

# Heraeus

Instruction and Operating Manual  
Temperature Measuring Unit

## Digilance V

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***Original instructions***



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Heraeus Electro-Nite further reserves the right to alter the specification of the product without obligation to notify any person or organization of these changes.

Improvements or instrument changes added after this document was printed are to be found on one or more pages enclosed at the end of this manual. We ask you to take note of these extra sheets.



All instrument boards contain electronic components that can be damaged by electrostatic discharge. These boards should only be handled by qualified personnel. The necessary safety precautions and security guidelines must be observed during maintenance and service on the instrument.

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## Table of contents

1	Safety and usage notes .....	4
1.1	General .....	4
1.2	Qualified personnel .....	4
1.3	Danger notices .....	4
1.4	Proper usage .....	5
1.5	RoHS regulations .....	5
1.6	WEEE regulations .....	5
1.7	Battery .....	6
1.8	Disposal of instrument or parts .....	6
1.9	CE-Declaration of Conformity .....	7
1.10	ISED Canada and FCC Compliance Notice .....	7
2	Introduction .....	8
3	Transportation .....	9
3.1	Instrument transport mode .....	9
3.2	Shipping of ESD-sensitive modules .....	9
3.3	Packaging the instrument .....	9
3.4	Shipment of Lithium Ion Batteries in the Instrument .....	9
4	Standard Operation .....	10
4.1	First Use .....	10
4.2	Lance Installation .....	11
4.2.1	TC Wire Color Codes .....	11
4.3	Performing Measurements .....	12
4.3.1	Measurement Evaluation .....	12
4.4	Measurement History .....	13
4.5	Additional Measurement Information .....	13
4.5.1	Working with Heat Numbers .....	13
4.5.2	Working with Measurement Places .....	13
4.6	Battery Charging .....	14
4.7	Power Management .....	15
5	Instrument Configuration .....	16
5.1	Configuration Login .....	16
5.2	Configuration Parameters .....	16
6	Advanced Operation (Wireless) .....	17
7	Maintenance .....	18
7.1	Procedures for maintenance and repair .....	18
7.2	Guidelines for Handling (ESD) .....	18
7.3	Cleaning notes .....	18
7.4	Battery .....	18
7.5	Performing a test measurement with a Checkmate .....	18
7.6	Calibrating the system .....	18
8	Troubleshooting .....	19
9	Technical data .....	20
10	Spare Parts .....	21



## 1 Safety and usage notes

### 1.1 General

This manual provides the information required to use the instrument. It is written for technically qualified personnel such as engineers, programmers, or maintenance specialists who have been specially trained and who have the specialized knowledge required in the field of instrumentation, electronics, and control.

This manual is an integral part of the instrument or device even if, for logistical reasons, it has to be ordered separately. For the sake of clarity, not all details of all versions of the instrument or device are described, nor can it cover all conceivable cases regarding installation, operation, and maintenance. If you require further information, or face special problems that have not been dealt with in sufficient detail in this manual, contact Heraeus Electro-Nite.

We would also point out that the contents of this manual shall not become a part of, or modify, any prior or existing agreement, commitment, or legal relationship. The Purchase Agreement contains the complete and exclusive obligations of Heraeus Electro-Nite. Any statements contained in this manual do not create new warranties or restrict the existing warranty.

### 1.2 Qualified personnel

Only qualified personnel should be allowed to work on this instrument or device. Non-compliance with the warnings contained in this manual or appearing on the instrument or device itself can result in severe personal injury or damage to property. Qualified personnel include:

- System planning and design engineers who are familiar with the safety concepts of automation equipment, instruments, or electronic devices.
- Operating personnel who have been trained to work with automation equipment, instruments, or electronic devices, and are conversant with the content of the manual in as far as it is connected with the actual operation of the instrument or device.
- Commissioning and service personnel who are trained to repair such equipment, instruments, or electronic devices, and who are authorized to energize, de-energize, clear, ground, and tag circuits, equipment, and systems in accordance with established safety practices.

### 1.3 Danger notices

The notices and guidelines that follow are intended to ensure personal safety, as well as protecting the instrument or device and any connected equipment against damage.

The safety notices are warnings for protection against loss of life (yours or service personnel) or for protection against damage to property and are highlighted in this manual by the terms and pictograms defined here. The terms used in this manual and marked on the instrument or device itself have the following significance:

**Danger:** Indicates that death, severe personal injury, or substantial property damage will result if proper precautions are not taken.

**Warning:** Indicates that death, severe personal injury, or substantial property damage can result if proper precautions are not taken.

**Caution:** Indicates that minor personal injury or property damage can result if proper precautions are not taken.

**Note:** Indicates important information about the product, its operation, or a part of the manual to which special attention is drawn.

**Attention:** Hints in this documentation to special safety-related guidelines, which equate to the safety level of Caution and Note.



This pictogram, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions on the literature accompanying the instrument or device.

This pictogram is used in relation to **Danger**, **Warning**, and **Caution** notices.

