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hot spot



KF300 OPERATORS MANUAL

SPECIAL NOTE

READ THIS ENTIRE BOOKLET
BEFORE PROCEEDING WITH
THE INSTALLATION

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1. INTRODUCTION

This document describes how to correctly operate the KF300 portable unit in grain elevators and processing facilities and using its software to display temperature readings.

2. TEMPERATURE DETECTION

Temperature Detection Equipment is very useful in the management of stored grain. It is a proven procedure that has been successfully used since its development in the early 1900's. Its operation is dependent on the increase in temperature caused by the micro-organisms associated with the growth of various molds, insect activity, or the growth of the individual seed due to the presence of moisture and the proper temperature within a specific portion of the stored grain.

Moisture migration due to seasonal temperature changes, mold activity, and insect infestation will threaten the condition of stored grain. Once grain is cooled to temperatures of 35° or below, the immediate danger is delayed until warmer weather will again cause gradual warming, and with it the potential for the above-mentioned problems.

When grain goes out of condition there is almost always a rise in the temperature in the critical area, commonly known as a hot spot. With the proper use and understanding of your temperature system the chances of damage are minimized. It is necessary for the operator to interpret the information given by the system, evaluate it, and take necessary precautions such as aerating, turning, or fumigating.

Temperature readings must be taken on a regular basis. The frequency of reading will depend on the type of grain being stored, its condition, as well as the geographical location and the time of year. The temperature should be logged and kept as a permanent record to be reviewed as necessary to check for temperature trends.

WARNING: DO NOT TAKE READINGS WHEN THE BIN IS BEING LOADED WITH PRODUCT. WAIT AT LEAST A DAY TO READ THE CABLES OR FIND A WAY TO DISSIPATE THE STATIC ELECTRICITY BUILD UP IN THE CABLES. IF NOT, IT CAN CAUSE SERIOUS DAMAGE TO THE KF300.

3. SYSTEM OVERVIEW

The KF300 portable temperature system is designed to manually select thermocouple (TC) temperature sensors for reading. (See figure 1) The temperature sensors are located in cables suspended from the ceilings of grain storage facilities. The cables are available in many different total lengths and thermocouple spacings. The cables are connected through lead-wire to the CRB box. The user then plugs the instrument into the desired cable plug and reads the temperature on the cable.

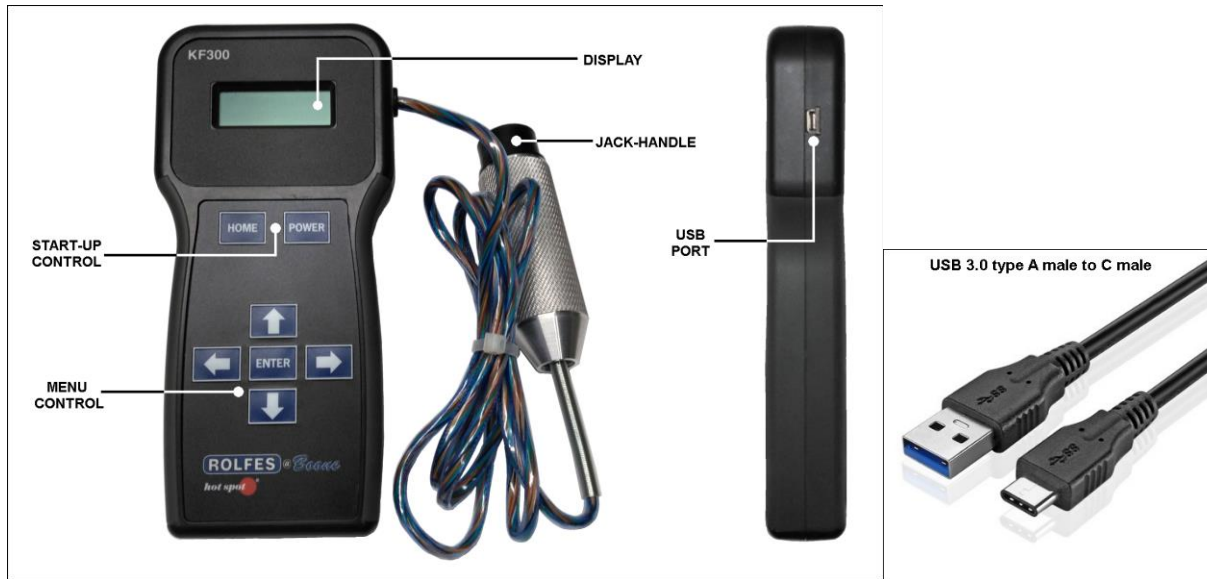


Figure 1. KF300 Portable Temperature Reader.

Figure 1a. USB cable.

