

# DBI-TX2 User Manual

## U.S. Version

**Free Balloon Envelope Radiation  
Temperature Wireless Transmitter**



## Safety

The manufacturer has designed this instrument to be safe when operated. Do not use this instrument for any other purpose than stated.

## Operating restrictions

- This instrument should ONLY be used in ships referred as *free manned balloons*.
- The DBI-TX2 must be mounted in the balloon exactly as shown in this manual. The responsibility however for the safety of the mounting of the sender is not a subject for the manufacturer or their representatives.

## Abbreviations

|                |   |
|----------------|---|
| <b>DBI-002</b> | DigiTool Instruments Free Balloon Flight Instrument                       |
| <b>DBI-TX2</b> | DigiTool Instruments Envelope Radiation Temperature Wireless Transmitter. |
| <b>RF</b>      | Radio Frequency   |

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# 1. Description

## 1.1. General

- The DBI-TX2 is a wire less transmitter monitoring free hot air balloon envelope top radiation temperature. It transmits data to the DBI-002 flight instrument where temperature is displayed.
- The unit consists of a sturdy aluminum tube enclosure attached by a velcro strap to the basket overhead frame.
- The unit is power supplied with a replaceable long life lithium battery. Battery replacement interval is typically four years.
- Power on/off is controlled automatic by the difference of device (ambient) and radiation (envelope fabric) temperatures. No operator action is required.
- Each unit has a unique serial code that is matched with the receiver DBI-002. DBI-002 data reception is qualified by serial code and comprehensive transmission error detection.
- Short duty cycle and low RF power data transmission enables interference free operation and multiple units to operate in close proximity.
- Conforms to FCC part 15.249
- FCC approval identification: **TDJGC132926**



## 1.2. DBI-TX2 Photo



Velcro strap  
attachment

Battery  
cap

ID label and  
location

IR lens  
aperture

## 2. Specification

### 2.1. Envelope thermometer accuracy

| Range °F   | Total error +/- °F |
|------------|--------------------|
| -15 to 32  | 9                  |
| 32 to 122  | 7                  |
| 122 to 167 | 6                  |
| 167 to 257 | 4                  |
| 257 to 302 | 6                  |
| 302 to 347 | 7                  |
| 347 to 392 | 9                  |

### 2.2. Physical dimensions

| Item         | Value    | Value     |
|--------------|----------|-----------|
| Length       | 110 mm   | 4.4 inch  |
| Diameter     | 50 mm    | 1.9 inch  |
| Total weight | 200 gram | 5.6 ounce |

### 2.3. Environmental ratings

| Item                 | Value  |
|----------------------|--------|
| Box sealing class    | IP65   |
| Box temperature High | 257 °F |
| Box temperature Low  | -22 °F |

## 2.4. Radio frequency transmission

| Item                         | Data  |
|------------------------------|---|
| Frequency                    | 914.5 MHz                                     |
| RF Power                     | +0 dBm (1mW)                                  |
| Modulation                   | FM, deviation +/- 30 kHz                      |
| Type Approval                |   |
| EMC conformity               | FCC part 15.249                               |
| Placard marking              | DBI-TX2<br>FCC ID: TDJGC132926<br>Code: NNNNN |
| Transmit duration            | 37 milliseconds                               |
| Transmit repetition interval | 2.3 seconds                                   |
| Transmit duty cycle          | 0.016   |

## 2.5. Power supply

|                               |                            |
|-------------------------------|----------------------------|
| Power supply                  | CR2450 3 Volt Lithium Cell |
| Cell life (on)                | > 1000 hours               |
| Cell life (off)               | > 10000 hours              |
| Lithium cell replace interval | 1 years                    |

## 2.6. RF transmit control

|   |           |
|---|-----------|
| Transmit on differential temperature threshold, (probe – box).  | > 10 °F   |
| Transmit off differential temperature threshold, (probe – box). | <= 10 °F  |
| Transmit on minimum duration                                    | 5 minutes |

## 3. Installation

### 3.1. Safety

Always consult corresponding envelope flight manual for safe attachment.

