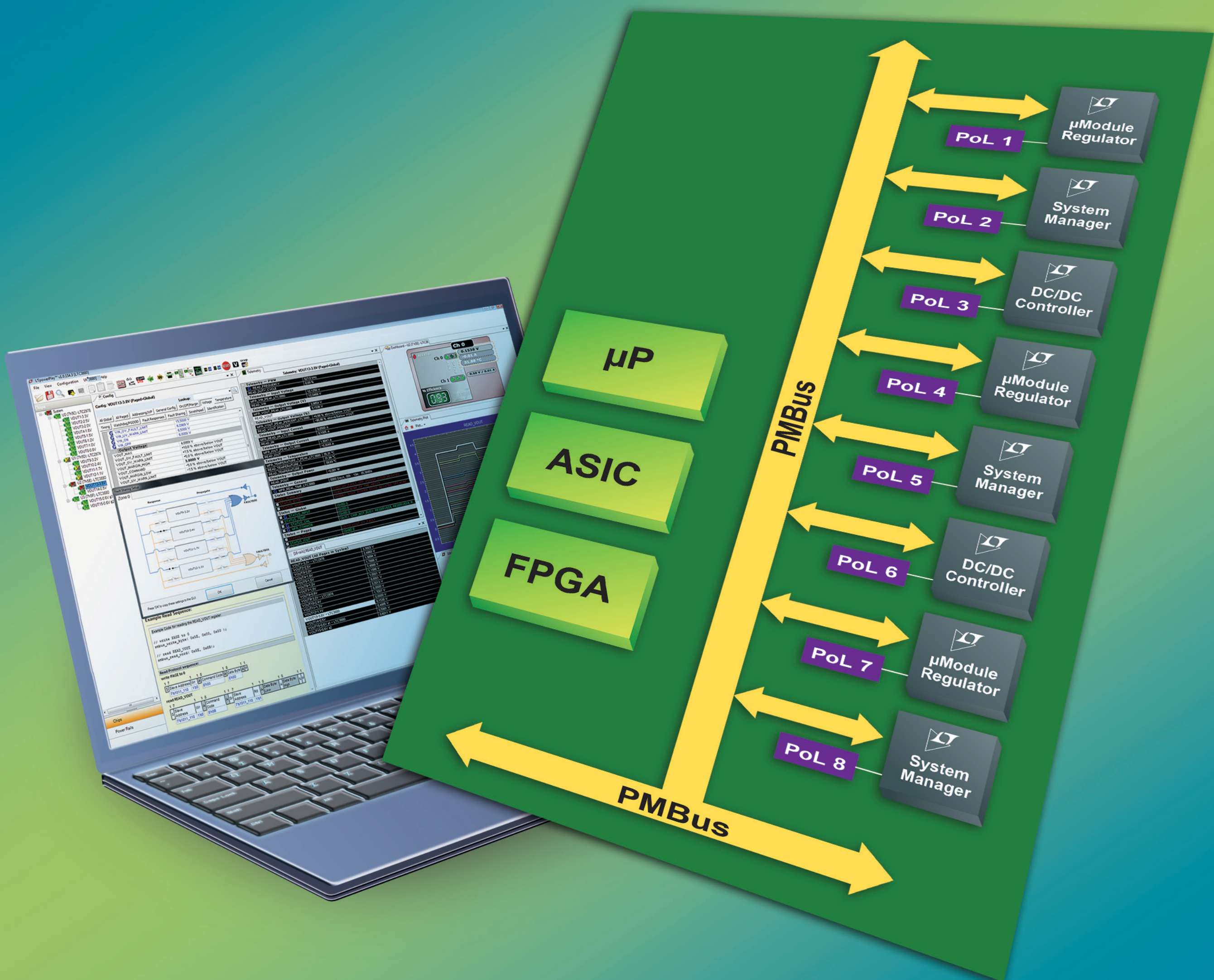
POWER SYSTEM MANAGER AND SUPER SEQUENCER SELECTION GUIDE



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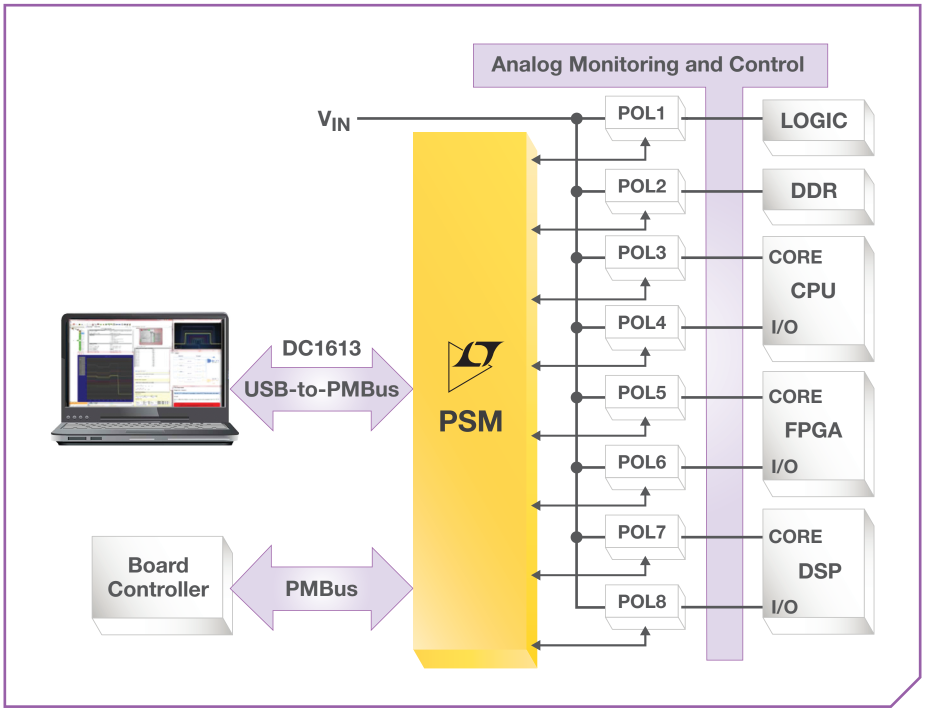
Power System Management

What is PSM?

