

DAS2.0 Webpage User Manual

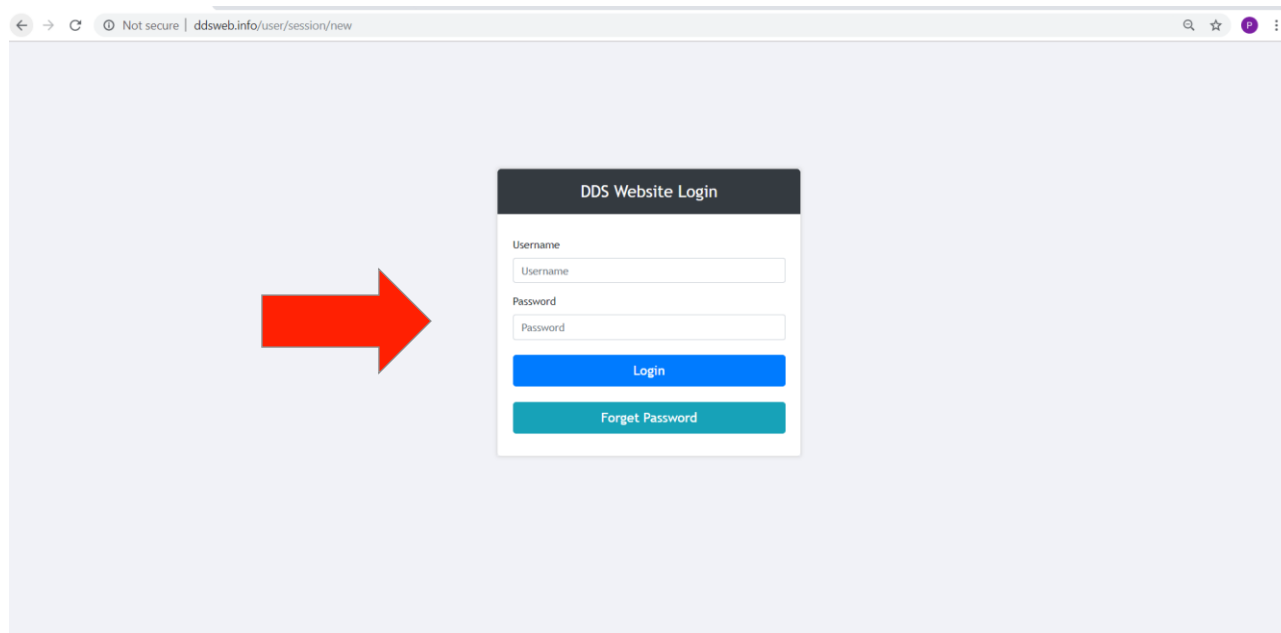
March 20th, 2024



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DAS2.0 Exclusive Webpage Login

- URL: <http://pva.extelenergy.com>
- Please enter your username and password



DAS2.0 Main Page_1

■ The main page (Portal page) displays the following key information:

1. Site location
2. Installed capacity
3. Current soiling loss (%)
4. Last cleaning date
5. Power generation loss due to soiling, etc.

The screenshot displays the EXTEL ENERGY portal interface. At the top, the logo and navigation links (Portal, soiling, Irradiance) are visible, along with user and site information (User: [redacted], Site: LCY_DAS_1(大林科定)). The main content area features a 'Sites' sidebar with a dropdown menu set to 'Taiwan' and a list of sites, including 'LCY_DAS_1(大林科定)'. A table below shows the following data:

Site Name	Soiling (Uncertainty: ±1%)	Capacity	Last cleaning/raining date	Profit Loss(NT\$)
LCY_DAS_1(大林科定)	1.2 %	1561.6 kW	2021/02/03	299

Annotations on the screenshot include: 1. A red arrow pointing to the site name in the sidebar. 2. A yellow box labeled 'DAS2.0 case name/location' pointing to the site name in the table. 3. A yellow box labeled 'Where to install DAS' pointing to a red location pin on the map of Taiwan. 4. Numbered callouts (1-5) pointing to the 'entries' dropdown, the table columns, the search bar, and the search input field respectively.

