

# **Automatic Power Factor Correction Panel**

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**Abstract:** Automatic Power Factor Controllers (APFCs) play a crucial role in modern electrical systems by ensuring efficient electrical power and improving power quality. The paper presents a comprehensive overview of the implementation and performance analysis of an APFC system. The proposed APFC system employs advanced control techniques to regulate the power factor of the electrical load, thereby minimizing reactive power consumption and optimizing overall system efficiency. The design process encompasses the selection of suitable power electronics converters, control algorithms, and sensing techniques tailored to the requirements of an application. The results demonstrate significant improvements in power quality, energy utilization, and system stability, thereby highlighting the practical relevance and applicability of the developed APFC technology.

**Keywords:** Automatic Power Factor Controller (APFC), Power Factor, Current Transformer, Circuit Breaker, Sensors, Display Unit, Load Bank, Power Supply, PCB, Microcontroller