Power System Management (PSM) adds digital control, telemetry, and black-box fault recording to analog DC/DC power converters. Devices with PSM provide the following capabilities:

- Digital monitoring and data-logging of voltage, current, power, energy and temperature
- Autonomous trimming, margining, sequencing, supervision, fault-logging, and management of multiple point-of-load supplies
- Software management of power supplies
- System level coordination
- On-the-fly adjustment of configuration parameters
- Remote supervision and command of a power system
- Industry standard I²C/SMBus/PMBus interface



Power System Management

System Level Benefits

- Monitor and predict energy use vs. system load and traffic. Optimize performance vs. energy consumed by managing power domains, load shedding, and tweaking supply voltages.
- Improve board reliability by precisely controlling power supplies over time and temperature. Continuously monitor and correlate board failure to EEPROM fault logs (black-box recorder).
- Avoid failures by monitoring board health in real-time to predict board aging and replacement.
- Maintain a high reliability power system by providing field upgrades via firmware and controlling the power system remotely.

Design Level Benefits

- PSM brings rapid prototyping and tweaking to power supplies.
- Easily trim, margin, sequence, supervise, fault-log/manage, and monitor multiple rails with one product.
- Margin power supplies to improve reliability, increase yield and test FPGA/ASIC timing.
- Reduce design and firmware development costs.
- Improve time-to-market by avoiding costly board respins.
- Get complete access to board level diagnostics.
- Replace discrete circuitry with a space-saving integrated solution.

PSM Features

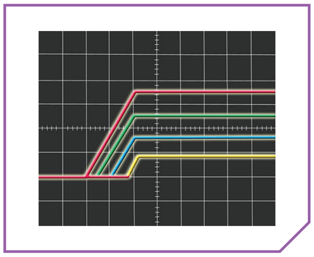
Power System Management products offer cutting edge features, such as the ability to trim, margin and monitor power supply outputs to ±0.25% accuracy (guaranteed over temperature) and coordinated sequencing and fault management across multiple supported devices. They are complete, ready-to-use solutions architected by power supply experts. A digital I²C/SMBus interface enables easy communication and many devices use an industry standard PMBus compliant command set. Autonomous operation and black-box, nonvolatile fault logging is possible using onboard EEPROM. The broad product line forms a comprehensive portfolio including Power System Managers, DC/DC Converters with Power System Management, and fully integrated DC/DC µModule® Regulators with Power System Management.

Development Tools

With today's increasingly complex power systems, tools to design and troubleshoot are more important than ever. The LTpowerPlay® GUI, an engineering level development environment with remote debug capability and integrated help, provides the tools necessary to efficiently design, develop, characterize, and debug any size power system, from large to small. The ADI Power Studio's intuitive graphical user interface enables rapid creation of new configurations for Super Sequencer devices, helps design custom state machines, and significantly reduces development time.

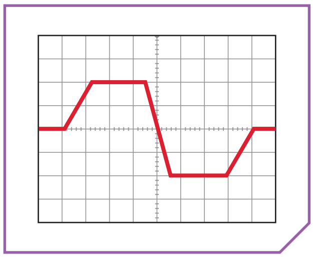
Several programming options are available for configuring PSM devices with customized, application-specific configurations. These include factory NVM programming services, in-circuit programming, and JTAG.

Power System Management Functions



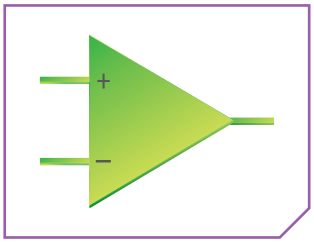
Sequence

A sequencer controls the ENABLE or RUN pins of multiple power supplies. It powers a system up and down in the correct order with appropriate dependencies and delays between channels. The order of sequencing, the dependencies that must be satisfied before continuing, and the delays are all user programmable.



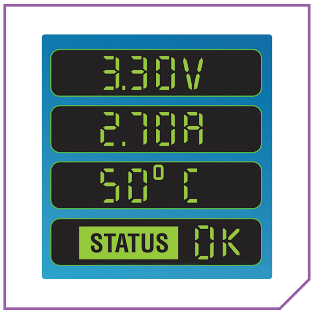
Trim (Servo) and Margin

A servo loop digitally adjusts the output voltage of a power supply, trimming it to the desired value and achieving tighter DC accuracy than possible with the power supply alone. Device-specific binning or VID can be applied to a load. Margining the power supplies during board test improves manufacturing quality.



Supervise

A supervisor detects fault conditions by monitoring a power supply for excursions above and below programmable thresholds. Supervision can apply to voltage, current, temperature, or any other measured parameter. When a fault is detected, a programmable response is rapidly activated to shut down the system, notify the board controller and log the fault.

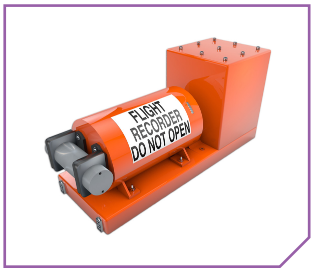


Monitor Telemetry

The current state of a power system is visible through telemetry data. Some of the many parameters available to read include voltage, current, power, temperature, and status. Telemetry is useful during board bring-up and debug, to monitor power and energy consumption, and to determine the overall health of a power system.

Manage Faults

Programmable fault responses protect a system by shutting it down in a coordinated and orderly fashion, notifying other devices in the system that a fault occurred, and restarting the system automatically when the fault is removed.



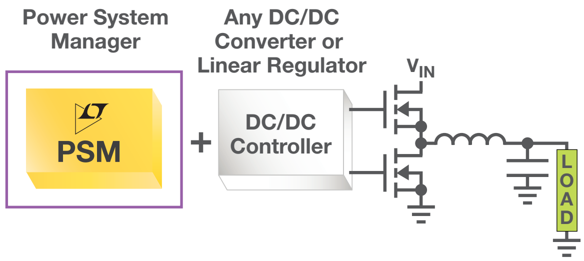
Create Fault Logs

Fault logs provide a historical record of the events that occurred in a power system. They can be used during board bring-up and debug to capture the events leading up to a fault. In the field, black-box, nonvolatile fault logs provide valuable information that aids in failure analysis of customer returns.