## 1.4 Proper usage

- The instrument or instrument components may only be used for the applications described in the manual or the technical description, and only in combination with the equipment, components, and devices of other manufacturers as far as this is recommended or permitted by Heraeus Electro-Nite.
- The instrument described has been developed, manufactured, tested, and the manual compiled in keeping with the relevant safety standards. Consequently, if the handling instructions and safety guidelines described for planning, installation, operation, and maintenance are adhered to, the instrument or device, under normal conditions, will not be a source of danger to property or life.

## 1.5 RoHS regulations

All electrical devices sold in the European market from the 1 July 2006 must fulfil the EU Directive 2002/95/EC, and RoHS 2 directive 2011/65/EU, on the Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) as well as the national laws derived from it. According to the definition in Annex IB of the EU Directive 2012/19/EU WEEE, Heraeus Electro-Nite measuring instruments and analysis devices belong to category 9 - monitoring and control instruments.

All Heraeus Electro-Nite instruments placed on the market after 1 July 2006 do not contain materials prohibited according to the RoHS directive.

Affected parts and components are identified and adapted to the statutory requirements and other substances in those parts and components are utilized where necessary. The quality and usability of our devices are not affected.

The adaptations are usually not visible, although adapted primary housing parts can show different surface color.

## 1.6 WEEE regulations



According to the EU Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE), all electrical devices sold in the European market from the 13 August 2005 must be marked with a special symbol. This symbol (crossed out waste disposal receptacle with thick black bar underneath) indicates to the customer that the device must not be placed in household waste, but must be either deposited at a collection place for commercial scrap or returned to the manufacturer.

Heraeus Electro-Nite devices are exclusively for commercial use and may not be transferred to private use. Devices must be disposed of according to the national, statutory regulations for commercial electrical scrap. You must also follow the EU Directive WEEE regulations and their national conversion. If in doubt, ask your national importer or Heraeus Electro-Nite.


All old Heraeus Electro-Nite devices can be deposited at Heraeus Electro-Nite premises, free of charge and using a certificated disposal company. The customer pays only for the carriage.




## 1.7 Battery

All batteries and cells require proper disposal. Do not discard in conventional trash disposal. The disposal of batteries and cells should be in compliance of local environmental guidelines and regulations.

The Digilance V contains a Lithium Ion battery and therefore requires certain precautions.

	<p><b>Warning:</b></p> <ul style="list-style-type: none"><li>• Do not open, disassemble or deform the battery.</li><li>• Avoid shorting the battery contacts.</li><li>• Do not immerse the battery in water.</li><li>• Do not expose to, or dispose of the battery in fire.</li><li>• Do not carry out any soldering work on batteries (danger of explosion).</li><li>• Avoid excessive physical shock or vibration to the battery.</li><li>• Keep the battery out of the reach of children.</li><li>• Never use a battery that appears to have suffered abuse.</li><li>• Battery must be charged in appropriate charger only.</li><li>• Never use a modified or damaged charger.</li><li>• Store battery in a cool, dry and well-ventilated area.</li><li>• To prevent fire or shock hazard, do not expose battery to rain or moisture.</li><li>• Batteries must be disposed of as classified waste.</li><li>• Maximum ambient temperature of the battery is 100°C.</li></ul>
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	<p><b>Warning:</b></p> <ul style="list-style-type: none"><li>• Do not heat the Digilance V or battery above 100°C.</li><li>• Battery may ignite, explode, leak or heat causing personal injury.</li></ul>
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## 1.8 Disposal of instrument or parts

If the instrument has to be discarded, think about the following recycling issues. The device consists of several components that can be disposed of separately:

- The electronic cards for electronic recycling
- The housing for metal recycling
- The battery pack

For further disposal information, follow the local legislation.



## 1.9 CE-Declaration of Conformity



Heraeus Electro-Nite International N.V.  
Centrum Zuid 1105  
3530 Houthalen  
Belgium

Declares that:

### ***Instrument: Digilance V***

Complies with the essential provisions of the following EU-directives:

- Directive 2014/30/EU concerning electromagnetic compatibility (EMC).
- Directive 2014/35/EU concerning electrical equipment designed for use within certain voltage limits (LVD).
- Directive 2015/863/EU RoHS 3
- Radio equipment directive (RED) 2014/53/EU

## 1.10 ISED Canada and FCC Compliance Notice

Section applies only to Wireless Models.

The enclosed device complies with Part 15 of the FCC Rules and Industry Canada License Exempt RSS Standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

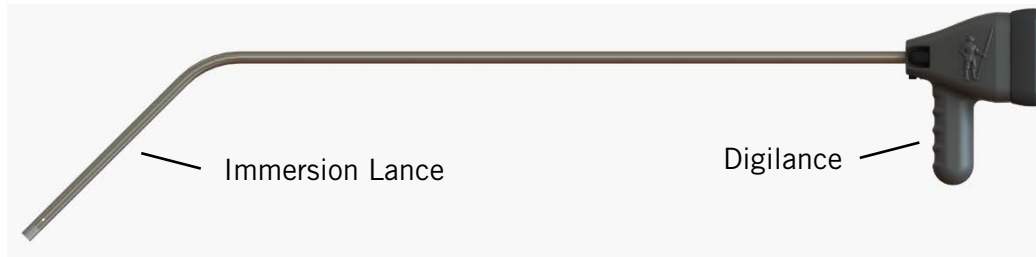
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent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

This portable transmitter with its antenna complies with FCC/IC RF exposure limits for general population / uncontrolled exposure.



