Thermocouple Digital Thermometer

Model: 72-7712 and 72-7715

IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

- Please operate according to this manual, otherwise the protection provided by the device will be impaired or fail.
- Check the condition before using. If you find any cracking, breakage, damage or abnormality, or you consider the device broken, stop using the device immediately
- Do not use the Thermometer if it operates abnormally. Protection may be impaired. When in doubt, have the Thermometer serviced.
- Do not operate the Thermometer around explosive gas, vapor, or dust.
- Do not apply more than the rated voltage, as marked on the thermometer (30V) between the thermocouple(s), or between any thermocouple and earth ground.
- When potential differences are anticipated between the thermocouples, use electrically insulated thermocouples.
- Use the correct thermocouples, function, and range setting of your Thermometer.
- When performing two thermocouples measurement, make sure there are no potential differences between the two thermocouples.
- Do not leave the Thermometer on or near objects of high temperature.
- Do not use the Thermometer with any part of the case or cover removed.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Remove dead batteries from the Thermometer or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.
- Before replacing the battery, turn off the Thermometer and disconnect all the thermocouples.
- To prolong battery life turn off the Thermometer after use.

WHAT'S INCLUDED

- Digital Thermometer
- (72-7712) thermocouple K- J- T- & E- type leads.
- (72-7715) thermocouple K- J- T- E- R- S- & N- type leads.
- 9V 6F22 Alkaline Battery (included)
- Instruction manual

DISPLAY ELEMENTS
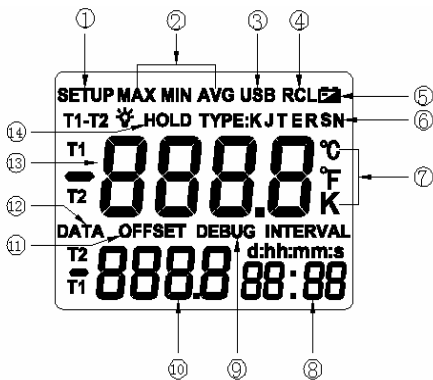
1. Setup is in progress when the icon blinks
2. Display readings of maximum, minimum and average
3. USB connected.
4. Logged readings are displayed when the icon blinks.
5. Low battery.
6. The thermocouple type
7. The temperature units
8. Time display
9. Under Calibration mode when the icon blinks. The displayed reading is fixed.
10. Secondary Display.
11. The thermocouple measurement includes an offset.
12. Data transfer in progress.
13. Main Display Output.
14. Hold displayed output.

BUTTON FEATURES
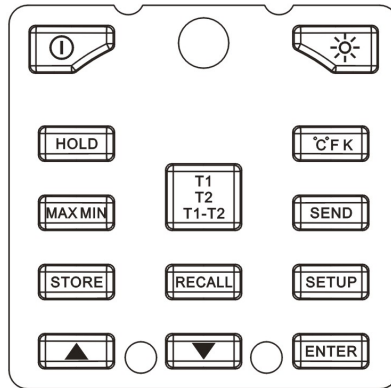
⏻	Press to turn the thermometer on or off.
☼	Press to turn the display backlight on and off.
HOLD	Press to freeze or unfreeze the displayed readings.
CFK	Press to switch between Celsius (ºC), Fahrenheit (ºF), and Kelvin (K).
MAX MIN	Press to step through the maximum, minimum, and average readings. Press and hold to turn off this display.
T1 T2 T1-T2	Press to switch between showing the T1, T2 and T1-T2 (differential temperature measurement) in the primary or secondary display.
SEND	Press to enter USB mode and the USB icon blinks. Press again to exit.
STORE	Press to start or stop logging.
RECALL	Press to show logged readings. Press again to stop.
SETUP	Press to start or exit Setup.
▲ ▼	Increase or decrease displayed setting.
ENTER	Confirm selected settings.

Thermocouple type

- Plug the thermocouple(s) into the input connector(s).
- Press the power button to turn on the thermometer.
- Set the type of thermocouple(s) to those plugged into the input connector(s).
- Press **SETUP** until the display shows TYPE.
- Press ▲or▼ to select the thermocouple type you want including E-, J-, K- and -T type (72-7715 also has N-, R- and S- type).
- If no thermocouple is plugged into the selected input or the thermocouple is open and the over-range positive deviation is too big, the display shows _ _ _ _.

