Wyze Temp Plus® Operation Manual
TP850 Probe and TP1113 Base Reader
Matrix Product Development
Version 1.0.2
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1. Quick Start Guide

This section will outline the steps to take with an out of the box system to start logging data as quickly as possible.

1.1 Quick Start Checklist

1. Install the antenna with ground plate in the oven and connect the antenna cable to the Base Receiver.

2. Install the Wyze Temp® Data Acquisition Software on a Windows 7 or greater PC.

3. Connect the USB cable from the Base Receiver to the PC.

4. Launch the Wyze Temp® Data Acquisition Software Application.

5. Power up the base by connecting the power cord to the base and plugging it into a standard wall socket

6. Adjust the communication settings for USB and communication port.

7. Wake up the sensor via the included magnet. The LED should momentarily flash GREEN when it awakes.

8. Observe that data is logging to the screen. Data is also being logged to a file (see section 6.1)

9. After logging is complete, put the sensor into SLEEP mode using the magnet.

Note:

To replace a battery, unscrew the battery cap using a quarter-sized coin and disconnect the miniature inline battery connector. Replace with a new Wyze Temp® battery with wire connector assembly.

2. Setup

2.1 Minimum Materials

You will need:

- A Wyze Temp® Plus Programmer
- Two USB A/B male cables
- A Wyze Temp® Plus Probe
- A Wyze Temp® Base
- A Wyze Temp Base power cord
- A magnet
- A Windows 7 or newer computer with the "Wyze-Temp Plus" application.

2.2 Launch the Application

Connect the Wyze Temp Base and the Wyze Temp Plus Programmer to the PC using the A/B male USB cables. Plug the Wyze Temp Base into a wall outlet using the 24V power cord. Launch the "Wyze-Temp Plus" application from its location in Windows Explorer. The window that opens will look like the window seen in Illustration 1.
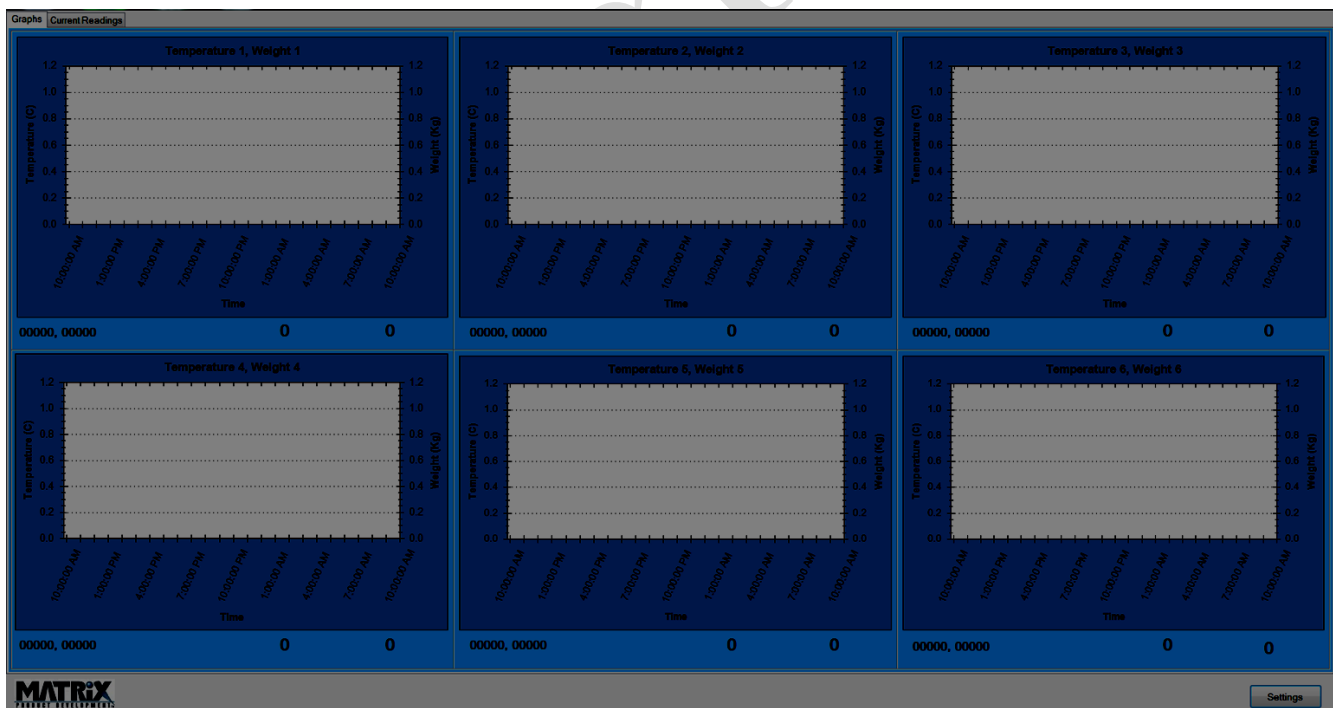

Illustration 1: The Wyze Temp® Plus application default screen.