The KF300 Jack-handle attached to the unit comes as a 6 TC, 12 TC, 18 TC, or 21 TC reader. (See figure 2)

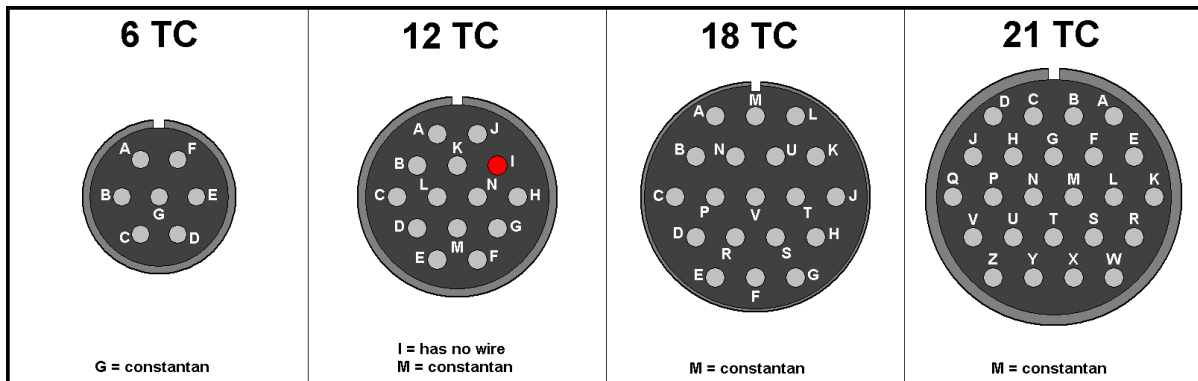


Figure 2. Jack-handle variations.

Once the readings are stored in the unit, they can be transferred to the KF300 computer software using a USB cable which plugs into the USB port on the side of the KF300 or through a Blue-tooth (wireless) device.

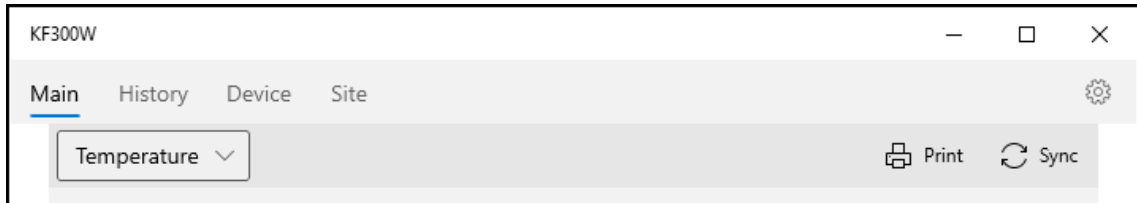
The USB port is also used for charging the 4 NIMH 1.2V DC batteries inside the KF300. The USB cable can be plugged into a computer's USB port to charge the unit or a separate 12V charger. Use a USB 3.0 type A male to C male cable. (See figure 1a)

The unit is protected and stored in a carrying case.

4. FIRST TIME USE

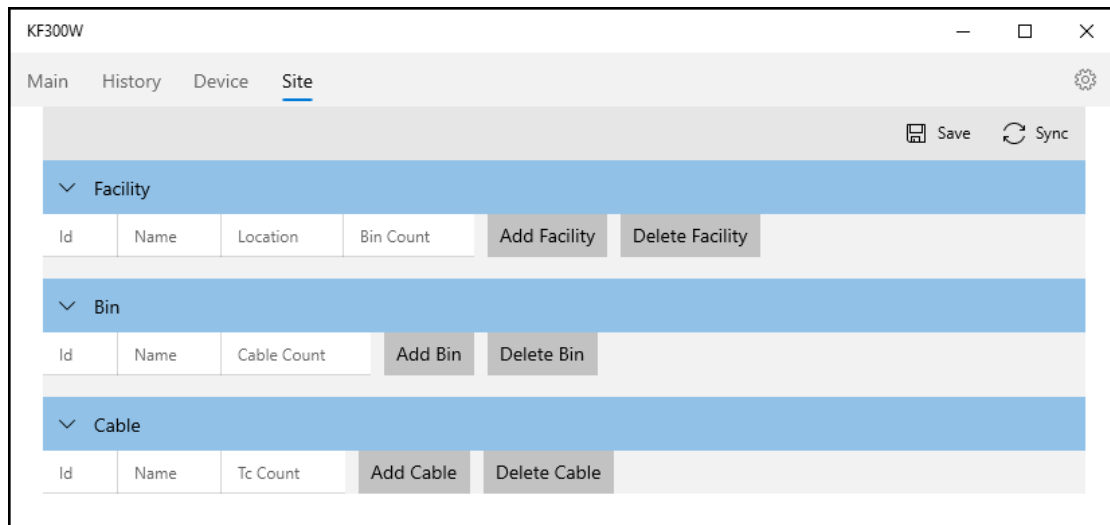
4.1 Installing KF300 software.

- 4.1.1 Insert the USB drive into the computer and browse the USB.
- 4.1.2 Run the file: **KF300W_(version#).appxbundle**.
- 4.1.3 Select **INSTALL** in the bottom right corner.
- 4.1.4 Launch the program and a screen will appear:

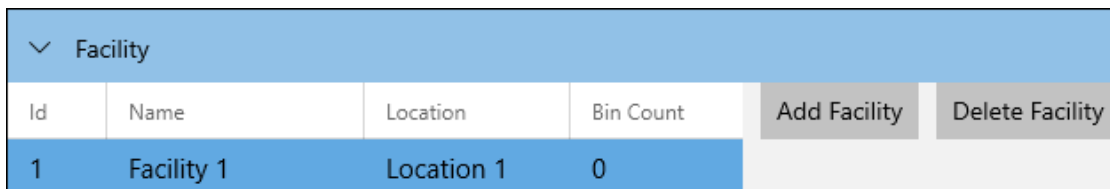


4.2 Creating the site file.

- 4.2.1. Select **Site** from the top toolbar.