DAS2.0 Main Page_2

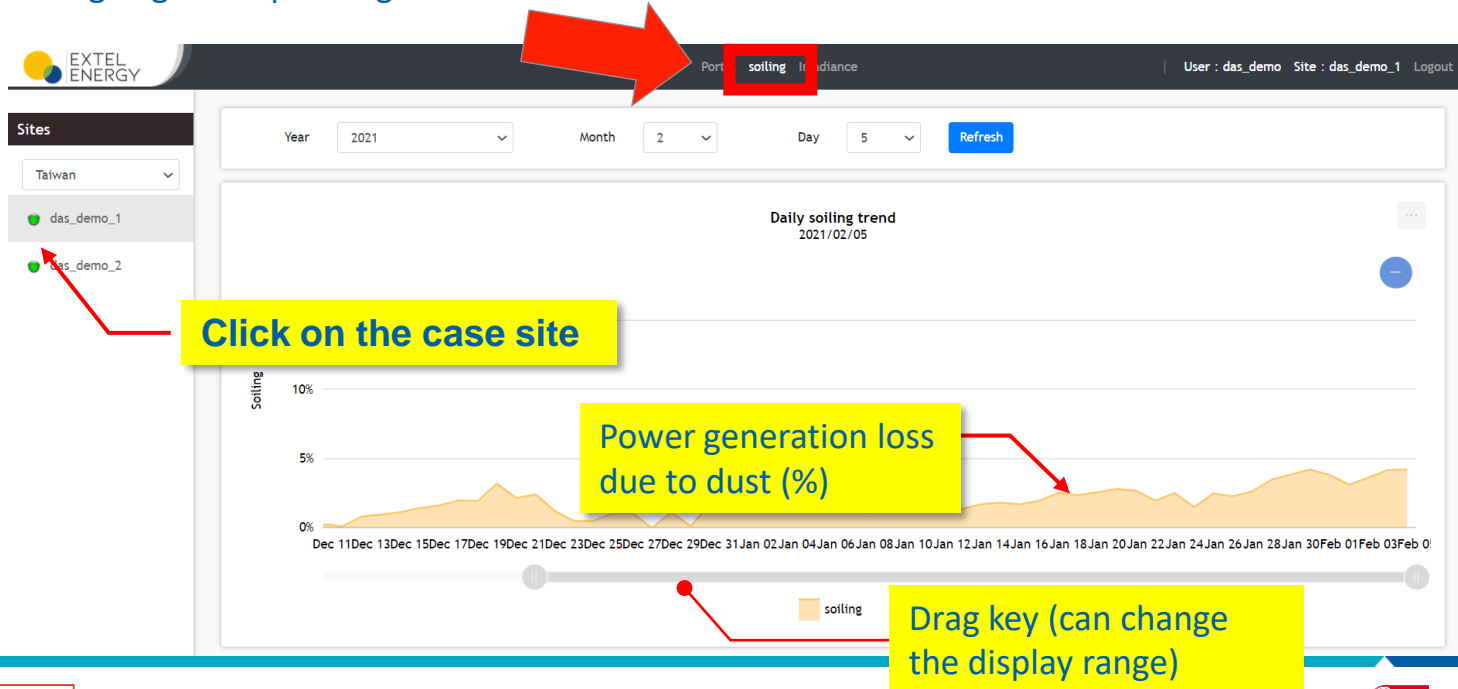
- Users can quickly grasp the degree of contamination of the case site on the home page and determine whether to proceed with cleaning based on the last cleaning date, case site size, and power generation loss, as well as the priority of cleaning.