3. The Settings Window

Click on the "Settings" button on the lower right hand corner of the plot screen. A new window should open. This window can be seen in Illustration 2.
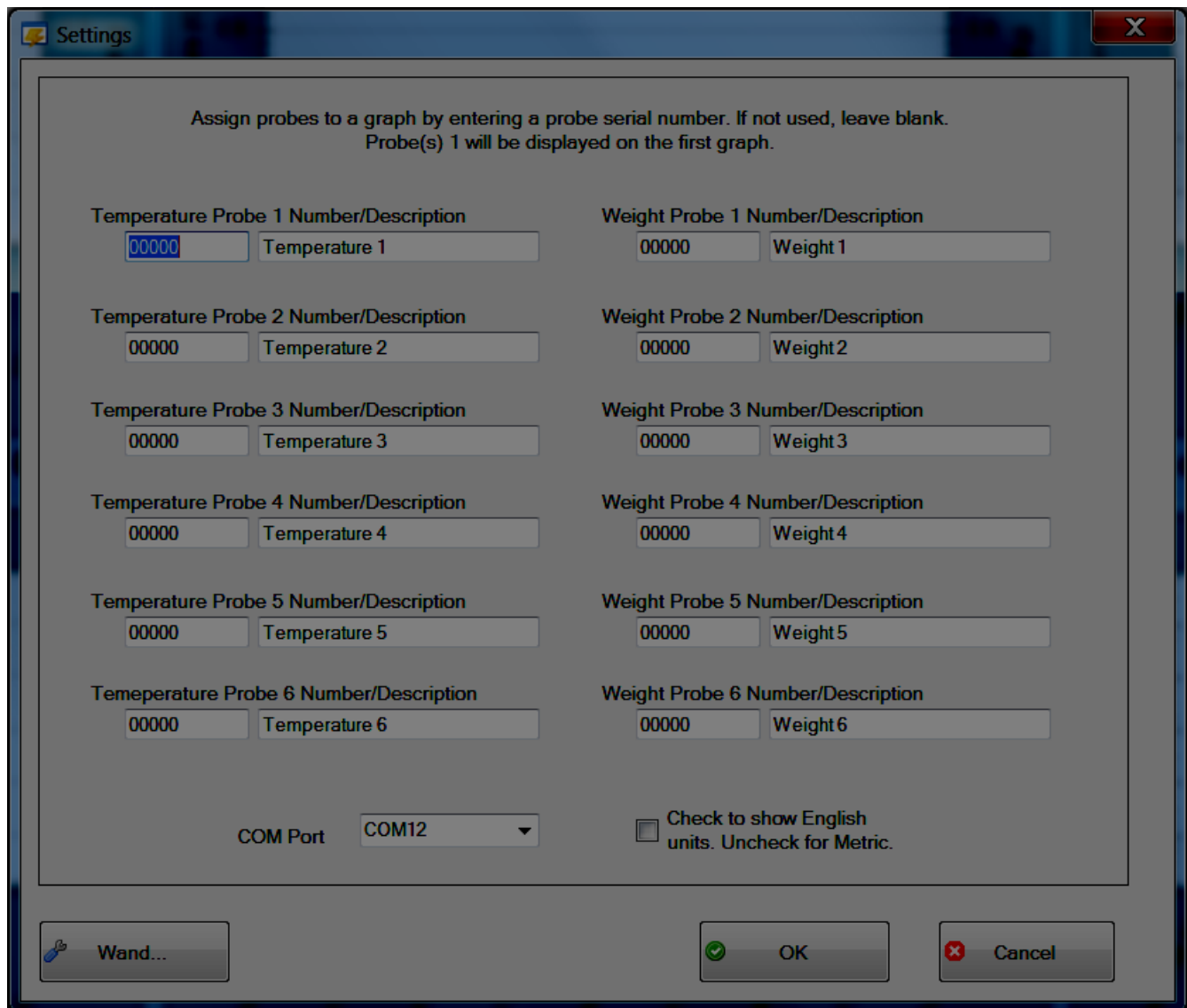
Illustration 2: The Settings window.

3.1 Initializing USB communications

The appropriate COM port should be chosen to communicate with the Wyze Temp Base. If multiple options are available, open the windows device manager from the control panel, expand the "Ports (COM & LPT)" section, and unplug the Wyze Temp Base. The COM number that is removed from the list after this is the COM port the base is using. Reinsert the USB and select the appropriate COM port in the Wyze Temp Plus application.

3.2 Choosing Probe Serial Numbers

In the settings window, six fields exist each for weight and temperature probe, and one graph tile can plot weight and temperature simultaneously, or can be set up to plot only weight or temperature. This can be done by setting the probe serial number in the field associated with the plot. Entering an unused serial number (typically 00000) will allow the tile to ignore the associated value.

For example, a possible use case involving one weight probe (serial number 10) and one temperature probe (serial number 5550) can be set up to look like one of the options seen in Illustration 3. Note the serial number settings located below each of the plots.
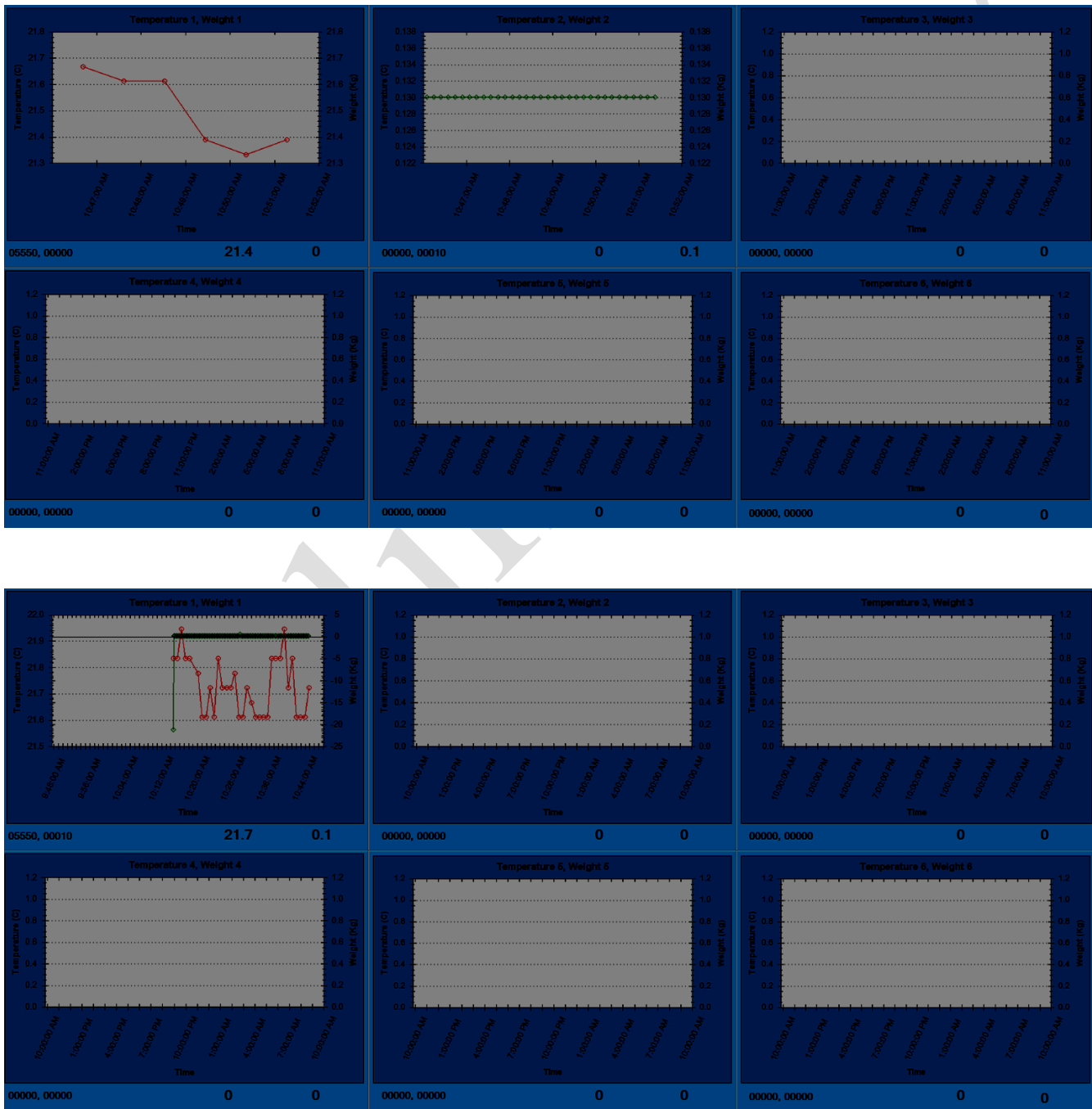
Illustration 3: The top screen capture demonstrates the individual plot settings, the bottom screen shows the shared plot setting.

