

OPERATOR'S MANUAL



X-NIR™ Analyzer



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INTRODUCTION



X-NIR™ by dinamica generale is a portable optical analyzer for fresh forages based on NIR technology in order to measure humidity (dry matter), crude protein, starch, ash, ADF and NDF of the analyzed materials. Thanks to X-NIR™ the analysis of most relevant and variable ingredients (forages!) used in your ratios can be performed in seconds on site, displaying in real time its actual nutritional values.

X-NIR™ is based on NIR (Near Infra-Red) technology: it scans the sample with light and reads the spectra absorbed by the sample in the NIR region. Thanks to chemometrics techniques and mathematical algorithms based on multivariate analysis, the X-NIR™ is able to provide predictions on actual nutrients of the sample in real time.

This device is composed by :

- A device with a touchscreen display which reads the sample, collects the data, carries out mathematical operations applying complex algorithms and transforms the optical signal in an electrical one;
- A carry case where the device is stored when it is not in use.

LICENCE AGREEMENT

IMPORTANT NOTICE: Acceptance and use of the enclosed NIR system (hereinafter referred to as “Purchased Product”) constitutes your agreement to the following terms and conditions. Please carefully read the following terms and conditions before using or reselling the Purchased Product.

1. **Limited License.** Dinamica generale, an Italian company (“Owner”) is the owner of the following Patents related to NIR solutions EP 2 377 392 / US 8 651 730 (“Patents”). Owner hereby grants to the customer (“Customer”) a non-exclusive, non-transferable, revocable, limited license to use the technology described in the Patents to use the Purchased Product in the process covered by the Patents (“Licensed Product”), and to sell and offer for sale other Licensed Product in accordance with the terms and conditions set forth herein. Alternatively, Customer may resell the Purchased Product to another entity for the purpose of that entity assembling the Licensed Product under a permitted sublicense from the Customer with the same terms as this Agreement.

2. **Acceptance of Terms and Conditions.** Customer warrants that it has the authority to enter into this binding agreement. If Customer does not accept the terms and conditions, Customer shall not use the Purchased Product. Customer understands and agrees that if it uses the Purchased Product as permitted herein, it will be deemed to have accepted these terms and conditions and they shall become a binding agreement.

3. **Limitations on Use.** Customer agrees that it will use the Licensed Product only as expressly authorized in this Agreement, and that any use not expressly authorized in this Agreement is prohibited. Customer agrees that it will not: (i) loan, rent, lease, assign, sublicense, distribute or otherwise transfer its rights under this Agreement to a third party, other than to resell the Purchased Product to another entity for the purpose of that entity assembling the Licensed Product; (ii) copy or reproduce the Licensed Product; or (iii) grant any sublicenses other than to an end user of the Licensed Product, or to another entity for the purpose of that entity assembling the unit of a Licensed Product. Customer agrees to use reasonable efforts to prevent any unauthorized use or copying of the Licensed Product and will notify Owner immediately upon learning of any such unauthorized use or copying.

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4. **Ownership of Proprietary Rights.** Customer acknowledges that the Licensed Product is covered intellectual and/or proprietary rights, and that all such intellectual and proprietary rights are owned by Owner. Customer hereby acknowledges that it has no rights in the foregoing except as expressly granted herein.

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PRODUCT. Customer agrees that Owner shall have no liability resulting from Customer's use of the Purchased Product for any indirect damages including consequential, incidental or special damages for loss of profit, good will or otherwise. Customer shall indemnify and hold Owner harmless from any and all losses, expenses, damages, costs or expenses of any kind, including but not limited to reasonable attorneys' fees, incurred by Owner resulting from Customer's use of the Purchased Product. NO ORAL OR WRITTEN STATEMENTS MADE BY OWNER OR ITS EMPLOYEES INCLUDING BUT NOT LIMITED TO STATEMENTS REGARDING CAPACITY, SUITABILITY FOR USE, OR PERFORMANCE OF THE PURCHASED PRODUCT SHALL BE DEEMED A WARRANTY OR REPRESENTATION BY OWNER FOR ANY PURPOSE NOR GIVE RISE TO ANY LIABILITY OR OBLIGATION OF OWNER.

6. **Remedies for Violations.** Owner reserves the right to seek all remedies available at law and in equity for violations of this Agreement, including but not limited to the right to recover the Licensed Product.

7. **Fees.** In consideration for the rights granted under this Agreement, Customer has paid a license fee that was included in the amount invoiced to the Customer for the sale of the Purchased Product.

8. **Entire Agreement.** Except as expressly stated herein to the contrary, this Agreement constitutes the entire agreement between the parties regarding the subject matter hereof, and no verbal or written prior statements or representations of any sort made by any party shall be effective or valid for any purpose whatsoever. This Agreement may be amended only upon the mutual consent of all parties in writing.

9. **Severability.** If any provision of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby. The failure of any party to enforce any provision of this Agreement shall not be considered a waiver thereof, nor shall such failure prevent the future enforcement of any such provision.

10. **Governing Law.** This Agreement and the relationship between the parties shall be governed in all respects by the laws of Italy. The parties consent to the jurisdiction and venue of the Italian court of Bologna for resolution of any dispute under to this Agreement.

Use or sale of the Licensed Product or of Purchased Product shall bind Customer to all terms and conditions herein without the necessity of signatures on this Agreement.

BEFORE USING



1. During delivery of the X-NIR™ it is important:
 - Not to put mobile and/or sharpened objects inside the case (X-NIR, lamp, replacement battery, battery charger, usb key, replacement glass and gasket) preventing the device from being broken or wrongly hurt.
 - To fasten the accessories to prevent them from moving inside the case or the electronic/optoelectronic device from being broken.

If it is not the case, dinamica generale is not responsible for damages to the X-NIR™.



2. To clean the X-NIR™ correctly:
 - use a soft and slightly wet cloth;
 - DO NOT use neither alcohol nor other solvents!
 - DO NOT wet with water!

If it is not the case, dinamica generale is not responsible for damages to the X-NIR™.

INFORMATION OF BATTERY



1. The X-NIR™ device must be supplied through 1 rechargeable Li-ion battery 3Ah 15V supplied with the instrument.

In case other supply sources were used, dinamica generale is not responsible for damages to people or the X-NIR™ device.



2. The battery has a maximum duration of 2 hours with the device always in operation.



3. Remove the battery if the device is not used for a long time.



4. Remove the battery before putting the device into its case.



5. Remove the battery from battery charger when the green control lamp lights.



6. See the battery's manual for all technical specifications.

NOTES FOR THE USER



1. After switching ON the X-NIR™, dinamica generale recommends strongly to wait at least **15 minutes** before executing the analysis. That will allow the optimization of the exercise temperature of the optoelectronic device.

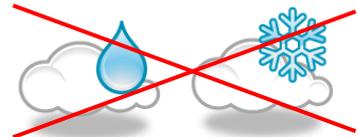


2. For a correct functioning of the optoelectronic device contained in the X-NIR™, it's better to monitor the temperature of the place where it is used. While working the ambient temperature mustn't exceed the temperature range between 0°C and +40°C.

If it is not the case, dinamica generale is not responsible for damages to the X-NIR™.



3. In case of use of the device outside, it SHOULD NOT be exposed directly to climatic agents such as rain, snow, hail ...



If it is not the case, dinamica generale is not responsible for damages to the X-NIR™.



4. Disconnect the battery from the device before servicing and/or clearing the X-NIR™.

If it is not the case, dinamica generale is not responsible for damages to people or to the X-NIR™.



5. DO NOT use USB extension cables LONGER than 1 meter to connect the USB key to the USB connector available on the side unit of X-NIR™ device.



6. dinamica generale CANNOT be considered responsible for damages to people or things because of a misuse of the device.



7. dinamica generale DOES NOT assume the responsibility for the result provided by X-NIR™ in case there were not correspondence between the material analyzed and the one declared by the system.



8. This marking on the product or on its packaging illustrates that this product may not be disposed of with normal household waste. You are responsible for disposal of this equipment in a correct way and in according to local regulations.



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2 TECHNICAL DATA & CONFIGURATION

X-NIR™ configuration		
Code	Machine	Features
999-0997	X-NIR™ Analyzer	standard machine

Accuracy

The percentage of Accuracy DOES NOT express the mathematical percentage of the error on analysis result, but it represents the maximum error in percentage points between the analysis result (just expressed in percentage points) provided by X-NIR™ and the real analysis value, that you can obtain by chemical analysis on the material in question.

The specific X-NIR™ Accuracy values for each NIR family / parameters are:

±2,0% for humidity and ±3,0% for chemical parameters

Working Temperature **0° ÷ +40°C**

Power **1 rechargeable Li-ion battery 3Ah 15V**

Display **Touchscreen 4,3", resolution 480 x 272**

Dimensions of case **50.2 x 40 x 18.8 cm**

Weight of X-NIR **1,6 Kg**

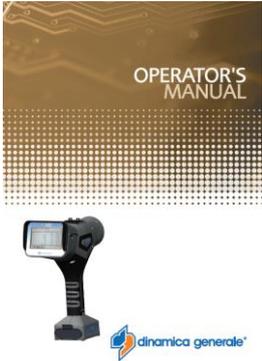
Weight of kit (case with accessories) **7,5 Kg**

Material of case **Polypropylene**

3 ACCESSORIES SUPPLIED



Accessory	Description																																								
	<p>1 BATTERY REPLACEMENT + 1 INSIDE THIS DEVICE</p> <p>Rechargeable Li-ion battery 3Ah 15V.</p>																																								
<p>Status LED Display:</p> <p>The battery can display the capacity information by using the push key.</p> <p>Each LED segment represents 25 percent of the full charge capacity. The LED pattern definition is given in the table below. The LED's illuminate for 4 seconds following switch activation. If the battery voltage is too low or the battery is inoperable (permanent fault), there will be no LED indication.</p> <table border="1" data-bbox="161 1832 1390 2101"> <thead> <tr> <th rowspan="2">Capacity</th> <th colspan="4">LED Indicators #</th> <th rowspan="2">Note</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>< 10%</td> <td></td> <td></td> <td></td> <td></td> <td>Blinks</td> </tr> <tr> <td>10% - 25%</td> <td></td> <td></td> <td></td> <td></td> <td>Lit for 4 seconds</td> </tr> <tr> <td>26% - 50%</td> <td></td> <td></td> <td></td> <td></td> <td>Lit for 4 seconds</td> </tr> <tr> <td>51% - 75%</td> <td></td> <td></td> <td></td> <td></td> <td>Lit for 4 seconds</td> </tr> <tr> <td>76% - 100%</td> <td></td> <td></td> <td></td> <td></td> <td>Lit for 4 seconds</td> </tr> </tbody> </table>		Capacity	LED Indicators #				Note	1	2	3	4	< 10%					Blinks	10% - 25%					Lit for 4 seconds	26% - 50%					Lit for 4 seconds	51% - 75%					Lit for 4 seconds	76% - 100%					Lit for 4 seconds
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	<p>BATTERY CHARGER</p>
	<p>USB MEMORY PEN-DRIVE</p>
	<p>Lamp</p>
	<p>Replacement glass + gasket</p>
	<p>CHECK CELL Suitable acetal resin control cell for optical testing of the machine.</p>
	<p>X-NIR™ User Manual</p>

4 Description of the portable Analyzer X-NIR™

In the following pictures it is explained how the **system X-NIR™** is composed:



The conceptual model that defines the functioning of the portable analysis system X-NIR™ is explained in the following scheme :



5 Use of the Portable X-NIR™ Analysis System

5.1 NIR Parameters and NIR Families

The portable analyzer X-NIR™ can analyze till to a max of 7 chemical parameters for a max of 7 feed ingredients.

