



Accurate Sensors Technologies

We measure accurate temperature in extreme conditions

AST P-GM+

Non-contact Infrared Pyrometers

USER MANUAL



AST - Accurate Sensors Technologies

Misgav Industrial Park, Misgav 20173, Israel

Tel: +972-4-9990025, Fax: +972-4-9990031

Email: info@accuratesensors.com

Web: www.accuratesensors.com

Index

1. Chapter - 1	1
General information	
2. Chapter - 2	2
Introduction	
2.1 Application, range and working principle	
3. Chapter - 3	3
Technical specification	
4. Chapter - 4	4
Setting at the instrument	
4.1 Operation	
4.2 Adjustment parameters	
5. Chapter - 5	6
Software Installation	
5.1 Installation	
5.2 parameters in main screen	

Chapter - 1

General Information

We are pleased that you have chosen this high quality and highly efficient AST pyrometer for non-contact temperature measurement.

Please read this manual carefully, step by step before performing any operation with the Pyrometer. It contains all the necessary instructions for set up and operation of the pyrometer. When operating the instrument, it is necessary to follow the general safety instructions.

1.1 Safety Measures

This section provides an overview about important safety regulations.

1.1.1 General

Each person working with the pyrometer must have read the user manual before operation. The Pyrometer has only to be used for the purpose described in the manual.

1.1.2 Safety Precaution

The Pyrometer works only with 3 'AAA' size batteries. This voltage is not harmful for the user.

1.1.3 Maintenance and use of Pyrometer

Pyrometer can be operated by the qualified person who has got instructions from the supervisor. It is strongly prohibited to do technical modifications of the device without permission of the manufacturer.

1.1.4 Environmental Protection

The lens or its coating may contain harmful materials and hence it should not be disposed of with normal waste.

1.1.5 Packaging and storage

Always use a shock-proof package for shipment of the pyrometer. It should be sealed to protect it against humidity. Also protect the lens of the pyrometer with a cover. They should be stored at the temperature ranges from -20°C to +70°C.

1.1.6 Warranty

AST P-GM+ instruments have a warranty of two years from the invoice date. AST will replace defective parts, which arises from design errors or manufacturing faults. In case, if pyrometer is opened, disassembled or modified then the guarantees will loss.

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

1.1.7 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 equipment with which this document is associated.

Chapter - 2

Introduction

AST P-GM+ are specially designed highly accurate digital pyrometers with extended fibre optic head, inbuilt OLED display to provide high performance and low maintenance of non contact temperature measurement in demanding industrial environment.

2.1 Application, Range and Working Principle

The AST P-GM+ pyrometers are especially designed for glass industries purposes. They are suitable for high temperature measurement ranging from 250°C to 600°C.

The AST P-GM+ are pyrometers with extended optical head. These instruments are equipped with a fibre optic and an optical head. The fibre & optical head are unaffected by electromagnetically interferences (e.g. induction) and can be used in ambient temperatures up to 70°C. The pyrometers are equipped with a display which shows in measuring mode the current temperature. Via serial interface and the provided software the temperature can be displayed and stored on a PC, parametrizing can also be done.

AST P-GM+ has response time of 2 msec in triggering mode. It has USB 2.0 output. Emissivity, response time Peak Picker, Auto OFF Timing and Temperature Hold Time can be observed or adjusted through available optional software.

The pyrometer temperature measurement method utilizes the fact that objects emit thermal radiation in an amount that directly corresponds to their own temperature and surface emissivity.

The pyrometer sensor detects the amount of infrared radiation emitted by the measured object (target). The infrared signal is analyzed and the temperature it represents is analyzed by built-in electronic system.

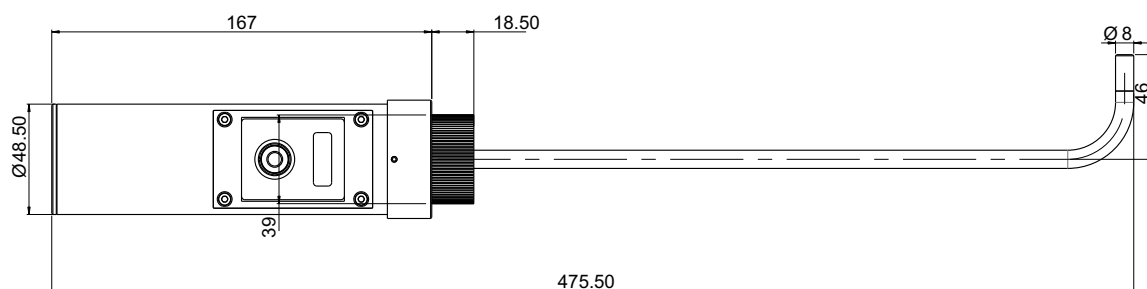
The applications in which AST PGM+ pyrometer can be used is:

- Glass Mould Industries

Chapter - 3

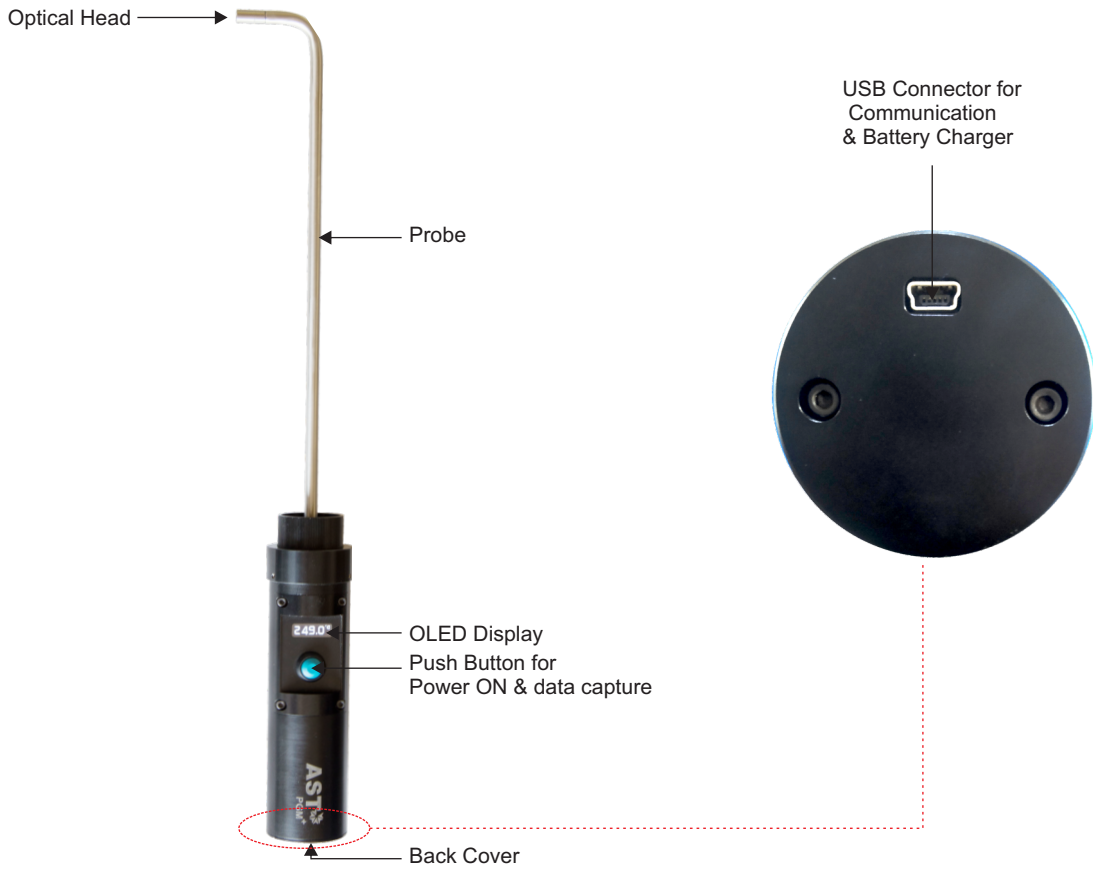
Technical Specifications

Model	P-GM+
Temperature Range	250°C....600°C
Photo Detector Type	InGaAs
Spectral Range	1.6 μm
Response Time	2 msec. Adjustable upto 10 sec.
Repeatability	0.1% of reading in °C $\pm 1^\circ\text{C}$
Accuracy	+/- 0.3% of the measured value $\pm 1^\circ\text{C}$
Ambient Temp. Limits	Max. 250°C at fiber optics cable and optical head
Emissivity	0.1....1.0 adjustable from PC via USB
Digital Output	USB 2.0
Logging	1000 reading downloaded to PC via USB 2.0
Power Requirement	3 AAA rechargeable Cell
Operating Temp. Range	0...70°C at handle end
Dimension	475.50 x 48.50 x 48.50 mm
Adjustable parameter through software	Emissivity, response time, temperature unit, clear time (peak picker) via USB.