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Each plot can track one weight probe and one temperature probe, allowing up to 12 paired probes, or six stand-alone probes, or a combination to report to the application.

An option to change the units on the plots exists in the lower right corner of the settings window, checking the box will enable English units.

4. Using the NFC Wyze Temp® Plus Programmer

Clicking on the "Wand" button on the settings window will open another new window. This wand application allows a user to field program a probe, extending the utility of a Wyze Temp Plus probe by granting the user the option to change serial numbers, recalibrate a probe, and change the averaging period used by the probe.

4.1 Programmer-Probe Interface
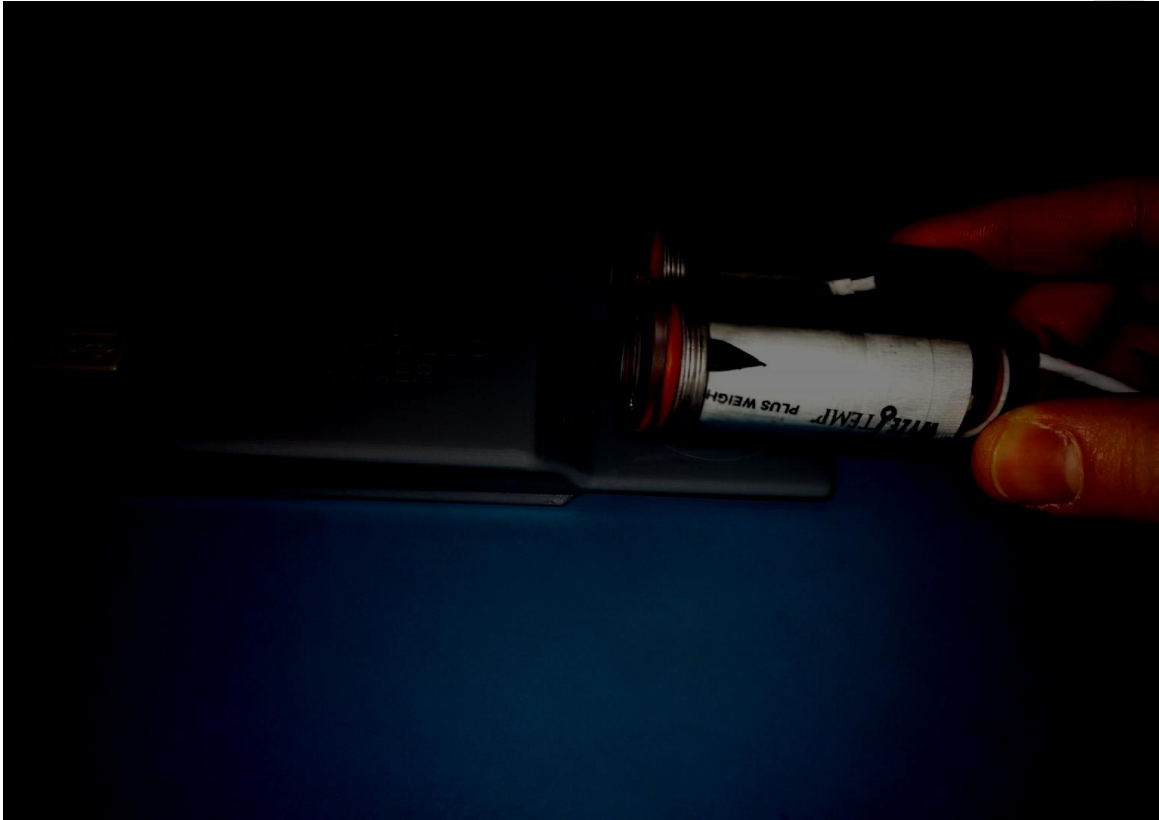

Illustration 4: An example of Wyze Temp Plus Programmer placement.

The programmer and probe utilize near field communications (NFC) to exchange data. This wireless method of communication means that the probe housing does not need to be opened, and that the programmer can be used by simply holding the target etching on the tapered end of the programmer to the probe compartment with the Matrix Logo. If an error message is received during a programming attempt, try repositioning the target on the probe. An example of how the programmer should be held can be seen in Illustration 4.