- 4.2.2. Under the **Facility**, select **Add Facility**.



- 4.2.3. Double click **Facility 1** to change the name of the facility.
- 4.2.4. Double click **Location 1** to change the name of the location.
- 4.2.5. If there are more than 1 facility, select **Add Facility** again. The maximum amount of facility you can add is 15.

4.2.6. Once the facility(s) is(are) in there, select **Add Bin** under the **Bin** option.

Bin				
Id	Name	Cable Count	Add Bin	Delete Bin
1001	Bin 1	0		

4.2.7. Double click **Bin 1** to change the Bin name.

4.2.8. Keep adding all the Bins in your facility and change their names accordingly.

4.2.9. Once all the Bins are listed, select the first Bin from the list and then select **Add Cable** from the **Cable** option.

Cable				
Id	Name	Tc Count	Add Cable	Delete Cable
10010001	1	0		

4.2.10. Double click **1** under **Name** to change the cable name.

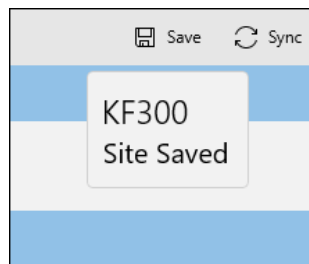
4.2.11. Double click **0** under **Tc Count** to change the number of thermocouples (TC's).

4.2.12. Keep adding cables and change the TC count accordingly.

4.2.13. Repeat this process for each Bin in the facility.

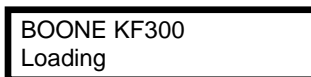
4.2.14. To delete a facility, Bin, or cable, select it and click the corresponding Delete button.

4.2.15. Once the site file is done, select Save in the top right corner.



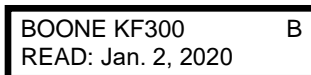
4.3 Transferring the Site file to the KF300.

4.3.1. Turn on the KF300 by pressing the **<POWER>** button. The opening screen will appear:

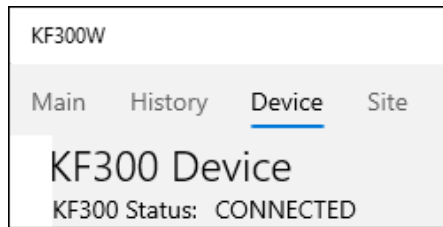


4.3.2. After a few seconds the word, **READ** will appear with the date and time listed below the **BOONE KF300**.

4.3.3. Verify the Blue-Tooth device/connection on the computer. If there is no internal Bluetooth device, use the external Bluetooth adapter. If the KF300 is connected through Bluetooth, a B will appear in the upper right corner on the Main screen.



- 4.3.4. Open the KF300 program and check the Bluetooth connection by selecting **Device** at the top. It will either say: CONNECTED or NO ADAPTER FOUND.



- 4.3.5. If no Bluetooth Adapter was found, check the internal adapter under Settings -> Devices in Windows 10 or check the external adapter. Re-insert it into the computer.
- 4.3.6. Once connected, select **Site** at the top, then select **Sync** in the top right corner.
- 4.3.7. Configuration should now be installed on the KF300 and it's ready to take temperatures from your cables.

4.4 Downloading Temperatures and/or Resistances.

- 4.4.1. Open the KF300 program and check the Bluetooth connection by selecting **Device** at the top.
- 4.4.2. Once connected, select **Main** from the top, then select **Sync** in the top right corner.
- 4.4.3. A window will appear in the upper right corner with the download count.
- 4.4.4. Temperatures or Resistances should now show up on the Main screen.

5. THE KF300 PORTABLE

This section describes how to use the KF300 Portable Instrument and the function of the buttons.

5.1. KF300 Buttons.



Press this button at any time to return to the main screen.



This button will turn the Unit On and Off.



Use the Enter button to select an item from the Menu.



Use the Up and Down Arrow button to toggle through the Menu items.



Use the Right and Left Arrow button to skip through Main Screen Options. Also use these buttons to change values under the Menu items.

5.2. KF300 Main Menus.

MAIN SCREEN; Pressing **HOME** returns to this screen from anywhere in the program. Displays last date data was saved. First shown when powered on. See 5.3.1. on page 10.

BOONE KF300
READ: Jan. 2, 2020

Using the **UP-ARROW** button and starting at the Main Screen, the following menu will appear:

AUTO SCAN CABLE TEMPERATURES; Automatically scan and save temperatures/resistance data. The KF300 can internally save greater than 10 histories of temperature data. See 5.3.2. on page 10.

AUTO SCAN CABLE
TEMPERATURES

VIEW CABLE TEMPERATURES; View last stored temperature/resistance data by Facility, Bin, Cable, and Thermocouple. See 5.3.3. on page 11.

VIEW CABLE
TEMPERATURES

CHOOSE MODE TEMPERATURE; Select whether temperature or resistance is to be scanned/analyzed. Resistance mode allows checking integrity of thermocouple signal. When switched to resistance the word Temperature will be replaced by Resistance in the menu items. See 5.3.4. on page 11.

