Serial MODBUS Sensor Application Definitions

Monnit Corporation

Version 1.1

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Revision History

Version	Date	Description
1.0	9/14/2012	created by Lynnette Padilla
1.1	1/14/2013	Added more app profiles. Edited Humidity, app profile # 18 and # 29

Contents

Introduction

The purpose of this document is to enumerate how to decode the data on a Monnit Serial MODBUS Gateway for every sensor type that Monnit offers.

Data Decoding Table

TYPE	NAME	DATA TYPE	UNIT	DATA
1	Analog Voltage	Unsigned Int16	Volts	Divide data by 1000 to get three decimal point resolution. Example: 236 / 100 = 0.236 V
2	Temperature	Signed Int32	° Celsius	Divide data by 10 to get one decimal point resolution. Example: 271 / 10 = 27.1°C
3	Dry Contact	Unsigned Int32		0 for loop open and 1 for loop closed in default operation
4	Water	Unsigned Int32		0 for no water present and 1 for water present in default operation
5	Activity, Profile 1	Unsigned Int32		0 for no movement and 1 for movement detected in default operation
6	Magnetic Presence	Unsigned Int32		0 for magnet absent and 1 for magnet present in default operation
9	Open/Closed	Unsigned Int32		0 for magnet absent and 1 for magnet present in default operation
11	Button	Unsigned Int32		0 for button not pressed and 1 for button pressed
14	ID			Always zero. Sensor doesn't acquire data
15	Accelerometer, Profile 1	Signed Int16 / Signed Int16 / Signed Int16	X-axis G-Force Y-axis G-Force Z-axis G-Force	NOT AVAILABLE in FRR!! Divide data by 1000 to get three decimal point resolution. Example: -2012 / 1000 = -2.012 G's
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-

TYPE	NAME	DATA TYPE	UNIT	DATA
18	Humidity	Unsigned Int16 / Unsigned Int16	°C / %RH	Data_H is Temperature; Data_L is Humidity. To convert temperature ticks to degrees Celsius: $TmpC = (T\_Ticks \div 100) - 40$; 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%
19	Activity, Profile 2	Unsigned Int16	# of vibrations	Count of vibrations
20	Accelerometer, Profile 2	Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 / Signed Int16 /	X-axis G-Force Y-axis G-Force Z-axis G-Force X-axis G-Force Y-axis G-Force Z-axis G-Force	NOT AVAILABLE IN FRR! 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
21	Lux	Unsigned Int16	Lux	Lux reading.
22	0-20 mA Current	Unsigned Int16	mA	Divide data by 100 to get two decimal point resolution. Example = 744/100 = 7.44 mA
23	Infrared Motion	Unsigned Int8		0 for no motion detected and 1 for motion detected
24	Flex	Unsigned Int32	Resistance	Divide data by 1000 to get three decimal point resolution.
26	Liquid Level, 8"	Unsigned Int16	Inches	Divide data by 100 to get two decimal point resolution.
27	Light Presence	Unsigned Int8		0 for light not present and 1 for light present
28	Compass	Signed Int16	Azimuth degr.	Azimuth reading.
29	HA Humidity	Unsigned Int16 / Unsigned Int16	°C / %RH	Data_H is Temperature; Data_L is Humidity. To convert temperature ticks to degrees Celsius: $TmpC = (T\_Ticks \div 100) - 40$; 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.

TYPE	NAME	DATA TYPE	UNIT	DATA
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
32	500 VAC/VDC Analog Voltage	Unsigned Int16	Volts	Divide data by 10 to get one decimal point resolution. Example: 1134/10=113.4V
33	Vehicle Presence	Signed Int16	Tics	Raw data from Compass IC
34	Gas Sensor	TBD	TBD	TBD
35	High Temperature	Signed Int16	° Celsius	Divide data by 10 to get one decimal point resolution. Example: 2550/10 = 255.0°C
36	Liquid Level 24"	Unsigned Int16	Inches	Divide data by 100 to get two decimal point resolution.
39	Vehicle Detection	Unsigned Int16/ Unsigned Int16/ Unsigned Int16/	Count Tics Detection Cnt	Raw Data from IC.
40	Vehicle Speed	Unsigned Int16/ Unsigned Int16/	Direction? milliseconds	Time calculated between Vehicle Detection and Speed sensor and used in the UI with the distance to calculate speed.
41	Pressure	Signed Int16	PSI	Divide data by 10 to get one decimal point resolution. Example: 1451 / 10 = 145.1 PSI
42	Activity Counter	Unsigned Int16/ Unsigned Int16/	Minutes	The current amount of time of calculated activity followed by the previous reading.
43	HA Humidity	Signed Int16/ Signed Int16/	°C %RH	Divide data by 100 to get Temperature. Divide data by 100 to get Relative Humidity.

TYPE	NAME	DATA TYPE	UNIT	DATA
45	Smart Repeater			
46	Low Temperature	Signed Int16	° C	Divide data by 10 to get one decimal point resolution. Example: -574/10= -57.4°C
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.
48	Single Input Pulse Counter	Unsigned Int16/ Unsigned Int16	Pulses	Current event count, followed by previous data.
51	Seat Sensor	Unsigned Int8/ Unsigned Int32	KOhms	0=no event, 1=event followed by the resistance measured (divide by 100)
52	Airflow Sensor	Unsigned Int8/ Unsigned Int32	KOhms	0=no event, 1=event followed by the resistance measured (divide by 100)