

EFFICIENT AND SAFE LANDINGS IN ALL-WEATHER CONDITIONS

Honeywell Airfield Ground
Lighting Solutions



Honeywell

EFFICIENT AIRFIELD GROUND LIGHTING SOLUTIONS FOR SKY-HIGH OUTCOMES

When it comes to safely landing or docking an aircraft, visual aids are paramount. Airfield Ground Lighting (AGL) plays a crucial role in airport operations and is subject to comprehensive safety and compliance regulations by global aviation standards and regulatory bodies. AGL represents the entire set of ground installed luminaires and related ancillaries that help aircraft land and find their way to the stand – helping enable uptime in all-weather conditions.



To respond to current demands and prepare for tomorrow's safety requirements, airports need to leverage a toolbox of ground lighting solutions that improve uptime and visibility and deliver safer, more efficient ground traffic movements in adverse conditions.

Sources:

1. <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>

2. <https://www.cirium.com/thoughtcloud/travel-disruption-demystified/>

THE AIRSIDE OPERATIONS OF TODAY

The expectations and requirements for airports have changed tremendously over the last 30 years. After a period of year on year growth, the COVID-19 pandemic brought the aviation ecosystem in uncharted territories. Airport operators face an increasing number of challenges, with depleted means. One thing remains clear: safety and compliance can never be compromised. And to serve this purpose, existing cutting-edge technologies can help you achieve uptime, optimized infrastructure, and airside throughput performance.

SAFETY AND COMPLIANCE

Enhancing airside ground traffic visibility and guidance in all-weather conditions

Promoting personnel health and safety

Complying with increased environmental regulation requirements

AIRFIELD UPTIME

Effectively reducing light failures

Provides near-realtime safety alerts from approaching aircrafts and vehicles

COST OPTIMIZATION

Increased competition between hub airports

Accelerated pressure on OpEx savings

Tremendous CapEx scrutiny following massive market disruption caused by the pandemic

AIRFIELD THROUGHPUT

Reducing congestion and delays

Operating in all-weather conditions

Future proof, sustainable investments



HONEYWELL

AIRFIELD GROUND LIGHTING SOLUTIONS PORTFOLIO

As the aviation industry is going through continuous changes, airports need to balance full compliance, safety, and environmental standards, all while limiting airfield closure, optimizing aircraft throughput, and decreasing costs. To help airports address these challenges, Honeywell delivers an extensive range of solutions that help keep airfield ground lighting operations safer and more efficient.

SAFETY AND COMPLIANCE

Honeywell's Airfield Ground Lighting solution complies with key international certifications such as ICAO, FAA, IEC 61821:2002-03 (Maintenance of aeronautical ground lighting constant current series circuits) in addition to regional aviation standards in many authorities.

IMPROVED UPTIME

Honeywell's AGL ecosystem improves operational uptime of the airfield thanks to:

- Lights tested to support 3x FAA specified load for improved safety
- Approximately 50% less rubber deposits
- Reduced water and dust accumulation with zero negative slope
- Less mechanical damage from snow plowing and sweeping equipment
- Verified electromagnetic compatibility to avoid certain failure modes
- Unique mechanical design helping reduce potential landing induced electronic failures
- Faster fault identification; live replacement of faulty lights
- Digitized maintenance options

OPTIMIZED COSTS

CAPEX OPTIMIZATION

- Fully compatible with Honeywell Airports Portfolio
- Easier retrofits/compatible with all third party standard shallow bases
- Single platform for both LED and Halogen lighting
- Faster returns on investment when using LED platform

OPEX REDUCTION

- Reduced power consumption with LED technology and optimized design
- Lower energy consumption than average LED solution
- Lower number of spares across variants, reducing inventory
- Extending light life through recalibration
- Reusable tools for maintenance

IMPROVED THROUGHPUT

Honeywell's AGL ecosystem supports even the most complex airports requirements:

- Right-sized and robust optical area with 40% larger light output through six windows
- Better light throughput with TIR based design
- Light start-up and settling time <600ms
- Control and monitoring capabilities to support various guidance concepts
- High-performance electronics to serve modern navigational guidance upgradable to A-SMGCS level 4

A-SMGCS LEVEL 4 SCALABLE SOLUTIONS



Traditional ground traffic guidance can lead to the following inefficiencies:

- Underutilization of taxiways infrastructure
- Back and forth controller to pilot radio communications leading to misunderstandings
- Manual conflict detection and holding commands
- Day/night and weather-based manual control of lights

HONEYWELL'S SOLUTIONS HELP:

- Calculate optimized taxi route and reduced CO₂ with shortened taxi time
- Decrease the number of voice interactions between Tower and Pilots
- Enable routing, guidance, and surveillance through the Advanced Surface Movement Guidance and Control System (A-SMGCS)
- Improve airfield availability, especially in highly congested airfields and low visibility conditions



HONEYWELL NAVITAS™ LIGHTS MANAGER

Honeywell NAVITAS™ Lights Manager is a Software platform that enables effective control, management, and monitoring of all relevant AGL equipment in accordance with ICAO Annex 14 recommendations. The platform is secured and compliant with ISA 62443-4-2 cybersecurity mandates. The system is scalable for different airport sizes and complexities. In addition, it offers specialized working positions, with separate Air Traffic Control and Engineering functions. Honeywell NAVITAS Lights Manager supports single lamp control and monitoring capabilities, a scalable platform to ASMGCS Level 4.

CONTROLLER WORKING POSITION (CWP)

The CWP supports changes in runway operations and stopbar control. The system is able to automatically monitor the serviceability of AGL field equipment through differentiated user interfaces.

- Airfield lighting control (On/Off, Intensity)
- Change runway category, direction and stop bar control
- Monitor ancillary systems and NAVAIDS
- Area of responsibility (AOR) assignments
- Contingency panel/operations
- Provide guidance through routing functionality
- Maintenance approvals

TECHNICAL WORKING POSITION (TWP)

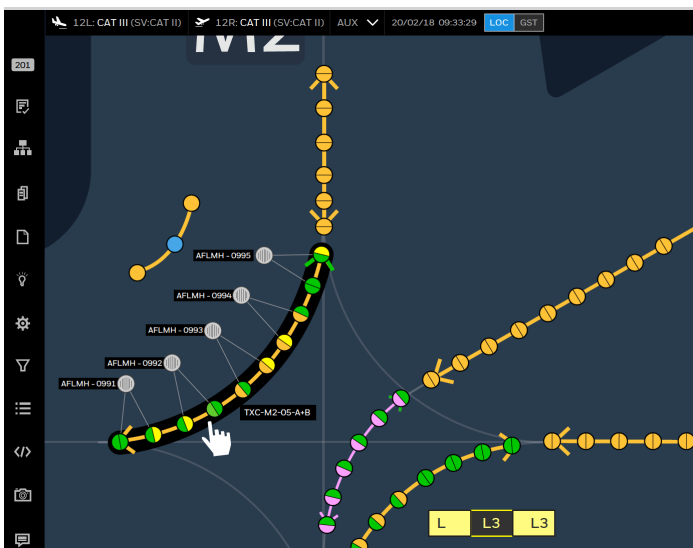
- The TWP provides insights into individual AGL field equipment health status enabling predictive and preventive maintenance.
- Monitor and manage alerts/faults
- Equipment hierarchy and substation views
- Airfield map navigation
- Centralized user management
- Maintenance workflows
- Advanced maintenance reports

MOBILE ENGINEERING MANAGER

Enables digitized paper less maintenance and airside inspection tool for preventive and predictive maintenance activities.

Monitor and manage alerts/faults

- Supports work order dispatch functionality
- Digitized inspection check lists
- Real-time, faster fault locating (Fitting/ Manhole location)
- Full airfield view with navigation functionality
- Provides near real-time safety alerts from approaching aircrafts and vehicles



HONEYWELL LIGHTS

LED technologies have advanced and been demonstrated over a short period of time to be a cost effective replacement to conventional halogen lamps for AGL applications. In the current challenging aviation market conditions, and with renewed initiatives for green airports, Honeywell introduces a new range of low wattage, LED based lighting products to help airports decrease their energy requirements whilst improving their Opex and the longevity of their assets.