CHOOSE MODE
TEMPERATURE

BACKLIGHT; change the value of the backlight screen to a lighter or darker setting. See 5.3.5. on page 12

BACKLIGHT: 0

MANUAL SCAN CABLE TEMPERATURES; Manually scan thermocouple cable temperature/resistance without saving the data. Displays values as they read. See 5.3.6. on page 12.

MANUAL SCAN CABL
TEMPERATURES

5.3. KF300 Submenus

5.3.1. Main Screen; when on the main screen, pressing the **LEFT-ARROW** or **RIGHT-ARROW** button will display the following submenus:

04/08/2020	16:09
76 F	

Displays current date and time on the first row and the ambient temperature on the second row. When batteries are replaced, the date and time will go to default, until the KF300 program starts and the unit connects with the Bluetooth.

BATTERY:	2404
USB: 0	CHRG: 0

Displays battery life on the first row in mV. On the second row it displays the state of the USB cable and charging condition. "0" state means nothing is plugged in/on. "1" state means the cable is plugged in and the unit is charging.

KF3200203-10
HW: A4 SW: 0.0020

Displays the serial number on the first row. On the second row it displays the Hardware version and the Software version.

5.3.2. Auto Scan Cable Temperatures; when the KF300 is plugged into the CRB box to read the temperature or resistance on a cable, use the **ENTER** button to select the Facility, Bin, and Cable. Use the **UP** and **DOWN-ARROW** buttons to navigate through each item.

Note: If you want to read the resistance, from the Main Screen, use the **UP-ARROW** button to go to **CHOOSE MODE TEMPERATURE**. Use the **RIGHT** or **LEFT-ARROW** button to change to **RESISTANCE**. Then return to **AUTO SCAN**.

FACILITY NAME
FACILITY LOCATION

After pressing **ENTER** the Facility name and location will display. If there is more than 1 facility, press the **UP-ARROW** button to select it. Press **ENTER** to select the Facility.

BIN NAME

Next it will display the first Bin. If there is more than 1 Bin, press the **UP-ARROW** button to select it. Press **ENTER** to select the Bin you want to read.

BIN NAME
CABLE NUMBER

Next it will display the first Bin and the first cable. If there is more than 1 cable, press the **UP-ARROW** button to select it. Press **ENTER** to select the cable you want to read.

BIN NAME
CABLE# TC 1 # F

As soon as you select **ENTER**, it will scan through the thermocouples, displaying the temperature of each TC. An **"OT"** means Open Thermocouple. **"—"** means it hasn't read anything yet.

ENTER=SAVE
Other key=CANCEL

After it read the first cable it will ask you to either Save it by selecting the **ENTER** button or any other button to Cancel the read.

BIN NAME
CABLE NUMBER

After you select **ENTER** it will display the Bin name with the second cable or if there was only 1 cable in the first Bin, it will go to the next Bin. Press **ENTER** to select the next cable you want to read.

Continue to read each cable in every Bin until complete. The readings are now stored in the KF300. Proceed to start the KF300 program and Sync to download the readings.

5.3.3.View Cable Temperatures; For looking at the result of the last read stored on the KF300 select **ENTER** to display the readings.

FACILITY NAME

After pressing **ENTER** the Facility name will display. If there is more than 1 facility, press the **UP-ARROW** button to select it. Press **ENTER** to select the Facility.

BIN NAME

Next it will display the first Bin. If there is more than 1 Bin, press the **UP-ARROW** button to select it. Press **ENTER** to select the Bin you want to look at.

BIN NAME
CABLE NUMBER

Next it will display the first Bin and the first cable. If there is more than 1 cable, press the **UP-ARROW** button to select it. Press **ENTER** to select the cable you want to look at.

BIN NAME
CABLE# TC 1 # F

Use the **UP** and **DOWN-ARROW** to toggle through each thermocouple displaying the temperature. An "**OT**" means Open Thermocouple. "**—**" means it hasn't read anything yet.

Use the **LEFT ARROW** button to return to the previous item in this menu and select other Facilities, Bins or Cables to view.

5.3.4.Choose Mode Temperature; to toggle the read mode between temperature and resistance, use this option.

CHOOSE MODE
TEMPERATURE

By default, the mode is set to temperature. Press the **RIGHT** or **LEFT-ARROW** button to change to resistance.

CHOOSE MODE
RESISTANCE

After changing the mode to resistance. Use the **UP** or **DOWN-ARROW** button to select the next menu item.

When switched to resistance the word Temperature will be replaced by Resistance in the menu items.

5.3.5.Backlight; For changing the background light on the display use this option.

BACKLIGHT: 0

By default, the mode is set to “0”. Press the **RIGHT** or **LEFT-ARROW** button to change the value with increments of 10. After that use the **UP** or **DOWN-ARROW** button to select the next menu item.

5.3.6.Manual Scan Cable Temperatures; If someone wants to manually read the cables in the Bin, use the manual scan option to read each thermocouple. In Manual scan mode it will just read the number of thermocouples up to 21 TC. There is no selection by Facility, Bin, or Cable.

If your unit only reads 6 TC’s, after the 7th thermocouple it will start reading “OT”. If you have a 12 TC unit, it will read “OT” after the 13th TC. With 18 TC’s it will read “OT” after the 19th TC.

MANUAL SCAN CABL
TEMPERATURES

Press the **ENTER** button to select the first thermocouple to read.