## 2 Introduction

The Digilance V is a hand-held instrument for the measurement of molten metal temperatures. Used with disposable thermocouples the instrument can measure temperatures from 300°C to 2300°C. Various pole lengths are available depending on the application.



Housed in a robust Aluminum case, the precision electronics are protected from the difficult environmental conditions encountered in the molten metals industry.

The instrument has the option to connect to a wireless receiver box, which enables communication and data storage possibilities using Heraeus Electro-Nite software. The instrument also stores measurement results internally for downloading via the wireless interface.



1. Green LED indicates that the instrument is ready for the next measurement.
2. Yellow LED indicates that a measurement is in progress.
3. Red LED indicates that a measurement is ready and the sensor can be taken out of the molten media.
4. Battery Charging Jack for 12 Volt power supply.
5. Display for reading measurements and setting parameters.
6. Scroll button up.
7. Start instrument button / Confirm button.
8. Menu button / Cancel button.
9. Scroll button down.
10. Handgrip.
11. Accelerometer to wake the instrument (only after 1<sup>st</sup> start-up).




## 3 Transportation

Report damage during or immediately after delivery to the transport company and to Heraeus Electro-Nite. Take all necessary steps to prevent further damage.

### 3.1 Instrument transport mode

When transporting the instrument, it can be set to transport mode. When set into transport mode the accelerometer is deactivated, so the instrument will remain Powered-Off to conserve battery life.

Procedure:

1. Set to Transport Mode (See Section 'Power Management').
2. The Transport Mode can be set by pressing and holding  and  for 3 seconds, from any display screen.
3. When the instrument is reactivated by pressing and holding  for 3 seconds, the transport mode is deactivated.

### 3.2 Shipping of ESD-sensitive modules

VLSI chips (MOS technology) are used in practically all Heraeus Electro-Nite electronic modules. These VLSI components are, by their nature, very sensitive to over voltages and thus to electrostatic discharge (ESD).

Anti-static packing material must always be used when storing and dispatching modules and components. If the container itself is not conductive, the modules must be wrapped in a conductive material such as conductive foam, anti-static plastic bag, aluminum foil, or paper. Normal plastic bags or foil should not be used under any circumstances. For modules with built-in batteries, ensure that the conductive packing does not touch or short-circuit the battery connections: if necessary cover the connections with insulating tape or material.

### 3.3 Packaging the instrument

Since the instrument or device is a high-quality electronic and/or measurement unit, it should only be dispatched in its original packing. If the original packing is no longer present, then it is advisable to properly pack the device in a sufficiently large box lined with a shock-absorbing material such as PUR foam, polystyrene flakes, or similar. The shock-absorbing layer should have a minimal thickness of 10cm on all sides. Before packing the instrument or device, it must be wrapped in paper or plastic film.

For overseas transportation, the instrument or device should be sealed into an air-tight plastic film, ideally with a desiccant added. These packing recommendations also apply when returning the instrument or device to the manufacturer.

### 3.4 Shipment of Lithium Ion Batteries in the Instrument

The instrument contains a Lithium Ion Battery Pack that is compliant with UN Manual of Tests and Criteria, Part III, sub-section 38.3.

As the battery pack (2 cells, 25Wh) is contained within the instrument, it may be shipped without special warning labels according to UN 3481, Section II of PI 967.

In order to maintain compliance with transportation regulations, the instrument Battery Pack should always be shipped inside of the housing.





Additional regulations will apply to Battery Packs shipped outside of the device.

Please refer to your transporter to confirm specific regulations.



## 4 Standard Operation

The four keys on the Digilance front panel are used to interact with the device:


Key	Primary Functions
	<ul style="list-style-type: none"> <li>• Enter</li> <li>• Power On/Off</li> </ul>
	<ul style="list-style-type: none"> <li>• Cancel</li> <li>• Exit</li> <li>• Access Main Menu</li> </ul>
	<ul style="list-style-type: none"> <li>• Scroll Up</li> </ul>
	<ul style="list-style-type: none"> <li>• Scroll Down</li> </ul>

### 4.1 First Use

- **To Activate the Digilance for the First Time, Press and Hold**



- After the initial activation, the instrument will Power-On by movement

- Press  to the access the Main Menu and the following options
  - History
  - Configuration Login
  - Instrument Info
  - Battery Info
  - Wireless Info (optional)
- Prior to using the instrument, it is recommended to confirm the following instrument settings (See Section '*Instrument Configuration*')