Changing Setup options

- Press **SETUP** to switch through the following settings you wish to change. When the thermometer is in setup mode, the display blinks SETUP:

Logging interval

- The logging interval determines how often the thermocouple stores logged readings in memory. Choose the length of the logging interval. The thermometer stores logged readings at the end of each logging interval. You can select a logging interval by pressing ▲or▼. Max 59.59min. When the logging interval is 00.00, the auto store feature will be disabled and readings are stored manually.

Offset (T1)

- Press **SETUP** until the display shows OFFSET and T1
- Press ▲or▼until the display shows the correct reading.

Offset (T2) (72-7715 only)

- Press **SETUP** until the display shows OFFSET and T2
- Press ▲or▼until the display shows the correct reading.

Sleep Mode

- Press **SETUP** until the display shows SLP.
- Press ▲or▼ as needed until the display shows the required sleep time between 5-60 minutes. Less than 5mins disables the sleep mode and displays OFF.

Line Frequency

- Press **SETUP** until the display shows LINE.
- Press ▲or▼ to select 50Hz or 60Hz.

Setting the Time (S-T)

- Press **SETUP** until the display shows S-T.
- Press **ENTER** to switch between hours, minutes and seconds.
- Press ▲or▼ until the display shows the correct time in 24hr format.
- If the time is not set the displays shows the current powered on duration period.

Low Limit Alarm (Lo) (72-7715 only)

- Press SETUP until the display shows LO.
- Press ▲or▼ until the required low limit alarm.
- Press ENTER to turn the alarm off or back on again.
- The minimum low limit alarm setting is the minimum range of the thermocouple type in use.

- The maximum low limit alarm setting is the maximum range of the thermocouple used -1, or the high limit alarm setting -1.

High Limit Alarm (Hi) (72-7715 only)
- Press SETUP until the display shows HI.
- Press ▲or▼ until the required high limit alarm.
- Press ENTER to turn the alarm off or back on again.
- The maximum high limit alarm setting is the maximum range of the thermocouple type in use.
- The minimum low limit alarm setting is the minimum range of the thermocouple used +1, or the low limit alarm setting +1.

Over Limit Signal (72-7715 only)
- Press SETUP until the display shows SI.

Thermocouple type measuring ranges	
E type	-150°C to +1000°C (-238.0^{o}F to +1832°F)
J type	-210°C to +1200°C (-346.0^{o}F to +2192°F)
K type	-200°C to +1372°C (-328.0^{o}F to +2501°F)
T type	-250°C to +400°C (-418.0^{o}F to +752°F)

Thermocouples are colour coded by type based on the North American ANSI Colour Code:

     -J type - Black
     -K type - Yellow
     -T type - Blue
     -E type - Purple
     -R type - Green
     -S type - Green
     -N type - Orange

- Press ▲or▼ to turn the over limit signal output on or off. The display indicates the current mode.
- After setting the high or low limit alarm and turning on the over limit signal output, the SIGN port of the Thermometer will output the corresponding signal if the tested temperature is over or under the high or low limit. When the temperature is under the low limit the SIGN port will output around 10Hz pulse signal.

Normal Temperature Compensation (NTC)
- Press SETUP until the display shows NTC.
- Press ▲or▼ to turn normal temperature compensation on or off.

Debug On/Off (72-7715 only)
- Press SETUP until the display shows DEBUG.
- Press ▲or▼ to turn debug mode on or off.
  You can self-debug the thermometer when the debug mode is on.

Displaying Temperatures
- Press ºC ºF K to select the correct temperature scale.
- Hold or attach the thermocouple(s) to the measurement location.
- The temperature reading appears in the selected display.

Holding the displayed temperature
- Press **HOLD** to freeze the readings on the display. The display shows HOLD.
- Press **HOLD** again to turn off the HOLD function.

Display backlight operation
- Under temperature measurement mode, press ☼ to turn the display backlight on.
- Press ☼ again to turn off. The display backlight will not automatically switch off after a time.

Viewing the minimum, maximum and average readings
- Press **MIN MAX** to step through the maximum (MAX), minimum (MIN), or the average (AVG) readings.
- Press and hold **MIN MAX** to exit MIN MAX mode.

