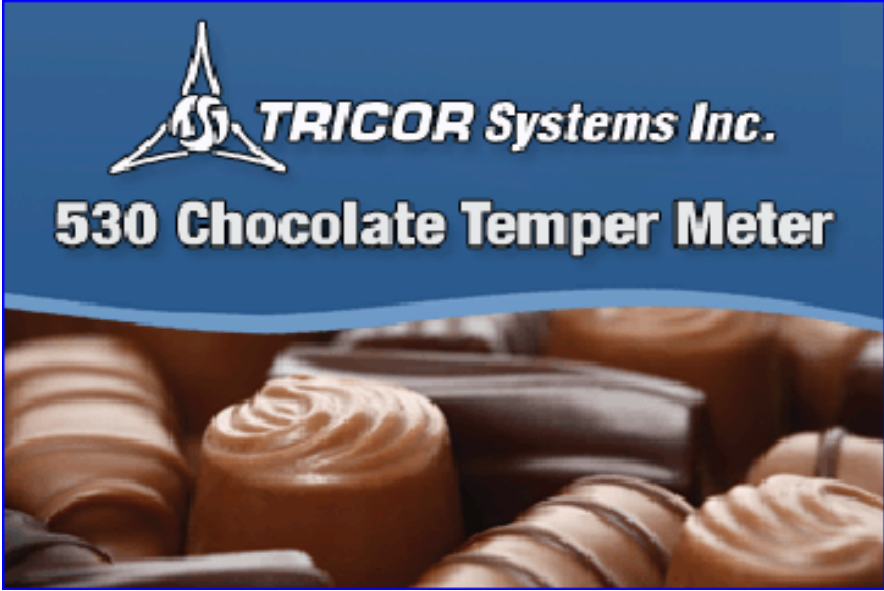# Model 530 Chocolate Temper Meter
Quick Start Guide

The following is a brief description on how to setup and use the Model 530 Chocolate Temper Meter.

Should you have any questions or encounter any problems please contact us at:

TRICOR Systems, Inc.
1650 Todd Farm Drive
Elgin, IL 60123
1-847-742-5542
www.tricor-systems.com

Power Up Sequence

The image to the left is displayed during power up initialization, along with progress bars showing:
- Initializing System ... during this sequence the unit performs a self-test, initializes parameter settings and electronic circuits
- Searching Stored Results ... during this sequence the unit verifies the stored run memory area and initializes stored run search parameters

The Self-Test result screen is displayed next
  When the self-test passes, the screen is visible for approx 2 seconds, then continues
    - no operator action is required
  If the self-test fails the screen will remain displayed, showing which test(s) failed
    - record the failed test(s) and contact TRICOR
    - press Continue

The next screen displays the cooler and heater temperature readings and set points while the unit waits for the cooler and heater to reach their set points

1

Performing a Test Run

Figure 1 ... Operator Action Required - ID Entry

```
      Model 530 Chocolate Temper Meter
             09/19/09 11:32am


Last Run: CTU= 6.5 Slope=+ 0.67


  Enter ID(s) before inserting sample
Prod ID      Oper ID      Line ID      Plnt ID
530          123          Off          Off

        Oper ID = █


Press Enter to accept new (or curr) val
Press Continue to accept current value
```

Test Run sequence ...
- wait for unit temperature stabilization
- enter desired ID's (if any ID enable = On) (Fig 1)
- wait for "Ready For Sample" message (Fig 2)
- remove sample cup from front of unit, fill cup such that chocolate is just below lip and above the fluted area
- lift sample lid, insert filled cup into well, slide knob right, close lid
- test run begins ...
    during a test run data is displayed the same as the stored runs display (Fig 8 or Fig 9) except if in graph mode the current sample time, temp and slope is displayed just below the ID's while the temp is plotted on the graph
- wait for test run completion
- test data printed to internal printer
- slide knob left, lift lid, remove sample cup, close lid
- if applicable, test data will be printed on the external printer
- if enabled the statistical graph is displayed