Programming is accomplished by retrieving the current settings with the "Get Info" button changing any desired settings, then pressing the "Write Info" button. After the settings are successfully written to the probe, waking the probe from a sleep state will cause the changes to be implemented.

4.2 Tag Number

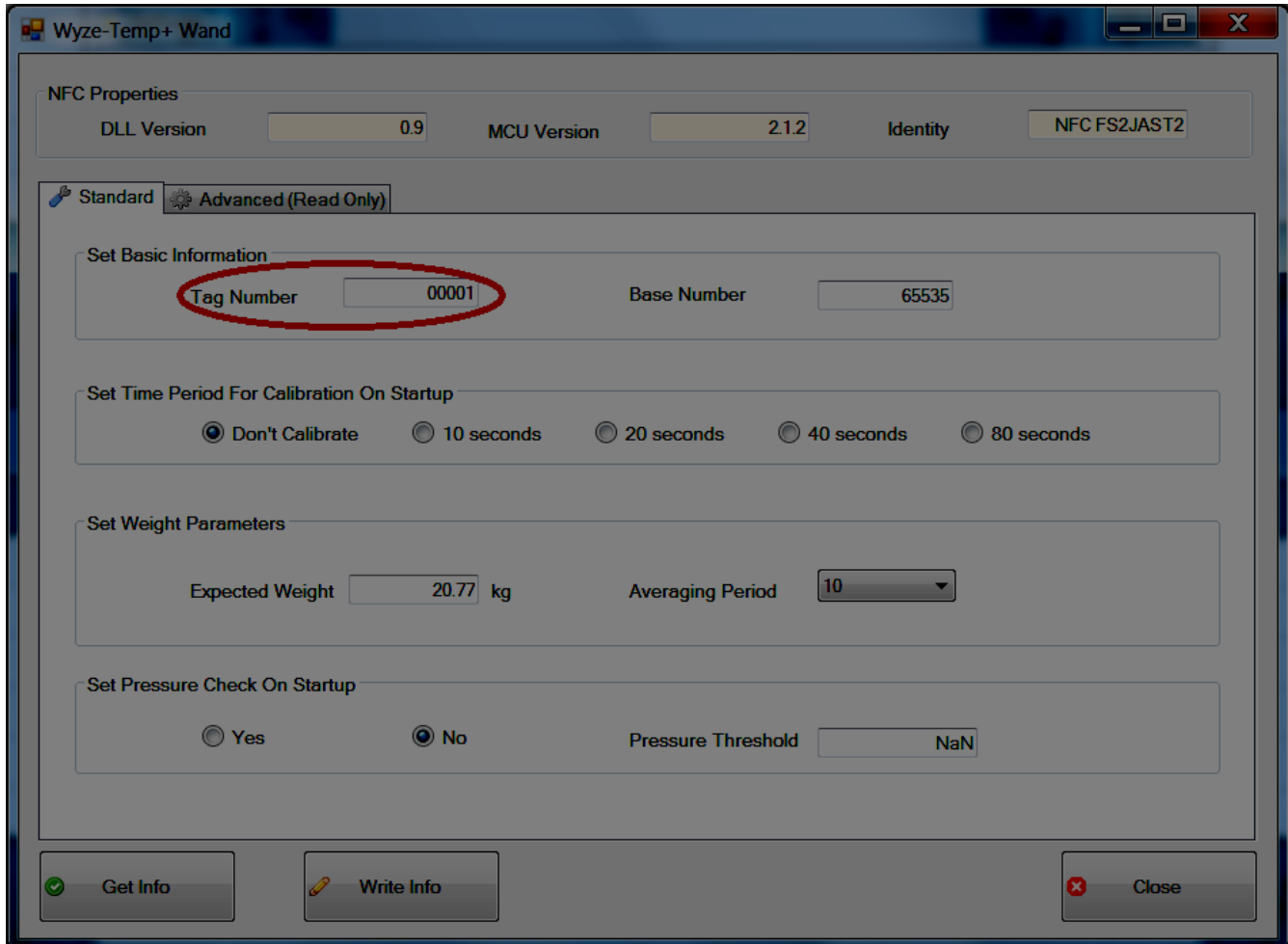*Illustration 5: The Tag Number field.*

Illustration 4 highlights which field will be used to change the tag number in the field.

4.3 Base Number

Illustration 5 highlights which window will be used to change the base Number field.

When using a Model TP1000A Wyze Temp Base, the value written to the "Base Number" field should always be 65535.

Illustration 6: The Base Number field.

4.4 Calibration

All Wyze Temp Plus products are shipped pre-calibrated, and can be used directly out of the box. However, in field calibration can be performed if necessary. The procedure for calibration for probes with this capability are outlined in this section.

