROM:
All the memory on this device is user accessible through the Semiconductor Test System (STS) Maintenance Software LabVIEW Applications Programming Interface (API).

WARNING: Changing any values in the memory could result in improper behavior of the system.

To **clear the IDPROM**, complete the following steps in LabVIEW:

1. Power ON the board by setting the System Power Supply to +3.3 V and enabling the output
    a. This can be done by using the "NI DCPower Soft Front Panel" and following the next steps:
        i. Open the Soft Front Panel and, if prompted, select the NI PXI-4110 device
        ii. Set Channel 1 Voltage Level to +3.3 V
        iii. Set Channel 1 Current Limit to 0.5 A
        iv. Check the Channel 1 Output Enabled checkbox
2. Open an STS session using the "niSTS Initialize SVCFWD.vi".
3. Configure the I2C communication using the "niSTS configure I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Configure"
    b. Wire in a constant into "I2C Protocol Configure" with the following:
        i. Set Address to 80 decimal (50 hex)
        ii. Set the Rate to 100 kHz
    c. Wire in a constant into "Write Options" with the following:
        i. Set the Page size to 32 bytes
        ii. Set Write Delay Between Pages to 5 ms
4. Configure the I2C path using the "niSTS Write I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Write – No Register (U8)"
    b. Wire into "Register Values" an array of size 1 with a U8 constant of 0
5. Configure the I2C communication using the "niSTS configure I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Configure"
    b. Wire in a constant into "I2C Protocol Configure" with the following:
        i. Set Address to 80 decimal (50 hex)
        ii. Set the Rate to 100 kHz
    c. Wire in a constant into "Write Options" with the following:
        i. Set the Page size to 32 bytes
        ii. Set Write Delay Between Pages to 5 ms
6. write to the memory using the "niSTS Write I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Write (U8 Data, U16 Address)"
    b. Wire into "Register Values" an array of size 4000 with U8 constants, these can all be set to 00 or FF
    c. Wire 0 into "Register Address"
    d. Wire 100000 into "ms timeout"
7. Close the STS session using the "niSTS Close.vi"
8. Disable the system power supply by unchecking the Output Enabled checkbox in the Soft Front Panel

To **verify the IDPROM** has been correctly cleared, complete the following steps in LabVIEW:

1. Power ON the board by setting the System Power Supply to +3.3 V and enabling the output
    a. This can be done by using the "NI DCPower Soft Front Panel" and following the next steps:
        i. Open the Soft Front Panel and, if prompted, select the NI PXI-4110 device
        ii. Set Channel 1 Voltage Level to +3.3 V
        iii. Set Channel 1 Current Limit to 0.5 A
        iv. Check the Channel 1 Output Enabled checkbox
2. Open an STS session using the "niSTS Initialize SVCFWD.vi".
3. Configure the I2C communication using the "niSTS configure I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Configure"
    b. Wire in a constant into "I2C Protocol Configure" with the following:
        i. Set Address to 80 decimal (50 hex)
        ii. Set the Rate to 100 kHz
    c. Wire in a constant into "Write Options" with the following:
        i. Set the Page size to 32 bytes
        ii. Set Write Delay Between Pages to 5 ms
4. Configure the I2C path using the "niSTS Write I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Write – No Register (U8)"
    b. Wire into "Register Values" an array of size 1 with a U8 constant of 0
5. Configure the I2C communication using the "niSTS configure I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Configure"
    b. Wire in a constant into "I2C Protocol Configure" with the following:
        i. Set Address to 80 decimal (50 hex)
        ii. Set the Rate to 100 kHz
    c. Wire in a constant into "Write Options" with the following:
        i. Set the Page size to 32 bytes
        ii. Set Write Delay Between Pages to 5 ms
6. Read the memory using the "niSTS Read I2C.vi" and setting it up as follows:
    a. Use drop down option "IDPROM I2C Read (U8 Data, U16 Address)"
    b. Wire 0 into "Register Address"
    c. Wire 4000 into IDPROM # of Bytes
    d. Wire 100000 into "ms timeout"
7. Close the STS session using the "niSTS Close.vi"
8. Disable the system power supply by unchecking the Output Enabled checkbox in the Soft Front Panel

Procedure 3 – Chicklet IDPROM:
All the memory on this device is user accessible through the Semiconductor Test System (STS) Maintenance Software LabVIEW Applications Programming Interface (API).

WARNING: Changing any values in the memory could result in improper behavior of the system and even *incorrect system calibration*. Return the board to National Instruments for evaluation if you alter the Chicklet EEPROM in any way.

To **clear the Chicklet IDPROM**, complete the following steps in LabVIEW:

1. Power ON the board by setting the System Power Supply to +3.3 V and enabling the output
    a. This can be done by using the "NI DCPower Soft Front Panel" and following the next steps:
        i. Open the Soft Front Panel and, if prompted, select the NI PXI-4110 device
        ii. Set Channel 1 Voltage Level to +3.3 V
        iii. Set Channel 1 Current Limit to 0.5 A
        iv. Check the Channel 1 Output Enabled checkbox
2. Open an STS session using the "niSTS Initialize SVCFWD.vi".

