

## FCC NOTICE

This device complies with Part 15 of the FCC Rules. 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.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**WARNING:** Modifications not expressly approved by this company could void the user's authority to operate the equipment.

**FCC ID: STG-DFQMX4**

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**HIGH PERFORMANCE  
INFRARED THERMOMETER**

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57701-E1

## WARRANTY

Raytek warrants this product to be free from defects in material and workmanship under normal use and service for a period of one year\* from date of purchase except as hereinafter provided. This warranty extends only to the original purchaser (a purchase from Raytek or Raytek's licensed distributors is an original purchase). This warranty shall not apply to fuses or batteries. Factory calibration is warranted for a period of one year. The warranty shall not apply to any product which has been subject to misuse, neglect, accident, or abnormal conditions of operation or storage. Should Raytek be unable to repair or replace the product within a reasonable amount of time, purchaser's exclusive remedy shall be a refund of the purchase price upon return of the product.

In the event of failure of a product covered by this warranty, Raytek will repair the instrument when it is returned by the purchaser, freight prepaid, to an authorized Service Facility within the applicable warranty period, provided Raytek's examination discloses to its satisfaction that the product was defective. Raytek may, at its option, replace the product in lieu of repair. With regard to any covered product returned within the applicable warranty period, repairs or replacement will be made without charge and with return freight paid by Raytek, unless the failure was caused by misuse, neglect, accident, or abnormal conditions of operation or storage, in which case repairs will be billed at a reasonable cost. In such a case, an estimate will be submitted before work is started, if requested.

The foregoing warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. Raytek shall not be liable for any special, incidental or consequential damages, whether in contract, tort, or otherwise.

## GARANTIEBEDINGUNGEN

Raytek gewährt für dieses Produkt eine Garantie von einem Jahr\* ab dem Kaufdatum. Der Hersteller garantiert, daß das Produkt im genannten Zeitraum bei ordnungsgemäßer Anwendung und Wartung keine Material- und Bearbeitungsfehler aufweist. Ausnahmen sind im folgenden festgelegt.

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Die vorstehenden Garantiebedingungen ersetzen alle anderen eventuell gemachten ausdrücklichen oder stillschweigenden Zusicherungen. Raytek übernimmt keine Haftung für einen besonderen, beiläufigen oder mittelbaren Schaden, gleich ob dieser im Rahmen des Vertrages, durch eine unerlaubte Handlung oder auf andere Weise entstanden ist.

\* European Union (EU): two years/zwei Jahre

## CONDITIONS DE GARANTIE

Raytek accorde sur ce produit une garantie d’un an\* à compter de la date d’ achat. Le fabricant garantit pendant cette période l’ absence de vice de matériau ou de fabrication, à condition que le produit soit utilis é et entretenu normalement et à l’ exclusion des cas définis ci-après. La présente garantie ne s’ applique qu’ au premier acheteur (est considéré comme premier achat l’ acquisition d’ un produit vendu directement par Raytek ou par un distributeur agréé par lui). Les fusibles et les piles sont exclus de la garantie. Raytek accorde une garantie d’ un an sur l’ étalonnage effectué en usine. L’ utilisation d’ un produit dans un but non conforme à l’ usage auquel il est destiné, la négligence, l’ utilisation de produits abîmés, les erreurs d’ utilisation ou de stockage entraînent une exclusion de garantie.

Dans le cas où Raytek ne serait pas en mesure de réparer ou de remplacer le produit dans un délai convenable, l’ acheteur pourra exiger uniquement le remboursement du prix de l’ appareil contre restitution de ce dernier au vendeur.

Raytek assurera la réparation des appareils tombés en panne pendant la période de garantie. L’ acheteur expédiera l’ appareil défectueux à une station technique agréée, à ses frais et pendant le délai de garantie. Raytek se réserve le droit de procéder à l’ échange de l’ appareil au lieu de le réparer. La réparation ou le remplacement seront effectués gratuitement si l’ appareil d éfectueux est retourné pendant le délai de garantie. Les frais de retour au client seront à la charge de Raytek. Les frais de réparation seront facturés au client lorsque la panne sera liée à un défaut de manipulation ou d’ utilisation, à de la négligence, à des causes extérieures ou à un stockage inapproprié. Un devis sera établi avant réparation à la demande du client.

Les présentes conditions de garantie remplacent toutes les autre assurances qui auraient pu être données expressément ou tacitement. Raytek décline toute respons abilité pour tout dommage particulier, causé incidemment ou indirectement, que celui-ci soit survenu dans le cadre du présent contrat ou ait été provoqué par un délit civil ou par toute autre cause.

<sup>[\*]</sup> European Union (EU): two years/deux ans

## CONDICIONES DE GARANTÍA

Raytek concede en relación a este producto una garantía de un año\* a partir de la fecha en que se realice la compra. El fabricante garantiza que el producto, dentro del espacio de tiempo referido, siempre que se aplique correctamente y se lleve a cabo el mantenimiento adecuado, no ha de presentar fallos de material o de fabricación. Más adelante se mencionará alguna excepción. Esta garantía es válida respecto de la adquisición primaria (se entiende por adquisición primaria del producto aquella llevada a cabo directamente de Raytek o bien por medio de un establecimiento autorizado por Raytek). La garantía no cubre los fusibles ni las pilas. En relación al calibrado llevado a cabo en fábrica,

Raytek concede un tiempo de garantía de un año. La garantía no cubre ningún producto que haya sido usado inadecuada o negligentemente, se haga hecho funcionar o se haya almacenado estando dañado o de manera no autorizada.En el caso de que a Raytek no le sea posible reparar o substituir un producto dentro de un plazo razonable, el comprador, con carácter de reivindicación jurídica única, puede exigir la devolución de la suma a la que haya ascendido la compra devolviendo por su parte el producto en cuestión. En el caso de un defecto del aparato que tenga lugar durante el tiempo de garantía, Raytek se hace cargo de la reparación. Para ello, el comprador, corriendo con los gastos, ha de enviar el aparato que sea objeto de reclamación a un servicio de reparaciones autorizado dentro del plazo de validez de la garantía. En caso de que lo considere conveniente, Raytek se reserva el derecho de substituir el aparato en lugar de hacerse cargo de la reparación. Si se envía un aparato defectuoso durante el tiempo en que es válida la garantía, la reparación o bien la substitución del aparato el cliente una cuenta por los costes correspondientes a la reparación. En este caso el cliente puede solicitar un presupuesto para la reparación antes de llevarse ésta a cabo.

