

INSTRUCTION MANUAL

Temp74 PT100 **√**io

Italiano:

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English:

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Español:

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Deutsch:

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Français:

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1. Security Information

• Definitions of warning words and symbols

The safety information in this manual is very important in order to avoid personal injury, damage to the instrument, malfunction or incorrect results due to non-compliance. Please read this manual carefully in its entirety and make sure you familiarise yourself with the instrument before you start working with it.

This manual must be kept close to the instrument so that the operator can refer to it if necessary. Safety instructions are indicated by warning terms or symbols.

• Reporting deadlines

- **WARNING** for a medium-risk hazardous situation, which could lead to serious injury or death if not avoided.
- WARNING for a hazardous situation with reduced risk which, if not avoided, may result in damage materials, loss of data or minor or moderate injuries.
- **NOTICE** for important product information.
- **NOTE** for useful product information.

Warning symbols:



Attention

This symbol draws attention to a possible danger from electric current.



Attention

The instrument must be used according to the instructions in the reference manual. Read the instructions carefully.



Attention

This symbol indicates a potential risk and warns of proceeding with caution.



Notes

This symbol highlights further information and tips.



Notice

This symbol draws attention to possible damage to the instrument or instrumental parts.

• Additional documents providing security information

The following documents can provide the operator with additional information to work safely with the measuring system:

• specific notes on product safety.

• Intended use

This instrument is designed exclusively for temperature measurements both in the laboratory and directly in the field. Pay particular attention to the technical specifications in the table INSTRUMENTAL CHARACTERISTICS / TECHNICAL DATA; any other use outside these is considered unauthorised. This instrument left the factory in perfect technical and safety condition.

The proper functioning of the device and the safety of the operator are only guaranteed if all normal laboratory safety regulations are observed and if all specific safety measures described in this manual are followed.

• Basic requirements for safe use

The proper functioning of the device and the safety of the operator are only guaranteed if all of the following points are observed:

- the instrument may only be used in accordance with the mentioned specifications;
- the instrument must only operate under the environmental conditions described in this manual;
- the only part of the instrument that can be opened by the user is the battery compartment.

Perform other operations only if explicitly authorised by the manufacturer.

• Unauthorised use

The instrument must not be operated if:

- it's visibly damaged (e.g. due to transport);
- it has been stored for a long period of time under adverse conditions (exposure to direct light, heat sources or places saturated with gas or vapours) or in environments with conditions other than those mentioned in this manual.

Device Maintenance

If used correctly and in a suitable environment, the instrument requires no special maintenance procedures. It is recommended to occasionally clean the instrument casing with a damp cloth and mild detergent. This operation should be carried out with the instrument switched off and only by experienced and authorised personnel. The housing is made of ABS/PC (acrylonitrile butadiene styrene/polycarbonate). This material is sensitive to certain organic solvents, e.g. toluene, xylene and methyl ethyl ketone (MEK). If liquids were to enter the housing, they could damage the instrument. Do not open the instrument housing: it contains no parts that can be serviced, repaired or replaced by the user. In case of problems with the instrument, please contact your local distributor. It is recommended to use only original spare parts. Contact your local distributor for information. The use of non-original spare parts can lead to malfunction or permanent damage to the instrument. Furthermore, the use of spare parts not guaranteed by the supplier can be dangerous for the user.

• Responsibility of the instrument owner

The person who owns and uses the instrument or authorises its use by others is the owner of the instrument and as such is responsible for the safety of all users of the instrument and third parties. The owner of the instrument must inform users of its safe use at their place of work and of the management of potential risks and provide the required protective equipment. When using chemicals or solvents, follow the manufacturer's safety data sheets.