MANUAL SCAN TEMP
TC 1 = ## F

Press the **UP** and **DOWN-ARROW** buttons to toggle between each thermocouple. Press the **HOME** button when finished.

MANUAL SCAN CABL
RESISTANCES

If the mode was set to resistance it will display the number in Ohms. Press the **ENTER** button to select the first thermocouple to read.

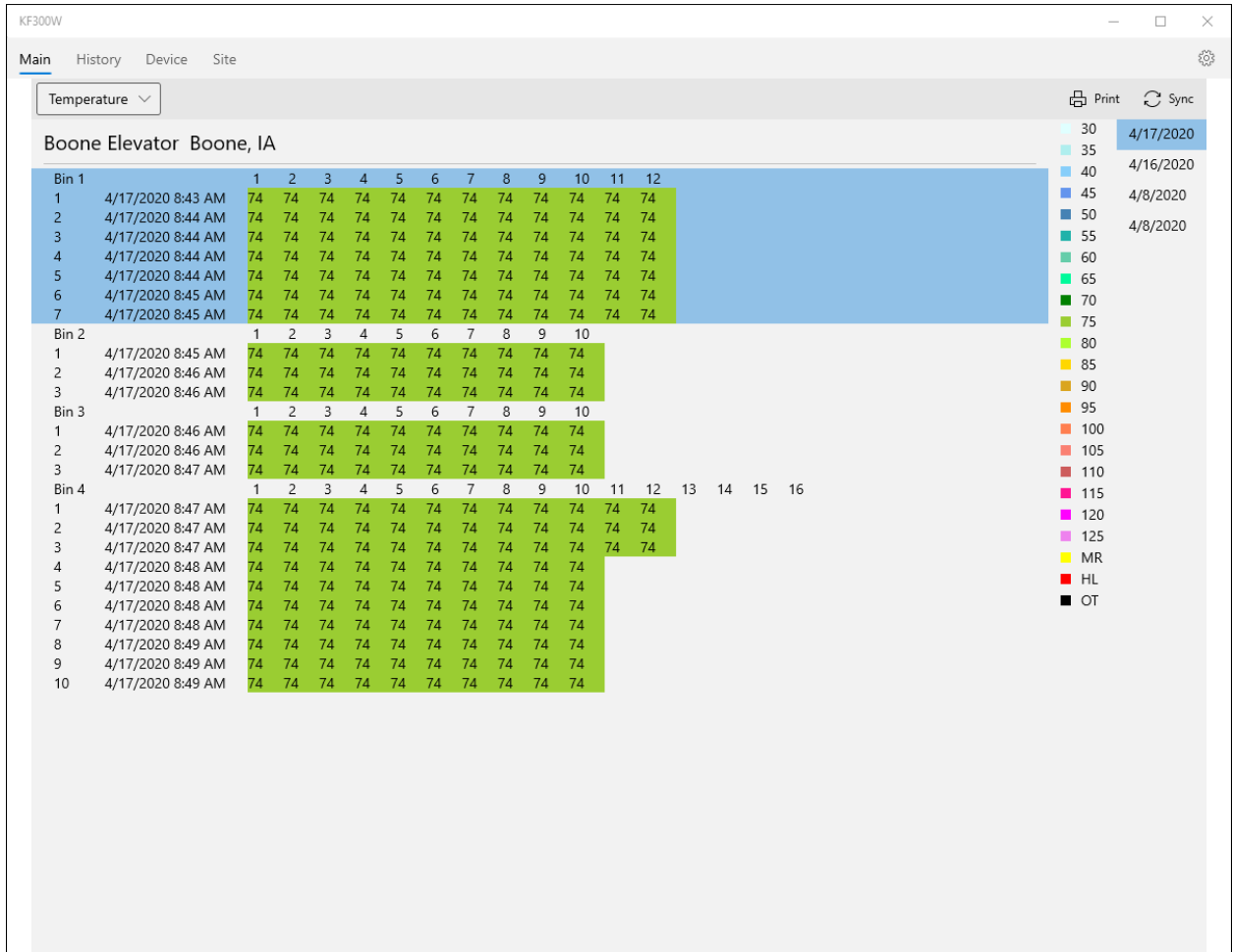
MANUAL SCAN RES
TC 1 = ###

Press the **UP** and **DOWN-ARROW** buttons to toggle between each thermocouple. Press the **HOME** button when finished.

6. KF300 SOFTWARE

This next section will go into detail on how to use the KF300 software and all its functions.

6.1 Main screen.



When the program start it opens on the Main screen which consists of the following functions:

