

WHITE PAPER

MPTS™ Power Management Controls System

For the past ten years, we have installed MPTS Power Management Controls System and prepared case studies and confirmed performance and scalability data from many Applications.

- A Breakthrough Technology for Real-Time Electrical Optimization, Energy Efficiency, and Infrastructure Resilience
- Proven Performance Across Government, Commercial, Industrial, and Mission-Critical Facilities.
- Ready for immediate mass deployment.

The outcome from deployment is “creating electrical capacity up to 20 percent” from existing infrastructure, Microgrids, retrofits or new builds.

Executive Summary

Electrical infrastructure in modern facilities is increasingly stressed by complex electrical loads, harmonic distortion, reactive power circulation, and voltage instability. These conditions increase electrical current flow, create thermal stress on electrical equipment, and reduce overall system efficiency.

The Power Management Controls System (MPTS™) represents a breakthrough advancement in electrical distribution optimization.

Unlike traditional power solutions, factor correction systems or passive filtering technologies, MPTS dynamically monitors and optimizes electrical network conditions in real time, adjusting to load changes within 3 milliseconds.

This capability enables continuous optimization of electrical power flow, reducing reactive energy circulation, minimizing harmonic distortion, stabilizing voltage conditions, and reducing electrical current throughout the distribution network.

Across hundreds of installations operating for more than ten years, measured performance results demonstrate consistent improvements including:

- reduction in electrical demand
- reduction in reactive power (kVAR)- dirty power.
- reduction in electrical current
- improvement in power factor
- release of transformer capacity, grid capacity., electrical capacity,
- reduction in electrical losses
- improvement in infrastructure reliability

These improvements have been validated across multiple sectors including commercial buildings, industrial manufacturing facilities, agricultural processing plants, and mission-critical government installations such as NORAD Cheyenne Mountain Air Force Station.

The Hidden Inefficiencies in Electrical Distribution Systems

Most energy efficiency initiatives focus on improving equipment such as lighting systems, HVAC systems, or industrial processes. However, the electrical distribution system itself often operates inefficiently due to several electrical phenomena.

Common inefficiencies include:

1. Reactive power circulation
2. Harmonic distortion from nonlinear loads
3. Voltage instability and electrical noise
4. Poor impedance matching within electrical networks

These conditions increase electrical current without increasing useful work.

The consequences include:

- increased electrical losses
- overheating of transformers and switchgear
- reduced equipment life
- increased peak demand charges
- reduced infrastructure capacity

Traditional technologies such as capacitor banks address only one of these issues and cannot dynamically adapt to continuously changing load conditions.

A Breakthrough Approach to Electrical Optimization

The MPTS Power Management Controls System represents a fundamentally different approach.

Rather than addressing only one electrical parameter, MPTS continuously optimizes the electrical environment of the distribution network.

The system performs several functions simultaneously:

- sensing supply input and load demand characteristics
- dynamically matching impedance parameters
- adjusting electrical resonance characteristics
- synchronizing electrical output conditions

These adjustments occur continuously and automatically as electrical loads change throughout the facility.

Unlike traditional solutions that react slowly to system conditions, MPTS responds in real time—within approximately 3 milliseconds—allowing it to continuously adapt to changing electrical load conditions.

Real-Time Electrical Intelligence

A key breakthrough capability of MPTS is its ability to operate as an intelligent electrical optimization platform.

The system continuously measures electrical parameters including:

- voltage
- current
- power factor
- harmonic content
- reactive power
- apparent power

Using this information, the system dynamically adjusts the electrical network conditions to maintain optimal power transfer efficiency.

The platform also provides:

- real-time monitoring dashboards
- before-and-after performance visualization
- remote monitoring capability
- automated data logging
- measurement and verification (M&V) reporting

These capabilities provide facility managers and engineers with unprecedented visibility into electrical system performance.

How MPTS Technology Improves Electrical Efficiency

The performance improvements observed across installations are the result of several electrical mechanisms.

Reactive Power Reduction

Reactive power increases electrical current but does not contribute to useful work.

By minimizing kVAR circulation, MPTS reduces apparent power demand and electrical current throughout the distribution network.

Harmonic Mitigation

Nonlinear loads such as:

- variable frequency drives
- switching power supplies
- LED lighting drivers
- industrial automation equipment

create harmonic distortion that increases RMS current and reduces system efficiency.

MPTS mitigates harmonic effects, improving waveform quality and reducing unnecessary current flow.

Electrical Loss Reduction

Electrical conductor losses follow the relationship:

$$\text{Loss} = I^2R$$

Reducing current reduces conductor losses and heat generation in electrical infrastructure.

Voltage Stability and Electrical Noise Reduction

Voltage disturbances and electrical noise can stress electrical equipment and reduce operating efficiency. MPTS stabilizes electrical conditions, improving voltage quality and reducing transient disturbances.

Proven Performance in Real-World Installations

The effectiveness of MPTS is demonstrated through real-world installations across multiple sectors. Some examples or applications below:

Mission-Critical Infrastructure

NORAD Cheyenne Mountain Air Force Station

The first MPTS installation occurred at NORAD Cheyenne Mountain Air Force Station, a strategic national defense installation requiring extremely stable electrical power.

