

Field	Byte	Bit #	
Extra Temp/Hum Alarms	75 - 81	7	Each byte contains four alarm bits (0 – 3) for a single extra Temp/Hum station. Bits (4 – 7) are not used and reserved for future use. Use the temperature and humidity sensor numbers, as described in Section XIV.4 to locate which byte contains the appropriate alarm bits. In particular, the humidity and temperature alarms for a single station will be found in different bytes.
Low temp X alarm		0	
High temp X alarm		1	
Low hum X alarm		2	
High hum X alarm		3	
Soil & Leaf Alarms	82 - 85	4	Currently active soil/leaf alarms.
Low leaf wetness X alarm		0	
High leaf wetness X alarm		1	
Low soil moisture X alarm		2	
High soil moisture X alarm		3	
Low leaf temp X alarm		4	
High leaf temp X alarm		5	
Low soil temp X alarm		6	
High soil temp X alarm		7	

2. LOOP2 Packet Format

The “LPS” command sends the different types of LOOP packet including the newer LOOP2 packet. The LOOP2 packet is NOT supported in Vantage Pro and only supported in Vantage Pro2 (Firmware 1.90 or later) and Vantage Vue.

Note: Some of the fields are included in both LOOP and LOOP2 packets.

Field	Offset	Size	Explanation
"L"	0	1	Spells out "LOO", identifies a LOOP packet
"O"	1	1	
"O"	2	1	
Bar Trend	3	1	Signed byte that indicates the current 3-hour barometer trend. It is one of these values: -60 = Falling Rapidly = 196 (as an unsigned byte) -20 = Falling Slowly = 236 (as an unsigned byte) 0 = Steady 20 = Rising Slowly 60 = Rising Rapidly 80 = ASCII "P" = Rev A firmware, no trend info is available Any other value means that the Vantage does not have the 3 hours of bar data needed to determine the bar trend.
Packet Type	4	1	0 for LOOP and 1 for LOOP2 packet
Unused	5	2	Unused field, filled with 0x7FFF
Barometer	7	2	Current Barometer. Units are (in Hg / 1000). The barometric value should be between 20 inches and 32.5 inches. Values outside these ranges will not be logged.
Inside Temperature	9	2	The value is sent as 10 th of a degree in F. For example, 795 is returned for 79.5°F.

Field	Offset	Size	Explanation
Inside Humidity	11	1	This is the relative humidity in %, such as 50 is returned for 50%.
Outside Temperature	12	2	The value is sent as 10 th of a degree in F. For example, 795 is returned for 79.5°F.
Wind Speed	14	1	It is a byte unsigned value in mph. If the wind speed is dashed because it lost synchronization with the radio or due to some other reason, the wind speed is forced to be 0.
Unused	15	1	Unused field, filled with 0xFF
Wind Direction	16	2	It is a two-byte unsigned value from 1 to 360 degrees. (0° is no wind data, 90° is East, 180° is South, 270° is West and 360° is north)
10-Min Avg Wind Speed	18	2	It is a two-byte unsigned value in 0.1mph resolution.
2-Min Avg Wind Speed	20	2	It is a two-byte unsigned value in 0.1mph resolution.
10-Min Wind Gust	22	2	It is a two-byte unsigned value in 0.1mph resolution.
Wind Direction for the 10-Min Wind Guest	24	2	It is a two-byte unsigned value from 1 to 360 degrees. (0° is no wind data, 90° is East, 180° is South, 270° is West and 360° is north)
Unused	26	2	Unused field, filled with 0xFFFF
Unused	28	2	Unused field, filled with 0xFFFF
Dew Point	30	2	The value is a signed two byte value in whole degrees F. 255 = dashed data
Unused	32	1	Unused field, filled with 0xFF
Outside Humidity	33	1	This is the relative humidity in %, such as 50 is returned for 50%.
Unused	34	1	Unused field, filled with 0xFF
Heat Index	35	2	The value is a signed two byte value in whole degrees F. 255 = dashed data
Wind Chill	37	2	The value is a signed two byte value in whole degrees F. 255 = dashed data
THSW Index	39	2	The value is a signed two byte value in whole degrees F. 255 = dashed data
Rain Rate	41	2	In rain clicks per hour.
UV	43	1	Unit is in UV Index
Solar Radiation	44	2	The unit is in watt/meter ² .
Storm Rain	46	2	The storm is stored as number of rain clicks. (0.2mm or 0.01in)
Start Date of current Storm	48	2	Bit 15 to bit 12 is the month, bit 11 to bit 7 is the day and bit 6 to bit 0 is the year offsetted by 2000.
Daily Rain	50	2	This value is sent as number of rain clicks. (0.2mm or 0.01in)
Last 15-min Rain	52	2	This value is sent as number of rain clicks. (0.2mm or 0.01in)
Last Hour Rain	54	2	This value is sent as number of rain clicks. (0.2mm or 0.01in)
Daily ET	56	2	This value is sent as the 1000 th of an inch.
Last 24-Hour Rain	58	2	This value is sent as number of rain clicks. (0.2mm or 0.01in)
Barometric Reduction Method	60	1	Bar reduction method: 0 - user offset 1- Altimeter Setting 2- NOAA Bar Reduction. For VP2, this will always be 2.
User-entered Barometric Offset	61	2	Barometer calibration number in 1000 th of an inch
Barometric calibration number	63	2	Calibration offset in 1000 th of an inch
Barometric Sensor Raw Reading	65	2	In 1000 th of an inch
Absolute Barometric Pressure	67	2	In 1000 th of an inch, equals to the raw sensor reading plus user entered offset
Altimeter Setting	69	2	In 1000 th of an inch
Unused	71	1	Unused field, filled with 0xFF
Unused	72	1	Undefined