Power System Management Device Types

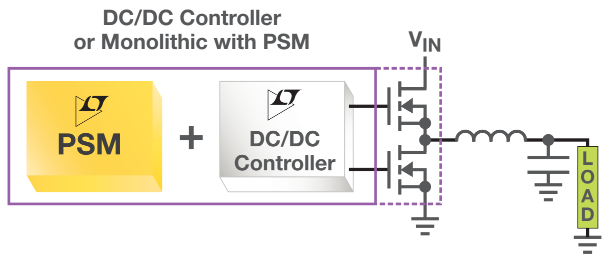
Power System Managers and Super Sequencers

- Manage any adjustable point-of-load power supply
- Trim, margin, sequence, supervise, manage faults, monitor telemetry, and record fault logs
- Read back voltage, current, power, energy, temperature, and faults



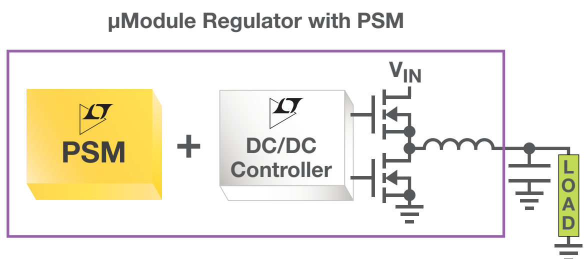
DC/DC Converters with PSM

- Fast analog feedback loop with digital telemetry and control
- Trim, margin, sequence, supervise, manage faults, monitor telemetry, and record fault logs
- Program output voltage, current limit, frequency, and ramp rate
- Read back voltage, current, power, duty cycle, temperature, and faults

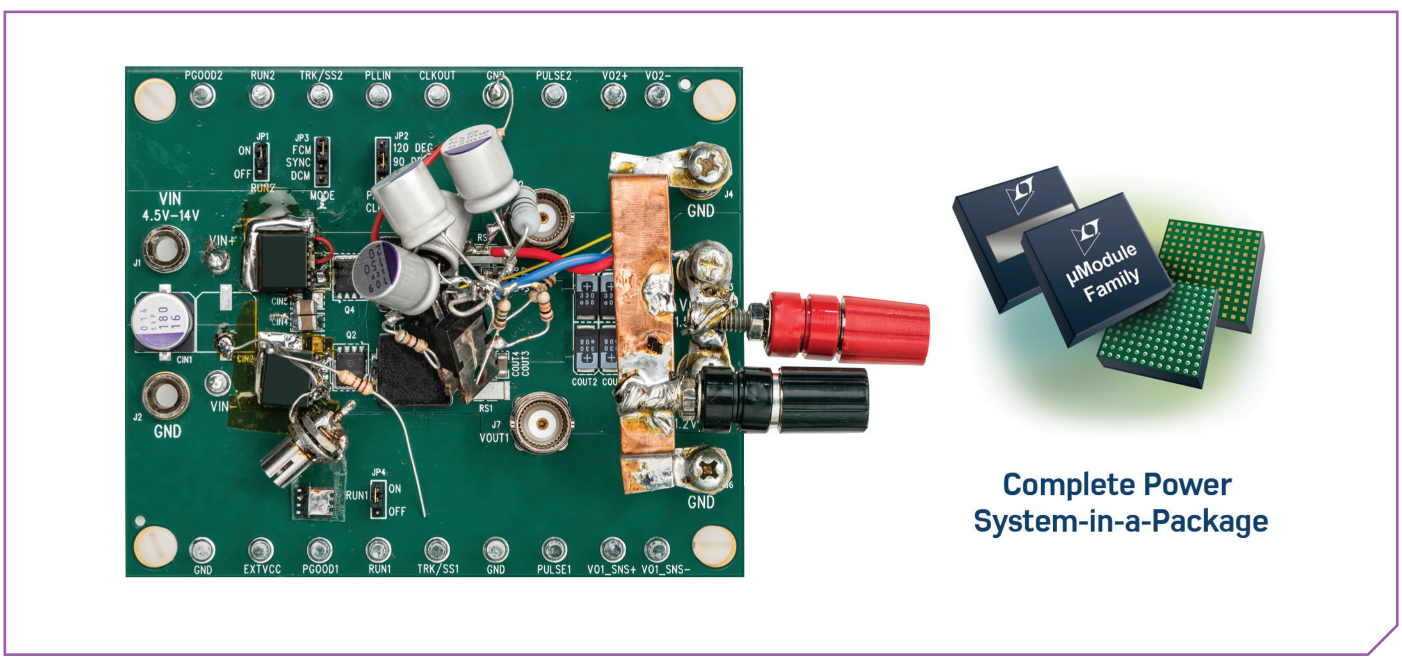


DC/DC µModule Regulators with PSM

- Fully integrated power functions in a compact package
- Fast analog feedback loop with digital telemetry, and control
- Trim, margin, sequence, supervise, manage faults, monitor telemetry, and record fault logs
- Program output voltage, current limit, frequency, and ramp rate
- Read back voltage, current, power, duty cycle, temperature, and faults



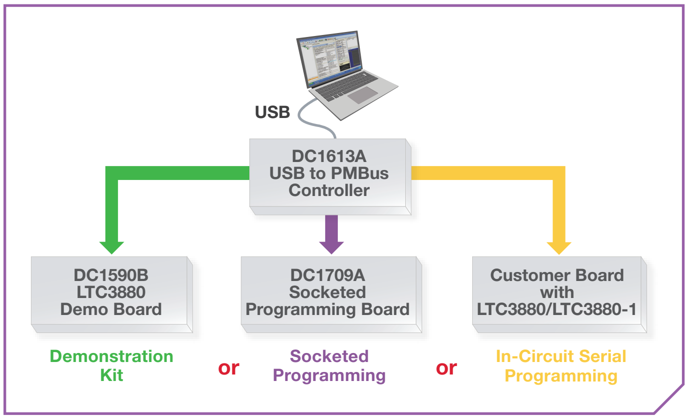
Simple and Done



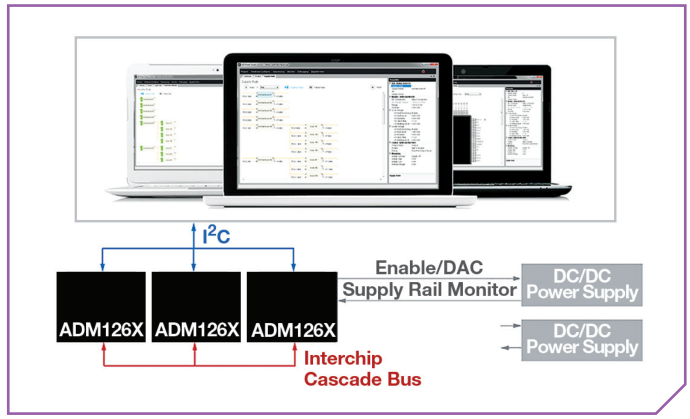
Complete Power System-in-a-Package

Graphical User Interface

The comprehensive LTpowerPlay and ADI Power Studio graphical user interface (GUI) tools provide a rich set of features to accelerate all phases of design and development. They can operate off-line, or in real-time, communicating over the I^2C bus with a complete system containing from one to hundreds of power supply rails.



