

ZSTC Grain Silo Temperature Monitoring System Software Documentation

1. Software Description

The ZSTC Grain Silo Monitoring System software can communicate with the data-collector to obtain the data from the grain temperature measurement cable, and informatively shown in the form of tables or graphs. It can help the custodians to effectively prevent grain damage caused by mildew, insects, and other reasons.

The software has many functions such as manual measurement, interval-based measurement , stereo-view mode, printing and displaying charts, silo-view mode, historical record, remote computer terminals, web application, desktop application, and mobile application. -

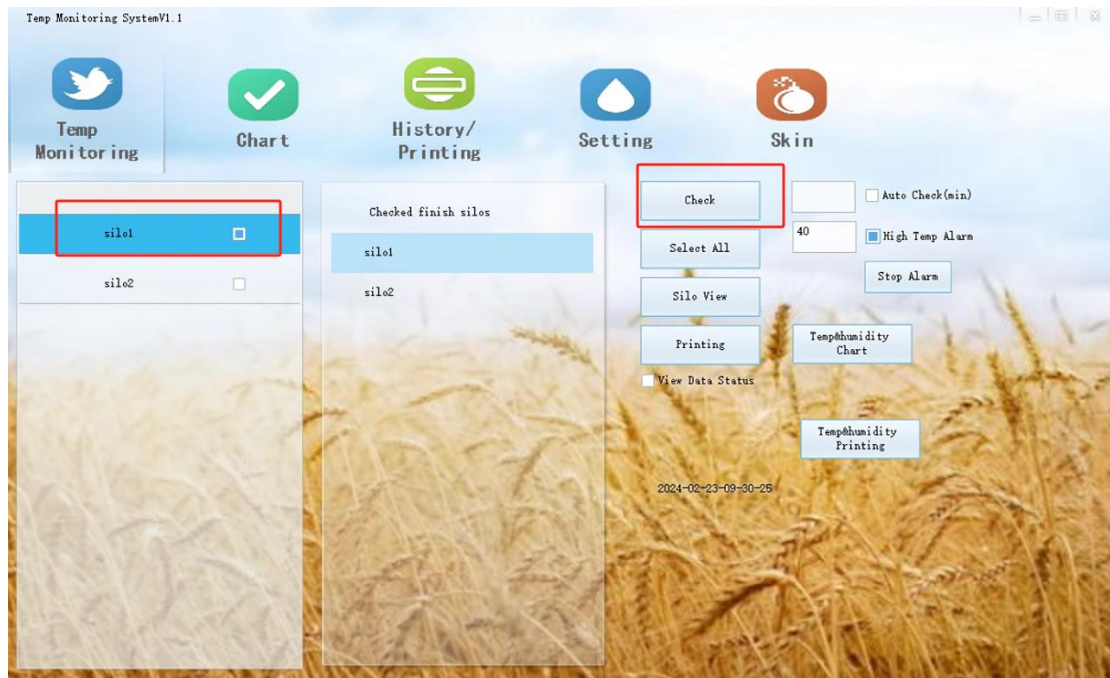
2. Software Specification Requirements

- CPU : 1.2GHz or higher
- RAM : 2GB or higher.
- Hard disk space : 500MB minimum.
- Desktop application operating system : Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10, Windows Server 2003 or higher.
- Mobile application operating system : Android.
- Web browser : IE11 or higher, Microsoft Edge, Google Chrome, Chromium based browser (including but not limited to 360 browser, Sogou browser, Baidu browser, Spartan browser, 2345 browser, QQ browser, Cheetah browser Device).

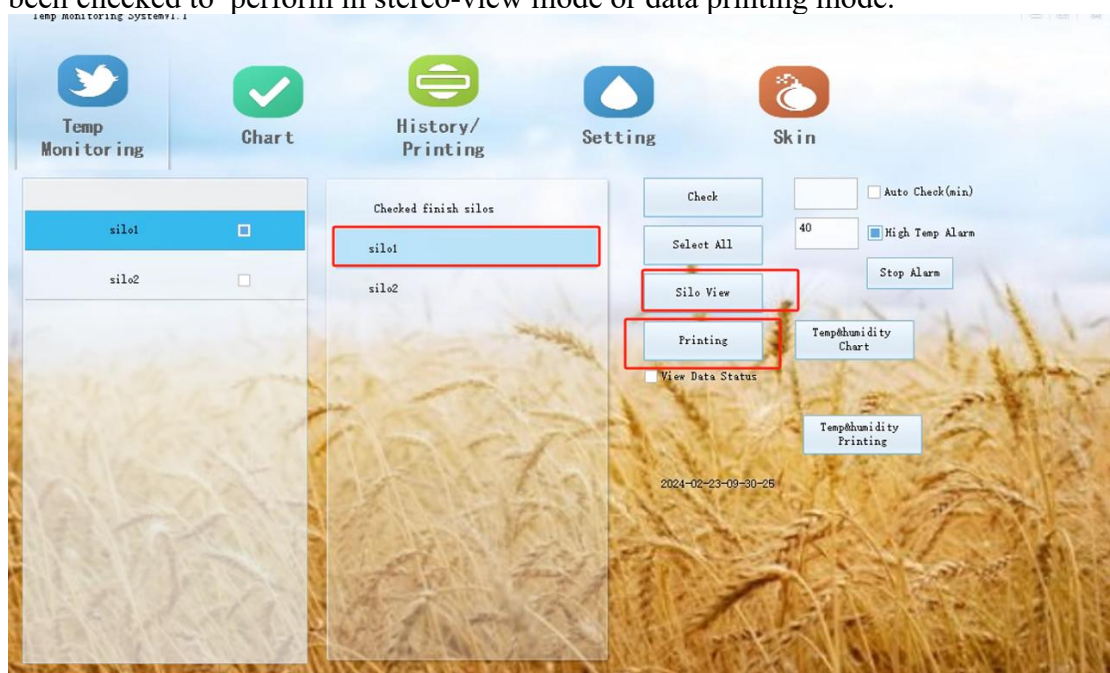
3. Software Features

a. Manual Measurement

After entering the ZSTC Grain Silo Temperature Monitoring System Software, user can select manually the silo name that needs to be measured on the left side compartment (if necessary to test all, click the "Select All" button on the right side), click the "Check" button to start the temperature measurement.