The screenshot displays the EXTEL ENERGY DAS2.0 Main Page. The page features a header with the EXTEL ENERGY logo, a user profile section, and a site selection dropdown. The main content area includes a table of site data and a map of Taiwan. A yellow callout box highlights the 'Power generation loss due to dust (%)' column in the table. Another yellow callout box highlights the 'Accumulated Profit Loss due to dust(NTD)' column. A third yellow callout box highlights the 'Case site device capacity' column. A fourth yellow callout box highlights the 'Date of last cleaning or raining' column. The map shows the location of the site LCY_DAS_1(大林科定) in Taiwan.

Site Name	Soiling (Uncertainty: ±1%)	Capacity	Last cleaning/raining date	Profit Loss(NTS)
LCY_DAS_1(大林科定)	1.2 %	1561.6 kW	2021/02/03	299

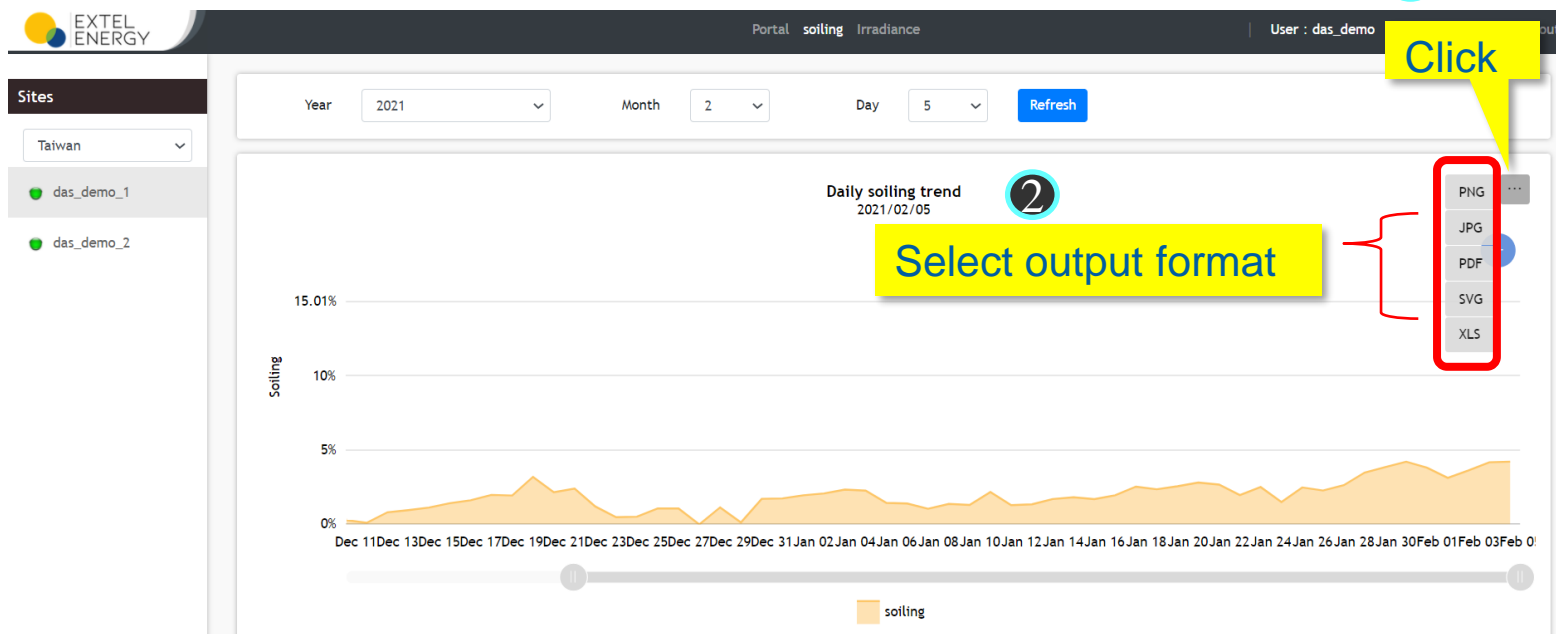
Soiling Loss Trend Chart_1

- The dust trend chart shows the daily power generation loss (%) caused by dust at each site, e.g. If the loss is 0%, it means that the module surface is clean. On the contrary, the higher the number, the surface is seriously dirty, resulting in greater power generation loss.



