# SMART IOT EXTENDED INTELLIGENCE PLATFORM (ExI PLATFORM)

## TURNING BUILDINGS INTO SMART ENERGY BUILDINGS

DHS Engineering Limited

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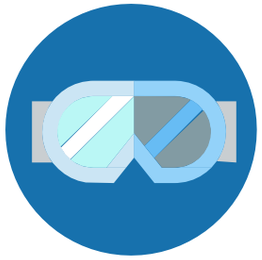
# DHS SMART IOT SOLUTIONS – SMART FIELD / INDUSTRIAL SOLUTIONS



## Smart AR glass

Emergency situation notification to display on glass. Work inspection

## Identity & Access control

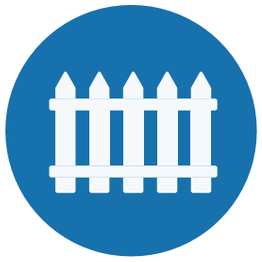
Every worker/ Vehicle access control through UHF RFID

## Healthy condition

Body temperature, Fall sensor Heart rate sensor to evaluate individual worker working condition

## Position tracking

Every worker/ Vehicle position tracking via BLE+LORA for open space and



## Forbidden Zone

Alarms with workers in more or more predefined forbidden zones

## Wearable Camera

Recording working condition and remote communication and adapt to low illuminance environment


## Harmful Air Detection

Detect Co Co2 O2 H2S and other air quality and directly link with Alarm system

## Natural Disaster

Automatic alarm of land slide/ water floor and other natural disaster incidents by LPwan IOT

## Alarm system

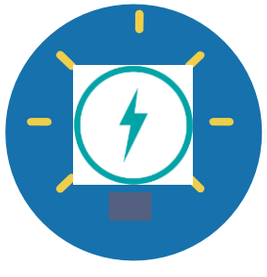
Emergency alarm system trigger through different event setup

## People counting

Calculates people passing through certain area

## Vehicle counting

Counting of individuals and /or vehicles. For separated moving objects



## Energy Management

Help save energy through Smart Mater and CMVP

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# DHS SMART IOT SOLUTIONS – SMART BUILDING/ CARE SOLUTIONS

## Facility Management

Temperature, Humidity, Water Leakage, Pressure, Light, Power Failure, Vibration Sensor, Fan Coil, Lighting Sensors

## Identity & Access control

Every staff access control through UHF RFID, working with Facial Recognition System

## Fainted Sensor

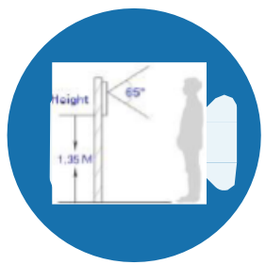
Body temperature, Fall sensor, Heart rate sensor to evaluate individual patients/workers condition

## Position tracking

Every staff / patientsracking via BLE+LORA for open space and

## Dashboard

All data to transform management KPI




## Facial Recognition

Facial recognition of the staff and workers in office for HR and security checking


## IAQ Detection

Detect Co Co2 O2 H2S and other air quality and directly link with Alarm system

## Backup

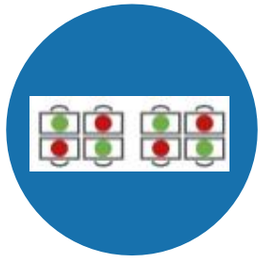
System data will be backup locally and in cloud

## Alarm system

Fire Alarm, Security Alarm etc. of Alarm Systems

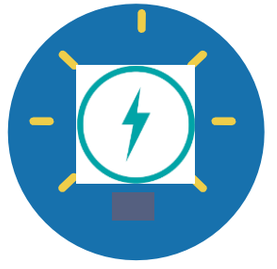
## Document

stores all documentation in a customer web portal for instant access.



