Software Design Specification Document
SDS13812 - Multilevel Sensor Command Class, list of assigned Multilevel Sensor types and scales

This document defines Multilevel Sensor types and scale that can be used with the Multilevel Sensor Command Class.

Refer to the "Multilevel Sensor" tab in this workbook for the assigned values.

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Revision Record

Doc. Revision	Change by	Date	Comment
1	Nicolas Obriot	12-11-2016	Initial revision. Adding the following sensors types: - Domestic Hot Water (DHW) temperature - Modulation level - Outside temperature - Exhaust temperature - Boiler water temperature Deprecated the General Purpose Sensor

Sensor Type (8 bits)				Scale (2 bits)		
Name	Value	Supported bitmask		Label	Value	Required version
		Byte #	Bit #			
Reserved	0x00	N/A	N/A	Reserved	0x00..0x03	N/A
Air temperature	0x01	Byte 1	Bit 0	Celcius (C)	0x00	V1
				Fahrenheit (F)	0x01	V1
				Reserved	0x02..0x03	N/A
General purpose [DEPRECATED by V11]	The use of this Sensor Type is NOT RECOMMENDED. It does not contain any information about the value being read and cannot be decoded by a controller. It is RECOMMENDED to use a read-only Configuration Parameter to advertise a device specific value					
	0x02	Byte 1	Bit 1	Percentage value (%)	0x00	V1
				Dimensionless value	0x01	V1
				Reserved	0x02..0x03	N/A
Luminance	0x03	Byte 1	Bit 2	Percentage value (%)	0x00	V1
				Lux	0x01	V1
				Reserved	0x02..0x03	N/A
Power	0x04	Byte 1	Bit 3	Watt (W)	0x00	V2
				Btu/h	0x01	V2
				Reserved	0x02..0x03	N/A
Humidity	0x05	Byte 1	Bit 4	Percentage value (%)	0x00	V2
				Absolute humidity (g/m^3)	0x01	V5
				Reserved	0x02..0x03	N/A
Velocity	0x06	Byte 1	Bit 5	m/s	0x00	V2
				Mph	0x01	V2
				Reserved	0x02..0x03	N/A
Direction	0x07	Byte 1	Bit 6	0 to 360 degrees 0 = no wind, 90 = east, 180 = south, 270 = west and 360 = north	0x00	V2
				Reserved	0x01..0x03	N/A
Atmospheric pressure	0x08	Byte 1	Bit 7	Kilopascal (kPa)	0x00	V2
				Inches of Mercury	0x01	V2
				Reserved	0x02..0x03	N/A
Barometric pressure	0x09	Byte 2	Bit 0	Kilopascal (kPa)	0x00	V2
				Inches of Mercury	0x01	V2
				Reserved	0x02..0x03	N/A
Solar radiation	0x0A	Byte 2	Bit 1	Watt per square meter (W/m^2)	0x00	V2
				Reserved	0x01..0x03	N/A
Dew point	0x0B	Byte 2	Bit 2	Celcius (C)	0x00	V1
				Fahrenheit (F)	0x01	V1
				Reserved	0x02..0x03	N/A
Rain rate	0x0C	Byte 2	Bit 3	Millimeter/hour (mm/h)	0x00	V2
				Inches per hour (in/h)	0x01	V2
				Reserved	0x02..0x03	N/A
Tide level	0x0D	Byte 2	Bit 4	Meter (m)	0x00	V2
				Feet (ft)	0x01	V2
				Reserved	0x02..0x03	N/A
Weight	0x0E	Byte 2	Bit 5	Kilogram (kg)	0x00	V3
				Pounds (lb)	0x01	V3
				Reserved	0x02..0x03	N/A
Voltage	0x0F	Byte 2	Bit 6	Volt (V)	0x00	V3
				Millivolt (mV)	0x01	V3
				Reserved	0x02..0x03	N/A
Current	0x10	Byte 2	Bit 7	Ampere (A)	0x00	V3
				Milliampere (mA)	0x01	V3
				Reserved	0x02..0x03	N/A
Carbon dioxide CO2-level	0x11	Byte 3	Bit 0	Parts/million (ppm)	0x00	V3
				Reserved	0x01..0x03	N/A
Air flow	0x12	Byte 3	Bit 1	Cubic meter per hour (m^3/h)	0x00	V3
				Cubic feet per minute (cfm)	0x01	V3
				Reserved	0x02..0x03	N/A

