Supply, Regulation, Control, and Monitoring for Airfield Lighting Systems
Honeywell Airport Systems GmbH
Electrical Components for Airfield Lighting Systems

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### About Honeywell

Honeywell is one of the internationally leading suppliers for superior airport solution products and systems. In the past 90 years, we have outfitted over 500 airports worldwide.

Our product scope includes:

- Components for runway and taxiway lighting
- Control and monitoring systems
- Surface movement guidance and control systems
- Visual docking guidance systems
- Components for obstruction lighting

Honeywell is renowned throughout the international aviation business for innovation, reliability, and integrity.

Our customers benefit from solid and long-time project management experiences and comprehensive system know-how. With Honeywell they have a technically leading and future-oriented partner at their side.

### Electrical Components from Honeywell

Especially for the supply, control, regulation, and monitoring of airfield lighting systems, Honeywell offers a broad range of products - from series transformers to digital constant current regulators with integrated individual lamp control and monitoring.

Our products always represent the latest technologies and are renowned for their high reliability and precision.

All our electrical components are in compliance with the respective national and international recommendations and standards (ICAO - International Civil Aviation Organization, FAA - Federal Aviation Administration of the USA, IEC - International Electrical Commission, and EN - European Norm).

Our devices are low-maintenance and characterized by their robust and long-lasting construction.

### Product Information und Documentation

For more detailed information about our products and systems, we provide individual data sheets and other product brochures.

Our concise manuals include all information regarding installation, operation and maintenance as well as troubleshooting and spare parts for the respective components.

### Trainings

As for all our products, we provide our customers with comprehensive trainings (theoretical and hands-on practice) for our electrical components, which can be held on-site or in Wedel, Germany by our own trainers:

- CCR 10 digital, CCR 25 digital, and CCR 30, incl. transformer modules TRM 08
- Analog Measurement Unit CAM-AME 2
- Approach Sequence Flash Light System SFL
- Control Unit CCU 7
- Traffic Sensor System ISA-2DET

Training in Hamburg/Germany
Honeywell ALS
Control and Switch Plant

Function
Honeywell’s control and switch plant ALS (Airfield Lighting System) is specially designed for the installation of the supply and monitoring devices for our airfield ground lighting systems.

By combining individual cabinet types, we are able to set up customer-specific control and switch plants with individual functional units.

Design
The ALS cabinets contain 19” plug-in devices, i.e. all control and supply connections are established automatically when a device is inserted into the cabinet.

The ALS 1000 control cabinet includes the constant current regulators CCR 10/25 digital (page 4-5), the Sequence Flash Unit SFU 40 for the approach sequence flash light system SFL (page 8), or the CCU 7 Control Unit for traffic lights/load circuits (page 9).

The ALS 2000 transformer cabinet comprises the transformer modules TRM 08 (page 6), required for the operation of the CCRs. Honeywell provides five different modules with different power ratings. Furthermore, this cabinet can store the Flash Terminal Unit FTU 40 for the SFL System (page 8).

For smaller lighting systems (e.g. heliports), Honeywell offers the 'combi cabinet' ALS 3000, which can include the CCR 10 digital, two transformer modules TRM 08, and the Control Unit CCU 7.

The monitoring cabinet ALS 6000 includes the analog measurement unit CAM-AME 2, the UNIX computer(s) for CMS control (incl. monitor, keyboard, mouse), as well as the network and station bus components.

Other cabinet types store the traffic sensor evaluation units ISA-2DET (page 10), and the low voltage supply.

Honeywell’s control and switch plant ALS is designed according to the recommendations of the ICAO, FAA, and IEC and is used to the full satisfaction of our customers worldwide.

Main features
- Space-saving, clearly arranged cabinets for up to eight 19” devices
- Automatic connection of supply and control cables (plug-in system)
- Safe and fast replacement of components due to individually fused devices
- Customer-specific control and switch plants due to combination of individual cabinet types

Cabinet types (examples)
- Control cabinet ALS 1000:
  - CCR 10/25 digital
  - Sequence Flash Unit SFU 40
  - Control Unit CCU 7
- Transformer cabinet ALS 2000
  - Transformer modules TRM 08 (max. five modules)
  - Flash Terminal Unit FTU 40
- Combi cabinet ALS 3000 (for smaller systems, e.g. heliports)
  - CCR 10 digital
  - Transformer modules TRM 08
  - Control Unit CCU 7
  - SPS Modicon control unit
- Monitoring cabinet ALS 6000
  - Analog Measurement Unit CAM-AME 2
  - UNIX computer(s) for CMS operation
  - Network/interbus components
Main features CCR 10/25 digital
- 19'' devices installed in ALS 1000 cabinet:
  - CCR 10 digital: 2 separate regulator units for 1 circuit each
  - CCR 25 digital: 1 regulator unit
- Designed for operation with Honeywell transformer modules TRM 08, TRM 96, TRM 90
- CCR connections and functions compatible with analog Honeywell regulators ALS-CCR 10/25
- Integrated lamp fault detection - LAF

