

# What is PMBus?

## PMBus features and applications!



# Overview

In modern life, we often use a variety of electronic devices, from personal items to industrial equipment and network servers, all of which require efficient power management to ensure the smooth operation of electronic devices. This article will introduce you to a key power management protocol - PMBus (Power Management Bus). Through this communication method, we can achieve functions such as remote monitoring and adjusting power output, thereby enhancing system performance. Now, let's take a closer look at how PMBus works!

What is PMBus?

What are the features of PMBus?

1. Monitoring of power supply
2. Configuration of power supply
3. Faults and protection
4. Data Logging

4 main applications of PMBus

1. For servers and data centers
2. Industrial Automation
3. Workstations
4. Telecommunication Equipment

Conclusion

# What is PMBus?

PMBus is a communication method based on the I2C (Inter-Integrated Circuit) communication protocol and uses digital signals to transmit data. The communication devices operating over serial bus for interfacing with the Power Supply Management Controller (PSMC) and the Field Replacement Unit (FRU) within the power supply must ensure compatibility with both the SMBus 2.0 "high power" mode and the power and driving specifications based on I2C Vdd. This enables power supplies and power managers to effectively exchange various types of information, including critical parameters such as voltage, current, temperature, and power, ensuring that all components related to power can work together effectively.

## What are the features of PMBus?

### **1. Monitoring of power supply**

PMBus enables precise monitoring of critical parameters such as voltage, current, and temperature of power supplies through its real-time monitoring capability. This allows system administrators to understand the power status in real-time, ensuring optimal performance and safe operation. The feature of real-time monitoring makes PMBus an indispensable tool in embedded systems, effectively enhancing the efficiency of power management.

### **2. Configuration of power supply**

PMBus realizes the configuration of parameters such as output voltage and current of the power supply through software commands, and the controller (master) is responsible for controlling and monitoring the reading of information from the power supply. This not only significantly reduces the need for control and signaling wires, but also reduces the number of contacts and the chance of line failures, improving system stability and ease of control operation.

### 3. Faults and protection

PMBus is equipped with current protection, high temperature protection, short circuit protection, etc. to ensure the stable operation of the power supply. Some industrial computer power supplies offer PMBus functionality, incorporating built-in OCP (Over Current Protection), OTP (Over Temperature Protection), and OVP (Over Voltage Protection) circuit protection designs, as well as the crucial output short-circuit protection feature, which can effectively prevent damage and save costs!

Recommended product >> [FSP1600-20HM](#)

### 4. Data Logging

PMBus not only supports a maximum bus speed of 400 kHz, but also provides timeout and optional Packet Error Check (PEC) features, which enhance the integrity of power supply performance data. This time-out mechanism not only helps in avoiding bus hang-ups but also effectively records and preserves the operating status of power supplies, making subsequent analysis and troubleshooting more efficient.

# 4 main applications of PMBus

PMBus is used in a wide range of applications, especially in industrial automation and communication applications where there is a significant need for power status monitoring. In recent years, PMBus has been widely applied in data centers, workstations, telecommunications, and other AI automation applications, making it the ideal communication method! Below, we will explore the four main applications of PMBus.

## **For servers and data centers**

PMBus plays a crucial role in monitoring and controlling power supplies on servers. Through PMBus, users can track the power consumption of servers in real time and accurately obtain various performance data. Data center operators can adjust the output of power supplies based on actual needs, significantly enhancing the operational efficiency of the data centers.

Read more: [Ensuring Reliable Power Supply for Data Centers: Best Practices and Solutions](#)

## **Industrial Automation**

With the highly controllable and protective features of PMBus, factories can control power supplies more precisely to minimize the incidence of circuit faults and ensure production efficiency. This makes PMBus a key tool for realizing energy efficiency and gives factories a greater competitive advantage!

Recommended product >> [FSP1300-20HM](#)

## **Workstations**

PMBus defines a set of commands specific to "power control" and "management components" to ensure proper system operation. These commands enable the system to perform functions such as configuration, control, and status monitoring, as well as storage of inventory and user data, and fault management. Based on these commands, PMBus provides more efficient power management to ensure that workstations running high-performance computing and professional applications run reliably and energy-efficiently.

Recommended product >> [FSP2000-20HM](#)

## Telecommunication Equipment

PMBus is being used more and more for "digital power management" in systems. It can be combined with many power management products, such as AC-DC power supplies, non-isolated point-of-load (POL) converters, voltage regulators, monitors, and fan controllers. This integration makes PMBus suitable for regulating and monitoring the power supply of communication equipment, allowing for broad applications in network switching equipment, wireless communication equipment, etc. to ensure that the power supply operates properly and maintains stability.

Recommended products >> [IPC PSU](#)

## Conclusion

As a crucial tool for power management, PMBus provides more efficient and accurate power control and management through its powerful features for industrial equipment, communication devices and data centers worldwide. Do you want to gain a competitive edge in power management? FSP offers PMBus-enabled industrial computer power products designed for the Edge Computing and Artificial Intelligence (AI) markets. We integrate PMBus, energy-efficient industrial computers, and Redundant Power Systems (RPS) in one go, committed to achieving maximum performance! You can view FSP's IPC PSU products and learn about the industry's top power management technologies.

## About FSP

FSP Group is one of the global leading power supply manufacturer. Since 1993, FSP Group has followed the management conception "service, profession, and innovation" to fulfill its responsibilities as a green energy resolution supplier.

