LOVE CONTROLS Division of Dwyer Instruments, Inc.
Michigan City, IN U.S.A. 46360

OPERATION MANUAL

CR10

Temperature, Humidity & Dew Point Recorder
Quick Start

Your CR10 recorder has been preset to operate using the most popular settings.

- **Recording Time:** 7 day
- **°F/°C:** °F
- **Temperature Range:** -20 - +120°F
- **Variables Recorded:** °F and %RH

Pens and a chart have already been installed for your convenience. All you need to do to start using your CR10 recorder with the settings listed above is follow these quick start instructions:

1. Plug in the AC adapter.
2. Set the appropriate time by inserting a coin into the groove in the chart hub and turning clockwise until the correct hour and day on the chart is referenced to the timing clip. (see "Instrument Anatomy" on page 4, if you need assistance locating instrument parts)
3. Remove the protective pen caps.
4. Press the “On/Off” key and the pens will move to the current reading.

After you get started using the “Quick Start Instruction”, we recommend that you also read the rest of the manual to ensure that you get the most out of your instrument.

Requires 4 “D” size batteries for battery back up.

Specifications

**Ranges:**
- **Temperature:** -20 to +120°F (-20 to +50°C)  
  +20 to +110°F (+5 to +40°C)
- **Humidity Range:** 0 to 95% RH (non-condensing)
- **Dew Point:** -22 to +122°F (-30 to +50°C)

**Sensors:**
- **Temperature:** Thermistor
- **Humidity:** Thin Film Capacitor

**Accuracy:**
- **Temperature:** ±1.8°F (±1°C)
- **Humidity:** ±2% RH between 0 and 60%  
  ±3% RH between 61 and 95%
- **Dew Point:** 95% to 30% RH  
  30% to 10% RH  
  10% to 5% RH  
  5% to 0% RH  
  +2°C -2°C  
  +4°C -3°C  
  +8°C -7°C  
  +49°C -48C

**Probe:** 0.92” diameter x 5.9” long on an 8” cord (2.3cm x 15cm long on a 20.3cm cord)

**Recording Times:** 1, 7, 14 & 31 day

**Average Response Time:**
- **Temperature:** 30 seconds for 63% step change at 1CFM airflow
- **Humidity:** 20 seconds to move 63% step change at 1 CFM

**Chart:** 8” diameter (20.3cm)

**Display Resolution:**
1°F (1°C), 1% RH

**Ambient Operating Conditions (body):**
- 0 to 90% RH, +32 to +122°F (0 to +50°C)

**Power Supply:** 120V AC adapter with 4 “D” batteries for back-up power

**Average Battery Life:**
- In 1-day recording mode=2 months,  
  7-day mode=3 months,  
  31-day mode=4 months

**Note:** Response time is slower when using battery power source.

**Calibration:** User calibration of zero

**Alarms:** Audio/visual - high and low  
(warning mechanism, no controller functions)

**Mounting:** Free standing or wall mounting  
(keyholes)

**Dimensions:** 10.5” x 13.2” x 2.8”  
(26.7cm x 33.5cm x 7.1cm)

**Weight:** Approximately 7 lbs. (3.1kg) with batteries
Instrument Anatomy

Figure 2
Operating Information

Pens
The blue pen has a longer pen arm and records humidity or dew point (depending on your dip switch selection, see page 6) and the red pen has a shorter arm and records temperature. The pens are offset to allow the red pen to glide under the blue pen. The blue pen indicates the correct time and the red pen precedes it by 3/16” of an inch.

The pens move in increments across the chart as sensor readings change. The display provides smoother and faster readings than the pens. At any given time there may be a slight discrepancy in the position of the pen and the reading on the display due to hysteresis.

For visual spot checks the display is more accurate than the pen position but both are within the stated specifications of the units. (See “Specifications” on page 2)

Pen Adjust
Pen adjustment may be needed if the pens and display do not match exactly
1. Make sure the pen lifting bar is lowered and press the “Pen Home” key.
2. Turn the chart hub clockwise rotating the chart.
3. With a small screwdriver loosen the pen adjust screw on the pen arms and adjust the pen tips to the outer most circle on the chart.
4. Retighten the screws. After pressing “Pen Home” again the pens should now read correctly with the display.

Probe
The CR10 probe sits in the cradle in the back of the unit. The CR10 probe comes with the standard 8” cord. An extension cord can be ordered to allow for remote sensing capabilities. (See “Replacement Parts” on page 8)

Cord Installation
If you have ordered an extension cord for remote sensing capabilities follow the instructions for cord installation listed below:
1. Turn the unit upside down or on its side so that you can see where the probe connects to the back of the CR10.
2. Twist and pull the black rubber strain relief, beginning on the back of the recorder body. (See “Instrument Anatomy” on page 4)
3. Slide the strain relief down the cord.
4. Inside you will see a standard connector which looks like a phone jack. Using a small screwdriver, press retention tab and the connector will pop out easily.
5. Remove wand from cradle by sliding upward. Repeat steps 1 through 3 for the portion of the cord that connects to the wand.
6. Return the wand to the cradle mounted position by sliding the wand down into the cradle until it fits into the grips. The probe can also be replaced by positioning it in back of the cradle area and pressing it into the cradle until it snaps in place.

