

Online Fruit Acidity and Sweetness Analyzer**NY2300****Features**

- Near-infrared spectroscopy technology offers high sampling coverage and enhanced detection accuracy.
- Online, non-destructive testing ensures no contamination and rapid detection speeds.
- Modular design allows for easy installation and seamless integration with fruit online intelligent sorting systems.
- Capable of analyzing fruit attributes such as sugar content.

Description

NY2300 Fruit Acidity and Sweetness Analyzer utilizes advanced near-infrared (NIR) spectroscopy to measure the internal quality of fruits non-destructively. By analyzing the absorption of different wavelengths by various fruit components, the NY2300 leverages chemometric methods to create precise analytical models. This technology enables rapid, non-invasive analysis of key indicators such as fruit sugar content and acidity. Additionally, it can detect internal defects and diseases through customized classification models for specific fruit types.

Application

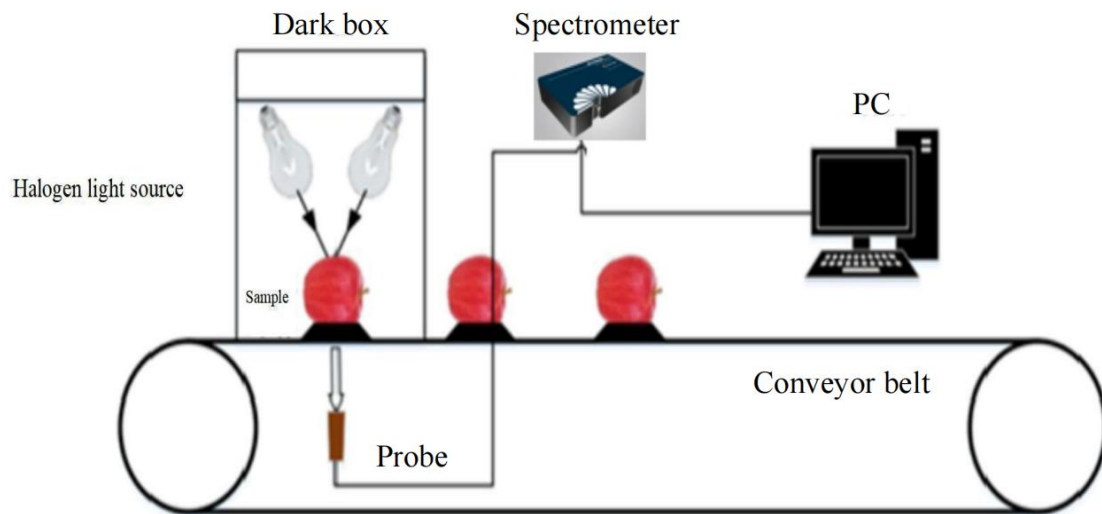
Spherical fruits with diameters ranging from 50mm to 110mm require customized modeling for different fruit types, including:

- Oranges
- Wogan Mandarins
- Lemons
- Grapefruits
- Apples, Persimmons, etc.

The NY2300 analyzer is composed of a collection module and a testing mainframe, designed for real-time, rapid analysis of internal contents in fruits of varying sizes (large, medium, small). It seamlessly integrates with fruit sorting systems to facilitate fast, accurate online sorting, ensuring high efficiency and reliability in fruit quality control.



1. Principle



When exposed to near-infrared light, light waves with the same frequency as certain molecular groups will resonate, causing the energy of the light to be transferred to the molecules through changes in molecular dipole moments. If the frequency of the near-infrared light does not match the vibrational frequency of the sample, the infrared light at that frequency will not be absorbed. Therefore, when continuously changing the frequency of near-infrared light is used to illuminate a fruit, the fruit will selectively absorb near-infrared light at different frequencies. The near-infrared light that passes through the sample will weaken in certain wavelength ranges, and the transmitted infrared light will carry information about the organic components and structure. By analyzing the optical density of the transmitted or reflected light with a detector, the content of the components can be determined.

The light source effectively illuminates the fruit to be tested, and after diffuse transmission, the light is transmitted to the optical fiber probe and then to the spectrometer responsible for the data processing module. The microprocessor processes, calculates, and analyzes the data, thus completing the detection of the fruit's sugar and acidity levels. The results are displayed on the screen, enabling non-destructive detection of the fruit's sugar and acidity.

2. Key Benefits

- Support for Integration with Online Fruit Sorting Production Lines.

The NY2300 can be customized according to the actual conditions of the production line, with no hardware installation barriers. To adapt to the production environment, the NY2300 offers the following features:

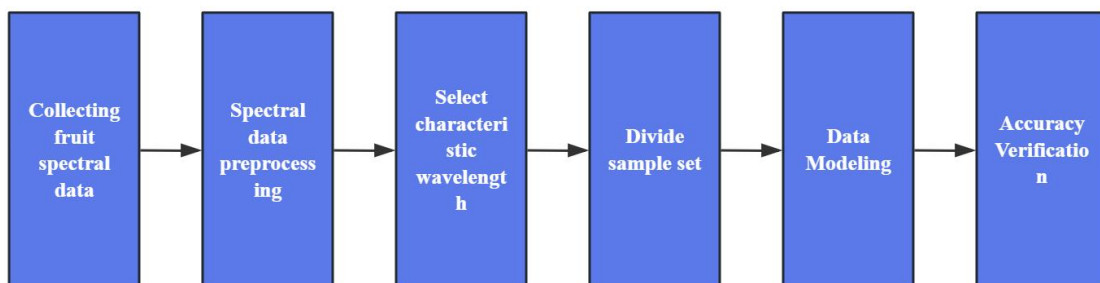
- (1) The sugar content values can be output to the upper computer or PLC via network and serial ports.
- (2) The hardware I/O supports up to 12 types of grading outputs, which can be flexibly configured on the upper computer.
- (3) Supports hardware-triggered measurement, ensuring more precise measurement positioning.
- (4) The algorithm runs on an embedded system, allowing measurements to be completed without the need for a PC, thereby reducing costs for the customer.