Main features CCR 30
- Lockable stand-alone device (acc. to FAA and IEC)
- Regulator unit and load transformer in the same cabinet

Functions (all CCR types)
- Comprehensive control, monitoring, and protection functions for series circuits (e.g. over-/under-current and actual current monitoring, open circuit, insulation and lamp fault detection, individual lamp control and monitoring)
- Comfortable operation by mode selector switch, alphanumeric display (VFD), and 4 function keys
- No readjustment/reconfiguration after replacement of a CCR
- Operation according to FAA, IEC, or customer-specification
- Operation with 3, 5, or 8 current steps, additional non-illumination-step available for maintenance procedures

Visual landing aids are used in changing visibility conditions; therefore, fast, precise, and reliable adjustment of AGL lighting to all kinds of weather conditions (e.g. bright sunlight, darkness, rain, snow, fog, mist, etc.) is most important.

Our microprocessor-driven regulators
- CCR 10 digital,
- CCR 25 digital, and
- CCR 30

are especially designed for small, medium, and high intensity AGL systems environments.

Our CCRs provide comprehensive functions for the control (parallel via multiwire- or serial via ethernet) and monitoring (over-/under-current, insulation and lamp failures) of the parameters of the connected series circuit.

All CCR types comply with the respective national and international requirements (IEC 61822, FAA AC 150/5345-10F) with respect to regulatory behavior and reliability.

Function
One regulator unit supplies, controls, and monitors one series circuit.

The microprocessor compares the actual current value of the series circuit with the target value of the selected current step and calculates the firing impulse of the thyristors, which adjust the primary voltage of the load transformer.

The series circuit is connected to the secondary side of the transformer.
Design
The CCR 10/25 digital are 19” plug-in devices, which are installed in ALS 1000 cabinets (the required transformer modules are installed in ALS 2000 cabinets).
The CCR 30 comes in a compact stand-alone housing and can be fitted with optional wheels.

The control units of our CCRs are almost identical. All configuration and calibration procedures are carried out by using the CCR’s function keys and display without any additional devices.

Optionally, an external memory device (Datakey®) can be used for storing and recovering the configured CCR parameters.

Further options include detection of insulation resistance (IRMS) and lamp faults (LAF) as well as individual lamp control and monitoring (SLCM).

The mode selector switch is used to select the operating mode (remote = remote control by tower signals; local = manual control, e.g. for maintenance or emergency mode; off = CCR is switched off).

Failures and warnings are indicated by colored fault and warning LEDs.

The CCRs’ display constantly indicates the CCR’s status, the selected current step, the output power, and the CCR’s operating hours.

Additional information can be indicated via the respective function key commands.

Options
- No external equipment required for set-up, calibration, and adjustment
- Storing of last step command, e.g. at voltage or communication break-down
- Continuous indication of CCR’s status, selected current step, output voltage (effective value), and operating hours on display
- Unlimited operation with circuit selector switches and individual lamp control

- Storage and recovery of parameters and operational data on external memory device (Datakey®)
- Serial interface - SIO:
  - Reduced wiring effort
  - Remote control by CMS
  - Communication of measured data to CMS
- Lamp failure measurement - LAF (two configurable failure thresholds, automatic calibration)
- Insulation measurement - IRMS
- Measurement and indication of:
  - Insulation resistance of the circuit
  - Input current
  - Input power
  - Power factor
  - Output power
  - Output voltage
- Integrated individual lamp control and monitoring - SLCM
- Only CCR 30:
  - Integrated over-voltage protection at the output
  - Cabinet with wheels
  - Circuit cut-out system for isolation and grounding of the circuit
Honeywell TRM 08
Transformer Modules for CCR 10/25 digital

Main features

- Low-maintenance power transformers for constant current regulators CCR 10/25 digital and ALS-CCR 10/25
- Five basic modules with identical standard functions; effective power ratings: 2.5, 5, 7.5, 15, 20 KW
- Installed in ALS 2000 cabinet
- Designed for phase control operation at 6.6 A_RMS output current
- 48 possible output voltages, thus:
  - optimization of CCR's working point
  - high power factor (according to IEC) and efficiency
  - reduced electromagnetic interferences (EMC) and crest factor
- Circuit cut-out system isolates and grounds the series circuit for maintenance purposes
- Compatible with TRM 96 and TRM 90

Options

- Measurement/monitoring of the circuit's insulation resistance
- Lamp fault detection - LAF (automatic calibration)
- Individual lamp control and monitoring - SLCM (all versions)
- Detection of output voltage and output power

Function

The TRM 08 is used to adjust the power of constant current series circuits and can be operated with our regulators CCR 10/25 digital or the analog series ALS-CCR 10/25.