Power Supply
We recommend using AC power with four “D” batteries installed as a back-up power source. This ensures that your recording will not be interrupted when there is a power failure. When the instrument is using battery power, the unit will update very slowly to extend battery life. The 120V AC adapter plugs into the back of the recorder beneath the probe cradle.

Display Symbols

Alarm is on.

LO BATT
Low battery indicator.

UC
User Calibration mode. This is displayed in the upper right hand corner of the display.

Reading update indicator. These rectangles will flash along the bottom of the display as long as the recorder is taking readings. If you are using batteries as the power source the update indicator rectangles will still flash but the rate will be very slow in some modes and “B” will light on display. The rectangle furthest to the right is lit continuously when the unit is using battery power.

MIN
This symbol is displayed when you are setting a minimum alarm or when you have pressed the “Min/Max” key and the minimum value is being displayed.

MAX
This symbol is displayed when you are setting a maximum alarm or when you have pressed the “Min/Max” key and the maximum value is being displayed.
Keypad Operations

**On/Off**
When you press the “On/Off” key the pens will move to the correct reading.

**Alarm Set**
The alarm set keys are labeled with arrows that point up and down. You can set a minimum and maximum alarm for both of the two variables you are recording.

1. To set the alarms press the “Alarm Set” key. The MIN symbol will be displayed and the temperature will flash. (Note: The alarm set function always starts with temperature. If you do not want an alarm to sound for temperature readings set the alarms for points that are outside of your range.)

2. Use the up arrow button to increase the minimum temperature alarm setting and the down arrow to decrease the minimum temperature alarm setting.

3. Press “Alarm Set” key a second time. The MAX symbol will appear and the temperature will flash indicating that you can now set the maximum temperature alarm setting.

4. Press the “Alarm Set” key a third time and the MIN symbol will appear and humidity (or dew point if dip switch #5 is on) will flash. Use the same procedure as in step #2 above for setting the maximum temperature alarm setting.

5. When you have set alarms for both variables press “Alarm Set” a final time to lock in settings.

The defaults for alarm settings are:

Temperature: +40°F Min to +100°F
Humidity: 20% Min, 80% Max

Note: Alarm settings will return to the default when AC power fails and there are no batteries installed for back-up power.

**Alarm On/Off**
This button turns the alarms on and off. When alarms are “on”, the alarm symbol appears on the display. When alarm sounds it will sound audibly for approximately 1 minute and then it will stop. For a visual alarm, the variable that has moved outside of the minimum or maximum points that you set will flash. (i.e. if you set a maximum alarm for +80°F and the temperature reaches +80°F the temperature portion of the display will flash)

**Min/Max**
1. Press the “Min/Max” key once and the minimum value during the recording time will be displayed for approximately 7 seconds.

2. Press the “Min/Max” key again and the maximum value during the recording time will be displayed for 7 seconds.

3. Press “Min/Max” key a third time during this period and the display will show current readings. The unit always return to current readings mode after 7 seconds.

Note: Turning the unit off resets the minimum and maximum values.

**Pen Home**
Press the “Pen Home” key while the unit is operating and the pen will move to the outside of the chart. Press the “Pen Home” key again and the pen will return to the current reading points on the chart.

**Display Change**
Press the “Display” key and the display will temporarily show the reading opposite of what is being recorded. (i.e. if dip switch #5 is off and you are recording the RH, pressing the “Display Change” will temporarily change the display to show the dew point reading)

Note: If the unit does not respond to keypad, check to see that dip switch #8 is off.
Dip Switch Set-Up

To set-up the CR10 for your specific application you might need to change some of the dip switches. Every time you change a dip switch setting, you must push the up arrow key on the keypad to activate the new dip switch settings.

Recording Time
The CR10 has four different recording time options: 1 day, 7 day, 14 day and 31 day. Dip switches #1 and #2 control the recording time.

<table>
<thead>
<tr>
<th>Recording Time</th>
<th>Dip Switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 day</td>
<td>#1 Off, #2 Off</td>
</tr>
<tr>
<td>1 day</td>
<td>#1 Off, #2 On</td>
</tr>
<tr>
<td>14 day</td>
<td>#1 On, #2 Off</td>
</tr>
<tr>
<td>31 day</td>
<td>#1 On, #2 On</td>
</tr>
</tbody>
</table>

Note: Remember to install correct chart to match corresponding switch setting.