2. Instrumental Characteristics

• Technical Data



		ТооІ
		Temp74 PT100 Vio
e.	Probes	PT100 (x4)
atur	Inputs	4 x 3-pin connector
era	Measuring range	-200,0+999,9 °C
d L	Resolution	0.01 °C (-99.99 to +99.99 °C) / 0.1 °C in the rest of the scale
Te	Accuracy	± 0.03 °C (-99.99 to +99.99 °C) / ± 0.1 in the rest of the scale
	Display	TFT- 4" high definition
	Brightness and contrast management	Manual and automatic with integrated sensor
	Sleep Mode	Yes
	Auto power-off	Yes, 20 minutes (can be deactivated)
	LED Indication	Yes
	Reading stability indicator	Yes Adjustable (Low-Nor-High)
	Reading Hold (HOLD)	Yes
	MAX/MIN reading	Yes
	Offset Adjustment	Yes for each channel independently
	Internal memory	200,000 data
	Data logger	Manual- Automatic- Programmed
	Sampling	1 min99 hours
	Working conditions	Temperature: 0+60 °C / Humidity: <95% R.H. (non-condensing)
	Maximum altitude of use	2000 m
	Dimensions	185 x 85 x 45 mm
	Weight	400 g
	Degree of protection	IP 56
	Sound level during operation	< 80 dB
E	Power supply	3 x 1.5V 'AA' alkaline
yste	Battery life	> 550 hours
S	Reference Standards	EMC 2014/30/EU / RoHS 2011/65/EU / EN 61326-1

3. Description Instrument





• Key Functions

Key	Pressure	Function		
	Brief	Press to switch the device on or off		
	Brief	In measurement mode, press to enter Setup. In the Setup menus, press to select the desired programme and/or value		
HOLD	Brief	Activating and deactivating the MAX/MIN recording function		
MIN-MAX	Long	Activation and deactivation of the HOLD function.		
	Brief	Scroll through the measurement channel screens (CH 1-2-3-4-multiview). Only channels to which a probe is connected are displayed. Within the Setup menu, press to return to measurement mode		
	Brief	Used to scroll through and change parameter values in the Setup menu. Manual- automatic data logger activation/deactivation		
RM	Brief	Used to scroll through and change parameter values in the Setup menu. Recalling saved data		

IMPORTANT:

- When Sleep mode is active (by default after two minutes of non-use of the instrument) press any key to reactivate the display brightness.
- Only at this point do the buttons regain their function.

LED

All instruments are equipped with a two-colour LED (red and green) that provides the user with important information on the status of the system:

Y	
	V

Function	LED	Description
Ignition	GREEN	Fixed
Shutdown	RED	Fixed
Instrument in Standby	GREEN	Flashing every 20 s
Stable size	GREEN	Flashing every 3 s
Error during measurement	RED	Flashing every 3 s
Confirmation of a selection / DataLogger (data storage)	GREEN	On for 1 s
Recalling saved data	GREEN/RED	0.5 seconds green and 0.5 seconds red

4. Installation

• Supplied Components

The instrument is always supplied in its own carrying case.

Inside the case there is always: instrument with batteries, user manual, connection cable and power supply.

Commissioning

- The device leaves the factory ready for use by the user.
- Batteries are already included.

• Switching on and off

Switch the system on by pressing the $\textcircled{}^{(\bigcup)}$ button. They will be displayed:

- device model and software;
- offset of the 4 channels;
- temperature measurement screen;
- to switch off the instrument, press the button in measurement mode.



• Replacing batteries

The instrument runs on 3 AA 1.5V batteries. For replacement:

- 1. switch off the device;
- 2. turn the instrument downwards, with the connector part resting on a table top, so that the battery compartment cap is facing upwards, towards the user;
- 3. while holding the battery compartment cap with two fingers, completely unscrew the screw next to the battery symbol with a screwdriver;
- 4. remove the battery compartment cap;
- 5. remove the 3 spent batteries and insert new ones. Pay attention to correct polarity. Follow the diagram above the battery symbol in the rear compartment of the instrument;
- 6. reinsert the battery compartment cap; hold it in place with two fingers, insert the screw and screw in.

• Instrument transport

The instrument always comes with its own carrying case. Only use the original carrying case to transport the instrument. Contact your local distributor if you need to buy it back. The inside of the case is shaped to accommodate the instrument and sensors.

• Input / Output Connections

Only use original accessories guaranteed by the manufacturer. If necessary, contact your local distributor.

