

<i><b>In this issue:</b></i>	<i><b>page</b></i>
Introduction .....	1
Membership Updates .....	1
New Product Announcements .....	2
Website Updates .....	4
Promotional Activities .....	4
Upcoming Events.....	4
FAQ.....	4
Other Items .....	5

### ***Introduction***

The PMBus<sup>®</sup> Conference was held on September 11-12 last month in Dallas. Attendees included both members and non-members from semiconductor suppliers, power supply manufacturers and end system OEMs. In addition to presentations, there were open discussions amongst the attendees regarding the future directions of the PMBus specifications.



The conference was opened with a keynote speech by Travis Summerlin of Texas Instruments, who is the lead director of the SMIF consortium. Travis presented a summary of open source standards initiatives along with an historical narrative of the PMBus protocol from conception to date.

During the 2 days there were presentations addressing software tools and tips, configuration techniques, application profiles and usage and AVSBus details and evolution.

The conference was wrapped up with a review of the PMBus roadmap and a discussion of future physical transport layers.

A summary of the 11 Conference presentations along with the authors' biographies can be found by clicking [here](#). The full presentations have been posted in the Adopters section of the PMBus.org website. Please use your ID and password to login and view or download the presentations. If you need assistance logging in, please contact [admin@simforum.org](mailto:admin@simforum.org).

### ***Working Group Update.***

In conjunction with the conference, the Working Groups held face-to-face meetings before and after the event. On Monday, September 10<sup>th</sup> the multi-point AVSBus specification was launched, led by Chris Eckhoff of Maxim. Wednesday afternoon and Thursday morning Oleg Volfson of Flex and Kris Dehnel of Intel led the WG meeting addressing application profiles for DC/DC and Front-End power solutions.

Please feel free to contact the WG leaders if you would like to contribute, or send an email to [questions@smiforum.org](mailto:questions@smiforum.org).

### ***Membership Updates***

We are pleased to announce another new member to the PMBus consortium, MaxLinear (see below). PMBus membership now stands at 46 members, comprised of 44 "Full Members" and 2 "Tools Members". We have several other interested companies who also attended the Dallas conference and expect to make announcements in the coming months.

**MaxLinear** delivers high-performance broadband and networking semiconductors based on its highly integrated radio frequency analog technology, high-performance optical networking technology and its pioneering MoCA and Direct Broadcast Satellite ODU single-wire technology. Founded in 2003, The company's original high performance, radio-frequency receiver products capture and process digital and analog broadband signals for applications including terrestrial, cable and satellite television and DOCSIS broadband. These products include both RF receivers and RF receiver systems-on-chip, or SoCs, which incorporate highly integrated radio system architecture and demodulator technology. The company's products were based on its pioneering low power, low cost CMOS process technology.

Interested in joining PMBus? Get a detailed description of the System Management Interface Forum and membership benefits by clicking [PMBus Organization Overview](#). Or, just send an email to [admin@smiforum.org](mailto:admin@smiforum.org) to get immediate answers to specific questions.

### *New Product Announcements*

**Analog Devices** announced the Power by Linear™ LTM4678 dual 25A or single 50A step-down  $\mu$ Module® regulator with PMBus digital interface. The LTM4678 integrates a dc-dc controller, EEPROM, power FETs, inductors and supporting components in a 16mm x 16mm x 5.86mm BGA package. Output voltage accuracy of  $\pm 0.5\%$  is guaranteed over line, load and temperature (-40°C to 125°C).

Onboard EEPROM and PMBus I<sup>2</sup>C enables a user to measure, alter and record key power parameters such as voltage, load current, temperature and sequencing. Five LTM4678s can current share at 50A each to deliver up to 250A to loads such as processors, FPGAs and ASICs. Applications include PCIe boards, communication infrastructure, cloud computing, optical as well as medical, industrial and test and measurement devices.