Figure 2 ... Unit Ready for Test Run

```
      Model 530 Chocolate Temper Meter
             09/19/09 11:32am


Last Run: CTU= 6.5 Slope=+ 0.67


            Ready For Sample

Prod ID      Oper ID      Line ID      Plnt ID
530          Off          Off          Off
```

To abort a test run, lift sample lid, remove sample, then close the lid

Press the "Status" key when either of these screens (Fig 1 or Fig 2) is displayed to access the SYSTEM STATUS screens, which are used to view stored runs, statistics or parameter settings and to access menus for configuration programming

2

Navigating Through Status and Menu Screens

Figure 3 ... Sample Status Screen

```
      Model 530 Chocolate Temper Meter
             09/19/09 11:32am
             SYSTEM STATUS
Stored Runs        Prod ID Enab     Auto
Statistics         Product ID        530
>ID Settings       Oper ID Enab      Off
Test Parameters    Operator ID     99999
Unit Parameters    Line ID Enab      Off
Display Setup      Line ID         99999
Print Setup        Plnt ID Enab      Off
Graph Setup        Plant ID        99999
System Info        Last Test ID
                                     486

Press Enter to view Menu
Scroll Up/Down to view Settings
Press Cancel to return to Main screen
```

- press Scroll Up, Scroll Down keys to navigate through status group screens (Fig 3) and menu screens (Fig 4)

- current parameter values are displayed on the right side of the screen

- when the desired Status group name is highlighted, press Enter to access menus and submenus

- when the desired menu item is highlighted, press applicable keys (see Figs 5, 6) to change value or press Enter to change numeric values

- press Print (from any SYSTEM STATUS screen) to print the unit's status information on the internal printer

- for all screens the bottom 3 lines of the display describe which keys to press for navigation

Figure 4 ... Sample Menu Screen

```
      Model 530 Chocolate Temper Meter
             09/19/09 11:32am
            Set ID Parameters
>Prod ID Enable                      Auto
 Preset Product ID                    530
 Oper ID Enable                       Off
 Preset Operator ID                 99999
 Line ID Enable                       Off
 Preset Line ID                     99999
 Plnt ID Enable                       Off
 Preset Plant ID                    99999


Enter= decr val    Status= incr val
Scroll Up/Down for menu item selection
Press Cancel to return to Status screen
```
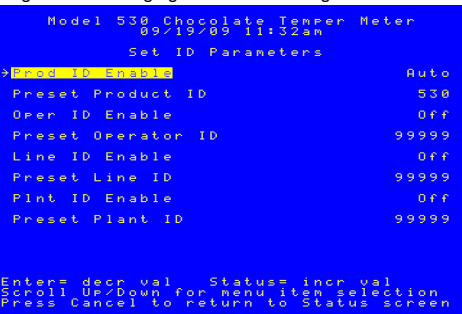
3

Parameter Descriptions and Uses

Status Group	Parameter	Description
Stored Runs	-	used to view and print stored runs
Statistics	-	used to view and print statistical analysis of stored runs for a selected Product ID
	Auto Disp Stat Graph	On = unit will display statistical graph at the end of the test run (after any printing is completed)
	CTU Low Limit	
	CTU High Limit	used on the statistical graph display to highlight a user specified range for acceptable test run results
	Slope Low Limit	
	Slope High Limit	
ID Settings	ID Enables	Off = ID not used (ref Fig 8) On = operator action required prior to test run (must accept current value or enter a new value) Auto = automatically uses preset ID value for a run
	ID Presets	valid range is 1 to 99999
	Last Test ID	not user accessible, this is a sequential run number the unit assigns to each test run
Test Parameters	Degrees	temperature unit of measurement - ℃ or ℉
	Runtime	valid range is 3:00 to 9:55 minutes, in 30 second incr's
	CTU Cutoff	If the 2nd inflection point occurs below this setting the test result will be No Inflection
	Result string format	CTU / Slope 2 ... CTU result and the slope at the 2nd inflection point (ref Fig 8) S2 / T1 / T2 ... the slope at the 2nd infl pt, the temps at the 1st and 2nd inflection points (ref Fig 9)
Unit Parameters	Date/Time	sets unit clock, sets the time format (12 or 24hr) and the date format (dd/mm/yy or mm/dd/yy)
	CTU Offset	this value is added to the calculated CTU result which allows users to obtain CTU results that correlate with previously obtained test data or which are more familiar to the user