After the measurement has been completed, click one of the silo's names that has been checked to perform in stereo-view mode or data printing mode.



b. Interval-based Measurement

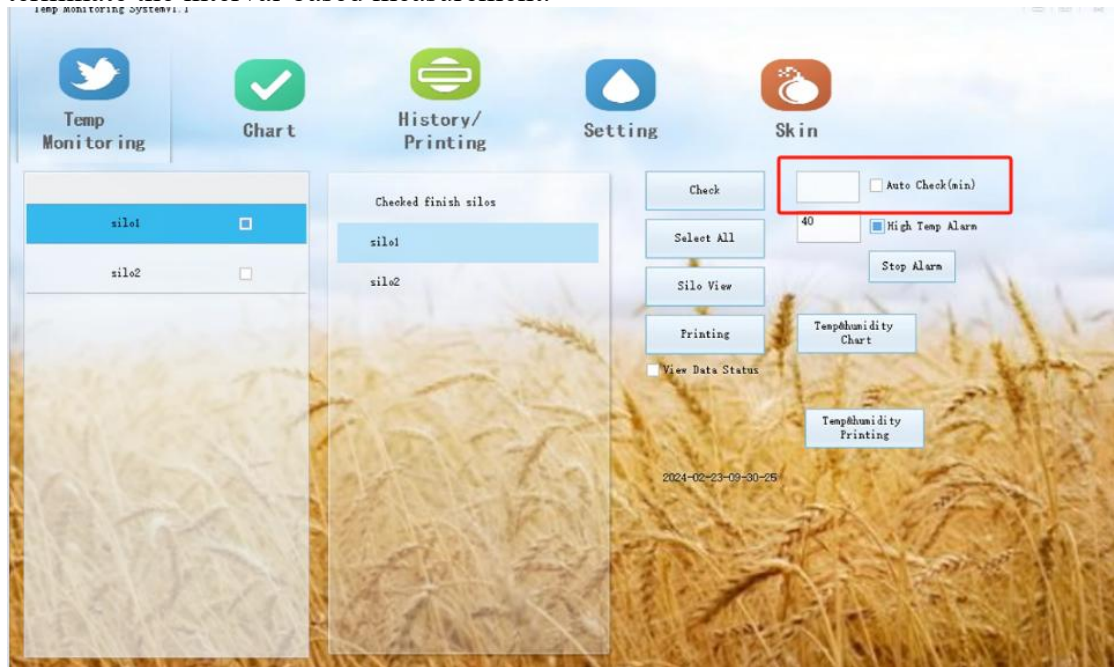
Interval-based Measurement is based on the interval time that is set to do a temperature measurement.

For example: Set 60, which means 60 minutes to check the grain temperature every 1 hours.

Instruction and precautions:

1. Before using the interval-based measurement, you need to select the silo by ticking the box beside the silo name.

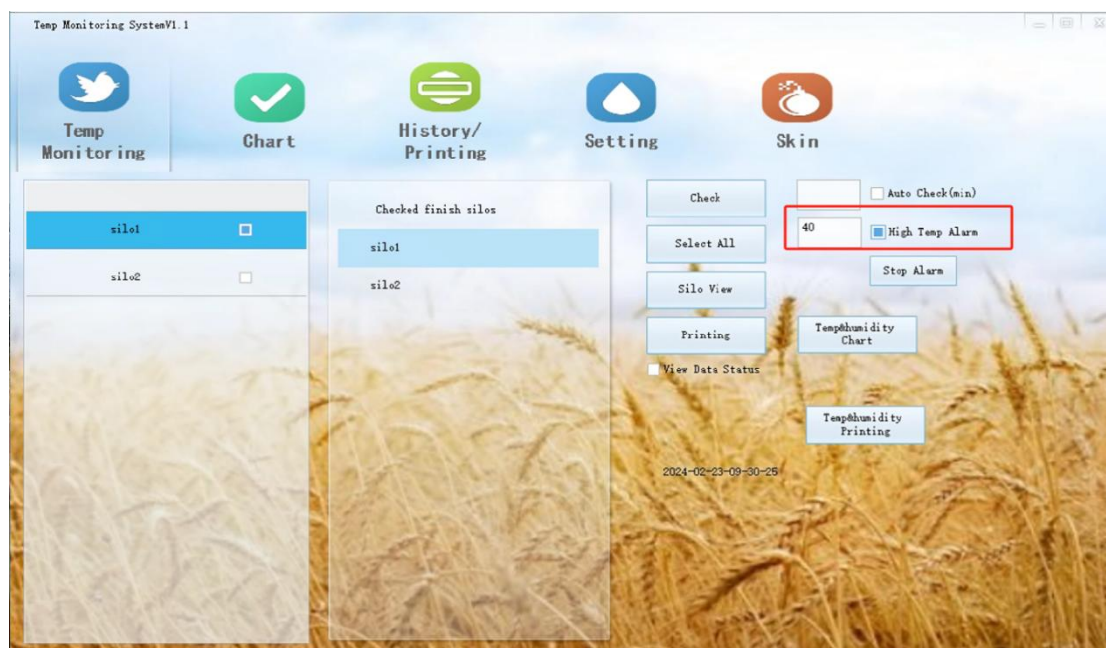
2. Fill in the interval time (minutes) in the setting box.
3. Click the “Auto Check” on the right side to start the interval-based measurement.
4. If the application is restarted, you need to reselect the silo and refill the interval time.
5. Minimizing the application is allowed, but closing the application will terminate the interval-based measurement.



6.