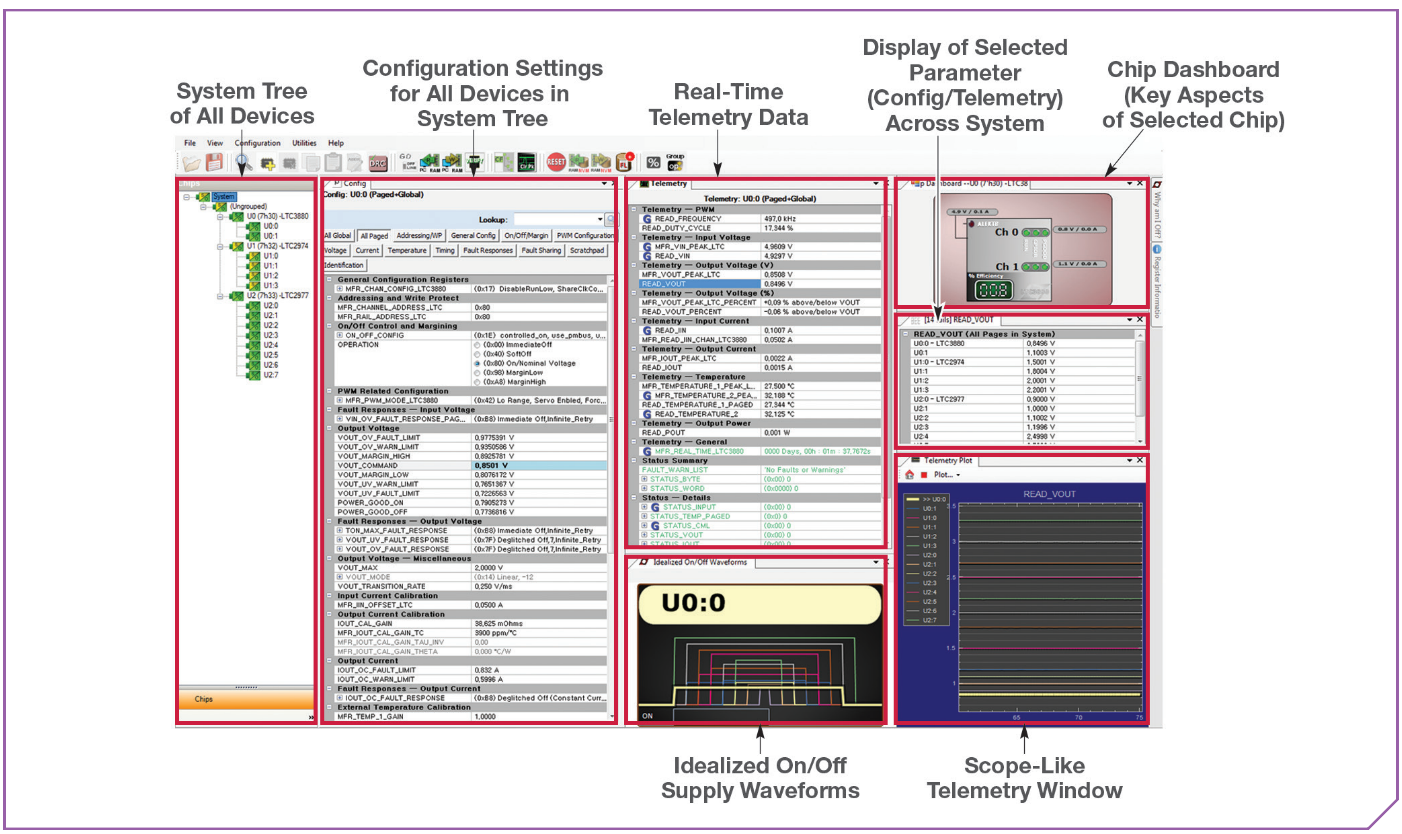
LTpowerPlay



ADI Power Studio

LTpowerPlay simplifies and streamlines generation of complex configurations by providing detailed information about registers and functions. It graphically represents all of the configuration, status, and telemetry information available in the system, making it clear and understandable while the system is operating. When faults occur, LTpowerPlay makes it easy to see where the fault happened, and what the status, telemetry, and black-box information indicate about what happened. It also provides detailed debugging help for common fault scenarios. In the event that someone needs a helping hand, LTpowerPlay has the ability to call for help, enlisting a live support person who can view the GUI running in real time and see what you see.

The ADI Power Studio's intuitive graphical user interface, along with the interchip cascade bus (ICB) makes multiple individual parts act like one single part. The user can design a virtual state machine, and the GUI compiles the state machine and programs each part with the corresponding actions and ICB communications. Wizards in the GUI help developers quickly create new configurations, significantly reducing development time. The intuitive GUI helps configure a powerful and flexible sequence engine to create complex state machines. Breakpoints, telemetry and black-box information help with detailed debugging, identifying fault scenarios and reducing development time.



LTpowerPlay GUI

Power System Manager Selection Guide

Feature Overview

Part Number	Power Supply Channels	Sequence	Trim and Margin	Supervise	Monitor Telemetry	Manage Faults	Create Fault Logs
LTC2972	2	•	•	•	•	•	•
LTC2974	4	•	•	•	•	•	•
LTC2975	4	•	•	•	•	•	•
LTC2977	8	•	•	•	•	•	•
LTC2979	16	•	•	•	•	•	•
LTC2980	16	•	•	•	•	•	•
LTM2987	16	•	•	•	•	•	•
ADM1260	10	•	•[1]	•	•	•	•
ADM1166	10	•	•[1]	•	•	•	•
ADM1168	8	•		•		•	•
ADM1169	8	•	•[1]	•	•	•	•
ADM1062	10	•	•[1]	•	•	•	
ADM1063	10	•		•	•	•	
ADM1064	10	•		•	•	•	
ADM1065	10	•		•		•	
ADM1066	10	•	•[1]	•	•	•	
ADM1067	10	•	•[2]	•		•	
ADM1068	8	•		•		•	
ADM1069	8	•	•[1]	•	•	•	
LTC2970	2		•		•	•	
LTC2933	6			•		•	•
LTC2936	6			•		•	•
LTC2937	6	•		•		•	•
LTC4151	1				•		
LTC2945	1			•	•		
LTC2946	1			•	•		
LTC2947	1			•	•		
LTC2990	4				•		
LTC2991	8				•		
LTC2992	2			•	•		

[1]The ADC and DACs can be used with other intelligence, such as a microcontroller, to implement a closed-loop margining system.
[2]Only supports open-loop margining since there is no ADC.

