Serial MODBUS Sensor Application Definitions

Monnit Corporation

Version 2.1

Revision History

Version	Date	Description
1.1	1/14/2013	Added more app profiles. Edited Humidity, app profile # 18 and # 29
2.0	10/1/2013	Added FRR column
2.1	9/15/2014	Corrected Type 1 math calculation

Contents

Data Decoding Table 4

The table below explains the data from each sensor type.

Data Decoding Table

TYPE	NAME	DATA TYPE	UNIT	DATA	FRR Data
1	Analog Voltage	Unsigned Int16	Volts	Divide data by 1000 for three decimal point resolution. Example: 236 / 1000 = 0.236 V. Range: 0-1.25	[0-1250]-[0]-[0]-[0]
2	Temperature	Signed Int16	° Celsius	Divide data by 10 to get one decimal point resolution. Example: 271 / 10 = 27.1°C . Range: -40 to 125	[65136 – 1250]-[0]-[0]-[0]
3	Dry Contact	Unsigned Int8		0 for loop open and 1 for loop closed in default operation	[0-1]-[0]-[0]-[0]
4	Water	Unsigned Int8		0 for no water present and 1 for water present in default operation	[0-1]-[0]-[0]-[0]
5	Activity, Profile 1	Unsigned Int8		0 for no movement and 1 for movement detected in default operation	[0-1]-[0]-[0]-[0]
6	Magnetic Presence	Unsigned Int8		0 for magnet absent and 1 for magnet present in default operation	[0-1]-[0]-[0]-[0]
9	Open/Closed	Unsigned Int8		0 for magnet absent and 1 for magnet present in default operation	[0-1]-[0]-[0]-[0]
11	Button	Unsigned Int8		0 for button not pressed and 1 for button pressed	[0-1]-[0]-[0]-[0]
12	Control	Unsigned Int8	Relay1 Status Relay2 Status	LSB bit is the status of Relay 1, which is 0 for off and 1 for on. Bit offset 2 is the status of Relay2.	[0-3]-[0]-[0]-[0]
14	ID	None		Always zero. Sensor doesn't acquire data	[0]-[0]-[0]-[0]
15	Accelerometer, Profile 1	Signed Int16 / Signed Int16 / Signed Int16	X G-Force Y G-Force Z G-Force	Divide data by 1000 to get three decimal point resolution. Example: -2012 / 1000 = -2.012 G's Range: -8.000 to 8.000	[X]-[Y]-[Z]-[0] [65472-8000]-[65472-8000]-[65472-8000]-[0]
16	Accelerometer, Profile 3	Unsigned Int8		Bit 7 - Internal Communication Problems Bit 6 - EA - 1= Global Event Happened, 0=none Bit 5 - ZTRANSE - 0 = none, 1 = happened Bit 4 - Z_Trans_Pol - 0 = g+, 1 = g- Bit 3 - YTRANSE - 0 = none, 1 = happened Bit 2 - Y_Trans_Pol - 0 = g+, 1 = g- Bit 1 - XTRANSE - 0 = none, 1 = happened Bit 0 - X_Trans_Pol - 0 = g+, 1 = g-	[0-255]-[0]-[0]-[0]

