



ICE Enterprises, Inc.
10302 Eaton Place
Suite 100
Fairfax, VA 22030

April 7, 2017

Non Volatility Statement **ICE Peripheral Interface Card (PIC)** **ICE-PIC8**

ICE-PIC8 Description

The Series-8 ICE-PIC card (ICE-PIC8 and ICE-PIC8L) consists of the base printed circuit board (PCB) and an ICE Crossbar module installed from the factory (See Figures 1 and 2). The base card and the ICE Crossbar constitute an “ICE-PIC8” for the purpose of this non-volatility statement.



Figure 1- ICE-PIC8L



Figure 2 – ICE-PIC8

Volatility of Onboard Memory

Volatile Memory: The ICE-PIC8, as described above, uses four volatile memory chips. These four memory chips lose their content when power is removed for 24 Hours.

Procedure to clear: Remove from AC power for 24 hours.

Non-Volatile EEPROM

Non-Volatile Memory: The Series-8 ICE-PIC (ICE-PIC8, and ICE-PIC8-L) cards use one EEPROM. This EEPROM is U6 on the ICE Crossbar. Manufacturer Part # N25Q128A11ESE40G.

This U6 EEPROM is reprogrammable and allows users to upgrade the PCI interface on the ICE-PIC8 card using ICE provided libraries and software.

To insure the user EEPROM contains only the content from ICE firmware, provided by ICE, a 32-bit CRC checksum is calculated on the entire content of the EEPROM. A procedure is provided to read-back the user accessible EEPROM content and calculate its 32-bit CRC. This 32-bit CRC is then checked against the 32-bit CRC signatures located in the icexxx/hlp/crcs.hlp file for a match.

Example of a check flash session within NeXt-Midas:

```
nM> picd checkflash pic1
Unloading SPI FLASH - 16006832 bytes
.....
.....
..... done
Flash ChkSum = 0x04AFF507
nM>
```

Example of a check flash session from a LINUX command line:

```
|xmidas@icetest| $ICEROOT/test/test pic 0 checkflash
Starting ICE test=checkflash on dev=ICEPIC,DEVNO=0,NONE,IOM=NONE,MUXCLK=I, with
flags=NONE
Unloading SPI FLASH - 16006832 bytes
.....
.....
..... done
Finished test status=0x4aff507
|icebox@icetest|
```

With each major software release of the ICE-PIC option tree, a new signature is used. Beginning with the ICE-PIC8 series the CRC matching values are found in the following directory: .../ice398-##/hlp/crcs.hlp where ## is the tree number of the ICE398 series. For legacy (non-current) signature of past ICE-PIC Option Trees the signatures can be found in here: ice398-##/hlp/crcs.hlp

Procedure to verify CRC value: To match the CRC32 checksum on the card to the CRC32 checksum listed here for the PIC8 the following procedure is used:

To read back the CRC from the PIC8 card, run the following while inside of the NeXt-Midas shell.

Type "nms" to initialize NeXt-Midas.

Type "nm" to enter the NeXt-Midas shell.
Type picd checkflash pic1 to read the flash and produce the CRC32 checksum
Match the checksum with the signature.

--- Begin Example---

```
nM> picd checkflash pic1
Unloading SPI FLASH - 16006832 bytes
.....
.....
..... done
Flash ChkSum = 0x04AFF507
nM>
```

--- End Example---

Checking ICE-PIC8 CRC32 Checksums if NeXt-Midas is not installed

To read back the CRC32 checksum from the PIC8 card directly from the command prompt accomplish the following:

On the server with the ICE-PIC8 installed, change directories to the "test" directory.

Changing directories to the "test" is accomplished as follows:

```
cd /$ICEROOT/test
cd /opt/ice/pkg/icexxx/test          ← current location
```

Execute the command "./build.lnx" to build the software "test" executable

--- Begin Example---

```
|user@icetest| ./build.lnx
Making libraries icelib.o, libice.so, and libice.a in /midas/opt/icexxx/lib
Building executable ice from ice.c
Building executable icenet from icenet.c
Building executable test from test.c
Building executable testsnt from testsnt.c
Building executable example from example.c
Building executable fatsnt from fatsnt.c
|user@icetest|
```

--- End Example---

When checking ICE-PIC cards externally (no in the NeXt-Midas shell), the devices are designated beginning at zero (0). To read the CRC32 checksum from the command prompt with only one ICE-PIC8 card use the following command:

```
|user@icetest| $ICEROOT/test/test pic 0 checkflash
```

--- Begin Example---

```
|user@icetest|$ICEROOT/test/test pic 0 checkflash
Starting ICE test=checkflash on dev=ICEPIC,DEVNO=0,NONE,IOM=NONE,MUXCLK=I,
with flags=NONE
Unloading SPI FLASH - 16006832 bytes
.....
```

```
.....
.....
..... done
Finished test status=0x4aff507
|user@icetest|
--- End Example---
```

If an additional ICE-PIC card is installed in the server you can run the following command :

```
|user@icetest| $ICEROOT/test/test pic 1 checkflash
```

--- Begin Example---

```
|user@icetest| $ICEROOT/test/test pic 1 checkflash
Starting ICE test=checkflash on dev=ICEPIC,DEVNO=0,NONE,IOM=NONE,MUXCLK=I,
with flags=NONE
Unloading SPI FLASH - 16006832 bytes
.....
.....
..... done
Finished test status=0x4aff507
|user@icetest|
--- End Example---
```

If additional ICE-PIC cards are installed in the server you can increase number following pic in the command to read back each CRC32 checksum:

```
|user@icetest| $ICEROOT/test/test pic 2 checkflash
```

After accounting for the four volatile memory chips and the one non-volatile EEPROM, there are no other non-volatile devices on the ICE-PIC8 card.