



# Precision **Instrumentation** for Superior **Tankhouse** Performance

Mipac Instrumentation Solutions for  
Copper Electrorefining and Electrowinning

January 2025



Copper tankhouses are at the heart of copper production, but they come with their fair share of challenges. Keeping everything running smoothly, ensuring top-quality copper, and avoiding downtime can feel like a constant juggling act. For Operations Managers and Metallurgists, having the right tools—like precision instrumentation—can make all the difference, helping you tackle these demands with confidence and control.

Mipac brings decades of expertise in copper electrorefining and electrowinning, delivering innovative instrumentation solutions that enable better control, improved decision-making, and measurable operational gains.

With solutions like ShortMeter®, CellView®, and Copper Monitor®, Mipac empowers you to transform your tankhouse into a high-performance, data-driven operation.

## Trusted to improve tankhouse performance in leading mineral processing plants

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Today's Electrowinning (EW) and Electrorefining (ER) tankhouses are critical in the production of the high-purity metals like copper and nickel demanded by today's manufacturing industries.

While they offer a reliable way to achieve precise refining, they also present significant operational, technical, and environmental challenges.

Our team of experienced Metallurgists and Process Control Engineers have worked across a range of EW and ER tankhouses with a specialty in copper production. Having worked day-to-day in complex tankhouse environments they know all about the challenges your plant might be facing.

## 1. Operational Challenges

- Anode and Cathode Maintenance
- Electrolyte Management
- Inefficient Current Distribution
- Short Circuits
- Frequent Equipment Downtime

## 2. Technical Challenges

- Energy Consumption
- Limited Process Variability
- Corrosion and Equipment Longevity

## 3. Environmental and Safety Challenges

- Acid Mist and Toxic Fumes
- Waste Management
- Water and Energy Use

## 4. Scaling and Optimisation Challenges

- Automation and Digital Integration

## 5. Workforce and Knowledge Gaps

- Skill Shortages
- Safety Training

Mipac's range of advanced instrumentation has been purposefully developed to address some of these unique challenges. Drawing on the expertise of our team we understand the critical pain points faced by operations like yours.

This real-world experience has guided the design of our range of copper tankhouse instruments, ensuring they deliver the precision, reliability, and actionable insights required to optimise performance, enhance cathode quality, and reduce operational risks.

With Mipac, you're not just getting innovative technology; you're gaining a partner who truly understands your operation.

Introducing:

## Mipac's Advanced Instrumentation Solutions for Copper Tankhouses

### ShortMeter®

Designed to simplifying short circuit location

### CellView®

Delivering simple, wireless cell voltage monitoring

### Copper Monitor®

Automated copper concentration monitoring so you can say goodbye to manual sampling.

# ShortMeter®

## Short Circuit Locator for Copper Electrorefining



### Simplifying Short Circuit Location

ShortMeter® is a specialised hand-held tool designed to locate short circuits and dead plates quickly and accurately in copper electrorefining operations. It is built for the demanding environments of tankhouses, ensuring durability and consistent performance.

#### Key Features

- ✓ Simple set up  
Requires minimal training
- ✓ Lightweight and ergonomic design for operator comfort during extended use in tough tankhouse environments
- ✓ Visual LED display that indicates the severity of shorts in the cell and the presence of dead plates at their exact location
- ✓ Cost-effective with low maintenance costs and minimal upkeep
- ✓ Adjustable calibration to ensure consistent shorts detection across operational teams

#### How it Works

Mipac's ShortMeter® utilises the Hall Effect principle to detect changes in magnetic field strength. Electrical current flowing through hanger bars generates a magnetic field proportional to the current.

The handheld device detects short circuits by monitoring the magnetic field strength directly above a shorting plate and presenting results instantly. A shorting cathode plate will carry more current, so the ShortMeter®, which measures the magnetic field, will show a greater indication when passing over the shorted plate.