Las presentes condiciones de garantía substituyen las demás eventuales garantías realizadas de modo explícito o implícito. Raytek no acepta niguna responsabilidad respecto a especiales daños ocasionales o indirectos, bien hayan acontecido éstos en el marco del contrato bien se deban a un manejo indebido o a cualesquiera otras causas. defectuoso es gratis. Los costes del envío de vuelta al cliente corren a cargo de Raytek. En el caso de que el defecto se deba a una manipulación incorrecta, negligencia, daño causado por agentes exteriores, almacenamiento o empleo no autorizados, recibirá

<sup>[\*]</sup> European Union (EU): two years/dos años

## CONDIÇÕES DE GARANTIA

Para o presente produto a Raytek concede uma garantia de um ano\* contados a partir da data de compra. O fabricante garante que o produto está livre de defeitos de materiais e de fabricação durante o período mencionado se o produto for devidamente utilizado e conservado. As exceções são estipuladas a seguir. Esta garantia só será concedida ao primeiro adquirente (a compra do produto na Raytek ou num concessionário autorizado da Raytek é considerada primeira aquisição). A garantia não cobre fusíveis e pilhas. A Raytek concede uma garantia de um ano para a calibragem feita na fábrica. A garantia não inclui produtos utilizados ou danificados indevida ou negligentemente, produtos usados ou armazenados inadmissivelmente. Caso a Raytek não esteja em condições de reparar ou substituir o produto durante um período de tempo apropriado, o comprador pode solicitar o reembolso do preço contra devolução do produto como úfanico recurso.

Em caso de um defeito no aparelho durante o período coberto pela garantia, a Raytek responsabiliza-se pela reparação do mesmo. Cabe ao comprador enviar o aparelho reclamado por conta própria e durante o período de garantia para um posto autorizado de assistência técnica. A Raytek reserva-se o direito de substituir o aparelho em vez de repará-lo. Ao enviar o aparelho defeituoso durante o período de garantia, a reparação ou a substituição do mesmo são gratuitos. Os custos da remessa do aparelho ao cliente serão pagos pela Raytek. Se o defeito resultar de tratamento impróprio, negligência, danos causados por efeitos exteriores, condições inadmissíveis de utilização ou armazenamento, os custos da reparação serão correspondentemente faturados. Neste caso é possível calcular uma estimativa dos custos antes da reparação por pedido do clientes condições de garantia presentes substituem todas as outras garantias feitas eventualmente explícita ou implicitamente. A Raytek não se responsabiliza por danos particulares, acidentais ou diretos, sejam causados no quadro do presente contrato, em consequência de atos ilícitos ou de qualquer outra forma.

<sup>[\*]</sup> European Union (EU): two years/dois anos



## **HIGH PERFORMANCE INFRARED THERMOMETER**



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## INTRODUCTION



We hope you enjoy using your infrared thermometer! It measures the amount of infrared energy emitted by a target object, and calculates the temperature of that object's surface.

## FEATURES

Your thermometer includes:

- Laser sighting
- Adjustable emissivity
- High/Low Alarm
- MAX, MIN, DIF, AVG
- Data Logger (100 points)
- Trigger lock
- Graphic display ... and more!

## ACCESSORIES

(optional)



The accessories package for your infrared thermometer, if ordered, includes:

- external power supply
- thermocouple type K
- Windows-based software
- RS232 cable

## OPTIONAL POUCH



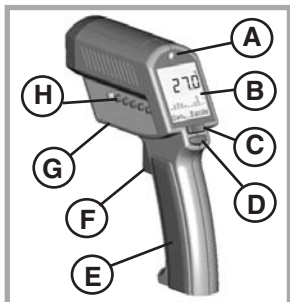
The optional pouch comes with a belt clip and helps to protect your infrared thermometer when not in use.

## FUNCTIONS

### USER INTERFACE

Function keys and display:

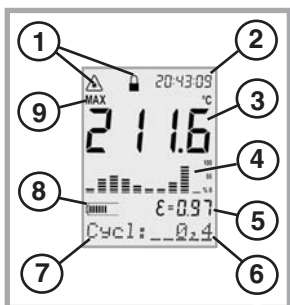
- (A) Visual and audible alarm
- (B) Display
- (C) Up and Down keys
- (D) Enter
- (E) Handle and battery compartment (DIP switches for adjustments are inside handle)
- (F) Trigger
- (G) Tripod mount
- (H) 6 main function keys



## DISPLAY

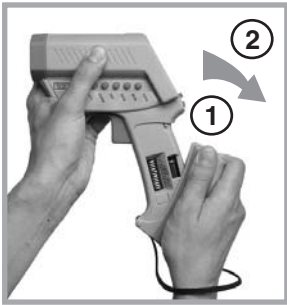
Displayed functions:

- (1) Laser condition / Lock symbol
- (2) Time (or date)
- (3) Main temperature display
- (4) Graphic display
- (5) Emissivity value
- (6) Status bar
- (7) Mode indicator
- (8) Battery life indicator
- (9) MAX, MIN, DIF, AVG symbols





## BATTERIES



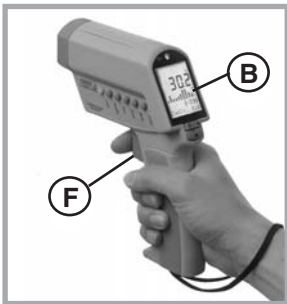
To open the battery compartment, press gently on the top part of the handle (1) to release the catch (2) and pivot the grip as shown in the figure.

Orient the batteries (two alkaline R6 (AA, UM3)) as shown on the housing.

english

## MEASUREMENT

### QUICK START



To take a temperature measurement, hold the unit as shown. Aim at the target. Pull the trigger (F). The temperature of the object being measured is shown on the display (B). The temperature will be displayed for seven seconds after the trigger is released.

The unit automatically switches “off” after 7 seconds if a function key is not pressed. The last settings are stored. The display returns to the last mode selected.

To recall the last reading, press ENTER without pulling the trigger.