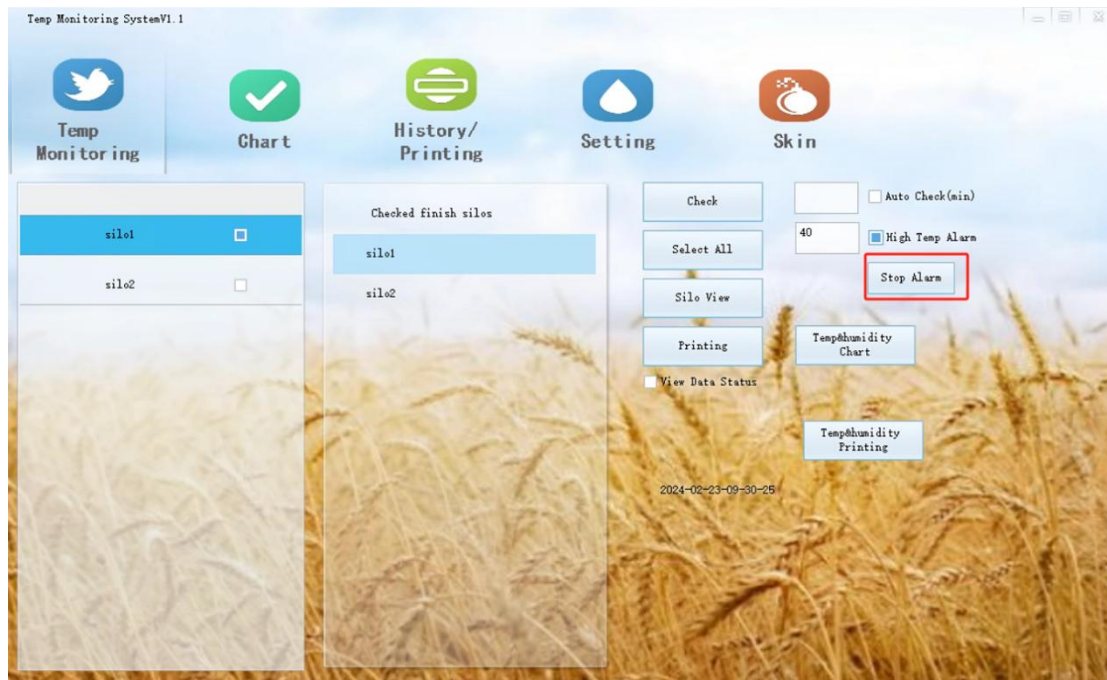
c. High Temperature Alarm

This feature will alarm the user if the temperature measurement exceeds the previously set threshold, a beep sound will be emitted through the computer audio. To activate this feature, you can fill in the threshold temperature in the setting box and tick the “High Temp Alarm” checkbox.



For example:

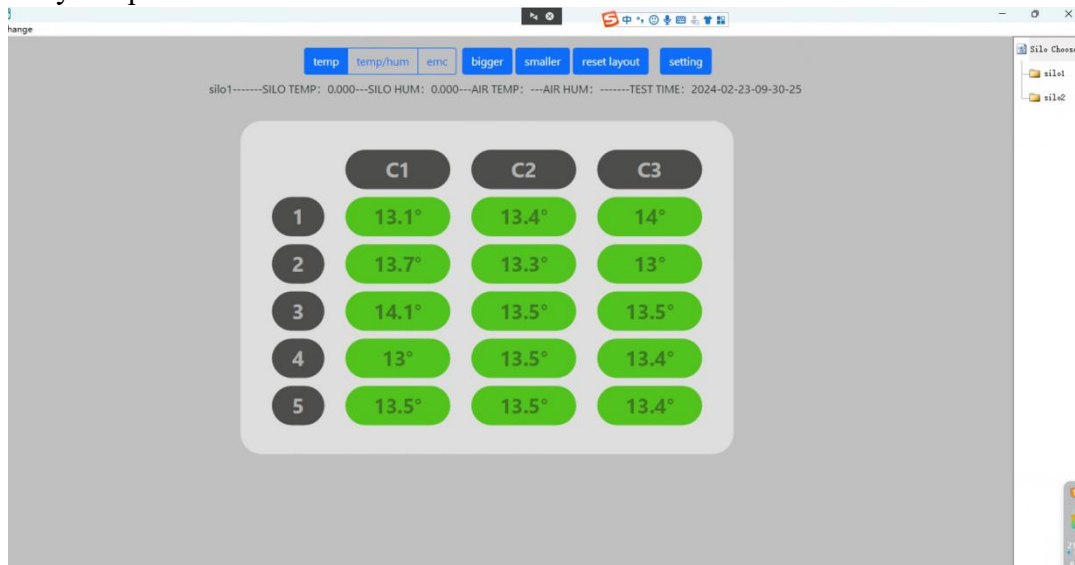
If the threshold is set to 40, the beeping alarm will ring if the measured temperature exceeds 40 degrees. When the alarm rings, you need to click the “Stop Alarm” button to stop the alarm.



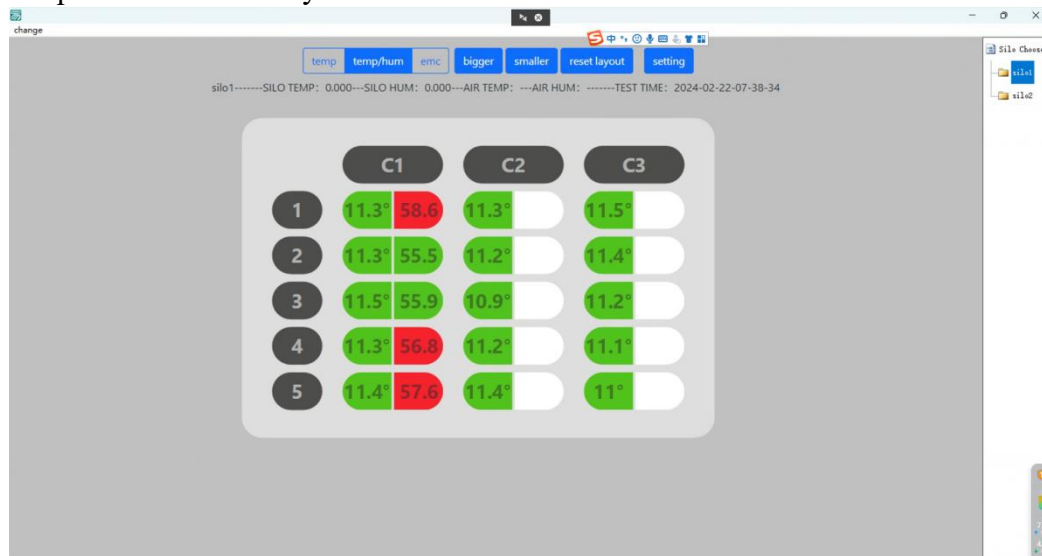
d. Stereo-View Mode

Click on the first line to visually view the temperature data of each cable.

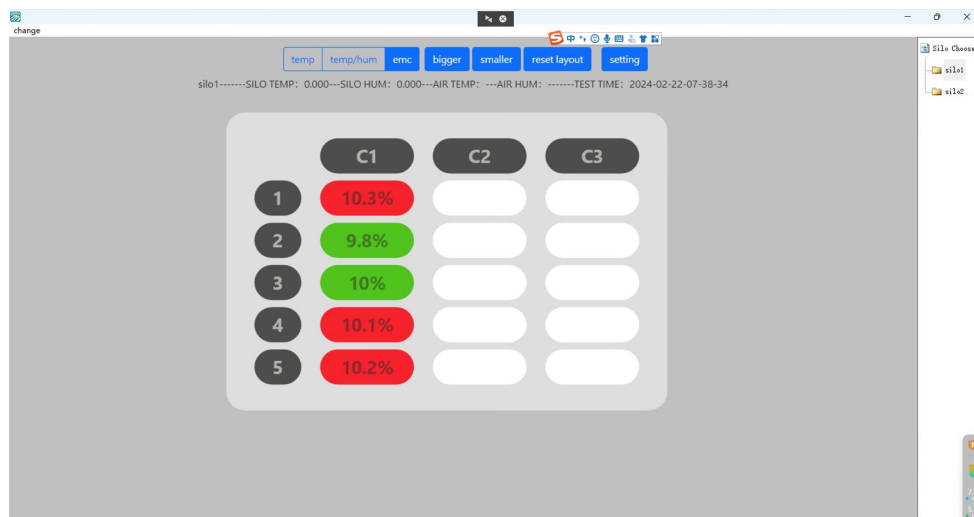
Only temperature view:



temperature & humidity* (moisture) view:



EMCview



e. Data Printing

This feature allows the user to print the data on the A4 size paper, adjustable to horizontal or vertical printout.