Sensor Type (8 bits)				Scale (2 bits)		
Name	Value	Supported bitmask		Label	Value	Required version
		Byte #	Bit #			
Tank capacity	0x13	Byte 3	Bit 2	Liter (l)	0x00	V3
				Cubic meter (m^3)	0x01	V3
				Gallons	0x02	V3
				Reserved	0x03	N/A
Distance	0x14	Byte 3	Bit 3	Meter (m)	0x00	V3
				Centimeter (cm)	0x01	V3
				Feet (ft)	0x02	V3
				Reserved	0x03	N/A
Angle position [DEPRECATED by V8]	The use of this Sensor Type is NOT RECOMMENDED. The Direction (0x07) Sensor Type SHOULD be used for reporting polar positions. A device implementing the Angle Position Sensor Type SHOULD also implement the Direction (0x07) Sensor Type.					
	0x15	Byte 3	Bit 4	Percentage value (%)	0x00	V4-V7
				Degrees relative to north pole of standing eye view	0x01	V4-V7
				Degrees relative to north pole of standing eye view	0x02	V4-V7
				Reserved	0x03	N/A
Rotation	0x16	Byte 3	Bit 5	Revolutions per minute (rpm)	0x00	V5
				Hertz (Hz)	0x01	V5
				Reserved	0x02..0x03	N/A
Water temperature	0x17	Byte 3	Bit 6	Celcius (C)	0x00	V5
				Fahrenheit (F)	0x01	V5
				Reserved	0x02..0x03	N/A
Soil temperature	0x18	Byte 3	Bit 7	Celcius (C)	0x00	V5
				Fahrenheit (F)	0x01	V5
				Reserved	0x02..0x03	N/A
Seismic Intensity	0x19	Byte 4	Bit 0	Mercalli	0x00	V5
				European Macroseismic	0x01	V5
				Liedu	0x02	V5
				Shindo	0x03	V5
Seismic magnitude	0x1A	Byte 4	Bit 1	Local	0x00	V5
				Moment	0x01	V5
				Surface wave	0x02	V5
				Body wave	0x03	V5
Ultraviolet	0x1B	Byte 4	Bit 2	UV index	0x00	V5
				Reserved	0x01..0x03	N/A
Electrical resistivity	0x1C	Byte 4	Bit 3	Ohm meter (Ωm)	0x00	V5
				Reserved	0x01..0x03	N/A
Electrical conductivity	0x1D	Byte 4	Bit 4	Siemens per meter (S/m)	0x00	V5
				Reserved	0x01..0x03	N/A
Loudness	0x1E	Byte 4	Bit 5	Decibel (dB)	0x00	V5
				A-weighted decibels (dBA)	0x01	V5
				Reserved	0x02..0x03	N/A
Moisture	0x1F	Byte 4	Bit 6	Percentage value (%)	0x00	V5
				Volume water content (m^3/m^3)	0x01	V5
				Impedance (kΩ)	0x02	V5
				Water activity (aw)	0x03	V5
Frequency	0x20	Byte 4	Bit 7	Hertz (Hz) MUST be used until 2.147483647 GHz	0x00	V6
				kilohertz (kHz) MUST be used after 2.147483647 GHz	0x01	V6
				Reserved	0x02..0x03	N/A
Time	0x21	Byte 5	Bit 0	Second (s)	0x00	V6
				Reserved	0x01..0x03	N/A
Target temperature	0x22	Byte 5	Bit 1	Celcius (C)	0x00	V6
				Fahrenheit (F)	0x01	V6
				Reserved	0x02..0x03	N/A