The TRM 08 generates the output voltage for the connected circuit by means of two separate secondary coils. Each secondary coil is equipped with four taps, which are used to set the output voltage and adjust the working point of the CCR to the load of the circuit.

The TRM 08 is designed for phase control operation at 6.6 A_RMS output current and can be used for series circuits with or without individual lamp control and monitoring (SLCM).

Design

The following components are assembled on the basic module:

- Power transformer
- Current transformer (detects the circuit's current)
- Surge arresters
- Capacitor for basic compensation
- Circuit cut-out system for isolation and grounding of the series circuit for maintenance operations
- Optional components:
  - ELFD (Earth and Lamp Fault Detection) for insulation measurement with CCR 10/25 digital, or
  - ISO measurement module for insulation measurement with CAM-AME 2
  - Primary voltage transformer for detection of the power transformer's primary voltage for lamp fault detection (LAF) with CAM-AME 2
  - Output voltage transformer for detection of output voltage and output power
  - Series circuit coupler SCC-V3 and SLCM Module V3 for individual lamp control and monitoring (SLCM) with CCR 10/25 digital
  - Additional measurement plug for manual insulation measurement
Honeywell CAM-AME 2
Analog Measurement Unit

Function
The analog measurement unit CAM-AME 2 (modular expansion cards in 19'' plug-in unit) monitors the connected lighting circuits with respect to lamp and insulation failures, and measures the current of the series circuits.

Design
The CAM-AME 2 includes the following components:

- **Lamp failure module LFD**
  Up to four separate LFD modules cyclically compare the actual voltage and current values of the connected circuits with calibrated values and thus detect the lamp failure status.
  If one of the two configurable thresholds (warning and failure) is exceeded, the respective LED lights up.
  In remote control, failure reports are sent to the CMS via an ethernet interface for evaluation purposes.

- **Insulation module EFD**
  The EFD module controls the operation and sequentially measures the insulation resistance against earth potential. The processing of the measurement voltage and the actuation of the decoder boards is carried out by the coupler module AME-ISO (19'' unit inside ALS 2000 cabinet). The measurement voltage is activated by the ISO Measurement Module on the TRM 08.

The CAM-AME 2 can be operated remotely by a CMS or manually (local control).
The concise web browser interface (password protected) allows individual calibration of measurement values, configuration of the device, as well as failure and/or operating status indication.

Features
- Monitoring of series circuits
  - Lamp faults (max. 64 circuits)
  - Insulation values (max. 99 circuits)
  - Series circuit current (max. 64 circuits)

- Comfortable web-browser interface for
  - concise status indication
  - easy device and system calibration
  - detailed indication of measured values
  - precise indication of failures (in addition to failure indication by LED)

- Ethernet interface for
  - automatic failure reports to CMS
  - remote maintenance

- Optimized calibration algorithms (typically two minutes per circuit)

- Connections compatible with CAM-AME 1

Option
- Redundant network connection
Honeywell SFL System
Approach Sequence Flash Light System

Main features

- Modular and configurable system design
- Installation:
  - ALS 1000/2000 cabinet, or
  - SFL Control Unit (stand-alone version)
- Operating modes (remote or local selection)
  - complete approach, or
  - reduced approach, or
  - runway threshold indication lights only
- High lighting intensity, adjustable in three steps
- Supply, monitoring, and control of flash lights (incl. failure indication) via parallel cable from the SFU 40
- Easy lamp replacement without additional tools, no readjustments after replacement

Function
The Approach Sequence Flash Light System SFL is used for additional identification of the approach center line lighting. Particularly in bad weather conditions (e.g. fog, rain, snow), the system improves the visibility of the approach lighting by its periodic flash sequence.

Design
The SFL System includes the following components:

- Sequential Flash Unit SFU 40 (supplies, controls, and monitors the entire system)
- Flash Terminal Unit FTU 40 (terminal board for the flash chain)
- Max. 32 flash lights type ASL 40

The SFU 40 and FTU 40 are either installed inside ALS cabinets or in the SFL Control Unit (stand-alone version in standard Honeywell CCR 30 cabinet).

The ASL 40 flash lights are supplied, controlled, and monitored by a parallel cable.

The modular design, the configurability, and the selectable operating modes allows the system to meet the meteorological and topographical requirements of individual airports.
Honeywell ALS-CCU 7
Control Unit for Traffic Lights and Load Circuits

Function
The Control Unit ALS-CCU 7 is used to supply, switch, and monitor up to three load circuits and/or two traffic lights.

The ALS-CCU 7 is installed either in an ALS 1000 cabinet or inside the Switching Control Unit (stand-alone version, standard CCR 30 cabinet). It is controlled either by remote control signals from the tower (normal operation) or manually by means of front panel controls.