Chapter - 4

Product Overview



Chapter - 4

Setting at the instrument

4.1 Operation

Before powering ON the pyrometer, make sure that the battery is charged up to some level. AST P-GM+ can be powered ON by pressing the trigger button for the first time at a single push. After power ON, the device starts an initializing routine for some seconds. After this the object temperature is shown on the OLED display. The default temperature value shown should be 249 C when pyrometer is not in front of the target.

It starts measuring the temperature when handle is put in front of the target body. Temperature can be displayed, save and hold by three different method, i.e. when pressing the button, when releasing the button and holding the peak value between pressing and releasing the button.

The AST P-GM+ is provided with in built Auto-OFF feature which enable the device to power OFF automatically when placed in an idle state to save the battery life. The Auto OFF Timing is adjustable from 1 min to 10 min through software. The battery charging can be done by the external DC charger only provided with the kit. Temperature measurement cannot be performed while battery charging. Make sure to remove the charger when the battery is fully charged to avoid any damage to the battery due to over charging. The approximately charging time is around 2:30 hours.

The additional feature is with the temperature measurement OLED display starts blinking to indicate that the measuring temperature range limit i.e. above 600°C.

Memory reallocation features is provided in which new readings over write on previous readings when 1000 readings is completed.

4.2 Indications

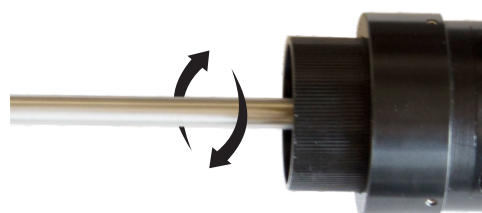
AST P-GM+ is featured with different indication of battery status such as low battery, battery charging and battery full.

It indicates battery level status when powered ON, after displaying AST logo. It shows full battery(100%) in terms of 5 Blocks that is 1 block showing 20% level each.



4.3 Optical Head

The optical head is provided with the rotational scheme which is beneficial for the user to rotate the head according to the target required. Head is provided with 20 rotation for 18° rotation each(Anti-Clockwise or Clockwise).



4.4 Adjustable parameters (Through PC Software)

Emissivity

: It is the relationship between the emissions of a real object and the emission of a black body radiation source at the same temperature. For a correct measurement it is necessary to adjust emissivity. Emissivity depends on the surface condition of the material, the spectral range of the pyrometer and the measuring temperature. Different material has different emissivity ranging from 0.1 to 1.0. user can change emissivity from the software through USB.

Temp. Unit

: User can select °C or °F unit.

Response time

: The response time can be set from 2msec to 10sec.

Clear Memory

: User can clear all the saved data from pyrometer. Before clearing the data, it ask to save or do not save the recorded data.

Auto OFF Timing

: The Auto OFF Timing can be adjustable from 1 min to 10 min maximum.

Temperature Hold Time

: It can be set from 1 sec to 30 sec. This time is use to hold the measured temperature reading on the OLED display for the desired time.

Temperature Hold on Pressing Button

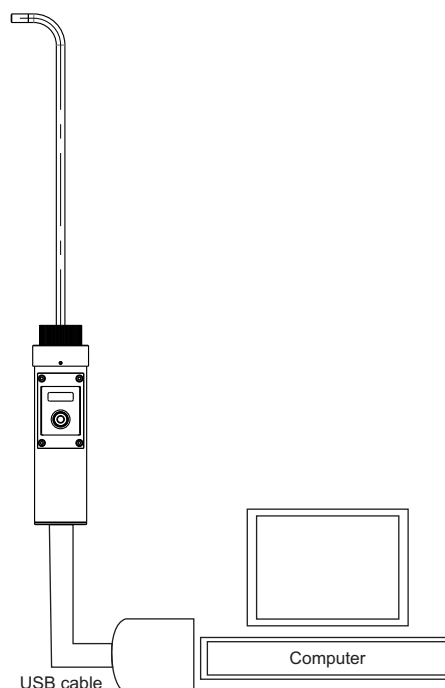
: Temperature data is displayed, saved and hold on pressing the button.

Temperature Hold on Releasing Button

: Temperature data is displayed, saved and hold on releasing the button. Peak

Temperature Hold between Pressing and Releasing the Button

: This feature is used to Hold the Peak value of the temperature between pressing and releasing the button.



