AST

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Accurate Sensors Technologies

We measure accurate temperature in extreme conditions

AST TI1800
Non-contact Infrared Pyrometer

USER MANUAL

Index

Chapter - 1
General Information

Congratulations on choosing this high quality and highly efficient AST pyrometer for non contact temperature measurement. Please read this user manual carefully, step by step, including all notes of security, operation and maintenance before installing the pyrometer. This manual contains all the necessary instructions for set up and operation of the pyrometer. This section provides an overview about important safety regulations.

Some Important Safety Regulations Given Below:

1.   **Safety Precaution :**

Each person working with pyrometer must read the user manual before operation. The pyrometer has only to be used for the purpose described in manual. The pyrometer works only with a potential free low voltage. This voltage is not harmful for user. The pyrometer may contain harmful material and hence it should not be disposed of with normal waste.

2.   **Packaging and Storage :**

Always use a shock proof package for shipment of pyrometer. It should be sealed to protect it against humidity. Also protect the lens of pyrometer with cover. They should be stored at the temperature range from -20°c to 55°C.

3.   **Limit of Liability and Warranty**

All general information and notes for handling, maintenance and cleaning of this instrument are offered according to the best of our knowledge and experience.

AST reserves the right to revise this document and to make change from time to time in the content hereof without obligation to notify any person or persons of such revisions or changes. AST instruments have a warranty of two year from the invoice date. This warranty covers manufacturing defects and faults which arise during operation only if they are the results of defects caused by AST.

AST does not accept liability for any damages or losses which might occur, including consequential damages and financial losses, as a result of use of the instrument.

4.   **Copyright :**

All rights reserved. This document may contain proprietary information and shall be respected as a proprietary document to AST with permission for review and usage given only to the rightful owner of the instrument with which this document is associated.

Chapter - 2

Introduction

TI-1800 portable digital pyrometer are specially designed for both non contact infrared and probe contact (K type thermocouple) temperature measurement. This instrument has a LCD display, Bluetooth digital interface, Small Spot Size. This instrument is equipped with inbuilt laser to simplify the alignment of the pyrometer .

2.1 Application, Range and Working Principle

TI-1800 are specially designed portable IR pyrometer for non contact temperature measurement between 250°C to 1800°C in demanding industrial environments. The back light a LCD display provides temperature, indication of status and configuration of pyrometer together with measurement mode. The measuring result is shown and can be analyzed directly on site.

The portable pyrometer provides fast, simple data logging with bluetooth connectivity to download this data to android mobile for analysis. The data storage (data store up to 1000 values) of measurement offers the best possibility for analyzing the data.

The applications in which AST pyrometers can be used are:

➢ Induction Heating

➢ Casting

➢ Annealing

➢ Welding

➢ Forging

➢ Sintering

➢ Melting

➢ Rolling

➢ Hardening

## 2.2 Technical Specifications

Model	TI-1800
Temperature Range	250°C to 1800°C (Non Contact IR mode) -40°C to 1372°C (Thermocouple Type K Probe mode)
Emissivity	0.1 to 1.0
Spectral Range	1.6um
Distance to Spot Ratio	100:1
Response time	100msec
Battery life	30hrs (without laser)
Accuracy	0.5% of measured value (Non Contact IR mode) 0.2% of full scale (Thermocouple Type K Probe mode)
Resolution	0.1°C below 1000°C 0.1°C above 1000°C
Temperature Unit	°C/°F
Operating Temperature	0°C to 50°C
Power Supply	2xAAA battery, 1.5V
Laser Sighting	Single laser pointer
Data Logging	1000 measured values of temperature with emissivity, date and time
RTC	Yes
Buzzer	Yes
Digital Interface	Bluetooth
Weight	370g
Dimensions (mm)	181 x 66 x 195
Tripod Thread	UNC¼"

2.3 Optical Data

1) **Sighting :-** TI1800 equipped with in-built pilot laser to focus on target to measure temperature.