Using the offset to adjust for probe errors
- Use the offset option in Setup to adjust the thermometerís readings to compensate for the errors of a specific thermocouple.
- Plug the thermocouple into the input connector.
- Place the thermocouple in a known, stable temperature environment (such
- as an ice bath or a dry well calibrator).
- Allow the readings to stabilize.
- In Setup change the offset until the display reading matches the calibration temperature.

Over limit alarm (72-7715 only)
- Setting the low alarm and high alarm limit at the SETUP mode, the thermometer beeps when the measured temperature is higher or lower than the pre-set limit.
- Setting the low and high limit signal output at the SETUP mode, the SIGN port output the corresponding signal when the measured temperature is higher or lower than the pre-set limit.

Using Memory
- During a logging session, the thermometer stores logged readings in its memory.
- The thermometer stores 00-99, total 100 sets of temperature readings. The stored
- readings are from primary display.
- Set the logging interval.
- Press **STORE** to start logging.
- The display blinks DATA.
- Press **STORE** again to stop logging.
- If you require a manual logging interval, set the logging interval as 00:00. Press **ENTER** each time you want to store logged readings in memory. The secondary display shows the logged reading. Each presses of **ENTER** will automatically store the logged readings in the next memory location.
- Press ▲or▼ changes the memory location. Empty locations show - - - - - .
- To view loged readings press **RECALL**, the display shows RCL then press ▲or▼ shows each stored reading in turn.
- The secodary display shows the memory location.

Clearing memory
- Press **STORE** to enter logging mode, the display shows DATA and blinks.
- Press and hold down STORE 2 seconds, the display shows CLR.
- Press **ENTER** to delete all the logged readings from memory. It is not possible to delete the logged readings one by one.

Communicating with a PC
- You can transfer the contents of the thermometerís memory to a PC using the
- included Software.
- Press **SEND** button and USB blinks on the display. It means the thermometer and the PC are connected correct. Details refer to the Installation Guide file in the Software.

MAINTENANCE

Changing the battery
- To install or change the 9V (6F22) battery, turn off the Thermometer,
- Remove the screw and remove the battery compartment lid.
- Replace only with the same type of battery.
- Replace the lid and tighten the screw.

Cleaning the casing
- Wipe using a damp cloth or sponge. Do not use solvents as these may damage the casing. Do not immerse in water.

SPECIFICATIONS

Function	72-7712	72-7715	Input Protection
Type	K, J, T, E	K, J, T, E, R, S, N	
Input	T1, T2	T1, T2	
Measurement Range	K type: -200.0ºC to +1372ºC (-328.0ºF to +2501ºF)		
	J type: -210.0ºC to +1200ºC (-346.0ºF to +2192ºF)		
	T type: -250ºC to +400.0ºC (-418ºF to +752.0ºF)		
	E type: -150.0ºC to +1000ºC (-238.0ºF to +1832ºF)		
Display Resolution	0.1ºC ºF/K (<1000) (T type below -200ºC and R type, S type is 1ºC ºF/K) 1.0ºC ºF/K (>1000)		30V
		R type: 0ºC to +1767ºC (+32ºF to +3212ºF) S type: 0ºC to +1767ºC (+32ºF to +3212ºF) N type: -200ºC to +1300ºC (+328ºF to + 2372ºF)	
Measurement Accuracy	±(0.5%+0.8ºC 1.6ºF))	K- J- T- E-type: ±(0.2%+0.6ºC (1.2ºF))	
		R- S type: ±(0.2%+3ºC (6ºF)) N type: ±(0.2%+1.5ºC (3ºF))	

Function	72-7712	72-7715	Input Protection
Measurement Accuracy	Below -10ºC: add 0.5ºC Below -200ºC: add +2ºC Type T below -200ºC: for reference only		30V
Sampling Rate	50 times per second - updates 2-3 times per second		
Time	Relative time		
Data Store	0 - 99 sets		
Setup	Logging interval, Thermocouple type, offset T1, Offset T2 (72-7712 and 72-7715 only), sleep mode, line frequency, time, high/low limit (72-7715 only) over limit signal output (72-7715 only), normal temp compensation, debug (72-7715 only)		
Over limit alarm	N/A	Yes	
	N/A	Yes	
Power	One 9V (6F22 or 006P) battery		

Made in China. PR2 9PP

Man Rev 1.0