Configuration Section	ID	Function
Thermocouple Type	1.1	S / B / K / R / D
Thermocouple Table	1.2	ITS90 / IPTS68 / IPTS48
Temperature Units	1.3	°C / °F
Time	1.4	Time Value Set in 24hr format
Date	1.5	Date Value Set in DD/MM/YY format
Measurement Mode	2.3	The Measurement Cycle is Reset dependent on the Measurement Mode <ul style="list-style-type: none"> <li>• DIP: Reset after the Thermocouple is replaced – For use with Single-Use Probes</li> <li>• MULTI: Reset when the Temperature drops by the amount of the Stop Difference below the Start Condition – For use with Multi-Use Probes</li> </ul>

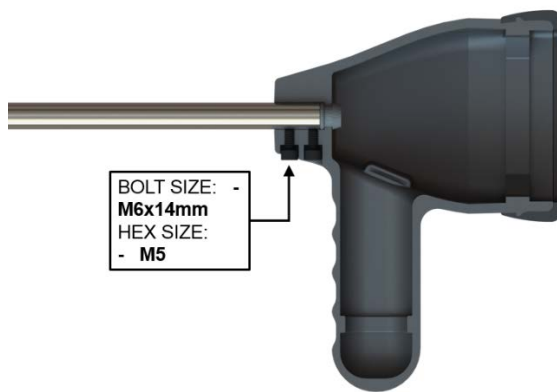


## 4.2 Lance Installation

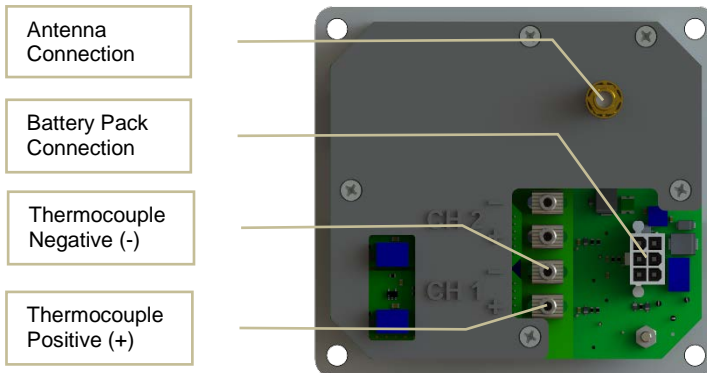
1. Open the Digilance V by removing the 4 Screws at the Corners of the Front Plate



2. Insert the Lance Pipe and secure with the 2 Bolts



3. Connect the cables from the Housing to the Instrument Assembly according to the diagram



- Conductive Shielding of the Thermocouple Extension Cable may not extending into the instrument housing.**
- This could create a short circuit of the electronic components or measurement circuit.**

### 4.2.1 TC Wire Color Codes

	EU		US	
	T+	T-	T+	T-
Type S/R	Orange	White	Black	Red
Type B	Grey	White	Grey	Red
Type K	Green	White	Yellow	Red

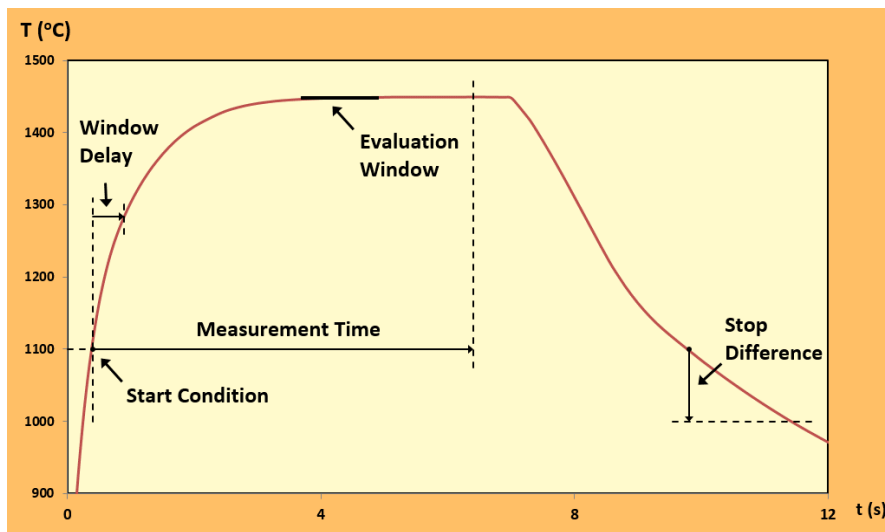
*\* Color of Contact Block Lead Wires\**



## 4.3 Performing Measurements

- The instrument will activate automatically when moved.
- Place a thermocouple onto the lance. The Green LED indicates that the system is Ready to measure.
- Dip the thermocouple tip into the molten metal:
  - The Yellow LED indicates that the measurement is Active.
  - The Red LED and a Buzzer indicate that the measurement is Complete.
- The measurement result is shown on the display.
- The instrument will shut down automatically, depending on the Power Management Settings (See Section 'Power Management').






