



**SMART  
ANALYSIS**

## Smart Analysis

**The intelligent and connected instrument that revolutionises analysis in the winery**

Smart Analysis is the platform that simplifies quality control of wine in the cellar and allows you to improve your product day after day. You can finally have the correct and immediate values necessary to control and manage your wine in the best way.

No more waiting times, make the right decisions at the right time.

### Optical Technology

Smart Analysis is a portable, accurate and reliable enzyme analyser. The new fiber optic and LED source technology makes Smart Analysis an extremely compact and robust spectrophotometer that does not require any particular maintenance. We have developed a remote diagnostic system to check whether your device is working properly.

### User Friendly App

The Smart Analysis APP is simple and intuitive, designed for any type of user. You download the APP directly on your tablet and it allows you, even if you are not an expert, to manage all the analysis operations in a guided way, up to the final step, the data storage.

### Analysis Traceability

Through the reagent kit QR code, the APP autonomously identifies the type of analysis, lot number and expiry date of the reagents, and the calibration curve as well, without the need to calibrate the machine.

### Data Management

The results are saved on the tablet, with the possibility of being downloaded in the format most convenient for you. Furthermore, if you wish, they can be stored in the cloud, a dedicated and customised page where you can manage the results of your analysis. You can aggregate and process your data anytime and anywhere, from a PC or tablet. You can use the information to obtain, over time, the historical archive of your wine.

### Analysis Kits

The reagent kits have an innovative format designed to simplify the analysis procedure and minimise the manual operations required. Disposable cuvettes with standard optical path are pre-filled with the reagents, inserted in convenient packs of 20 tests to optimise consumption. The prefilled cuvettes are pre calibrated, meaning no manual calibration is required by the user!



## TECHNICAL SPECIFICATIONS

Optical Module	Connectivity	Incubation Module	Software Interface	Dimensions/ Weight	Power Supply
LED light sources; continuous spectrum 340-760nm	Bluetooth/Wi-Fi	37.0°C +/- 0.5	App for Android 6 or higher	85x75x200mm; 1kg	5V, 1.5A; 7Ah battery capacity [7hrs of operation]

## RECOMMENDED ACCESSORIES

### Smart Ring Test (SRT)

The Smart Ring Test service was created with the aim of periodically checking the status of the system and the quality of the analysis performed by the customer. The service is provided through the use of 5 standard matrices (Glucose/Fructose, Malic, Acetic, Free SO<sub>2</sub>, Total SO<sub>2</sub>).

#### Why is this service so important?

SRT allows the customer to independently evaluate, through a report that the system generates at each check, the following aspects:

- the instrumental performance, to verify any anomalies at the hardware level in the optical device;
- the performance of a particular kit of reagents, which has expired or been kept in a bad state (e.g. outside the refrigerator at room temperature for a long period) or which has shown anomalous behavior (contaminations, bad storage, etc.);
- the dexterity of the operator, which from our experience is the main component in the event of anomalous results. This allows the user to verify the correctness of all the manual steps, and guarantee the quality of the analysis procedure.

**Note:** SRT contains the standard matrices only. The customer will need to purchase the reagent kits they wish to test additionally.

### Mini Centrifuge

Compact mini centrifuge with two rotor types. Speed can be adjusted to 4000 min<sup>-1</sup> or 6000 min<sup>-1</sup>. Powerful motor for fast starting. Quick stop when the lid is opened.



### Thermoblock

Smart Analysis integrates with a thermoblock, enabling simultaneous analysis of one parameter, on up to 10 samples. This accessory allows producers to acquire a larger source of information over a short time; compared to sequential analysis (i.e. 10 Malic Acid tests in 10 minutes).

Applicable to every available parameter, the thermoblock improves and increases the efficiency of quality control throughout the entire production method; from must through to finished wine.



### Sonicator/De-gasser

Convenient and efficient degassing of samples, by ultrasonic air bubbles.



### Backup & Restore: Cloud Service and Android APP

- Extended Access: allows access to the analysis archive; including from PC, MAC and tablets not used for analysis.
- Simplified Management: allows better organisation of the data you have gained over time thanks to storing user preferences.
- Android APP for smartphone: Monitor real time analysis, wherever you are!

