

Plenus

The Full CP Remote Monitoring & Control System (RMCS)

The all-in-one Cathodic Protection RMCS "Plenus" is a robust, integrated hardware and software solution designed for the remote monitoring and control of cathodic protection (CP) systems.

This system provides a comprehensive platform for real-time data acquisition, a secure web-based control interface, and advanced alarming capabilities. Its primary purpose is to ensure the integrity and efficiency of CP systems by providing continuous visibility into asset health.

By automating data logging and enabling remote adjustments, the CP RMCS significantly reduces the need for costly and time-consuming manual site visits while simultaneously improving regulatory compliance and extending the operational lifespan of critical assets.

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Plenus RMCS - Remote Monitoring & Control System

The RMCS is a comprehensive solution that offers a range of features to optimize the management of cathodic protection systems and ensure the long-term health of assets.

Enhanced Uptime: Continuous, proactive monitoring reduces the risk of undetected CP system failures. By alerting personnel to issues the moment they occur, the system enables rapid response and minimizes asset downtime, preventing catastrophic corrosion events.

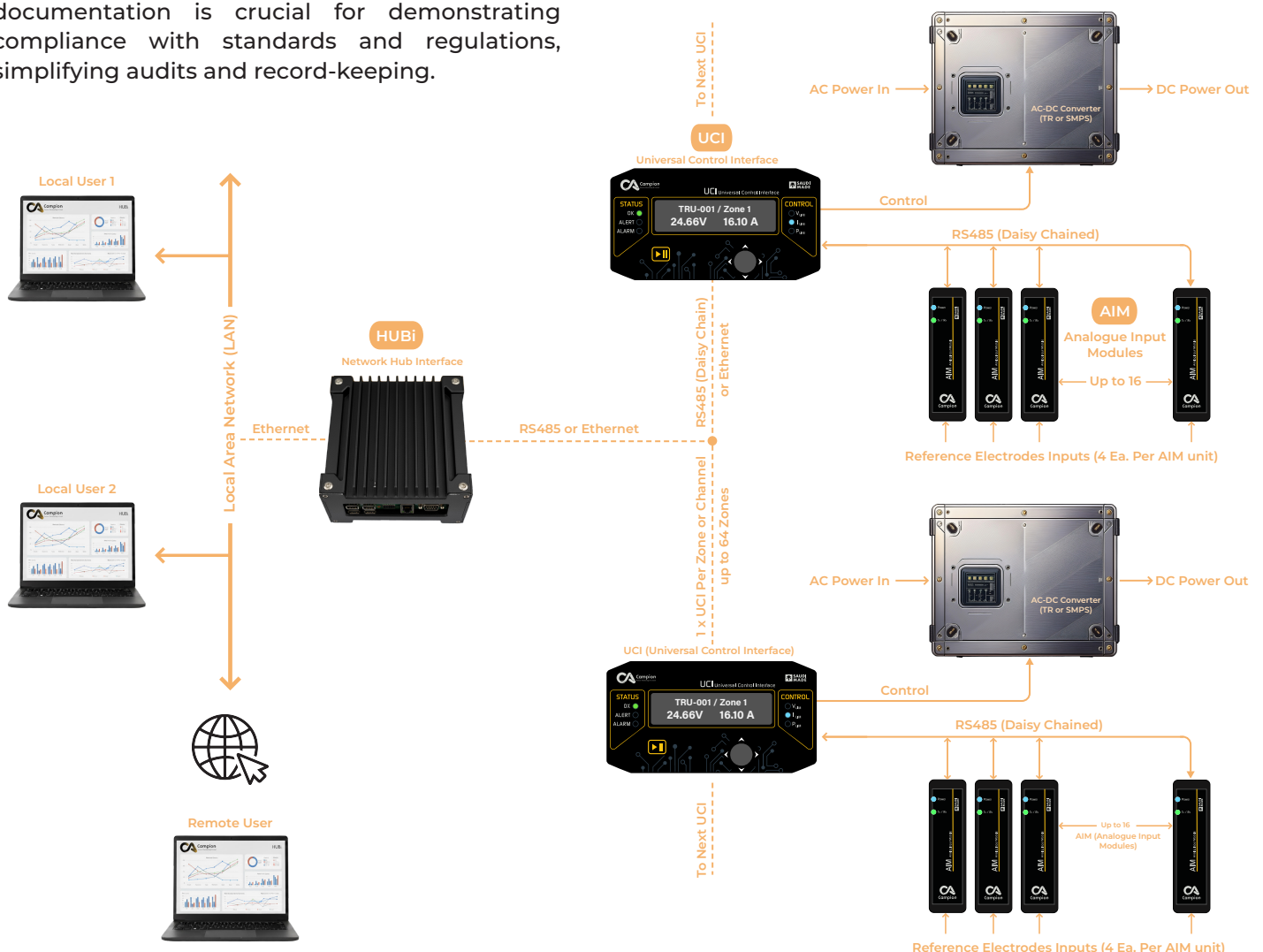
Improved Efficiency: The ability to remotely monitor and control systems eliminates the need for routine field visits for data logging and minor adjustments. This significantly reduces operational costs, travel time, and technician labor, allowing teams to focus on more critical tasks.