## MEASUREMENT

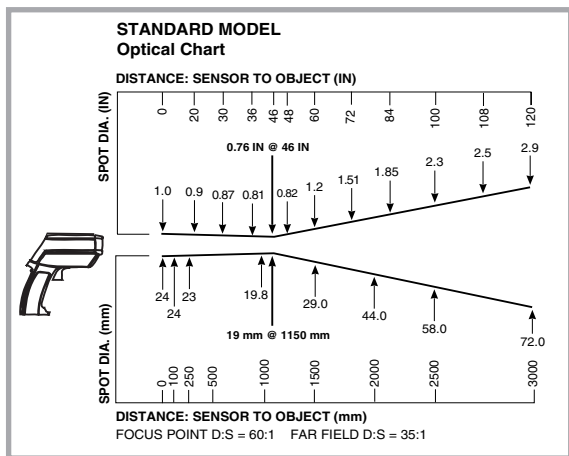
### CONTINUOUS

Open the battery compartment and switch LOCK "on" to lock the unit on. You may mount the unit on a tripod, using the tripod mount. Pull the trigger for continuous temperature measurement. (The laser will not be locked on.) To unlock, switch LOCK off.



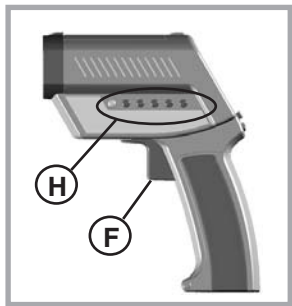
## MEASUREMENT

### SPOT SIZE



The measured spot size depends on the distance between the object you are measuring and the infrared thermometer. The relationship between distance and spot size is 60:1 at the focus point. The D:S in the far field (>33ft/10m) is 35:1.

## SELECTING A FUNCTION



To select a function, first turn the unit on by pulling the trigger (F). Then push the button of the desired function (H). To change functions, press ENTER or the function button again, and then the new function button.

## LASER ON/OFF



The laser sight simplifies sighting of the measurement object. It shows the spot size that includes the measured target.

To turn the laser on or off press the LASER button (K) when the trigger is pulled. A laser symbol (1) appears when the laser is on. The laser automatically turns off if you release the trigger.



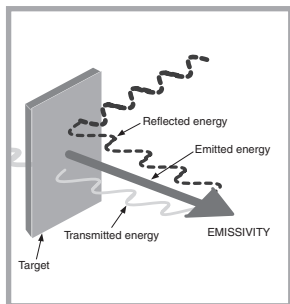
laser ON  
symbol

## EMISSIVITY

### EMISSIVITY EXPLAINED

The amount of infrared energy radiated by an object depends on its emissivity and its temperature.

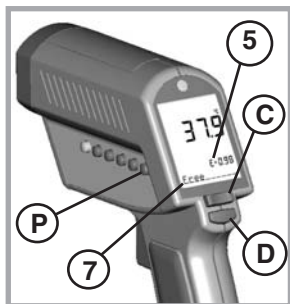
The emissivity depends on the material and its surface characteristics. For more accurate readings, adjust the emissivity value for the type of material being measured.



## EMISSIVITY

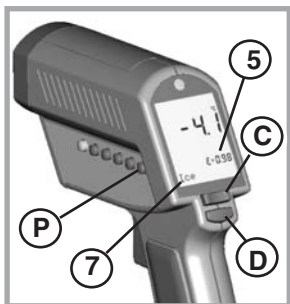
### ADJUST EMISSIVITY

To adjust the emissivity value, press EMISS (P). Use the Up and Down keys to select "Free" ("Free" will have a flashing underline) (7). Press EMISS again. "Free" is not underlined, and the emissivity icon (5) flashes. Use the Up and Down keys (C) to adjust. Press ENTER (D) to activate this setting.



## EMISSIVITY

### TABLE OF VALUES



To choose the emissivity of a material, press EMISS (P). The display shows a material name (7), an emissivity value, and the calculated temperature value (5). To choose another material, use the Up and Down keys (C). Press ENTER (D) to activate this setting.



## EMISSIVITY

### UNKNOWN VALUE



To adjust the unit's emissivity value for a material with unknown emissivity, plug in the probe.

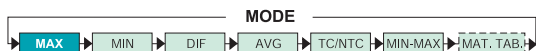
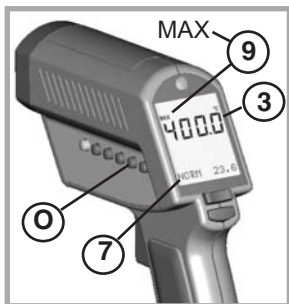
Pull the unit's trigger. Place the measuring tip of the probe on the area to be measured. Wait for the reading to stabilize.

Note the indicated probe temperature reading. Release the trigger. Pull the trigger again. Measure the same area using infrared measurement. Press the emissivity button (P). Use the Up and Down keys (C) to select the material name "Free" which will be shown in the display (7). Press the emissivity button (P) again until the emissivity sign (5) flashes. Use the arrow keys (C) to change the emissivity value until the temperature matches the probe's reading.

## MODE

### MAXIMUM

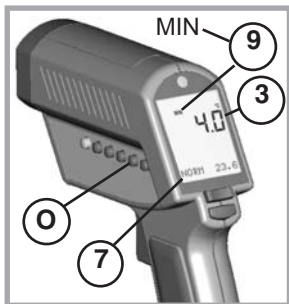
To activate the MAX mode, press MODE (O) until the MAX symbol appears (9). The measured maximum temperature is displayed (3) as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).



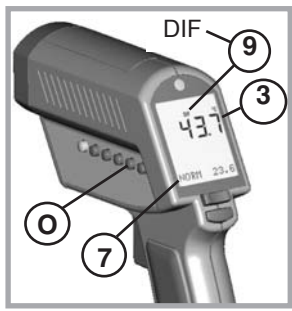
## MODE

### MINIMUM

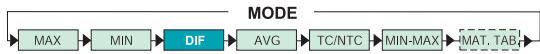
To activate the MIN mode, press MODE (O) until the MIN symbol (9) appears. The measured minimum temperature (3) is displayed as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).



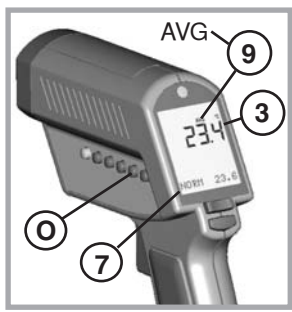
## MODE DIFFERENCE



To activate the DIF mode, press MODE (0) until the DIF symbol (9) appears. The difference between the measured max and min temperatures is displayed (3) as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).