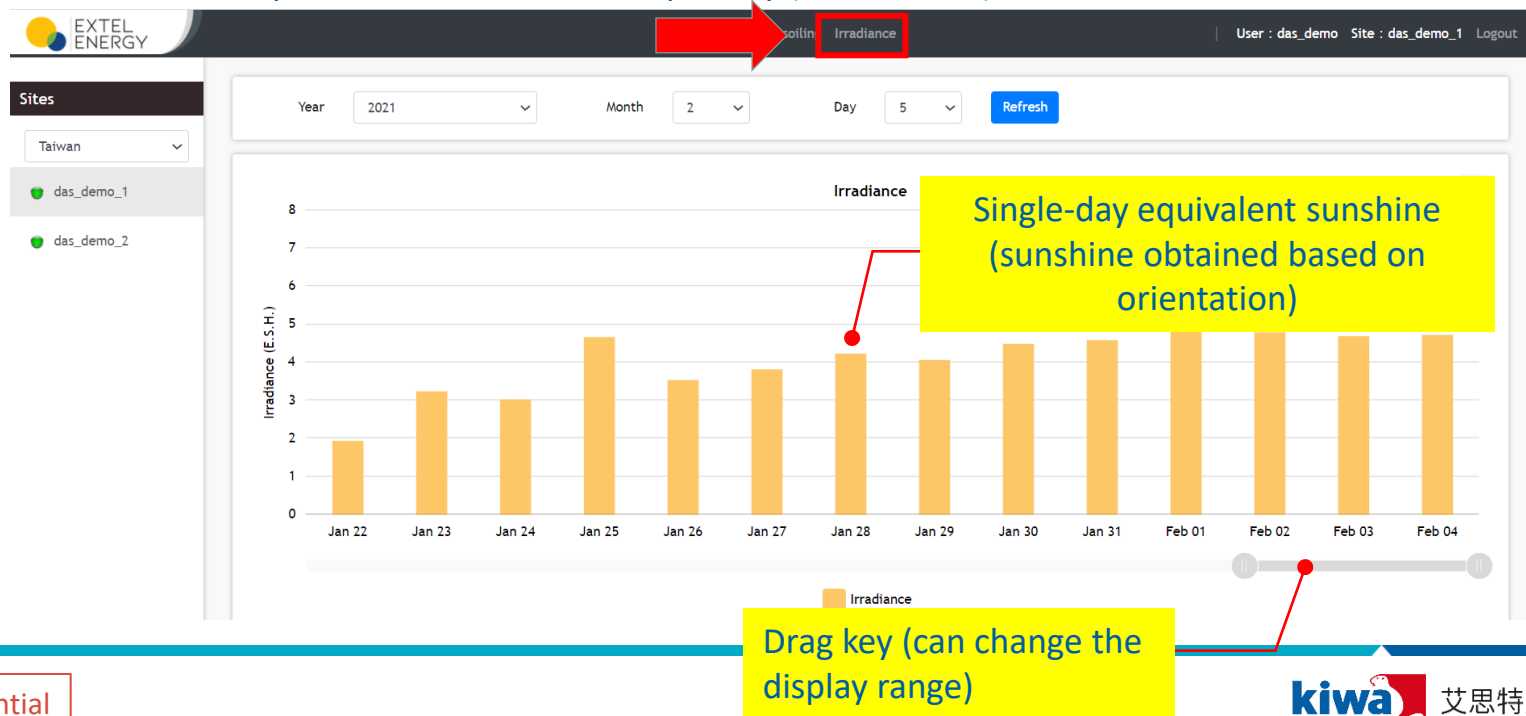
Soiling Loss Trend Chart_2

- If users need further data analysis, they can download daily soiling data from the trend chart page (see below).