Sequencing Functions

Time-based sequencing uses basic time delays to enable and disable power supplies. It is simple, easy to understand, and very deterministic.

Cascade sequencing uses the power good output of one power supply to enable the next power supply in a sequence. Power-on time can be faster than with time-based sequencing. Fixed time intervals are used to disable the power supplies.

Event-based sequencing is similar to cascade sequencing, but allows other logic signals or conditions to participate in both the power-up and power-down sequences. It provides the fastest power-up and power-down time and is highly flexible, allowing signals unrelated to the power supply to participate in, or hold off, the sequencing.

Communication between devices allows a system with multiple Power System Managers to power up and down in a coordinated manner. A shared timebase ensures coherency of any time delays in the sequencing.

Part Number	Sequencing Channels	Time-Based Sequencing	Cascade Sequencing	Event-Based Sequencing	Inter-Device Coordination	Shared Time Base (SHARE_CLK)
LTC2972	2	•	•		•	•
LTC2974	4	•	•		•	•
LTC2975	4	•	•		•	•
LTC2977	8	•			•	•
LTC2979	16	•			•	•
LTC2980	16	•			•	•
LTM2987	16	•			•	•
ADM1260	10		•	•	•	
ADM1166	10		•	•		
ADM1168	8		•	•		
ADM1169	8		•	•		
ADM1062	10		•	•		
ADM1063	10		•	•		
ADM1064	10		•	•		
ADM1065	10		•	•		
ADM1066	10		•	•		
ADM1067	10		•	•		
ADM1068	8		•	•		
ADM1069	8		•	•		
LTC2937	6	•		•	•	•

Trim and Margin Functions

Trimming improves the accuracy of a power supply by servoing the output voltage to the desired value, compensating for initial inaccuracy, temperature drift, and component aging. The Total Unadjusted Error (TUE) of the Power System Manager determines the final accuracy of the output voltage. The same servo loop can be used to adjust the nominal voltage of the power supply, as well as margin the power supply rails during board test to improve overall test coverage and product quality.

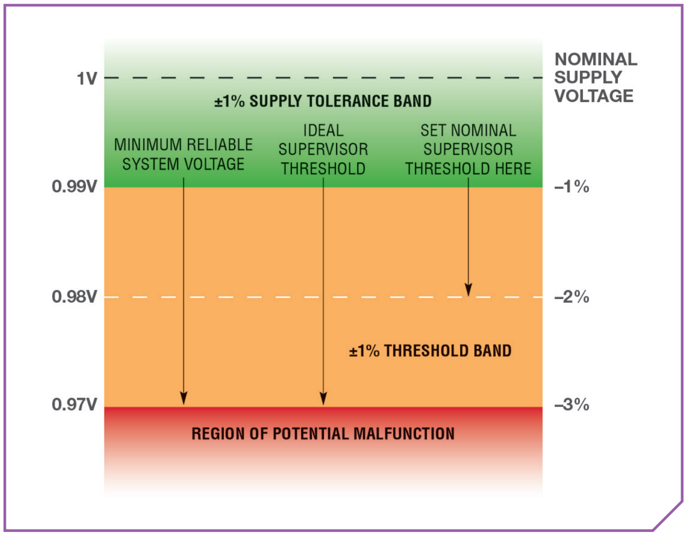
Devices with an automatic servo loop contain all of the necessary logic to close the loop around the power supply. The ADC results are used to adjust the DAC output automatically, trimming the power supply output voltage to the desired value. With a manual servo loop, a microcontroller or other logic is used to close the loop external to the Power System Manager. An open loop device does not have an ADC, so the DAC is set to a predetermined value to move the power supply output to the desired voltage.

Part Number	Trim/Margin Channels	Closed Loop Total Unadjusted Error (TUE)	DAC Resolution	DAC Type	Servo Loop
LTC2972	2	0.25 %	10-Bit	Voltage	Automatic
LTC2974	4	0.25 %	10-Bit	Voltage	Automatic
LTC2975	4	0.25 %	10-Bit	Voltage	Automatic
LTC2977	8	0.25 %	10-Bit	Voltage	Automatic
LTC2979	16	0.5 %	10-Bit	Voltage	Automatic
LTC2980	16	0.25 %	10-Bit	Voltage	Automatic
LTM2987	16	0.25 %	10-Bit	Voltage	Automatic
ADM1260	6	0.4 %	8-Bit	Voltage	Manual
ADM1166	6	0.4 %	8-Bit	Voltage	Manual
ADM1169	4	0.4 %	8-Bit	Voltage	Manual
ADM1062	6	0.4 %	8-Bit	Voltage	Manual
ADM1066	6	0.4 %	8-Bit	Voltage	Manual
ADM1067	6	N/A	8-Bit	Voltage	Open Loop
ADM1069	4	0.4 %	8-Bit	Voltage	Manual
LTC2970	2	0.5 %	8-Bit	Current + Voltage	Automatic

Supervision Functions

Supervisors detect excursions of the power supply output voltage, current, or temperature beyond preset thresholds. The output of the supervisor is typically used to shut down the power supply, notify the system of the fault, and take appropriate action. A fast response time minimizes the potential damage to the power supply or load.

The Total Unadjusted Error (TUE) of a voltage supervisor determines the maximum variation in the power supply output that can be tolerated under normal conditions without falsely tripping the supervisor. A smaller supervisor TUE relaxes the requirements for both the DC accuracy and the transient response of the power supply.



Part Number	Supervision Channels					Worst Case Voltage Supervisor Total Unadjusted Error (TUE)	Typical Response Time
	Voltage			Current	Temperature		
	< 6V	< 15V	> 15V				
LTC2972	2	1			2 External	1.5 %	12 µs
LTC2974	4	1		4	4 External	1.5 %	12 µs
LTC2975	4	1		4	4 External	1.5 %	12 µs
LTC2977	8	1			1 Internal	1.5 %	12 µs
LTC2979	16	2			2 Internal	1.5 %	12 µs
LTC2980	16	2			2 Internal	1.5 %	12 µs
LTM2987	16	2			2 Internal	1.5 %	12 µs
ADM1260	9	1				1 %	45 µs
ADM1166	9	1				1 %	10 µs
ADM1168	7	1				1 %	10 µs
ADM1169	7	1				1 %	10 µs
ADM1062	9	1			1 Int + 1 Ext	1 %	10 µs
ADM1063	9	1			1 Int + 2 Ext	1 %	10 µs
ADM1064	9	1				1 %	10 µs
ADM1065	9	1				1 %	10 µs
ADM1066	9	1				1 %	10 µs
ADM1067	9	1				1 %	10 µs
ADM1068	7	1				1 %	10 µs
ADM1069	7	1				1 %	10 µs
LTC2933	5	1				1.5 %	25 µs
LTC2936	6					1 %	7.5 µs
LTC2937	6					1.5 %	10 µs
LTC2945	1		1 (80 V)	1		0.75 %	
LTC2946	1		1 (100 V)	1		0.7 %	
LTC2947		1		1*	1 Internal	0.5 %	
LTC2992	3		2 (100 V)	2		0.8 %	