## MODE AVERAGE



To activate the AVG mode, press MODE (0) until the AVG symbol (9) appears. The average value of measured temperatures (3) is displayed as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).

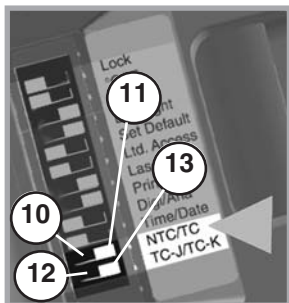


## MODE TC/NTC

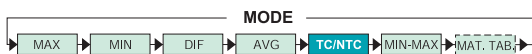
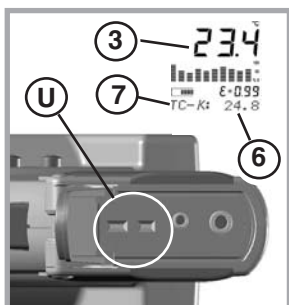
### PROBE CONNECTIONS

Open the battery compartment and set the switches according to the desired probe type.

- (10) NTC - thermistor
- (11) TC - thermocouple
- (12) Thermocouple type J
- (13) Thermocouple type K



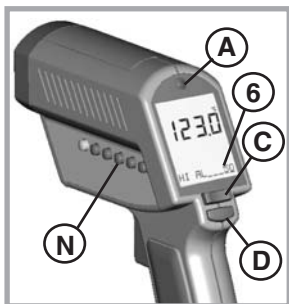
Connect the probe to the input (U). Press MODE, until the desired probe symbol (7) appears. The probe temperature is shown in the lower part of the display (6). The real time infrared temperature is shown in the main display (3).





## SETUP

### HIGH ALARM



The high alarm (HiAl) generates an audible and visual (flashing LED (A) and laser) alarm if the temperature is above the setpoint.

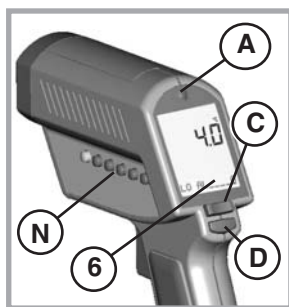
To set the alarm value (6), Press SETUP (N) once, and use the Up and Down keys (C).

Then press ENTER (D) to activate this setpoint.



## SETUP

### LOW ALARM



The low alarm (LoAl) generates an audible and visual (flashing LED (A) and laser) alarm if the temperature is below the setpoint. To set the alarm value (6), Press SETUP (N) twice and use the Up and Down keys (C).

Then press ENTER (D) to activate this setpoint.

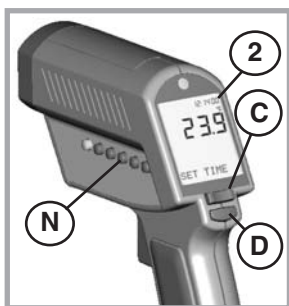


## SETUP

### TIME

To set the time, press SETUP (N) three times. Change the time (2) using the Up and Down keys (C).

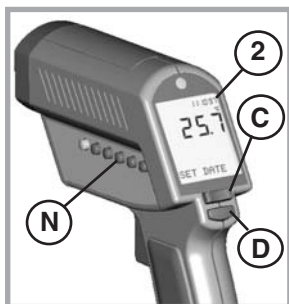
Then press ENTER (D) for each time segment to activate this time setting. The time appears on the display, is stored within the data logger, and is part of the printer output.



## SETUP

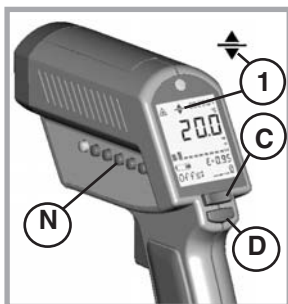
### DATE

To set the date, press SETUP (N) four times. Change the date using the Up and Down keys (C). Then press ENTER (D) for each date segment to activate this date setting. The date (2) is stored within the data logger and is part of the printer output.



## SETUP

### OFFSET



This function is used with a selected emissivity to add or subtract an offset value ( $\pm 10^{\circ}\text{C}/\pm 18^{\circ}\text{F}$ ) to the temperature value. Press the Setup button (N) until "Offset" appears in the display. With the arrow keys (C) adjust the display to the corrected value. Press ENTER (D) to

confirm. If OFFSET is used, a symbol (1) appears in the display. The OFFSET feature allows the temperature values for several units to be matched, correcting for the allowed temperature tolerance difference between units. The OFFSET function can also be used to increase the accuracy for a narrow temperature range.



## MODE

### MIN-MAX VALUES



To show the minimum and maximum temperature values during a measurement at the bottom of the display, press MODE (O) until the two values appear (6).

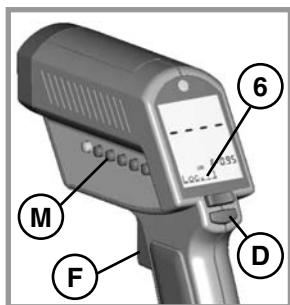


## DATA LOGGER

### HOW TO STORE DATA

By pressing the ENTER button (D) the LOG function (6) appears on the display. Pull the trigger (F) and hold it. Aim at the target. Be sure that the laser sighting is inside the target. Gently release the trigger to record the temperature. The next location will be shown on the display.

This function is also initiated by pressing the DATA button (M) once.

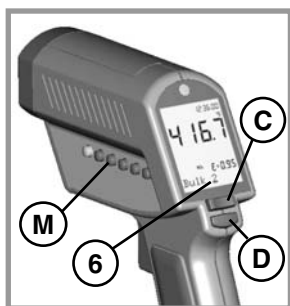


## DATA

### RECALL

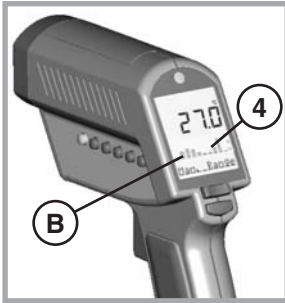
To Recall stored data, press the ENTER button (D), without pulling the trigger. Then press the DATA button (M) until RCL appears on the display. A log location will be shown (6).

To select another log location, use the Up and Down keys (C).

