PMBus Application Profiles for PoLs

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What is a PMBus Application Profile?

- Describes typical command functions used in systems
- Provides compatible functionality across device vendors
- Uses commands common to many devices
- Example app profiles on PMBus website
  - PMBus Application Profile for AC/DC Server Power Supplies
  - PMBus Application Profile for Hot Swap Controllers
Goals for this Rev of PoL App Profile

• Assist the system designer in selecting PMBus PoL devices
• Provide common set of commands
  – Commands pertinent to typical system functions
• Allow the user to create reusable code
• Be inclusive of legacy devices currently in market
Functions in the PoL App Profile

• Three levels of profile
  – Level 0: Control
  – Level 1: Control + Telemetry
  – Level 2: Control + Telemetry + Configuration

• Run-time system functions
  – Device specific configuration may be required during production
Key Features

- Device identification
- Enable/Disable Regulation
- Output voltage setting
- Regulation status
Level 0 Application Profile

Control

• Device identification from IC_DEVICE_ID/REVISION
  – MFR_ID/REV allowed in legacy devices
• On/off control using OPERATION and ON_OFF_CONFIG
• Output voltage control via VOUT_MODE and VOUT_COMMAND
• Status indication with bits in STATUS_BYTE and STATUS_WORD
• Fault indication control through CLEAR_FAULTS
Level 1 Application Profile

Control + **Telemetry**

- All functionality found in Level 0 app profile
- Read telemetry data
  - Vout, Iout and temperature 1
- Communication fault indication via STATUS_CML
- PMBus revision using PMBUS_REVISION
Level 2 Application Profile
Control + Telemetry + **Configurability**

- All functionality found in Level 0 and 1 app profile
- Voltage margining
  - More bits in OPERATION
  - VOUT_MARGIN_HIGH/LOW commands
- Configuration memory using STORE/RESTORE_USER_ALL
  - STORE_DEFAULT_ALL allowed in legacy devices
Normal Practices

• Bitwise command writes: read – change bit - write
• Device identification is required
  – IC_DEVICE_ID is default identifier
  – MFR_ID may be used with legacy devices
• SMBus operation >100kHz requires CAPABILITY command
• Multipage devices will require PAGE command
Assumptions

• Linear or Direct format indicated by VOUT_MODE for all numbers
• Device datasheet should include detail on rounding
  – Inform customer about expected readback data
• Device vendor must provide production configuration detail
• Command design and usage guidance in application note
• PEC support is required for this app profile
  – Use of PEC by the system is optional
For the Vendors: Preferred PMBus Commands

• IC_DEVICE_ID for unique device identification
  – Block command filled with ASCII hex
  – Manufacturer should be clear from this data, i.e. part number

• STORE_USER_ALL for single store implementation
Resources

• [http://pmbus.org/Specifications/ApplicationProfiles](http://pmbus.org/Specifications/ApplicationProfiles)
• [http://pmbus.org/Home](http://pmbus.org/Home)
• [http://smiforum.org/](http://smiforum.org/)
Thank you!

Questions?