BENEFITS

OpEx efficiency: 15% lower energy consumption than average LED solution and lower number of spares across variants reducing inventory

Improved visibility: Higher operational reliability in all-weather conditions

Improved uptime redundancy: Approximately 50% less rubber deposits, decreased water and dust accumulation as well as reduced potential landing induced electronic failures

Reduced maintenance: Longer light lifecycle and less mechanical damage from snow plowing and sweeping equipment

Backward compatibility: Easier retrofits/compatibility with most common shallow bases and, faster response with both proprietary and non-proprietary AGL installations

FEATURES

- 8" (20cm) IL-Unique 6 window design increases uptime by reducing dirt and rubber deposits
- Fail/Open (FO) technology in case of light failure as per FAA guidelines
- A unique, patented internal toe enables modular optical engines to be reused across different applications, hence reducing spare parts inventory and waste
- Patented design and improved insulation method for thermal management
- Compatible with multiple third-party shallow bases such as Eaton Crouse Hinds, TKH, Ocem, and ADB Safegate*

*List constantly updated



HONEYWELL SEQUENTIAL FLASH LIGHTING SYSTEM

Honeywell Sequential Flash Lighting System is part of the approach lighting system and designed according to ICAO & IEC. It requires a project-specific installation procedure. Its modular design, configuration options and controller-switchable operating modes enable flexible adaptation to airport-specific approach directions. This approach flash lighting system consists of an SFU48 controller and up to 32 individual SFL48 flashing lights. The SFU48 controller is responsible for controlling the flash sequences, switching intensities, and monitoring the flashing chain. It is also used to connect the flash lighting supply cable. Each of the SFU48 individual flashing lights contains both the electronics used for coordinated LED activation and a heating system used to avoid condensation build-up.

FEATURES

- The Control Unit can be rack mounted in a sub-station, thereby reducing the need of heavy civil work for commissioning.
- Master slave architecture enables simpler electrical cabling.
- Unique address for each lamp enables simple lamp fault indication
- Lower inspection and maintenance costs



HONEYWELL POWER AND CONTROL SOLUTIONS

Addressable Switching Devices (ASD)

The Honeywell Addressable Switching Devices (ASD) are designed to provide a fast and reliable control and monitoring function for the On/Off status of each individual AGL lamp. ASD communicates over power line technology to detect faults, with each device offering a real-time control and monitoring function for one or two AGL lamps.

BENEFITS

- Honeywell Single Lamp and Monitoring Technology enable individual light control and monitoring that make Follow The Greens advance guidance system possible
- With a faster lamp fault detection, the maintenance team understands better where to spend time to focus on critical issues



FEATURES

- Support all Fail-Open (FO) methods – Mechanical FO or Software/Electronic Pulse FO
- Interoperable and Single Platform for Halogen and LED lights with high starting impedance.
- Configurable Failsafe mode: On, Off, or previous status. For enhanced airside safety in case of communication or power failure.
- Backward compatible with previous ASD's and SLCM versions.
- Proven stable performance with most of CCR's and LED Light manufacturers.
- Switching time in less than 1 second
- Time for energizing of series circuit to start of communication with the ASD, less than 4 seconds
- For power failure below one second in the series circuit, communication reactivation in less than 2 seconds
- Stable communication on long circuit up to 15 Km with 115 ASD's (For longer circuits or larger number of ASD's Engineering review is required)
- High mean time between failures: 200,000 hrs
- Honeywell's SLCM system can maintain a reliable and stable communication even if Primary Circuit IR value drops down to 5 MΩ
- Support stable operations at lowest non-illuminated Step of 1.3A

HONEYWELL POWER AND CONTROL SOLUTIONS

Constant Current Regulator (CCR 30)

The Honeywell Constant Current Regulator (CCR 30) is used to supply, control, and monitor constant current series circuits of air-field ground lighting systems.

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 a Thyristor module, which adjusts the primary voltage of the power transformer by phase control.



BENEFITS

- Optimized CapEx Investments with flexible CCR power rating
- OpEx Savings: least power consumption during non-illuminated step powered by 1.3A only and by efficiency optimization through 48 different output tapping configuration
- Compact and integrated SLCM solution within the CCR enclosure
- Regulation maintained stable even with input voltage drop to >80% of nominal voltage.
- In case of input power loss, operations will resume within one seconds after input power restoration
- Improved safety and throughput proven Follow the Greens capabilities

FEATURES

- CCRs ranging from 2.5 KVA to 30 KVA
- Available in two regulating technologies: Thyristor based (Phase-Cut) and IGBT based (Sinewave)
- Failsafe function in case of communication failure
- Temperature range - 40 C° to +55 C° with monitoring.
- Relative humidity 10- 95%
- Altitude 0 - 2000 m
- Innovative Data Key, to restore or shift CCR configuration in case of CCR Failure or replacement
- Two configurable levels for lamp fault detection
- Two configuration levels for circuit insulation resistance detection
- Improved safety and throughput, thanks to the proven Follow the Greens capabilities

HONEYWELL GUIDANCE SIGNAGE

Taxiway information signs provide assistance in directing pilots while maneuvering aircraft around the taxiway infrastructure. A mandatory runway sign is provided to identify a location beyond which a vehicle or an aircraft taxiing is not to proceed unless authorized by air traffic control.