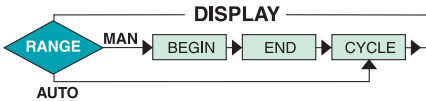


## DISPLAY

### GRAPHIC DISPLAY

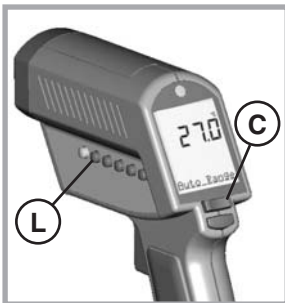


The graphic display (4) shows the temperature as a picture. The last ten measurements are shown (B). It is possible to choose between Auto Range and Manual Range. In manual range the user defines the beginning and ending temperature points of the graph.

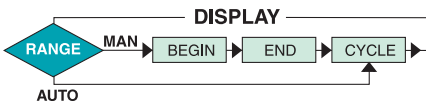


## DISPLAY

### AUTO OR MAN RANGE



Press DISPLAY (L) once. Use the Up and Down keys (C) to toggle between ranges. Auto Range is automatically defined by the measured maximum and minimum value. Manual Range (Man Range) is user defined (see DISPLAY, BEGIN section).

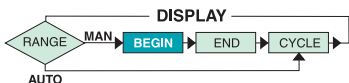
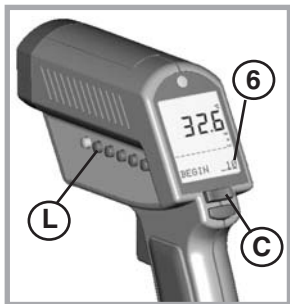


## DISPLAY

BEGIN

(Man. Range)

To set the BEGIN value for the graphic display (Man Range is activated), press DISPLAY (L) until "Begin" is shown at the status bar. Use the Up and Down keys (C) to select the value (6).

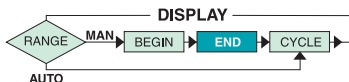
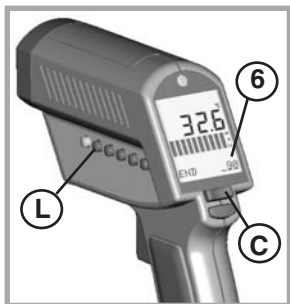


## DISPLAY

END

(Man. Range)

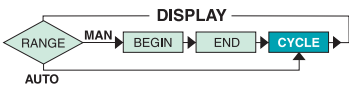
To set the END value of the graphic display (Man. Range), press DISPLAY (L) until "End" is shown at the status bar. Use the Up and Down keys (C) to select the value (6).



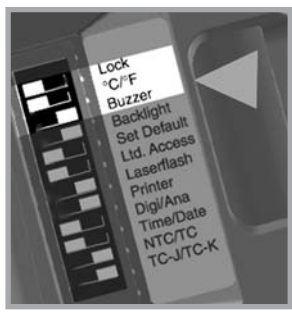
## DISPLAY CYCLE



CYCLE allows the adjustment of the display interval. Press DISPLAY (L) until Cycl.: (7) is shown at the status bar. To select the interval time, use the Up and Down keys (C). The default value is pre-set for 0.2 sec.



## SETTINGS (PART 1)



























Change the setting in the unit by using the DIP switches located in the battery compartment (see BATTERIES section).

- Lock: Trigger locked (on) or unlocked (off).
- °C/°F: changes between °C and °F and date and time format.
- Buzzer: Audible alarm On or Off.

# SETTINGS

(PART 2)

Factory Defaults		DIP-Switch Settings	
	Lock		Lock
	C/ F		C/ F
	Buzzer		Buzzer
	Backlight		Backlight
	Set Default		Set Default
	Ltd. Access		Ltd. Access
	Laserflash		Laserflash
	Printer		Printer
	Digi/Ana		Digi/Ana
	Time/Date		Time/Date
	NTC/TC		NTC/TC
	TC-J/TC-K		TC-J/TC-K

Celsius setting shown                      Fahrenheit setting shown

**Backlight:** Backlight On or Off.

**Set Default:** Activates the factory defaults by overwriting listed settings (see specifications).

**Ltd. Access:** No function buttons will work.

**Laserflash:** The laser flashes in case of over- or underranging of the alarm values.



## SETTINGS

(PART 3)  
PRINTER

	D17.03.98 @14:41:38 T023.9 X025.6	
(15)	D18.03.98 @14:53:30 T024.5 X-30.0	(16)
	D18.03.98 @14:53:31 T024.4 X-30.0	
	D18.03.98 @14:53:32 T024.3 X-30.0	
(14)	D18.03.98 @14:53:33 T024.3 X-30.0	(17)
	D18.03.98 @14:53:34 T024.4 X-30.0	
	D18.03.98 @14:53:35 T024.4 X-30.0	
	D18.03.98 @14:53:36 T024.4 X-30.0	
	D18.03.98 @14:53:37 T034.0 X-30.0	
	D18.03.98 @14:53:38 T033.7 X-30.0	
	D18.03.98 @14:53:39 T024.4 X-30.0	
	D18.03.98 @14:53:40 T024.3 X-30.0	
	D18.03.98 @14:53:41 T031.4 X-30.0	
	D18.03.98 @14:53:42 T024.5 X-30.0	
	D18.03.98 @14:53:43 T022.2 X-30.0	
	D18.03.98 @14:53:44 T024.8 X-30.0	
	D18.03.98 @14:53:45 T024.6 X-30.0	

Printer: (ON) The printer's data output (RS232) is working as long as the trigger is pulled. The protocol includes:

- (14) Date
- (15) Time
- (16) Target temperature - infrared
- (17) Target temperature- probe "X"

See software manual for other printout options.

## SETTINGS

(PART 4)

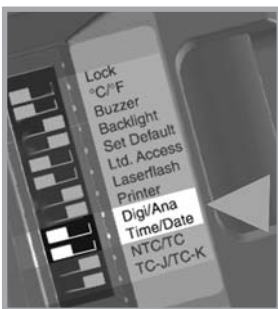
Digi/Ana:

Digital or Analog output.

Digital (RS232) output must be used with the printer or a PC. Analog output (mV/°) is usually used for data logging.

Time/Date:

Time or date shown on the display.



## SETTINGS

(PART 5)

CONTACT PROBES

NTC/TC:

Thermistor (NTC) or thermocouple (TC).