- Mode selection
- Print
- Sync
- Readings
- Color legend
- Date

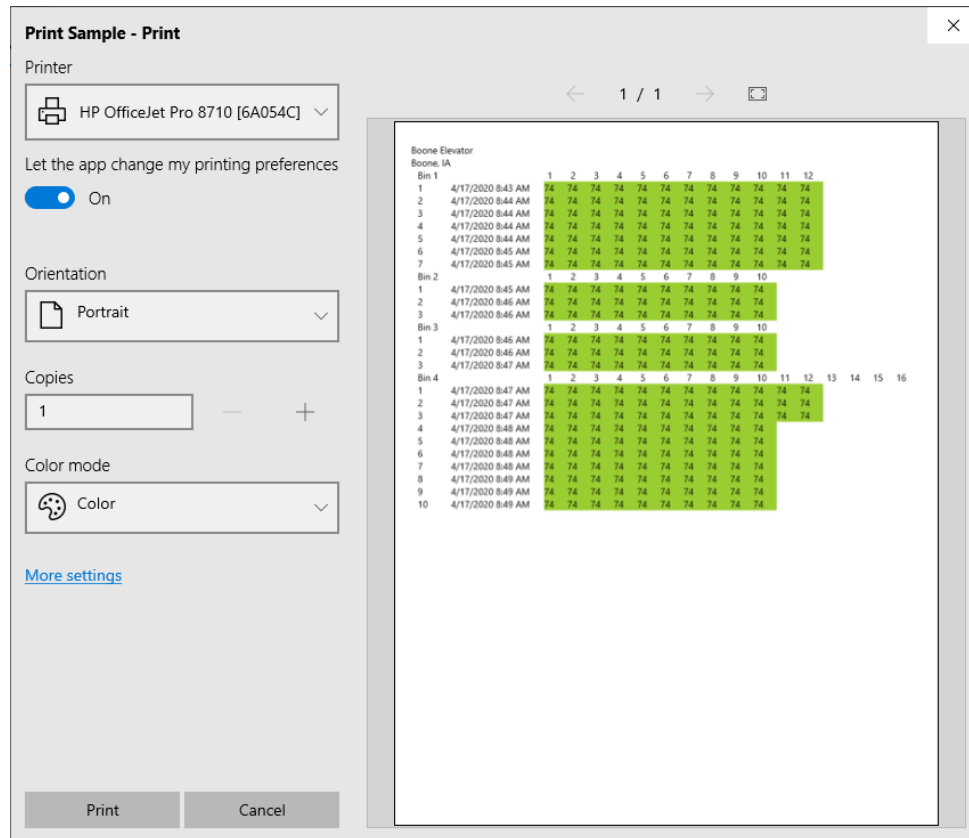
6.1.1. Mode selection

This box switches the view of the readings from Temperature to Resistance.



6.1.2. Print

To print any readings, select this option, which will open the Print screen to select a specific printer or to print to file (PDF).



6.1.3. Sync

After a reading is taken of the cables in the Bins and stored in the KF300 portable, use the Sync function to download the information to the program. Always check under the Device option, you are connected to the Bluetooth device or that the USB cable is plugged into the unit.

6.1.4. Readings

All the readings downloaded from the KF300 are shown on the main screen, displaying the facility and the date & time of when the reading was taken. It shows each thermocouple inside the cable starting with TC 1 which is at bottom of the Bin and ending with the last TC at the top of the Bin.

6.1.5. Color Legend

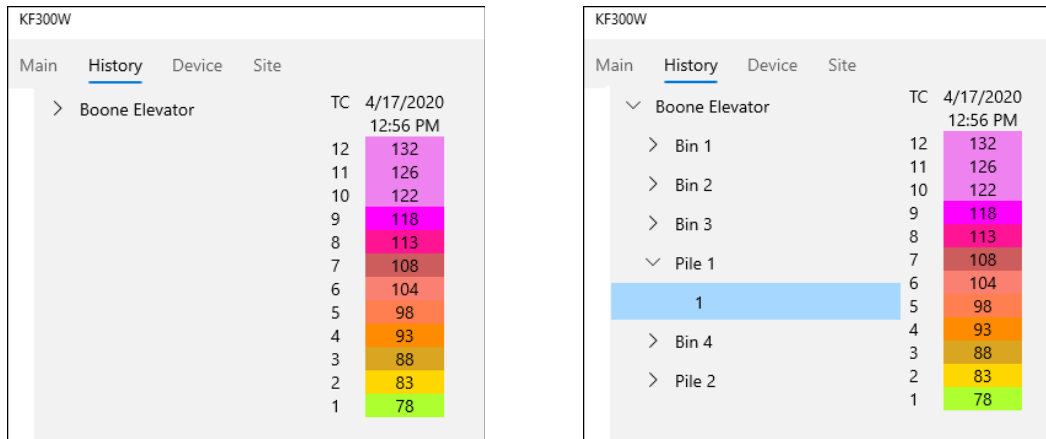
On the right side of the screen is a vertical row of colors and numbers. The colors beside the numbers indicate the color that the temperature will be displayed. Below the last temperature is **MR**. **MR** stands for Maximum Rise alarm, **OT** represents an Open Thermocouple, and **HL** stands for the High Limit alarm.

6.1.6. Date

Displays a list of the readings downloaded to the program with the current read at the top.

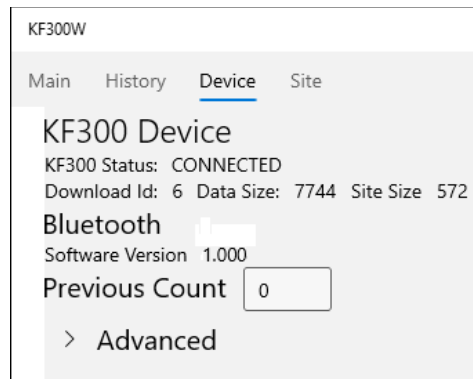
6.2 History screen.

The History screen displays all the reading history of one particular cable. Select the facility to show all the Bins. Then select a cable from a Bin to display its history.