This feature supports both local printing and internet printing.

On the printout, users can intuitively see data of :

1. The temperature of each point.
2. The highest temperature of the entire silo or single level of the silo.
3. The lowest temperature of the entire silo or single level of the silo.
4. The average temperature of the entire silo or single level of the silo.
5. Silo information card (optional) and the other data.

				Highest Temp:	27.6	Avg Temp:	27.3
				Lowest Temp:	27.1	Varieties:	
In Temp:	0	In Hum:	0	Out Temp:	0	Out Hum:	0
Check Time:	2021/01/27 12:25:06			Keeper:		Name:	1
Count			Checker				
Temp Analy			Design Storage(T)				
Truth Storage(T)			In Time				
In Water			Now Water				
Out Time			Place				
Germination%			Impurity%				
Water Holding%			Weight%				
Imperfect%			Checker				
	1Line(1Row)	2Line(1Row)	3Line(1Row)	4Line(1Row)			
1Col	27.6						
2Col	27.3						
3Col	27.1						
4Col	27.1						
5Col	27.3						
6Col	27.6						
7Col							

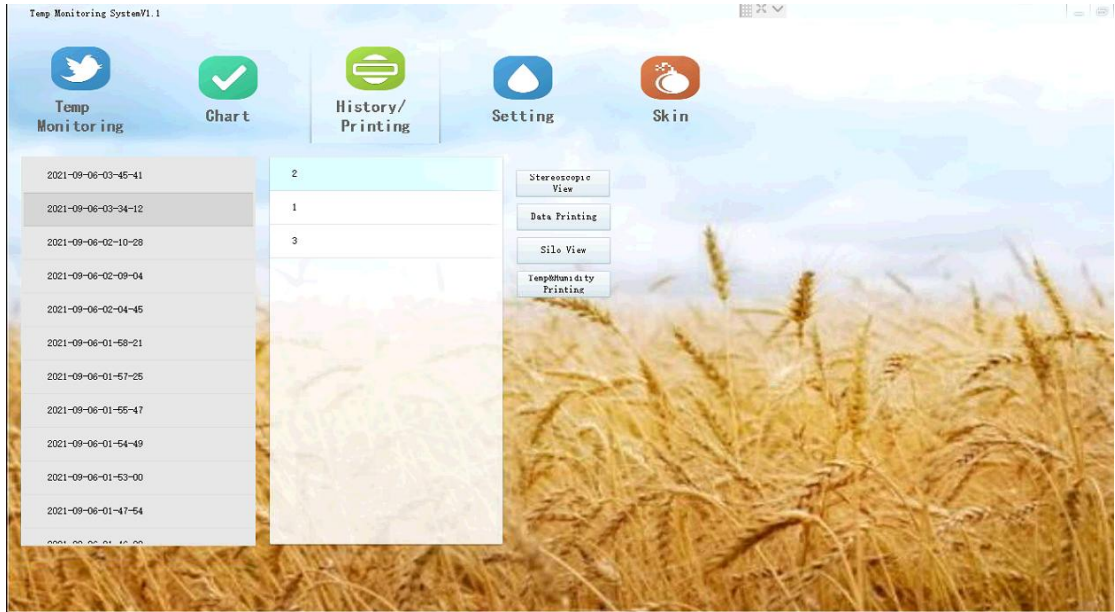
View | Print | Horizontal | Vertical

f. History record

The software will automatically save each temperature measurement data into the local computer hard disk.

Users can click the "History/Print" on the top navigation bar of the software to preview the temperature measurement history as stereo-view mode, silo-view mode and as printout by clicking the button on the right side after selecting the date/time and the silo name.

There is no theoretical limit for the temperature measurement data record, but it is recommended to save a thousand temperature data as the standard, and regularly clear the data in the "aaa folder" where the program is located.

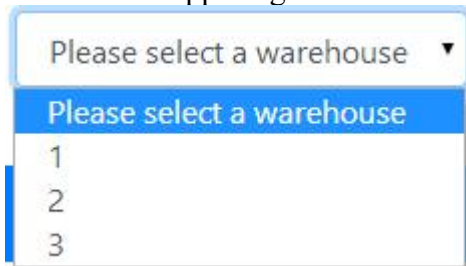


g. Chart

This feature allows users to check the measured temperature as a chart by clicking the "Chart" button on the top navigation bar and the following steps :



1. Click on the upper right corner to select the silo.



2. User has 3 choices to view silo's temperature data :
 - a. **Whole silo average temperature chart**
Select the time and date box of "the whole warehouse temperature" column.

Temperature curve

Please select a warehouse ▾

Point/layer temperature

Time range
2021/09/13 00:00:00 - 2021/09/13 21:41:02

Line no. **Layer no.**

Calculate the average layer temperat

Plot a graph

All the warehouse temperature

Time range
2021/09/13 00:00:00 - 2021/09/13 21:41:02

Plot a graph

The graph



All the warehouse temperature

Time range
2021/01/29 00:01:00 - 2021/01/29 23:01:59

Plot a graph

Enter the start date and end date

2021/01/29 00:01:00 - 2021/01/29 23:01:59

today
yesterday
Seven days ago
30 days before the
This month,
Last month,
The custom

Month 2021						February 2021							
Day	one	two	three	four	five	six	Day	one	two	three	four	five	six
27	28	29	30	31	1	2	31	1	2	3	4	5	6
3	4	5	6	7	8	9	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28	1	2	3	4	5	6
31	1	2	3	4	5	6	7	8	9	10	11	12	13