18	Humidity	Unsigned Int16/ Unsigned Int16	°C / %RH	Data_H is Temperature; Data_L is Humidity. To convert temperature ticks to degrees Celsius: TmpC = (T_Ticks÷100) – 40; To convert humidity ticks to RH: (Need TmpC and these constants: C1 = -4.0 T1 = 0.01 C2 = 0.0405 T2 = 0.00008 C3 = -0.0000028) $RH_Linear=C3*H_Ticks^2+C2*H_Ticks+C1$ RH_True= (TmpC-25)*(T1+T2*H_Ticks)+RH_Linear If the RH_True is > 100, the %RH is just 100%. If RH_True < 0.1, the %RH is 0.1%	[0-65535]-[0-65535]-[0]-[0]
19	Activity, Profile 2	Unsigned Int16	Vibrations	Count of vibrations	[0-65535]-[0]-[0]-[0]
20	Accelerometer, Profile 2	Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 /	X G-Force Y G-Force Z G-Force X G-Force Y G-Force Z G-Force	Divide data by 1000 to get three decimal point resolution. The first data set is the MAX recorded value, the second data set is the AVG recorded value. Example: 1244 / 1000 = 1.244 G's Range: -8.000 to 8.000 Only the average values are available in the FRR. Max values can only be accessed in the corresponding WDR.	[DATA_3]-[DATA_4]-[DATA_5]-[0] [65472-8000]-[65472-8000]-[65472-8000]-[0]
21	Lux	Unsigned Int16	Lux	Lux reading. Range: 0-1300	[0-13000]-[0]-[0]-[0]
22	0-20 mA Current	Unsigned Int16	mA	Divide data by 100 to get two decimal point resolution. Example = 744/100 = 7.44 mA	[0-2400]-[0]-[0]-[0]
23	Infrared Motion	Unsigned Int8		0 for no motion detected and 1 for motion detected	[0-1]-[0]-[0]-[0]
24	Flex	Unsigned Int32	Resistance	Divide data by 1000 to get three decimal point resolution. Data_High is in the first FRR register.	[0-65535]-[0-65535]-[0]-[0]
26	Liquid Level, 8"	Unsigned Int16	Inches	Divide data by 100 to get two decimal point resolution.	[0-850]-[0]-[0]-[0]
27	Light Presence	Unsigned Int8		0 for light not present and 1 for light present	[0-1]-[0]-[0]-[0]
28	Compass	Signed Int16	Azimuth degr.	Azimuth reading.	[0-360]-[0]-[0]-[0]

29	HA Humidity	Unsigned Int16/ Unsigned Int16	°C / %RH	Data_H is Temperature; Data_L is Humidity. To convert temperature ticks to degrees Celsius: TmpC = (T_Ticks÷100) – 40; To convert humidity ticks to RH: (Need TmpC and these constants: C1 = -4.0 T1 = 0.01 C2 = 0.0405 T2 = 0.00008 C3 = -0.0000028) RH_Linear=C3*H_Ticks^2+C2*H_Ticks+C1 RH_True= (TmpC-25)*(T1+T2*H_Ticks)+RH_Linear If the RH_True is > 100, the %RH is just 100%. If RH_True < 0.1, the %RH is 0.1.	[0-65535]-[0-65535]-[0]-[0]
30	Grains Per Pound	Signed Int16 / Signed Int16	°C / %RH	Divide data by 100 to get Temperature. Divide data by 100 to get Relative Humidity.	
31	120VAC Voltage Detect	Unsigned Int8		0 for no voltage detected and 1 for voltage detected	[0-1]-[0]-[0]-[0]
32	500 VAC/VDC Analog Voltage	Unsigned Int16	Volts	Divide data by 10 to get one decimal point resolution. Example: 1134/10=113.4V Range: 0-500	[0-5000]-[0]-[0]-[0]
33	Vehicle Presence	Unsigned Int8/ Signed Int16	Magnitude	In the state field, the presence is marked 0 for no vehicle and 1 for vehicle presence. This is displayed in the FRR in the first register. The second register contains the data from WDR Data_0	[0, 1, 2, 15]-[0-65535]-[0]-[0] [STATE]-[DATA_0]-[0]-[0]
34	CO Gas Sensor	Signed Int16/ Unsigned Int16	Temperature PPM	Temperature and the gas concentration in PPM	[Temp range]-[0-65535]-[0]-[0]
35	High Temperature	Signed Int16	° Celsius	Divide data by 10 to get one decimal point resolution. Example: 2550/10 = 255.0°C	[65036-3700]-[0]-[0]-[0]
36	Liquid Level 24”	Unsigned Int16	Inches	Divide data by 100 to get two decimal point resolution.	[0-2400]-[0]-[0]-[0]
39	Vehicle Detection	Unsigned Int8/ Unsigned Int16/ Unsigned Int16/ Unsigned Int16/	Vehicle Count Magnitude Duration Cnt	The number of vehicles counted, the magnitude of the field and the duration is reported. The direction is displayed in the first FRR register.	[0, 1, 15]-[0-65535]-[0-65535]-[0-65535] [Direction]-[Data_0]-[Data_1]-[Data_2]
40	Vehicle Speed	Unsigned Int8/ Unsigned Int16/ Unsigned Int16/	Direction Magnitude Milliseconds	Direction is reported in first FRR register. Time calculated between Vehicle Detection and Speed sensor is Data_0 is the WDR and is the second FRR register here.	[0, 1, 15]-[0-65535]-[0-65535]-[0] [Direction]-[Data_0]-[Data_1]-[0]