2) **Spot Size Table :-** The objective can be focused to adjust within distances between 0.5m to 3.0m.

Measuring Distances MD (mm) with standard focusable optics	TI1800 250°C - 1800°C (100:1)
500	5
1000	10
2000	20
3000	30

TI-1800

A=7mm

20mm@2000mm
FOV 100 : 1

30mm@3000mm
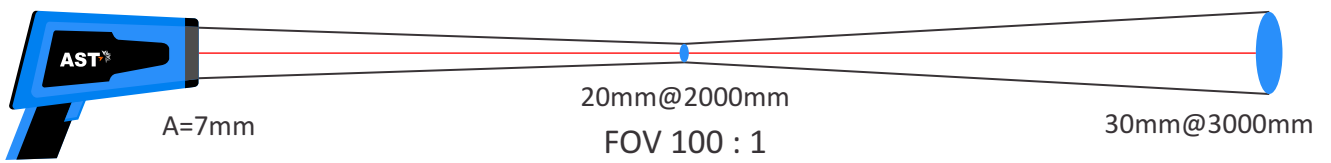
2.4 Standard Item supplied with AST TI-1800.

☑ Calibration certificate.

☑ Software CD and Operation manual.

☑ Carry Box

☑ 2xAAA 1.5V batteries

Chapter - 3

3.1 Parameters

Name	Scrolling Display	Parameter Description	Value	Default
LLLL	Low temperature	Measured temperature is not within the selected range.	temperature below 250°C (Probe mode OFF) temperature below -40°C (Probe mode ON)	LLLL
EMI	Emissivity	Select the Emissivity as per target	0.1 to 1.00	1
UNT	Temeprature Unit	Select Suitable measurement Unit	°C °F	F
PRB	Probe selection	Select Probe for contact type temperature measurment i.e Thermocouple	ON	oFF
		Select Probe for non contact type temperature measurement i.e Pyrometer	oFF	
OPEn	Open	Probe is selected ON but Thermocouple sensor is not connected.	OPEn	OPEn
ALR	Alarm	To set Alarm for Thermocouple & Pyrometer Mode selection	For Probe oFF : Pyrometer 250°C/482°F to 1800 °C/3272°F. For Probe on: Thermocouple -40°C/-40°F to 1372°C /2501°F	oFF
MAX	Maximum Temperature	To Capture & Display measured maximum temperature	on oFF	oFF
MIN	Minimum Temperature	To Capture & Display measured minimum temperature	on oFF	oFF
CLR	Clear	To clear all the logged temperature data	YES NO	NO
LOG	Data Logging	To log the Temperature data	YES NO	NO
BT	Bluetooth	To select Bluetooth Mode to communicate with Mobile	on oFF	oFF
RCd	Number of records	To record 1000 Temperature Data	1-1000	0
S T	Set time	Set the Real time Clock	on oFF	oFF
HRS	Hours	To set hours timing	24 hrs Format	0
MNT	Minuts	To set Minuts timing	0 to59	0
SEC	Seconds	To set Seconds timing	0 to 59	0
YER	Year	To set the Year number		0
MON	Month	To set the Months number	1 to 12	0
dAT	Date	To set the Date number	0-31	0
SCAN	SCAN	when trigger Pressed, in SCAN mode to measure the target temperature	SCAN	/
HOLD	HOLD	When Trigger not pressed, in HOLD Mode	HOLD	HOLD

3.2   Installation of Pyrometer

3.2.1   Battery Insertion

Battery Case
cum Handle

For operating the pyrometer 2 batteries are required (Note :- Alkaline- manganese batteries should not be used). They must be inserted into the battery holder (Note:- polarity of battery should be correct). And installed afterward into the pyrometer handle (Note :- position and direction of battery should be correct). After closing the battery case cover the pyrometer is ready for use. The direction of battery holder shown in figure.
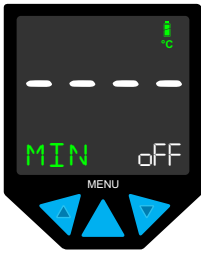
Insert
Direction