12 : 00 AM 11 : 00 PM

2021/01/29 00:01:00 - 2021/01/29 23:01:59

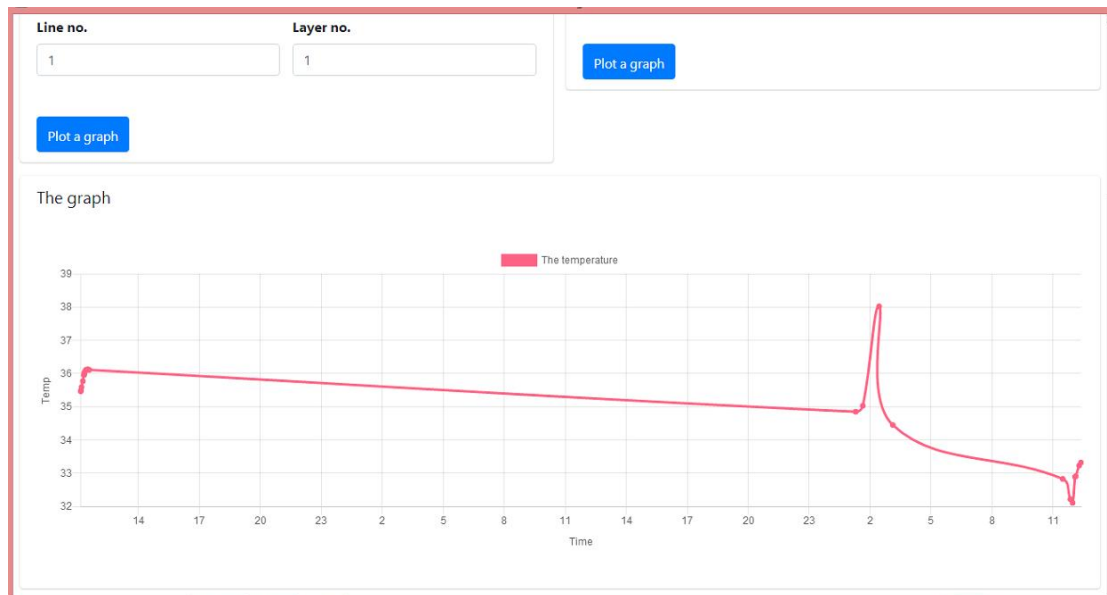
click “Plot a graph” to show the average temperature chart of the whole silo.

All the warehouse temperature

Time range

2021/01/29 00:01:00 - 2021/01/29 23:01:59

Plot a graph



b. Single-level average temperature chart

Select the time and date box of the “point / level temperature” column.

Enter the start date and end date, no need to fill in the “line no” column, just fill the “level no” to show the chart of the level you want to view.

Example: If you want to see the average temperature of the first level, just fill in “1” in the “level no”.

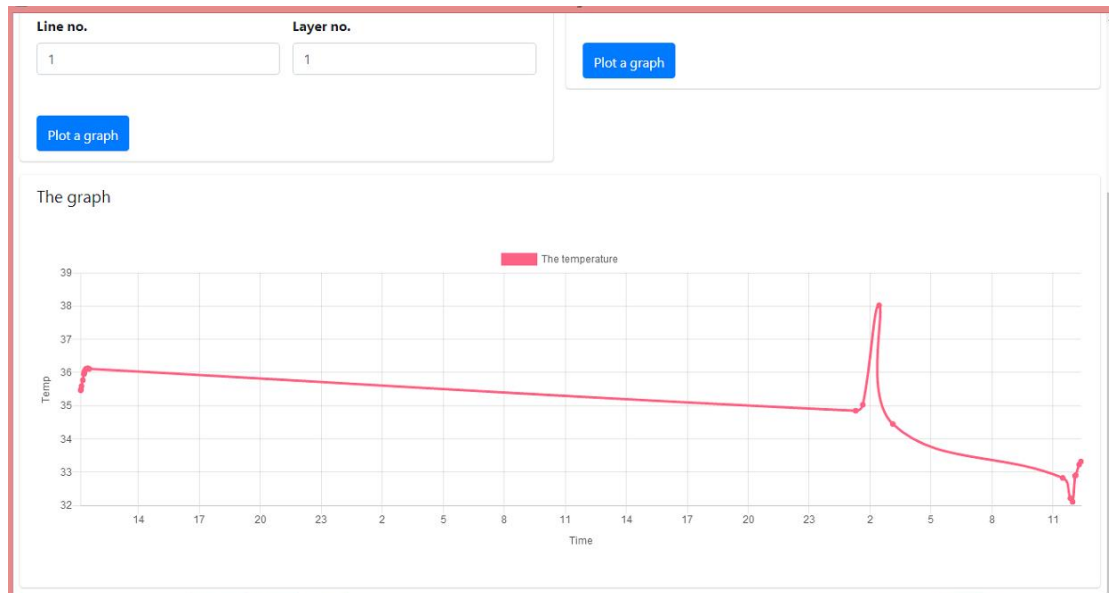
Temperature curve

Please select a warehouse ▾

Point/layer temperature	All the warehouse temperature
Time range <input type="text" value="2021/09/13 00:00:00 - 2021/09/13 21:41:02"/>	Time range <input type="text" value="2021/09/13 00:00:00 - 2021/09/13 21:41:02"/>
Line no. <input type="text" value="Calculate the average layer tempera"/>	Layer no. <input type="text"/>
<input type="button" value="Plot a graph"/>	<input type="button" value="Plot a graph"/>



click “Plot a graph” to show the average temperature chart of the single level.



c. Single cable temperature chart

Select the time and date box of the “point/level temperature” column.

Enter the start date and end date

Fill in the “line no” column to show the temperature chart of the single cable and fill the “level no” to show the chart of the layer you want to view.

Example: if you want to see the temperature of the first level of cable no. 1, just fill in “1” in the “line number” and fill in “1” in the “level number”.

click “Plot a graph” to show the average temperature chart.