6.3 Device screen.

The Device screen displays if the KF300 is connected via the Bluetooth device or the USB cable.



6.3.1. KF300 Status.

There are 4 possible indications for the KF300 Status:

- **NO_ADAPTER_FOUND**; the external Bluetooth device is not connected to the computer or the USB cable is not plugged in. If there is an internal Bluetooth adapter, in Windows 10, right click on Start, select Settings and go to Devices. Check the status of the “Bluetooth & Other Devices”.
- **DISCONNECTED**; the external Bluetooth device or USB cable has been disconnected from the KF300 portable unit.
- **WATCH**; the external/internal Bluetooth device is waiting for a response from the KF300 portable.
- **CONNECTED**; the external/internal Bluetooth device or USB cable is connected to the KF300 and ready for download.

6.3.2. Download ID, Data Size, Site Size.

- 6.3.2.1. Download ID; Indicates the number of readings has been downloaded from the KF300 to the program.
- 6.3.2.2. Data Size; The total number in bytes of the size of downloaded temperature readings as data.
- 6.3.2.3. Site Size; the total number in bytes of the size of the site file.

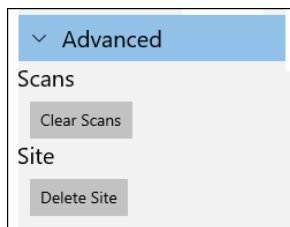
6.3.3. Bluetooth.

Displays the Software version of the Bluetooth device inside the KF300 portable.

6.3.4. Previous Count.

Set this box to the number of previous readings you wish to download to the program. If set to "0", it will only download the current read. By default, this option is set to "0". If for some reason the Scans in the program got deleted, retrieve the data from the KF300 by setting the previous count greater than "0".

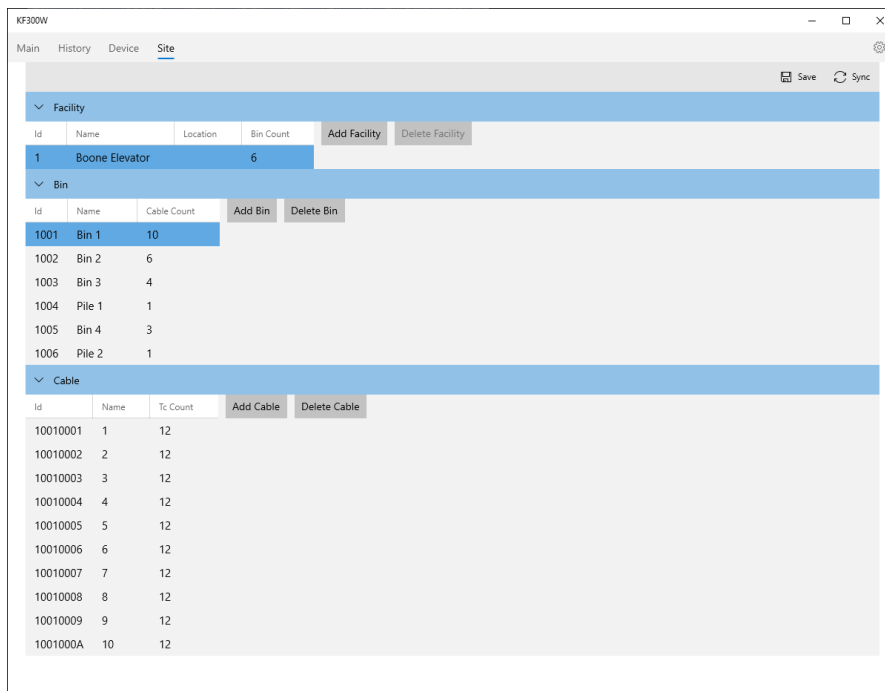
6.3.5. Advanced.



Under the Advanced section are ways to clear the scans and/or delete the site on the KF300 portable. Warning! This will erase all the date on the KF300.

6.4 Site screen.

The Site screen displays the facility configuration as it was created during first time use (See item 4).