### 4.3.1 Measurement Evaluation



Configuration Section	ID	Function
Measuring Time	2.1.1	If Evaluation Window Criteria is not met, the Measurement will end after the Measuring Time
Start Condition	2.1.2	Measurement Starts when the Measured Temperature exceeds this value
Stop Difference	2.1.3	See Measurement Mode 'MULTI'
End Signal Duration	2.1.4	Controls the length of time that the Buzzer and Red Light will signal the end of the measurement
Window	2.2	Temperature Result will be selected when the Measured Temperature stays within the Window Height for the Window Length time
Window Delay	2.2.3	The Evaluation is not started until after the Window Delay time
Window Mode	2.2.4	Temperature Result can be calculated as either the Mean (Average) or the Mid-Point ((Min+Max)/2) of the Temperature Values in the Evaluation Window by selecting the Window Mode
Measurement Mode	2.3	The Measurement Cycle is Reset dependent on the Measurement Mode <ul style="list-style-type: none"> <li>• DIP: Reset after the Thermocouple is replaced – For use with Single-Use Probes</li> <li>• MULTI: Reset when the Temperature drops by the amount of the Stop Difference below the Start Condition – For use with Multi-Use Probes</li> </ul>
Display Precision	3.3	Measurement Results are evaluated with one-tenth of a degree precision. Setting this parameter to 'No' will cause the result to be displayed to the nearest one degree.

## 4.4 Measurement History

The Digilance stores the last 500 measurements in the History section, accessed from the Main Menu.








- Scroll through the Measurement Results using  and  when the result list (e.g. '1 of 500') is highlighted
- Additional measurement information can be accessed by pressing  and using  and  to change pages, when the page number (e.g. 'Page 1') is highlighted
- Measurement Result can be re-transmitted using Page 3 of the History (Only Wireless Devices)
- The Measurement History can only be cleared by the Administrator (See Section 'Instrument Configuration')

## 4.5 Additional Measurement Information






The Digilance has the possibility to label measurements with additional information, such as Heat Number and Place, to connect the results with the production process.



Configuration Section	ID	Function
Set Heat Number	3.1.1	Configure the Heat Number Value (Alphanumeric, 10 digits)
Display Heat Number	3.1.2	If set to 'Yes' it is possible to enter Heat Numbers from the Main Measurement Display
Set Place1 – 8	3.2.1 – 8	Configure the List of Eight Measurement Place Names (Alphanumeric, 10 digits)
Display Place	3.2.9	If set to 'Yes' it is possible to select the Measurement Place from the Main Measurement Display

### 4.5.1 Working with Heat Numbers

- Set Parameter 'Display Heat Number' (3.1.2) to 'Yes'
- On the Main Measurement Display, edit the Heat Number by pressing 
- Use  and  to adjust the value for each digit
- Use  to advance to the next digit
- Press  to exit the edit function and finalize the Heat Number value
- Once a new Heat Number is entered,  will appear next to the value until a measurement is taken
- When Checkmate Measurements are detected:
  - The Heat Number will be stored as 9999999999
  -  will be displayed after the Heat Number

### 4.5.2 Working with Measurement Places

- Configure the Place Names in Parameters 'Set Place1 – 8' (3.2.1 – 8)
- Set Parameter 'Display Place' (3.2.9) to 'Yes'
- On the Main Measurement Display, select the Place by pressing 
- Use  and  to scroll through the list of Places
- Press  to confirm selection
- Press  to cancel

If both Heat Number and Measurement Place are activated, use  and  to toggle between the two options on the Main Measurement Display.



## 4.6 Battery Charging


The Digilance utilizes a Lithium Ion Battery Pack. The Battery Pack monitors the conditions and cell output, in order to protect the Battery Cells from Damage, such as Short Circuit or Excessive Temperatures.

- The Charge Level of the Digilance Battery Pack is show in the Upper-Left Corner of the Display.
- Information on the Status of the Battery Pack can be found in the Main Menu

	<p><b>Warning:</b></p> <ul style="list-style-type: none"> <li>• <b>Exchange the battery when the Battery State of Health is below 50%.</b></li> </ul>
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- Charge the Battery Pack with included Power Supply (12V DC, 2A) by connecting the Power Supply Plug to the Charging Jack:



- During the Charging Process, the Charge Status can be viewed by pressing 

### Charging Process:

Display Message	LED	Status
Setup Charging	Yellow (Blinking)	Displayed when the Power Supply is initially connected to the device
Charging ...%	Green (Blinking)	Charge Level Indication
Battery Full 100%	Green (Stable)	Battery is Fully Charged




### Charging Errors:

Display Message	LED	Status
No Charge Power	Yellow (Blinking)	Power Supply is connected to the device, but there is no charging current
Battery Too Cold	Yellow (Blinking)	Battery Temperature is below charging limit (0°C) If the Battery is Too Cold, the charge current is used to heat the pack, charging will initiate when the temperature is above the minimum limit.
Battery Too Hot	Yellow (Blinking)	Battery Temperature is above charging limit (45°C)
Over temperature	Yellow (Blinking)	Battery Temperature is above maximum limit (60°C)
Charging Error	Yellow (Blinking)	There is a problem with the Battery Pack. Check state of health of battery. Consult Heraeus Electro-Nite.