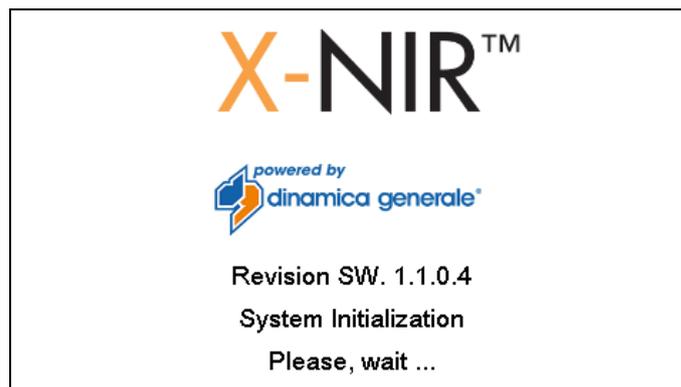
In all NIR analysis systems produced by dinamica generale and therefore also for X-NIR™ it is defined:

NIR Parameters all chemical parameters analyzable by an optical NIR analysis system

NIR Families the categories or families of feed components analyzable by an optical NIR analysis system

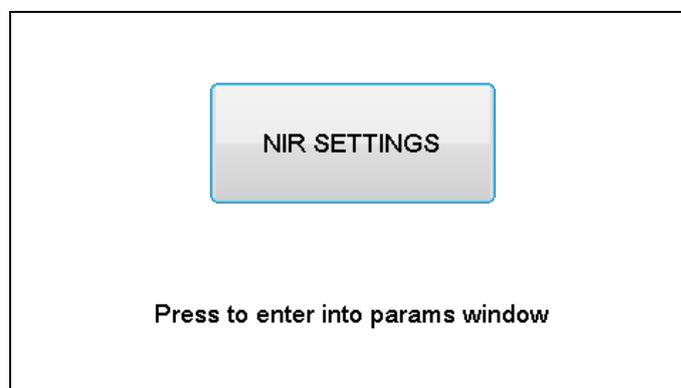
5.2 Turning on the X-NIR™ system

To switch on the X-NIR™ analyzer, press the  button for 2 seconds; the initialization screen will appear showing the X-NIR™ logo and the current software revision installed on the system:



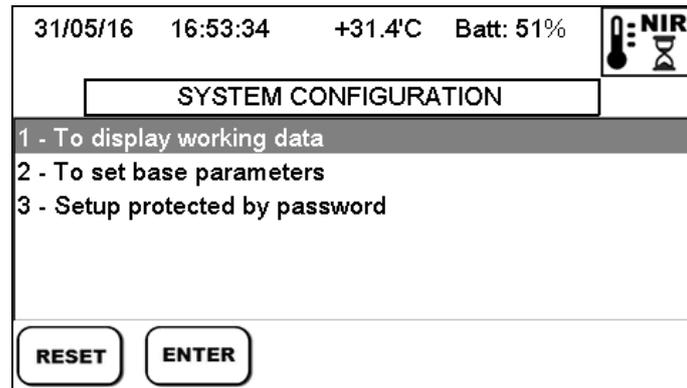
In this phase there is the initialization of X-NIR™. During this initialization the device loads all the settings requested from the customer and previously set.

After that, "SETTING PARAMETERS" key appears:

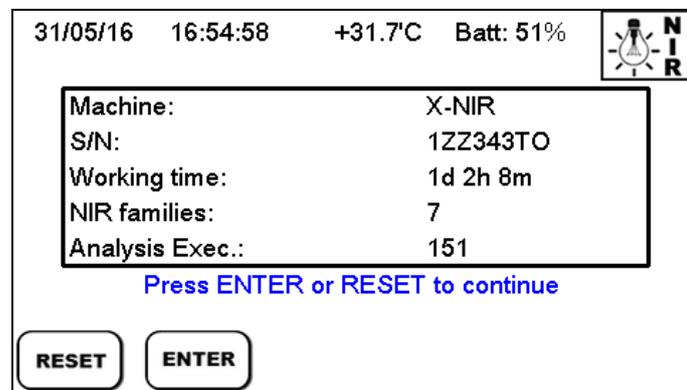


- If you don't press this key, the system goes directly to the main page (see paragraph "Main page of X-NIR").

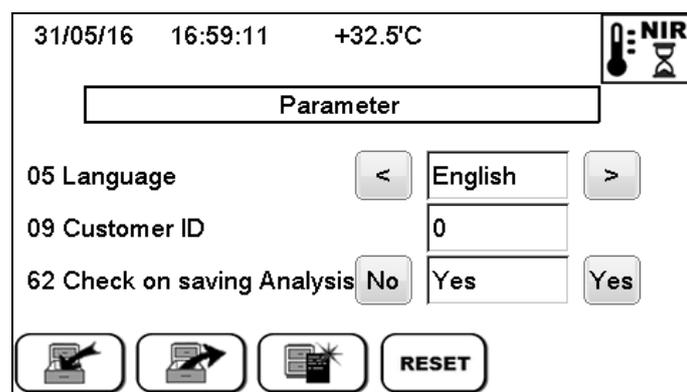
- If you press this key, you can enter into the system configuration menu.



- 1- Click on the first line and press ENTER to display the device job information:



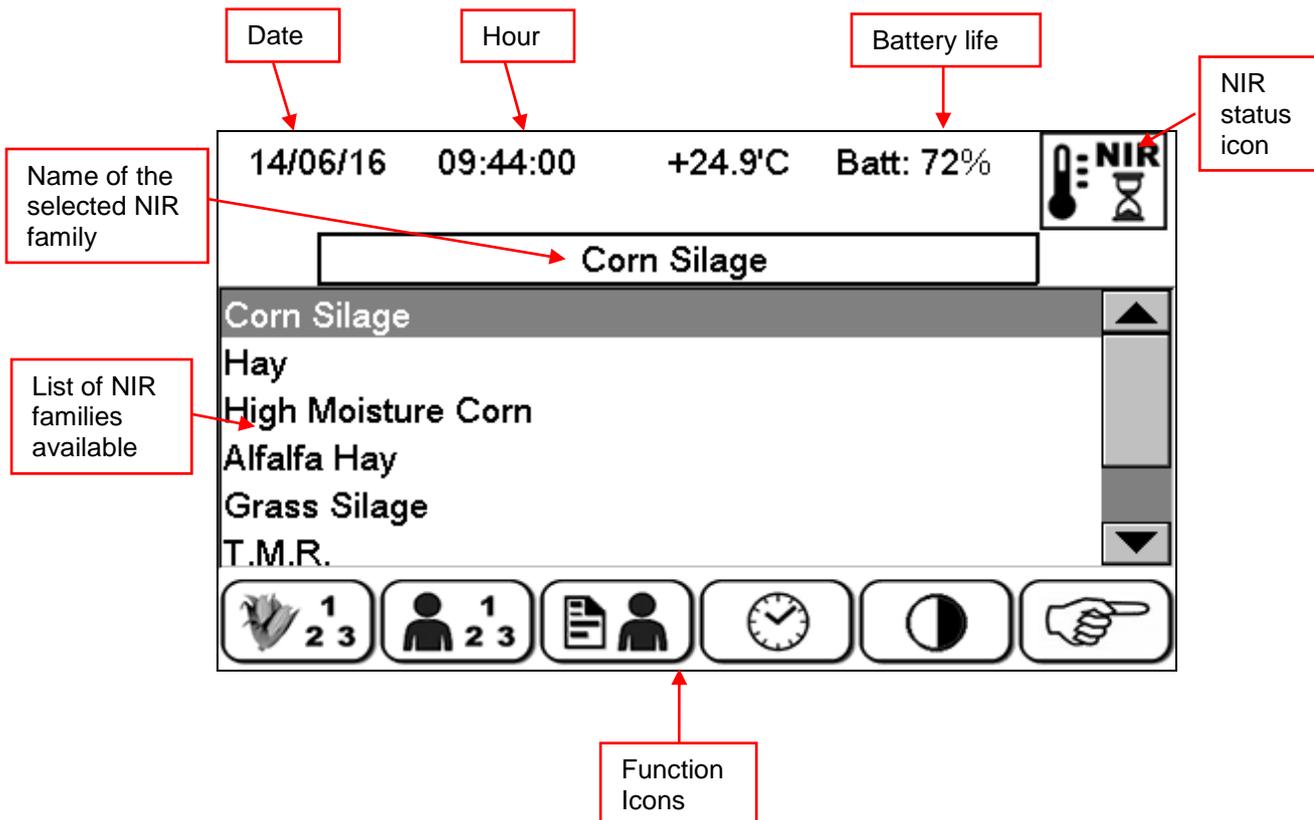
- 2- Click on the second line and press ENTER to set the basic parameters:



- press the  key in order to save all data and exit
- If you press the  key you can recall the **Information previously stored on internal memory**.
- If you press the  key you can recall the **Information defaults** provided on the X-NIR™ analyzer by dinamica generale

- 3- The third line allows access to the password-protected settings (contact the Support Service dinamica generale for more details).
- 4- Press RESET in order to switch to the main page.

