ADM1266 Linux API and Python Library

ANALOG
DEVICES

AHEAD OF WHAT'S POSSIBLE™

Top Level Functions

- ► Firmware Load/Upgrade

- ► Configuration Load/Upgrade

- ► Monitoring and Telemetry Readback

- ► Closed Loop Margining

- ► Blackbox Readback

- ► Open Loop Margining

Benefits

- Significantly reduces time to implement ADM1266 functions into user software
  - The API and library is modular and can be easily integrated into existing software
  - In-depth documentation of the functions

- Scalable from 1 device to 16 devices
  - Automatically scales based on the number of ADM1266 PMBus addresses provided
  - No additional modifications required

- Provides system level information relevant to the end user

- Linux API uses standard Linux SMBus system calls
  - Can also be easily modified to interface with custom SMBus/I2C API

- Python Library can be used with Total Phase Aardvark dongle for programming in ICT
  - Can also be easily modified to interface with other I2C masters
  - Compatible with Python 2.7 and 3.x

Firmware and Configuration Loading

- Selectable option to load firmware, configuration or both
- User only provides the paths to firmware and configuration HEX files
  - HEX files are automatically parsed
  - Follows the required delay specification after writing to commands
  - Option to do a seamless update or reset after loading a new configuration
  - Checks for CRCs to confirm configuration and firmware were loaded successfully
  - Triggers a memory refresh
- Displays summary of the CRC and update status

```
Enter '1' to update both firmware and configuration, '2' to update firmware only,
'3' to update configuration only: 1
Loading firmware to device 0x40.
Loading firmware to device 0x42.
Loading configuration to device 0x40.
Loading configuration to device 0x42.
Running Memory Refresh.


Programming Summary
----------------------------------------

Firmware version in device 0x40 is v1.14.3
All CRC passed in device 0x40.

Firmware version in device 0x42 is v1.14.3
All CRC passed in device 0x42.
```

Monitoring and Telemetry

- Read and display real-time telemetry information from all the ADM1266 in a system
  - Telemetry from all the ADM1266 are combined and displayed as system information
  - User defined rail and signal names are read back from ADM1266 and displayed
  - Fault statuses are displayed based on priority (OV, UV, Normal, Disabled)
  - Option to read back individual or all rails and signals

```
Type 0 for reading back the status of all rails and signals, 1 for reading back a specific
Rail and 2 for reading back a specific Signal : 0

--------------------------------------------------------------------------------------
Rails
--------------------------------------------------------------------------------------
12V Main : Normal - 12.198V
ADJ Rail 1 on Board 1 : Normal - 1.466V
ADJ Rail 2 on Board 1 : Normal - 1.466V
5V Rail on Board 1 : Normal - 5.004V
1.2V Rail on Board 1 : Normal - 1.167V
3.275V Rail on Board 1 : Normal - 3.271V
1.1V Rail on Board 1 : Normal - 1.068V
3V Rail on Board 1 : Normal - 2.989V
1V Rail on Board 1 : Normal - 0.971V
2.5V Rail on Board 1 : Normal - 2.48V
0.9V Rail on Board 1 : Normal - 0.874V
2V Rail on Board 1 : Normal - 1.992V
0.9V Rail 2 on Board 1 : Normal - 0.873V
1.8V Rail on Board 1 : Normal - 1.748V
0.85V Rail on Board 1 : Normal - 0.826V
1.5V Rail on Board 1 : Normal - 1.456V
0.85V Rail 2 on Board 1 : Normal - 0.825V
ADJ Rail 1 on Board 2 : Normal - 1.47V
ADJ Rail 2 on Board 2 : Normal - 1.467V
5V Rail on Board 2 : Normal - 4.978V
1.2V Rail on Board 2 : Normal - 1.138V
3.275V Rail on Board 2 : Normal - 3.268V
1.1V Rail on Board 2 : Normal - 1.068V
3V Rail on Board 2 : Normal - 3.001V
1V Rail on Board 2 : Normal - 0.971V
2.5V Rail on Board 2 : Normal - 2.478V
0.9V Rail on Board 2 : Normal - 0.874V
2V Rail on Board 2 : Normal - 1.995V
0.9V Rail 2 on Board 2 : Normal - 0.874V
1.8V Rail on Board 2 : Normal - 1.748V
0.85V Rail on Board 2 : Normal - 0.825V
1.5V Rail on Board 2 : Normal - 1.456V
0.85V Rail 2 on Board 2 : Normal - 0.825V
--------------------------------------------------------------------------------------
Signals
--------------------------------------------------------------------------------------
Power Good on Board 1 - Value : High
Fault on Board 1 - Value : Low
Warning on Board 1 - Value : Low
Enable_L on Board 1 - Value : Low
External Fault_L on Board 1 - Value : Low
Warning on Board 2 - Value : Low
--------------------------------------------------------------------------------------
```