## 4.7 Power Management






After the initial activation, the instrument will Power-On by movement. This behavior can be adjusted with the Power Management settings (See Section '*Instrument Configuration*')

Configuration Section	ID	Function
Awake Time	4.1	Determines how long the instrument will remain awake after activity. Set the values to 'ALWAYS' to manually power the instrument On and Off.
Motion Sensitivity	4.2	Controls the accelerometer sensitivity, to avoid that the instrument is powered On by vibrations.
Transport Mode	4.3	<ul style="list-style-type: none"><li>• Transport Mode can be activated by:<ul style="list-style-type: none"><li>○ By pressing and holding  and  for 3 seconds</li><li>○ By setting Configuration Option 4.3 to 'Yes'</li></ul></li><li>• If Transport Mode is active, the instrument must be re-activated by pressing and holding </li></ul>



## 5 Instrument Configuration

Configuration can be accessed from the Main Menu.

- Press  to access the Main Menu
- Select 'Configuration', and Login
- Scroll through the menu using  and .
- Use  to edit an item or confirm a selection and  to cancel or exit the menu.

### 5.1 Configuration Login

- The standard password for the instrument is **2 4 4 8**
- A special password is required to access the Administrator Section. Contact your local Heraeus Electro-Nite sales representative to access these parameters.

### 5.2 Configuration Parameters

ID	Configuration Section	Options	Default (EU)	Default (US)
<b>1</b>	<b>Instrument Setup</b>			
1.1 <sup>(L)</sup> <sup>(R)</sup>	TC Type	S / B / K / R / D	See Table Below	See Table Below
1.2 <sup>(L)</sup> <sup>(R)</sup>	TC Table	ITS90 / IPTS68 / IPTS48	ITS90	ITS90
1.3 <sup>(L)</sup> <sup>(R)</sup>	Temperature Unit	°C / °F	°C	°F
1.4	Time			
1.4.1 <sup>(L)</sup> <sup>(R)</sup>	Time Format	AM/PM, 24hr	24hr	AM/PM
1.4.2	Set Time			
1.5	Date			
1.5.1 <sup>(L)</sup> <sup>(R)</sup>	Date Format	DD/MM/YY, MM/DD/YY	DD/MM/YY	MM/DD/YY
1.5.2	Set Date			
<b>2</b>	<b>Evaluation</b>			
2.1	Timing & Start			
2.1.1 <sup>(L)</sup> <sup>(R)</sup>	Measuring Time	4 – 60 s	6s	10s
2.1.2 <sup>(L)</sup> <sup>(R)</sup>	Start Condition	200 – 1200 °C	1100°C	500°C
2.1.3 <sup>(L)</sup> <sup>(R)</sup>	Stop Difference	0 – 200 °C	100°C	100°C
2.1.4 <sup>(L)</sup> <sup>(R)</sup>	End Signal Duration	0.5 – 10 s	2s	2s
2.2	Window			
2.2.1 <sup>(L)</sup> <sup>(R)</sup>	Window Height	0.2 – 10 °C	3°C	3°C
2.2.2 <sup>(L)</sup> <sup>(R)</sup>	Window Length	0.2 – 5 s	1.2s	1.2s
2.2.3 <sup>(L)</sup> <sup>(R)</sup>	Window Delay	0.0 – 5 s	0.5s	0.5s
2.2.4 <sup>(L)</sup> <sup>(R)</sup>	Window Mode	Average, (Min-Max)/2	Average	Average
2.3 <sup>(L)</sup> <sup>(R)</sup>	Measurement Mode	DIP/MULTI	DIP	MULTI
<b>3</b>	<b>Display Setup</b>			
3.1	Heat Number			
3.1.1	Heat Number	Alphanumeric, 10 digits	0000000000	0000000000
3.1.2 <sup>(R)</sup>	Display Heat Number	Yes/No	No	No
3.2	Place			
3.2.1	Place	Alphanumeric, 10 digits	- FURNACE 01	- FURNACE 01
...	...	...	...	...
3.2.8	Place	Alphanumeric, 10 digits	- FURNACE 08	- FURNACE 08
3.2.9 <sup>(R)</sup>	Display Place	Yes/No	No	No
3.3 <sup>(R)</sup>	Display Precision	Yes/No	No	No