5.3 Main page of X- NIR™



It is possible to visualize a maximum of 6 function icons at the bottom of display. The other icons are visualized on the next page by pressing .

5.4 States & Messaging of NIR analyzer internal system

After turning on the X-NIR™, before going on with the execution of the analysis it is better to wait always at least **15 minute** before starting to allow :

- the necessary warming up of the internal lamp;
- one first calibration of the internal optical of the NIR analysis system.

To assist the user the X-NIR™ system always displays at the top right of its screen an icon which shows the current status of the X-NIR™ NIR analysis system:

X-NIR™	Description of the icon
	WARM-UP the NIR system is executing the initial warm-up phase of the internal lamp.
	OPTICAL CALIBRATION the NIR system is executing the calibration phase of the internal optical.
	READY the X-NIR™ system is ready for the analysis execution.
	RUNNING ANALYSIS the X-NIR™ system is executing the analysis.
	CONNECTION MISSING or ERROR STATUS the NIR group is not connected to the electronic unit or there is an issue the internal NIR system.
	ERROR OF NIR CALIBRATION The system cannot perform the calibration.

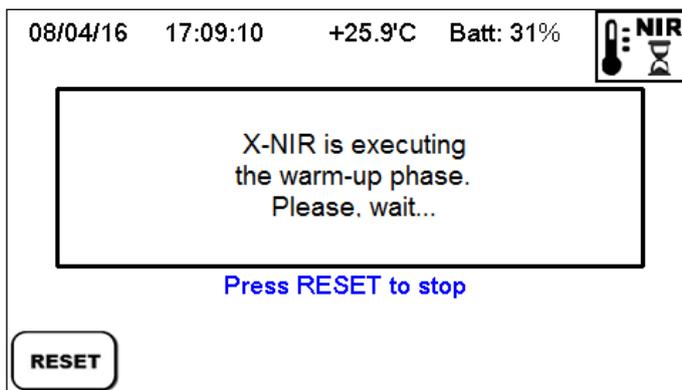
After turning ON the machine **BEFORE STARTING** with the analysis executions, the X-NIR™ system executes automatically :

1. the **WARM-UP phase** of the NIR group with status icon  , to allow the necessary warming of the lamp inside the NIR Reader;
2. the **FIRST CALIBRATION phase** of the NIR group with status icon  , to allow the first calibration of the internal optical of the NIR analysis system;
3. after these first two phases the X-NIR™ analyzer is **READY**, with status icon  .



Although the **WARM-UP** takes less time and the **CALIBRATION** phase is already done, it's **STRONGLY RECOMMENDED** to wait always at least **15 minutes** before starting use the X-NIR™ machine in order to allow the internal lamp to warm up.

If you attempt to start the analysis execution during the **WARM-UP phase**, the X-NIR™ system shows the following wait message:



← The status icon of the NIR system indicates the **WARM-UP** phase.

At the end of the calibration this message disappears and the X-NIR™ automatically begins the CALIBRATION phase and the following is displayed:

If you attempt to start the analysis execution during the **FIRST CALIBRATION phase**, the X-NIR™ system shows the following message :



← The status icon of the NIR system indicates the **CALIBRATION** phase.

At the end of the calibration this message disappears and the X-NIR™ automatically beginning the ANALYSIS EXECUTION of the selected component, without pressing start.

5.5 Initial optical control of the X-NIR™ system



Every day, **BEFORE** starting to use the X-NIR™ dinamica generale analyzer, it is advisable to perform the **OPTICAL TEST** via the **CHECK CELL** supplied as an accessory.



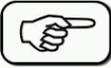
CHECK CELL ← particular sample in acetal resin for the X-NIR™ tests.

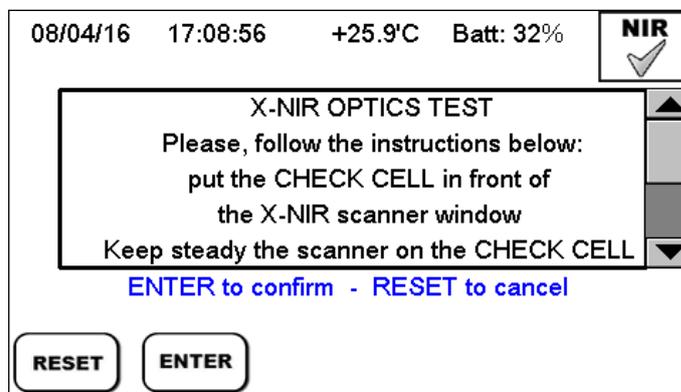
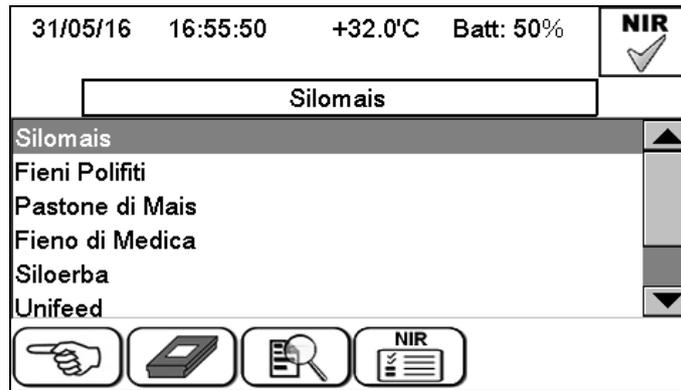
The correct position to perform an **OPTICAL TEST** requires the device to be perfectly supported on the check cell and perpendicular to the work surface:



Follow the steps below to perform an **OPTICAL TEST**.

1. Position the **CHECK CELL** on the work surface with the white part pointing upwards, and place the optical face of the X-NIR™ device as shown in the figure.

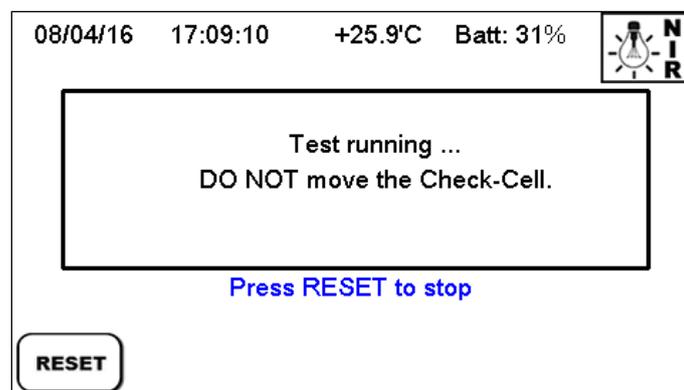
2. On the home screen, press  to change the page and then press  to enter the X-NIR™ **OPTICAL TEST** procedure:



The X-NIR™ analyser shows the instructions to correctly perform the **OPTICAL TEST**.

- Press ENTER to start the optical test or RESET to exit without performing the test.

3. Pressing ENTER starts the automatic test procedure:

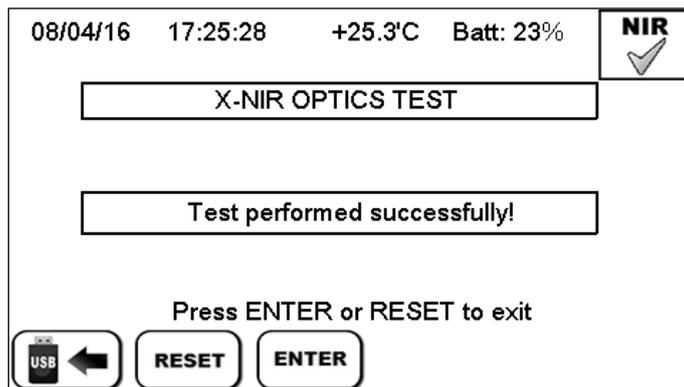


ATTENTION!

DO NOT move the device and the CCHECK CELL during test execution as otherwise the reading may be valid.

Press RESET to immediately stop the operation.

4. After the procedure, the X-NIR™ analyser shows the result of the optical test:

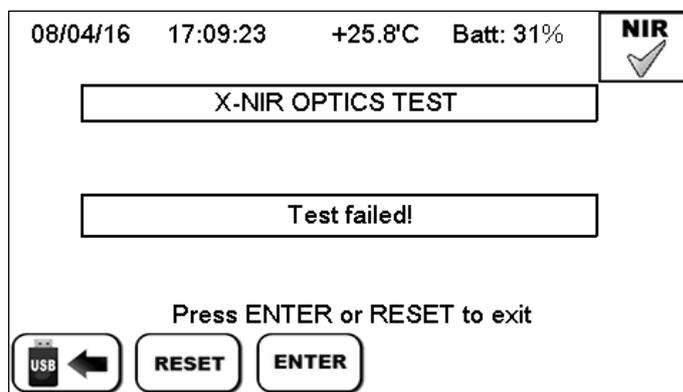


The internal optical unit of X-NIR™ is OK!

It is now possible to proceed with execution of the analysis.

- Press ENTER or RESET to exit and continue.

5. If the optical test procedure is unsuccessful, the X-NIR™ analyser displays the following message:



ATTENTION!

Problems with the internal optical unit.

Refer to the following troubleshooting procedure.

Press ENTER or RESET to exit and continue.

In any case it is possible to save the optical spectra on the USB key by pressing the function

key , then send the data to the Support Service dinamica generale for further inspection.

TROUBLESHOOTING



1. Check the correct positioning of the X-NIR™ device on the CHECK CELL. See the figure on page 17.



2. Make sure the glass of the CHECK CELL or of the reading glass of the X-NIR™ is clean.



3. Make sure the glass of the CHECK CELL or of the reading glass of the X-NIR™ is not broken otherwise contact the Support Service dinamica generale for spare parts.



4. Check whether the light inside the X-NIR™ is in the correct position or whether its duration (1 year) will shortly be expiring; in the second case, contact the Support Service dinamica generale for spare parts.