Micro USB PC and Power supply connection



Read the manual before connecting the probes

• Symbols and icons on the display

	Symbol	Description
Error in measurement		Error in measurement
	Battery charge indication	
	(;)	Measurement Stability Indicator
Automatic Datalogger		Automatic Datalogger
Programmed Datalogger		Programmed Datalogger
	125	Number of data stored in data logger mode on instrument memory
Press the arrow buttons to change the parameter or value on the		Press the arrow buttons to change the parameter or value on the display
Instrument connected to the DataLink+ software		Instrument connected to the DataLink+ software
Reference channel		Reference channel
		Minimum and maximum values
	CH	Measuring channel displayed





5. Setup Menu

TEMP: Measurement Settings

LOG: Data logger settings

SETTINGS: General Instrument Settings

- In measurement mode, press the $\sqrt{6\kappa}$ button to enter SETUP mode.
- Within the setup, move through the different menus using the▲▼ buttons and press the √ok button to access the submenu you wish to edit.
- Press *Esc* to return to the previous menu and to exit without saving.

6. Temp Settings Menu

The **TEMP** Settings menu contains all settings concerning the measurement.

TEMP: Measurement Settings

LOG: Data logger settings

SETTINGS: General Instrument Settings

- In measurement mode, press $\sqrt{\kappa}$ to enter the SETUP menu.
- Press the $\sqrt{\kappa}$ button to access the **TEMP SETTINGS** menu.
- Use▲▼ to select the programme you wish to access.

The table below shows the Setup menu structure for the parameter, for each programme the options the user can choose and the default value:

Description	Options	Factory Settings
Sensor ID	Probe 1- Probe 2- Probe 3- Probe 4	
Reference probe	Probe 1- Probe 2- Probe 3- Probe 4	
Offset	Probe 1- Probe 2- Probe 3- Probe 4- Align all	
Calibration Data		
Resolution	1 °C- 0.1 °C- 0.01 °C	0,01 °C
Stability filter	Low- Normal- High	High
Alarms	Probe 1- Probe 2- Probe 3- Probe 4	Deactivated
Reset	No- Yes	No

Sensor ID

Access this menu to **enter an** ID (identification code) to one or more connected channels.

- Select which channel you wish to identify.
- Starting with the digit with the flashing cursor, enter the desired value using the keys ▲▼ and press to move to the next digit.
- A code with a maximum length of 10 digits can be entered.

Note: If you select a channel with no probe connected, the display will show the error message: "CONNECT THE

PROBE", accompanied by the icon flashing 4.



• Reference probe

Through this menu we can select the **Reference Probe.** In the right column of the **Multiview** screen, for each channel, the difference of the measurement from the reference channel will be displayed.

Multiview					
сн1	37,05 °C	▲ 37,05 °C ▼ 12,2 °C	\odot		
сн2	37,07 °C	▲ 37,05 °C ▼ 12,2 °C		+0,02	
сн3	37,00 °C	▲ 37,05 °C ▼ 12,2 °C	\odot	-0,05	
сн4	37,09 °C	▲ 37,05 °C ▼ 12,2 °C		+0,04	

• Offset

The Offset menu allows you to adjust the measurement of each individual channel independently or to align all measurements to the reference channel.

Offset adjustment (single channel)

- Select which individual channel you wish to adjust (Probe 1-2-3-4-) or select Align All to align all readings to the reference channel.
- Choosing a single channel will open the screen allowing adjustment of the channel value in real time. At the top the real-time reading is shown, at the bottom the adjustment value.
- Using the buttons \blacktriangle change the 'Adjustment' value until the desired 'Current Temperature' is reached and press $\sqrt[6]{\kappa}$ to confirm.

Note: An adjustment of a maximum of \pm 5.00 °C from the current temperature can be made. If you select a channel with no probe connected, the display will show the error message: "CONNECT



THE PROBE", accompanied by the icon flashing \triangle . If the offset has never been changed or a reset has been carried out, the message "Offset 0.00 °C" will be shown for each channel.

Offset adjustment (align all)

This function allows the measurements of all channels to be aligned to the reference channel.

- Select our reference channel from the Setup menu →Temp Settings-> Reference Probe and press vok to confirm.
- In the Offset Probes menu, select Align All.
- The measurements of all channels will be aligned to the measurement of the reference channel.

• Calibration data

Accessing the **Calibration Data** menu will display the calibration data for each channel. In addition to the value of the adjustment, the date and time at which it was made are displayed. If no offset has been entered, 0.00 °C appears. The same screen is displayed each time it is switched on.