BENEFITS

- Robust, low-maintenance taxi signage design
- One-piece front panel with combined mandatory/interdiction and/or informational signs
- Better longevity, higher reliability and quality
- End-to-end portfolio AGL ecosystem

FEATURES

- Corrosion and UV-resistant materials
- Lighting provided by long-life LEDs
- Power supply via series circuit transformer (6.6 A)
- Suitable for runway visibility < 800 m (RVR)
- Sign height: 650 mm or 850 mm
- Sign width: 800 to 3000 mm (Custom sizes on request)
- Weight: approx. 19 kg to 73 kg (depending on type)
- Delivered pre-assembled
- Designed and manufactured in Germany
- Anti-theft devices
- Bird spikes



AIRSIDE MAINTENANCE

Safety and compliance come first with Honeywell Airside Services offerings that empower airports to carry out maintenance activities with speed and precision. Honeywell Airside Services respect system standards in alignment with industry practices, regulatory requirements, and specific airport operating procedures. And thanks to Honeywell's extensive Operational Technology (OT) cybersecurity expertise and dedicated maintenance, airports can not only identify potential hazards and obsolescence well ahead of time but also address light failures quickly.

BREAKDOWN MAINTENANCE

Prioritize repairs of unserviceable equipment or systems

Breakdown maintenance includes tasks that identify, isolate, and rectify a fault – so that failed airside equipment, machines, or systems can more quickly be restored to an operational condition. For Honeywell, effective management of corrective maintenance means:

- Carrying out operations right and fast
- Adopting measures to promote prevention of the recurrence of that failure by improving the MBTF (Mean Time Between Failures)
- Consuming less resources (both labor and material)

PREVENTIVE MAINTENANCE

Planned equipment maintenance, as per manufacturer recommendation and ICAO (Annex 14 and CAR IX)

For Honeywell, preventive maintenance means planned maintenance of systems and equipment that improves asset life, therefore limiting unscheduled maintenance activities. This also includes cleaning, adjusting angles and alignments of elevated fixtures, and minor component replacement. Honeywell provide airports with a bona fide preventive maintenance program that helps minimize breakdowns and excessive equipment depreciation and is trusted by some of the most demanding airports in the world. The program includes:

- Periodic inspection
- Preplanned maintenance activities
- Maintenance to correct deficiencies found through testing or inspections

CORRECTIVE MAINTENANCE

Recertification of identified faults during daily inspections

Honeywell's corrective maintenance approach offers a precise approach, tailored to the aircraft runway category. This promotes the goal of ensuring that during any event or period of operations, at least 95% of all approach and runway lights are serviceable.



OPERATIONAL CYBERSECURITY

From utility SCADA systems to AGL control systems and everything in between, operational technologies in airports require a specific approach. At Honeywell, cybersecurity is taken seriously and protection is built into our solutions. Leveraging expert knowledge and technologies, Honeywell developed a suite of solutions that strongly secures your OT environment.

CYBERSECURITY ASSESSMENTS AND ADVISORY

Review airport site's OT system following the National Institute of Standards and Technology Cybersecurity Framework — and identify vulnerabilities and potential issues.

OUTCOMES

- Detailed report
- Action plan
- Cyber baseline

SECURE CONFIGURATION

Honeywell can help implement a securely designed OT infrastructure — following the industry's top best practices to help harden physical, network, and application layers.

OUTCOMES

- Reduce OT risks
- Lower potential costs

CYBERSECURITY APPLIANCES AND SOFTWARE AND DESIGN

Install and support Cybersecurity Hardware and Software to protect the OT. Next generation Firewalls and Antivirus to backup and restore.

OUTCOMES

- Reduce OT risks
- Lower potential costs

CYBERSECURITY MONITORING AND REMOTE MANAGEMENT

Get alerts on systems performance stats or security issues with remote monitoring of IT/OT networks, applications, and servers.