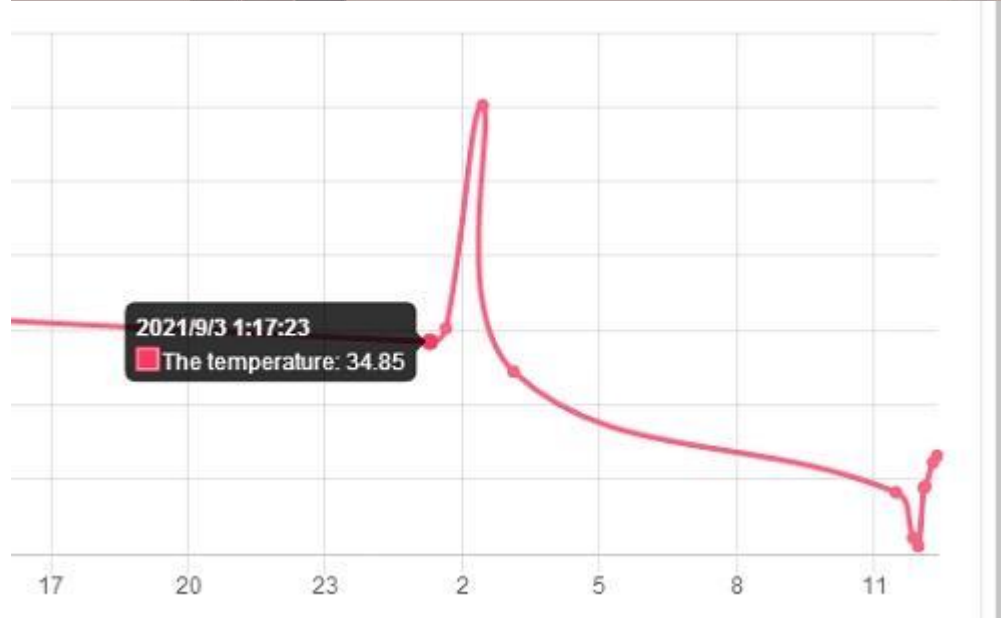
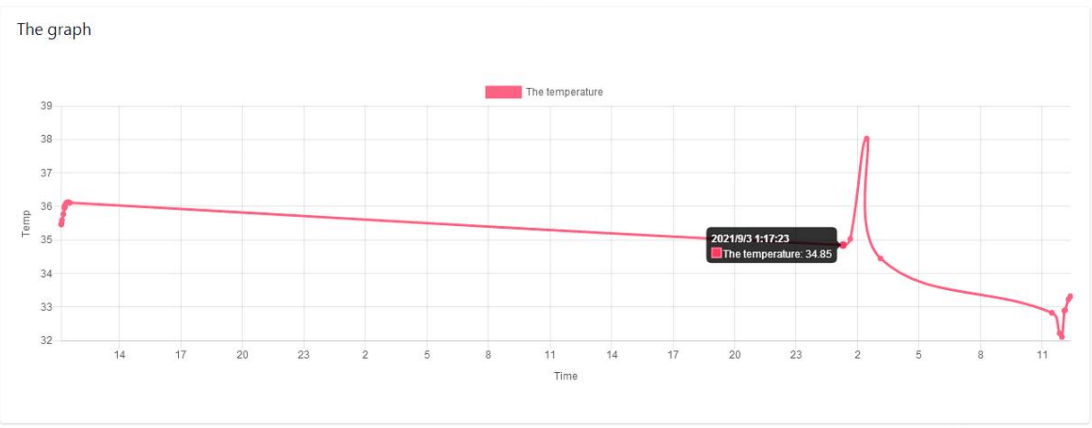
Line no. Layer no.

Calculate the average layer tempera:



Note: The chart shown by all methods can display the specific time and temperature by moving your mouse to the point on the chart.

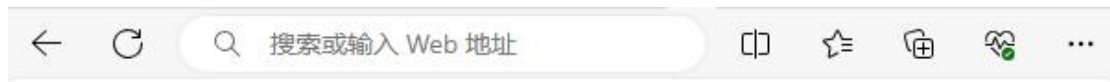
Line no. Layer no.



h. Web application

This feature allows users to check the measured temperature on a web browser.

Users need to enter the provided URL on a supported web browser. Enter the company name and account password provided by us and click the login button.



Zstc Cloud

After logging in, click on the subsidiary that you want to view (Note: This system supports the group structure. It means that one head office account can monitor the data of up to 200 subsidiaries. The head office account and the subsidiary account are independent, but the head office account can view all Subsidiary data, but subsidiary accounts can only view its own data.)

guest		⋮
Subcompany List		
China Beijing branch office	Enter	
China Shanghai branch office	Enter	

Click the date you want to view, or click the latest data.

guest		⋮
Subcompany List > Date		
View New Data		
2020-10-11 17:05:53	Enter	
2020-10-11 17:05:52	Enter	
2020-10-11 17:05:51	Enter	
2020-10-11 17:05:50	Enter	
2020-10-11 17:05:49	Enter	
2020-10-11 17:05:47	Enter	
2020-10-11 17:05:46	Enter	
2020-10-11 17:05:44	Enter	

Select the silo's name

guest



Subcompany List > Date > Silo List

1silo

Enter

2silo

Enter

3silo

Enter

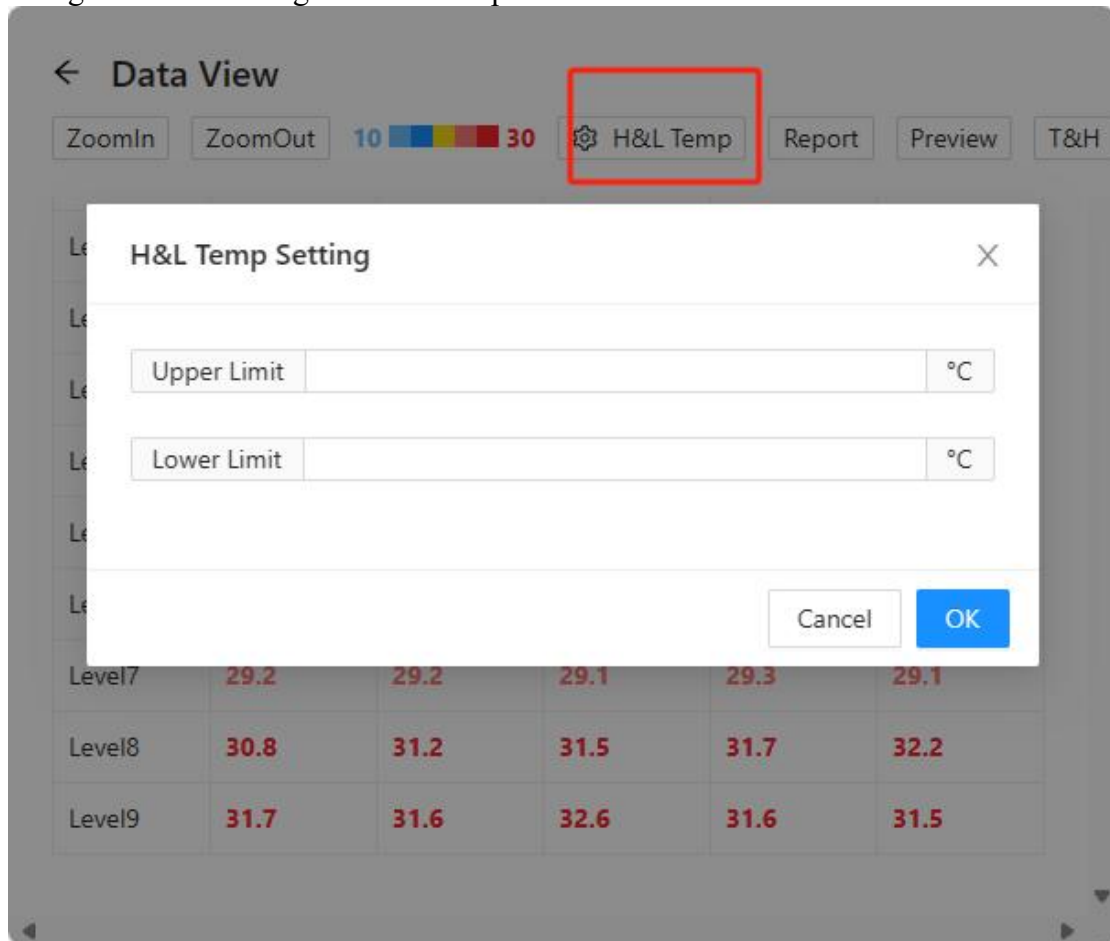
The default view is the table display mode. The temperature color in the table changes according to the temperature. The brighter the red, the higher the temperature; the brighter the blue, the lower the temperature.