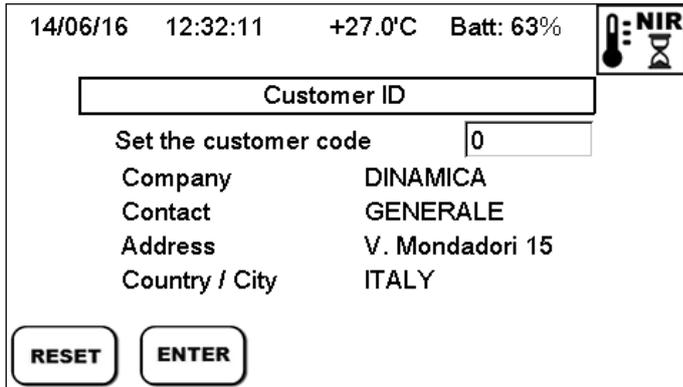
5. Check whether the optical fibre terminal (visible inside the optical part through the glass on the bottom) is correctly inserted into its seat. If it is out of position, contact the Support Service dinamica generale for spare parts.



6. If it is not none of the above cases save the optical spectra on the USB key and contact the Support Service dinamica generale for spare parts.

5.6 Customer data management

If you press the  key it's possible to set :



14/06/16 12:32:11 +27.0°C Batt: 63% 

Customer ID

Set the customer code

Company DINAMICA
Contact GENERALE
Address V. Mondadori 15
Country / City ITALY

← **CUSTOMER ID**, allows you to assign a code number to the customer who the analysis sample belongs.

Click on the field to edit and change the Customer ID.

Press ENTER in order to exit and save the ID.

Press RESET in order to exit without saving.

If you press the  tasto it's possible to set :



14/06/16 12:32:29 +27.2°C Batt: 63% 

Client Information

Company
Contact
Address
Country / City

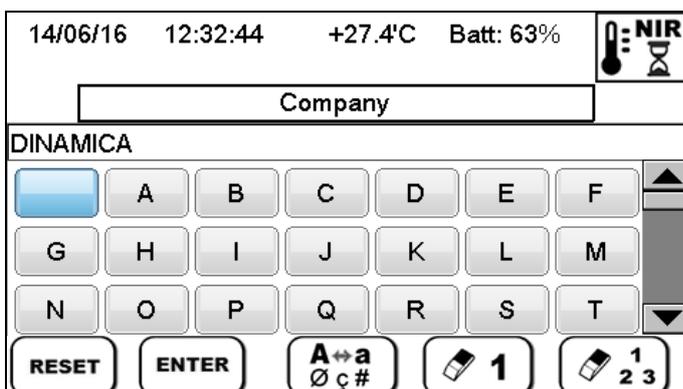
← **CLIENT INFORMATION**, allows you to enter more details about the customer who the physical sample belongs.



All the **CLIENT INFORMATION** will be stored in the **INFO.DAT file** containing the Client's data, when analysis is saved on USB key.

To modify the data in the **CLIENT INFORMATION** window :

- Click on the field to edit;
- Write the name using the keyboard that appears:



14/06/16 12:32:44 +27.4°C Batt: 63% 

Company

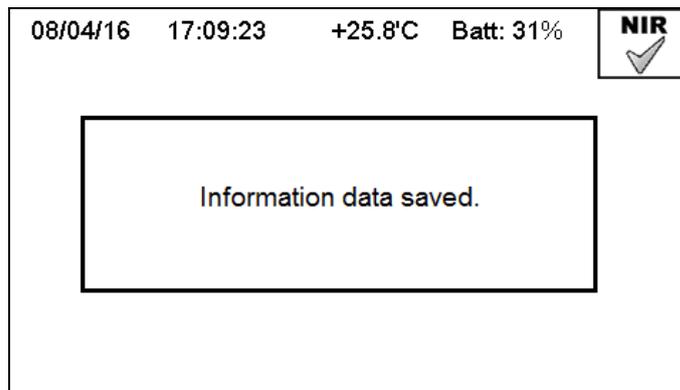
DINAMICA

- press  in order to select capital letters / small letters, numbers, symbols;
- press  in order to delete a letter;
- press  in order to delete the word;
- press ENTER in order to confirm and exit or RESET for cancel.

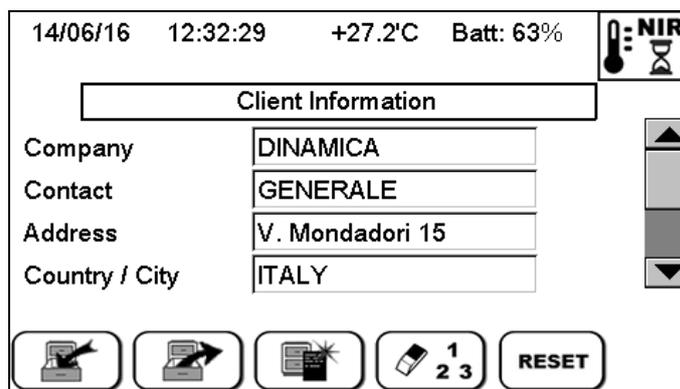
From the **CLIENT INFORMATION** page,

- press the  key in order to save all data and exit



If you press the  key you can recall the **Client Information previously stored on internal memory**.

If you press the  key you can recall the **Client Information defaults** provided on the X-NIR™ analyzer by dinamica generale:



- Press the  key in order to delete all the data of customer;
- Press RESET in order to cancel and return to the main page.

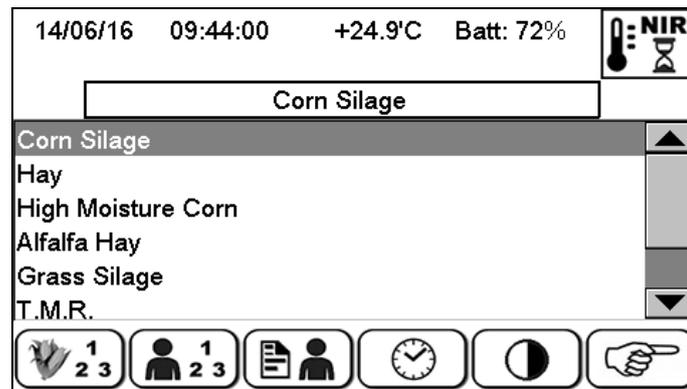
5.7 Analysis Execution with X-NIR™ System

After turned ON the X-NIR™ system and waiting for the following phases:

- WARM-UP (at least 15 minutes) and CALIBRATION ← please see icons in the paragraph “States and Messaging of NIR analyzer internal system” for more details;
- Setting of the customer information (CUSTOMER CODE  and CUSTOMER INFORMATIONS );

it's possible to prepare the sample and starts to execute the analysis.

Select the family of sample to analyze from the list on the main page:



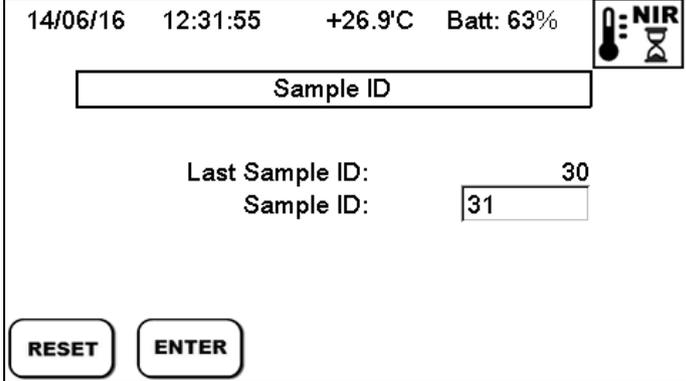
Please be sure to select the correct Component / NIR family before starting the analysis on the forage sample because it represents the feed components category which the sample to analyze belong.

The correct position for performing an analysis assumes that the device is perpendicular to the area to be treated and is resting perfectly on the material to be analyzed, that is, that the reading window is in contact with the element avoiding the formation of any empty spaces which could alter the reading :



At this point, the analysis can start in 2 ways:

- 1- Clicking on the  key visualized on the display.
 - Set the sample ID, press ENTER in order to confirm or RESET to cancel



14/06/16 12:31:55 +26.9°C Batt: 63%

Sample ID

Last Sample ID: 30

Sample ID: 31

RESET ENTER



SAMPLE ID

is the current sample identification number : this ID number will be automatically proposed before starting the analysis on the sample.



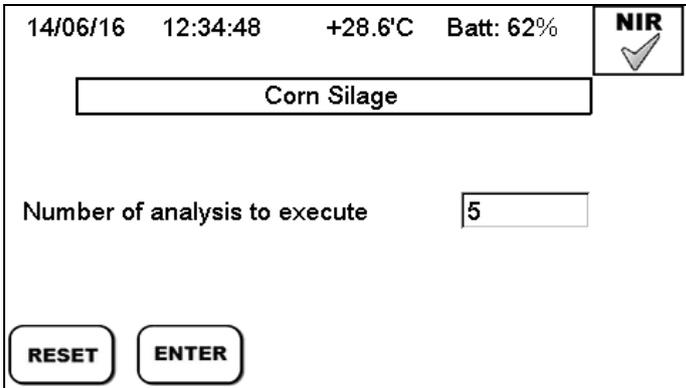
LAST SAMPLE ID

is the previous sample identification number used in the last analysis.



After every analysis the **SAMPLE ID number** is automatically increased by 1.

- Write the number of analysis that you want execute: this allows you to define the number of analysis points on the sample. Press ENTER in order to confirm or RESET to cancel.