4.4.1 Weight Probe
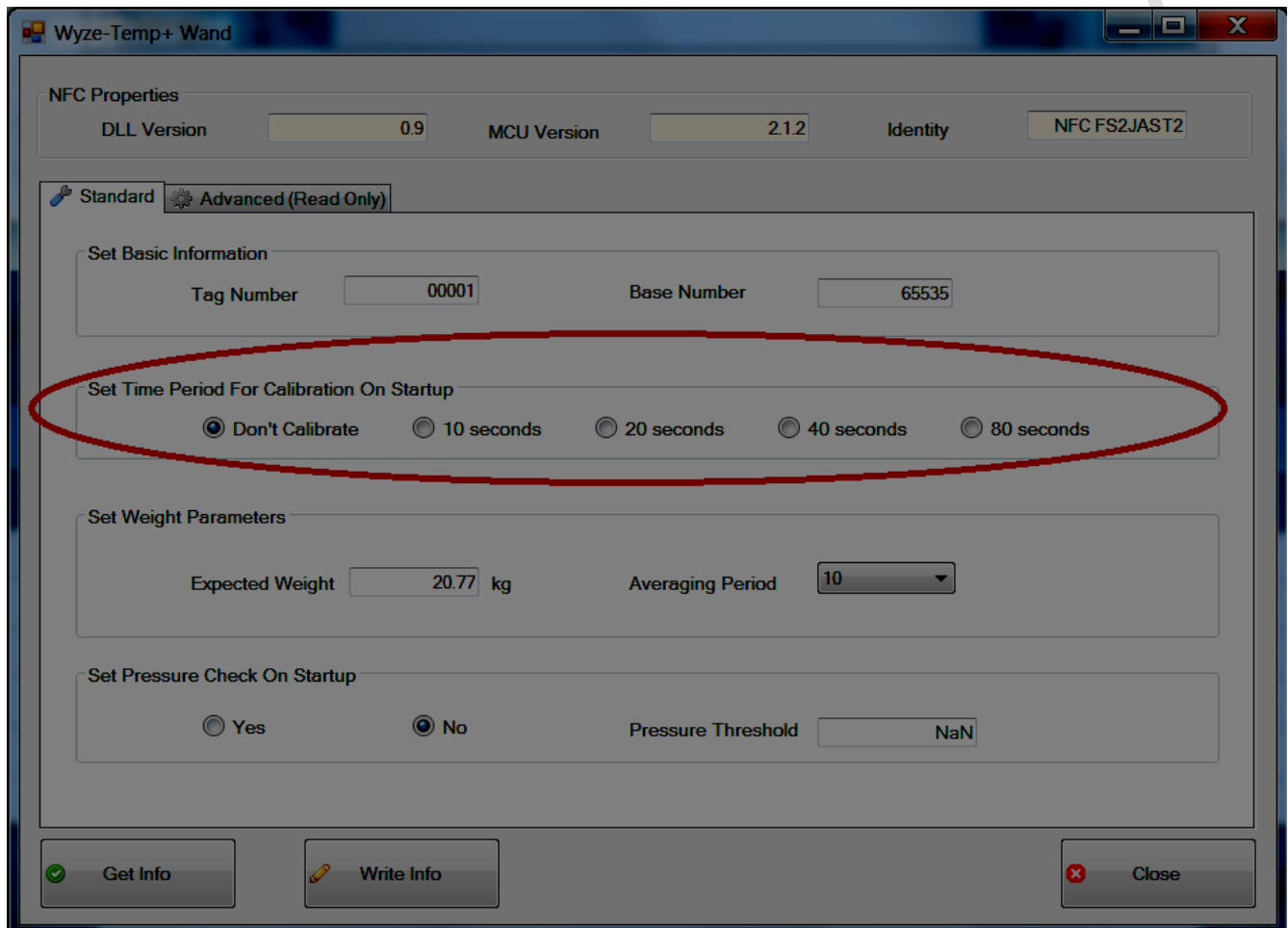
Illustration 7: The calibration selection options.

The probe includes an in field calibration option to increase the accuracy of its readings and can be accomplished using a single known weight. A step by step example procedure is outlined below:

1. Open the Wand application window and use the "Get Info" button to load in the current probe settings.

2. Choose a known weight (here 20.77 kg) that can be applied to the Wyze Temp Plus Weight during calibration. Typically, a weight closer to full scale (22.6 kg, or 50 lb) will yield better calibration results. Select a wait period in the area circled in Illustration 7, this time period will be the time that is allotted the user to apply or remove weight in each step. Matrix recommends using at least 40 seconds for calibration time to ensure accurate calibration results.

3. Write the chosen values to the probe with the "Write Info" button.

4. The probe will need to wake up to start calibration. If the device is already awake, put it to sleep and wake it again.

5. At this point, an orange LED will start blinking, this means that it is time to remove any weight from the sensor. During this period, apply the zero weight condition. (Note: if the probe is left laying down, calibration will not proceed correctly. The device MUST be in the actual use case 0 load condition.) The orange LED will last the amount of time that was chosen in step 2.

6. When the LED changes to purple, it is time to apply the known weight set in step 2 to the Wyze Temp Plus Weight sensor. Minimize any motion by the weight during this period to achieve best results. The purple LED will again last the amount of time chosen in step 2.

7. When the LED returns to its normal green blinking pattern, calibration is completed and the device is ready for use. It is recommended that prior to use, the probe is tested with a known weight to ensure calibration was successful.

4.4.2 Temperature Probe

The temperature probe can be successfully calibrated for use over its intended temperature range using two temperature points (0C and 100C). The method for accomplishing this is outlined in the numbered steps below. Currently, the wand application does not have temperature calibration options, so the calibration must be done using the ST M24LRXX_Application_Software.

1. Connect a Wyze Temp Plus Programmer to a USB port on your computer.

1. Start the M24LRXX_Application_Software and select the CR95HF DEMO KIT option at the bottom of the list in the dropdown box and then click the "Ok" button.

2. On the top of the window click the "Reader Application" option, select the "M24LR64E category, and select "A" from the menu that expands.