← Data View

ZoomIn ZoomOut 10 30 H&L Temp Report Preview T&H

Level1	29.2	29.3	29.4	29.3	29.3
Level2	29.3	29.5	29.6	29.4	29.5
Level3	29.3	29.3	29.5	29.3	29.3
Level4	29.4	29.3	29.3	29.3	29.2
Level5	29.3	28.9	29.3	29.3	29.2
Level6	29.4	29.3	29.1	29.3	29.3
Level7	29.2	29.2	29.1	29.3	29.1
Level8	30.8	31.2	31.5	31.7	32.2
Level9	31.7	31.6	32.6	31.6	31.5

Click the “high and low temperature” in the upper right corner to modify the color change threshold of high and low temperature.



Click the “report” in the upper right corner to change the temperature display into a three-dimensional interface.

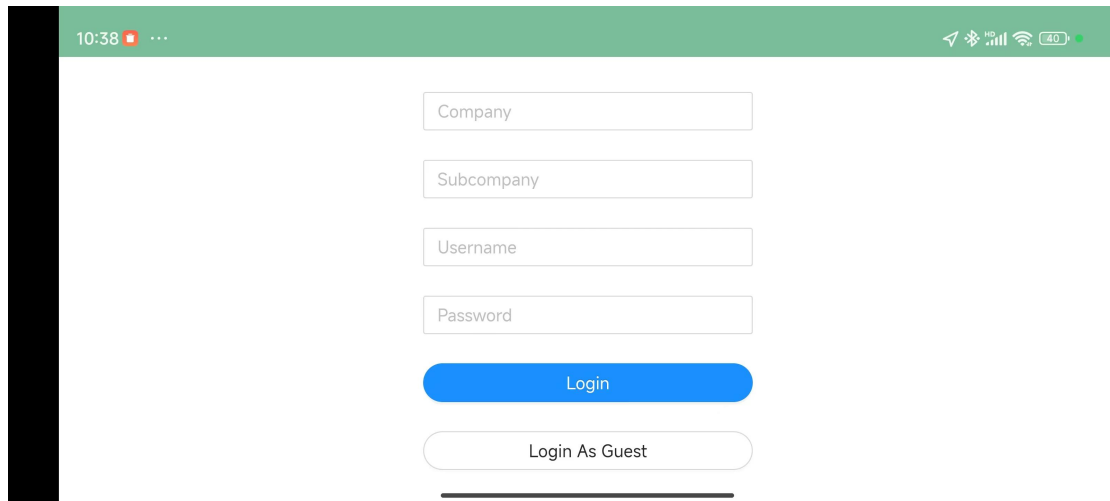


Note: you can zoom in and out of table data or three-dimensional display data by clicking “zoom in/zoom out”

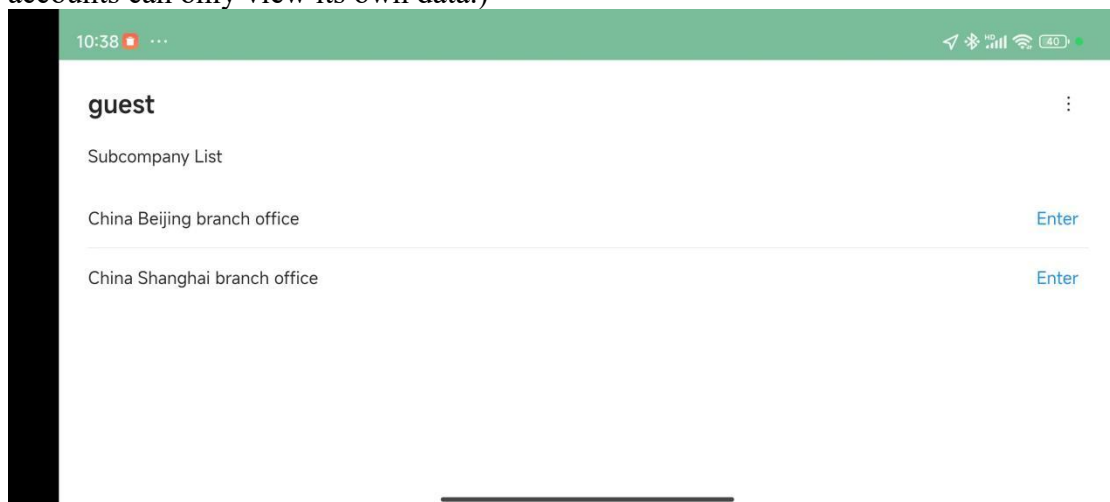
i. Mobile application

This feature allows users to check the measured temperature on an android mobile device.

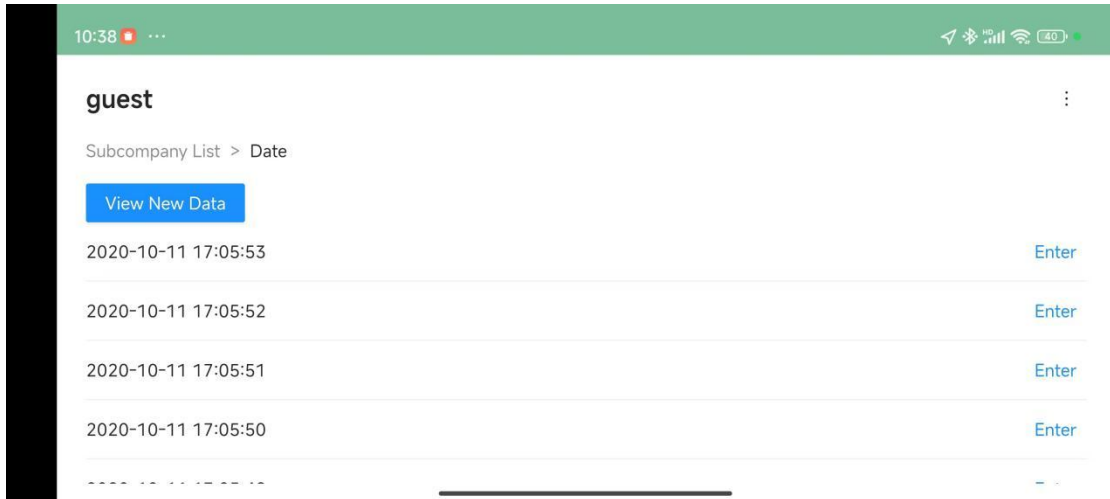
Open the mobile application, enter the company name and account password provided by us and then click the login button.