Status Group	Parameter	Description
Unit Parameters	Line Frequency	programs A/D filter circuit for power line frequency - 50 hz or 60 hz
	Alarm Enable * (end of run and self-test alarm sound is 50 cycles of triple beeps)	On = internal beeper will sound when: - keys are pressed (short clicking sound) - at end of test run * - if self-test fails (except on power-up) *
	Cooler Ref	available with the Programmable Cooler Option; allows user to change Cooler Reference
Display Setup	Run Data Disp Format	controls how test run data (real time or stored) is displayed - as a graph (Fig 8) or a data list (Fig 9)
	Disp Infl Pts Enable	controls displaying of inflection point data
	Color Settings	sets the displayed color of various displayed items - text, background, graph and No Infl highlight
Print Setup	Int Printout Format	controls internal printer test run data format Off = test run will not be printed Short = only the header and results will be printed Shrt/Gr = the graph will also be printed Long = each 5 second sample point will be printed Long/Gr = the graph will also be printed
	Auto Print Ext	available with the External Print / Plot option Off = test run will not be printed On = test run data will be printed on external printer at end of run (starts when sample is removed)
Graph Setup	Set Graph Baseline	sets the baseline for the temperature axis of all graphs (display, internal and external printer)
System Info	System Readings	displays various temperature, voltage and current readings of internal electrical circuits
	Self-Test	performs system self-test
programmed through UserApp530 only	Sample Description	a string containing up to 12 characters is stored with each test run (ref Fig 9)

4

Changing Parameter Values

Figure 5 ... Changing fixed value settings

```
      Model 530 Chocolate Temper Meter
               09/19/09 11:32am
           Set ID Parameters

→Prod ID Enable                    Auto
 Preset Product ID                  530
 Oper ID Enable                     Off
 Preset Operator ID               99999
 Line ID Enable                     Off
 Preset Line ID                   99999
 Plnt ID Enable                     Off
 Preset Plant ID                  99999



Enter= decr val    Status= incr val
Scroll Up/Down for menu item selection
Press Cancel to return to Status screen
```
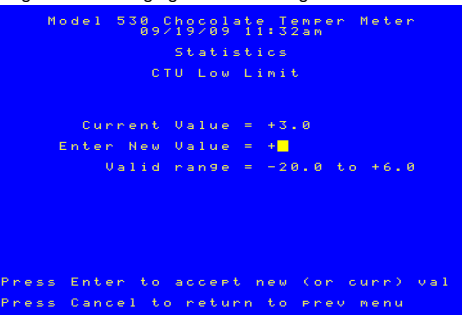
- two value settings
    press Enter to toggle

- multi-value settings
    press Status to increment
    press Enter to decrement

- see lines at bottom of display for description of
  which key(s) to use based on the
  currently selected parameter

Figure 6 ... Changing numeric settings

```
      Model 530 Chocolate Temper Meter
               09/19/09 11:32am
                 Statistics
               CTU Low Limit


        Current Value = +3.0
      Enter New Value = +█
        Valid range = -20.0 to +6.0




Press Enter to accept new (or curr) val
Press Cancel to return to prev menu
```

- press numeric keys to change value
    - press Enter to accept new value
    - press Backspace to clear last key entered

- press Cancel to exit without changing value

Statistical Data Viewing

Figure 7 ... Statistical Analysis Graph

```
 Model 530 Chocolate Temper Meter
            09/19/09 11:32am
  Statistics for Product ID 530
08/23/09 07:22am - 08/24/09 05:45pm
         111 Valid Results

CTU   X-Bar   Sigma    SLP   X-Bar   Sigma
       6.19    2.28           0.55    0.51
```

```
+15                         +4

+10                         +2

 +5                          0

  0                         -2

 -5                         -4
4 NI       ...         4 NI        ...

Press Cancel to return to prev menu
```

to display a Statistical
Analysis graph ...