°F/°C
You can record in °F or °C with the CR10 by using dip switch #3.

<table>
<thead>
<tr>
<th>°F/°C</th>
<th>Dip Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>#3 Off</td>
</tr>
<tr>
<td>°C</td>
<td>#3 On</td>
</tr>
</tbody>
</table>

Temperature Range
The CR30 will record in four temperature ranges. Dip switch #4 allows you to select the temperature range.

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Dip Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Range</td>
<td>#4 Off</td>
</tr>
<tr>
<td>-20 to +120°F (-20 to +50°C)</td>
<td></td>
</tr>
<tr>
<td>Narrow Range</td>
<td>#4 On</td>
</tr>
<tr>
<td>+40 to +110°F (+5 to +40°C)</td>
<td></td>
</tr>
</tbody>
</table>

RH/Dew Point
Dip switch #5 allows you to select whether RH or dew point is recorded by the blue pen. (The red pen always records temperature.)

<table>
<thead>
<tr>
<th>RH/Dew Point</th>
<th>Dip Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH</td>
<td>#5 Off</td>
</tr>
<tr>
<td>Dew Point</td>
<td>#5 On</td>
</tr>
</tbody>
</table>

Display On/Off
Dip switch #7 will allow you to turn the display on and off.

<table>
<thead>
<tr>
<th>Display On/Off</th>
<th>Dip Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display On</td>
<td>#7 Off</td>
</tr>
<tr>
<td>Display Off</td>
<td>#7 On</td>
</tr>
</tbody>
</table>

Keypad Lock
For security purposes it is possible to lock the keypad to prevent unauthorized persons from using the keypad to set alarms or change the calibration. (For more information on use of the keypad see “Keypad Operation” on page 6 & 7)

<table>
<thead>
<tr>
<th>Keypad Operation</th>
<th>Dip Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keypad Unlocked</td>
<td>#8 Off</td>
</tr>
<tr>
<td>Keypad Locked</td>
<td>#8 On</td>
</tr>
</tbody>
</table>

Calibration
Your instrument was carefully tested and calibrated before being shipped from the factory. Additional calibration is not required. However, should calibration be desired in the future, identify a standard that is more accurate than this unit. Calibration salt capsules or electronic instruments recently calibrated at a certified lab are recommended. Sling psychrometers and instruments using mechanical sensing elements (human hair, wood elements, bimetals, etc.) should not be used.

Note: The unit does not have to be recalibrated if you used a longer probe cord.

Calibrate Humidity/Dew Point
(using a controlled chamber)
1. Turn the unit on and use dip switch #5 to select humidity or dew point. (RH = #5 Off) or (Dew Point = #5 On) Use dip switch #3 to select °F or °C. (°F = #3 Off) or (°C = #3 On)
2. To activate the calibration mode, turn the unit off. Now press the “On/Off” key and the “Up Arrow” key at the same time. The “UC” symbol will appear in the display to indicate you are in “User Calibration” mode.
3. Place the probe of the unit along with your precision relative humidity/dew point instrument (RH/Dew Point standards), into a controlled environment chamber and allow 15 minutes for the unit to stabilize. For best results, calibrate the unit at levels typically monitored during normal operation.
5. When calibration is complete, simply press the “On/Off” key to save calibration setting.

Calibrating in an open room, without the use of a salt capsule or a chamber, is not recommended as humidity can vary greatly within a very small area.
Calibration

Calibrate RH/Dew Point
(using salt capsules)
1. Turn the unit on and use dip switch #5 to select humidity or dew point. Use dip switch #3 to select °F or °C (°F = #3 Off) or (°C = #3 On)
2. To activate the calibration mode, turn the unit off. Now press the “On/Off” key and the “Up Arrow” at the same time. The display should read “UC” in the upper right hand corner of the display to indicate you are in the “User Calibration” mode.
3. Place the probe of the unit into a 11% salt capsule or 75% salt capsule, by removing the cap and inserting the probe. Allow approximately 2 hours for the unit to stabilize.
4. Match the CR10 reading with either 11% or 75%, depending on the salt capsule being used. To raise the RH/Dew Point reading, press the “Up Arrow” key. To lower the reading, press the “Down Arrow” key.
5. When calibration is complete, simply press the “On/Off” key to save calibration settings.

Calibrate Temperature
1. Press the “On/Off” key & “Up Arrow” key simultaneously to enter the “User Calibration” mode. Use dip switch #3 to select °F or °C (°F = #3 Off) or (°C = #3 On) The display should read “UC” in the upper right hand corner of the display.
2. Place the CR10 probe, along with your precision temperature instrument (your temperature standard) into a controlled environmental chamber allowing both instruments to completely stabilize, approximately 1 hour.
3. Match the CR10 reading with your precision temperature instrument.
4. To raise temperature reading, press the “Alarm Set” key. To lower the temperature reading press the “Alarm On/Off” key. Each key press adjusts the reading by 1°F.
5. When calibration is complete, simply press the “On/Off” key to save calibration settings.