## Smart Space

Check availability of Space or seats inside the office space



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# DHS LORA SENSORS AND DEVICES

## Product Catalogue

2020

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# DHS LoRa Wireless Gateway

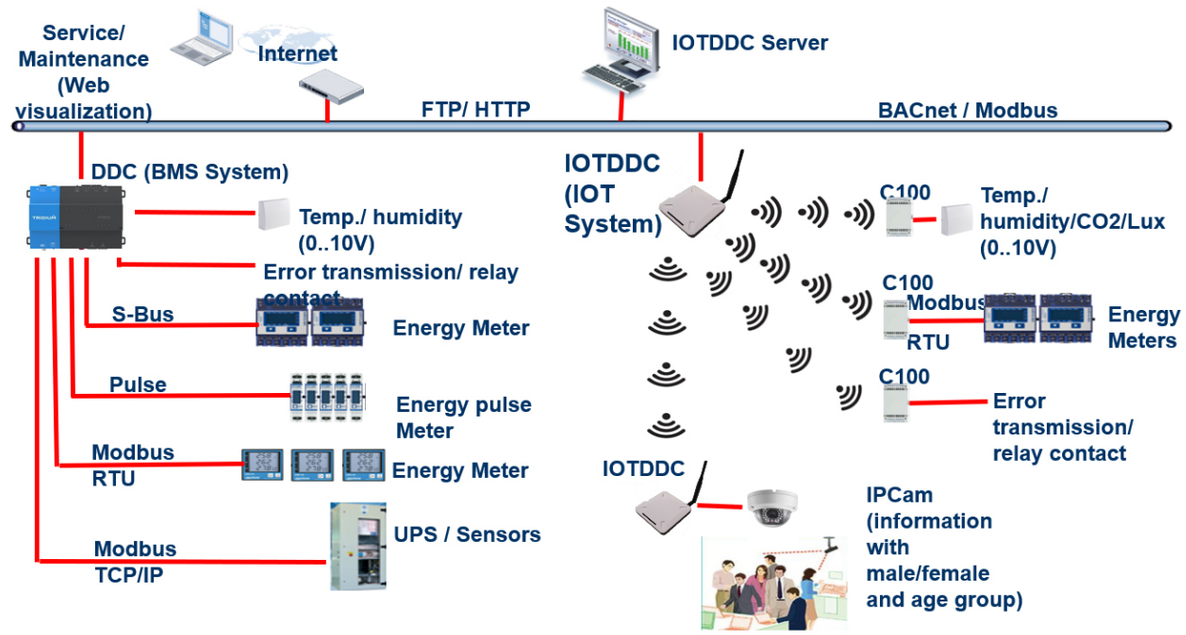


## Technical Parameter

| | |
|---|---|
| **LoRa Interface** | |
| Number of antennas | 1 |
| Connector | M16, female |
| Standards | 863-870 MHz (Europe)<br>470-510 MHz (China)<br>915-927 MHz (Australia)<br>902-928 MHz (North America)<br>920-928 MHz (Japan) |
| Max transmitted power | +24.5 dBm |
| Max sensitivity | -142 dBm |
| Reception capacity | Supports 8 channels, and each channel can receive data simultaneously<br>Supports 1 MHz bandwidth demodulation |
| Communication range | 15 km |
| **Cellular Interface** | |
| Number of antennas | 2 (MAIN + AUX) |
| Connector | M16, female |
| SIM | 2 (3 V & 1.8 V) |
| Standards | 2G/3G/4G |
| **Ethernet Interface** | |
| Number of ports | 2 x 10/100 Mbps |
| Connector | M12, 4Pin&8Pin |