- from the SYSTEM STATUS
  screen navigate to the
  Statistics group and
  press Enter

- select the View Stats by
  Prod ID menu item and
  press Enter

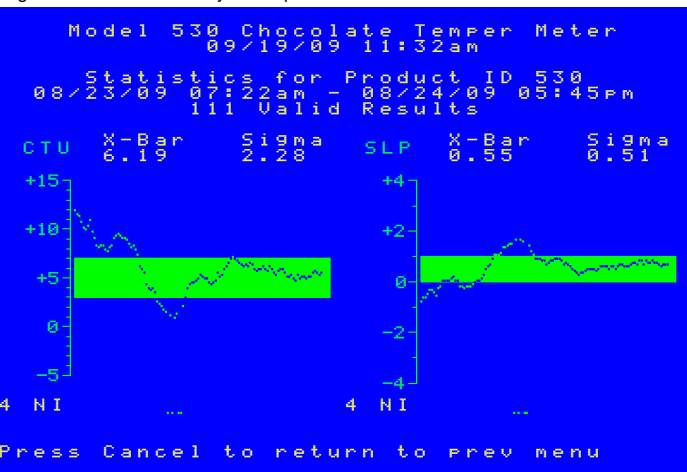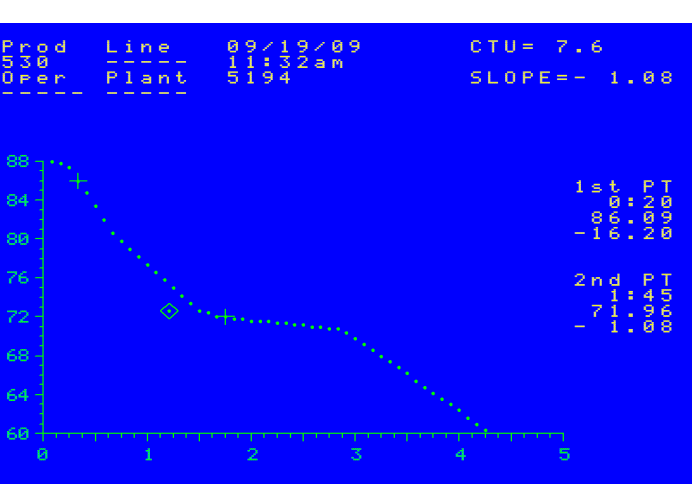- select the desired Prod ID
  and press Enter

- press Print to send statistical data results to the internal printer (the graph is not printed)

- up to 120 run results are displayed, if more are stored then the latest 120 are displayed
    - all stored runs for the selected Product ID are included in the calculations, even if not displayed
    - oldest data is to the left, newest to the right. each dot represents one test run result

- Product ID's are selected through a menu that includes up to 9 ID's, if more are stored then an
  additional menu item is displayed to allow user entry of an ID via the keypad

Stored Run Viewing

Figure 8 ... Stored Run - Graph

```
Prod   Line   09/19/09    CTU= 7.6
530    -----  11:32am
Oper   Plant  5194        SLOPE=- 1.08
-----  -----
```

```
88
84                                  1st PT
80                                     0:20
76                                    86.09
72                                   -16.20
68
64                                  2nd PT
60                                     1:45
   0    1    2    3    4    5          7:96
                                      -1.08
```
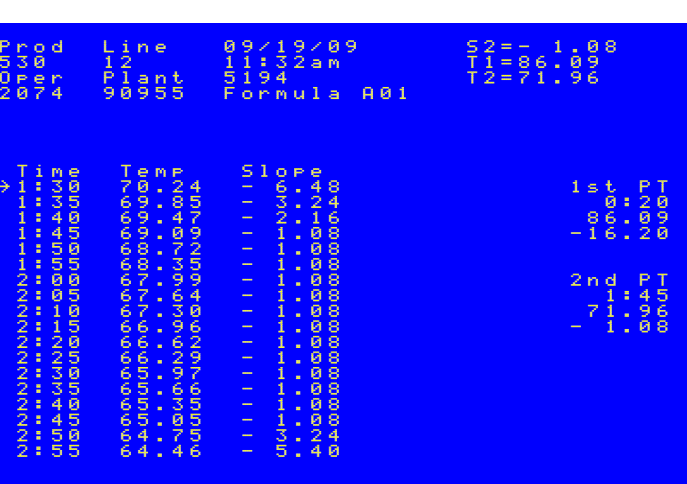
(Result string format = CTU / Slope 2)
("-----" signifies ID enable = Off)