Connection Diagram

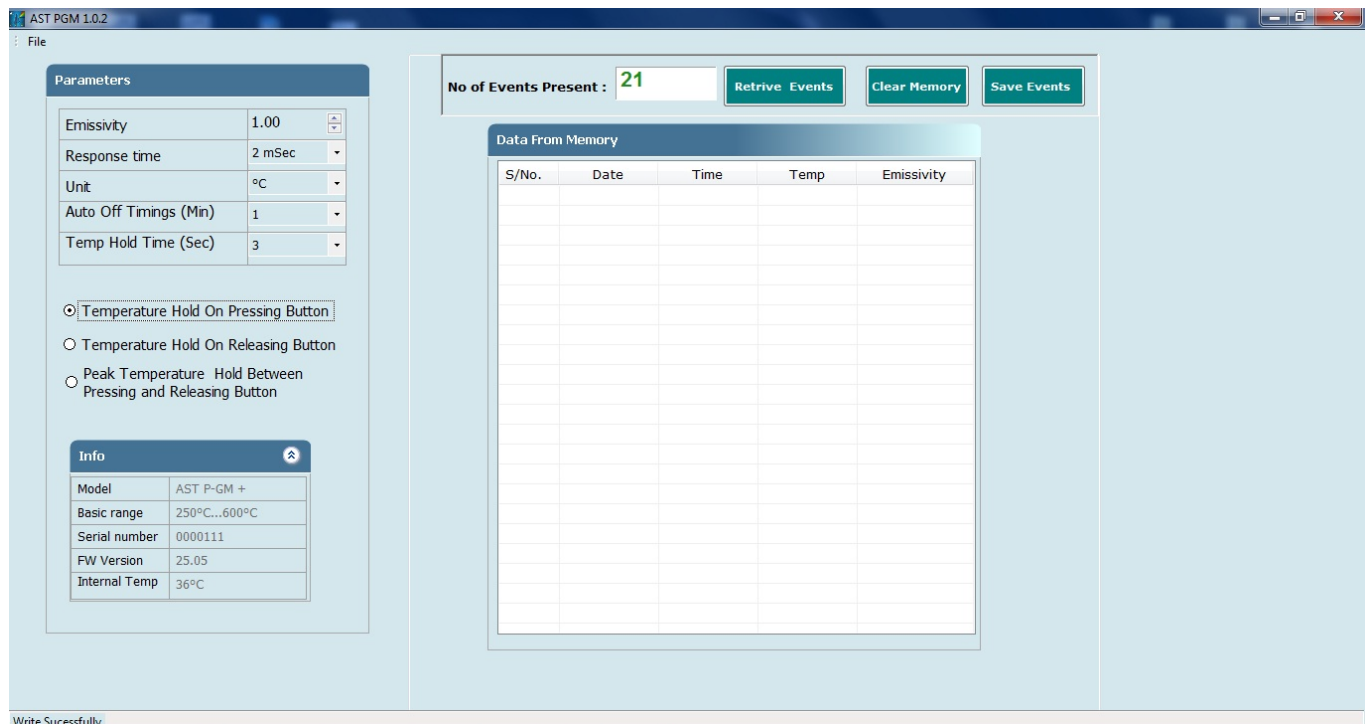
Chapter - 5

Software Installation

The provided AST P-GM+ software offers possibilities to connect with your system shows recorded data for parameter setting, view offline data and to evaluate the measured data.

5.1 Installation

Install the pyrometer software using the installation guide file on CD ROM. After installation of the software. Double click the application. It will open the screen of software.

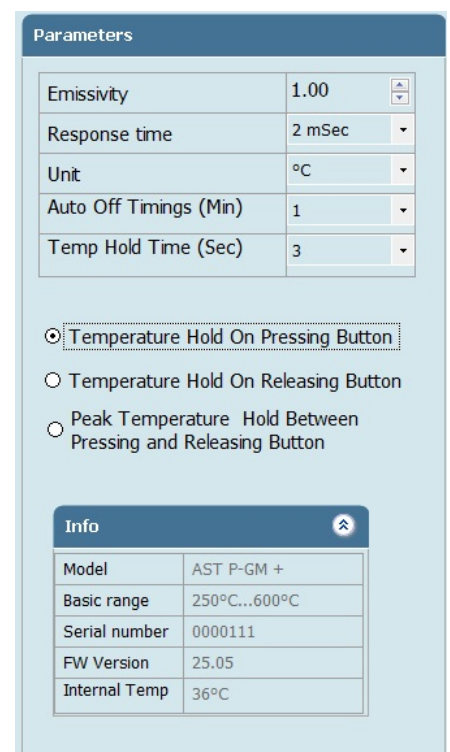
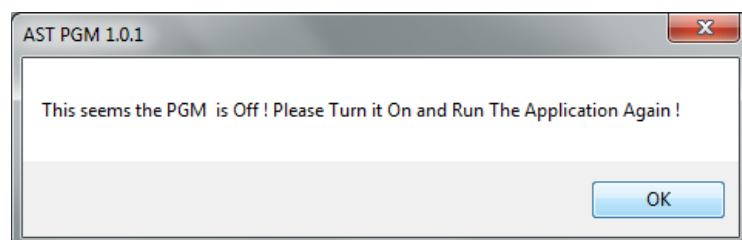