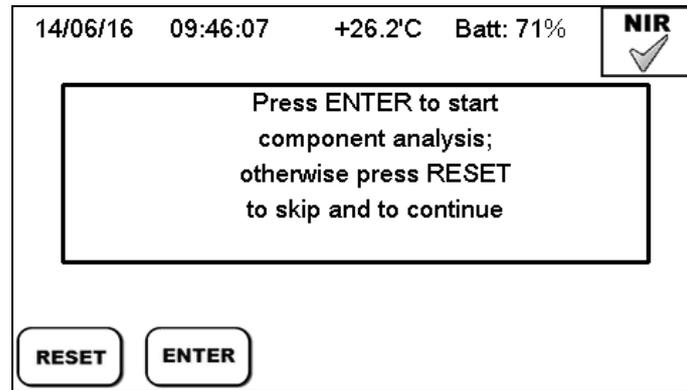
14/06/16 12:34:48 +28.6°C Batt: 62%

Corn Silage

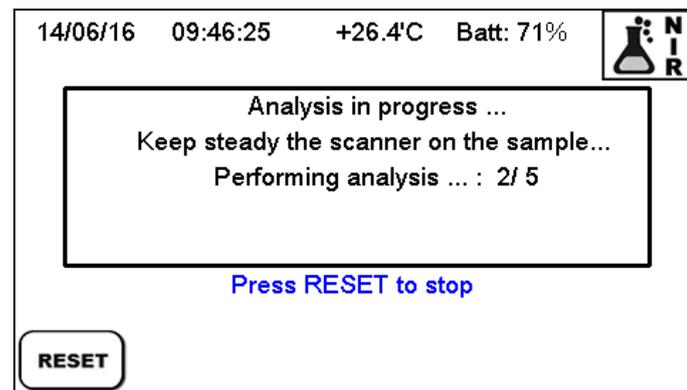
Number of analysis to execute 5

RESET ENTER

- It is request the confirmation in order to start the analysis, press ENTER in order to confirm or RESET to cancel. Before proceeding with the analysis, correctly position the X-NIR™ analyzer on the sample.

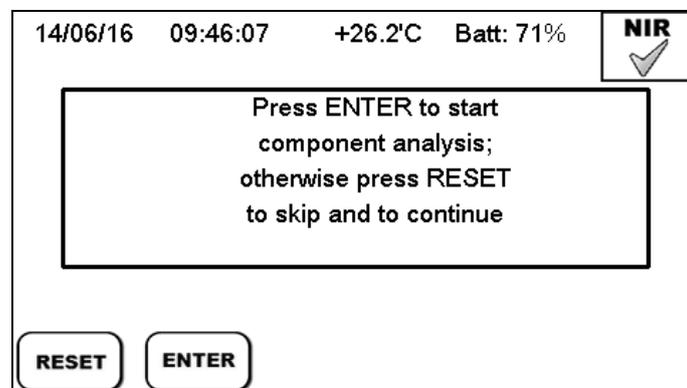


- After that, the analysis phase starts. It's shown the number of execution in progress. For example: execution N° 2 of the 5 total analysis. Keep steady the device on the sample



- Before starting every single analysis of the total N° scheduled, the X-NIR™ system asks always a confirmation from the operator before to proceed with the next analysis.

In this phase it is possible to move the X-NIR™ analyzer to a different point on the sample.



At the end of the analysis executions the X-NIR™ system shows the results :

The screenshot shows the following data on the display:

15/06/16 14:46:22 +31.6°C Batt: 44% NIR ✓

Corn Silage	%Asls	%DM
Moisture:	68.1 %	31.9 %
Starch:	6.4 %	20.2 %
Protein:	2.6 %	8.2 %
ADF:	8.9 %	28.1 %
NDF:	16.6 %	52.0 %
Ash:	1.4 %	4.4 %
Crude Fat:	0.6 %	1.9 %

Buttons: RESET, USB

Annotations:

- MOISTURE (Humidity) value of the sample**: Points to the 68.1 % value in the %Asls column.
- DRY MATTER value of the sample : calculated as 100% - Moisture.**: Points to the 31.9 % value in the %DM column.
- Chemical Parameters on DM**: the chemical values expressed on the dry matter : calculated as $\text{Param}_{\text{Asls}} /$. Points to the values in the %DM column.
- Chemical Parameters on Asls**: values of the sample. Points to the values in the %Asls column.

On display it is shown a table that reports the prediction values of NIR chemical parameters obtained from the analysis performed on the sample.

The values of the chemical parameters are always expressed in % and in 2 columns :

- in the left column are the **prediction values expressed on Asls**, that is to say the total % present in the sample just analyzed;
- in the right column are the **prediction values expressed on the DRY MATTER**, on the sample part without water.

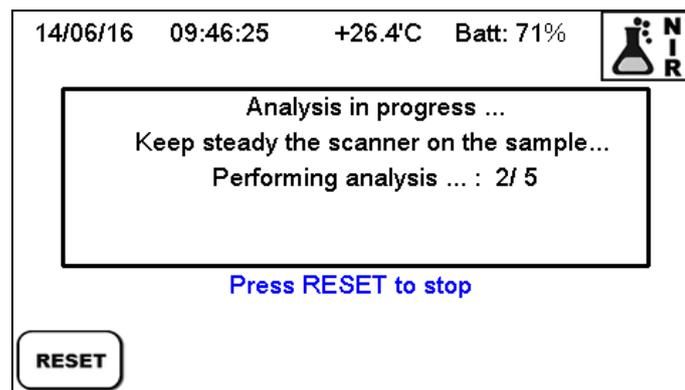
In case a NIR chemical parameter following results :

- n.a. Parameter NOT AVAILABLE**
This chemical parameter hasn't been defined for the NIR family chosen in analysis.
- Err. Parameter with WRONG RESULT**
The X-NIR™ analyzer cannot predict this chemical parameter.
Please check the sample, the NIR family chosen or the NIR calibration.
- Out. Parameter OUT OF RANGE**
This chemical parameter prediction value is out of the acceptability range.

- 2- Pressing the orange key in the front of device.

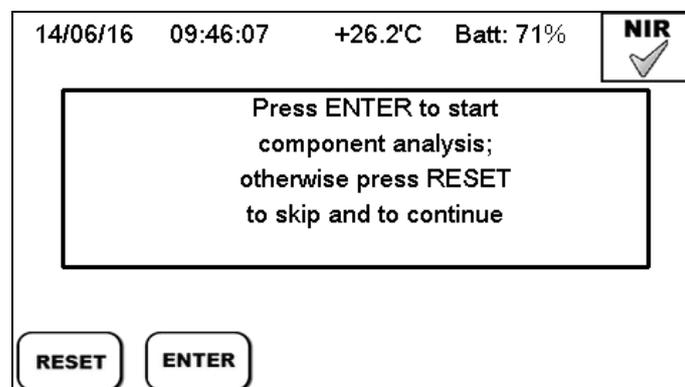


- After that, the analysis phase starts immediately and it's shown the number of execution in progress. For example: execution N° 2 of the 5 total analysis. During the execution of the analysis, keep the analyzer motionless on the sample.



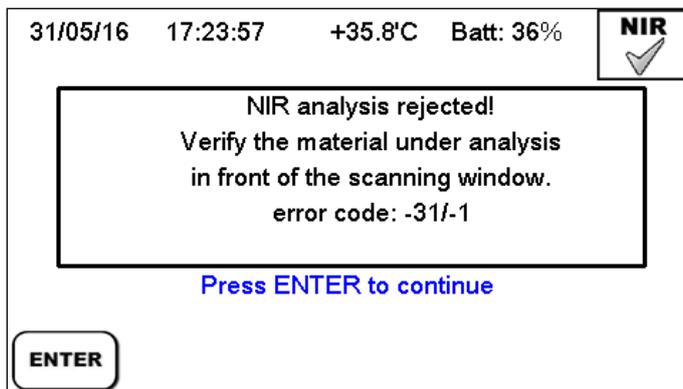
- Before starting each single analysis of the total N° scheduled, the X-NIR™ system asks always a confirmation from the operator before to proceed with the next analysis.

In this phase it is possible to move the X-NIR™ analyzer to a different point on the sample.



In this mode of analysis, the parameter "number of analyses to be performed" retains the value set previously, while the sample ID will be automatically incremented by 1.

5.7.1 Analysis rejected



In case of analysis that are NOT correct, the X-NIR™ system shows the following error message, identified by a specific code:

Press ENTER in order to execute the analysis on the same component just selected.

TROUBLESHOOTING



1. Check if you have chosen the correct NIR family / component before start the analysis on the sample.



2. Check that the reading glass is clean.



3. Check that the reading procedure is correct.



4. Verify that the reading glass is not broken, in this case contact the dinamica generale Customer Service for the spare parts, writing an e-mail to nir.support@dinamicagenerale.com



5. Check that the lamp is in the correct position or its time life is expiring (1 year); in second case, please substitute it with the lamp supplied.



6. Verify if the optic fiber terminal is properly inserted on its brass fitting, otherwise if it's moved please contact the dinamica generale Customer Service, writing an e-mail to nir.support@dinamicagenerale.com

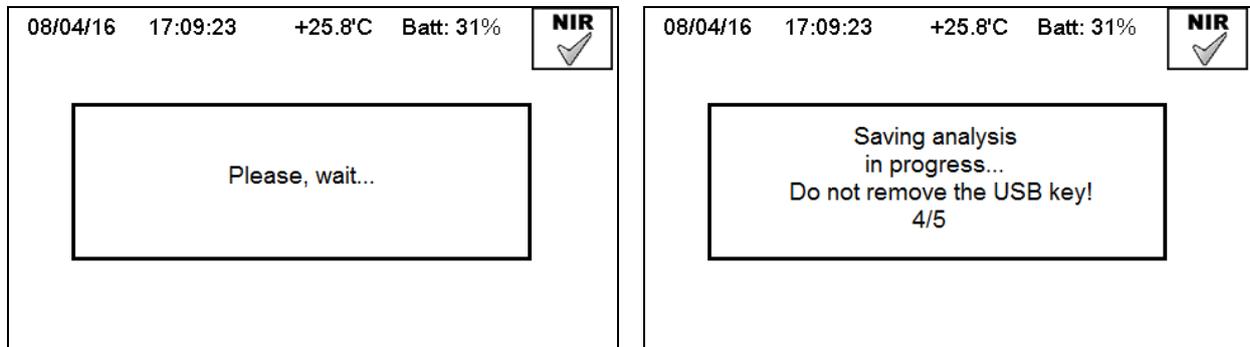


7. If it's none of the previous cases, please contact the dinamica generale Customer Service, writing an e-mail to nir.support@dinamicagenerale.com

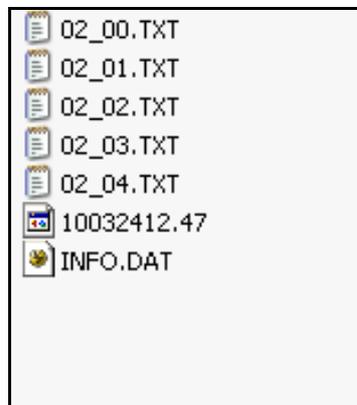
5.7.2 Analysis saving on USB pen drive

At the end of analysis execution, you can store the results on the USB key :

Press the  key to SAVE THE DATA ON USB PEN DRIVE (on USB key).