Battery Holder
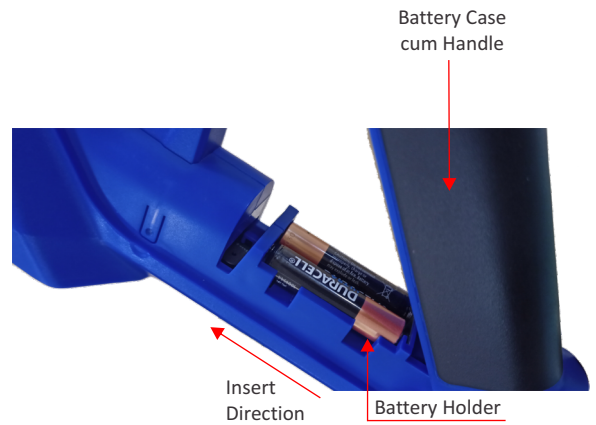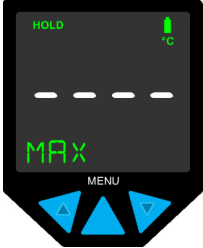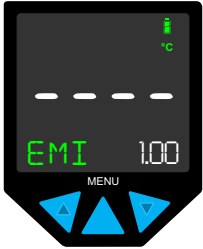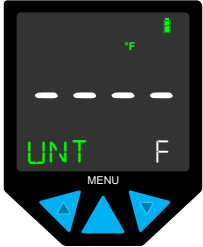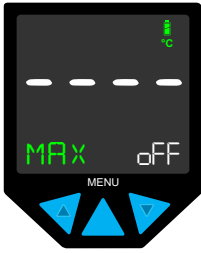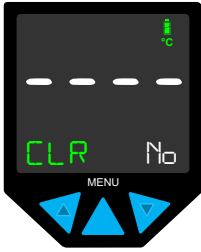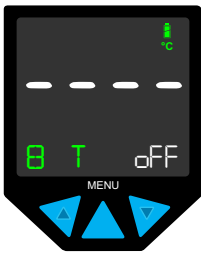
3.2.2   Switching ON

The pyrometer can be switched ON/OFF by pressing trigger key. Trigger key can be long pressed for 3 sec. to switching ON pyrometer.

(A) Triggering Point/Single Value Storage :- User will trigger the key on handle to scan the value, the value will automatically save into the pyrometer if data logging mode ON.
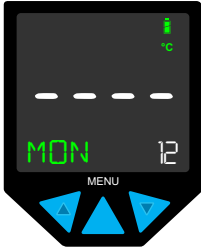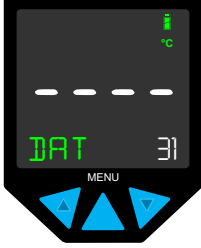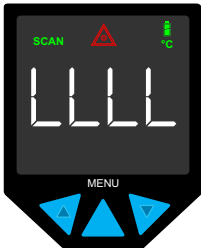
Trigger Key
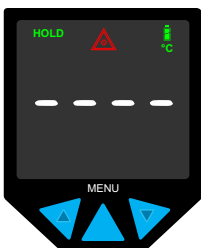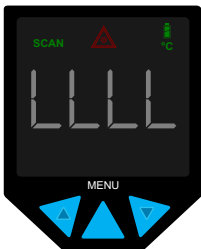
3.2.3 Display Functions