*Integrated current sense resistor

Monitoring Functions

The monitoring function reads back measured parameters of a power supply system. Some values, like voltage and current, are directly measured while others, like power and energy, are computed inside the Power System Manager using other measured parameters. Differential voltage sensing compensates for IR drops by using two sense lines, resulting in a more accurate measurement of the target voltage. This can be used to accurately sense load voltages that are far away from the power supply or to sense internal core voltages in CPUs and ASICs.

Part Number	Monitoring Channels						
	Voltage			Current	Power	Energy	Temperature
	< 6V	< 15V	> 15V				
LTC2972	2 Differential	1		3	3	1	1 Int + 2 Ext
LTC2974	4 Differential	1		4	4		1 Int + 4 Ext
LTC2975	4 Differential	1		5	5	1	1 Int + 4 Ext
LTC2977	8 Differential	1		4*			1 Internal
LTC2979	16 Differential	2		8*			2 Internal
LTC2980	16 Differential	2		8*			2 Internal
LTM2987	16 Differential	2		8*			2 Internal
ADM1260	9	1					
ADM1166	11	1					
ADM1169	7	1					
ADM1062	9	1					1 Int + 1 Ext
ADM1063	9	1					1 Int + 2 Ext
ADM1064	11	1					
ADM1066	11	1					
ADM1069	7	1					
LTC2970	2	1		2			1 Internal
LTC4151	1		1 (80 V)	1			
LTC2945	1		1 (80 V)	1	1		
LTC2946	1		1 (100 V)	1	1	1	
LTC2947		1		1†	1	1	
LTC2990	5‡			2‡			1 Int + 2 Ext‡
LTC2991	9‡			4‡			1 Int + 4 Ext‡
LTC2992	4		2 (100 V)	2	2		1 Internal

*Not temperature compensated. Available on odd channels only. All other channel features are disabled.
†Integrated current sense resistor.
‡Not all measurements are available at the same time. See data sheet for details.

Fault Management and Logging Functions

The most basic action taken when a fault occurs is to disable the power supply with the fault. Beyond that, the ability to shut down other supplies in the system, including the intermediate bus converter, can prevent out-of-order sequencing when the faulting supply goes down or stop a cascade of faults from causing further damage.

Sharing fault information between devices is an important part of coordinating the fault response across an entire system. Fault sharing may take different forms, from a simple, shared fault pin to a more complex serial communication bus. Autonomous retries allow a system to restart automatically after a fault occurs, in the event the fault was a one-time event.

Fault logging provides a record of the events and system status leading up to a fault. During board bring-up and testing, fault logs provide valuable information to debug problems. In the field, fault logs assist in failure analysis of customer returns.

Part Number	Disable Power Supply On Fault	Disable Intermediate Bus On Fault	Fault Sharing Between Devices	Autonomous Retry	Nonvolatile Fault Logging
LTC2972	•	•	•	•	•
LTC2974	•	•	•	•	•
LTC2975	•	•	•	•	•
LTC2977	•	•	•	•	•
LTC2979	•	•	•	•	•
LTC2980	•	•	•	•	•
LTM2987	•	•	•	•	•
ADM1260	•	•	•		•
ADM1166	•	•[1]			•
ADM1168	•	•[1]			•
ADM1169	•	•[1]			•
ADM1062	•	•[1]			
ADM1063	•	•[1]			
ADM1064	•	•[1]			
ADM1065	•	•[1]			
ADM1066	•	•[1]			
ADM1067	•	•[1]			
ADM1068	•	•[1]			
ADM1069	•	•[1]			
LTC2970	•				
LTC2933	•				•
LTC2936	•				•
LTC2937	•		•	•	•

[1]Uses a programmable driver output (PDO), reducing the effective number of sequencing channels by one.

Additional Features

Autonomous operation reduces the development work required to get a power system running. No software is required to create a full featured and robust power system. By having the configuration stored in EEPROM, the device automatically configures itself upon application of power, sequences the system on, and trims the power rails to the appropriate values. It can also autonomously detect and respond to faults.

Power good outputs provide an indication of system health or status. General purpose inputs/outputs (GPIO) allow external signals to influence the operation of a power system and can generate reset or overall power good outputs.

The I^2C/SMBus/PMBus interface provides a simple and standardized method of communication. Code development is simplified by using an industry standard interface (I^2C) and protocol (SMBus). A PMBus command set provides code compatibility with other PMBus compliant devices.

Part Number	Autonomous Operation "Set and Forget"	Configuration Stored in EEPROM	Power Good Output(s)	General Purpose Inputs/Outputs (GPIO)	Max I^2C Clock w/o Clock Stretching	PMBus Compliant Command Set
LTC2972	•	•[1]	•	•	400 kHz	•
LTC2974	•	•[1]	•		400 kHz	•
LTC2975	•	•[1]	•		400 kHz	•
LTC2977	•	•[1]	•		400 kHz	•
LTC2979	•	•[1]	•		400 kHz	•
LTC2980	•	•[1]	•		400 kHz	•
LTM2987	•	•[1]	•		400 kHz	•
ADM1260	•[2]	•	•[3]		400 kHz	
ADM1166	•[2]	•	•[3]		400 kHz	
ADM1168	•	•	•[3]		400 kHz	
ADM1169	•[2]	•	•[3]		400 kHz	
ADM1062	•[2]	•	•[3]		400 kHz	
ADM1063	•	•	•[3]		400 kHz	
ADM1064	•	•	•[3]		400 kHz	
ADM1065	•	•	•[3]		400 kHz	
ADM1066	•[2]	•	•[3]		400 kHz	
ADM1067	•[2]	•	•[3]		400 kHz	
ADM1068	•	•	•[3]		400 kHz	
ADM1069	•[2]	•	•[3]		400 kHz	
LTC2970			•	•	400 kHz	
LTC2933	•	•		•	400 kHz	
LTC2936	•	•		•	400 kHz	
LTC2937	•	•	•		400 kHz	
LTC4151					400 kHz	
LTC2945					400 kHz	
LTC2946				•	400 kHz	
LTC2947				•	400 kHz	
LTC2990					400 kHz	
LTC2991					400 kHz	
LTC2992				•	400 kHz	

[1]EEPROM contains error-correcting code (ECC) for improved long-term reliability.
[2]Trimming power supply rails requires external intelligence, such as a microcontroller.
[3]Uses a programmable driver output (PDO), reducing the effective number of sequencing channels by one.