The LED display highlights significant shorts, less severe shorts and dead plates. The more lights that illuminate, the worse the short. On average when fewer lights illuminate it typically indicates a plate with bad contacts that should be inspected and possibly readjusted.





“ShortMeter® is still the preferred and efficient way of short correction over Infrared cameras. It helps us have a high current efficiency rating and determines if there is good deposition of copper in our cathode. Its ideal for poor contact inspection and correction.”  
**Shift Manager, Glencore PASAR Philippines.**

## Why choose ShortMeter® for your ER Tankhouse



### Increased Current Efficiency

Identifying and correcting short circuits and dead plates improves current efficiency and maximises cathode production.



### Cost-Effectiveness

Compared to alternative short circuit detection methods, such as infrared cameras, the ShortMeter® offers a more affordable solution.

In addition, infrared cameras cannot detect dead plates.



### Ease of Use

The intuitive design and visual display simplify operation, enabling rapid training for personnel. Other hand-held methods such as tong-testers/multimeters are only able to measure single contact voltages at a time and are not designed for actual tankhouse operation.

On an industrial scale multimeter use is very tedious and labour intensive.



### Improved Safety

Promptly addressing short circuits reduces the risk of overheating, electrical fires and other potential safety hazards associated with high currents.



## ShortMeter® is a Game-Changer

ShortMeter® is a robust, field-proven instrument tailored to address one of the most critical issues in electrorefining tankhouses.

Its combination of real-time monitoring and precision detection enables operators to:

- Improve cathode production.
- Operate more sustainably by reducing specific energy consumption and off “spec” cathode production that needs to be reprocessed
- Ensure safer and more reliable tankhouse operations.

By providing tangible solutions to common tankhouse challenges, ShortMeter® helps operators achieve higher currency efficiency, better cathode quality within specification, and lower operating costs, all while extending the lifespan of their assets.



# CellView®

## Real-time Cell Voltage Monitoring for Tankhouses



### Simple, wireless monitoring

Mipac's CellView® is a transformative wireless cell voltage monitoring system designed to optimise tankhouse operations and provide continuous insights into cell performance.

CellView® delivers innovative technology to help realise the full potential of electrorefining and electrowinning processes by minimising production losses, operational costs, and underperformance.

### Key Features

- ✓ Wireless communication for easy installation and reduced cabling costs.
- ✓ Continuous and accurate monitoring of cell voltage, detecting short circuits early.
- ✓ Scalable – just add more monitoring units as required
- ✓ Durable construction withstands harsh tankhouse environments.
- ✓ Long battery life between 5-10 years.

#### Additional customisation includes:

- ✓ Customisable and configurable operator interface.
- ✓ Seamless integration with existing plant systems through an OPC interface.


### How it Works

Wireless cell monitors are mounted on each cell, measuring cell voltage and, optionally, temperature.

Data is transmitted through a robust mesh network optimised for long-term use in hot, corrosive tankhouse environments.

The system integrates with data historians and other platforms for comprehensive reporting and analysis.

Add-ons to the standard CellView setup include a central operator interface that displays real-time data when used in conjunction with AVEVA PI Vision or the Mipac MPA Suite. This enables operators to monitor cell voltage trends, both live and historical, quickly identifying and correcting shorts.



“Glencore Technology considers cell voltage monitoring to be an important feature of its refinery technology offerings.

With Cellview® we have a proven system easy to install and maintain, and the custom-configured operator interface ensures refining cells with short circuits are readily identified.”

**Brendan O’Rourke, Refinery Projects Manager, Glencore Technology**

## Why choose CellView® for your EW/ER Tankhouse



### Early Short Circuit Detection

Real-time voltage monitoring enables proactive detection and correction of short circuits, minimising high anode scrap rates. This is especially useful for efficiently allocating labour to the worst-performing cells and sections.