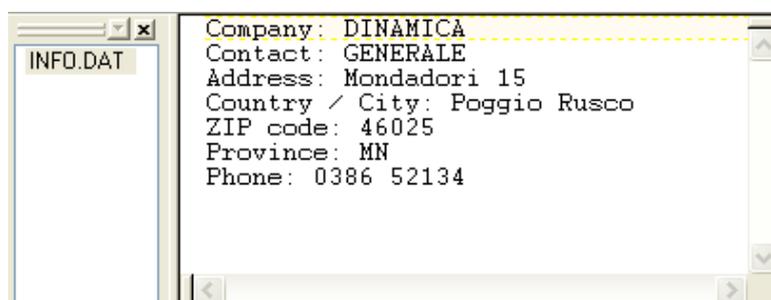
On USB key a file folder is created with naming convention **< Date Time >**, which contains :



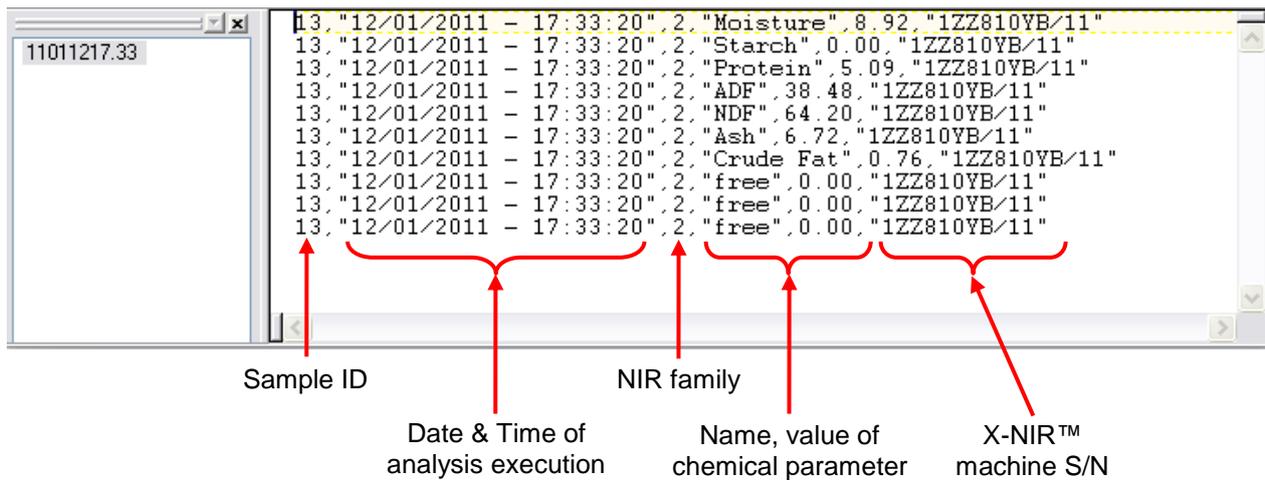
- one file `.txt` with naming convention **< ID NIR Family _ progressive number >** for each single analysis just executed;

NOTE. The `.txt` files are used for saving the optical spectra of the samples, and then later for the creation of new calibration curves.

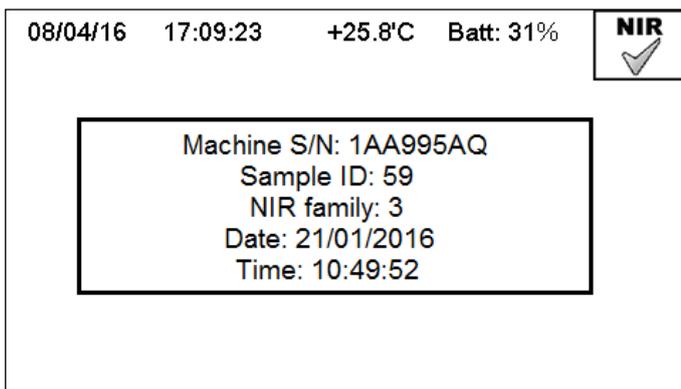
- the file **INFO.DAT** containing the Client's Data set on X-NIR™ by Client Information windows:



- the file with naming convention < **DATE&TIME** > containing the analysis results (show on display at the end of analysis execution) :



At the end of data saving on USB key, the following message appears :



- Machine S/N** → serial number of X-NIR™ device used to make the analysis
- Sample ID** → identifier number of the particular physical sample just analyzed
- NIR family** → identifier of the NIR family of the analyzed component
- Date** → date of the analysis execution
- Time** → hour of the analysis execution

During the data store on USB Key, if the following error messages appear :

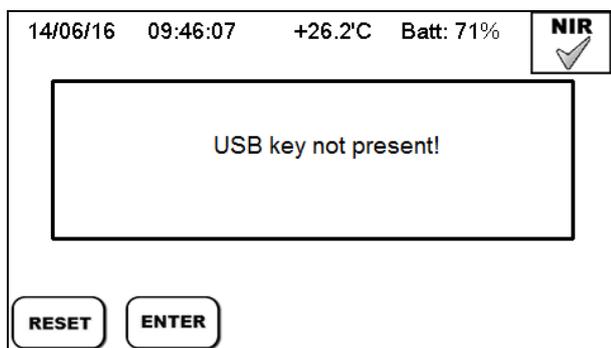


Fig. 1

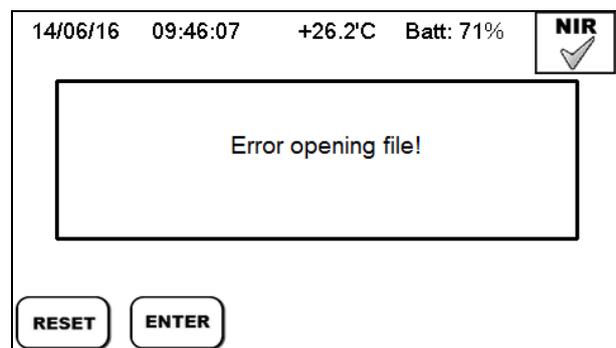


Fig. 2

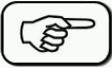
Error message in Fig. 1 → the USB Key (Pen Drive) is not connected to the proper USB port on X-NIR™;

Error message in Fig. 2 → the USB Key (Pen Drive) has been disconnected from USB port or It's necessary to erase a part of data stored on USB Key.

5.8 Analysis History

The X-NIR™ automatically saves the last 50 analyses performed in its internal memory. Through historic analysis it is possible to:

- See video of the results of every single analysis;
- Save single or multiple archived analyses to USB key.

To access the historic analysis, press  on the main display, to move to the next page press .

At this point, the follow screen will appear with the list of analysis executed:

15/06/16	14:46:07	+31.5°C	Batt: 44%	NIR ✓
ANALYSIS HISTORY				
#	Date and Time	ID	NIR family	
01)	15/06/2016 - 14:45 - 15 -	1 -	Corn Silage	▲
02)	15/06/2016 - 14:44 - 14 -	1 -	Corn Silage	
03)	15/06/2016 - 14:43 - 13 -	1 -	Corn Silage	
04)	15/06/2016 - 14:42 - 12 -	1 -	Corn Silage	
05)	15/06/2016 - 14:40 - 11 -	1 -	Corn Silage	▼
RESET ENTER USB ← 1 2 3 USB ← 1 2 X USB ← 1 2 3				

1. To view the predictions relating to this analysis in the history, select the corresponding row and press ENTER:

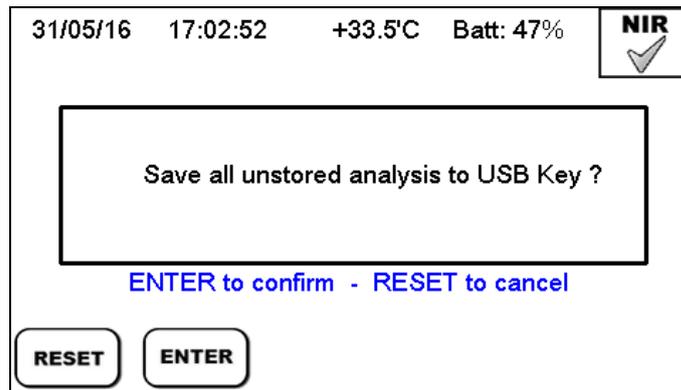
15/06/16	14:42:09	+29.9°C	Batt: 46%	NIR ✓
Corn Silage				
	%Asls	%DM		
Moisture:	66.2 %	33.8 %		
Starch:	7.8 %	23.1 %		
Protein:	2.7 %	8.0 %		
ADF:	9.0 %	26.7 %		
NDF:	17.3 %	51.1 %		
Ash:	1.3 %	3.9 %		
Crude Fat:	0.6 %	1.8 %		
RESET USB ←				

Press  to save the individual analysis to USB key.

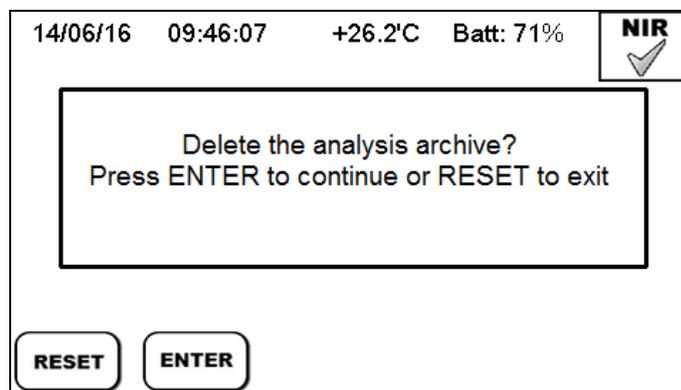
2. Press the  key in order to copy the data of analysis on the usb key.