Design Tools

LTpowerPlay and ADI Power Studio are powerful and intuitive Windows-based development environments used to configure and debug systems with PSM devices. QuikEval™ and the Super Sequencer software simplify configuration and evaluation of supported devices. Linduino is an Arduino-compatible system for developing and distributing firmware libraries and example code for Analog Device's integrated circuits. The code is written in C and C++, making it highly portable to other microcontroller platforms.

Part Number	Evaluation and Configuration Software				Interface Controller	Linduino Support	Demo Board(s)
	LTpowerPlay	ADI Power Studio	Super Sequencer v4.2.3	QuikEval			
LTC2972	•				DC1613	•	DC2739
LTC2974	•				DC1613	•	DC1978 DC1962
LTC2975	•				DC1613	•	DC2022 DC2428 DC2518
LTC2977	•				DC1613	•	DC1540 DC1962 DC2028
LTC2979	•				DC1613	•	
LTC2980	•				DC1613	•	DC2198
LTM2987	•				DC1613	•	DC2023
ADM1260		•			USB-SDP-CABLEZ		EVAL-ADM1260
ADM1166			•		USB-SDP-CABLEZ		EVAL-ADM1166
ADM1168			•		USB-SDP-CABLEZ		EVAL-ADM1168
ADM1169			•		USB-SDP-CABLEZ		EVAL-ADM1169
ADM1062			•		USB-SDP-CABLEZ		EVAL-ADM1062
ADM1063			•		USB-SDP-CABLEZ		EVAL-ADM1063
ADM1064			•		USB-SDP-CABLEZ		EVAL-ADM1064
ADM1065			•		USB-SDP-CABLEZ		EVAL-ADM1065
ADM1066			•		USB-SDP-CABLEZ		EVAL-ADM1066
ADM1067			•		USB-SDP-CABLEZ		EVAL-ADM1067
ADM1068			•		USB-SDP-CABLEZ		EVAL-ADM1067
ADM1069			•		USB-SDP-CABLEZ		EVAL-ADM1069
LTC2970	•			•	DC1613/DC590	•	DC980/DC2467
LTC2933	•				DC1613	•	DC1633
LTC2936	•				DC1613	•	DC1605
LTC2937	•				DC1613	•	DC2313
LTC4151	•			•	DC590	•	DC1208
LTC2945				•	DC590	•	DC1697
LTC2946				•	DC590	•	DC2156
LTC2947				•	DC590	•	DC2334 DC2574-KIT
LTC2990				•	DC590	•	DC1338
LTC2991				•	DC590	•	DC1785
LTC2992				•	DC590	•	DC2561

Temperature Range, Package and Special Features

Part Number	Supply Voltage Range	Temperature Range	Package	Special Features
LTC2972	3.3 V or 4.5 V to 15 V	–40°C to 105°C	44-Pin 6 mm × 7 mm QFN	Supports current measurement using regulator IMON outputs
LTC2974	3.3V or 4.5 V to 15 V	–40°C to 105°C	64-Pin 9 mm × 9 mm QFN	Pin Compatible with LTC2975
LTC2975	3.3V or 4.5 V to 15 V	–40°C to 105°C	64-Pin 9 mm × 9 mm QFN	Pin Compatible with LTC2974
LTC2977	3.3 V or 4.5 V to 15 V	–40°C to 105°C	64-Pin 9 mm × 9 mm QFN	
LTC2979	3.3 V	–40°C to 105°C	144-Pin 12 mm × 12 mm BGA	
LTC2980	3.3 V or 4.5 V to 15 V	–40°C to 105°C	144-Pin 12 mm × 12 mm BGA	
LTM2987	3.3 V or 4.5 V to 15 V	–40°C to 105°C	144-Pin 15 mm × 15 mm BGA	Integrated passive support components
ADM1260	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP	
ADM1166	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1168	3 V to 14.4 V	–40°C to 85°C	32-Pin 7 mm × 7 mm LQFP	
ADM1169	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 32-Pin 7 mm × 7 mm LQFP	
ADM1062	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1063	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1064	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1065	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1066	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1067	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 48-Pin 7 mm × 7 mm TQFP	
ADM1068	3 V to 14.4 V	–40°C to 85°C	32-Pin 7 mm × 7 mm LQFP	
ADM1069	3 V to 14.4 V	–40°C to 85°C	40-Pin 6 mm × 6 mm LFCSP 32-Pin 7 mm × 7 mm LQFP	
LTC2970	5 V or 8 V to 15 V	–40°C to 125°C	24-Pin 4 mm × 5 mm QFN	
LTC2933	3.4 V to 13.9 V	–40°C to 85°C	16-Pin 5 mm × 4 mm DFN 16-Pin SSOP	
LTC2936	3.13 V to 13.9 V	–40°C to 85°C	24-Pin 4 mm × 5 mm QFN 24-Pin SSOP	Individual comparator outputs
LTC2937	2.9 V to 16.5 V	–55°C to 125°C	28-Pin 5 mm × 6 mm QFN	Simple event-driven and time based sequencing
LTC4151	7 V to 80 V	–40°C to 125°C	10-Pin 3 mm × 3 mm DFN 10-Pin MSOP 16-Pin SO	
LTC2945	4 V to 80 V	–40°C to 125°C	12-Pin 3 mm × 3 mm QFN 12-Pin MSOP	
LTC2946	4 V to 100 V	–55°C to 125°C	16-Pin 4 mm × 3 mm DFN 16-Pin MSOP	Includes charge accumulator
LTC2947	4.5 V to 15 V	–40°C to 85°C	32-Pin 4 mm × 6 mm QFN	Integrated 300 μΩ current sense resistor
LTC2990	2.9 V to 5.5 V	–40°C to 85°C	10-Pin MSOP	
LTC2991	2.9 V to 5.5 V	–40°C to 85°C	16-Pin MSOP	
LTC2992	3 V to 100 V	–40°C to 125°C	16-Pin 4 mm × 3 mm DFN 16-Pin MSOP	

Which One Do I Choose?