# DHS Wireless Mesh IOT DDC Controller

## Technical Parameter



# DHS Wireless Door / Window Sensor


## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.0V CR2450 button batteries |
| Working Voltage | DC 2.4V～3V |
| Standby Current | 12uA/3.0V |
| Transmitting Current (max) | 120mA/3.0V |
| Receiving Current (max) | 11mA @3.0V |
| Low Voltage Threshold | 2.4V |
| Voltage Measurement Accuracy | ±0.1V |

| | |
|---|---|
| Main Body Dimension | 57mm x 35mm x 15mm |
| Magnet Dimension | 43mm x 13mm x 12mm |
| Weight | 43.8g |
| Operating Temperature | -20℃ ～ 55℃ |
| Environment Humidity Range | <90% RH (No condensation) |
| Storage Temperature | -40℃ ～ 85℃ |

# DHS Wireless Activity Sensor

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## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.0V CR2450 button batteries |
| Working Voltage | DC 2.4V～3V |
| Standby Current | 40uA /3.0V |
| Transmitting Current (max) | 120mA/3.0V |
| Receiving Current (max) | 11mA @3.0V |
| Low Voltage Threshold | 2.4V |
| Voltage Measurement Accuracy | ±0.1V |
| Main Body Dimension | 57mm x 35mm x 15mm |
| Weight | 48.9g |
| Operating Temperature | -20℃ ～ 55℃ |
| Environment Humidity Range | <90% RH (No condensation) |
| Storage Temperature | -40℃ ～ 85℃ |

# DHS Wireless Light Sensor

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## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.0V CR2450 button batteries |
| Operating Power | DC 2.4V～3V |
| Standby Current | 12uA/3.0V |
| Transmitting Current (max) | 120mA/3.0V |
| Receiving Current (max) | 11mA/3.0V |
| Brightness Detecting Range | 1～3000LUX |
| Low Voltage Threshold | 2.4V |
| Voltage Measurement Accuracy | ±0.1V |
| Main Body Dimension | 57mm x 35mm x 15mm |
| Weight | 32.3g |
| Operating Temperature | -20℃ ～ 55℃ |
| Environment Humidity Range | <90% RH (No condensation) |
| Storage Temperature | -40℃ ～ 85℃ |

# DHS Wireless Water Leakage Detector


## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.0V CR2450 button batteries |
| Operation Voltage | DC +2.4V～3.0V |
| Standby Current | 12uA/3.0V |
| Transmitting Current (max) | 120mA/3.0V |
| Receiving Current (max) | 11mA @3.0V |
| Low Voltage Threshold | 2.4V |
| Voltage Measurement | ±0.1V |
| Water Leakage Material | UL2468 28AWG |
| Water Line Maximum Temperature | 80˚C |
| Water Line Weight | 5g |
| Water Line Core resistance | 1.3 Ohm / meter |
| Water Line Diameter | 1mm |
| Water Line Length | 1000mm (±5mm) |
| Water Line Flame Rating | VW-1 |

# DHS Wireless Emergency Button

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## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.0V CR2450 button batteries |
| Working Voltage | DC 2.4V～3V |
| Standby Current | 40uA /3.0V |
| Transmitting Current (max) | 120mA/3.0V |
| Receiving Current (max) | 11mA @3.0V |
| Low Voltage Threshold | 2.4V |
| Voltage Measurement Accuracy | ±0.1V |
| Main Body Dimension | 57mm x 35mm x 15mm |
| Weight | 48.9g |
| Operating Temperature | -20℃ ～ 55℃ |
| Environment Humidity Range | <90% RH (No condensation) |
| Storage Temperature | -40℃ ～ 85℃ |

# DHS Wireless Temperature and Humidity Sensor


## Technical Parameter

| | |
|---|---|
| Input power | 2 x 1.5V AA batteries |
| Operating power | DC 2.4V～3V |
| Standby current | 12uA/3V |
| Transmitting current (max) | 120mA/3V |
| Receiving current (max) | 11mA/3V |
| Voltage Measurement | ±0.1V |

| | |
|---|---|
| Dimension | L:112mm*W:34mm*H:17mm |
| Weight | 83.8g |
| Operating Humidity | ＜90%RH |
| Operating Temperature | -20˚C - 55˚C |
| Storage Temperature | -40˚C － 85˚C |
| Temperature Measurement Range | -20˚C － 55˚C |
| Temperature Measurement Accuracy | ±0.5˚C @25˚C Max. +/-0.8˚C@ -20˚C~55˚C |
| Humidity Measurement Range | 10%RH － 90%RH |
| Humidity Measurement Accuracy | ±4%RH @25˚C |