Equivalent Irradiance Bar Chart_1

- According to the DAS2.0 system measurements, the daily irradiance data is directly displayed on the Irradiance tab.
- The ESH value is the equivalent irradiance hours per day (06:00-18:00).

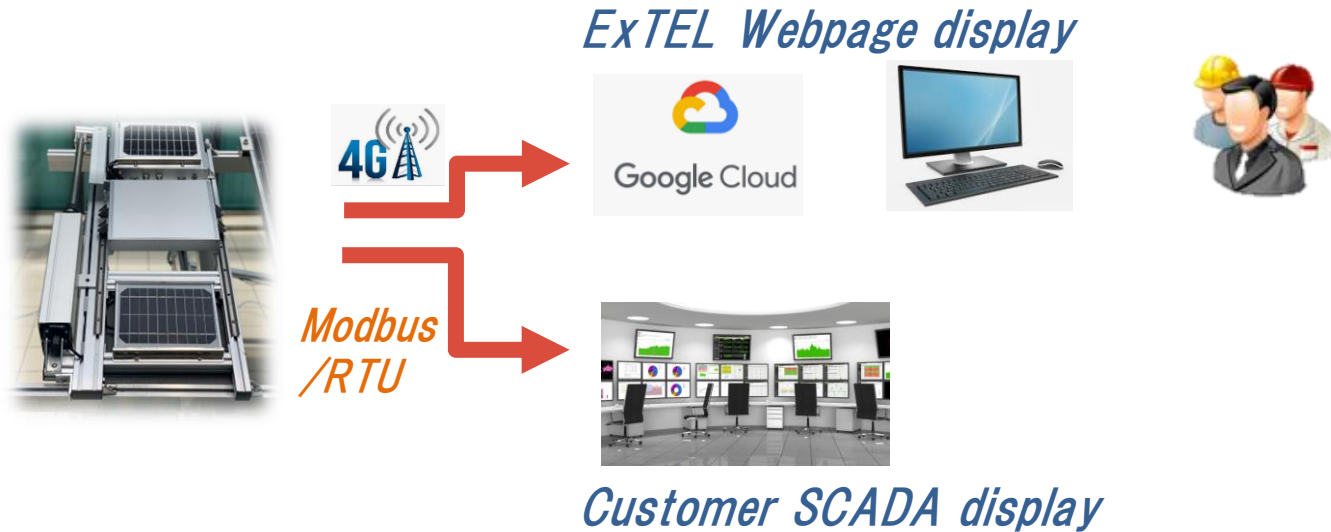


Appendix

Data Transmission Method – 4G Webpage (KIWA EXTEL) / SCADA (Customer)

■ DAS 2.0 provides two data interfacing options:

1. DAS 2.0 Webpage display (4G webpage provided by Extel Energy)
2. Modbus/RTU direct communication with on-site SCADA (customer data collector)



DAS Modbus Communication Protocol (Optional)

Read Holding Registers (0x03)

Addr	Variable description	Units	Size	Read / Write
0x00	Date_1	YYYY	2_byte	Read Only
0x01	Date_2	MMDD	2_byte	Read Only
0x02	Soiling Gap	*0.01+%	2_byte	Read Only

Send : 01H+03H+0000H+0003H+05CBH(CRC)

Response : 01H+03H+06H+07ECH+0A0FH+0CAFH+C7B2H(CRC)

Example

Send : 01 03 00 00 00 03 05 CB

Response : 01 03 06 07 EC 0A 0F 0C AF C7 B2

YYYY => 0x07EC = 2020 MMDD=>MM+DD=>0x0A0F=1015

Date=2020/10/15

Soiling Gap=>0x0CAF=3247*0.01% =32.47%

DAS Modbus Communication Protocol

ID Setting

Preset Single Register (0x06)

Send : 01H+06H+001FH+AAH+ (id code)H+(CRC)

Response : (id code)+06H+001FH+AAH+(id code)+(CRC)

Example :

Send : 01 06 00 1F AA 03 86 AD

Response : 03 06 00 1F AA 03 87 4F

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