



Explosion-Proof Camera

Low Noise AC-DC Solution for Harsh Environments



Small Size,
Low Profile



Low
EMI



Rugged

The Customer's Challenge

One manufacturer was looking to improve the system reliability of one of their video surveillance cameras for use in a plethora of applications within potentially explosive atmospheres, where no other cameras are allowed, and in harsh and hazardous environmental conditions. At the same time, they wanted to provide the superior functionality and performance one would expect from such devices in a reduced size for easier installation.

The ability to provide clear, sharp images, even with variable lighting conditions, when objects are moving or accurate identification, was vital.



The Solution

A PFM isolated AC-DC converter was used to convert the AC voltage to a 48V rail. To provide the necessary low noise output a PRM Regulator was used to deliver the power to the camera.

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The Results

As power supply noise can degrade the total performance of a surveillance system the power solution had to offer both low ripple and low EMI to maximize quality of video output. This was achieved as a result of the low noise topologies of the solution selected.

Along with the PRM's ability to support up to 500µF of external capacitance (reducing output ripple), the equipment's noise levels were easily managed with only a few small components for filtering, ensuring the high quality images demanded.

The use of high power density, low weight power components in the new design reduced the size of the complete AC-DC power solution to a footprint of just 58.8cm². The significant reduction in power supply and filtering size helped the designers to reduce the overall system size, to facilitate the safe, efficient and future-proofed installation of the surveillance equipment.

Rugged packaging enabled reliable operation in harsh environments and over wide temperature ranges (including a cold start at -40°C).

Product Family Key Specifications

PFM Isolated AC-DC Converters with PFC

Input Voltages	Universal rectified: 85 – 264V _{RMS}
Output Voltages	24 and 48V isolated and regulated outputs
Output Power	400W
Efficiency	Up to 92%
Power Density	≥127W/in ³
Dimensions	PFM 4414: 111 x 36 x 9.4mm PFM 4914: 125 x 36 x 9.4mm

Product Family Key Specifications

PRM Regulator

Input Voltages	48V (36 – 75V)
Output Voltages	48V
Output Power	Up to 600W
Efficiency	Up to 97%
Dimensions	Full Chip: 32.5 x 22 x 6.73mm Half Chip: 22 x 16.5 x 6.73mm