Field	Offset	Size	Explanation
Next 10-min Wind Speed Graph Pointer	73	1	Points to the next 10-minute wind speed graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next 15-min Wind Speed Graph Pointer	74	1	Points to the next 15-minute wind speed graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Hourly Wind Speed Graph Pointer	75	1	Points to the next hour wind speed graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Daily Wind Speed Graph Pointer	76	1	Points to the next daily wind speed graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Minute Rain Graph Pointer	77	1	Points to the next minute rain graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Rain Storm Graph Pointer	78	1	Points to the next rain storm graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 254on Vantage Vue console)
Index to the Minute within an Hour	79	1	It keeps track of the minute within an hour for the rain calculation. (range from 0 to 59)
Next Monthly Rain	80	1	Points to the next monthly rain graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Yearly Rain	81	1	Points to the next yearly rain graph point. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Next Seasonal Rain	82	1	Points to the next seasonal rain graph point. Yearly rain always resets at the beginning of the calendar, but seasonal rain resets when rain season begins. For current graph point, just subtract 1 (range from 0 to 23 on VP/VP2 console and 0 to 24 on Vantage Vue console)
Unused	83	2	Unused field, filled with 0x7FFF
Unused	85	2	Unused field, filled with 0x7FFF
Unused	87	2	Unused field, filled with 0x7FFF
Unused	89	2	Unused field, filled with 0x7FFF
Unused	91	2	Unused field, filled with 0x7FFF
Unused	93	2	Unused field, filled with 0x7FFF
"\n" <LF> = 0x0A	95	1	
"\r" <CR> = 0x0D	96	1	
CRC	97	2	
Total Length	99		

3. HILOW data format

The "HILOWS" command sends a 436 byte data packet and a 2 byte CRC value. The data packet is broken up into sections of related data values.

Contents of the HILOW packet.

Field	Offset	Size	Explanation
Barometer Section	0	16	
Daily Low Barometer	0	2	
Daily High Barometer	2	2	
Month Low Bar	4	2	

Field	Offset	Size	Explanation
Month High Bar	6	2	
Year Low Barometer	8	2	
Year High Barometer	10	2	
Time of Day Low Bar	12	2	
Time of Day High Bar	14	2	
Wind Speed Section	16	5	
Daily Hi Wind Speed	16	1	
Time of Hi Speed	17	2	
Month Hi Wind Speed	19	1	
Year Hi Wind Speed	20	1	
Inside Temp Section	21	16	
Day Hi Inside Temp	21	2	
Day Low Inside Temp	23	2	
Time Day Hi In Temp	25	2	
Time Day Low In Temp	27	2	
Month Low In Temp	29	2	
Month Hi In Temp	31	2	
Year Low In Temp	33	2	
Year Hi In Temp	35	2	
Inside Humidity Section	37	10	
Day Hi In Hum	37	1	
Day Low In Hum	38	1	
Time Day Hi In Hum	39	2	
Time Day Low In Hum	41	2	
Month Hi In Hum	43	1	
Month Low In Hum	44	1	
Year Hi In Hum	45	1	
Year Low In Hum	46	1	
Outside Temp Section	47	16	
Day Low Out Temp	47	2	
Day Hi Out Temp	49	2	
Time Day Low Out Temp	51	2	
Time Day Hi Out Temp	53	2	
Month Hi Out Temp	55	2	
Month Low Out Temp	57	2	
Year Hi Out Temp	59	2	
Year Low Out Temp	61	2	
Dew Point Section	63	16	
Day Low Dew Point	63	2	
Day Hi Dew Point	65	2	
Time Day Low Dew Point	67	2	
Time Day Hi Dew Point	69	2	
Month Hi Dew Point	71	2	
Month Low Dew Point	73	2	
Year Hi Dew Point	75	2	
Year Low Dew Point	77	2	