# DHS Wireless Door / Window Sensor

## Technical Parameter

| | |
|---|---|
| Input power | 2 x 1.5V AA batteries |
| operating voltage | DC 2.4V～3V |
| Standby current | 12uA/3V |
| Transmitting current (max) | 120mA/3.6V |
| Receiving current (max) | 11mA/3.6V |

| | |
|---|---|
| Dimension | L:222mm*W:130mm*H:195mm |
| Working Temp | -20˚C - 55˚C |
| Storage Temp | -40˚C － 85˚C |
| Working Humidity | <90% RH (no condensation) |
| Temperature Detecting Range | -20˚C - 55˚C |
| Temperature Accuracy | ±1℃ @25℃ |
| Humidity Detecting Range | 10%RH～90%RH |
| Humidity Accuracy | ±4.5%RH @25℃ |

# DHS Wireless Light Sensor


## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.6V ER14505 AA lithium batteries (3.6V2400mah/section） |
| Sleeping Mode | 18uA |
| Wake up Mode | 6.3mA@3.3V |
| Receiving Current (max) | 11mA @3.3V |
| Transmitting Current (max) | 120mA/3.3V |
| Battery Voltage Measurement Accuracy | ±0.1V |
| Low Voltage Threshold | 3.2V |

## Light Sensor

| | |
|---|---|
| Supply Voltage Range | 2.3VDC-3.3VDC |
| Light Sensor Model | TSL45315 |
| Illuminance Range | 3LUX~220KLUX |
| Communication Method | I2C communication |

# DHS Single Phase Current Meter with CT


| | |
|---|---|
| Input Power | 2 x 3.6V ER14505 AA lithium batteries (3.6V2400mah/section） |
| Sleeping Current | 25uA |
| Wake up Current | 7mA |
| Receiving Current (max) | 11mA @3.3V |
| Transmitting Current (max) | 127mA @3.3V |
| Battery Voltage Measurement Accuracy | ±0.1V |
| Current Measurement Accuracy | <+-1% |
| Current measurement Accuracy Range | 100mA to 30A (depending on the current transformer configuration) |

| | |
|---|---|
| Rated Input Current | 30A, 50Hz~60Hz |
| Rated Output Current | 10mA |
| Ratio | 3000:1 |
| Phase Difference (at rated input) | ≤10' (100Ω) |
| Linearity | 0.1% |
| Isolation Withstand Voltage | 3000V |
| Housing Material | Flame Retardant Grade 94-V0 UL Material |
| Environmentally Friendly | In line with ROHS |
| Working Temperature | -40° C~+85° C |

# DHS Wireless Asset Sensor

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## Technical Parameter

| | |
|---|---|
| Input Power | 2 x 3.6V ER14505 AA lithium batteries (3.6V2400mah/section） |
| Sleeping Mode | 22 uA |
| Wake up Mode | 6.3mA@3.3V |
| Receiving Current (max) | 11mA @3.3V |
| Transmitting Current (max) | 120mA/3.3V |
| Dimension | Main Part: L: 112mm*W: 65mm*H: 32mm |
| Weight | 141g |
| Environment Temperature Range | -20℃ ～ 55℃ |
| Environment Humidity Range | <90% RH (No condensation) |
| Storage Temperature | -40℃ ～ 85℃ |