5.2 Parameters in main screen

5.2.1 Communication

Communication between the AST P-GM+ pyrometer and the software is implemented via a USB cable connected between the pyrometer and the PC serial port. This enables the acquisition and recording of data, as well as the transfer of commands from the software application to the AST pyrometer. When PGM is in OFF condition, a message will appear.

Now ON the PGM and software will auto detect the pyrometer.



A. 5.2.2 Parameter Setting

All user selectable device parameters can be set by using the software in the Panel "Parameter".

Parameters	
Emissivity	1.00
Response time	2 mSec
Unit	°C
Auto Off Timings (Min)	1
Temp Hold Time (Sec)	3

Temperature Hold On Pressing Button
 Temperature Hold On Releasing Button
 Peak Temperature Hold Between Pressing and Releasing Button

Info	
Model	AST P-GM +
Basic range	250°C...600°C
Serial number	0000111
FW Version	25.05
Internal Temp	36°C

A) Emissivity settings : The emissivity can be set by clicking on "Parameters" and select or type in the desired emissivity directly in the description field. The emissivity value will be transferred to pyrometer by hitting the "TAB" button. The emissivity range is from 0.1 to 1.0.

For a correct measurement it is necessary to adjust the emissivity. This emissivity is the relationship between the emission of an real object and the emission of a black body radiation source at the same temperature. Different materials have different emissivities ranging

between 0% and 100%. The major parameters effecting emissivity are:

1. The surface condition of the material, rough surfaces have higher emissivities.
2. The spectral range of the pyrometer and the measuring temperature.
3. The Pyrometer spot size is fully filled by measured object or not.
4. The optical losses due to any obstruction in between pyrometer & measured object like glass window.

The emissivity setting of the pyrometer has to be adjusted accordingly. The tolerance of the emissivity values for each material is mainly dependent on the surface conditions.

(B) Response Time : It can be adjustable from 2msec. to 10sec. maximum.

(C)Unit : User can change the measuring unit of temperature from "Centigrade" to "Fahrenheit" and vice versa.

(D) Auto OFF Timing : The Auto OFF Time can be adjustable from 1 min to 10 min maximum

(E) Temperature Hold Time: It can be set from 1 sec to 30 sec. This time is used to hold the measured temperature reading on the OLED display for the desired time.

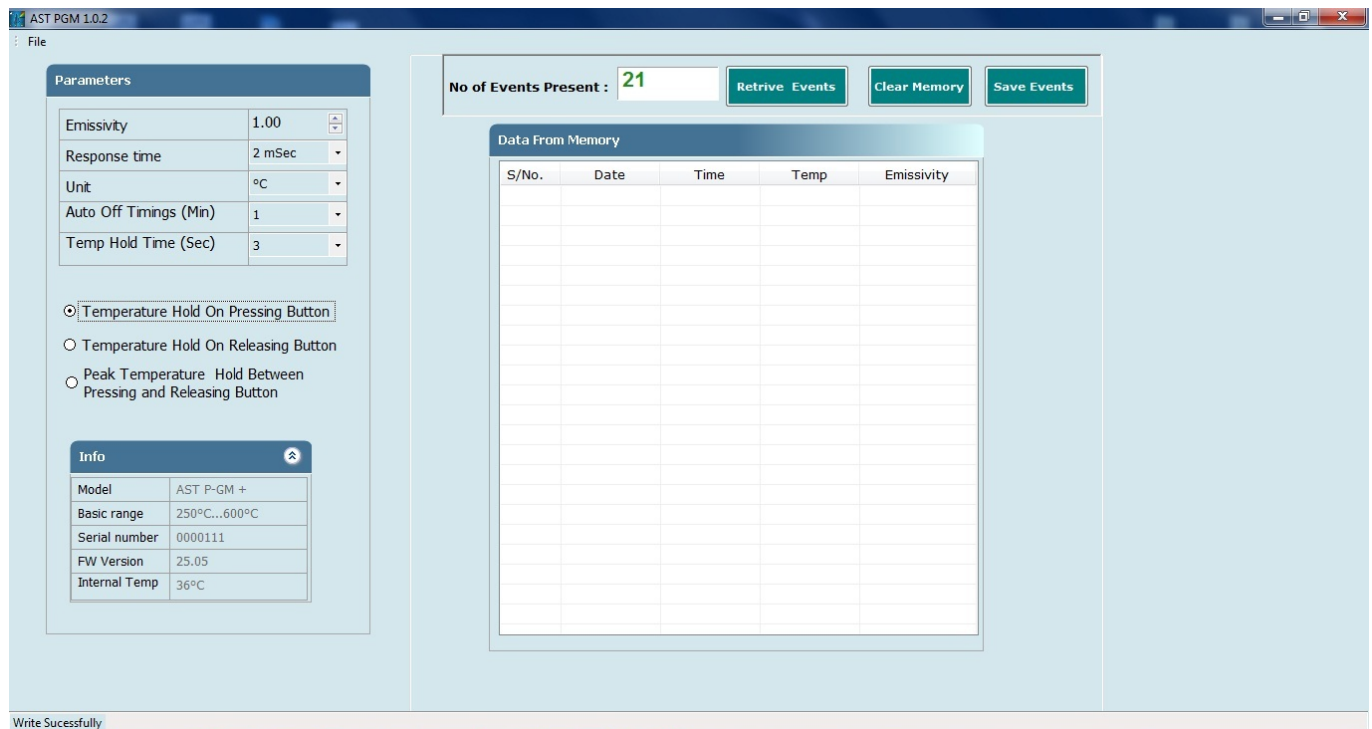
(F) Temperature Hold on Pressing Button : Temperature data is displayed, saved and hold on pressing the button.