- Proprietary Algorithm

The NY2300 collects the near-infrared spectra of the target fruit, selects specific wavelength data matrices, and establishes a Partial Least Squares (PLS) model using the training set. The model's effectiveness is evaluated through the prediction set, with an error margin of $\pm 0.5\%$.

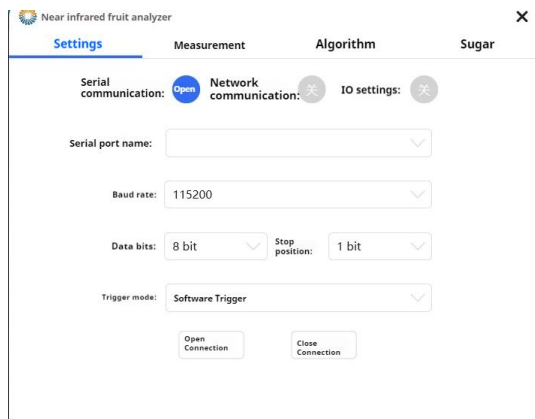
- User-Friendly Modeling Software

The NY2300 features a proprietary, simple, and efficient modeling program that allows for personalized modeling for different types of fruits, ensuring measurement accuracy.

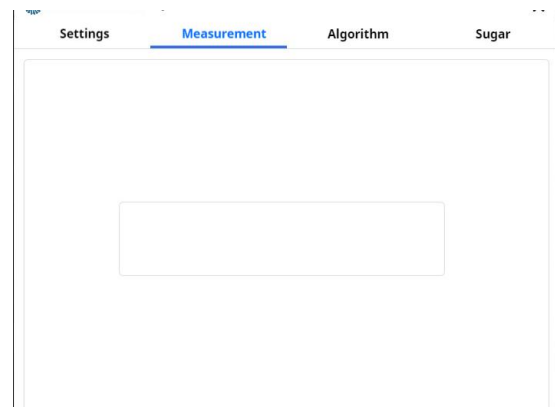


- Detection Terminal Display Results

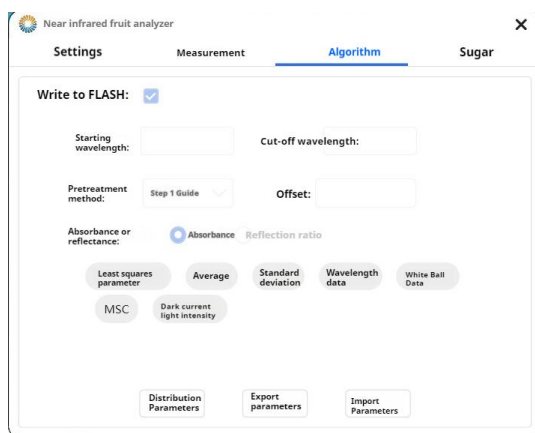
After simple configuration, the instrument can directly display the test results on the digital screen of the main testing unit, eliminating the need for a separate computer. The accessory software interface is shown below:



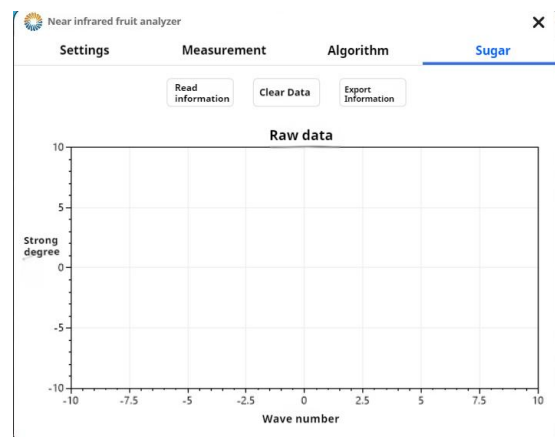
Communication settings interface



Sugar content display



Write algorithm parameters to the lower computer



Reading raw data for modeling

3. Product Images



4. Parameter

Product Features	Detectable varieties	Citrus oranges, apples, pears, peaches and other fruits with a diameter of 50-110mm (based on fruit modeling)
	Detectable indicators	Sugar content, etc.
	Sugar acidity	Sugar content detection accuracy: ± 2 (depends on modeling)
	Moldy core disease	Accuracy>95%
Product Parameters	Detection speed	About 5-8 pieces/second (determined by production line speed, etc.)
	Power	1KW
	Product size	Acquisition module 450mm*540mm*350mm
	(standard, customized according to actual size))	Test host 270mm*378mm*170mm
	Material	Sheet metal + aluminum alloy
	Product weight	
	(standard, customized according to actual size)	Test host + acquisition module about 45KG
IO Function	Communication method	RS232, network port
	Trigger method	Supports soft trigger and hard trigger