# DHS Wireless CO Sensor


## Technical Parameter

| | |
|---|---|
| Power Supply | Adapter (12VDC/1A) |
| Operating Current 1 | 80mA (no RF signal transmission) |
| Operating Current 2 | 120mA (with RF signal emission) |

| | |
|---|---|
| CO Sensor Power supply | +12VDC |
| CO measurement range | 0-1000ppm |
| CO measurement method | Electrochemical sensor |
| CO measurement accuracy | <± reading 3% (@25˚C) |
| CO measurement resolution | 0.5ppm |
| Response time | ≤50s |
| Service life | >5 years in the air |
| Working pressure range | Standard atmospheric pressure ±10% |

# DHS Wireless pH Sensor

## Technical Parameter

### Electric

| | |
|---|---|
| Power Supply | Adapter DC Power Supply (12V/1A) |
| Operating Current 1 | 40mA (RX) |
| Operating Current 2 | 80mA (TX) |

### PH Sensor

| | |
|---|---|
| Operating voltage | 12VDC-24VCD±10% |
| Operating temperature range | 0-65˚C |
| Range | 0-14PH |
| Accuracy | ±0.01PH |
| Working pressure | <0.2MPa |
| Temperature Compensation | Automatic Temperature Compensation (NTC) |
| Signal output | RS485 |
| Wet material | PPR |
| Mounting Method | 3/4" NPT Thread, Immersion Mount |
| Cable length | 5m, other lengths can be customized |
| Calibration method | 2-point calibration |
| Power Consumption | <0.5W |
| Protection class | IP68 |

# DHS Wireless PM2.5 / Temperature / Humidity Sensor

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## Technical Parameter

| | |
|---|---|
| Input power | 12VDC/1A |
| Operating current 1 | 40mA (RX) |
| Operating current 2 | 80mA (TX) |
| Particle measurement range | 0.3~1.0；1.0~2.5（um） |
| Particle counting efficiency | 50%@0.3um，98%@≥0.5um |
| Particle mass concentration effective range (PM2.5 standard value) | 0~500 ug/$m^3$ |
| Particle mass concentration resolution | 1ug/$m^3$ |
| Particle mass concentration accuracy (PM2.5 standard value) | ±10%@100-500ug/ $m^3$<br>±10ug/ $m^3$@0-100ug/ $m^3$ |
| Response time | ≤10s |
| Temperature measurement range | -20˚C 55˚C |
| Temperature measurement accuracy | ±0.8˚C @25˚C |
| Humidity measurement range | 10%RH －90%RH |
| Humidity measurement accuracy | ±4%RH @25˚C |

# DHS Wireless Occupancy Sensor

## Technical Parameter

| | |
|---|---|
| Power Supply | 2pcs of 3.6V ER14505 AA |
| Operating Voltage Range | 3V～3.6V |
| Standby Current | 110uA |
| Transmitting Current (max) | 120mA |
| Receiving Current (max) | 11mA |
| Measurement Accuracy | ±0.1V |

| | |
|---|---|
| Dimension | 78mm*78.8mm*82.2mm |
| Weight | 125.8g |
| Operating Humidity | ＜90%RH |
| Operating Temperature | -20˚C ～ 55˚C |
| Storage Temperature | -40˚C ～ 85˚C |
| Built-in Devices | Tamper switch, light sensor, temperature sensor |

# DHS Wireless Sensors/ Devices from Honeywell

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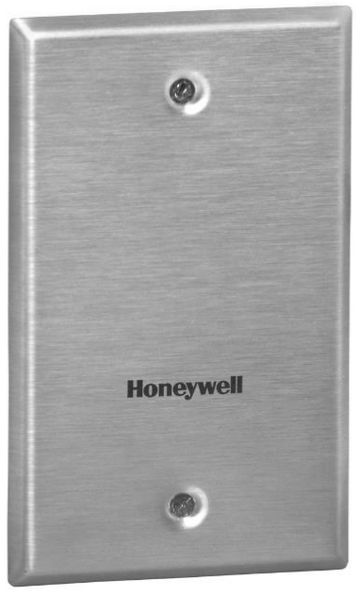



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