14/06/16	09:53:08	+30.2°C	Batt: 68%	NIR ✓
Saving analysis in progress ... Do not remove the USB key ! 4 / 5				

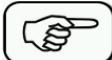
3. Press the  key in order to save the data of the analysis present on the USB key.



4. Press the  key in order to delete the archive relative to the analysis.

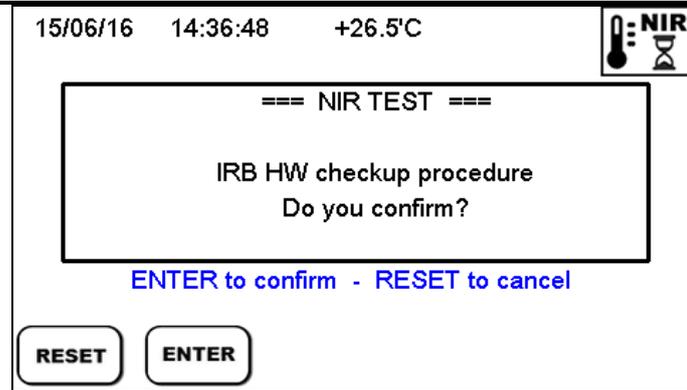


5.9 NIR System Hardware Verification

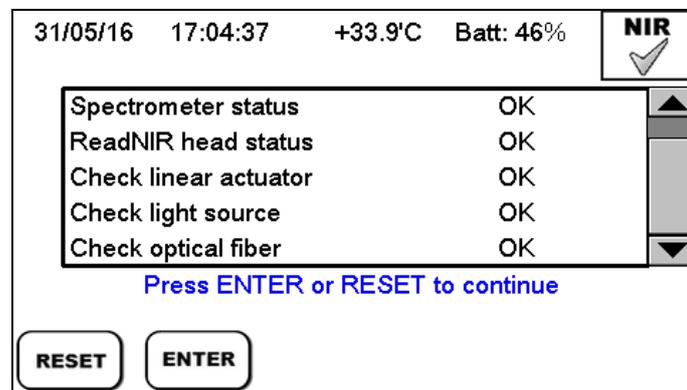
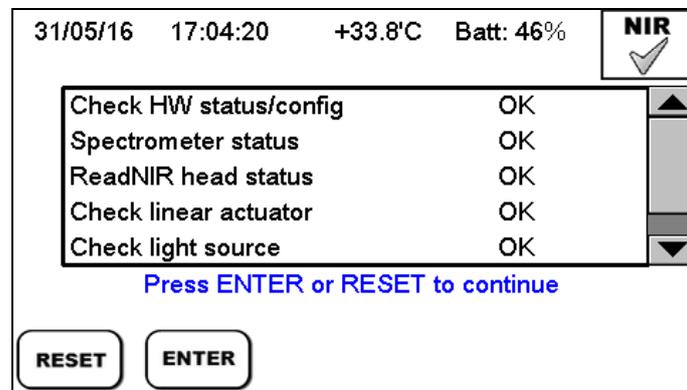
1. Switch on the X-NIR™ device. On the home screen press  to change the page then press  to perform the device hardware control.



2. The message "HW verification procedure. Confirm?" appears.



3. Press the ENTER key to confirm and wait for execution of the system HW verification for 10-15 seconds.
4. Press the ENTER key again in order to display the final report.



5. The table below shows the errors that may be displayed in the report.

HW/configuration status verification

Error Code	Error type	Description
Err.1	IRB system initialisation error	error during starting of the IRB card
Err. 2	Memory error IRB 1	memory error #1 of the IRB card
Err. 4	Memory error IRB 2	memory error #2 of the IRB card
Err. 8	Clock error IRB #1	error on the clock chip of the IRB card
Err. 16	Clock error IRB #2	Error on the date and time setting on the clock chip of the IRB card
Err. 32	Internal IRB error	microprocessor error on the IRB card

Spectrometer Status

Error Code	Error type	Description
Err.1	initialisation error of the spectrometer system	error starting the spectrometer
Err. 2	memory errors spectrometer	memory error of the spectrometer card
Err. 4	communication error s spectrometer #1	error on the communication with the spectrometer when it is analysing
Err. 8	communication error s spectrometer #2	error on the communication with the spectrometer during the IRM test

NIR Reader head status

Error Code	Error type	Description
Err.1	error system initialisation NIR Reader	error during starting of the IRB Reader
Err. 2	NIR Reader configuration error	error on the memory configuration of the NIR Reader
Err. 4	NIR Reader communication error	error on the communication with the NIR Reader card

Linear actuator verification

Error Code	Error type	Description
Err.1	Home position error	error on the end-switch sensor on the HOME position
Err. 2	error 5th position window	error on the end-switch sensor on the 5 th position window

Light source verification

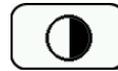
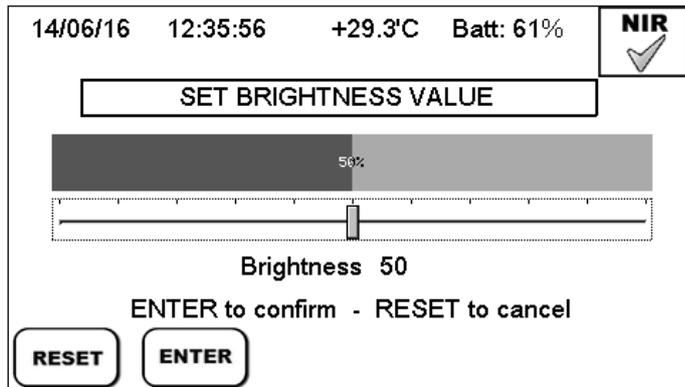
Error Code	Error type	Description
Err.1	bulb brightness error	error on the bulb brightness

Optical fibre verification

Error Code	Error type	Description
Err.1	fibre cable error	error on the light through the fibre cable

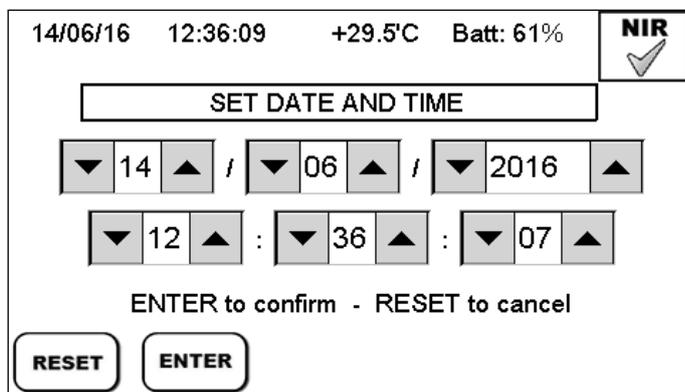
5.10 Other Settings of X-NIR™ System

In the main two screens, the X-NIR™ system allows other simple setting commands:



CONTRAST ADJUSTMENT

This command allows to adjust the display contrast.



DATE & TIME SETTING

This command allows to set the current date and time of the X-NIR™ system.

NOTE. This is important for a correct data chronology.

- From the main page, press the   keys to go to the NEXT and PREVIOUS screen.

5.11 Software Updating and/or Calibration of the X-NIR™ System



Before the software updating it is suggested to save the data of the analysis saved in the history on a USB pen drive because at the first start-up after the software updating the history is automatically reset/initialized

After having copied to an empty USB key the files required for the update, obtained from NIR EVOLUTION or directly from dinamica generale, follow the instructions:

1. Turn off the device
2. Connect the USB key to the X-NIR™ analyzer.

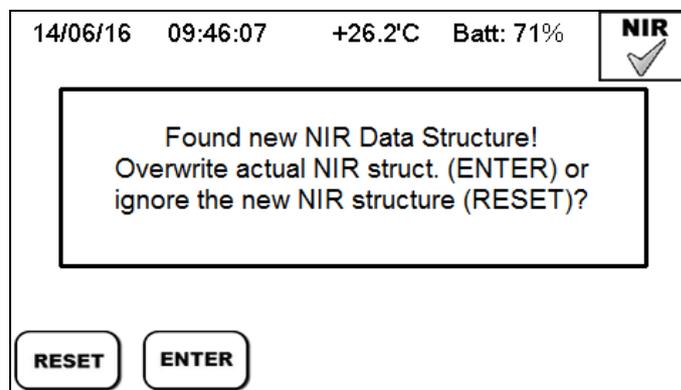


3. Simultaneously press the on/off button and the analysis button . The device will start in bootloader mode and perform the updates. Once it has finished loading, the X-NIR™ analyzer will switch off automatically and will be ready for normal use.

5.12 Loading the new nir data structure (file nirdata.bin)

After having copied to an empty USB key the files required for the update, obtained from NIR EVOLUTION or directly from dinamica generale, follow the instructions:

1. Turn off the device
2. Connect the USB key to the X-NIR™ system.
3. Turn on the X-NIR™ system normally and press ENTER to accept the new NIR data structure, otherwise press RESET:

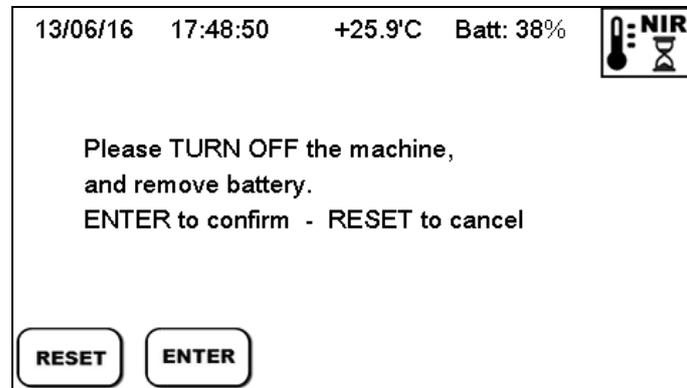


4. DO NOT remove the USB key while the file is being loaded!



5.13 Shutdown of the X-NIR™ system

To switch off the X-NIR analyzer, press  for 2 seconds; the following screen will appear:



Press the ENTER key to switch off the device, or the RESET key to cancel shutdown and return to the previous screen.

6 ***CLEANING THE DEVICE***

It is important to clean thoroughly and periodically the reading glass using a soft, damp and scratchproof.