Measured results showed:

- 73 kW reduction in peak demand
- 83 kVAR reduction in reactive power
- power factor improvement from 0.298 to 0.811

Over an eleven-year period the installation achieved:

- 401,500 kWh energy savings
- 750,805 pounds of CO₂ reduction

These improvements enhanced electrical reliability while releasing additional transformer capacity for mission expansion.

In operation since 2015.

[NORAD - Power Management Controls System at Cheyenne Mtn Air Force Base.pdf](#)

Commercial Building Case Study

AVCO Center

The AVCO Center is a 142,300-square-foot commercial office building served by a 3000 kVA transformer. Engineering monitoring performed before and after installation demonstrated substantial improvements.

Pre-installation conditions:

- 390 kVA average demand
- 216 kVAR reactive power
- power factor 0.85

Post-installation performance:

- 321 kVA average demand
- 6.9 kVAR reactive power

- power factor 0.99

Results:

- 17.8% reduction in apparent power demand
- 96.8% reduction in reactive power
- 16% improvement in power factor

These improvements released significant electrical capacity within the building distribution system.

In Operation Since 2017

[AVCO building CaseStudy_210114r0.pdf](#)



Industrial Manufacturing Case Study

Plastic Injection Molding Facility

A plastic injection molding facility operating 24-hour production provided utility-verified performance data.

Average demand decreased from:

563 kW to 444 kW

Power factor improved from:

0.73 to 0.98

Average apparent power demand decreased from:

636.6 kVA to 465.3 kVA.

Independent testing also confirmed reductions in electrical current and apparent power when loads were connected to the MPTS system.

In operation since 2013

[FACTORY - MPTS Performance.pdf](#)



Correctional Facility Case Study

Morgan County Detention Facility – Colorado

A 377,000 sq ft detention facility operating **24-hour critical operations** provided measured performance data to verify long-term performance of the MPTS Power Management Controls System.

Average apparent power demand decreased from:

95.3 kVA to 51.4 kVA

Reactive power decreased from:

82.2 kVAr to 6.1 kVAr

Power factor improved from:

0.60 to 0.99

The installation also demonstrated an average **peak demand reduction of approximately 70 kW**, confirming sustained improvements in electrical efficiency and power quality.

In Operation since 2020

[Morgan County Prison Case Study - MPTS Performance Confirmation.pdf](#)



Agricultural Processing – Porterville Citrus

A citrus packing plant provided a detailed verification case due to the availability of utility billing data and interval monitoring.

Following installation, **PG&E utility bills and 15-minute interval electrical measurements were analyzed.**

Average seasonal demand values were:

2016 – 562 kW

2017 – 551 kW

2018 – 524 kW

2019 – 425 kW

Despite a 25% increase in plant production, electrical demand dropped approximately 23%.

Electrical measurement and verification system indicated:

- average current reduction of 21%
- peak current reduction of 17%
- peak kW reduction of 17%
- power factor improvement from 0.77 to 0.99

Reactive power, dirty power was reduced from 247 kVAR to 57 kVAR.

This is a citrus processing and packaging plant

In operation since 2017.

[PG&E Performance Verification - 15 Min Interval Data and the Bills at Porterville Citrus with and without MPTS .pdf](#)



Infrastructure Benefits

Across installations, the following benefits have been consistently observed.

- Electrical Capacity Release
- Reducing apparent power demand releases unused transformer capacity without infrastructure expansion.
- Reduced Infrastructure Stress
- Lower current reduces thermal stress on transformers, switchgear, and electrical conductors.
- Extended Equipment Life

- Lower electrical stress reduces wear on motors and electrical infrastructure.
- Improved Power Quality
- Mitigation of harmonics and electrical noise improves waveform quality.
- Increased Energy Resilience
- Improved electrical stability enhances operational reliability for mission-critical environments.

A Proven Platform

MPTS is not an experimental technology. It has been tested and commercialized.

The platform has been deployed in hundreds of facilities across multiple sectors and has demonstrated reliable performance over more than a decade of continuous operation.

These installations include:

- government facilities
- military installations
- commercial buildings
- industrial manufacturing plants
- food processing facilities

Long-term performance data confirms the repeatability and scalability of the technology.

Technology Credentials

The MPTS platform is:

- based on patented electrical optimization technology
- manufactured to meet UL and CSA electrical safety standards
- designed for installation in compliance with the National Electrical Code (NEC)

These certifications ensure safe and reliable integration within existing electrical infrastructure.

Strategic Implications

Electrical optimization technologies such as MPTS provide an important new pathway for improving energy efficiency and infrastructure resilience.

Benefits include:

- reduced peak electrical demand
- improved electrical infrastructure utilization
- reduced energy losses
- enhanced power quality
- improved operational reliability

These improvements support corporate sustainability goals while strengthening electrical infrastructure performance.

Conclusion

Electrical distribution systems represent a largely untapped opportunity for improving facility energy efficiency and infrastructure performance.

The MPTS Power Management Controls System introduces a breakthrough approach to electrical optimization by continuously adapting to changing load conditions in real time.

Measured installations across government, commercial, industrial, and mission-critical facilities demonstrate that this technology can significantly improve electrical efficiency, reduce demand, mitigate harmonics, and enhance infrastructure resilience.

With hundreds of installations and more than a decade of operational performance, MPTS represents a validated and scalable solution for modern electrical energy management.