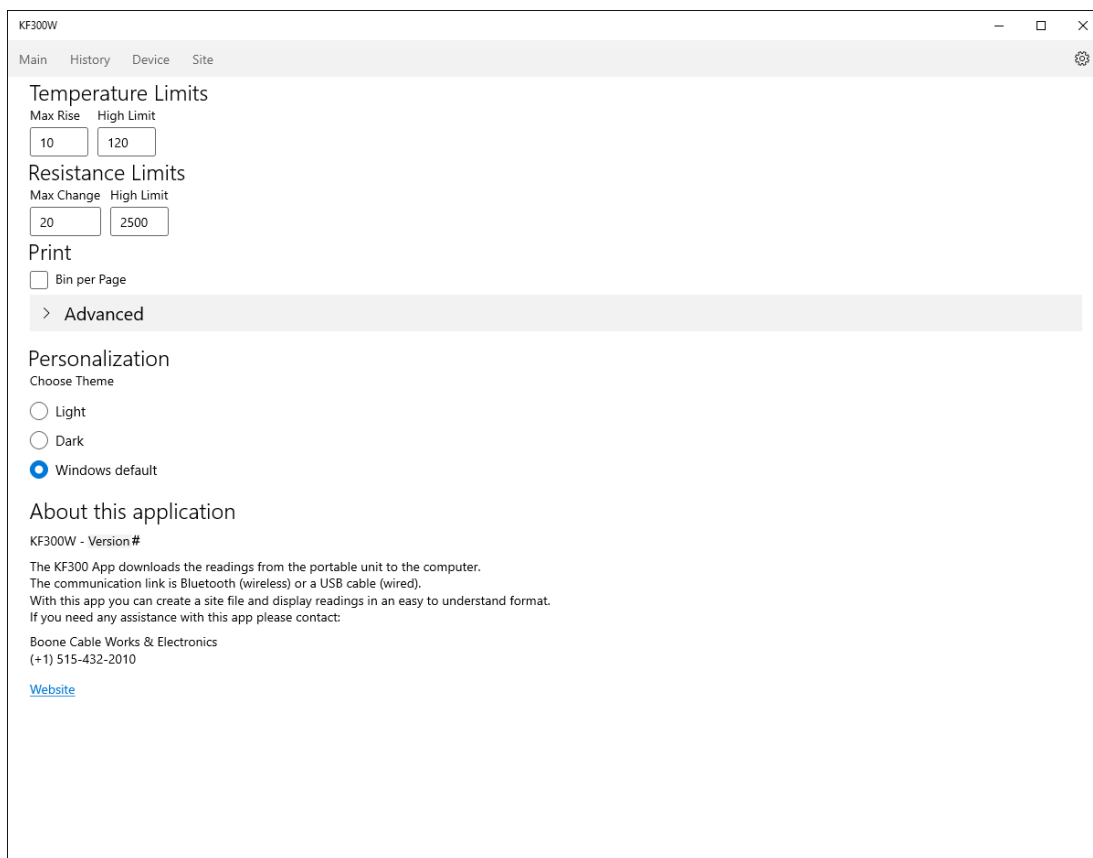
Depending on the size of the facility you can Add at least 15 facilities into the KF300 portable unit. If they are smaller sites, it will take more than 15. You can delete any facility after the first facility has been created. If you wish to delete the entire site from the program, select Settings (the gear icon), go to Advanced, and Delete Site.

Add as many Bins and cables as the facility calls for. For each Cable change the number of TC's (ThermoCouples) to your specifications.

Once the Site has been created or modified, select Save from the upper right corner and then Sync it to your KF300 portable unit.

6.5 Settings.

The Settings screen show the parameters of the program which can be changed. It also has information about the App and how to contact Rolfes@Boone for any assistance with the program and/or KF300 portable unit, plus a link to our website.



6.5.1. Temperature Limits.

- 6.5.1.1. **Max Rise**; The difference in °F or °C between the current read and the previous read. The default is set to 10 °F or 5 °C.
- 6.5.1.2. **High Limit**; This is the maximum temperature set before it starts alarming on HL. The default is set to 120 °F or 60 °C.

6.5.2. Resistance Limits.

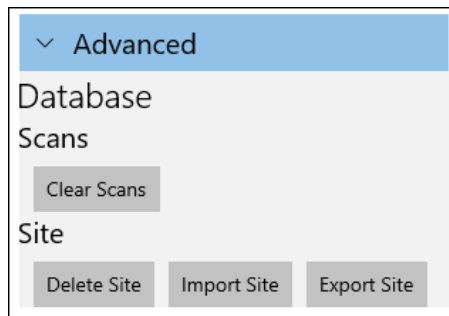
6.5.1.1. **Max Change**; The difference in Ohms between the current read and the previous read. The default is set to 20 Ohms.

6.5.1.2. **High Limit**; This is the maximum resistance set before it starts alarming on HL. The default is set to 2500 Ohms.

6.5.3. Print.

Check this option if the readings of each Bin need to be displayed on a separate page. If left unchecked it will print the readings continuously.

6.5.4. Advanced.



Listed under the Advanced section are a few Database options. The **Clear Scans** option will erase all the readings from the program. Under the Site option, you can **Delete** the Site, **Import** a Site file from a different KF300 stored on the computer, or **Export** a Site file from the current program to the computer. When you delete a Site, make sure you also clear the Scans.

6.5.5. Personalization.

To change the Theme of the program, select either **Light**, **Dark** or **Windows default**.

6.5.6. About this application.

Information about what this App does and how to reach Boone Cable Works & Electronics if any help or further documentation is needed. The Website will link directly to <http://www.rolfesatboone.com>.

7. TROUBLESHOOTING

To check the KF300 portable unit when the readings are OT, do the following test:

- Determine the number of holes on the end of the Jack-handle (See figure 2 on page 4).
- Take a paperclip (or wire) and unwind it.
- Stick one end into the hole marked as constantan (6 TC=G, 12, 18, 21TC=M).
- Stick the other end into the hole marked "A".
- Turn unit on and go to "MANUAL SCAN CABLE TEMPERATURES".
- Make sure it's on TC 1 and see if there is an ambient reading.
- Test TC 2, between "constantan" and "B".
- TC 3 = C, TC4 = D, etc.
- If you get an ambient read on every TC, check the CRB box or cable.
- If you don't get an ambient read, send the unit in.
- In that case, go to our website (www.rolfesatboone.com) and at the top, click on Repair Services.
- Scroll down and click on "Download Repair Form".
- Print and fill out the form and send it with unit to the address on the document.