

# iSERVER - ADDENDUM

## For iTHX-M



This addendum applies to PART 5 Section in your iServer Operator's Manual.



### SENSOR SPECIFICATIONS

#### Relative Humidity (RH)

**Accuracy/Range:**

±2% for 10 to 90%;  
±3% for 5 to 10% and 90 to 95%  
±4% for 0 to 5% and 95 to 100%  
Refer to chart in **Appendix F**

**Hysteresis:**

±1% RH

**Non-linearity:**

±3%

**Response Time:**

8 seconds, tau 63% (time for reaching 63% of a step function, valid at 25C and 1m/s airflow)

**Repeatability:**

±0.1%

**Resolution:**

0.1%, 12bit

**NOTE:** Reconditioning of the probe may be necessary if the probe is stored for a period of time in a harsh environment (temperatures below 0°C or above 70°C or exposure to chemical vapors, condensation, etc). To recondition the probe refer to **Appendix F.4**

#### Temperature (T)

**Accuracy/Range\*:**

**Wand Probe:**

±0.5°C for 5° to 45°C (±1°F for 41° to 113°F);  
Up to ±1°C for 0° to 5°C and 45° to 60°C  
(Up to ±2°F for 32° to 41°F and 113° to 140°F)  
Refer to chart in **Appendix F**

**Industrial Probe:**

±0.5°C for 5° to 45°C ( ±1°F for 41 to 113°F);  
Up to ±1.5°C for -40° to 5°C and 45° to 124°C  
(Up to ±2.7°F for -40° to 41°F and 113° to 255°F)  
Refer to chart in **Appendix F**

\*Note: extended temperature range is for Industrial Probe only, the iServer's operating temperature is 0 to 60°C

**Response Time:**

5 to 30 seconds, tau 63% (response time depends on heat capacity of and thermal resistance to sensor substrate)

**Repeatability:**

±0.1°C

**Resolution:**

0.1°C, 14 bit

## **iSERVER SPECIFICATIONS**

### **ENVIRONMENTAL**

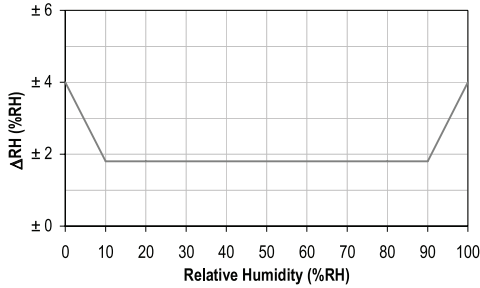
#### **Operating Temperatures**

<b>iServer Unit:</b>	0 to 60°C (32 to 140°F), non-condensing
<b>Battery:</b>	-18 to 55°C (-0.4 to 131°F)
<b>ac Power Adapter:</b>	0 to 40°C (32 to 104°F)
<b>Wand Cable:</b>	0 to 80°C (32 to 176°F)
<b>Industrial Cable:</b>	-40 to 125°C (-40 to 257°F)
<b>Storage Temperature:</b>	-40 to 85°C (-40 to 185°F)