Resolution

The Resolution menu allows you to select how many decimal digits to show in measurement. By default, the instrument is set with the highest resolution (0.01 °C). Using the buttons \checkmark select the desired resolution and press $\checkmark \kappa$ to confirm.

• Stability filter

In order for a value reading to be considered true, it is advisable to wait for measurement stability, indicated by the icon . Using the buttons \blacktriangle select the desired degree of stability and press $\checkmark \kappa$ to confirm.

- Low: with variations less than or equal to 3 hundredths of a degree, the stability icon remains fixed and indicates the stable value.
- Nor: with variations less than or equal to 2 hundredths of a degree, the stability icon remains fixed and indicates the stable value.
- **High**: with variations less than or equal to 1 hundredth of a degree, the stability icon remains fixed and indicates the stable value.

Alarms •

A range, consisting of a minimum and a maximum value, can be set for each channel.

- If the alarm is enabled, the moment the measurement exceeds the set range the instrument will signal an error.
- Select the channel on which we want to set the alarm.
- Press $\sqrt{\kappa}$ to enable the alarm on the channel.
- The cursor will move to the value 'Minimum Threshold: Set the minimum threshold using the keys ▲▼ and press $\sqrt{\kappa}$ to confirm.
- The cursor will move to the value 'Maximum threshold: set the maximum threshold using the keys ▲▼ and press $\sqrt{\kappa}$ to confirm.

Once in measurement, should the channel measurement exceed the values entered, the instrument will signal the alarm both visually and by an acoustic signal.

Note: The blue-coloured measurement indicates that the temperature has fallen below the set minimum threshold. The red-coloured measurement indicates that the temperature has risen above the maximum set threshold.



Reset •

Access this Setup to reset the thermometer to its factory settings.

Resetting will reset all values to the default values shown in the table above.

Note: When the reset is complete, the instrument returns to measurement mode and the parameters are reset to default settings.

7. Log Settings Menu

TEMP: Measurement Settings

LOG: Data logger settings

SETTINGS: **General Instrument Settings**

The table below shows the Setup menu structure for the parameter, for each programme the options the user can choose and the default value:

Description Options		Factory Settings
Logger settings	Manual- Automatic- Programmed	Automatic
Memory		
Erase memory	No-Yes	No

Logger Settings

Access this menu to select the data acquisition mode:

- Manual: The data is only acquired when the user presses the 🕰 button;
- Automatic. The data is acquired autonomously by the instrument at regular intervals, set in this menu. The acquisition interval (1 second to 99 hours) and the departure delay (00:00:00 = no delay) will be requested;

Scheduled: allows you to enter start date and time, end date and time, and acquisition interval.

The instrument will autonomously save data starting at the start date and time and stopping at the end date and time.

Automatic logger- Setting the Automatic Data Logger

First set the acquisition interval (hh:mm:ss) then the delay (hh:mm:ss). Use the arrows ▲▼ to change the flashing value. Press \sqrt{k} to confirm and move to the next value.

Automatic start/stop of the data logger

In measure press to start or stop automatic recording. When automatic data storage is running, the icon flashes on the display. When set, but not in operation, the icon on the screen remains fixed. When the memory is complete, recording stops automatically.

Note: Entering the Setup menu stops recording. If recording takes place while there is a single channel measurement on the display, data concerning only that channel will be saved. If recording takes place while the display is showing the multiview screen, data concerning all channels available at the same time will be saved.

Programmed logger- Setting the Programmed Data Logger

Set in order: start date (dd:mm:yy)- start time (hh:mm:ss)- end date (dd:mm:yy)- end time (hh:mm:ss)acquisition interval. Use the arrows \checkmark to change the flashing value. Press $\checkmark \kappa$ to confirm and move to the next value.

Programmed Data Logger Start/Stop

A flashing (h) icon will appear in measurement. The instrument will start recording data independently once the set date and time is reached and will stop.

Note: If recording takes place while there is a single channel measurement on the display, data concerning only that channel will be saved. If recording takes place while the display is showing the multiview screen, data concerning all channels available at the same time will be saved.

• Memory

This menu shows the percentage of memory available, memory used and the number of saved data.

• Erase memory

Access this menu and select 'Yes' to delete saved data. At the end of deletion, the instrument returns to the measurement screen.