3. You should be presented with the screen below:
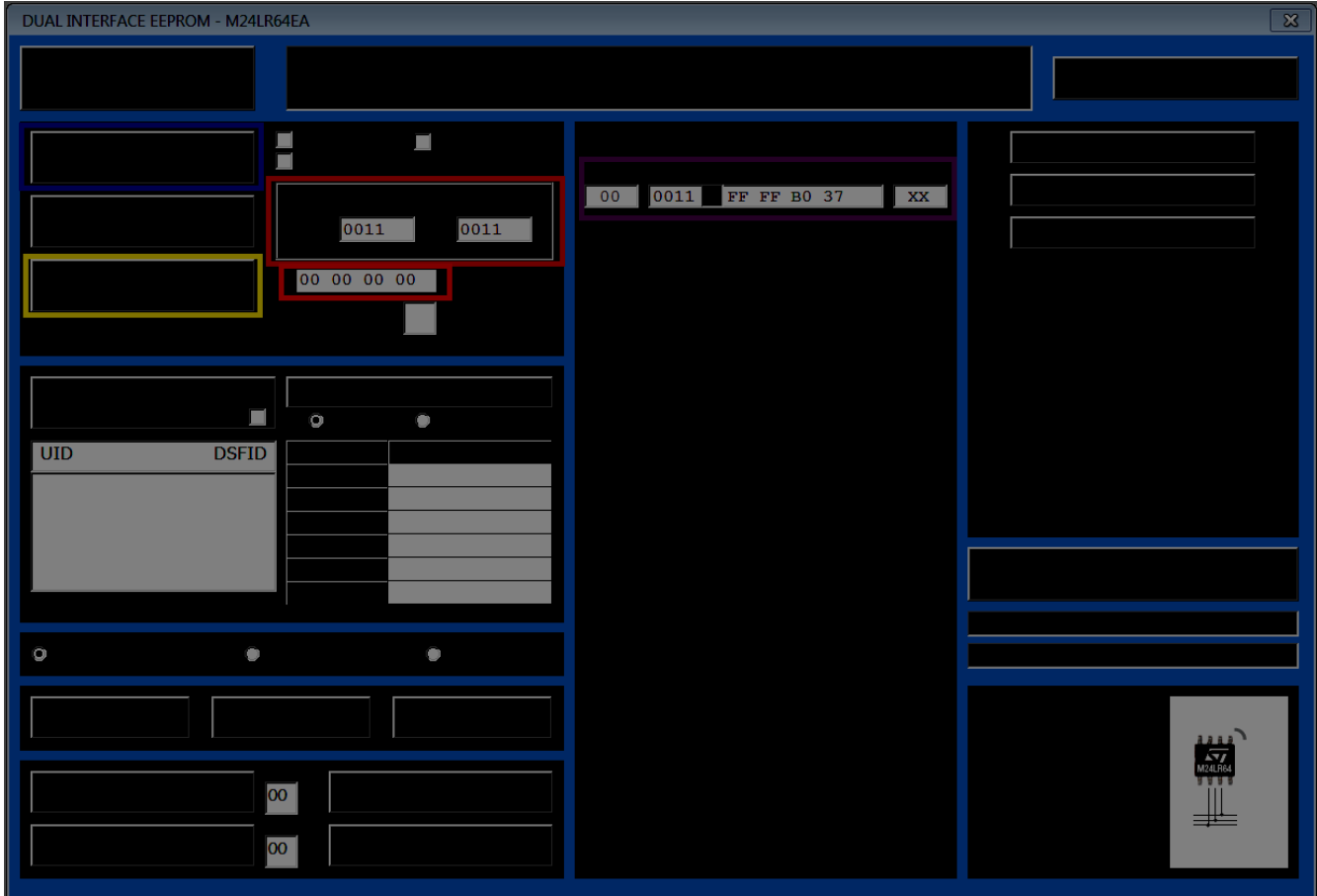
4. in the area highlighted by the red box, fill both fields with "0011," this will access the correct memory location on the Wyze Temp Plus.

5. Click the "Read" button in the blue box. You should see a field appear like the one in the purple box if this is successful.

6. The first two bytes (FF FF in this example) should be filled in to the field highlighted with orange.

7. The second two bytes (B0 37) are the values we will need to change as outlined in the following step.

8. The number stored in our field of interest is currently "37 B0" (note: NOT B0 37, this is little endian format). Using a hexadecimal to binary converter calculator will output the binary value, in this case we are looking at 0011 0111 1011 0000. We will want to selectively change these values to indicate our how we want to calibrate as outlined in the next step.

9. There are three areas of this number relevant to temperature calibration, they are as follows:

xxxx xxxx xxxx xxx**1** – The bold value, when set to 1, will indicate that we are to calibrate a point on the next wake up.

xxxx xxxx xxxx **1**xxx – The bold value, when set to 1, will indicate that we are calibrating a 100C point. When it is set to 0, we are calibrating the 0 C point.

xxxx xxxx xxxx x**11**x – The bold value can be equal to 0(00), 1(01), 2(10), or 3(11) and will

control how long after wake-up the probe will wait to read the temperature and consider it as the 0 or 100 point reading. The time waited is 4 minutes at setting 0, with an additional four minutes for each setting past 0 (01 gives 8 minutes, 10 gives 12, etc.).

10. Selectively change the numbers read out to indicate what you would like to do. For example, if we want to teach our probe what 100C looks like, give it 4 minutes to come to the correct temperature, and we have read out the value 37 B0 that we have been using as our example we would make the following changes:

1111(F) 1111(F) 1111(F) 1111(F) 1011(B) **0000(0)** 0011(3) 0111(7) to

1111(F) 1111(F) 1111(F) 1111(F) 1011(B) **1001(9)** 0011(3) 0111(7)

11. Enter the new number into the box highlighted in orange, and with the probe on the wand, press "Write."

12. The next time the probe wakes up, it will calibrate itself to the indicated point after the chosen amount of time, then continue normal operation. The probe will indicate it is calibrating by flashing an orange LED when calibrating the 100C point, or a purple LED when calibrating the 0C point.

13. A complete recalibration will require that both these points are measured. To accomplish this, the same steps should be followed while indicating the other point type.

