1 Node Descriptor 43 – Humidity

1.1 Device Description

The Humidity sensor is a sensitive surface mount sensor that is capable of determining the relative humidity of the ambient air, as well as the current temperature and dew point.

1.2 Hardware Details

1.2.1 Humidity sensor

Possible hardware combinations include:

- Platform RFSC Rev A, Version x: Not supported
- Platform RFSC Rev B, Version 1.2: Not supported
- Platform RFSC Rev C, Version 2.0+: SP5 – Power, SP6 – Clock, SP7 – Data, SP8 – GND

The humidity sensor is mounted onto a daughter board and soldered. The daughter board is attached to a 4-pin header and the 4-pin header is inserted on the sensor ports of the RFSC.

Source Voltage	2.4 V min, 3.3 V typ, 5.5 V max
Sleep Power Consumption	2 µW typ, 5 µW max
Measuring Power Consumption	3 mW
Average Power Consumption	90 µW
Storage Temperature	10-50° C, 20-60% RH
RH Resolution	0.4% RH min, 0.05% RH typ
RH Accuracy	±2% RH (50% - 85% RH)
RH Repeatability	±0.1% RH
RH Hysteresis	±1% RH
RH Non-linearity	<<1% RH
RH Response Time	8 s
RH Operating Range	0 – 100 % RH
RH Long Term Drift	<0.5% RH/year
Temperature Resolution	0.04°C min, 0.01° C typ
Temperature Accuracy	±0.04° C (25° C)
Temperature Repeatability	±0.01° C
Temperature Operating Range	-40 to 123.8° C
Temperature Response Time	5 to 30 sec
Temperature Long Term Drift	<0.04° C / year

1.3 Enclosure Details

Standard Monnit enclosures including: WIT, WIT2, Industrial, MOWI.

1.4 MNP Message Details

1.4.1 STATE (SOM, SDM)

Both the Spurious Orphan Message (SOM) and the Spurious Data Message (SDM) contain the STATE field. STATE is defined here. (For definition of STATE, refer to Monnit Network Specifications, Section 4.2).

Field	Length	Description
Test Active	1 bit LSB	Test state is active (1) or inactive (0)
Aware State	1 bit	Aware state is active (1) or inactive (0)
Sensor Disable	1 bit	Sensor is disabled (communication still happens)
RSVD	1 bit	Currently not used
STS	1 bit	Self Test results are normal (0) or out of range (1)
Not Used	1 bit	
Not used	1 bit	
Not used	1 bit MSB	

This application specifies no additional action control types.

1.4.2 SDATA (SDM)

The Spurious Data Message contains the SDATA field, which is defined here. The field is defaulted to 5 bytes total for this application.

SDATA[0]: App_DiscoverState()

SDATA[1-2]: Temperature Ticks.

SDATA[3-4]: Humidity Ticks.

Field	Length	Value	Format
SDATA[0]	1 byte	Int8	STATE.
SDATA[1-2]	2 bytes	Signed Int16	Temperature Data. Divide by 100 to get 2 decimal points.
SDATA[3-4]	2 bytes	Signed Int16	Humidity Data. Divide by 100 to get 2 decimal points.

1.5 General Configuration Defaults

The Configuration Defaults below are native to the Humidity sensor only.

Field	Default	Min	Max	Comments
NODEDESC	43	N/A	N/A	Fixed.

1.6 Profile Defaults

The Humidity sensor operates using the Interval device profile.

Field	Default	Min	Max	Comments
PROFILE	1	N/A	N/A	1 = Interval device profile.
MRES	1	1	250	1 = Every RH measurement is reported.
SYNCMASK	0	0	255	Synchronization or offset of heartbeats.
HYST	0	0		Specified in 0.01%RH
THRSHMIN	60536	60536	655375000	Operating Range: Low bits are temp (min=-50C), high bits are humidity. See note.
THRSHMAX	655375000	60536	655375000	Operating Range: Low bits are temp (max=150C), high bits are humidity. See note.
CALVAL_1	0xFFFFFFFF	N/A	N/A	Not used.
CALVAL_2	0xFFFFFFFF	N/A	N/A	Not used.
CALVAL_3	0xFFFFFFFF	N/A	N/A	Not used.
CALVAL_4	0xFFFFFFFF	N/A	N/A	Not used.

Note:

Threshold	Hex value	Humidity value	%RH	Temperature value	Temperature
60536	0x0000EC78	0x0000 = 0	0%RH	0xEC78 = -5000	-50°C
655375000	0x27103A98	0x2710 = 10000	100.00%RH	0x3A98 = 15000	150°C