Sensor Type (8 bits)				Scale (2 bits)		
Name	Value	Supported bitmask		Label	Value	Required version
		Byte #	Bit #			
Particulate Matter 2.5	0x23	Byte 5	Bit 2	Mole per cubic meter (mol/m^3)	0x00	V7
				Microgram per cubic meter (µg/m^3)	0x01	V7
				Reserved	0x02..0x03	N/A
Formaldehyde CH2O-level	0x24	Byte 5	Bit 3	Mole per cubic meter (mol/m^3)	0x00	V7
				Reserved	0x01..0x03	N/A
Radon concentration	0x25	Byte 5	Bit 4	Becquerel per cubic meter (bq/m^3)	0x00	V7
				Picocuries per liter (pCi/l)	0x01	V7
				Reserved	0x02..0x03	N/A
Methane (CH4) density	0x26	Byte 5	Bit 5	Mole per cubic meter (mol/m^3)	0x00	V7
				Reserved	0x01..0x03	N/A
Volatile Organic Compound level	0x27	Byte 5	Bit 6	Mole per cubic meter (mol/m^3)	0x00	V7
				Parts/million (ppm)	0x01	V10
				Reserved	0x02..0x03	N/A
Carbon monoxide (CO) level	0x28	Byte 5	Bit 7	Mole per cubic meter (mol/m^3)	0x00	V7
				Parts/million (ppm)	0x01	V10
				Reserved	0x02..0x03	N/A
Soil humidity	0x29	Byte 6	Bit 0	Percentage value (%)	0x00	V7
				Reserved	0x01..0x03	N/A
Soil reactivity	0x2A	Byte 6	Bit 1	Acidity (pH)	0x00	V7
				Reserved	0x01..0x03	N/A
Soil salinity	0x2B	Byte 6	Bit 2	Mole per cubic meter (mol/m^3)	0x00	V7
				Reserved	0x01..0x03	N/A
Heart rate	0x2C	Byte 6	Bit 3	Beats per minute (bpm)	0x00	V7
				Reserved	0x01..0x03	N/A
Blood pressure	0x2D	Byte 6	Bit 4	Systolic (mmHg) (upper #)	0x00	V7
				Diastolic (mmHg) (lower #)	0x01	V7
				Reserved	0x02..0x03	N/A
Muscle mass	0x2E	Byte 6	Bit 5	Kilogram (kg)	0x00	V7
				Reserved	0x01..0x03	N/A
Fat mass	0x2F	Byte 6	Bit 6	Kilogram (kg)	0x00	V7
				Reserved	0x01..0x03	N/A
Bone mass	0x30	Byte 6	Bit 7	Kilogram (kg)	0x00	V7
				Reserved	0x01..0x03	N/A
Total body water (TBW)	0x31	Byte 7	Bit 0	Kilogram (kg)	0x00	V7
				Reserved	0x01..0x03	N/A
Basis metabolic rate (BMR)	0x32	Byte 7	Bit 1	Joule (J)	0x00	V7
				Reserved	0x01..0x03	N/A
Body Mass Index (BMI)	0x33	Byte 7	Bit 2	BMI Index	0x00	V7
				Reserved	0x01..0x03	N/A
Acceleration X-axis	0x34	Byte 7	Bit 3	Meter per square second (m/s^2)	0x00	V8
				Reserved	0x01..0x03	N/A
Acceleration Y-axis	0x35	Byte 7	Bit 4	Meter per square second (m/s^2)	0x00	V8
				Reserved	0x01..0x03	N/A
Acceleration Z-axis	0x36	Byte 7	Bit 5	Meter per square second (m/s^2)	0x00	V8
				Reserved	0x01..0x03	N/A
Smoke density	0x37	Byte 7	Bit 6	Percentage value (%)	0x00	V8
				Reserved	0x01..0x03	N/A
Water flow	0x38	Byte 7	Bit 7	Liter per hour (l/h)	0x00	V9
				Reserved	0x01..0x03	N/A
Water pressure	0x39	Byte 8	Bit 0	Kilopascal (kPa)	0x00	V9
				Reserved	0x01..0x03	N/A
RF signal strength	0x3A	Byte 8	Bit 1	RSSI (percentage value)	0x00	V9
				dBm	0x01	V9
				Reserved	0x02..0x03	N/A

Sensor Type (8 bits)				Scale (2 bits)		
Name	Value	Supported bitmask		Label	Value	Required version
		Byte #	Bit #			
Particulate Matter 10	0x3B	Byte 8	Bit 2	Mole per cubic meter (mol/m^3)	0x00	V10
				Microgram per cubic meter (µg/m^3)	0x01	V10
				Reserved	0x02..0x03	N/A
Respiratory rate	0x3C	Byte 8	Bit 3	Breaths per minute (bpm)	0x00	V10
				Reserved	0x01..0x03	N/A
Relative Modulation level	0x3D	Byte 8	Bit 4	Percentage value (%)	0x00	V11
				Reserved	0x01..0x03	N/A
Boiler water temperature	0x3E	Byte 8	Bit 5	Celcius (C)	0x00	V11
				Reserved	0x01..0x03	N/A
Domestic Hot Water (DHW) temperature	0x3F	Byte 8	Bit 6	Celcius (C)	0x00	V11
				Reserved	0x01..0x03	N/A
Outside temperature	0x40	Byte 8	Bit 7	Celcius (C)	0x00	V11
				Reserved	0x01..0x03	N/A
Exhaust temperature	0x41	Byte 9	Bit 0	Celcius (C)	0x00	V11
				Reserved	0x01..0x03	N/A