Pen Installation
1. Press the “Pen Home” key to return pen to the home position.
2. Use the pen lifter to raise the pens.
3. Gently lift the cartridge slightly and slide it off the pen arm.
4. With the pen tip facing the chart, and the new pen cap off, thread the pen arm through the sleeve on the underside of the pen. Slide the cartridge back until you feel the notch in the pen arm seat securely around the plastic portion of the pen tip.

Chart Installation
1. Press the pen home key to make pens move to the outside of the chart.
2. Press the pen lifting bar to raise the pens. Remove the recorded chart if present.
3. Place the new appropriate chart on the chart hub – being certain that the edge of the chart slides under the chart guide clips located at the outside of the chart.
Note: The chart should lay flat on the dial face.
Replacement Parts

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Part#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20° - +120°F/24-hour</td>
<td>100</td>
<td>CR721</td>
</tr>
<tr>
<td>-20° - +120°F/7-day (included)</td>
<td>100</td>
<td>CR771</td>
</tr>
<tr>
<td>-20° - +50°C/0 - 100% RH/24-hour</td>
<td>100</td>
<td>CR725</td>
</tr>
<tr>
<td>0° - +100°F/7-day</td>
<td>100</td>
<td>CR776</td>
</tr>
<tr>
<td>+40° - +110°F/0 - 100% RH/24-hour</td>
<td>100</td>
<td>CR724</td>
</tr>
</tbody>
</table>

Note: If you will be using the 14 day recording time, you can use a 7 day chart in the range desired and divide up each day by two.

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
<th>Part#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement Pen Pack</td>
<td>6/pack</td>
<td>CR820</td>
</tr>
<tr>
<td>10’ Probe Extension Cable</td>
<td></td>
<td>CR810</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Temperature Pen and Display do not match           | • Check dip switch setting 7 proper chart.  
• May also be hysteresis, see p.4 “Pens”.  
• Need for pen adjustment, see p.4 “Pen Adjust”.   |
| Instrument is not responding to key presses        | • Keypad may be locked, check dip switch #8  
• Slower firmer key presses (may take multiple presses) |
| Instrument turns off                               | • Check AC adapter connection (widen prongs of adapter to fit tighter)  
• Check battery installation & reinstall            
• Display may be off, check dip switch #7            |
| Probe exposed to environments exceeding 95% RH for extended period | Probe should be dried out under normal ambient conditions-Time required varies on Temp, RH & air flow |
| Alarm symbol is flashing in digital display        | Alarm sounds audibly for 60 seconds if out of range conditions occur, then indicator will flash until alarm key is depressed & alarm is reset (depress MIN/MAX keys for information) |
| Display shows dc and indicator on the left part of the digital display is lit | Factory repair is necessary |
| Display shows E (lower left of display)            | System error or error in calibration                                      |
| Out of calibration or Questionable accuracy        | • Instrument exposed to harsh environments or stressful conditions, see calibration procedure in manual. |
| Display won’t light                                | Check dip switch #7. Switch should be OFF.                               |
| Unit won’t work at all                             | Check both dip switch #7 & #8. Both should be OFF to allow operation.    |
| Pen trace too fine or absent                       | • Pen may need to be replaced, moistened or sanded  
• Remove pen cap                                    |
| Display shows Err                                  | Temperature being monitored is to high, see p.2                          |
| Display shows Prob                                 | Temperature being monitored is extremely cold or probe is disconnected    |
| Display shows cold                                 | Temperature being monitored is to low, see p.2                           |
| Display and unit are frozen                        | • Reset the unit by shutting it down (unplug the AC adapter and take the batteries out) then restore power source and turn it on. |
**Factory Service and Returns**

We recommend that damaged instruments be returned to our factory for complete repair. Before returning any instrument or package, please call for a Return Authorization (RA) number.

When calling, please have the following information available:

1. P.O. number for out-of-warranty units.
2. Serial number of unit.
3. Model number of unit.
4. The problem you’re experiencing with unit.

**Warranty**

Dwyer Instruments, Inc. warrants the CR10 will be free from defects in material and workmanship for a period of twelve months after delivery. In the event of a claim under this warranty, the product or part must be returned to the factory for repair or replacement (shipping prepaid) with a Return Authorization Number (See “Factory Service & Returns” information above). It will be repaired or replaced after evaluation.

The foregoing warranty and remedy are exclusive and in lieu of all other warranties either expressed or implied.

Dwyer shall not be liable for consequential or incidental damages resulting from failure or malfunction of its products.