Do This	Display	Additional Notes
Press Trigger for 3 sec	AST MENU	Display while powering ON
After Power ON, It will show existing paramters Battery Indication, UNIT, HOLD, Desh etc…	HOLD °C — — — — MAX MENU	After Power On Display
If Trigger is Pressed pyrometer will be in SCAN mode.	SCAN °C 550.0 MAX 550.0 MENU	Pyrometer will measure & display temperature value until trigger key released.
Press "MENU" Key to Set "EMI"	°C — — — — EMI 1.00 MENU	Press "UP" & "DOWN" Key to "Increment" or "Decrement" emmissivity value. *Press MENU key to confirm changes.
Press "MENU" Key to Set "UNT"	°F — — — — UNT F MENU	Press "UP" & "DOWN" Key to change measurement Unit °C or °F. *Press MENU key to confirm changes.
Press "MENU" Key to Set "PRB"	°C — — — — PRB oFF MENU	Press "UP" & "DOWN" Key to ON & OFF. PRB ON: Thermocouple Mode PRB OFF: Pyrometer Mode *Press MENU key to confirm changes.

Do This	Display	Additional Notes
Press "MENU" Key to Set "ALR"	---- ALR 1368 °C MENU	As per UNIT "°C" & "°F" selection & Probe "ON" & "OFF" selection below Alarm max value will display. For Pyrometer: 250°C/482°F to 1800°C /3272°F. For Thermocouple: -40°C/-40°F to 1372°C/2501°F. Press "UP" & "DOWN" key increment & decrement value of Alarm. User can set value of temperature range at that value buzzer operate. *Press MENU key to confirm changes.
Press "MENU" Key to Set "MAX"	---- MAX oFF °C MENU	Press "UP" & "DOWN" Key to "ON" or "OFF". IF MAX is "ON", It will show maximum measured temperature on the screen until next MAX temperature measures. *Press MENU key to confirm changes.
Press "MENU" Key to Set "MIN"	---- MIN oFF °C MENU	Press "UP" & "DOWN" Key to "ON" or "OFF". IF MIN is "ON", It will show minimum measured temperature on the screen until next MIN temperature measures. *Press MENU key to confirm changes.
Press "MENU" Key to Set "CLR"	---- CLR No °C MENU	Press "UP" & "DOWN" Key to "YES" or "NO". IF CLR is YES and confirmed then it will clear all saved Logged Temperature Data. *Press MENU key to confirm changes.
Press "MENU" Key to Set "LOG"	---- LOG YES °C MENU	Press "UP" & "DOWN" Key to "YES" or "NO". If LOG is YES then only it will store the Temperature data. *Press MENU key to confirm changes.
Press "MENU" Key to Set "BT"	---- B T oFF °C MENU	For data analaysis communication with mobile appliction Press "UP" & "DOWN" Key to "ON" or "OFF". *Press MENU key to confirm changes.

Do This	Display	Additional Notes
Press "MENU" Key to view "RCD"	RCD --	Press "UP" & "DOWN" Key to view all the saved records from 1-1000 values *Press MENU key to confirm changes.
Press "MENU" Key to Set "ST"	ST oFF	Press "UP" & "DOWN" Key to "ON" or "OFF". *Press MENU key to confirm changes.
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "HRS"	HRS 23	Press "UP" & "DOWN" Key to set 1 to 23 Hrs. *Press MENU key to confirm changes.
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "MNT"	MNT 59	Press "UP" & "DOWN" Key to set 1 to 59 Mins. *Press MENU key to confirm changes.
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "SEC"	SEC 59	Press "UP" & "DOWN" Key to set 1 to 59 Sec. *Press MENU key to confirm changes.
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "YER"	YER 21	Press "UP" & "DOWN" Key to set current Year. Press long time for Fast Incremental value. Year will display in 2 digit. *Press MENU key to confirm changes.