ID	Configuration Section	Options	Default (EU)	Default (US)
<b>4</b>	<b>Power Management</b>			
<b>4.1<sup>(L)</sup> <sup>(R)</sup></b>	Awake Time	Always – 180s	15s	15s
<b>4.2<sup>(L)</sup> <sup>(R)</sup></b>	Motion Sensitivity	LOW/MID/HIGH	Mid	Mid
<b>4.3</b>	Transport Mode	Yes/No	No	No
<b>5<sup>(W)</sup></b>	<b>Communication</b>	<i>(Wireless Versions Only)</i>		
<b>5.1<sup>(R)</sup></b>	Wireless ID	1 – 39	35	35
<b>5.2<sup>(R)</sup> <sup>(W)</sup></b>	Wireless Mode	Wireless Off MC Telegram Data Telegram MC Telegram & Data Telegram	MC Telegram	MC Telegram
<b>5.3<sup>(R)</sup> <sup>(W)</sup></b>	Data Telegram	Telegram 1 Telegram 2 Telegram 3 Programmable Telegram	Telegram 1	Telegram 3
<b>5.4<sup>(W)</sup></b>	Melt Control ID	Alphanumeric, 6 digits	Production Serial Number	Production Serial Number
<b>6</b>	<b>Service</b>			
<b>6.1</b>	Device Status	Hardware Status Screen		
<b>6.2</b>	Load Standard Parameters	Yes/No	No	No
<b>6.3</b>	Reset All Parameters	Yes/No	No	No
<b>6.4</b>	Temperature Offset	-5.0°C to +5.0°C	0°C	0°C
<b>7<sup>(A)</sup></b>	<b>Administrator</b>			
<b>7.1<sup>(A)</sup></b>	Region Preference	EU/US	EU	US
<b>7.2<sup>(A)</sup></b>	Calibrate System	Yes/No	No	No
<b>7.3<sup>(A)</sup></b>	Clear Result History	Yes/No	No	No
<b>7.4<sup>(W)</sup> <sup>(A)</sup></b>	Laird System ID	No (Automatic) or 1 – 39	No	No

- <sup>(R)</sup> – Reset to Default by Reset All Parameters
- <sup>(L)</sup> – Reset to Default by Load Standard Parameters
- <sup>(W)</sup> – Wireless Instruments Only
- <sup>(A)</sup> – Administrator Access Only

#### Default TC Type Table

Part Number	Default TC Type
3102001X	TYPE S
3102002X	TYPE R
3102003X	TYPE B
3102004X	TYPE K

## 6 Advanced Operation (Wireless)


- Wireless Communication Options are only available for device Model DL5W
- Information on Wireless Communication Configuration can be found in the Wireless Communication Appendix



## 7 Maintenance


### 7.1 Procedures for maintenance and repair

If measurement or testing work is to be carried out on an active unit, your national accident prevention rules and regulations must be observed. Use only suitable electrical tools.

	<p><b>Warning:</b></p> <ul style="list-style-type: none"> <li>Repairs may only be carried out by Heraeus Electro-Nite service personnel. For replacement purposes, use only parts or components contained in the spare parts list or listed in the Spare Parts. Unauthorized opening of equipment and improper repairs can result in loss of life or severe personal injury as well as substantial property damage.</li> <li>Do not throw batteries into an open fire and do not solder on batteries (danger of explosion).</li> <li>Only use replacement battery packs supplied by Heraeus Electro-Nite.</li> </ul>
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### 7.2 Guidelines for Handling (ESD)

VLSI chips (MOS technology) are used in practically all Heraeus Electro-Nite electronic modules. These VLSI components are, by their nature, very sensitive to over voltages and thus to electrostatic discharge (ESD).


	<p>This pictogram and warning label is used on cabinets, subracks, and packing and suggests that modules are susceptible to ESD.</p> <p>Before starting maintenance or installation make sure that you have sufficient protection against ESD.</p>
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Electronic devices can be destroyed by voltage and energy levels that are far below the level perceptible to human beings. Such voltages can occur when a component or a module is touched by a person who has not been electrostatically discharged. In most cases, the components subjected to such over voltages, cannot be immediately detected as faulty; the fault occurs only after a long period in operation.

### 7.3 Cleaning notes

The instrument can be cleaned with a damp cloth and mild detergent.


### 7.4 Battery

	<p><b>Warning:</b></p> <ul style="list-style-type: none"> <li>Battery should not be replaced. The only allowed replacement is by the one specified in the 'Spare Parts' list</li> </ul>
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### 7.5 Performing a test measurement with a Checkmate

A Checkmate instrument is used to check the basic function of Heraeus Electro-Nite instrumentation. The Digilance the burnout is set to negative, and the Checkmate should also be set to negative.


When Checkmate Measurements are detected:

- Heat Number will be stored as 9999999999
-  will be displayed after the Heat Number

More information about the configuration of the Checkmate can be found in its user manual.



