Specs of Oregon Scientific WMR918/928/968 weather station

WMR928 Protocol

Byte	Bit	Wind	Rain	TH	Mush-room	T	THB	Minute	Clock	New THB
Header 1	Bits 0-7	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
Header 2	Bits 0-7	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3rd Byte (Device type)	Bits 0-7	0000000 wind (outdoor)	00000001 rain (outdoor)	00000010 thermo hygro (indoor)	00000011 thermo hygro (outdoor)	00000100 thermo only (indoor)	00000101 thermo hygrobaro (indoor)	00001110 minute (base station)	00001111 clock (base station)	00000110 thermo hygrobaro (indoor)
4th Byte	Bits 0-3	--	--	Channel number	--	Channel number	--	Date1 digit minute	Date1 digit minute	--
	Bit 4	Gust over	Rate over	Dew under	Dew under	--	Dew under	Date10 digit minute	Date10 digit minute	Dew under
	Bit 5	Avgerage over	Total over	--	--		--			--
	Bit 6	Low batt.	Low batt.	Low batt.	Low batt.	Low batt.	Low batt.			Low batt.
	Bit 7	--	Yesterday over	--	--	--	--	Batt. Low	Batt. Low	--
5thByte	Bits 0-3	Wind Direction 1° digit	Current Rain Rate1 digit in mm/hr	Temp 0.1°Cdigit	Temp 0.1°Cdigit	Temp 0.1°Cdigit	Temp 0.1°Cdigit	Check-sum	Date 1 digithour	Temp 0.1°Cdigit
	Bits 4-7	Wind Direction 10° digit	Current Rain Rate10 digit in mm/hr	Temp 1°Cdigit	Temp 1°Cdigit	Temp 1°Cdigit	Temp 1°Cdigit		Date 10 digithour	Temp 1°Cdigit
6thByte	Bits 0-3	Wind Direction 100° digit	CurrentRain Rate 100 digitin mm/hr	Temp 10°Cdigit	Temp 10°Cdigit	Temp 10°Cdigit	Temp 10°Cdigit		Date 1 digitDay	Temp 10°Cdigit
	Bit 4	Gust WindSpeed 0.1m/sec	TotalRainfall 0.1 digitin mm	Temp 100°C	Temp 100°C	Temp 100°C	Temp 100°C		Date 10 digitDay	Temp 100°C
	Bit 5									
	Bit 6			Over/ Under	Over/ Under	Over/ Under	Over/ Under			Over/ Under
	Bit 7			Sign	Sign	Sign	Sign			Sign
7thByte	Bit 0-3	Gust WindSpeed 1 m/sec	Total Rainfall 1 digitin mm	Hum 1% digit	Hum 1% digit	Check-sum	Hum 1% digit		Date 1 digitMonth	Hum 1% digit
	Bit 4-7	Gust WindSpeed 10 m/sec	Total Rainfall 10 digitin mm	Hum 10% digit	Hum 10% digit		Hum 10% digit		Date 10 digitMonth	Hum 10% digit
8thByte	Bits 0-3	Average WindSpeed 0.1 m/sec	Total Rainfall 100 digitin mm	DewTemp 1°Cdigit	DewTemp 1°Cdigit		DewTemp 1°Cdigit		Date 1 digitYear	DewTemp 1°Cdigit
	Bits 4-7	Average WindSpeed 1 m/sec	Total Rainfall 1000 digitin mm	DewTemp 10°Cdigit	DewTemp 10°Cdigit		DewTemp 10°Cdigit		Date 10 digitYear	DewTemp 10°Cdigit
9thByte	Bits 0-3	Average WindSpeed 10 m/sec	Yesterday Rainfall 1 digitin mm	Check-sum	Check-sum		ADCBARO Reading		Check-sum	ADC0BARO Reading
	Bit 4	--	YesterdayRainfall 10 digitin mm							
	Bit 5	Chill no data								
	Bit 6	Chill over								
	Bit 7	Sign								
10thByte	Bit 0	WindChill 1°Cdigit	Yesterday Rainfall				WeatherStatus			ADCbit9

Byte	Bit	Wind	Rain	TH	Mush-room	T	THB	Minute	Clock	New THB
	Bit 1		100 digitin mm							--
	Bit 2									
	Bit 3									
	Bits 4-7	WindChill 10°Cdigit	Yesterday Rainfall 1000 digitin mm				--			Weather
11thByte	Bits 0-3	Check-sum	TotalStart Date 1 digitminute				Sea level offset0.1 digitmb			--
	Bits 4-7		TotalStart Date 10 digitminute				Sea level offset1 digitmb			Sea level offset0.1 digitmb
12thByte	Bits 0-3		TotalStart Date 1 digithour				Sea level offset10 digitmb			Sea level offset1 digitmb
	Bits 4-7		TotalStart Date 10 digithour				Sea level offset100 digitmb			Sea level offset10 digitmb
13thByte	Bits 0-3		TotalStart Date 1 digitDay				Check-sum			Sea level offset100 digitmb
	Bits 4-7		TotalStart Date 10 digitDay							Sea level offset1000 digitmb
13thByte	Bits 0-3		TotalStart Date 1 digitDay							Check-sum
	Bits 4-7		TotalStart Date 10 digitMonth							
15thByte	Bits 0-3		TotalStart Date 1 digitYear							
	Bits 4-7		TotalStart Date 10 digitYear							
16thByte	Bits 0-7		Check-sum							