Closed Loop Margining

- Displays a list of all the rails that are configured for closed loop margining in a system
- Option to Margin High, Low, Vout or Disable
  - Option to margin a single rail or all rails in a system
  - Margin based on the thresholds defined in the configuration
- Update margining thresholds by percentage

```
Enter 'a' to margin all rails, 's' to margin a single rail, 'u' to update margin percentage: s
0. 1.2V Rail on Board 1
1. 1.1V Rail on Board 1
2. 1V Rail on Board 1
3. 0.9V Rail on Board 1
4. 0.9V Rail 2 on Board 1
5. 1.8V Rail on Board 1
6. 0.85V Rail on Board 1
7. 1.5V Rail on Board 1
8. 0.85V Rail 2 on Board 1
9. 1.2V Rail on Board 2
10. 1.1V Rail on Board 2
11. 1V Rail on Board 2
12. 0.9V Rail on Board 2
13. 0.9V Rail 2 on Board 2
14. 1.8V Rail on Board 2
15. 0.85V Rail on Board 2
16. 1.5V Rail on Board 2
17. 0.85V Rail 2 on Board 2
Select rail to margin (0-17): 16
Enter margin type (e.g. High, Low, Vout, Disable): high
Rail margined - high
```

Blackbox

- Read and display Blackbox information for all the ADM1266 in a system
  - Data from all the ADM1266 are combined and displayed as system information
  - User defined rail and signal names are read back from ADM1266 and displayed
  - Fault statuses are displayed based on priority (OV, UV, Normal, Disabled)
  - Option to read and display specific or all Blackbox records
- Additional information such as power-up counter, fault time, configuration name are displayed
- Option to erase Blackbox records

```
1 records found
Enter the record number you want to read, or type A for all, or type C for clearing the blackbox : 1


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Summary
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Configuration Name - '2 Board Demo'
Record ID : 38922
Power-up Counter : 237
Time : 0:00:00
Trigger Source : Enable Blackbox[1] in 'Power Ok' state
Previous State : ST_0.85V Rail 2 on Board 2
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Rails
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ADJ Rail 1 on Board 1 : OV
------------------------------------------------------------------------
12V Main : Normal
ADJ Rail 2 on Board 1 : Normal
5V Rail on Board 1 : Normal
1.2V Rail on Board 1 : Normal
3.275V Rail on Board 1 : Normal
1.1V Rail on Board 1 : Normal
3V Rail on Board 1 : Normal
1V Rail on Board 1 : Normal
2.5V Rail on Board 1 : Normal
0.9V Rail on Board 1 : Normal
2V Rail on Board 1 : Normal
0.9V Rail 2 on Board 1 : Normal
1.8V Rail on Board 1 : Normal
0.85V Rail on Board 1 : Normal
1.5V Rail on Board 1 : Normal
0.85V Rail 2 on Board 1 : Normal
ADJ Rail 1 on Board 2 : Normal
ADJ Rail 2 on Board 2 : Normal
5V Rail on Board 2 : Normal
1.2V Rail on Board 2 : Normal
3.275V Rail on Board 2 : Normal
1.1V Rail on Board 2 : Normal
3V Rail on Board 2 : Normal
1V Rail on Board 2 : Normal
2.5V Rail on Board 2 : Normal
0.9V Rail on Board 2 : Normal
2V Rail on Board 2 : Normal
0.9V Rail 2 on Board 2 : Normal
1.8V Rail on Board 2 : Normal
0.85V Rail on Board 2 : Normal
1.5V Rail on Board 2 : Normal
0.85V Rail 2 on Board 2 : Normal
------------------------------------------------------------------------
Signals
------------------------------------------------------------------------
Power Good on Board 1 - Input Value : Low - Output Value : High
Fault on Board 1 - Input Value : Low - Output Value : Low
Warning on Board 1 - Input Value : Low - Output Value : Low
Enable_L on Board 1 - Input Value : Low - Output Value : Low
External Fault_L on Board 1 - Input Value : Low - Output Value : Low
Warning on Board 2 - Input Value : Low - Output Value : Low
```

Open Loop Margining

- Automatically calculates the DAC range and code based on the user entered DAC output voltage

- Checks if the DAC is configured for open loop margining
  - Gives the user option to convert DAC used for closed loop margining to open loop margining