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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





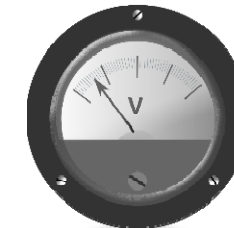
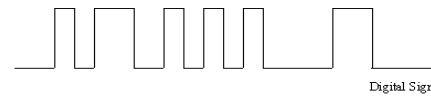
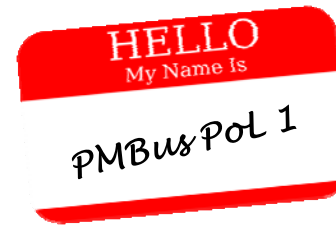
Functions in the PoL App Profile

- 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



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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



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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





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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



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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



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- <http://pmbus.org/Specifications/ApplicationProfiles>
- <http://pmbus.org/Home>
- <http://smiforum.org/>





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Thank you!

Questions?