* holding down any scroll key switches to fast scroll mode:
    - stored run scrolling - only the header data is displayed
    - list scrolling - only one line of time, temp, slope is displayed

to display stored run data ...

- from the SYSTEM STATUS screen navigate to the Stored
  Runs group and press Enter

- select the View Stored Runs menu item and press Enter

- first run displayed is last run stored (newest)

- display format graph (Fig 8) or list (Fig 9) per "Run Data
  Display Format" setting

- press Print
    - internal printout format per "Int Printout Format"
    - if the external printer option is present then a menu
      pops up to select where to print: "1 = Int 2 = Ext"

- scrolling through stored results
    - press Enter to scroll to previous run (older) *
    - press Status to scroll to next run (newer) *
    - press "+/-" to scroll to 10th prev run (older) *
    - press "3" to scroll to 10th next run (newer) *

- scrolling will automatically rollover at memory boundaries
    - if currently viewing newest and scroll "Next" past
      memory boundary then oldest will be displayed
    - if currently viewing oldest and scroll "Prev" past
      memory boundary then newest will be displayed

Figure 9 ... Stored Run - List

```
Prod   Line   09/19/09    S2=- 1.08
530    12     11:32am     T1=86.09
Oper   Plant  5194        T2=71.96
2074   90955  Formula A01
```

```
Time   Temp    Slope
→1:30   70.24  - 6.48              1st PT
 1:35   69.85  - 3.24                 0:20
 1:40   69.47  - 2.16                86.09
 1:45   69.09  - 1.08               -16.20
 1:50   68.72  - 1.08
 1:55   68.35  - 1.08              2nd PT
 2:00   67.99  - 1.08                 1:45
 2:05   67.64  - 1.08                 7:96
 2:10   67.30  - 1.08                -1.08
 2:15   66.96  - 1.08
 2:20   66.62  - 1.08
 2:25   66.29  - 1.08
 2:30   65.97  - 1.08
 2:35   65.66  - 1.08
 2:40   65.35  - 1.08
 2:45   65.05  - 1.08
 2:50   64.75  - 3.24
 2:55   64.46  - 5.40
```
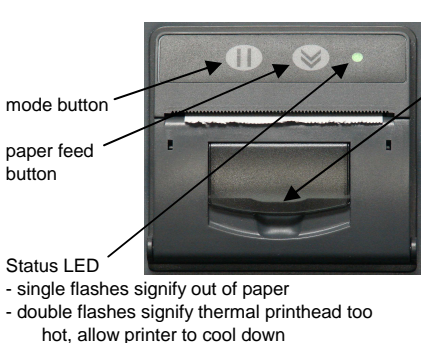
(Result string format = S2 / T1 / T2 and run has a Sample Description)

- scrolling through list format sample data
    - press Scroll Up/Down keys for single step scroll *
    - press "6" key to page up through list *
    - press "9" key to page down through list *

Figure 10 ... Printer Buttons (as viewed on unit)

mode button

paper feed
button

Status LED
- single flashes signify out of paper
- double flashes signify thermal printhead too
  hot, allow printer to cool down

---- Changing Printer Paper Roll ----

- carefully pull access door lever (Fig 10, 11)
  until door is released from its locked
  position
- remove empty roll
- insert new roll, leave approx 2 cm (3/4 in)
  outside door (Fig 12)
- close door by carefully pressing the center
  of door until door locks closed (Fig 13)