Remarks:

Weather Status : 1100-sunny 0110-half cloudy 0010-cloudy 0011-rainny	**Channel :** 0001-Channel 1 0010-Channel 2 0100-Channel 3	**Sign:** 0=positive 1-negative	**over:** 1=over range 0=normal **under:** 1=under range 0=normal	**over/under :** 1=over /under 0=normal * to identify over/under check also the sign of data	**Low batt. :** 1=low battery **Batt.Low :** 1=low battery of main unit	**ADC baro reading :** range 0 to FF (hex) ADC0 & ADCbit9 range : 0 to 1FF (Hex) where ADC0 is the LSB ADCbit9 is the MSbit

- For Device 5 (THB), the barometic pressure reading = ADC baro reading (converted from HEX to BCD) + 795mb
- For Device 6 (newTHB), the barometric pressure reading = ADC reading (converted from 9 bit HEX to BCD) + 600mb
- For Device 5 (THB), the Sea level offset of 1000mb digit is not send out. If the Sea level offset pressure is less than 400.0mb,
  then it means the Sea level offset is (1000mb + offset). Howver, if the offset is larger or equal to 400.0mb, then (0mb + Offset)
  The above will only applied to device 5. There is NO NEED TO ADJUST FOR DEVICE 6 (newTHB)
- Sea level pressure reading = ADC baro reading (converted from HEX to BCD) + Sea level offset
- Total start date = The date that total rainfall started to count.
- The total rainfall that send is added by 0.5mm, please minus 0.5mm before display.
- Check sum = the lower byte of the sum of the data send (include header)
- 1000 thanks to www.netsky.org for providing this information on their web pages.

Basics about the station's RS232 communication:

- Serial data is sent in 9600 bps from Main unit to PC through RS232
- For the PC to receive the data from WMR928, the 'Request to send' pin of the PC must be setted to request data, otherwise no data will be sent.
- When WMR928 is going to send the data, it will send a header 'FFFF' first, then follow by the code of the type of data
- At the end of data, WMR928 will send the checksum of the data
- WMR928 will send data to the PC when new data is received.
- WMR928 will send the 'Minute' data to the PC every minute to ensure connection is OK.
- WMR928 will send the clock data every 1 hour or when new RF clock time is being received
- WMR928 will not send the data continously to the PC, it will send the data byte by byte. (ie. If there is other task for WM928 to complete such as to receive sensor data, WMR928 will go to receive the data first, then resume the sending of PC data).

A brief "Who is Who" on Sensors:

Name	Productname	Specification	Picture
-	**WMR918N, WMR928, WMR968** Remark: All these statinons are funtionally the same. The WMR928NX cones in a silber finish. The older WMR918H is not supported by this program as the protocol on the rs232 interface is different.	This is the base station that provides all sensor data via an rs232 interface to the pc. Apart from tunneling data from the wireless sensors to the pc the station gives some time information for itself. In order to have the rs232 running the station must be plugged to the powersupply, in battery mode the rs232 is not working. Provides the data records **CLOCK** and **MINUTE**	
wind	**WGR918, WGR928, WGR968** Remark: Older sensors don't have on big solar panel but two small panels as the other outdoor sensors.	The wind sensor provides data about wind direction, gust speed, average wind speed and wind chill. The wind chill data is provided in combination with the outdoor temperature reading. Provides data record **WIND**	
rain	**PCR918, PCR928, RGR968**	Rain sensor provides rain rate, yesterdays rainfall and the total rainfall since last reset (together with the start date) Provides data record **RAIN**	
th0	**THGR918, THGR928, THGR968** This sensor delivers the same data as the outdoor sensor from the WMR122 base station.	This outdoor sensor provides temperature, humidity and dew point. Provides data record **MUSHROOM**	
th0	**THGN228** This sensor usually comes along with the WMR112 station. It is mainly identical to the THGR sensor type, but has conventional internal batteries onstead of a solar panel.	This outdoor sensor provides temperature, humidity and dew point. The wmr928d software supports just one of the outdoor temp sensors gathered at th0. If the base station scan handle both at a time is unclear to me. Provides data record **TH, channel 0**	

thb	**BTHR918, BTHR 928, BTHR968** There are two versions out there. The newer version has an enhanced measurement range for barometric pressure. Both sensors are supported by the wmr928d deamon.	This indoor sensor provides temperature, humidity, dew point and barometric pressure. It also computes the weather forecast based on barometric pressure development, which is a wuite simple und not very good way to do this. Provides data record **THB** or **NewTHB**	
th1, th2, th3	**THGR228, THGR238, THGR268** These are additional indoor thermo-hygro sensors. The base station can handle up to 3 of these.	This additional indoor sensor provides temperature, humidity and dew point. On wihich channel the sensor sends data can be selected by a dip-switch at the sensor's battery compartment. Provides data record **TH, channel 1-3**	
t1, t2, t3	**THR228, THR238** These are additional indoor thermo sensors. The base station can handle up to 3 of these.	This additional indoor sensor provides temperature. On which channel the sensor sends data can be selected by a dip-switch at the sensor's battery compartment. Provides data record **TH, channel 1-3**	
t1, t2, t3	**THC268** This is an additional thermo sensor with a waterproof probe **THWR288** This is a swimming thermo sensor	Acts like the sensor above