**Analog Devices** announces the Power by Linear™ LTM4686, a dual 10A or single 20A ultrathin step-down  $\mu$ Module® regulator with a PMBus interface housed in a 16mm x 11.9mm x 1.82mm LGA package. The 1.82mm package height allows the LTM4686 to be placed on a PC board very close to its load such as an FPGA or ASIC, while sharing one heat sink covering both low-profile packages. The ultrathin package allows the LTM4686 to be mounted on the backside of a PCB, freeing topside space for components such as memory and transceiver ICs. The PMBus interface enables users to measure and alter key power parameters such as voltage, load current and temperature. Users can also program sequencing, fault thresholds and responses via PMBus, storing values and fault log data in the onboard EEPROM.

The LTM4686 operates from 4.5V to 17V and the LTM4686-1 from 2.375V to 17V input supplies. These modules regulate an output from 0.5V to 3.6V with  $\pm 0.5\%$  maximum DC output error over temperature, -40°C to 125°C. They deliver 80% efficiency at 12VIN to 1.0VOUT at a full load condition. The LTM4686 can deliver 18A from a 5VIN to a 1VOUT at 85°C ambient

with 400LFM air flow. Current mode control enable operation in a parallel configuration, to deliver increased output current. Its internal switching frequency is settable from 250kHz to 1MHz and can be synchronized to an external clock from 250kHz to 1MHz for noise-sensitive applications.

**Delta** announced the new MEG series of configurable power supplies designed for both medical and industrial applications. The first release of MEG series is MEG-2K1A6 with a total output power of 2.1 kW that can support up to 6 isolated outputs. The outputs can be configured between 2Vdc to 60Vdc and output current up to 45A with a single slot single output module.

The MEG series come with universal ac input from 90Vac to 264Vac and wide operating temperature of -20°C to +70°. Additional features include current sharing, PC GUI for easy parameter setting and monitoring, and intelligent fan speed control. Communication adapters are available to convert PMBus to USB, RS232 or RS485 according to the system requirement.

**Renesas Electronics Corporation** introduced two new PMBus<sup>™</sup> compliant, fully digital DC/DC controllers that provide single output point-of-load (POL) conversions for FPGAs, DSPs, ASICs, network processors and general-purpose system rails. The ISL68300 with integrated MOSFET drivers and ISL68301 with PWM output simplify designing power supplies for data center, wired and wireless communications, and factory automation equipment. The ISL68300 can drive discrete external MOSFETs directly, while the

ISL68301 pairs with Renesas' smart power stages or DrMOS power stages to create a complete voltage regulator solution.

The ISL68300 and ISL68301 digital controllers feature a high-speed current share bus that parallels up to eight controllers in an 8-phase 240A+ current share configuration. Both controllers implement Renesas' digital ChargeMode<sup>™</sup> control modulation, which responds to load transients in a single switching cycle, and provides an inherently stable control loop without requiring external compensation.

**TDK Corporation** has announced the introduction of the TDK-Lambda brand QS series of single output medical and industrial AC-DC power supplies. Rated at 600 to 1200W output power, these high efficiency products utilize low speed fan cooling, significantly reducing acoustical noise. The QS series has been certified to both medical and industrial safety standards and are suitable for a wide range of applications, including BF rated medical equipment, test and measurement, broadcast, communications and renewable energy applications.

Operating from a wide range 90- to 264-Vac input, the QS is available with three standard output voltages: 12V, 24V and 48V. The QS5 delivers 600W, the QS5H can deliver between 1080 to 1200W with an input voltage of 180-Vac or greater and 700W below 180-Vac. The QS7 is rated at 1200W over the full input voltage range. An optional standby/signal can be selected with a choice of one or two 5V standby voltages, unit

inhibit or unit enable and a PMBus™ interface.

If your company has new products that you would like to be included in our next newsletter, just send an email with the subject line “new product(s)” and the details to [admin@smiforum.org](mailto:admin@smiforum.org). Then watch this space for updates.

