Weather stations comparison

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index

1 Acurite 5 in 1

https://www.acurite.com/learn/weather-stations/acurite-5-in-1-sensor

The 5-in-1 wireless weather sensor measures temperature, humidity, wind speed, wind direction and rain.

It updates wind speed every 18 seconds, wind direction every 30 seconds and temperature and humidity every 36 seconds.

1.1 Example of messages captured by the rtl_433 tool

```
~/rtl_433$ rtl_433
rtl_433 version unknown inputs file rtl_tcp RTL-SDR
…..
Trying conf file at "/etc/rtl_433/rtl_433.conf"...
25-26 29-36 38-60 62-63 67-71 73-100 102-103 108-116 119 121 124-126 ]
```

```
Detached kernel driver
Found Rafael Micro R820T tuner
Exact sample rate is: 250000.000414 Hz
[R82XX] PLL not locked!
Sample rate set to 250000 S/s.
Tuner gain set to Auto.
Tuned to 433.920MHz.
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:56:43
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 0
battery   : OK          message_type: 49        wind_speed: 0.0 km/h
wind_dir_deg: 202.5      Rainfall Accumulation: 0.00 in
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:56:43
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 1
battery   : OK          message_type: 49        wind_speed: 0.0 km/h
wind_dir_deg: 202.5      Rainfall Accumulation: 0.00 in
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:56:43
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 2
battery   : OK          message_type: 49        wind_speed: 0.0 km/h
wind_dir_deg: 202.5      Rainfall Accumulation: 0.00 in
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:57:01
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 0
battery   : OK          message_type: 56        wind_speed: 0.0 km/h
temperature: 84.4 F       humidity  : 68
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:57:01
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 1
battery   : OK          message_type: 56        wind_speed: 0.0 km/h
temperature: 84.4 F       humidity  : 68
– _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
_ _ – _ – _ – _ – _ – _ – _ – _ – _ – _ – _
time      : 2019-08-27 16:57:01
model     : Acurite 5n1 sensor                    sensor_id : 259        channel
: A           sequence_num: 2
battery   : OK          message_type: 56        wind_speed: 0.0 km/h
temperature: 84.4 F       humidity  : 68
```

1.2 The weather station identification code

Each 5 in 1 sensor unit has a unique 12bit Identification Code hard coded.

Remains unchanged even if the power supply for a battery change is lost.

2 LaCrosse WS2300

The Outdoor Sensors are composed by the **"Thermometer-Hygrometer Transmitter"** to which they are connected by cables the **Rain** sensor and **Wind** sensor (measure wind speed and wind direction, 16 directions possible).

The "Thermometer-Hygrometer Transmitter" unit:

- Measure outdoor temperature and humidity
- Gather rain/wind data and transmit to display unit through cable or 433 MHz TX
- Supply DC power to wind sensor and rain sensor
- Battery operated (2 x IEC LR6 1.5 V) or can access power from display unit through cable

2.1 Example of messages captured by the rtl_433 tool

~/Documents/rtl_433$ rtl_433
```
rtl_433 version unknown inputs file rtl_tcp RTL-SDR
Trying conf file at "rtl_433.conf"...
……..
Found Rafael Micro R820T tuner
Exact sample rate is: 250000.000414 Hz
[R82XX] PLL not locked!
Sample rate set to 250000 S/s.
Tuner gain set to Auto.
Tuned to 433.920MHz.

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
time     : 2019-08-27 17:05:14
model    : LaCrosse WS  id       : 120
Temperature: 26.9 C
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```

```
time      : 2019-08-27 17:05:14
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:14
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:15
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s     Direction : 67.500
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:15
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:15
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:16
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:16
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s     Direction : 67.500
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:22
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:22
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:22
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:23
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s     Direction : 67.500
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:23
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```
time      : 2019-08-27 17:05:23
```

```
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _
```
time      : 2019-08-27 17:05:24
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _
```
time      : 2019-08-27 17:05:24
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s      Direction : 67.500
```
_ _
_ _
```
time      : 2019-08-27 17:05:31
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _
```
time      : 2019-08-27 17:05:31
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _
```
time      : 2019-08-27 17:05:31
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _
```
time      : 2019-08-27 17:05:32
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s      Direction : 67.500
```
_ _
_ _
```
time      : 2019-08-27 17:05:32
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _
```
time      : 2019-08-27 17:05:32
model     : LaCrosse WS  id        : 120
Humidity  : 77
```
_ _
_ _
```
time      : 2019-08-27 17:05:33
model     : LaCrosse WS  id        : 120
Rainfall  : 0.00 mm
```
_ _
_ _
```
time      : 2019-08-27 17:05:33
model     : LaCrosse WS  id        : 120
Wind speed: 0.0 m/s      Direction : 67.500
```
_ _
_ _
```
time      : 2019-08-27 17:05:39
model     : LaCrosse WS  id        : 120
Temperature: 26.9 C
```
_ _
_ _
```
time      : 2019-08-27 17:05:39
model     : LaCrosse WS  id        : 120
```

Humidity : 77

− −
− −
time   : 2019-08-27 17:05:39
model   : LaCrosse WS id   : 120
Rainfall : 0.00 mm

− −
− −
time   : 2019-08-27 17:05:40
model   : LaCrosse WS id   : 120
Wind speed: 0.0 m/s   Direction : 67.500

− −
− −
time   : 2019-08-27 17:05:40
model   : LaCrosse WS id   : 120
Temperature: 26.9 C

− −
− −
time   : 2019-08-27 17:05:40
model   : LaCrosse WS id   : 120
Humidity : 77

2.2 The weather station identification code

Important:

If the "Thermometer-Hygrometer Transmitter" unit loses power for a battery change, a new "WS identification code" (8 bit) will be generated when power is restored.

3 Comparative table of the WS characteristics

This table was obtained from the information contained in the technical documentation of the weather station

	Acurite 5 in 1	Lacrosse WS 2300
Temperature Range	-40°C to +70°C	-29.9°C to + 69.9°C
Humidity Range	1% to 99% Relative Humidity	1% to 99% in 1%
Wind Speed	0 to 159km/h	0 to 180km/h
Wind Direction Indicators	16 directions	16 directions
Rainfall Capacity	0.25 mm and up	1 to 999.9mm or 2499.9mm total
Wireless Signal	433 MHz, OOK modulation	433 MHz, OOK modulation
Wireless Range	100 meters	100 meters

sources:

https://www.acurite.com/learn/weather-stations/acurite-5-in-1-sensor

http://www.betterworld.com.au/WS2300.html