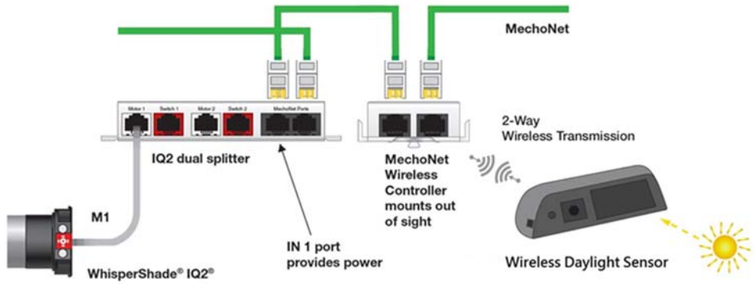
Verify Functionality

Before mounting the sensor, verify that the sensor possesses enough voltage level to operate. Press the sensor's "Teach" button momentarily and the Status LED should flash RED to indicate the sensor is powered. If the LED does not flash, then place the sensor so that the solar cell faces the sun or is in good proximity to a light source delivering greater than 200 lux to the sensor for about 5 minutes. (Watch out for excessive heating from non-LED light sources if the sensor is too close to the source.) Alternatively, attach the Quick-Charge Portable Power Source (P/N: WDSX 1X9V AS BK) to the Quick Charge port on the sensor for approximately 2 minutes.



Verify Communication

Before mounting the sensor, it is beneficial to verify the sensor's communication signal strength at the intended mounting position.

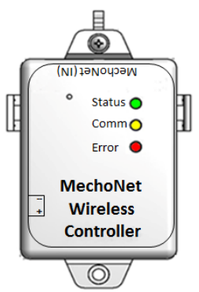
Install the MechoNet Wireless Controller.

The RF signal strength is confirmed by reading the LED indicator on the WDS as follows:

1. Connect the Quick-Charge Portable Power Source.
2. Press and hold the Teach button for about 6 seconds until the red LED illuminates. Release the button. The red LED begins flashing every 0.5 seconds.
3. Within 5 seconds, press and release the Teach button again.
4. The LED flash rate will change and the Status LED will flash different colors to indicate signal strength:
   a. green for the strongest signal level,
   b. amber for good signal level, and
   c. red for a poor signal level.
5. Position the sensor where it flashes ideally yellow or green while still maintaining the proper view of the daylight conditions (See Mounting Position Planning on page 4 for recommendations).
6. RF Range Confirmation Mode will flash the LED for about 1 minute before it automatically returns the sensor to standard operation. Remove the portable power source.

Signal strength can be determined on the MWC also:

1. Push the Teach button momentarily on the sensor. The YELLOW Comm LED should flash on the MWC verifying that it heard the transmission from the sensor.
2. Also, the RED LED on the MWC will light for a period of time indicating signal strength:
   - RED LED On for 5 seconds - Excellent signal.
   - RED LED On for 4 seconds - Good signal.
   - RED LED On for 2 seconds - Low signal strength.



Alternate Method to Verify Communication

1. Make sure the WDS is charged.
2. On the back of the Daylight Sensor, press the Teach button 3 times to jog the shades. This indicates communications between devices.
   Note: If shades do not jog, try getting closer to controller and press the Teach button 3 times to rule out any distance related issues.
3. Verify that Controller and Daylight Sensor are a paired device which have the same UIDs.
4. Verify that wiring is USOC.
5. Use a laptop with MechoSystems IQ Software and a USB Interface to troubleshoot the network and controllers.
6. Contact Techsupport at 718-729-2020, ext. 2001 and request to speak with a tech if there are any issues.

Installation

1. Clean the surface where the sensor is to be mounted with an alcohol wipe, then ensure surface is thoroughly dry before applying the sensor.
2. Remove the blue plastic film from the adhesive mounting pads and position the sensor over the cleaned surface.
3. Press down firmly on the sensor to adhere the pads to the cleaned surface.
4. Hold the sensor in place with a reasonable force for about 30 seconds.

Troubleshooting

Problem	Possible Cause	Solution
Status LED does not flash when button is pressed.	Sensor is not charged.	Charge using a good light source for 10 min. or attach quick charger.
Sensor data is not found by MWC.	Weak or no RF signal.	Position sensor within RF range or away from RF obstructions.
Sensor readings are not accurate.	Sensor is positioned in a shaded area or indirect sunlight.	Position the sensor such that mullions or over hangs do not cast shadows over the sensor.

Warranty

Limited warranty on motors and electronics to be free of manufacturing defects in factory materials or workmanship for five years from the date of shipment. For exact terms and conditions, refer to the MechoSystems Warranty.