Main features
- Switching and monitoring (also for clocked loads) of:
  - three load circuits, or
  - one traffic light and one load circuit, or
  - two traffic lights
- Manual operation or remote control by CMS via parallel inputs/outputs
- Compact, modular, and maintenance-free 19” plug-in design
- Three separate expansion cards:
  - +24 VDC control voltage for CMS
  - Interface board
  - Current monitoring board

Option
- Monitoring of second current threshold per load circuit by additional expansion board

Design
The ALS-CCU 7 is available in three customizable versions:

- Function units 1, 2, and 3 switch one circuit each
- Function units 1 and 2 switch one traffic light each, function unit 3 is not used
- Function unit 2 switches one traffic light, function unit 3 switches one load circuit, function unit 1 is not used

The layout of the unit’s current monitoring board allows lamp fault monitoring, and monitoring of clocked loads (e.g. flashing obstruction lights).

The switching version of the ALS-CCU 7 is determined by programming the respective terminal board inside the control cabinet.
Honeywell ISA-2DET
Traffic Sensor System

Features

- Interference-free detection of moving aircraft and vehicles by sensor evaluation
- Enhanced integrity of traffic control by communication interface to radar system
- Single sensors for up to 30 m runway width
- Two sensors for double width (65 m)
- CVD-sensors for detection of aircraft class, velocity and direction (two sensors in defined distance)
- Configurable detection of presence, roll-over, taxi-way exit, take-off
- Very short response and trouble detection time
- Continuous self-tests and automatic calibration of the system
- Automatic error detection
- Up to 2500 m cable length between sensor and evaluation unit
- No electronics in the field
- Cable installation across runway joints

Options

- Redundant power supply
- Serial interface for redundant communication with CMS

Function

Our traffic sensor system ISA-2DET reliably detects the movement of aircraft and vehicles on runways and taxiways by means of ground sensor evaluations.

Design

The system consists of:

- Evaluation unit ISA-2DET (installed in ALS 5000 cabinet)
- Copper cable sensors (embedded in runway/taxiway)
- Standard telephone cable for signal transmission

The evaluation unit ISA-2DET sends impulses to the sensors and evaluates their inductance changes when passed over by aircraft or vehicles.

Depending on the system design, five to eight evaluation units be installed in one 19” plug-in unit. The units can be configured by a service interface at their front panels.

One evaluation unit detects and processes the signals of up to four sensors. The distance between the ISA-2DET units and the sensors can be 2500 m.

Depending on the sensor installation, the system can detect presence, roll-over, size, speed, and direction of moving objects.

Sensors can be embedded in runways and taxiways with a width of up to 65 m.

The ISA-2DET units are equipped with a serial and a parallel interface for connection with a CMS.
Honeywell NTR
Series Transformers for LED and Halogen Lights

Function
The series circuit transformers NTR are used to supply the lights in 6.6 A_{RMS} series circuits (max. operating voltage 5 kV).

The devices allow continuous operation of the circuit even at loss of load on the transformer, and galvanically isolate the lights from the high voltage primary circuit.

In the event of a lamp failure, the NTR limits the secondary voltage.

At a secondary short circuit (e.g. due to the destruction of a light) the NTR limits the secondary current to the nominal value.

Our transformers are specifically designed for the operation with our individual lamp control and monitoring system SLCM.

Main features
- Power ratings: 45, 65, 100, 150, 200, 300 W
- Max. operating voltage: 5000 V
- Suitable for LED and halogen lights
- Polyurethane encapsulation
- High efficiency: min. 0.85 or 0.9
- Low leakage inductance - optimized for operation with individual lamp control and monitoring system SLCM

Options
- Earthing connection (E)
- Adapter/extension cables - installation in greater distance from the light - connection of one light to two or three NTRs

Honeywell CAM-ASD V3
Addressable Switch Devices

Funktion
The addressable switch devices CAM-ASD V3 are an integrated component of our individual lamp control and monitoring system SLCM.

The SLCM System allows selective switching and monitoring of individual lamps and lamp groups of series circuits.

Depending on the type (CAM-ASD 1 or CAM-ASD 2), the devices switch and monitor one or two loads (e.g. LED or halogen lights, traffic guidance signs).

Supply, bi-directional CMS communication, software download, and configuration updates are realized via the series circuit cable without any additional interfaces or control cables.

Main features
- Integrated component of Honeywell SLCM System
- Switching and monitoring of one or two loads in a series circuit
- Supply, bi-directional CMS communication, software download, and configuration updates via the series circuit cable
- Polyurethane encapsulation
- ASD installation independent of lamp position in the circuit - no manual addressing required before installation
Honeywell Airport Systems GmbH
Brochures and Product Overviews

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For more information on these and other Honeywell Airport Systems products, visit http://honeywellairports.com

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