4.5 Averaging Period

The Wyze Temp Plus Weight Probe will sample at a fixed rate and keep a running average of the values it reads since its last report to the base. Once the end of an averaging period is reached it will transmit the result then start a new average. This averaging period is configurable by the user in 1 second steps between 1 and 30 seconds. Longer averaging periods are more likely to eliminate error associated with motion applied to the mass and increase battery life by reducing the number of transmits. For these reasons, longer averaging periods recommended. For more frequent updates, a smaller averaging period can be chosen as well. The drop-down menu to set the averaging period is highlighted in illustration 8.
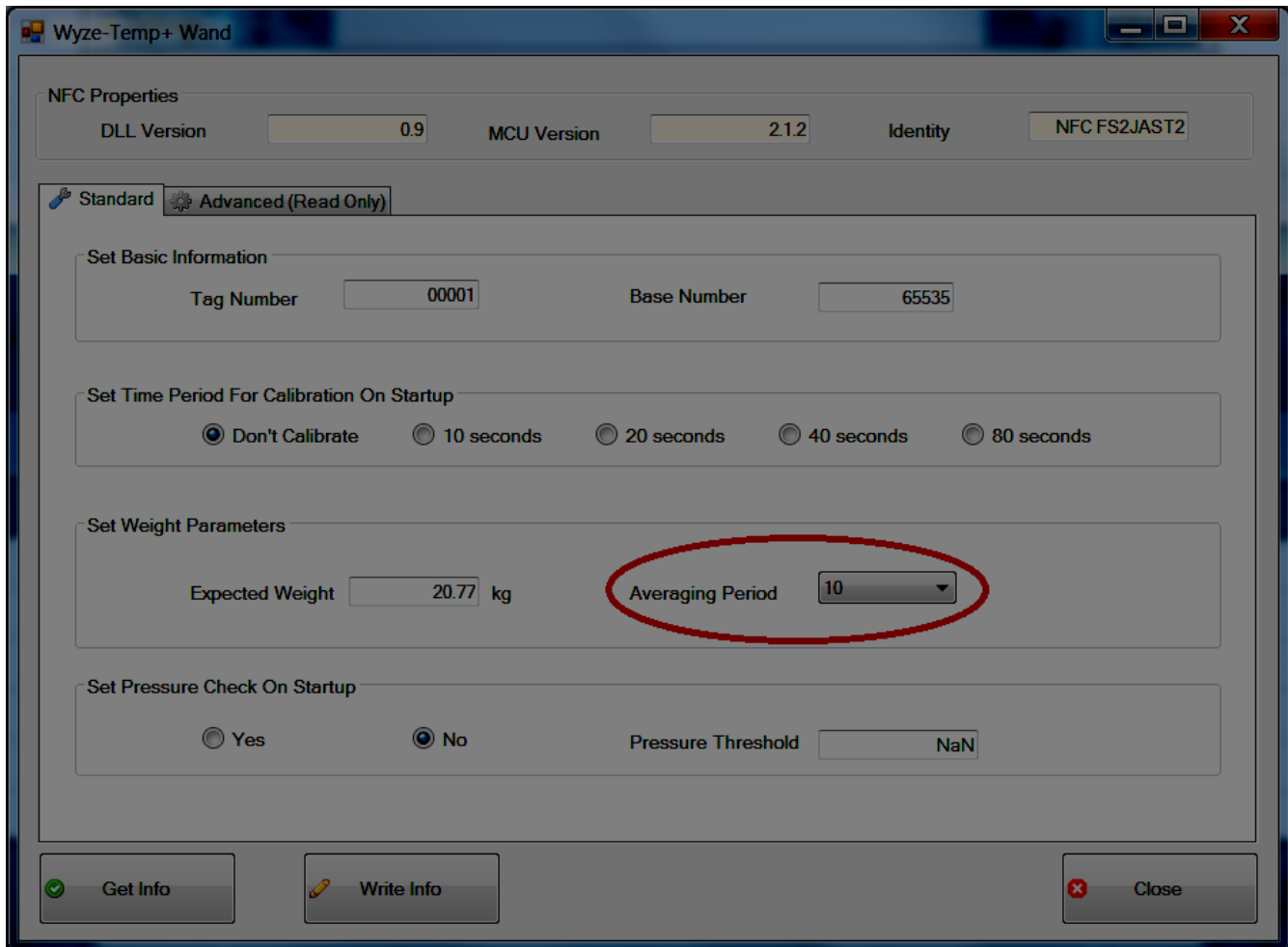
Illustration 9: The Averaging Period drop-down menu.

4.6 Retrieving the Current Settings

In many cases, it can be useful to see how the probe is currently configured. This can be accomplished by applying the programmer to the probe as previously described, and pressing the "Get Info" button. If successful, this will populate the boxes with the current setting of the probe.

4.7 Other Options

The Advanced (Read Only) settings and fields are not necessary for field utilization of this device, and are implemented as measures to help Matrix troubleshoot. The pressure check options are currently in development and should not be changed by the user.

5. Operating the Wyze Temp® Plus Probe

The Wyze Temp Plus Probe is calibrated on delivery and is set up for immediate use. A quick start guide is included with this guide to start data logging immediately. The following section details how to use the device in a more in depth manner.

5.1 Turning the Wyze Temp® Plus Probe on and off

The probe utilizes a reed switch that can be closed via a magnet. Holding a magnet to the LED on the probe will toggle the power. The Wyze Temp Plus probe uses its LED to signal if it is turning off or waking up. When the device is turning off, it will display a solid blue LED for approximately half a second. When turning on, the Wyze Temp Plus Probe will display a green LED for approximately one second. A complete description of LED colors and their meanings can be seen in the next section.

5.2 Description of the LED signals of the Wyze Temp® Plus Probe

LED Color	LED Pattern	Description
Green	Solid for one second	The probe is waking up.
Green	Flashing every four seconds	The probe is awake and transmitting normally.
Blue	Solid for one second	The probe is going to sleep.
Red	Flashing every four seconds	An error has occurred. This is likely caused by a weight seen outside the acceptable range. Try recalibrating the probe and verifying that weight is being correctly reported. If recalibration does not remove the blinking red LED and the probe is otherwise malfunctioning, a problem has occurred. If you will contact Matrix, please have the "error log" value that can be read under the Advanced tab of the wand application ready.
Orange	Flashing every four seconds	The probe is in calibration mode. An orange light informs the user to remove all weight from the Wyze Temp Plus Weight Probe, or that the probe will be expecting a 100C temperature sample point if it is calibrating temperature.
Purple	Flashing every four seconds	The probe is in calibration mode. A purple light informs the user to load the known weight onto the Wyze Temp Plus Weight Probe

		or that the probe will be expecting a 0C temperature sample point if it is calibrating temperature.
Purple	Intermittent	The purple LED will flash whenever the Wyze Temp Plus probe receives an acknowledge from a base. This indicates a healthy connection between the two components.
White	Flashing every four seconds	This pattern occurs when the "Set Pressure Check On Startup" option is selected and written to the Wyze Temp Plus Weight Probe. This pattern will end, potentially followed by an error LED pattern, after 12 minutes. Putting the device to sleep and re-waking it after this process will restore normal operation. Alternatively, open the battery compartment and disconnect the battery for at least 10 seconds. After this time, use the Wyze Temp Plus Programmer to deselect the pressure check option(the probe does not need to be powered for the programmer to work) and then reapply power by connecting the battery and closing the probe.