(G) Temperature Hold on Releasing Button : Temperature data is displayed, saved and hold on releasing the button.

(H) Peak Temperature Hold between Pressing and Releasing the Button : This feature is used to Hold the Peak value of the temperature between pressing and releasing the button.

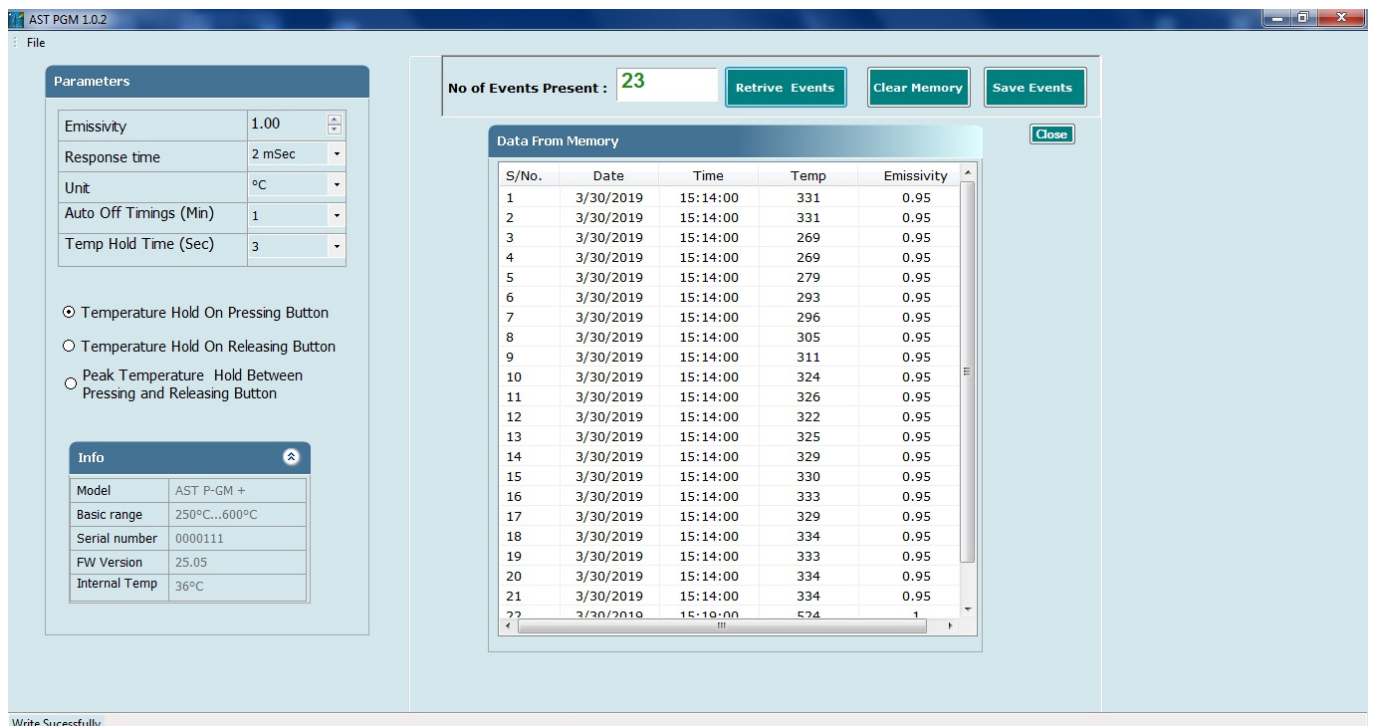
No of Events Present

This head shows the no of events recorded.



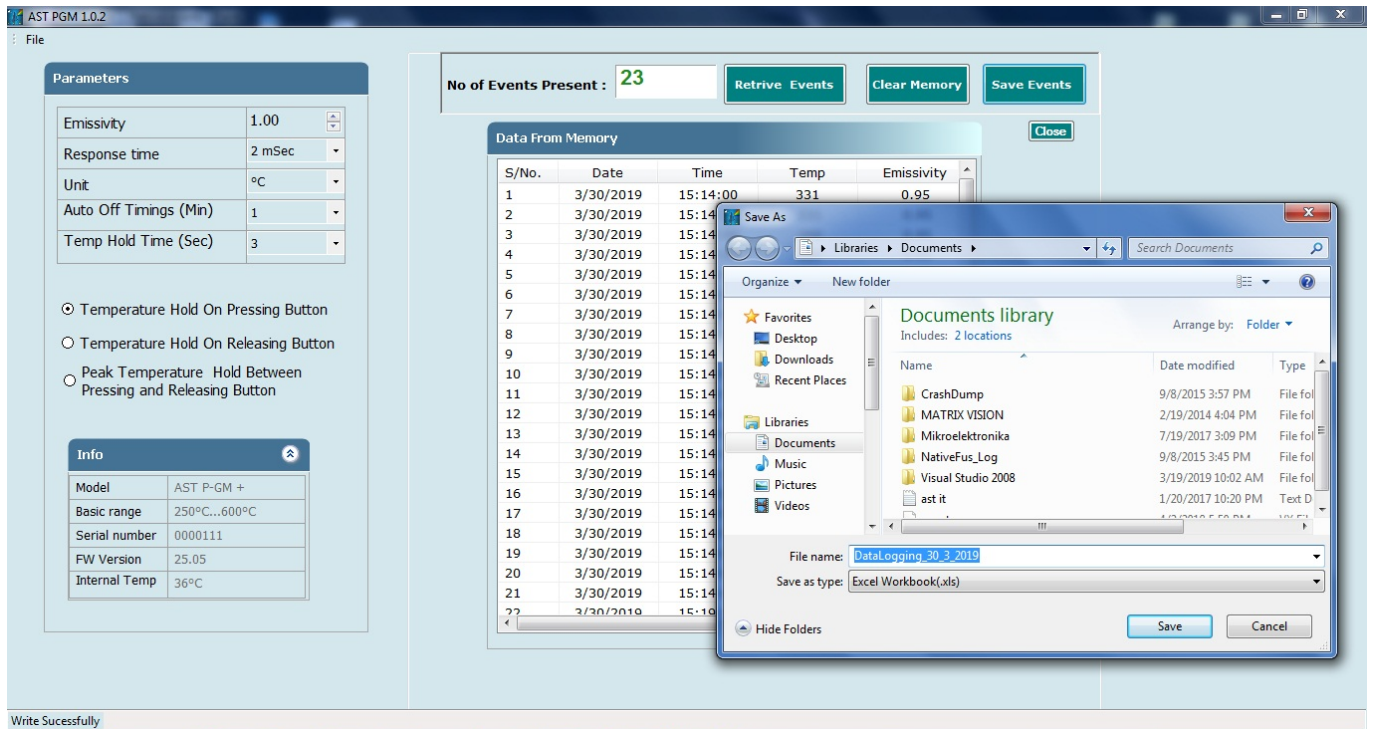
Retrieve Events

By clicking on Retrieve Events Button, the data which are recorded in pyrometer shows on the screen with time, date, Temperature & Emissivity.