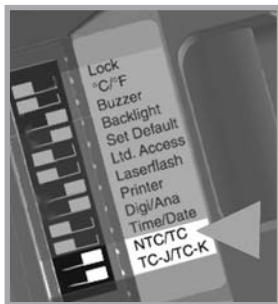
TC-J/TC-K:

Type of thermocouples. The temperature range for the probes:

K: -30°C to 400°C  
(-25°F to 750°F)

J: -30°C to 650°C  
(-25°F to 1200°F)

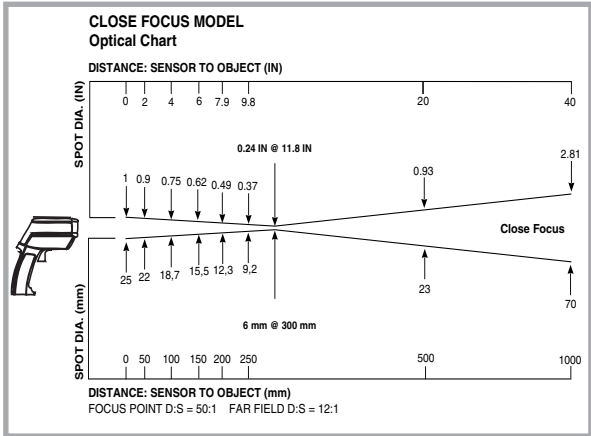
NTC: -30°C to 120°C  
(-25°F to 250°F)



Note:

The temperature ranges given are for the unit's optional type K thermocouple.

## Close-Focus Model



The measured spot size depends on the distance between the object you are measuring and the infrared thermometer. The relationship between distance and spot size is 50:1 at the focus point. The D:S in the far field is 12:1.

The best distance between sensor and object is from 10 cm (4") up to 50 cm (20").

## Sub-Zero Model

Temperature Range: -50 to 500°C (-58 to 932°F)

Following is the accuracy table for the sub-zero model when the ambient temperature is 25°C (77°F) ±5°C (9°F):

<u>Target Temperature</u>	<u>Accuracy</u>
-5 to 500°C (23 to 932°F)	±1% of reading or ±1°C (2°F), whichever is greater
-30 to -5°C (-22 to 23°F)	±1.5°C (3°F)
-50 to -30°C (-58 to -22°F)	±2°C (4°F)

## APPENDIX B

### TROUBLESHOOTING

## TROUBLESHOOTING

Code	Problem	Action
-O- -U-	Target temperature is over <i>or</i> under range	Select target within unit's specs
EEPROM-Err	EEPROM error	Contact Factory
CalAreaErr ProbCalEr	calibration errors	Contact Factory
Battery icon flashes or LowBatt	Battery is low	Replace Batteries
Blank display	Battery is dead	Replace Batteries
Laser won't work	Low or dead battery  Ambient above 45°C (113°F)	Replace Batteries  Operate unit in 45°C (113°F) ambient or below
Display "ON"	Display locked "ON"	Disconnect the unit from the PC or power supply

## APPENDIX C

### MAINTENANCE



**Lens Cleaning:** Blow off loose particles using clean compressed air. Brush remaining debris away with a camel's hair brush. Wipe the surface with a moist cotton swab. The swab may be moistened with water or a water based glass cleaner.

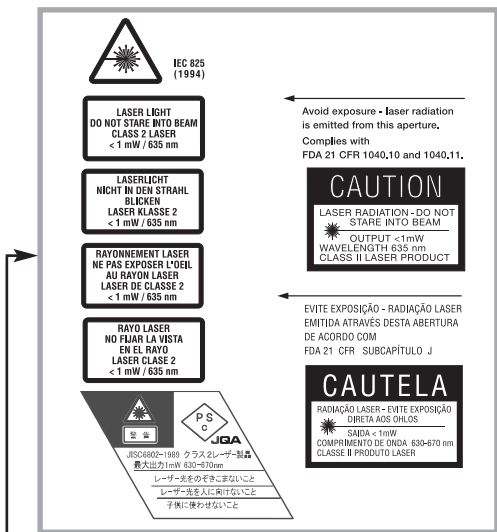
**NOTE: DO NOT** use solvents to clean the plastic lens.



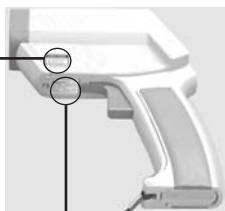
**Cleaning the Housing:** To clean the exterior housing, use soap and water or a mild commercial cleaner. Wipe with a damp sponge or soft rag.

# APPENDIX D

## LASER WARNING LABEL



**CAUTION!** Do not stare into beam!  
Avoid indirect exposure via  
reflective materials!



### SERIAL NUMBER LABEL

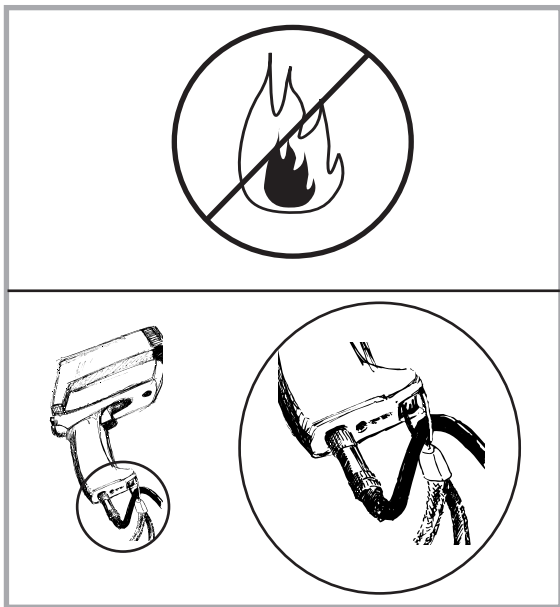
Manufacturer,  
Address

Made in Germany: Month, Year

**Model:** XXXXXXX

**Serial:** 000000-0000-0000

Power Requirements 3 V

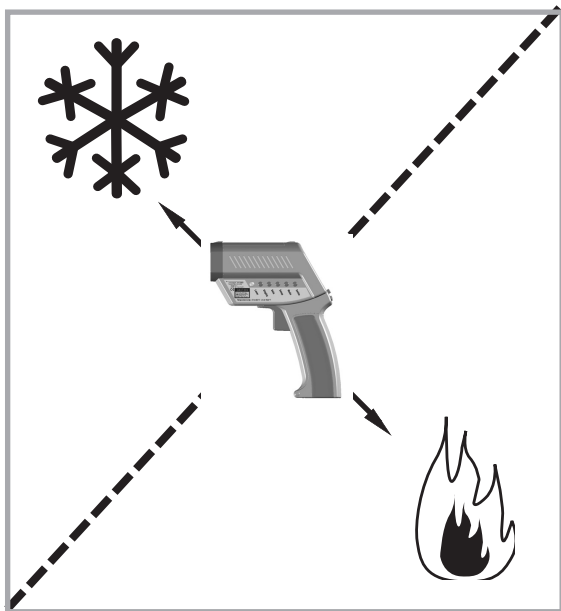


Avoid static electricity, arc welders, and induction heaters. Keep away from very strong EMF (electromagnetic fields). Don't leave the unit on or near objects of high temperature.