### 3.2. Attachment

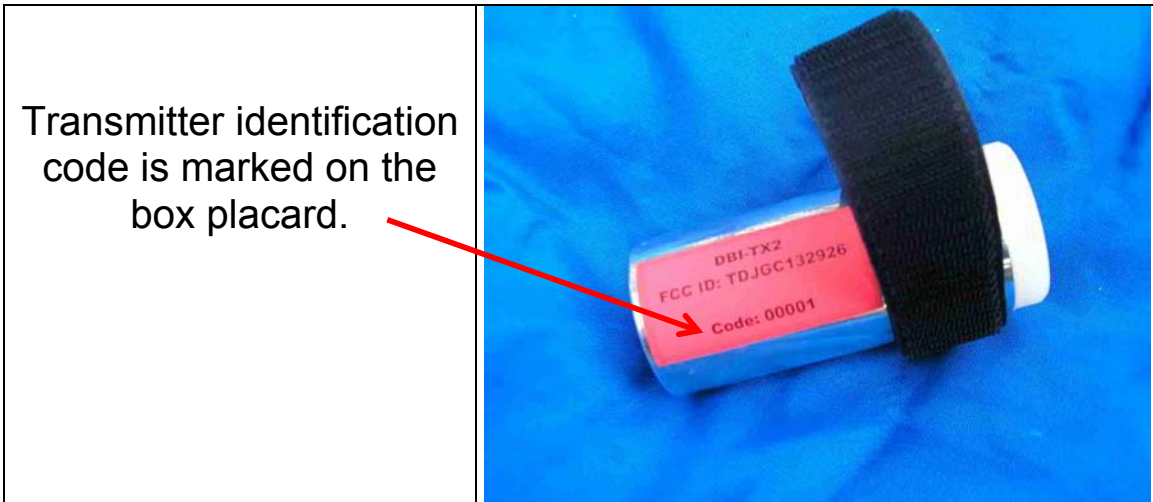


The DBI-TX2 attaches on one overhead frame rod. The IR lens aperture shall point straight up to the top centre of the envelope on a free line of sight.



## 4. Operation

### 4.1. DBI-TX2 identification code



### 4.2. DBITX2 identification code programming

Program the DBI-TX2 identification code to the DBI-002 flight instrument by using the DBI-002 PC application software. Refer to “DBI-002 User Manual”.

### 4.3. Power On / Off




The power on / off is automatic:

- The DBI-TX2 will start transmission when a temperature difference between the ambient and the radiation temperature is greater than 10 °F.
- The DBI-TX2 will stop transmit after 5 minutes when a temperature difference between the ambient and the radiation temperature is greater than 10 °F.
- For permanent power off, remove internal battery coin cell. See “5.2 Battery replacement”.

## 5. Maintenance

### 5.1. Battery (Lithium cell) replacement

- During normal operation, the internal battery will last for typical 2 years. Recommended replace interval is 1 years.
- Replace battery if DBI-TX2 does not operate properly.

|  |  |
|--|--|
| <p>Unmount the battery cap by pulling it from the tube.</p>  |    |
| <p>Replace the coin cell:</p> <ul style="list-style-type: none"><li>• Replace type is “CR2450”.</li><li>• Positive terminal facing up.</li><li>• Inspect for clean battery holder metal surface. Clean with soft cloth if dirty.</li></ul> |   |
| <p>Mount the battery cap by pushing it into the tube.</p>  |  |

## 5.2. Approved service agents

| <b>Name</b> | <b>Location</b>                        | <b>Contact</b>                                |
|-------------|--|---|
| DigiTool AB | Box 6190<br>100 00 Stockholm<br>Sweden | tel +46 8 343410<br>Email service@digitool.se |
|             |  |   |
|             |  |   |
|             |  |   |