8. Instrument Configuration Menu

TEMP: Measurement Settings

LOG: Data logger settings

SETTINGS: General Instrument Settings

The table below shows the Setup menu structure for the parameter, for each programme the options the user can choose and the default value:

Description		Factory Settings	
	THEME COLOUR	Light theme- Dark theme	Clear theme
	STANDBY	No- 30 sec- 1, 2, 5 minutes	30 seconds
SCREEN SETTINGS	BACKLIGHTING	Car- Indoor- Outdoor	Cars
	BRIGHTNESS	Low- Normal- High	Normal
DATE AND TIME			
UNIT OF MEASUREMENT	°C- °F		°C
LANGUAGE	Ita- Eng- Fra- Deu- Esp		Ita
AUTO SWITCH-OFF	No- Yes, after 20 minutes		No
SOUND	No- Alarm only- Yes		No
PASSWORD			
RESET SETTINGS	No- YES		No





• Screen Settings

This menu contains the display configurations:

Colour Theme

You can select Light Theme or Dark Theme, depending on your personal preferences or conditions of use.

Standby

Access this Setup menu to select whether and after how long to activate the device's power-saving mode.

- OFF: Mode deactivated.
- 30 sec, 1,2,5 MIN: The instrument enters standby mode if no key is pressed for the set time.

When the device is in standby mode, the brightness of the display is reduced to a minimum, which saves significantly on battery consumption.

Note: To exit standby mode and return the display to normal brightness, press ANY button. Once the display brightness is restored, the buttons regain their function (section 'Button Functions').

Backlighting

Access this Setup menu to adapt the visibility of the display to the environment:

- INDOOR (In) Recommended when using the device indoors;
- OUTDOOR (Out) Recommended if using the device outdoors;
- **AUTO** Factory setting. Thanks to the brightness sensor, the display automatically adapts to the ambient conditions. This mode also guarantees a longer battery life.

Brightness

Access this Setup menu to choose between three different display brightness levels:

- Low
- Normal
- High

Note: Keeping the display at high brightness at all times negatively affects battery life.

• Date and time

Access this setup menu to update the date and time of the device. Use $\blacktriangle \forall$ to change the time, confirm with $\checkmark \kappa$ and repeat the same operation for minutes, day, month and year.

• Units of Measurement

Access this setup menu to select the desired unit of measurement, ° Celsius or ° Fahrenheit. *Important*: by setting a different unit of measurement, the offset will also be converted to the new unit of measurement. The offset correction is also visible when the instrument is switched on.

Language

Access this setup menu to select the language of the instrument from the 5 selectable languages:

• Italian, English, French, German and Spanish.

Auto-off

Access this Setup menu to activate or deactivate the instrument's auto switch-off.

- No: The instrument always remains switched on.
- Yes: The instrument switches off automatically after 20 minutes of inactivity.

Note: With an automatic or programmed data-logger set, the auto-off is automatically deactivated.

• Sound

Access this menu to set whether the sound should always be on (every time a button is pressed), always off or only activate when the instrument detects an alarm.









Password

Through this menu it is possible to enter a 4-digit password, which will be required later to enter the Temp and Log menus, in order to safeguard sensitive settings. To enter or change the password, proceed as follows:

- access the Password menu;
- enter the current password (*) using \checkmark to change the digit with the blinking cursor, and press $\sqrt{\kappa}$ to confirm and move to the next digit;
- the words change password appear: you can now enter the desired password;
- press the **GESC** button until you return to the measurement screen.

The password is now set correctly and will be required to access the TEMP settings and LOG settings menus. *Note:* *When first set up after purchase, the factory password is 0000.

To deactivate the password lock, set password: 0000.

9. Temperature measurement

Measure

- Switch the instrument on with the 0 button.
- When switched on, they are displayed in order:
 - start page with software version;
 - calibration data page: the calibration data of each channel are shown;
 - if several probes are connected, the instrument shows the multiview screen;
 - if only one probe is connected, the dedicated channel page is accessed.
- Place the probe(s) at the point to be measured and wait for stability.
- When the reading becomes stable, the icon expease on the display. Always wait for the measurement to become stable.

Note If no temperature probe is connected, the message 'CONNECT A PROBE' appears. When connecting or disconnecting probes, the instrument will automatically update the measurement screen to show the temperatures of the connected probes on the display.