6 Accessing Logged Data

6.1 The Data Log File

The Wyze Temp Plus data acquisition program will in addition to displaying a real-time plot, log the data to a file in windows. This file can be found in the following default directory:

C:\ProgramData\wyzetempplus

If windows explorer does not show "ProgramData" as an option, it is because the file is hidden by the Windows operating system. The logged data can still be accessed by entering the above address into the address bar of Windows explorer.

The data for the current session will be named by date. For example, data recorded on March 28, 2014 will be named "data_20140328.txt" There will be a similarly named file "com_20140328.txt" This second file contains raw output from the base and can be ignored. The data stored in the data file will have the following format:

<date>, <time>, <probe serial number>, <data point>

The comma delimitation will allow for excel processing, and data points from all active probes will be listed in the order they were received by the Wyze Temp base (i.e. the data will NOT be sorted by probe number or type).

If a new data logging session is started, and a file was already generated on the current date, the new data will automatically be appended to the already existing data. If this is not desired, simply renaming the existing file will cause the program to regenerate the standard file name for the new data.

7 Troubleshooting

This section will outline potential fixes for undesired behaviors.

7.1 Potential Errors

Problem	Fix
The Wyze Temp Plus Weight Probe is transmitting incorrect weight values.	Calibrate the device, being careful to apply the use case 0 load during the first LED pattern, and having a motionless applied weight during the second LED pattern.
The Wyze Temp Plus Weight Probe is blinking a white LED, is not transmitting, and cannot be put to sleep.	The probe has entered a "pressure test" this mode will be exited after some time (the time span of the test varies based on user settings) and operation will return to normal. If a red LED blinks in place of the green one after this test, cycle the wake state and the green LED will return. If the user needs immediate use of the probe, unplugging the field replaceable battery for 10 seconds, then reapplying it will force the probe to exit the pressure test. In both cases, the user must deselect the "Check Pressure Test on Startup" prior to waking the probe using the Wyze Temp Plus programmer.
The green LED will occasionally remain on for a few seconds when it should be blinking.	This is a known firmware bug. The operation of the device is not negatively impacted and the error is only cosmetic.
The red LED is blinking	This is a universal indication that an error has occurred. Usually the red LED is caused by a weight that is outside its allowable range. If this occurred after a recent calibration, the calibration process should be repeated. If this has occurred during normal operation, make sure that no excess weight has been or is being applied to the Wyze Temp Plus Weight Probe. After the weight error has been resolved, resetting the probe will return the LED color to green. If the red LED pattern persists, and erratic operation such as calibration occurring when not set is noted, the device should be returned to Matrix for more advanced troubleshooting.
The Wyze Temp Plus Weight Probe will not go to sleep after 10 minutes without base contact.	The Wyze Temp Plus Weight Probe is in a data logging mode. At the current revision, the probe should not be able to enter this mode because it is automatically disabled by the Wyze Temp Plus Programmer. Reprogram the probe using the NFC application. No settings need to be changed, the

	Programmer only needs to rewrite the settings currently on the probe.
The Wyze Temp Plus Weight Probe is turning itself off within a minute and a half of wake up, and there is no data being reported on the screen.	The Wyze Temp Plus Weight Probe is not receiving communications from the Wyze Temp Base. Make sure that the correct base is being used, and that the serial number programmed into the probe is correct. Verify that the base is being powered via the external two-pin power supply.

8. FCC Warnings

IC: Per RSS-GEN, Sec 5.3 - Suppliers of radio apparatus shall provide notices and user information in both English and French. Please refer to sample statements below and make sure that any statements that are applicable to your type of device are included in your user manual.

FCC Part 15.19 Warning Statement- (Required for all Part 15 devices)

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

FCC Part 15.21 Warning Statement-

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

IC RSS-GEN, Sec 7.1.3 Warning Statement- (Required for license-exempt devices)

ENGLISH:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FRENCH:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC RSS-GEN, Sec 7.1.2 Warning Statement- (Required for Transmitters)

ENGLISH:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

FRENCH:

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec

une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

IC RSS-GEN, Sec 7.1.2 Warning Statement-

(Required for Transmitters w/ detachable antennas)

ENGLISH:

This radio transmitter (identify the device by certification number, or model number if

Category II) has been approved by Industry Canada to operate with the antenna types listed

below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.

FRENCH:

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

IC RSS-102, Sec 2.6 Warning Statements

ENGLISH:

The applicant is responsible for providing proper instructions to the user of the radio device, and any usage restrictions, including limits of exposure durations. The user manual shall provide installation and operation instructions, as well as any special usage conditions, to ensure compliance with SAR and/or RF field strength limits. For instance, compliance distance shall be clearly stated in the user manual.

English:

The user manual of devices intended for controlled use shall also include information relating to the operating characteristics of the device; the operating instructions to ensure compliance with SAR and/or RF field strength limits; information on the installation and operation of accessories to ensure compliance with SAR and/or RF field strength limits; and contact information where the user can obtain Canadian information on RF exposure and compliance. Other related information may also be included.

French : Le mode d'emploi des appareils destinés à l'utilisation contrôlée doit aussi inclure des informations sur les caractéristiques de fonctionnement de l'appareil; les instructions de fonctionnement pour assurer la conformité avec SAR et / ou les limites d'intensité de champ RF; informations sur l'installation et l'exploitation d'accessoires pour assurer le respect des SAR et / ou les limites d'intensité

de champ RF; et les coordonnées où l'utilisateur peut obtenir des informations sur l'exposition canadienne de radiofréquences et la conformité. Autres renseignements connexes peuvent également être inclus.