### 7.6 Calibrating the system

	<p><b>Warning:</b></p> <ul style="list-style-type: none"> <li>ONLY AUTHORISED PERSONNEL MAY CALIBRATE THE SYSTEM.</li> <li>The instrument is calibrated prior to delivery.</li> <li>Calibration should be performed yearly.</li> <li>Before calibration, ensure the instrument is acclimatized.</li> </ul>
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## 8 Troubleshooting

Fault/Warning Sign	Possible Cause	Remedy / required action
With sensor plugged in, the instrument fails to signal <b>Ready</b> .	Sensor defective. Contact piece defective. Compensating cable defective.	Exchange the sensor. Exchange the contact piece. Exchange compensating cable.
After dipping the sensor, the instrument signals no measurement.	Polarity of the measuring cable reversed.	Connect the cable correctly.
Setup charging	Charging is configuring.	Wait a few seconds for the setup is configured.
Charging ..%	Battery is charging.	None.
Battery Full 100%	Battery is fully charged.	None.
No charge power	Adapter is connected but no power is supplied.	Apply power to the adapter.
Overtemperature	Temperature is too high.	Battery Temperature is above maximum limit (60°C). Lower the instrument temperature.
Battery too cold	Battery is too cold for charging.	Battery Temperature is below charging limit (0°C). The charge current is used to heat the pack, charging will initiate when the temperature is above the minimum limit.
Battery too hot	Battery is too hot for charging.	Battery Temperature is above charging limit (45°C). Lower the instrument temperature.
Charging error	Error occurred during charging; no charging possible.	Check state of health of battery. Consult Heraeus Electro-Nite.
Transport mode	Accelerometer is switched off.	Accelerometer will be switched on as soon as the instrument is switched on by pressing the green button.
Error TC Break	Thermocouple is broken.	Apply a new thermocouple. Check lance wiring and contact block if errors continue.
Error No Eval	No evaluation possible because the measurement values are not in the set window and the end time is reached.	Review the window settings.
Error No CJT	Not possible to compensate the measurement for cold junction temperature because no cold junction temperature was measured.	Reference temperature measurement within instrument is defective. Consult Heraeus Electro-Nite.
Error Out of range	Measured temperature is out of range for the configured TC type.	Check TC type and start temperature.





## 9 Technical data

<b>Measurement Application</b>	Single or Multi-dip temperature measurement											
<b>Measurement Channel</b>	One analog input											
<b>Sample Rate</b>	10 samples/second											
<b>Measurement Range</b>	<table border="0"> <tr> <td>Type S (Pt 10%Rh / Pt)</td> <td>400 to 1768°C (752 to 3214°F)</td> <td rowspan="5">According to IEC 60584</td> </tr> <tr> <td>Type R (Pt 13%Rh / Pt)</td> <td>400 to 1768°C (752 to 3214°F)</td> </tr> <tr> <td>Type B (Pt 30%Rh / Pt 6%Rh)</td> <td>400 to 1820°C (752 to 3308°F)</td> </tr> <tr> <td>Type K (Ni-Cr / Ni)</td> <td>400 to 1372°C (752 to 2502°F)</td> </tr> <tr> <td>Type D (W / Re)*</td> <td>400 to 2300°C (752 to 4172°F)</td> </tr> </table> <p style="text-align: right;">*ASTM 988</p>	Type S (Pt 10%Rh / Pt)	400 to 1768°C (752 to 3214°F)	According to IEC 60584	Type R (Pt 13%Rh / Pt)	400 to 1768°C (752 to 3214°F)	Type B (Pt 30%Rh / Pt 6%Rh)	400 to 1820°C (752 to 3308°F)	Type K (Ni-Cr / Ni)	400 to 1372°C (752 to 2502°F)	Type D (W / Re)*	400 to 2300°C (752 to 4172°F)
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Type D (W / Re)*	400 to 2300°C (752 to 4172°F)											
<b>Thermocouple Tables</b>	IPTS 48 / IPTS 68 / ITS 90											
<b>Thermocouple Accuracy</b>	Better than +/- 1°C between 0°C and 50°C ambient temperature											
<b>Display Resolution</b>	Configurable 1° or 0.1°											
<b>Display Units</b>	°C or °F											
<b>Data Storage</b>	500 measurement results with heat number and date/time storage. Transfer of stored data using wireless technology.											
<b>Power Supply</b>	Lithium Ion Battery Pack (3.5Ah – 7.2V)											
<b>Charging Voltage</b>	12V DC, 2A MAX											
<b>Battery Life</b>	40 operating hours (nominal)											
<b>Wireless Communication (optional)</b>	Range of 100 meters - line of sight Frequency hopping 2.4 GHz ISM unlicensed band technology Max 10 mW transmit power											
<b>Operating Ambient Temperature Range</b>	-20°C (-4°F) to 60°C (140°F), max. 90% RH non-condensing											
<b>Environmental Protection</b>	IP55 (with lance installed)											
<b>Size</b>												
<b>Weight (without lance)</b>	1.9kg (4.2lbs)											

## 10 Spare Parts

When ordering spare parts, always provide the instrument type and instrument serial number.

Description	UCS (Part Number)
Battery Pack Replacement 	31600257
Rubber Boot 	31600258
Standard Housing Replacement 	31600259
Wireless Housing Replacement 	31600260
Antenna Assembly 	31600261
Thermocouple Lug Screw 	31600262
Front Plate Screw 	31600263
Lance Bolt 	31600264
Power Supply 	31320010
Lances and Cable Assemblies	Contact your local representative for information

