Description

This module has two displays Temperature and Humidity, suitable for environment monitor. The ambient temperature and relative humidity are measured using high performance DHT22 sensor which has output calibrated digital signal. The DHT22 sensor has exclusive digital-signal-collecting-technique and humidity sensing technology, assuring its reliability and stability. Its sensing elements are connected with 8-bit single-chip computer. Every sensor of this model is temperature compensated and calibrated in accurate calibration chamber and the calibration-coefficient is saved in type of program in OTP memory, when the sensor is detecting, it will cite coefficient from memory.

Digital relative humidity & temperature sensor T22 Features
❖ High precision
❖ Capacitive type
❖ Full range temperature compensated
❖ Long transmission distance
❖ Calibrated digital signal
❖ Low power consumption

Product Features

❖ Highly accurate, fast & reliable sensing technology
❖ Outstanding long term stability
❖ Compact size, easy to install & flexible
❖ Complete environmental monitor
❖ Large led display with real time data
Notes and Options

- All display are in Single colour.
- The Default supply is always in RED colour.
- Other colours on request at extra cost.
- RED colour Brightness is good for viewing both indoors and outdoors.
- For outdoor units – cost increases by 18% on base price.
- Titles and other fixed designs can be added to your specification.
- All units work off 230V AC mains (110V can be quoted for separately)
- Mounting provision
  - #1 – Top eye bolts – you can hang it from ceiling.
  - # 2 – Side clamps – you can bolt it to your supports.
## Sizes and Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Digit Height (mm)</th>
<th>Layout</th>
<th>Height (mm)</th>
<th>Width (mm)</th>
<th>Depth (mm)</th>
<th>Max Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON-IC-T-11</td>
<td>120mm for Temp</td>
<td>12.3C</td>
<td>160</td>
<td>320</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>ECON-IC-T-22</td>
<td>240mm for Temp</td>
<td>12.3C</td>
<td>320</td>
<td>640</td>
<td>50</td>
<td>125</td>
</tr>
<tr>
<td>ECON-IC-RH-11</td>
<td>120mm for RH</td>
<td>12.3%</td>
<td>160</td>
<td>320</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>ECON-IC-RH-22</td>
<td>240mm for RH</td>
<td>12.3%</td>
<td>320</td>
<td>640</td>
<td>50</td>
<td>125</td>
</tr>
<tr>
<td>ECON-IC-TRH-11</td>
<td>50mm for Temp top line and 50mm for RH bottom line</td>
<td>12.3C 12.3%</td>
<td>160</td>
<td>320</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>ECON-IC-TRH-21</td>
<td>120mm for Temp top line and 120mm for RH bottom line</td>
<td>12.3C 12.3%</td>
<td>320</td>
<td>320</td>
<td>50</td>
<td>95</td>
</tr>
<tr>
<td>ECON-IC-TRH-12</td>
<td>120mm for Temp right side 120mm for RH left side</td>
<td>12.3C 12.3%</td>
<td>160</td>
<td>640</td>
<td>50</td>
<td>95</td>
</tr>
</tbody>
</table>
## Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VOLTAGE</strong></td>
<td>230 VAC 1 PHASE MAIN POWER</td>
</tr>
<tr>
<td><strong>OPERATING TEMP</strong></td>
<td>5 TO 55°C</td>
</tr>
<tr>
<td><strong>STORAGE TEMP</strong></td>
<td>0 TO 65°C</td>
</tr>
<tr>
<td><strong>RELATIVE HUMIDITY</strong></td>
<td>UPTO 95% RH NON CONDENSING</td>
</tr>
<tr>
<td><strong>DISPLAY</strong></td>
<td>FULL MATRIX</td>
</tr>
<tr>
<td><strong>LED COLOUR</strong></td>
<td>RED</td>
</tr>
<tr>
<td><strong>CHARACTERS TABLE</strong></td>
<td>ASCII CHAR. (CODE 30H TO 5 FH)</td>
</tr>
<tr>
<td><strong>PROTOCOL</strong></td>
<td>FULL DUPLEX, ASCII CODED, STX-ETX</td>
</tr>
<tr>
<td><strong>INTERFACE BY</strong></td>
<td>TEMPERATURE &amp; HUMIDITY SENSOR DHT22 DIGITAL SIGNAL VIA SINGLE BUS</td>
</tr>
<tr>
<td><strong>RANGE SETTING</strong></td>
<td>RS232/485 COMMUNICATION TX-RX-GND</td>
</tr>
<tr>
<td><strong>DATA TRANSFER RATE</strong></td>
<td>9600 BAUD (8,n,1)</td>
</tr>
<tr>
<td><strong>SETUP PARAMETERS STORAGE</strong></td>
<td>IN AN EEPROM - NON VOLATILE MEM</td>
</tr>
<tr>
<td><strong>SENSING ELEMENT</strong></td>
<td>POLYMER CAPACITOR</td>
</tr>
<tr>
<td><strong>OPERATING RANGE</strong></td>
<td>HUMIDITY 0-100% RH</td>
</tr>
<tr>
<td></td>
<td>TEMPERATURE -40~80 CELSIUS</td>
</tr>
<tr>
<td><strong>ACCURACY</strong></td>
<td>HUMIDITY +/-2% RH(Max +/-5%RH)</td>
</tr>
<tr>
<td></td>
<td>TEMPERATURE &lt;=+0.5 CELSIUS</td>
</tr>
<tr>
<td><strong>RESOLUTION</strong></td>
<td>HUMIDITY 0.1% RH</td>
</tr>
<tr>
<td></td>
<td>TEMPERATURE 0.1 CELSIUS</td>
</tr>
<tr>
<td><strong>REPEATABILITY</strong></td>
<td>HUMIDITY 1% RH</td>
</tr>
<tr>
<td></td>
<td>TEMPERATURE 0.2 CELSIUS</td>
</tr>
<tr>
<td><strong>LONG TERM STABILITY</strong></td>
<td>+/-0.5%RH/year</td>
</tr>
<tr>
<td><strong>SENSING PERIOD</strong></td>
<td>AVERAGE: 2s</td>
</tr>
<tr>
<td><strong>ACCESSORIES</strong></td>
<td>POWER CABLE 1 METER/RS232 CABLE</td>
</tr>
</tbody>
</table>
Electrical Connections.