Questions regarding which Power System Manager is right for your application? Here are some points to consider.

Require Only Readback and Margining

Consider the LTC2970. This device is simple and easy to use, in conjunction with a system microcontroller to tell it how and when to margin.

Best Performance

Take a look at the LTC2977 or LTC2980. With guaranteed 0.25% total unadjusted error, fast supervision, and coordinated and autonomous sequencing and fault responses, these parts provide best-in-class performance for today's advanced FPGAs and ASICs.

Manage Only a Few Rails

The 2-channel LTC2972 and 4-channel LTC2975 are ideal for managing small numbers of rails or creating compact, easily copied layout macros.

Manage Hundreds of Rails

Consider the 16-channel LTC2980 or LTM2987 with the ability to scale to larger channel counts and maintain seamless coordination between devices. The LTM2987 saves space by integrating all support components into a single package.

GPIO Signals Included in Sequencing

The ADM1260 is capable of including logic inputs such as power good, reset, or ready signals in the power supply sequence.

Complex Sequencing Requirements

The flexible state machine of the ADM1260 can accommodate many complex sequencing requirements.

Manage Current in My Power System

Take a look at the LTC2974, LTC2975, and LT2972. These devices provide dedicated, temperature compensated current sense inputs for each managed power supply. The LTC2975 and LTC2972 also measure current and accumulate energy on intermediate bus voltages as high as 15 V.

Monitor High Voltage Rails

Look at the LTC2945 and LTC2946. These devices accurately measure voltage and current, calculate power, and accumulate energy and charge (LTC2946). They directly connect to rail voltages as high as 80 V (LTC2945) or 100 V (LTC2946) without using any external components.

Power Supplies with Integrated Power System Management

Consider a DC/DC converter with PSM such as the LTC3884 or a fully-integrated μModule regulator with PSM such as the LTM4677.

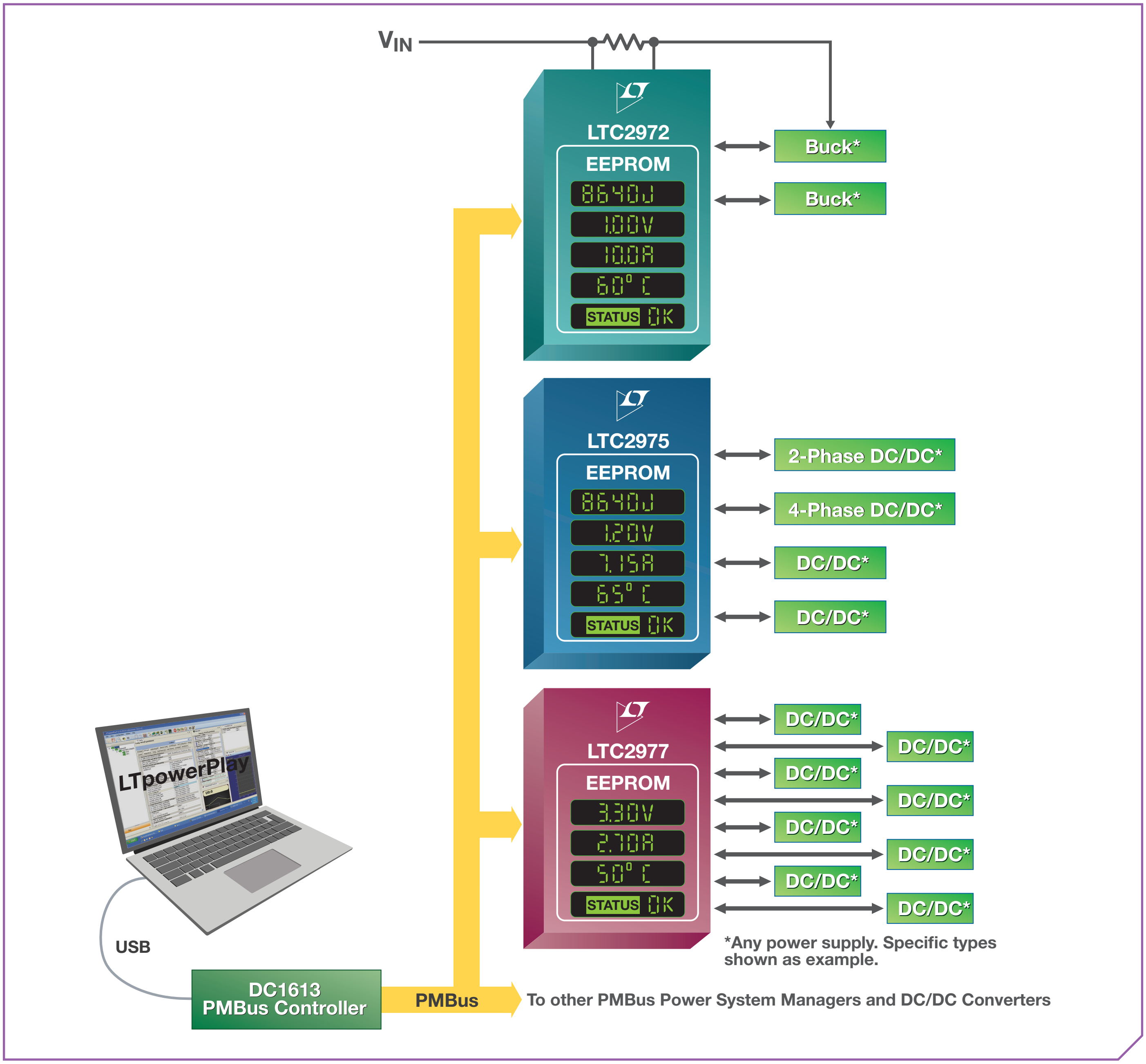
Monitor or Supervise Temperature

The LTC2972 measures and supervises two external temperatures while the LTC2974 and LTC2975 measure and supervise four external temperatures.

Interchip Coordination and Fault Sharing Compatibility

Part Number	SHARE_CLK and FAULTB	Interchip Bus (ICB)	Sequence Position Clock (SPCLK)
LTC2972	•		
LTC2974	•		
LTC2975	•		
LTC2977	•		
LTC2979	•		
LTC2980	•		
LTM2987	•		
ADM1260		•	
LTC2937			•

Power System Management



Getting Started

1. **Obtain the PSM Starter Kit,** *DC1962C-KIT*
2. **Download** *LTpowerPlay*
3. **Watch the** *Video*

Scan to watch video:
http://www.linear.com/solutions/7162

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