Creating an interconnected platform allowing you to keep results within an arms reach; and collaborate with your team even when you are not working in the same place.

- Enjoy the convenience of viewing and managing your data in a way that best suits you



## WINE ANALYSIS PARAMETERS

PARAMETER	RANGE	TEST DURATION			
		STEP 1	STEP2	STEP3	TIME PER TEST
<b>D-Glucose + D-Fructose</b>	0.10-8.00* g/L <i>*extended to 320 g/l with "dilution kit"</i>	3 mins	7 mins	-	10 mins
<b>D-Glucose + D-Fructose + Sucrose</b>	0-25 g/L	20 mins	3 mins	7 mins	20 mins hydrolysis + 10 mins
<b>Acetic Acid</b>	0.05-1.00 g/L	3 mins	7 mins	-	10 mins
<b>L-Malic Acid</b>	0.10-4.50 g/L	3 mins	7 mins	-	10 mins
<b>L-Lactic Acid</b>	0.10-3.00 g/L	3 mins	7 mins	-	10 mins
<b>Total SO<sub>2</sub></b>	10-300 mg/L	30 secs	3 mins	-	3 min 30 secs
<b>Free SO<sub>2</sub></b>	5-50 mg/L	3 mins	7 mins	-	10 mins
<b>Tartaric Acid</b>	0.50-6.00 g/L	3 mins	7 mins	-	10 mins
<b>Total Acidity</b>	0.50-8.00 g/L	30 secs	1 min	-	1 min 30 secs
<b>pH</b>	2.80-4.01	30 secs	30 secs	-	1 min
<b>Anthocyanins</b>	-	30 secs	5 mins	-	5 min 30 secs
<b>Primary Amino Nitrogen* (PAN/FAN)</b>	20-300 mg/L	30 secs	3 mins	-	3 min 30 secs
<b>Alpha Amino Nitrogen* (inorganic nitrogen)</b>	20-140 mg/L	3 mins	7 mins	-	10 mins
<b>Alcohol</b>	up to 15 % vol /vol	10 mins	5 mins	-	15 mins
<b>Colour</b>	<ul style="list-style-type: none"> <li>• Reading at 420-520-620 nm (OIV-MA-AS2-07B)</li> <li>• CIELab colour space (OIV-MA-AS2-11)</li> </ul>	Immediate			
<b>Polyphenols</b>	5-100 IPT	Immediate			

\* YAN can be tested using the PAN and Alpha Amino Nitrogen kits.

**Note:** The range of all parameters (excluding pH and colour can be extended with a simple water dilution.

## SMART ANALYSIS TECHNOLOGY

### What is unique about the Smart Analysis technology?

Smart Analysis is a single beam spectrophotometer with fixed optics (patented). This feature allows you to have a continuous spectrum and to use all the wavelengths of interest in the high UV-VIS range, necessary for Quality Control. Analysis carried out with Smart Analysis is based on enzymatic or colorimetric chemical reactions, unlike other non-quantitative but statistical technologies. Enzymatic chemistry, for some parameters (eg malic, lactic, acetic, sugars etc) is among the official methods of the OIV.

### What will I find in the Smart Analysis box?

Smart Analysis is supplied together with the micro USB power supply to recharge the device, the cuvette holder and the fixed volume pipettes that are used for taking the sample during the analysis (excluding G/F/S and alcohol pipette). All supplied in a convenient case to be easily transported.

### What type of maintenance does the instrument require?

Smart Analysis has been designed with fixed optics. Having no moving parts inside, it does not require to be periodically calibrated or recalibrated like the classic bench spectrophotometers (provided instead with moving parts). Never coming into direct contact with liquids, it does not even require special cleaning. In addition, Smart Analysis is equipped with a special cap to cover the reading cell during the non-use phase.

### Charge and battery life

Smart Analysis is charged via the supplied charger through a microUSB port. When fully charged the Smart Analysis battery has a duration of approximately 7 hours of work. Smart Analysis can also be used while connected to the power supply. The instrument can be fully recharged in approx 5 hours.

### Can I add parameters to be analysed?

Smart Analysis has been designed to be able to analyse all the liquid matrices for analysis kits which fall within the spectral range of the instrument (wine, beer, oil, water, etc). Being a spectrophotometer with continuous spectrum in the high UV-VIS range, it is able to be used with all enzymatic and colorimetric kits. The activation of new parameters or new supply chains on the device is performed remotely, via software, and does not require replacement of the instrument.