Field	Offset	Size	Explanation
Wind Chill Section	79	8	
Day Low Wind Chill	79	2	
Time Day Low Chill	81	2	
Month Low Wind Chill	83	2	
Year Low Wind Chill	85	2	
Heat Index Section	87	8	
Day High Heat	87	2	
Time of Day High Heat	89	2	
Month High Heat	91	2	
Year High Heat	93	2	
THSW Index Section	95	8	
Day High THSW	95	2	
Time of Day High THSW	97	2	
Month High THSW	99	2	
Year High THSW	101	2	
Solar Radiation Section	103	8	
Day High Solar Rad	103	2	
Time of Day High Solar	105	2	
Month High Solar Rad	107	2	
Year High Solar Rad	109	2	
UV Section	111	5	
Day High UV	111	1	
Time of Day High UV	112	2	
Month High UV	114	1	
Year High UV	115	1	
Rain Rate Section	116	10	
Day High Rain Rate	116	2	
Time of Day High Rain Rate	118	2	
Hour High Rain Rate	120	2	
Month High Rain Rate	122	2	
Year High Rain Rate	124	2	
Extra/Leaf/Soil Temps	126	150	Each field has 15 entries. Indexes 0 – 6 = Extra Temperatures 2 – 8 Indexes 7 – 10 = SoilTemperatures 1 – 4 Indexes 11 – 14 = Leaf Temperatures 1 – 4
Day Low Temperature	126	15	(15 * 1)
Day Hi Temperature	141	15	(15 * 1)
Time Day Low Temperature	156	30	(15 * 2)
Time Day Hi Temperature	186	30	(15 * 2)
Month Hi Temperature	216	15	(15 * 1)
Month Low Temperature	231	15	(15 * 1)
Year Hi Temperature	246	15	(15 * 1)
Year Low Temperature	261	15	(15 * 1)

Field	Offset	Size	Explanation
Outside/Extra Hums	276	80	Each field has 8 entries Index 0 = Outside Humidity Index 1 – 7 = Extra Humidities 2 – 8
Day Low Humidity	276	8	(8 * 1)
Day Hi Humidity	284	8	(8 * 1)
Time Day Low Humidity		16	(8 * 2)
Time Day Hi Humidity		16	(8 * 2)
Month Hi Humidity		8	(8 * 1)
Month Low Humidity		8	(8 * 1)
Year Hi Humidity		8	(8 * 1)
Year Low Humidity		8	(8 * 1)
Soil Moisture Section	356	40	Each field has 4 entries. Indexes 0 – 3 = Soil Moistures 1 – 4
Day Hi Soil Moisture		4	(4 * 1)
Time Day Hi Soil Moisture		8	(4 * 2)
Day Low Soil Moisture		4	(4 * 1)
Time Day Low Soil Moisture		8	(4 * 2)
Month Low Soil Moisture		4	(4 * 1)
Month Hi Soil Moisture		4	(4 * 1)
Year Low Soil Moisture		4	(4 * 1)
Year Hi Soil Moisture		4	(4 * 1)
Leaf Wetness Section	396	40	Each field has 4 entries. Indexes 0 – 3 = Leaf Wetness 1 – 4
Day Hi Leaf Wetness		4	(4 * 1)
Time Day Hi Leaf Wetness		8	(4 * 2)
Day Low Leaf Wetness		4	(4 * 1)
Time Day Low Leaf Wetness		8	(4 * 2)
Month Low Leaf Wetness		4	(4 * 1)
Month Hi Leaf Wetness		4	(4 * 1)
Year Low Leaf Wetness		4	(4 * 1)
Year Hi Leaf Wetness		4	(4 * 1)
CRC	436	2	

4. DMP and DMPAFT data format

There are two different archived data formats. Rev "A" firmware, dated before April 24, 2002 uses the old format. Rev "B" firmware dated on or after April 24, 2002 uses the new format. The fields up to ET are identical for both formats. The only differences are in the Soil, Leaf, Extra Temperature, Extra Humidity, High Solar, High UV, and forecast fields (reedOpen and reedClosed fields are removed).

You can use the VER command and parse the date returned to determine the archive data format, or you can examine byte 42 in the archive record. In a Rev B record, it will have the value 0x00. In a Rev A record, this byte is used for "Leaf Wetness 4" which is never assigned a real data value, so it will always contain 0xFF. Future record formats may assign different values for this field.