- a pink stripe at edge of paper signifies
  end of paper roll

Figure 11 ... Open paper access door

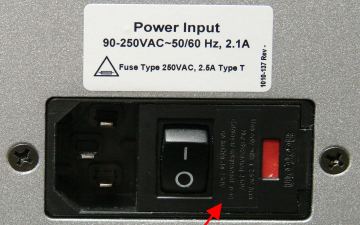#### Figure 12 ... Insert new paper roll
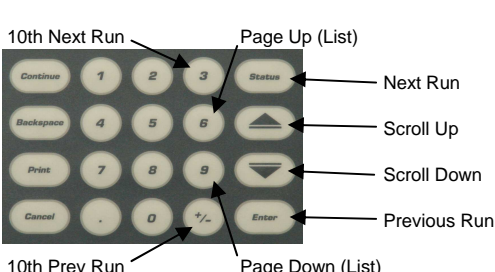

Figure 13 ... Close and lock access door

Figure 14 ... Power Entry Module (rear panel)


```
Power Input
90-250VAC~50/60 Hz, 2.1A
Fuse Type 250VAC, 2.5A Type T
```

fuse access door (remove power
cord before opening)

Figure 15 ... Keypad Buttons

10th Next Run ──── Page Up (List)

Next Run

Scroll Up

Scroll Down

Previous Run

10th Prev Run ──── Page Down (List)
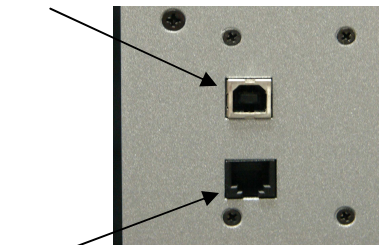
(hold any scroll key down for fast scroll mode)

Figure 16 ... Serial Comm Connectors (rear panel)

USB (Type B) (used with UserApp530 and TMDAS PC programs)

RS-232 (RJ-11) (used with External Print / Plot option)

---- Specifications ----

Dimensions .... 27h x 47w x 38d cm
10.5h x 16.5w x 15.0d inches

Weight .... 8.7kg (19 lbs)

Power Requirements .... Universal AC Input
range 90 to 250 vac, 50 or 60 Hz
1.7A @ 115vac (0.85A @ 230vac)

Internal Memory Storage .... 165 five minute runs

Sample Test Time .... 3 to 10 minutes (programmable)

Sample Volume .... 11.0 mL (0.38oz)

Sample Stabilization Time .... 30 sec

CTU Repeatability .... ± 0.5 ctu

Cooler Stability .... ±0.06℃ (±0.1℉)

Probe Heater Temperature Accuracy .... ±0.6℃ (±1.0℉)

Temperature Measurement Sensitivity .... ±0.003℃ (±0.005℉)

Temperature Measurement Range .... -8°to 55℃ (18°to 131℉)

Ambient Operating Temperature Range ... 10°to 41℃ (50°to 105℉)

Temper Curve Graph Scales
Temperature axis scale .... 14℃ (28℉) (display, printouts)
Temperature axis baseline ... 14°to 32℃ (56°to 92℉) (display, printouts)
Time axis scale .... 5 min or 10 min (display)
per test run (printouts)

Self-Test .... automatic on power up
can also be run from menu

Color TFT LCD Display .... 16 user selectable colors
LED backlight
320w x 234h pixels
40 characters (w) x 29 lines (h)

PC Configuration Application .... PC program used for
(UserApp530) configuration setup

RoHS Compliant .... EU Directives 2002/95/EC and 2005/618/EC

Sample cup storage tube capacity .... 80 cups

---- Supplies ----

Sample cups (box of 5000) 130-226

Printer Paper roll (box of 24) 321-161

Well cleaning tool 130-245

---- Options ----

Programmable Cooler Temperature 321-420

External Print / Plot (includes dot matrix printer) 321-421

Data Acquisition Application (TMDAS) 150-124