### Optimised Process Control

Continuous monitoring of cell voltage provides insights into specific cell performance, facilitating early shorts detection and removal and maximising current efficiency.

CellView® also provides immediate feedback on the effective correction of shorts.



### Lower Operational Costs

Wireless installation and long battery life minimise cabling and maintenance costs.



### Indepth Process Monitoring

Cell voltage monitoring can also help identify process issues like temperature, reagent, or electrolyte flow problems. CellView® also signals anode passivation and allows real-time tracking across multiple circuit sections to detect common effects, such as temperature or reagent inconsistencies.

Historical trends can highlight cathode quality problems, such as those caused by stopped cell flow, which may not be evident until harvesting.

“Installation is easy. With 500 cells in the plant we were operational in under two weeks with two people performing the installation.”

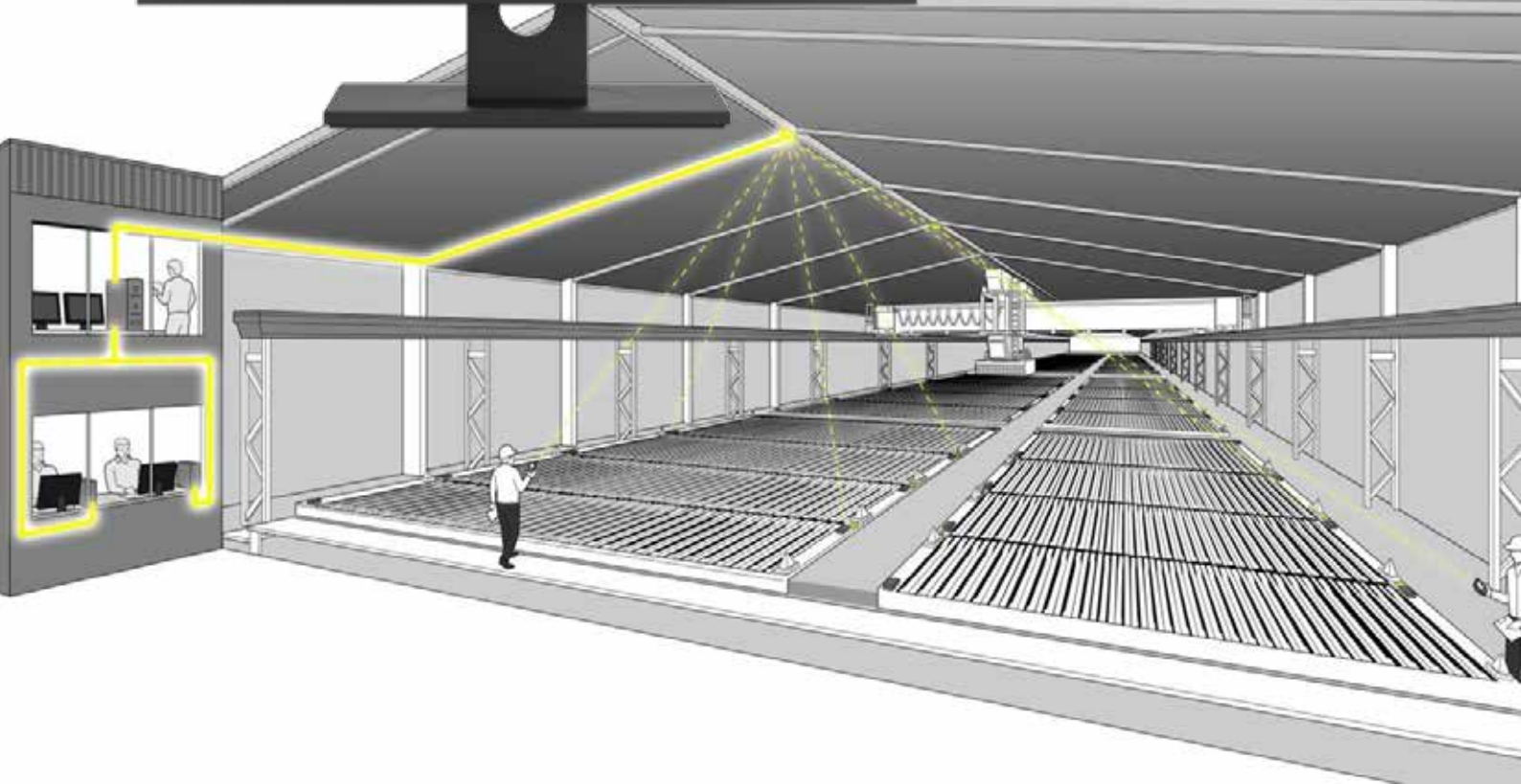


## CellView® puts you in control

CellView® transforms tankhouse management by combining precision monitoring, ease of use, and actionable insights.

With its ability to detect and address key issues like short circuits, process inefficiencies, and operational costs, CellView® not only enhances performance but ensures long-term reliability, safety, and sustainability.

By choosing CellView®, operators gain a reliable partner in overcoming tankhouse challenges, ensuring their refining processes achieve their full potential.



# Copper Monitor®

## Automated Copper Concentration Monitoring for Tankhouses



### Say goodbye to manual sampling for chemical analysis

Mipac's Copper Monitor® is a revolutionary online monitoring system that continuously measures copper concentration in the electrolyte of your electrowinning and electrorefining operations.

It can be used for process control to maintain a target copper concentration in electrolyte, helping reduce operational costs, increase productivity and ultimately improve the quality of production.

#### Key Features

- ✓ Faster decision-making from continuous, online monitoring
- ✓ Easy set-up and integration with operation-wide control systems.
- ✓ Facilitates automatic control of copper concentration.
- ✓ Avoid production of dangerous gases by controlling copper concentration.