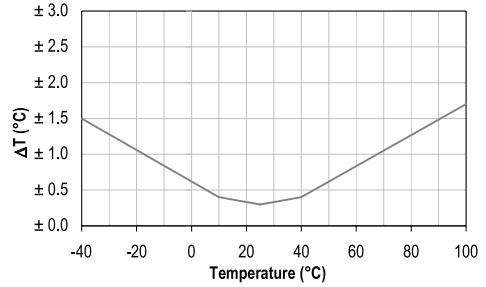
# Appendix F

# Sensor Information

## F.1 Accuracy



**Figure F.1**  
**RH Accuracy Chart**

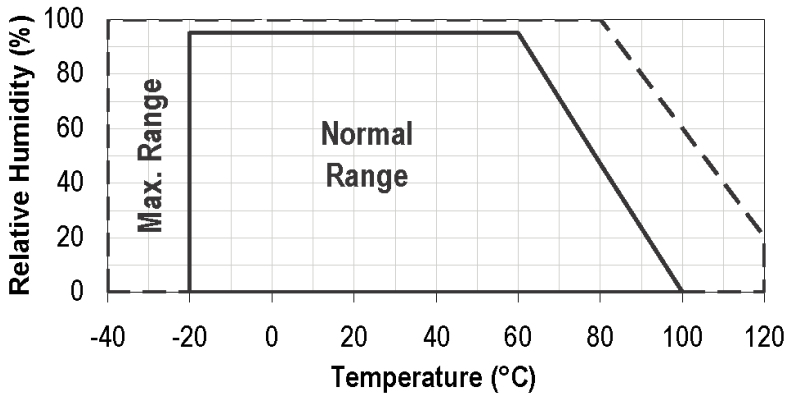


**Figure F.2**  
**Temperature Accuracy Chart**

Accuracies are tested at Manufacturer's Outgoing Quality Control at 25°C (77°F) and 3.3V. Values exclude hysteresis and non-linearity, and is only applicable to noncondensing environments.

## F.2 Operating Conditions

Sensor works stable within recommended normal range – see Figure. Long term exposures to conditions outside normal range, especially at humidity >80%RH, may temporarily offset the RH signal (+3 %RH after 60h). After return to normal range it will slowly return towards calibration state by itself. See **Section F.4** "Reconditioning Procedure" to accelerate eliminating the offset. Prolonged exposure to extreme conditions may accelerate ageing.



**Figure F.3** Normal Range

## **Appendix F Sensor Information (continued)**

### **F.3 Storage Conditions and Handling Instructions**

It is of great importance to understand that a humidity sensor is not a normal electronic component and needs to be handled with care.

Chemical vapors at high concentration in combination with long exposure times may offset the sensor reading. For these reasons it is recommended to store the sensors in original packaging including the sealed ESD bag at following conditions: Temperature shall be in the range of 10°C – 50°C (0 – 80°C for limited time) and humidity at 20 – 60%RH (sensors that are not stored in ESD bags). For sensors that have been removed from the original packaging we recommend to store them in ESD bags made of PE-HD8.

In manufacturing and transport the sensors shall be prevented of high concentration of chemical solvents and long exposure times. Out-gassing of glues, adhesive tapes and stickers or out-gassing packaging material such as bubble foils, foams, etc. shall be avoided. Manufacturing area shall be well ventilated.

### **F.4 Reconditioning Procedure**

As stated above extreme conditions or exposure to solvent vapors may offset the sensor. The following reconditioning procedure may bring the sensor back to calibration state:

**Baking: 100 – 105°C at < 5%RH for 10h**

**Re-Hydration: 20 – 30°C at ~ 75%RH for 12h.**

*(75%RH can conveniently be generated with saturated NaCl solution. 100 – 105°C correspond to 212 – 221°F, 20 – 30°C correspond to 68 – 86°F)*

### **F.5 Temperature Effects**

Relative humidity reading strongly depends on temperature. Therefore, it is essential to keep humidity sensors at the same temperature as the air of which the relative humidity is to be measured. In case of testing or qualification the reference sensor and test sensor must show equal temperature to allow for comparing humidity readings.

The packaging of sensor is designed for minimal heat transfer from the pins to the sensor. Still, if the sensor shares a PCB with electronic components that produce heat it should be mounted in a way that prevents heat transfer or keeps it as low as possible. Furthermore, there are self-heating effects in case the measurement frequency is too high.

### **F.6 Light**

The sensor is not light sensitive. Prolonged direct exposure to sunshine or strong UV radiation may age the housing.

### **F.7 Materials Used for Sealing / Mounting**

Many materials absorb humidity and will act as a buffer increasing response times and hysteresis. Materials in the vicinity of the sensor must therefore be carefully chosen. Recommended materials are: Any metals, LCP, POM (Delrin), PTFE (Teflon), PE, PEEK, PP, PB, PPS, PSU, PVDF, PVF. For sealing and gluing (use sparingly): Use high filled epoxy for electronic packaging (e.g. glob top, underfill), and Silicone.

Out-gassing of these materials may also contaminate the sensor (see **Section F.3**). Therefore try to add the sensor as a last manufacturing step to the assembly, store the assembly well ventilated after manufacturing or bake at 50°C for 24h to outgas contaminants before packing.