Technical Support

MechoSystems, Inc.
www.mechosystems.com
T: +1 (718) 729-2020 (x2001)
E: techsupport@mechosystems.com

MechoSystems, Inc. reserves the right to make improvements or changes in its products without prior notice. However, every attempt is made to ensure the information herein is accurate and up to date. Verify with MechoSystems to confirm the product availability, latest specifications and suitability for your application.

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MechoNet® Wireless Daylight Sensor

Installation and Setup Guide

SM106

⚠ IMPORTANT DOCUMENT – DO NOT DISCARD

Model

902 MHz MechoNet Wireless Daylight Sensor (FCC and IC Certified)

Stock no.:	WDS9 EN01 TP BB	Black Face Plate, Black Housing
Stock no.:	WDS9 EN01 TP BG	Black Face Plate, Gray Housing
Stock no.:	WDS9 EN01 TP BW	Black Face Plate, White Housing
Stock no.:	WDS9 EN01 TP BB	Black Face Plate, Black Housing
Stock no.:	WDS9 EN01 TP BG	Black Face Plate, Gray Housing
Stock no.:	WDS9 EN01 TP BW	Black Face Plate, White Housing
Stock no.:	WDK9 EN01 BW WH	Black Face Plate, White Housing
Stock no.:	WDK9 ENPR BW WH	Black Face Plate, White Housing

Description

MechoSystems' Wireless Daylight Sensor (WDS) employs innovative EnOcean RF technology to deliver self-powered, wireless daylight measurement and automation for today's intelligent buildings and homes. Designed for indoor use, the sensor uses energy-harvesting solar cells to draw power directly from the sunlight it is monitoring instead of requiring batteries or wiring to other sources of power. The lack of wires for both power and communication enables the sensor to mount flexibly and inconspicuously by the window mullion. Adhesive pads attach the sensor horizontally, vertically or even upside down as conditions require to ensure the sensor has the best view of glare sources while limiting the sensor's impact to the window condition.

Employing EnOcean's EEP A5-06-04 for CurtainWall Brightness Sensor, the WDS communicates the daylight conditions at the curtain wall to other EnOcean devices such as the MechoSystems' MechoNet Wireless Controller (MWC). The sensor sends out readings whenever the daylight level has changed by more than 3%. Heartbeat messages of the current condition are sent out every minute during daylight hours and every hour during night hours. The sensor automatically detects the transitions between night and day. Using the MWC the illuminance (16 bit) and temperature (8 bit) data can be employed to support automation algorithms for shading via SolarTracTM or using the Solar Activated Control (SAC) modes within the MWC to operate shades directly.

For interior use only

Specifications

MECHANICAL

Size:	3.10” (78.7mm) w x 1.20” (30.5mm) h x 0.88” (22.4mm)
Weight:	1.20 oz (34.0 g)

ENVIRONMENTAL

Enclosure:	Type 1 – INDOOR USE ONLY
Temperature:	32 to 140 deg F (0 to 60 deg C)
Humidity:	<90% relative humidity, non-condensing

FEATURES

Quick Charge Port:	Charger: P/N WDSX 1X9V AS BK
Full charge time	< 1 minute
Power Supply:	Integrated solar cells, NO BATTERIES OR WIRES
Solar Level	Operational Level >100 lux
Startup period	< 2 minutes @ 100 lux, Day mode > 200 lux for more than 2 min. Night mode < 200 lux for more than 5 min.
PhotoSensor	Field Of View 60 degree cone angle (horizontal, vertical)

COMMUNICATION

Radio Frequency	902 MHz
Transmit/Receive Range	80 feet typical in an open commercial office setting 25 ft max at curtainwall between the sensor and the MWC.

CERTIFICATION

FCC Part 15.231	FCC ID: SZV-STM300U
Industry Canada RSS-210	IC ID: 5713A-STM300U
EnOcean Equipment Profile:	EEP A5-06-04 - Curtainwall Brightness Sensor
Illuminance	16 bit, 0 – 65,535 lux, +/- 5%
Temperature	8 bit, 0…255 = -20 - 60 deg C, +/- 1%
Energy storage	4 bit, 0…15 = 0 – 100%

Agency Listings and Compliance

FCC Part 15.231 Compliant
Contains FCC ID: SZV-STM300U

This device complies with RSS-210 of the Industry Canada Rules.
Contains IC ID: 5713A-STM300U

Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device pursuant to

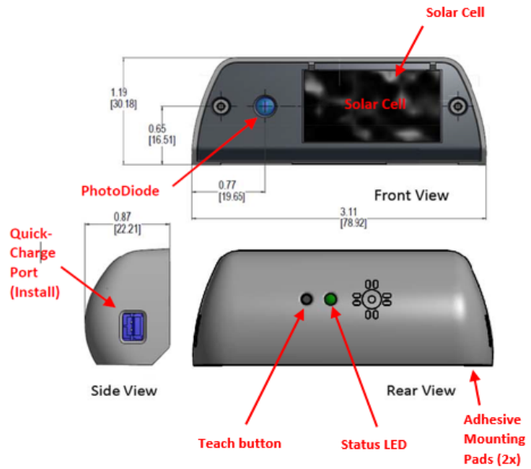
- Part 15 of the FCC Rules
- Canadian ICES-003

MWC backside showing label

WDS underside showing label

WARNING

- These installation instructions contain important safety information.
- Read all instructions before installing this equipment. If you are unsure about any part of these instructions, stop and contact a qualified installer.
- Before installing or servicing, remove unnecessary cords and disable unnecessary equipment to avoid unexpected hazards.
- Do not connect terminals to voltages greater than the specifications.
- Do not use the product in a location with strong magnetic or electrical interference.
- Improper wiring may result in injury and damage to equipment and surroundings.
- Do not chase low voltage cables in the same conduit with line voltage cables.



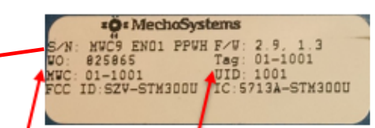
Commissioning/Programming

Each Wireless Daylight Sensor (WDS) is to be paired with a MechoNet Wireless Controller (MWC). The WDS can be purchased already paired with a MWC or it can be paired during the time of installation. Please refer to the *MechoNet Wireless Controller Installation and Setup Guide, Pairing a Sensor or Switch to the MWC.*

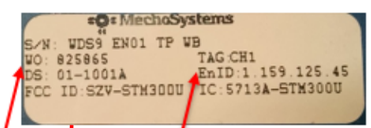
Location Planning

If Wireless Daylight Sensors (WDS) are paired with MechoNet Wireless Controllers (MWC) at the factory prior to shipping, review the labels on both devices to ensure that the MWC number and the WDS number matches before installing (see example below).

Controller (MWC) Label:



Sensor (WDS) Label:



MWC # MWC UID Sensor # Sensor's EnOcean ID

The sensor label identifies the sensor number (DS:) and its EnOcean ID (EnID:). The sensor number (DS:) correlates to the MechoNet Wireless Controller number (MWC:) and the floor plan drawings for the project highlighting where the MWC and WDS should be installed. The letter at the end of the sensor number designates the MWC channel to which the sensor is paired.

Variations in urban landscape typically affect the spacing between sensors along a façade. The general rule of thumb is to space sensors every 25 feet. Sensors can be spaced closer to handle more diverse daylight conditions. Since MWCs can support up to 16 channels each, sensors can typically be added easily to a project if glare conditions prove to be more complicated than originally expected.

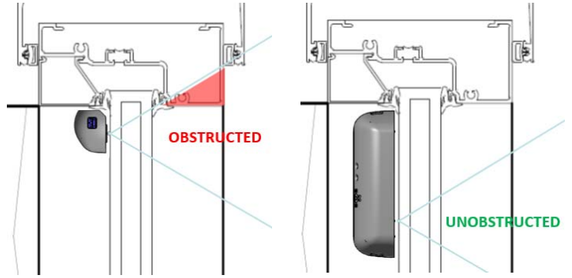
Note: Photo sensors are not well suited to detect glare from reflections. Reflections are typically highly directional and tend to only trigger photo sensors for a very short window of time even though the glare source is still affecting the area. Please contact technical support to best handle glare when it is caused by reflections.

In general, the MWC should be located within 25 feet of its paired sensor or switch. Due to the high prevalence of metal surrounding the curtain wall area. RF energy cannot penetrate metal surfaces.

Mounting Position Planning

The Daylight sensor is designed for open loop operation. This means that the sensor must be positioned between any window covering and the glass so that the solar cell and photo sensor are facing directly through the glass with no obstructions. Critical to ensuring reliable operation:

- Position the sensor right up against the window to ensure reflections from interior lights cannot affect its light level readings. In addition, this can help ensure that dust and other obstacles cannot build up between the sensor and the glass.
- Ensure no dirt on the glass that is located directly in front of the sensor. Dirt can cause an obstructed view.
- Consider the FOV of the sensor, and ensure no overhangs outside the window block or shadow its view of any glare sources.



The sensor mounts horizontally or vertically along either side of a mullion. See the examples below.

Refer to the *Installation* section on page 6 for installation instructions.