3. Create a 2D array of (U8) elements as shown in table 1:

Table 1: Configuration Array

1	1	2
1	1	8
1	2	1
1	2	2
1	2	4
1	2	8
1	4	1
1	4	2
1	4	4
1	4	8
1	8	1
1	8	2
1	8	4
1	8	8
2	1	1
2	1	2
2	1	4
2	1	8
2	2	1
2	2	2
2	2	4
2	2	8
2	4	1
2	4	2
2	4	4
2	4	8
2	8	1
2	8	2
2	8	4
2	8	8
4	1	1
4	1	2
4	1	4
4	1	8
4	2	1
4	2	2
4	2	4
4	2	8
4	4	1
4	4	2

4. Create a for loop and index the loop off the “configuration array” above. (indexing should result in a 1D array inside the loop).
    a. Create a three element array [112,113,114] called “configure address”. Place inside first loop.
    b. Create another for loop inside the first and index the second loop off the already indexed “configuration array” above. (indexing the indexed “configuration array” should result in a single U8 inside the second loop.
        i. Inside the second loop, configure the I2C communication using the “niSTS configure I2C.vi” and setting it up as follows:
            1. Use drop down option “IDPROM I2C Configure”
            2. Wire in a constant into “I2C Protocol Configure” with the following:
                a. Set Address to 0
                b. Set the Rate to 100 kHz
                c. Insert “Bundle by Name” into the “I2C Protocol Configure” wire and select Address. Wire “configure address” indexed wire into the Address terminal.

3. Wire in a constant into “Write Options” with the following:
    a. Set the Page size to 32 bytes
    b. Set Write Delay Between Pages to 5 ms
ii. Configure the I2C path using the “niSTS Write I2C.vi” and setting it up as follows:
    1. Use drop down option “IDPROM I2C Write – No Register (U8)”
    2. Place a “Build Array” and wire the “configuration array” (which should now be just a U8) into the block.
    3. Wire into “Register Values” the output of the “Build Array” block.

c. Outside of the second for loop, configure the I2C communication using the “niSTS configure I2C.vi” and setting it up as follows:
    i. Use drop down option “IDPROM I2C Configure”
    ii. Wire in a constant into “I2C Protocol Configure” with the following:
        1. Set Address to 81 decimal (50 hex)
        2. Set the Rate to 100 kHz
    iii. Wire in a constant into “Write Options” with the following:
        1. Set the Page size to 32 bytes
        2. Set Write Delay Between Pages to 5 ms
d. write to the memory using the “niSTS Write I2C.vi” and setting it up as follows:
    i. Use drop down option “IDPROM I2C Write (U8 Data, U16 Address)”
    ii. Wire into “Register Values” an array of size 4000 with U8 constants, these can all be set to 00 or FF
    iii. Wire 0 into “Register Address”
    iv. Wire 100000 into “ms timeout”

5. Close the STS session using the “niSTS Close.vi”
6. Disable the system power supply by unchecking the Output Enabled checkbox in the Soft Front Panel

To **verify the Chicklet IDPROM** has been correctly cleared, complete the following steps in LabVIEW:

1. Power ON the board by setting the System Power Supply to +3.3 V and enabling the output
    a. This can be done by using the “NI DCPower Soft Front Panel” and following the next steps:
        i. Open the Soft Front Panel and, if prompted, select the NI PXI-4110 device
        ii. Set Channel 1 Voltage Level to +3.3 V
        iii. Set Channel 1 Current Limit to 0.5 A
        iv. Check the Channel 1 Output Enabled checkbox
2. Open an STS session using the “niSTS Initialize SVCFWD.vi”.
3. Create a 2D array of (U8) elements as shown in table 1 (above):
4. Create a for loop and index the loop off the “configuration array” above. (indexing should result in a 1D array inside the loop).
    a. Create a three element array [112,113,114] called “configure address”. Place inside first loop.
    b. Create another for loop inside the first and index the second loop off the already indexed “configuration array” above. (indexing the indexed “configuration array” should result in a single U8 inside the second loop.
        i. Inside the second loop, configure the I2C communication using the “niSTS configure I2C.vi” and setting it up as follows:
            1. Use drop down option “IDPROM I2C Configure”
            2. Wire in a constant into “I2C Protocol Configure” with the following:
                a. Set Address to 0
                b. Set the Rate to 100 kHz
                c. Insert “Bundle by Name” into the “I2C Protocol Configure” wire and select Address. Wire “configure address” indexed wire into the Address terminal.

3. Wire in a constant into “Write Options” with the following:
    a. Set the Page size to 32 bytes
    b. Set Write Delay Between Pages to 5 ms
ii. Configure the I2C path using the “niSTS Write I2C.vi” and setting it up as follows:
    1. Use drop down option “IDPROM I2C Write – No Register (U8)”
    2. Place a “Build Array” and wire the “configuration array” (which should now be just a U8) into the block.
    3. Wire into “Register Values” the output of the “Build Array” block.

c. Outside of the second for loop, configure the I2C communication using the “niSTS configure I2C.vi” and setting it up as follows:
    i. Use drop down option “IDPROM I2C Configure”
    ii. Wire in a constant into “I2C Protocol Configure” with the following:
        1. Set Address to 81 decimal (50 hex)
        2. Set the Rate to 100 kHz
    iii. Wire in a constant into “Write Options” with the following:
        1. Set the Page size to 32 bytes
        2. Set Write Delay Between Pages to 5 ms

d. Read the memory using the “niSTS Read I2C.vi” and setting it up as follows:
    i. Use drop down option “IDPROM I2C Read (U8 Data, U16 Address)”
    i. Wire 0 into “Register Address”
    ii. Wire 4000 into IDPROM # of Bytes
    ii. Wire 100000 into “ms timeout”
    iii. Create a 2D U8 indicator outside the for loops
    iv. wire the output “Register Values” out of the for loop to verify the values match what was written in the previous step.

5. Close the STS session using the “niSTS Close.vi”
6. Disable the system power supply by unchecking the Output Enabled checkbox in the Soft Front Panel

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.