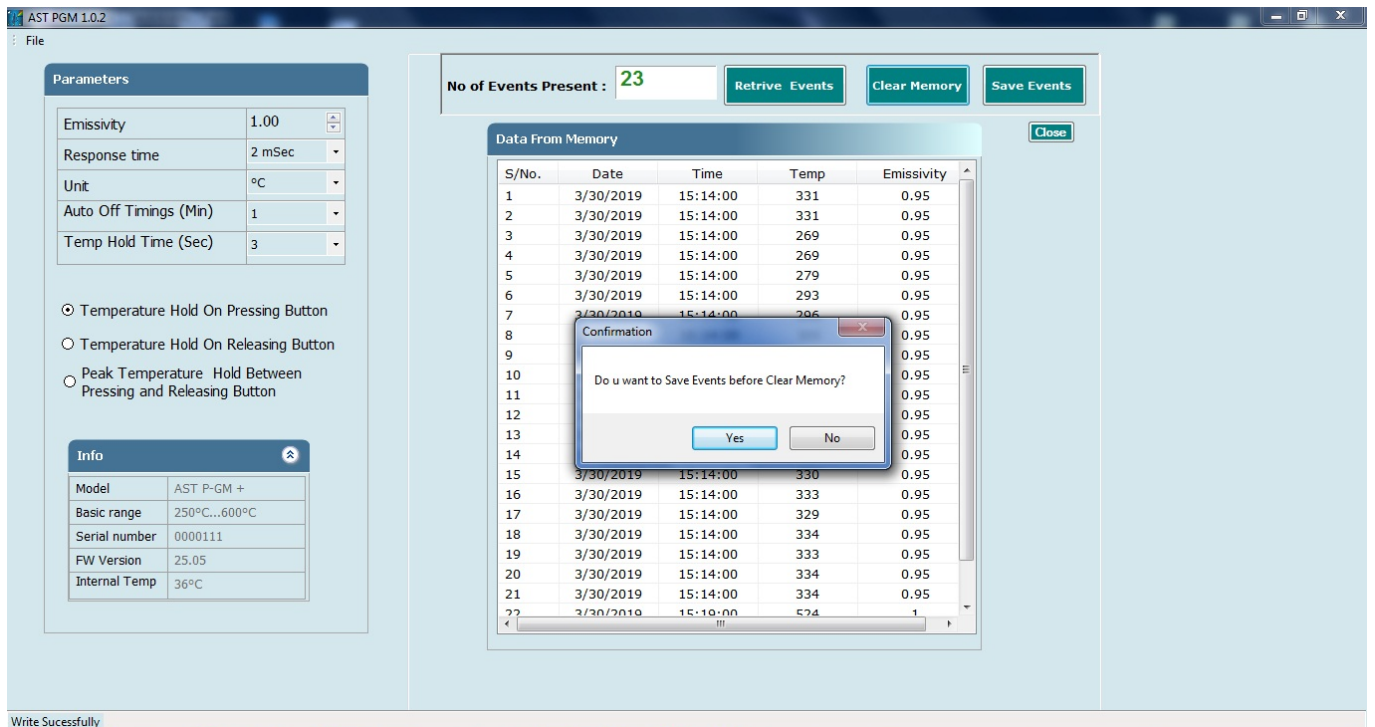
Save Events

By clicking on the save events, File will be stored in .xls format.



Clear Memory

After clicking on Clear Memory button, the window appears with the box ask to save events or not before clear memory. If yes, record will be saved



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 P-GM+ instruments have a warranty of two years from the invoice date. This warranty covers manufacturing defects. User-induced faults are not covered under this warranty.

Software warranty

The windows compatible software was thoroughly tested on a wide range of windows operating systems. Nevertheless, there is always a possibility that windows or PC configuration or some other unforeseen condition exists that would cause the software not to run smoothly. The manufacturer assumes no responsibility or liability and will not guarantee the performance of the software. Liability regarding any direct or indirect damage caused by this software is excluded.

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

Copyright: © 2009, AST. 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 equipment with which this document is associated.

AST reserves the right to make changes, without further notice, to any products herein to improve reliability, function, or design. AST does not assume any liability arising out of the application or use of any product described herein, neither does it convey any license under its patent rights nor the rights of others.

Copyright: © 2009

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 brought 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



www accuratesensors.com

AST - Accurate Sensors Technologies

Misgav Industrial Park,
Misgav 20174, Israel
Ph. : +972-4-9990025, Fax. : +972-4-9990031
E-mail: info@accuratesensors.com

AST - Accurate Sensing Technologies

188A, B-169 (Part), B-188 & B-189 (A)
Road No.-5, M.I.A., Madri, Udaipur
(Rajasthan.) INDIA 313 003
Ph.: +91-294-3290271
E-mail: sales@accuratesensors.com