- ✓ Self-cleaning and calibrating capabilities on the run minimises down time for maintenance.
- ✓ Weatherproof and corrosion-resistant construction withstands harsh tank-house conditions.

#### How it Works

Mipac's Copper Monitor® utilises optical analysers (light-emitting diodes) to measure the absorbance of copper ions in electrolyte at specific wavelengths to calculate a concentration.

Real-time data can be stored in your data historian. Options are available to have it transmitted wirelessly for continuous monitoring and integration with control systems.

“Simple design, easy to use and maintain.”

The Copper Monitor signal is part of the automatic control circuit to regulate electrolyte flow through the cells and thus maintain required levels of copper concentration.”



Desktop Copper Monitor Display Unit



## Why choose Copper Monitor® for your EW/ER Tankhouse



### Enhanced Task Management

Real-time voltage monitoring enables proactive detection and correction of short circuits, minimising high anode scrap rates. This is especially useful for efficiently allocating labour to the worst-performing cells and sections.



### Reduced Operational Costs

Automation reduces the reliance on manual sampling and laboratory analysis, saving time and labour costs.



### Continuous Process Control

Real-time data allows for proactive adjustments to process parameters such as feed pump speeds and outlet concentration, maintaining target copper levels in electrolyte for maximised current efficiency and cathode quality.



### Increased Production Quality

Consistent electrolyte conditions improve product purity and quality.



## Master Your Process with Copper Monitor®

With Copper Monitor®, tankhouse operators gain real-time visibility into their electrolyte conditions, empowering them to:

- Improve safety by preventing hazardous gas formation.
- Enhance process control, leading to greater current efficiency.
- Reduce operational costs by minimising manual intervention.
- Deliver higher-quality cathode, derived from a more stable process with consistent copper concentrations.

This innovative system helps realise the full potential of electrorefining and electrowinning processes, making it an essential tool for modern tankhouse operations.

By automating copper concentration monitoring, Copper Monitor® ensures efficiency, safety, and sustainability in even the most challenging environments.