The display panel can be simply installed on a wall using the brackets provided at the back side. After installation Power up the unit. Temperature and Humidity will be displayed as per model no.

Configuration Protocol. (For Logging - This feature is OPTIONAL and does not come with the default board.)

Connect the display with PC to calibrate and to change the log interval etc..

Connect the unit to serial port of computer through RS232 cable or connect the unit to computer through USB to serial adapter like USB to RS232 adapter or USB to RS485 adapter.

The RS232 / RS485 should be connected to the board and a terminal program like Hyperterminal,TeraTerm, putty or RealTerm should be used. The Board uses 9600 8,n,1 Setting.

In the terminal program

Set your communication port no,
Set Baud rate as 9600 Baud
Set Data as 8 Bit
Set Parity as none  
Set Stop bit as 1 Bit

In the serial port Send the following packets for Setup.

**Packet Format**

- Start of Packet SOP => [  
- End Of Packet EOP => ]

[**ID Command Data CRC**]

**ID** (2 chars) is the ID of the board default is 01  
**Command** (1 char) is the command character which defines the function.  
**Data** (n chars) is the data associated with the command.  
**CRC** (2 chars) is the CRC for the data packet. To ignore CRC provide XX.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Log Interval In Mins</td>
<td>This command sets the data logging interval in minutes</td>
<td>[ID ZL MM CRC]</td>
</tr>
<tr>
<td></td>
<td>Ex: To set log interval 5min</td>
<td>[01ZL05XX]</td>
</tr>
<tr>
<td>Dump Temperature Humidity Logs</td>
<td>This command dumps temperature and humidity data values in serial monitor .</td>
<td>[ID ZM CRC]</td>
</tr>
<tr>
<td></td>
<td>Ex: [01ZMXX]</td>
<td></td>
</tr>
</tbody>
</table>
### Erase Temperature Humidity Logs.

This command erases temperature and humidity data values in serial monitor..

**Example:**

```
[ID ZN CRC]
Ex: [01ZNXX]
```

### Set DHT Read Interval

This command decides the data read interval in seconds from DHT sensor. The display will refresh the readings according to this set time interval.

**Example:**

```
[ID ZC DD CRC]
Ex: For data read Interval 1 sec [01D01XX]
```

### Set Brightness

This command is used to set the brightness of the LED display. Where Brightness can be from 0-9.

**Example:**

```
[ID B N CRC]
Ex: To set minimum brightness [01B1XX]
```

### Advanced Commands (Do Not use without knowing what they do.)

#### Set Temperature calibration adjust

This command is used to adjust the Temperature data calibration.

**Examples:**

```
[ID ZI +DDD CRC]  
[ID ZI - DDD CRC]
Ex: [01ZI123XX]
```

#### Set Humidity calibration adjust

This command is used to adjust the Humidity data calibration.

**Examples:**

```
[ID ZJ +DDD CRC]  
[ID ZJ - DDD CRC]
Ex: [01ZJ123XX]
```

### CRC Calculation

The CRC is the ASCII Encoded HEX

**Example:**

CRC is calculated by XORing all the characters from ID to end of data. STX character [ is not included in the CRC.

```
[01E2000.0169]
```

```c
byte i, CalcCRC=0;
for(i=1;i<PacketLen-2;i++)
{
    CalcCRC = CalcCRC ^ InputText[i];
}
```
Temperature & Humidity LED Display
Low Cost & Industrial Grade Cabinets

Dimensions

All Units in mm

<table>
<thead>
<tr>
<th>Model No</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON-IC-T-11</td>
<td>250</td>
<td>410</td>
<td>93</td>
</tr>
<tr>
<td>ECON-IC-T-22</td>
<td>410</td>
<td>730</td>
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</tr>
<tr>
<td>ECON-IC-TRH-12</td>
<td>250</td>
<td>730</td>
<td>93</td>
</tr>
</tbody>
</table>
Heavy Duty Cabinet

- The Heavy Duty Cabinets make the LED board more durable and robust.
- The cabinets are made from extruded aluminium profiles and moulded corners for better appearance.
- The front filter used is Perspex / LEXAN ® sheets for UV and robust.
- The hanging hooks are also heavy and suited for mounting from your support structure.

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