Regulatory Compliance: Automated data collection and scheduled reporting create a verifiable digital record of CP performance. This documentation is crucial for demonstrating compliance with standards and regulations, simplifying audits and record-keeping.

Asset Protection: By ensuring that the CP system is always operating within optimal parameters, the CP RMCS provides superior control to ensure corrosion protection. This extends the service life of concrete structures, pipelines, tanks, and other buried or submerged metal structures, safeguarding significant capital investment. The system is equipped with high-precision data collection and industrial control devices to provide accurate and reliable management of the system's critical parameters. All data is time-stamped, logged for historical analysis, and transmitted to web-based interface for remote viewing and controlling.

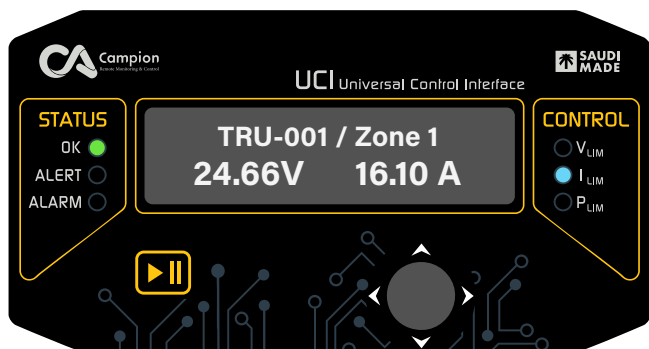
The system incorporates 3 major devices:

1. Universal Control Interface (UCI)
2. Analogue Input Module (AIM)
3. Network Hub Interface (HUBi), featuring a state-of-the-art software interface



UCI - Universal Control Interface

UCI module is designed specifically for the control and monitoring of industrial cathodic protection systems. The UCI provides a common, versatile, and networkable control interface for a wide variety of Cathodic Protection power supplies (e.g. SCR, Switch Mode, Solar, etc.) and for any DC output range. UCI is considered the main device in the RMCS system and boasts the following features:



Intuitive HMI, Easy-to-navigate graphical display enabling Operators to view & adjust all operating levels, set control mode, schedule data polling, view & update diagnostics and initiate special functions.

User Selectable VIP Control Mode, UCI operates in either Constant Current, Constant Voltage, or Potential Control mode at user-selected operating limits

Stand-alone or Networked Configuration, UCI can be configured for stand-alone operation or in a multi-UCI network

Fully Autonomous (Local) and/or Networked (Remote) Operation, UCI automatically transitions between Local & Remote operating modes to provide all functions and features via its local HMI and/or via a networked terminal

True Simultaneous Data Acquisition & Onboard Storage, UCI acquires multiple parameter data simultaneously on every poll (i.e. not multiplexed) with non-volatile memory capable of storing 10+ years of daily acquired operating data

64 Simultaneous Reference/Parameter Measurement Capacity, UCI can manage up to 16 connected AIM modules, each measuring 4 parameters, to provide simultaneous (not multiplexed) data acquisition of 64 reference potentials or other parameters.