### Website Updates

There are now 388 PMBus listings on our members’ *Products* pages from 26 different companies. The items include PMBus-compliant products as well as other supporting material such as evaluation kits, reference designs, articles and videos. We encourage you to contact us when you are ready to include or update your company’s product listings.

The dedicated *Products* pages are one of the benefits of PMBus membership. They enable our members to identify and promote all of their PMBus-compliant products.

You can click [here](#) to see an example of the [TDK-Lambda Products](#) page. Be sure to utilize the “Featured Product”, option which includes graphics on your company’s page. Please send any request for changes to [admin@smiforum.org](mailto:admin@smiforum.org).

### New Website.

Development of our new PMBus website is near conclusion. In addition to a new ‘look & feel’, the site features advanced functionality to help sort/filter to locate products, simplified usability for content updates and integrated contact database for subscription and email.

For those of you on our mailing list, you will receive an email notification as soon as the new website is launched.

### Promotional Activities

We invite you to join the [PMBus Group](#) on LinkedIn. In the future we will be utilizing the platform for new product announcements, meeting notifications and other newsworthy items.

### Upcoming Events

Mark your calendars to visit the PMBus booth #226 at the upcoming **APEC 2019 Conference & Expo**, March 17-21, 2018 in Anaheim, CA.

### FAQ

This newsletter’s *Frequently Asked Question* section includes a recently received multi-part AVSBus question along with the detailed answer.

**Question:** *I am implementing a slave device in my AVSBus design and have some questions regarding Part III Rev.1.3.1 of the PMBus specification.*

1. *How exactly do I confirm the CRC? Do I apply the CRC only the first 29 bits, and then shift in the remaining 3 bits untouched, and then do a comparison?*
2. *Do you have an online CRC validator, similar to the Java one you had for PMBus PEC? Or a software model?*
3. *If a master holds AVS\_Clock low during idle, does that mean the very first clock it issues for the next transaction must*

have AVS\_MData high so that it can generate a <StartCode> (i.e. AVS\_MData is low) on the second clock?

### **Answers, in order:**

1. That is one way: Recompute the CRC and compare it against what the sender computed. The results must match.
2. At this point we do not have an online CRC validator. However, a Java model would not be that difficult to create and make available, just as the one for PEC. Depending on how that one was created, it may be possible to extend it so that you can invoke it for either, and a parameter chooses which polynomial to use.
3. Keeping the clock low while idle is not a good idea. Aside from the fact that the specification calls for the clock to be high, if you keep it low it would be possible for glitches to be injected into the clock trace, causing the slave to [potentially] get out of sync.

Have a question about the PMBus or SMBus specifications? SMIF provides free answers. Send your question to

[techquestions@smiforum.org](mailto:techquestions@smiforum.org) and a PMBus or SMBus consultant will respond.

### **Other Items**

The PMBus name and logo are registered trademarks of SMIF. PMBus adopters who are SMIF members in good standing are allowed free, unlimited commercial use of the PMBus name and logo. Proper usage of the name and logo is important in order to retain our rights. Please encourage your company's marketing communications department to collaborate with SMIF whenever there are publications or questions.

Please remember to use the ® symbol when referencing PMBus and the ™ symbol with AVSBus in data sheets, press releases or other written material. It should be included in any title or blurb and with the first usage in the main text for articles. The logo graphics for web postings and hi-res print can be downloaded from the [resources](#) section of the PMBus website.

### **Contacts:**

Membership inquires: [admin@smiforum.org](mailto:admin@smiforum.org)

Tech help: [techquestions@smiforum.org](mailto:techquestions@smiforum.org)

General: [questions@smiforum.org](mailto:questions@smiforum.org)

*PMBus and AVSBus name and logo are trademarks of SMIF, Inc. Commercial use of the PMBus or AVSBus name or logo is restricted to PMBus adopters. Commercial use is defined as any activity related to the promotion and sales of products and/or services, including claims of compliance. A PMBus adopter is defined as any company who is a member in good standing of SMIF, Inc., and has signed and submitted the PMBus adopters' agreement to SMIF.*