OUTCOMES

- Proactive monitoring
- Periodic reporting
- Early warning

INCIDENT READINESS AND ADVISORY

Access post incident advisory services that offer assessment and implementation of all procedures and processes.

OUTCOMES

- Reduced downtime
- Reduced costs

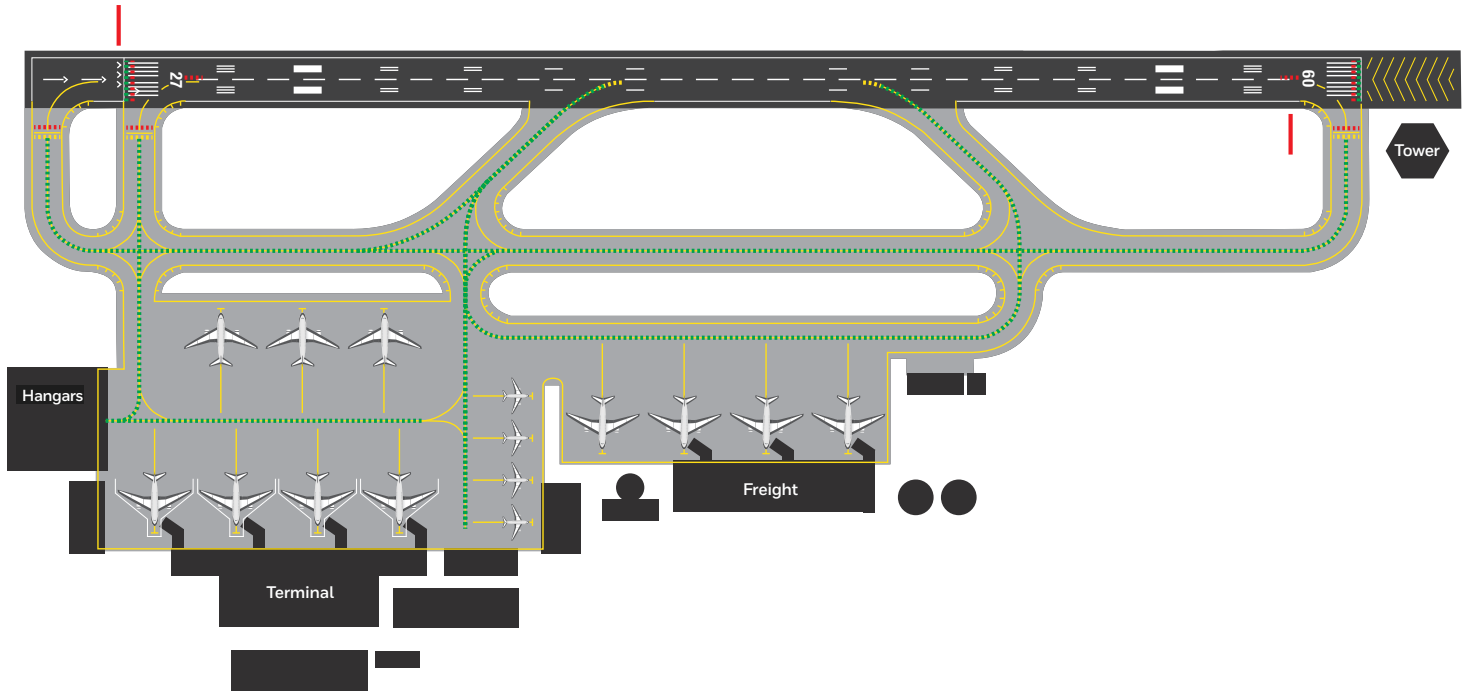


THE FUTURE OF MAINTENANCE IS DIGITIZED

Honeywell is constantly working with leading airports to improve the efficiency of maintenance operations leveraging online tools and systems. Maintenance digitization enables a better utilization of resources, improved response time, and an increased equipment lifecycle. For more details contact your account manager.

ALL-WEATHER SAFETY LIGHTS THE WAY

Find out what your business can achieve when you have Honeywell Airport Ground Lighting solutions working for you.



- Honeywell Lights
- Honeywell NAVITAS™ Lights Manager
- Honeywell Addressable Switching Devices
- Honeywell Power Constant Current Regulators
- Honeywell Taxiway Guidance Signage
- Airside Service, Maintenance and OT Cybersecurity

For More Information

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SL-53-0000 | 03/21
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