Standard & Fast Data Polling, Standard polling at user-selectable intervals from 1 minute to 24 hour – and a Fast-Polling function that polls data at 0.1s intervals

Scheduled Depolarization Test Sequence, Scheduled Depolarization test sequence including 5s of 0.1s Fast-polling and up to 4 user-configurable subsequently scheduled polling sets.

Multiple Electronic Interruption & Run/Stop Facilities, Interrupt DC power output via toggle on HMI, built-in interrupter function, conventional/GPS interruption, and/or via the RS4985/Ethernet network

Intelligent Diagnostics, Clear Diagnostics for all Alert/Alarm conditions

Wide Operating Temperature Range -10°C to +85°C

Operator HMI, The UCI's OLED Display and LED indicators provide an intuitive user interface for a wide variety of functions

AIM - Analogue Input Module

AIM is designed specifically for data acquisition in industrial cathodic protection systems. The AIM provides four high-impedance, analog signal inputs controlled by an industrial microprocessor that manages the acquisition and non-volatile storage of all parameters and enables RS485 communication functions. The AIM provides a common, versatile, and networkable data acquisition interface for a wide variety of Cathodic Protection operation parameters (e.g. reference electrodes, shunts, etc.)

Analog Input Interface: Four (4) fully-differential, transient-protected, high-impedance analog inputs for Reference Electrodes, Shunts, or any other parameter.

True Simultaneous Potential Measurements: Each input has independent buffering and analog conversion, so all four inputs may be measured simultaneously (rather than sequentially via multiplexed inputs). Multiple AIMs on a common RS485 communications link enable true simultaneous measurement of hundreds of reference electrode inputs.

User-defined 'Instant Off' Delays: Users may define when 'Instant Off' potential measurements are captured after system de-energization. Coupled with the simultaneous potential measurement capability, this enables truly synchronous instant off measurements from all reference electrodes in the system.

Internal Memory / Data Storage: Users may define exactly when 'Instant Off' potential measurements are captured after system de-energization. Coupled with the simultaneous potential measurement capability, this enables truly synchronous instant off measurements from all reference electrodes in the system and time-stamped storage.

RS-485 Interface: The built-in RS-485 standard protocol communications port enables users to remotely access, log, monitor and adjust AIM operation using a comprehensive command set.



HUBi - Network Hub Interface

The Network Hub Interface (HUBi) is a software-centric solution designed to interface with field hardware (UCI & AIM), manage data collection, and provide a user-friendly web interface. It is deployed on a dedicated industrial computer and aims to streamline Cathodic Protection remote monitoring and control operations in industrial environments.

Self-Configuration: Enables system setup via CSV file uploads, simplifying deployment and reducing manual configuration errors.

Access Control: Implements a secure login system with three user roles-read, write, and admin-ensuring appropriate access to system functions.

Job Management: Supports creation, scheduling, and repetition of jobs like depolarization test, instant off, and polling, with user-defined targets for alarms.

Web Interface: Provides a structured and intuitive layout with multiple screens for different functionalities, including navigation and data visualization.

Site Visualization: Displays a plan view of the site with zone-wise status indicators based on the latest alarm conditions.

Hardware Configuration: Allows users to view and modify UCI hardware settings such as voltage, current, and operational modes.

Data Handling: Facilitates downloading and viewing of data in CSV format, tables, and graphs, with filtering by date or job.

Alarm System: Evaluates readings against user-defined thresholds and displays status using color-coded indicators.

Document Management: Supports uploading and viewing of documents categorized as drawings, manuals, or reports.

Administrative Tools: Includes user management, system clock settings, and safe shutdown options.

Power Monitoring: Monitors UPS status and battery test results to ensure reliable operation.

Sorted Lists: Ensures all item lists are sorted alpha-numerically for ease of navigation.