**WARNING: DO NOT touch live voltage with contact probe.** Use the wrist strap for cable support.

## APPENDIX E

### CAUTIONS (cont.)



#### Thermal Shock

Avoid abrupt changes in temperature. If this occurs, allow 40 minutes for thermal stabilization before use to prevent the possibility of inaccurate temperature readings. Use only the power supply from the manufacturer.



## APPENDIX F

### EMISSIVITIES

Aluminum*	0.30
Asbestos	0.95
Asphalt	0.95
Basalt	0.70
Brass*	0.50
Brick	0.90
Carbon	0.85
Ceramic	0.95
Concrete	0.95
Copper*	0.95
Dirt	0.94
Frozen food	0.90
Hot food	0.93
Glass (plate)	0.85
Ice	0.98
Iron*	0.70
Lead*	0.50
Limestone	0.98
Oil	0.94
Paint	0.93
Paper	0.95
Plastic**	0.95
Rubber	0.95
Sand	0.90
Skin	0.98
Snow	0.90
Steel*	0.80
Textiles	0.94
Water	0.93
Wood***	0.94

\* oxidized

\*\* opaque, over 20 mils

\*\*\* natural

# SPECIFICATIONS

---

Temperature Range	- 30 to 900°C (- 25 to 1600°F)
Display Resolution	0.1°C (0.2°F)
Accuracy (Infrared)	± 0.75% of reading or ± 0.75K (± 1,5°F), whichever is greater at 25°C (77°F) ambient temperature, ± 2K (± 4°F) for targets below -5°C (23°F)
Ambient derating	< 0.05K/K or < 0.05%/K, whichever is greater at + 25°C (77°F) ± 25K (± 45°F)
Optical Resolution (Standard Focus)	60:1 (19mm spot size at 1.15 M.) (0.75in. spot size at 3.8 feet)
Optical Resolution (Close Focus)	50:1( 6mm spot size at 0.3 M.) (0.24in. spot size at 0.98 feet)
Accuracy (Thermocouple K & J)	± 2K or ± 0.75%, whichever is greater
Accuracy (Thermistor)	
-30 to 0°C (-22 to 32°F)	± 0.6K
0 to 70°C (32 to 158°F)	± 0.4K
70 to 100°C (158 to 212°F)	± 1K
100 to 120°C (212 to 248°F)	± 1.5K
Repeatability (Infrared)	± 0.5% of reading or ± 0.5°C (1°F), whichever is greater, ± 1°C (± 2°F) for targets below -5°C (23°F)
Response Time (95%)	250 mSec
Hot Spot Detection (30%)	85 mSec
Spectral Range	8 to 14 μm
Ambient Operating Range	0 to 50°C (32 to 122°F)
Storage Temperature (without batteries)	-20 to 50°C (-4 to 122°F)
Analog output	1 mV/°C(°F)
Digital Output	RS232

## SPECIFICATIONS (Cont.)

Power	2 x 1.5 V Alkaline Type AA
Battery Life	13 hrs. (50% laser and 50% backlight on)
Power supply (External)	7.5 V $\geq$ 200 mA (Using the power supply the display automatically switches on)
Dimensions	200 x 170 x 50 mm (7.9 x 6.7 x 2 inches)
Tripod Mount	1/4"-20 UNC

## FACTORY DEFAULTS

	Default	Range
Emissivity/Gain	0.95	0.10 to 1.50 in steps of 0.01
Emissivity Table Mode	Free normal	30 materials
Hi Alarm	50°C (100°F)	-30 to 900°C (-25 to 1600°F)
Lo Alarm	0°C (32°F)	-30 to 900°C (-25 to 1600°F)
Offset Adjust	0°C (0°F)	-10 to 10°C (-18 to 18°F)
Graphic Display	Auto Range	Auto Range / Man Range
Cycle Time	0.2 sec	0.1 sec to 300 sec
Printer Mode	Data Recording	3 modes, selectable via software
Printer output	ASCII 8 bits 1 Stop bit No Parity Baud Rate 9600	
Data logger	100 points pre-set with emissivity 0.95 Lo-Al: 0°C Hi-Al: 50°C adjustable only via Software Accessory	

## CE CONFORMITY



This instrument conforms to the following standards:

EMC: - EN 61326-1

Safety: - EN 61010-1:1993 / A2:1995  
- EN 60825-1:1994

This product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC.

This instrument conforms to the Standards of the European Community.

## **NIST/DKD CERTIFICATION**

The temperature sources used to calibrate this instrument are traceable to the U.S. National Institute of Standards and Technology (NIST) and the Deutscher Kalibrierdienst (DKD). NIST and DKD certificates are available as an option from the manufacturer.

## Infrared Thermometer with LinTech\* Bluetooth module

This infrared thermometer allows wireless data transfer with the aid of Bluetooth technology.

### System requirements:

- Windows-compatible computer (operating system 98, ME, 2000, XP or higher)
- Bluetooth system fully installed on the computer (not included)
- BlueTool configuration software (included)

After the Bluetooth system has been installed as required on the computer, the thermometer can be operated in two different modes:

### 1. Passive mode

In this mode, the thermometer is constantly activated and is searched for by the computer. This is advantageous when continuous temperature monitoring should take place.

**Attention:** As a result of continuous operation, the thermometer's batteries are discharged much faster than during intermittent use.

Proceed as follows:

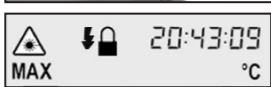
1. Switch on the thermometer with the measurement button.