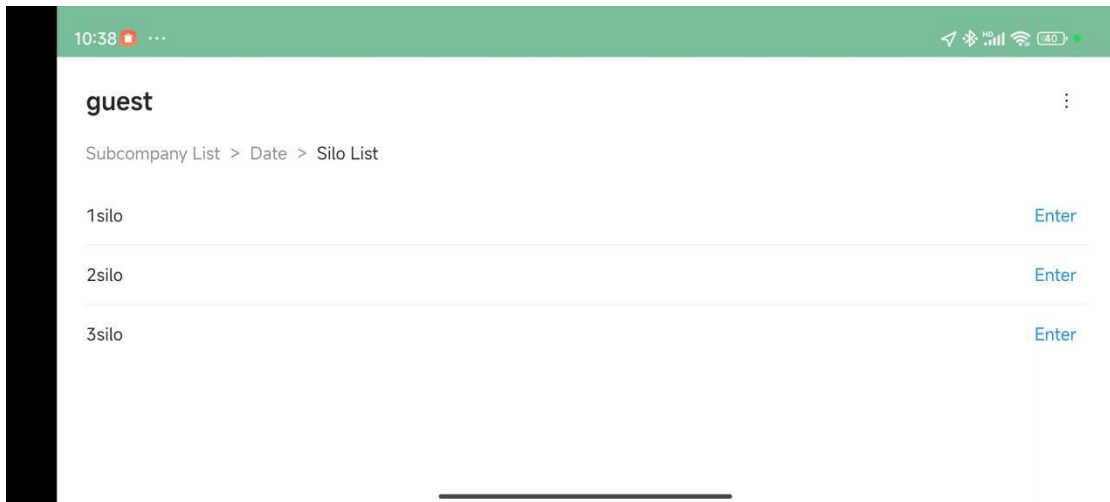
After logging in, click on the subsidiary you want to view (Note: This system supports the group structure. One head office account can monitor the data of up to 200 subsidiaries. The head office account and the subsidiary account are both independent. The head office account can view all Subsidiary data, subsidiary accounts can only view its own data.)



Click the date you want to view, or click the latest data.



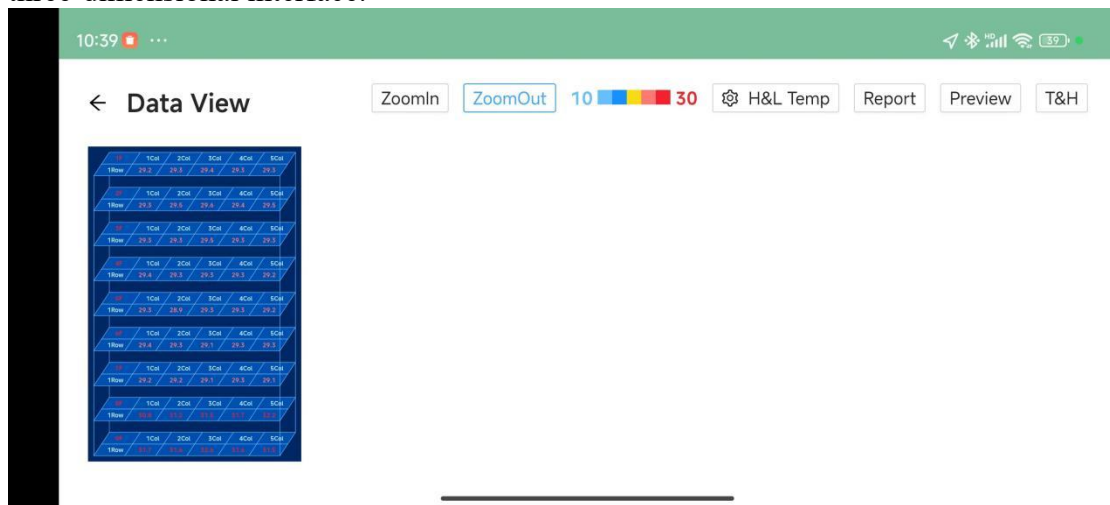
Select the silo's name



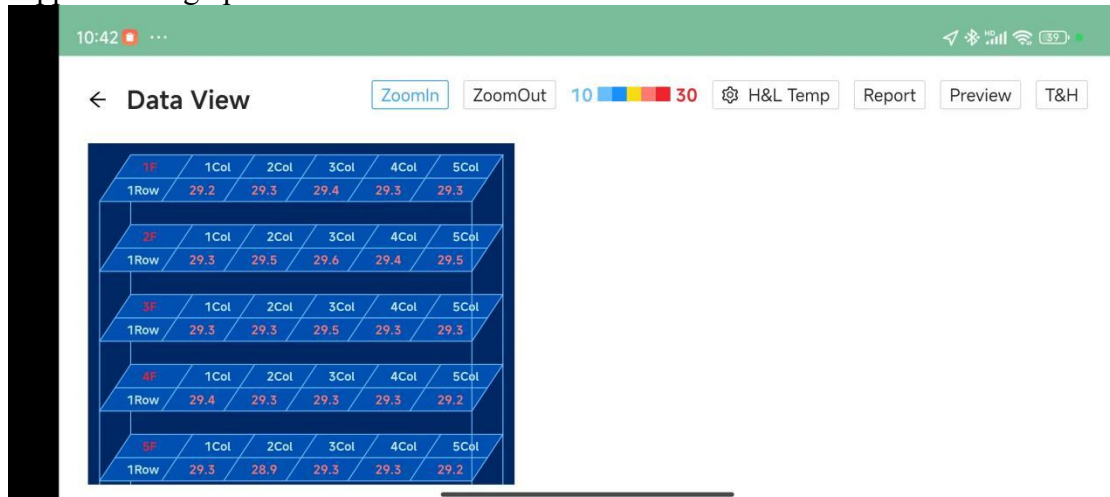
The default view is the table display mode. The temperature color in the table changes according to the temperature. The brighter the red, the higher the temperature; the brighter the blue, the lower the temperature.



Click the “report” in the upper right corner to change the temperature display into a three-dimensional interface.



You can click to zoom in and out to adjust the size of the table or three-dimensional map. To be easily presented/viewed, both the table and the three-dimensional map support sliding up and down.



Click the “high and low temperature” in the upper right corner to modify the color change threshold of high and low temperature.