### How do the device and the tablet communicate? Do I need wifi for analysis?

The connection between Smart Analysis and the tablet is via Bluetooth. It is not necessary to have the WiFi connection active to carry out the analysis. WiFi is only required for the following activities: (I) account creation on the Smart Analysis APP; (II) login to the Smart Analysis APP; (III) uploading analysis results to the Cloud; (IV) sharing of the analysis; (V) to send diagnostic data to DNAPhone server.

## REAGENT KITS

### What is included in the Smart Analysis test kits?

All material required for analysis, in particular:

20 pre-filled cuvettes containing R1 reagent. Dispenser dropper containing reagents R2, R3 (if necessary), disposable tips and all the necessary consumables for the analysis.

### Format, storage and duration of reagents

Smart Analysis kits are packaged in formats of 20 disposable tests. In general, the kits must be stored in a refrigerated environment between 2 and 8°C to guarantee performance until the date indicated. The storage temperature is indicated on the carton for each reagent kit. Smart Analysis kits have a shelf life of 12-18 months from the production date, except for some special cases in which the kits have a shorter expiry.

### General information about Smart Analysis analysis kits

The Smart Analysis reagent kits have been formulated in order to provide a simplified method compared to the traditional manual methods. The reagents are pre-filled in disposable cuvettes and associated reagent dropper dispenser (if required). The Smart Analysis system eliminates the need to use the classic laboratory pipettes and minimises the manual operations required by the user, preventing spills and contaminations that would lead to waste of material.

In addition, the Smart Analysis system eliminates the need of calibrating instruments during the analysis phase; all Smart Analysis kits are pre-calibrated during production (batch by batch). The only operation to be performed will be the analysis of your samples.

### **What sample preparation is required?**

As with any photometric analysis, the sample to be analysed must be free of elements that can interfere with the reading (air bubbles, particulates, suspended particles, etc). Samples must be degassed (ideally by the sonicator/ degasser) before being analysed. Must samples (particularly rich in pectin) or turbid wine samples should be filtered or centrifuged. Non-turbid still wine samples, on the other hand, can be analysed in their natural state.

It is not necessary to decolorize red wine samples, as Smart Analysis acquires the reference for measuring the parameter with the wine sample inside the cuvette. The sample volume used with the Smart Analysis kits is small compared to the volume of the reagents, therefore the effect of any interferents is negligible.

### **Analytical Performance**

All tests have average repeatability with a coefficient of variation (CV) between 2% and 5% (obtained by 10 repetitions on three concentration levels).

### **How do you ensure reliability and high quality of the reagent kits?**

All batches of kits produced for the Smart Analysis system are checked with pure calibrants and with certified matrices used in the ring test circuits by laboratories. In addition, random checks are carried out through comparative analysis with accredited laboratories, university departments with which we collaborate and individual partners made up of professionals in the sector, selected for their high-profile skills and laboratory equipment.

### **How can I be sure I am performing the analysis accurately?**

We encourage the use of Smart Ring Tests or certified material (pure standards) with known values for each of the parameters available. The standards can be used for self-control; to verify the proper performance of the analysis procedure.

## **SOFTWARE APP & CLOUD**

### **How is the data saved?**

The Smart Analysis platform uses an innovative analysis data storage and management system for the sector. All analysis data is automatically saved in the internal APP archive. The data from each session can be accessed from the “archive” section of the APP. The cloud is also accessible from “cloud.dnaphone.it” page, using the same credentials that are used to access the APP. From here, it is possible to share (via email, whatsAPP or other), delete or upload the analysis data on your personal management page in the DNAPhone Cloud.

The cloud management software allows the control and management of analysis results anywhere, anytime and from any platform (PC, Tablet, Smartphone etc). In addition to storing data, the cloud offers additional services including: the ability to add information related to specific analysis and the ability to graph the trend of the parameters of interest for a specific sample. The user can monitor the entire analytical history relating to the product at any time.

### **How safe is my data?**

The Cloud system implemented by DNA has the same degree of security and data protection used in banking IT systems.