# Tankhouse Instrument FAQs

## How does Mipac's range of tankhouse instrument integrate with existing refinery systems?

Our products are designed for seamless integration with existing control systems and software platforms. They support standard communication protocols, ensuring compatibility with most tankhouse setups.

## What level of training is required to use Mipac's instrumentation?

Our solutions are user-friendly and come with comprehensive training for operators and technicians. We also provide relevant manuals and ongoing technical support to ensure smooth implementation.



## ShortMeter®

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### How does ShortMeter® detect short circuits in cells?

ShortMeter® uses the Hall Effect principle to measure magnetic fields created by electrical currents in hanger bars. A short circuit causes a stronger magnetic field above the affected plate. The handheld device detects this change and instantly identifies the shorted or dead plate, enabling quick and accurate troubleshooting.

### How is ShortMeter® maintained or calibrated?

ShortMeter® requires minimal maintenance and comes with straightforward calibration procedures. Our team can provide guidance or troubleshoot calibration issues over the phone.

## CellView®

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### What parameters does CellView® monitor in real time?

CellView® monitors cell voltage, and optionally temperature to provide a comprehensive view of tankhouse operations.

### How does CellView® handle data storage and reporting?

CellView® data can be stored on a data historian of a client's choice, usually via an OPC server. Depending on the client's data historian and reporting requirements, this historical data can be turned into Dashboards and reports.

### **Can CellView® send alerts for abnormal conditions?**

When paired with software should as AVEVA PI, CellView can send alerts for abnormal conditions via email or SMS.

### **Is CellView® scalable for larger tankhouses?**

Absolutely, CellView® is highly scalable and can be deployed across tankhouses of any size, monitoring thousands of cells if needed. It can also be tailored to be installed on select parts of your operation, e.g. liberators, certain sections or certain circuits for stagewise implementation.

## **Copper Monitor®**

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### **What kind of data does Copper Monitor® analyse?**

Copper Monitor monitors copper concentration in electrolyte in real time. This online measurement can be in a data historian of a client's choice.

### **Can Copper Monitor® integrate with predictive maintenance systems?**

Yes, Copper Monitor® can integrate with predictive maintenance tools to enhance equipment reliability and reduce downtime.

## **Support and Implementation**

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### **What is the typical installation timeline for these products?**

The installation timeline varies depending on the product and tankhouse size, but most solutions can be deployed and operational within a few weeks of stock being delivered.

### **Can Mipac customise instrumentation packages to our meet specific requirements?**

Yes, we can tailor our products and configurations to address your unique operational needs.

Mipac – trusted partner with many of the world's largest copper processors

### **Proven Expertise**

Mipac has been a trusted partner to copper tankhouses worldwide, delivering tailored instrumentation solutions that drive measurable results.

### **Comprehensive Support**

From initial consultation to implementation and beyond, Mipac offers dedicated technical support to ensure your success.

### **Cutting-Edge Technology**

Our solutions are designed with the latest advancements in instrumentation, ensuring durability, accuracy, and seamless integration into your processes.

### **Results-Driven Approach**

Every solution we deliver is focused on helping you achieve operational excellence, improve copper quality, and reduce costs.



We believe in working together with our clients and partners to achieve their goals by providing a range of engineering services specific to the needs to mineral processors.

- ✓ Advanced Process Control
- ✓ Industrial Automation
- ✓ Asset Performance Management
- ✓ Data Visualisation and Analytics
- ✓ Electrical and Instrumentation
- ✓ Process Optimisation
- ✓ Cybersecurity
- ✓ Operations Support and Procurement
- ✓ Mining 4.0 Consulting

At Mipac we go  
*beyond the solution*



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With more than

**730**

projects delivered  
worldwide

over the past

**3**

decades, we've  
worked in

more than

**55**

countries around  
the globe

for more than

**110**

clients across  
the globe

with a team of

**180**

experts dedicated to  
projects like yours