7 DEVICE SERVICING

7.1 Replacement of the reading glass

If the reading glass is damaged, it is possible to replace it through the following steps:



Turning the reading glass counterclockwise



Unscrew the four screws of the reading glass



Replace glass and gasket with provided parts then screw the four screws of the reading glass clockwise



Assemble the reading glass again

7.2 Replacement of lamp



REMOVE the battery before starting the replacement procedure

If the lamp is damaged or its time life is expiring (we suggest to replace it once a year), it is possible replace it through the following steps:



Unscrew the two screws of the lamp cover on top of X-NIR™



CAREFULLY pull out the lamp by lifting the two hooks on top



Unscrew the seal support of the lamp



CAREFULLY disconnect the cable from the lamp.



Connect the new light bulb provided and secure it to the support seal.

Insert and screw the light bulb into its compartment.

8 TROUBLESHOOTING

8.1 Error messages on the device

Error code	Description	Warning/msg (a generic message should be shown together with the related error code, as specified in the first column)
1	During the start-up an error on the Head initialization is detected.	“Error code: 1” “Please restart X-NIR!”
2	During the start-up an error on the Sensor initialization is detected.	“Error code: 2” “Please restart X-NIR”
3	During the start-up an error with copying from N25Q to RAM can take place (never noticed indeed but can be).	“Error code: 3” “Please restart X-NIR”
4	During the work (analysis or check cell or after warm-up phase) a calibration error is detected.	A corresponding icon is shown  “Error code: 4” “Please do the Check Hardware” “Press ENTER to continue”
5	During the work (no matter in what moment – during analysis or simply if a user, for example, selects an item in Family List or edits his company info) disconnection of Sensor is detected.	A corresponding icon is shown  “Error code: 5” “Please do the Check Hardware” “Press ENTER to continue”
6	During the work (no matter in what moment – during analysis or simply if a user, for example, selects an item in Family List or edits his company info) disconnection of Head is detected.	A corresponding icon is shown  “Error code: 6” “Please do the Check Hardware” “Press ENTER to continue”
7	Error with touch screen initialization .	“Error code: 7” “Please restart X-NIR”
8	Error with RTC initialization.	“Error code: 8” “Please restart X-NIR”
9	Error with AT45 flash initialization.	“Error code: 9” “Please restart X-NIR”
10	Error with USB Core initialization.	“Error code: 10” “Press ENTER to continue”
11	During a NIR analysis the timeout is fulfilled, that means the Application hasn't received the 'END_MEASURE' status due to a communication error with the IRB.	A corresponding icon is shown  “Error code: 11” “Please do the Check Hardware” “Press ENTER to continue”
12	The Serial Number reported inside the file “sensorirb.bin” is different than that one received from the sensor board during the system initialization.	“Error code: 12” “Press ENTER to continue”

8.2 Conditions of malfunction on the device

Error	Cause	Solution
USB data saving error	1. Incorrect connection of the USB card	<ul style="list-style-type: none"> • Check correct insertion of the USB card
	2. Malfunctioning of the USB card	<ul style="list-style-type: none"> • Format the USB card and retry. • Use another USB card
	3. Incorrect communication between USB card and device	<ul style="list-style-type: none"> • Contact Customer Service
Prolonged historical initialisation upon power-up	1. First initialisation of the historical analysis	<ul style="list-style-type: none"> • Wait until completion of the historical initialisation (a few minutes) and run an analysis (this must be successful).
X-NIR™ does not turn on	1. Battery not connected	<ul style="list-style-type: none"> • Check that the battery is inserted inside the device; • Check that the battery is inserted correctly.
	2. No battery power	<ul style="list-style-type: none"> • Check the charge level of the battery; • Charge the battery.
	3. HW problem	<ul style="list-style-type: none"> • Contact Customer Service
Analysis errors	1. Incorrect analysis procedure	<ul style="list-style-type: none"> • Carefully follow the instructions in the manual on paragraph 5.7; • Clean the reading glass after each analysis; • Check the correspondence between the NIR family selected and the forage that is being analysed.
	2. Incorrect loading of the calibration file	<ul style="list-style-type: none"> • Check the file loading procedure on paragraph 5.12 of the manual. • Check correct functioning of the USB card.
	3. Analyzer malfunction	<ul style="list-style-type: none"> • Check the status icon of the device (list on paragraph 5.4 of the manual); • Perform a device Check Hardware (instructions on paragraph 5.9 of the manual); • Contact Customer Service

DICHIARAZIONE DI CONFORMITA' UE - EU DECLARATION OF CONFORMITY - EU KONFORMITÄTSEKTLÄRUNG - DÉCLARATION UE DE CONFORMITÉ - DECLARACION UE DE CONFORMIDAD - EU ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ

Nr 20/16

- IT** Il sottoscritto, designato a legale rappresentante della Dinamica Generale s.p.a. , via Mondadori 15, Poggio Rusco (MN) - Italy, dichiara che i prodotti sottoelencati:
- EN** The undersigned, an authorised officer of Dinamica Generale s.p.a. , via Mondadori 15, Poggio Rusco (MN) - Italy, hereby declares that the products listed hereunder:
- D** Der Unterzeichner, rechtlicher Vertreter der Dinamica Generale s.p.a. , via Mondadori 15, Poggio Rusco (MN) – Italy, erklärt, daß die nachstehend beschriebenen Produkte:
- FR** Je soussigné, représentant légal désigné de Dinamica Generale s.p.a. , via Mondadori 15, Poggio Rusco (MN) - Italy, déclare que les produits énumérés ci-après:
- ES** El suscrito, nombrado representante legal de la Dinamica Generale s.p.a. , via Mondadori 15, Poggio Rusco (MN) - Italy, declara que los productos indicatos a continuación:
- RU** Нижеподписавшийся, являющийся законным представителем компании Dinamica Generale s.p.a., расположенной по адресу via Mondadori 15, Poggio Rusco (MN) – Italy, заявляет, что продукция ниже

X-NIR

- IT** Sono conformi a quanto prescritto dalle seguenti direttive:
- EN** Are in compliance with the following directives:
- D** Mit den Vorschriften konform sind, die in den folgenden Richtlinien:
- FR** Sont conformes aux prescriptions des directives suivantes:
- ES** Respetan las prescripciones contenidas en las siguientes directivas:
- RU** Соответствует требованиям следующих директив:

2014/30/EU

- IT** E dalle seguenti norme:
- EN** And with the following standards:
- D** Und Normen stehen:
- FR** Et aux normes ci-apres:
- ES** Y en las siguientes normas:
- RU** И следующих стандартов:

Main Standards:

- EN 61326-1 (2013-01)

Test Methods:

- EN 55011 (2009-11) + A1 (2010)
- EN 61000-4-2 (2009-03)

- IT** E, in applicazione a quanto previsto dalle direttive citate, sono stati dotati di marcatura CE ed é stato predisposto un adeguato fascicolo tecnico presso la ns. sede.
- EN** And, pursuant of the above-mentioned directives, the CE mark has been applied. Furthermore, adequate technical file has been prepared and is available from our offices.
- D** Und daß sie in Übereinstimmung mit den Vorschriften der obengenannten Richtlinien mit dem CE-Zeichen versehen sind und daß dafür ein angemessenes technisches Heft erstellt wurde, das bei uns in der Firma zur Verfügung steht.
- FR** En application des directives citées, ils portent la marque CE et un dossier technique est déposé auprès de notre siège.
- ES** Y, conforme con lo previsto en las citadas directivas, han recibido la marca CE. Existe asimismo un específico prospecto técnico relativo disponible en nuestra sede.
- RU** И, в исполнении данных директив, был нанесен знак CE и соответствующее техническое досье было заведено в нашем офисе.

Poggio Rusco, 21/04/2016

Andrea GHIRALDI

The Battery Charger provided combined with X-NIR device has been tested and found to comply with the limits of the following Norms, directly by the producer:

- **Safety Standards:** EN60950-1* / IEC/UL60950-1* / EN55011 / EN55022 / EN55024* / FCC15 class
- **EMC Standards:** B* / EN/IEC61000-4-2,-3,-4,-5,-6,-8,-11* / EN61000-3-2,-3-3*

Dinamica Generale Spa so is not responsible for this conformity declarations, so you must refer to the conformity report of the Battery Charger producer.

9 **WARRANTY**

The supplier guarantees, for 24 months from the delivery date, the good quality of materials used, the excellent construction and the steady functioning of the instrument they have manufactured and that bears the trademark or the production serial number. During the warranty period the supplier undertakes to repair or replace, free supplier's head office, faulty parts due to poor materials or faulty construction, provided that such parts are delivered free port supplier's head office.

Shortcomings and defects due to incorrect use of instruments, inadequate maintenance, changes carried out without the supplier's approval, normal wear are not included in this guarantee.

Liability and compensations by the supplier due to direct or indirect damages to persons, objects or production, even as a consequence of faulty functioning of the supplied instruments or of material or construction defects, are not included in this warranty.

NOTES :

Congratulations Dear User!

You have chosen a product by **dinamica generale®**, a leading company in the development and production of electronic weighing systems, automation systems and NIR solutions. These systems bring a highly technological level in every field of application such as zootechnical, feeding, industrial and biomedical. Year by year the international market recognizes our quality, experience, reliability and most of all our innovative technology, as a part of a highly developed and innovative know how. These are the pillars of our work and according to these beliefs we are at your service, providing you with a simple as well as new, precise and professional product, which is going to make your job easier for many years. This user's manual intends to take you through the different performances of the weighing system in the easiest way and to show you some new functions as well. **dinamica generale®** did not forget to provide you even with the basic information: the configuration, the use of different accessories at your disposal, the service of "searching for faults" and the equipment's safety rules, in order to guarantee our customers always more and more support and technical assistance for years to come.

Now there is nothing left for us to do but wish you a work well done!

The team of **dinamica generale®**



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ASSISTANCE



Technical assistance 24 hours a day, 365 days a year.

QUALITY & CERTIFICATIONS

For **dinamica generale**, sustainability means integrating long term economic, environmental and social dimensions into the way we operate our business according to the:



ISO 9001:2008



ISO 14001:2004



ISO 13485:2012



Dinamica Generale® uses PEFC paper for printing manuals and catalogues.

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