2. Press the Setup button on the display.



The words "Bluetooth on-up, off-down" appear. Activate Bluetooth with the Up button below the display. A lightning symbol in the display indicates that the Bluetooth module is ready



- the lock symbol signals continuous operation.

**Note:** If the automatic battery test finds that the battery is too weak here (display: "LowBat - no BT"), the Bluetooth application is not started.

3. Now start the Bluetooth software on your computer and allow it to search for and connect the Bluetooth devices. (Please refer to the relevant operating instructions for how this happens in the case of your Bluetooth application)

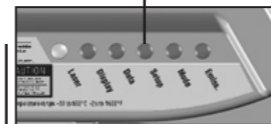


4. The thermometer is recognized as "IR Therm...". The requested PIN is "1234" when the unit is delivered. With the right mouse button, click on the symbol for the device and select "Eigenschaften/Properties" in the submenu. Make a note of the ComPort's number. The green LED on the left above the thermometer's display signals the existing connection.



5. If you have not already done so, now start the relevant application software for the thermometer. Before you can exchange data between the thermometer and computer, you must set in this software the number of the ComPort found under Point 4.

6. Press the Setup button and then the Down button below the display to end the Bluetooth connection.



**If data is being transferred at this time, you cannot deactivate the Bluetooth module.**



**Important note:** The above refers to the thermometer as delivered. It can be programmed on a user-defined basis with the aid of the "BlueTool" software. For details, see the section "User-defined configuration".

### 2. Active mode

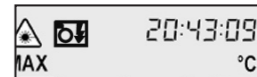
After switching on, the thermometer automatically establishes contact with the computer, the address of which has been programmed for the thermometer. This is done by the supplied BlueTool software (for details, see the section "User-defined configuration"). The active mode is particularly suitable for intermittent operation of the infrared thermometer. The thermometer's power consumption is significantly less than in passive mode.

#### Making contact with the computer and data transfer

Open the thermometer's handle and switch the DIL switch 9 to ON (Master). Switch on the thermometer with the measurement button.



In the display, a framed lightning symbol points to the Bluetooth module in active mode and the thermometer starts to search for the associated computer. When the connection has been made, a green LED lights up on the left above the display



and the color of the Bluetooth symbol changes on the connected computer. You can now transfer data to the thermometer's user software. The thermometer automatically switches itself off after approximately 7 seconds if the measurement button is not pressed and if there is no data transfer.

### 3. User-defined configuration

#### Preparing the thermometer

Open the device's handle and set the DIL switch 5 to ON (Set Default). "Default ?" appears in the display. At this point in time, it is essential for the DIL switch 9 to be set to OFF (Slave). Now start the Bluetooth module as described under "Passive mode".

#### Programming the thermometer with the aid of BlueTool

Start the Bluetooth software on your computer and start the device search. Make the connection by double clicking on the symbol for the in-framed thermometer (signaling by the green LED on the left above the display and the color of the Bluetooth symbol changes on the computer). The properties can be displayed by right-clicking on the service under

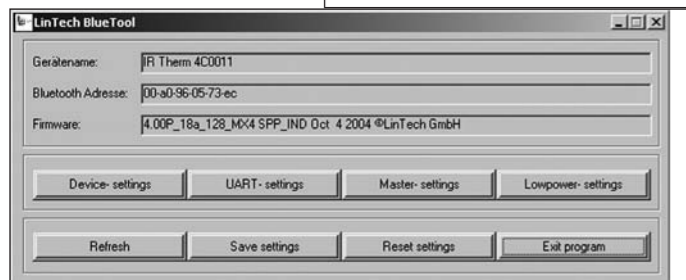
	ON	
1	<input type="checkbox"/>	Lock
2	<input type="checkbox"/>	C/ F
3	<input type="checkbox"/>	Buzzer
4	<input type="checkbox"/>	Backlight
5	<input type="checkbox"/>	Set Default
6	<input type="checkbox"/>	Ltd. Access
7	<input type="checkbox"/>	Laserflash
8	<input type="checkbox"/>	Printer
9	<input type="checkbox"/>	Slave/Master
10	<input type="checkbox"/>	Time/Date
11	<input type="checkbox"/>	NTC/TC
12	<input type="checkbox"/>	TC-J/TC-K

\* Please refer to the LinTech specifications overview for the exact specification of the Bluetooth module used.

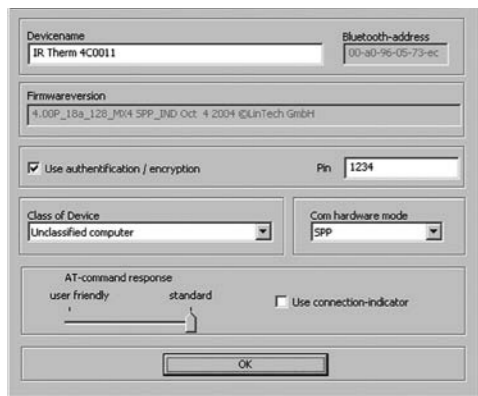
Serial Ports. Note the number of the connected ComPort. Now start the BlueTool application, enter the ComPort number just found and then click on Connect. A configuration window opens.



It shows various details of



the device and several fields for calling up additional setting possibilities. First open "Device settings".



Here you can give the thermometer a name and change the PIN.

**Attention:** Be sure to make a note of this PIN, because you will be asked to provide it for encrypted transmissions and connections with the aid of the BlueTool software. SPP must be selected as the ComHardware mode and the connection indicator must be deactivated. Confirm the settings with OK. Now open "Master settings".



Here, place a tick in front of both "Master - automatic connection attempt" and "Master attempts to establish connection when starting". The address of the current computer is in the Remote BTA field

**Note:** Only if you wish to address another computer (e.g. PDA or notebook) with the thermometer later must you enter the Bluetooth address of the other computer here. The same applies to the PIN in this window. It is then binding for the connection with the other computer. **It is therefore essential to note it.**

Click on OK. In the main window, **first** click on "Save settings" - the data is transferred to the thermometer. With "Update", you can call up the current settings to check them.

Then end the program. Now switch the DIL switch 5 in the thermometer's handle back to OFF. Press the DOWN button under the display. Now wait until the device switches itself off automatically (approximately 7 s).

## FCC NOTICE

This device complies with Part 15 of the FCC Rules. 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.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**WARNING:** Modifications not expressly approved by this company could void the user's authority to operate the equipment.

**FCC ID: STG-DFQMX4.**