MAX/MIN function

During measurement, press the MIN-MAX button to display the minimum and maximum values. The following symbols will appear on the display:

- **Maximum** measured value
- **Minimum** measured value

The values are updated in real time, as long as the function remains active.

To deactivate the MAX/MIN function, press the **MIN-MAX** button, the values will disappear from the display.

Note: If auto switch-off is set, then the instrument will switch off after 20 minutes. If you intend to record minimum and maximum values over a longer period of time, it is necessary to disable the auto switch-off.

MAX/MIN values are not saved in the instrument's memory and cannot be exported.

However, they can be easily obtained from the Excel file available on the DataLink+.

HOLD function

During measurement, press and hold the button for 3 seconds to freeze the reading. HOLD appears on the display and the reading is no longer updated. Press and hold for 3 seconds to unlock the reading.

10. Other functions

Automatic switch-off

The instrument switches off automatically after 20 minutes of inactivity. To disable auto power off, go to Setup \rightarrow Settings \rightarrow Auto Power Off and select No.









• Offset adjustment

All instruments are factory pre-calibrated and remain stable over time, but in the event of a reading error, the measuring chain can be recalibrated to eliminate this error.

In the setup menu- Temp Settings- Probe Offset it is possible to adjust the measurement of each individual channel independently or to align the measurements of all channels to the reference channel.

Example: Single channel calibration at 0.0 $^{\circ}\mathrm{C}$

To recalibrate the instrument at 0.0°C, proceed as follows:

- prepare ice with double-distilled water;
- put ice cubes in a 500 ml beaker up to half the volume;
- add double-distilled water to ¾ of the volume;
- place the beaker on a magnetic stirrer under gentle agitation;
- immerse the probe in the beaker, ensuring that it is immersed in water and does not touch the beaker wall;
- cover the beaker with polystyrene to isolate the water/ice mixture from the air as much as possible;
- leave to stir for about 10 minutes;
- wait until the temperature reaches 0°C.

If the instrument reads $0.0^{\circ}C$ (± measuring chain accuracy), this means that the measuring chain is correctly calibrated. Otherwise:

- access the Setup menu→ Temp Settings→ Offset probes;
- select the channel to be adjusted;
- the display will show the current temperature, which is to be corrected, and the adjustment value, with flashing cursor;
- using the keys▲▼ correct the value to 'Current Temperature' to 0.0 °C;
- press $\sqrt{\kappa}$ to confirm and record the adjustment.

Note: The adjustment affects the entire measurement scale, e.g. if you correct by -1.0°C, then the measurement shifts by -1.0°C over the entire range. The setting made in this way remains in memory both after switching off the instrument and in case of replacement of batteries.



If the sensor is replaced, we recommend resetting the factory calibration from the Temp Settings menu \rightarrow Reset and proceed with a new calibration if necessary. If the sensor is replaced, we recommend resetting

the factory calibration from the Temp Settings menu \rightarrow Reset and proceed with a new calibration if necessary. If there is no probe connected to the selected channel, the offset cannot be changed.

11. DataLink+ Software

It is possible to connect the Temp 74 to a PC and use the DataLink+ software to perform data downloads, recording directly on the PC and exports to Excel and PDF.

The software can be downloaded free of charge from the site:

- https://www.giorgiobormac.com/it/download-software_Download.htm.
- Connect the USB cable inside each package to the USB port on the top panel of the instrument and the other end to a COM port on your computer.
- Only use the USB cable supplied with each instrument.
- Start the programme and then switch on the instrument.
- Wait for the connection to be established (connection data are shown at the bottom left of the display).

12. Warranty



• Warranty Duration and Limitations

- The manufacturer of this appliance offers the end user of the new appliance a three-year warranty from the date of purchase in the event of proper maintenance and use;
- During the guarantee period, the manufacturer will repair or replace defective components;
- This guarantee applies only to the electronic part and does not apply if the product has been damaged, misused, exposed to radiation or corrosive substances, if foreign materials have penetrated into the product, or if modifications have been made that have not been authorised by the manufacturer.

13. Disposal



This equipment is subject to regulations for electronic devices. Dispose of in accordance with existing local regulations.

XS Instruments

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