41	Pressure	Signed Int16	PSI	Divide data by 10 to get one decimal point resolution. Example: 1451 / 10 = 145.1 PSI	[0-1600]-[0]-[0]-[0]
42	Activity Counter	Unsigned Int16/ Unsigned Int16/	Minutes	The current amount of time of calculated activity followed by the previous reading.	[0-65535]-[0-65535]-[0]-[0]
43	HA Humidity	Signed Int16/ Signed Int16/	°C %RH	Divide data by 100 to get Temperature. Divide data by 100 to get Relative Humidity.	[63536-6000]-[0-10000]-[0]-[0]
45	Smart Repeater	Unsigned Int16/ UnsignedInt16/ UnsignedInt16/ UnsignedInt16/	DCnt Rxm Fls Qu	Device Count (on network) Received Messages (from sensors) Failures (Messages that failed) Queue (Messages waiting for delivery)	[0-1000]-[0-65535]-[0-65535]-[0-65535]
46	Low Temperature	Signed Int16	° C	Divide data by 10 to get one decimal point resolution. Example: -574/10= -57.4°C	[63536-1620]-[0]-[0]-[0]
47	Multi Input Pulse Counter	Unsigned Int16/ Unsigned Int16/ Unsigned Int16/ Unsigned Int16	Pulses Pulses Pulses Pulses	The cumulative count of pulse events detected since the last heartbeat.	[0-65535]-[0-65535]-[0-65535]-[0-65535]
48	Single Input Pulse Counter	Unsigned Int16/ Unsigned Int16	Pulses	Current event count, followed by previous data.	[0-65535]-[0-65535]-[0]-[0]
51	Seat Sensor	Unsigned Int8/ Unsigned Int32	KOhms	0=no event, 1=event followed by the resistance measured (divide by 1000). Data High is in the second FRR register and Data Low is in the third.	[0-1]-[0-65535]-[0-65535]-[0]
52	Airflow Sensor	Unsigned Int8/ Unsigned Int32	KOhms	0=no event, 1=event followed by the resistance measured (divide by 1000). Data High is in the second FRR register and Data Low is in the third.	[0-1]-[0-65535]-[0-65535]-[0]
53	Multi Temp Strip				
55	CT1mA	Unsigned Int16	Milliamps	Milliamp divided by 10	[0-10000]-[0]-[0]-[0]
59	Battery Health	Unsigned Int16	Volts	Volts divided by 1000	[0-50000]-[0]-[0]-[0]
60	HMI Activity	Unsigned Int8			[0-255]-[0]-[0]-[0]
61	HMI PIR	Unsigned Int8			[0-255]-[0]-[0]-[0]
62	HMI Seat	Unsigned Int8			[0-255]-[0]-[0]-[0]
64	AC Voltage Detector	Unsigned Int8		No voltage detected = 0; Voltage detected = 1	[0-1]-[0]-[0]-[0]