Do This	Display	Additional Notes
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "MON"	---- MON 12 MENU	Press "UP" & "DOWN" Key to set 1 to 12 months. *Press MENU key to confirm changes.
IF "ST" is ON then Press "MENU" you will see Time & Date parameter then select "DAT"	---- DAT 31 MENU	Press "UP" & "DOWN" Key to set 1 to 31 date. *Press MENU key to confirm changes.
If temperature reading shows "OPEn"	OPEn MENU	If you have selected "PRB" as "ON" and no thermocouple is connected then "OPEn" will Show. Please connect Thermocouple properly & try again.
If temperature reading shows "LLLL"	SCAN LLLL MENU	Temperature below 250°C (Probe mode OFF) Temperature below -40°C (Probe mode ON)
If "DOWN" key Press & Hold for 5 Sec	HOLD ---- MENU	Press DOWN key for 5 sec. : Laser ON Press DOWN key for 5 sec. : Laser OFF.
If "UP" Key Press & Hold for 5 Sec	SCAN LLLL MENU	Press UP key for 5 sec. : LCD back light Intensity High Press UP key for 5 sec. : LCD back light Intensity Low

NOTE :
1. For PRB "ON" mode only UNIT, ALR is Enable.
2. For PRB "ON" mode there is no bluetooth communication and data storage available.
2. Portable pyrometer display "Auto OFF" after 1 Min if not in Operation.
3. Portable pyrometer display "Auto OFF" after 10 Min if not in Operation and Bluetooth mode ON.
4. RTC will reset after every removal of Batteries and need to reconfigure "ST".
5. When the 'Low battery' icon indicates the battery is low : The battery should be replaced immediately (Battery 'OK' temp. measurement and saving are possible, if battery 'Exhausted' temperature measurement and saving are not possible)

3.2.4 Bluetooth Communication

In TI 1800, for PRB "OFF" i.e Pyrometer mode selection we have Bluetooth Communication option to retrieve the data from the pyrometer. To retrieve data we need to install "INFRASMART TI" App in to the android mobile. In Pyrometer press "BT" menu "ON" then switch on the Bluetooth discoverable from Mobile. User will receive Bluetooth name (e.g. TI-1002) select the Bluetooth name & initiate the pairing. (For pairing it will ask the password and password will reverse order of the Pyrometer Sr. No. i.e 2001) then establish the communication between Mobile & Portable Pyrometer as shown in **fig 1**.

Once pyrometer and mobile bluetooth paired successfully it will display "show data". User have to press show data option to view saved temperature values in pyrometer. as shown in **fig 2.**
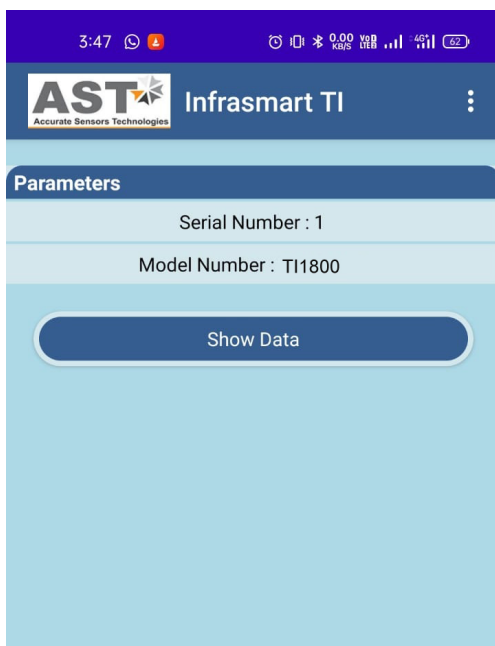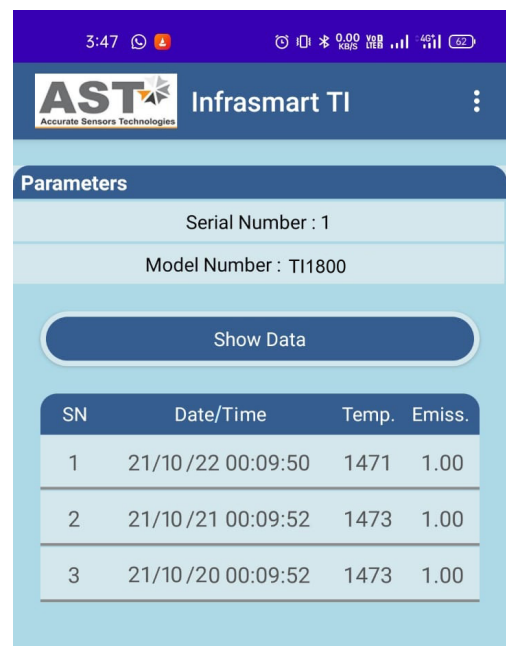

Fig 1

Fig 2

To save or clear the data from mobile you can see right side top menu. Either you can Save or Clear the temperature value.

If you have chosen "save" option, it will be saved in mobile in the form of .txt file.

If you have chosen "CLEAR DATA" option then it will clear all saved data from mobile & Pyrometer.

Path of the saved file will be File Manage → Phone Storage → Download →.txt file.

File name will be saved in the format of TI----data_YMDHMS.txt

TI---- : Sr. No

Y : Year

M : Month

D : Date

H : Hours

M : Minutes
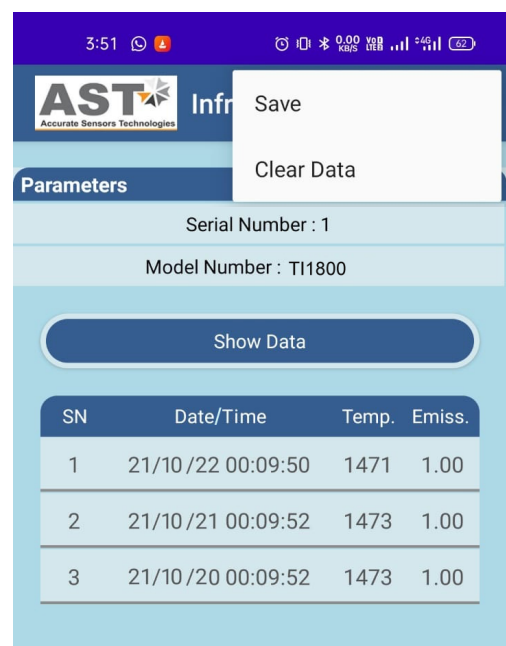
S : Seconds

Fig 3

Note : Temperature data will be stored in °C format only irrespective of unit selection in pyrometer.

Information

Maintenance

The pyrometer has no internal parts, which have to be cleaned. The lens can be cleaned with compressed air, which is dry and free of oil. If the protection glass requires more thorough cleaning, use a soft, dry cloth such as that used to clean camera lenses.

Packing instructions

To transport or store the instrument, please use the original box or a box padded with sufficient shock absorbing material. For storage in humid areas or shipment overseas, the device should be placed in welded foil (ideally along with silicone gel) to protect it from humidity.

Warranty

AST TI1800 instruments have a warranty of one years from the invoice date. This warranty covers manufacturing defects. User-induced faults are not covered under this warranty.

Limit of liability

AST not liable for any damages that arise from the use of any examples or processes mentioned in this manual.

Specifications are subject to change without notice

ABOUT US

AST - Accurate Sensors Technologies

Accurate Sensors Technologies along with 3T - True Temperature Technologies established in 1994 focusing on the development and commercialization of non-contact temperature measurement technologies.

Based on these technologies, AST/3T has bought to the market a line of pyrometers for the remote measurement of target temperatures using no physical contact. AST/3T pyrometers use a totally new approach for remote temperature measurement achieving high accuracy.

The following products are available from AST/3T

- ❖ Single color pyrometer
- ❖ Ratio (2 color) pyrometer
- ❖ Fiber optics with single color and two color pyrometer
- ❖ Multi wavelength pyrometer specially for Aluminum & other Non - ferrous application
- ❖ Black Body calibration sources
- ❖ Special system for automatic Isothermal Extrusion (MOMAS)
- ❖ Parameter setting Devices

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